Systemwide Program

on

Participatory Research and Gender Analysis for Technology Development and Institutional Innovation

A proposal to the: Technical Advisory Committee (TAC)

Submitted by:

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(International Center for Tropical Agriculture)
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(International Maize and Wheat Improvement Center)
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The Need for a Systemwide Program

The participation of farmers—especially women—in technology development is vital for achieving impact that benefits poor people. Household food security, and especially the well-being of children in poor countries, is vitally affected by women's access to technology appropriate for their needs. This is why the CGIAR system urgently needs to strengthen, consolidate, and mainstream its gender analysis and participatory research in a high-priority, high-visibility program that recognizes farmer participation as an important strategic research issue.

Over the last decade or more, the IARCs have done substantial work to introduce a user perspective into adaptive research. This proposal builds upon that work but offers something more. It originates from recent evidence that user participation can be critical in the *pre-adaptive* stages of certain types of research. In contrast to earlier approaches to on-farm research, pre-adaptive participatory R&D brings users into the early stages of technology development as researchers and decision makers, who help set priorities, define criteria for success, and determine when an innovation is "ready" for release to farmers. This new role changes the division of labor between farmers and scientists, and may dramatically reduce the cost of applied research. We have some evidence that this novel approach can significantly improve the impact of research for poor farmers, especially women. However, evidence is patchy and it is not well understood how to replicate success on a large scale. The key contribution of this proposal will be to develop clear guidelines on how to achieve this, and build capacity to operationalize novel approaches in practice.

It is now widely recognized that sustaining the productivity gains from earlier CGIAR success must be done in a way that preserves biodiversity and the natural resource base, protects the environment, and maintains and protects the farm family's health and livelihood. Pre-adaptive participatory research will be an important research tool in developing NRM technologies.

To determine the potential of pre-adaptive participatory R&D involves considerable effort in methodology development. The outputs of this work are participatory techniques and tools for gender analysis that are useful inside and outside the CGIAR. These products are truly "international public goods," requiring rigorous empirical research on new techniques integrated with strategic and applied research for technology development.

This type of methodology development is dispersed and often sporadic. The result is duplication of effort and a persistent deficit of knowledge on how to incorporate the methods cost-effectively. By pooling resources in a systemwide effort, institutions will greatly accelerate the development of new tools that make farmers genuine partners in research.

Program Goal

To improve the ability of the CGIAR System and other collaborating institutions to develop technology which alleviates poverty, improves food security and protects the environment with greater equity.

Program Purpose

To assess and develop methodologies and organizational innovations for gender-sensitive participatory research, and operationalize their use in plant breeding, crop and natural resource management.

Beneficiaries

- Poor farmers, especially women, will benefit from accelerated and more widespread adoption of more appropriate technology, by having regular input into its development.
- CGIAR centers, NARIs, NGOs, and rural grassroots organizations will be able to work more effectively with gender differentiated technology users, and as a result, they will develop and deliver appropriate technology for low-income farmers more cost-effectively.

Expected Impact

Methods

- This research will accelerate technology development and adoption for crop improvement and natural resource management (NRM), by accelerating learning from existing experience and by generating new, widely applicable methodologies for pre-adaptive participatory research and gender analysis tested in at least eight contrasting projects around the world.
- Researchers will have a stronger capacity to process feedback on technology design from gender-differentiated client groups.

Institutional strengthening

- The CGIAR and NARS will access worldwide exchange of expertise on participatory research and gender analysis among a wide range of institutions.
- Better designed technologies, with a greater probability of adoption and with less time

in the pipeline before testing by clients, will result in considerable savings and increased impact for NARS.

- Indigenous systems of crop development and natural resource management will be strengthened and integrated in a mutually reinforcing way with formal research.
- Organisational innovations required to "mainstream" gender analysis and participatory approaches will be identified and tested.
- Capacity-building in participatory research methods and gender-analysis tools will be expanded for a wide audience.

Poverty-alleviation and environmental protection

- Poor rural women will be important participants in and beneficiaries of the research.
- The development and adoption of diverse germplasm that uses and conserves the genetic traits deemed valuable by farmers and breeders will be greatly accelerated in major food crops.
- Technologies for natural resource management that increase food security while protecting the environment will be more acceptable to users and will be adopted more rapidly.

Innovations

- Methodologies for pre-adaptive participatory R&D will promote user involvement in the early stages of technology design.
- Gender analysis will be integrated into core plant breeding and NRM research projects.
- Through empirical studies and comparative data, it will be possible to assess the payoff to participatory methods and gender analysis in different stages of research.
- NARS, NGOs, and producers will be closely involved with the CGIAR in methodology development for participatory R&D.
- The institutions involved will acquire a stronger capacity to operationalize participatory research and gender analysis in their core activities.

Institutional Partners

CIAT, CIMMYT, IRRI and ICARDA have agreed to cosponsor this programme in the CGIAR. A plan of work has been developed by interested institutions which have capacity to contribute to methodology development are actively engaged in some aspect of participatory research. Among partners of this character, interest has been indicated to date by a diversity of IARCs, NGOs and NARS (see list of participants attached).

Implementation Period

- Planning phase: April to December 1996 (completed).
- Full program: Five years. 1997-2001

Location

This will be a global effort, with sites for empirical work, training workshops, and dissemination in Africa, Asia, and Latin America.

Budget

Total program funding for 1997 amounts to US$0.9 million. This will enable partners to conduct empirical studies needed for methodology development, conduct capacity-building training and workshops; assess current practices; and network by e-mail.

Management

Three decentralized working groups will be formed from projects in their respective thematic areas: participatory plant breeding, participatory NRM research, and gender analysis. The 8-member Planning Group has elected representatives from each working group and from 4 types of stakeholders (NARIs, NGO's, Donors and IARCs), and will allocate resources to the workplans developed by each working group.

Executing Agency

The International Center for Tropical Agriculture (CIAT) in Colombia, South America.

Outputs

1. Methods for participatory plant breeding (PPB)

- Participatory research methods and gender analysis tools suitable for integrating farmer crop development systems with advanced breeding techniques.
- Participatory breeding strategies refined for a cross section of species, with guidelines on appropriate breeding populations, field techniques, and suitable biotechnology tools.
- Methods to identify, strengthen, and link to research the knowledge and skills of rural men and women in germplasm management.
- Varieties acceptable to farmers that incorporate traits derived from local landraces and global germplasm.

2. *Methods for participatory research on natural resource management (NRM).*

- Participatory research methods and gender analysis tools suitable for integrating indigenous experimentation on NRM with formal research.
- Strategies and methods for participatory development of a cross section of prototype NRM technologies, which can address the diversity of farmers' objectives in soil, water, and plant management.
- Methods to identify, strengthen, and link to research the knowledge and skills of rural men and women in experimenting with NRM practices.
- Technologies acceptable to farmers for increasing productivity while protecting the environment.

3. *Gender-sensitive methodologies suitable for pre-adaptive participatory research.*

- Participatory methods for determining when it is crucial to involve women at an early stage in technology design.
- Methods that enable user groups to provide feedback to research from participatory monitoring of gender-differentiated effects of new technologies.

4. *Organizational innovations for institutionalizing participatory approaches operationalized and evaluated.*

- Participatory projects will test and evaluate novel organizational linkages.

5. *Innovative approaches to capacity building operationalized.*

- International seminars, training and trainers workshops will draw on studies of best practices and empirical methodology development.

6. *New partnerships among the IARCs, NARS, NGOs and farmer groups.*

- The programme will provide a mechanism for these different institutions to work together in practice.

Activities:

- Empirical field studies for methodology development will be integrated into ongoing CGIAR/NARS projects.

- Training in participatory research methods and gender analysis will be offered to IARCs, NARs, and producer organizations taking part in joint projects.

- Specialized workshops will be organized on participatory plant breeding, participatory NRM research, and gender analysis.

- International seminars on comparative analysis of results will be held to assess applications of the same methodologies across different fields.

Budget Summary (in US $)

Total grant request: US$990,000

1. Workshops and empirical studies for participatory plant breeding: US$640,500
2. Workshops for participatory NRM: US$130,500
3. Gender analysis for participatory research: US$130,500
4. courses: US$40,000
5. Project Coordination: US$48,500

Introduction

Achieving the participation of users - especially women - in the process of technology development is an important strategic research issue, vital to achieving impact which benefits poor people. User participation in the early stages of technology design ensures that new technologies can be adopted rapidly. Household food security, particularly among children in poor countries, is vitally affected by women's access to income-generating technologies. Gender analysis is an important tool for ensuring that user participation includes women, so that their special needs and constraints are taken into account in technology development. The "feminization of poverty," a trend which is driving rural women in particular to form an increasing proportion of the very poor, makes it increasingly imperative that a high priority and visibility be given to strengthening, consolidating and main streaming gender analysis and participatory research in the CGIAR system.

Need for a Systemwide Effort on Methodology Development and Organizational Innovation in Participatory R&D and Gender Analysis

Over the last decade, substantial work has been done to introduce a user perspective into adaptive research. For example, CIMMYT's development of on-farm research methodology and resulting manuals and training have been very influential, as have CIP's "farmer back-to-farmer" approach, IRRI's experience with the Women and Rice Farming Network, FAO's Women and People's Participation in Development, ISNAR's study of client oriented approaches and CIAT's farmer participatory research. At present there is a significant growth in the application of extant participatory techniques in adaptive research and technology transfer.

This proposal builds upon past work, but offers something more. It originates from recent evidence that user participation can be critical in preadaptive stages of certain types of research. In contrast to earlier approaches to on-farm research, preadaptive participatory R&D brings users actively into the early stages of technology development, as researchers and decision-makers who help to set priorities, define criteria for success and determine when an innovation is "ready" for release to farmers. The benefits of this approach are summarized in Box 1.

To determine the potential of preadaptive participatory R&D involves considerable effort in methodology development. At present, it is difficult to say what degree of user participation is appropriate at an early stage in the research process, and for which circumstances. Some experience suggests that preadaptive-adaptive participatory R&D moves scientists into a different set of strategic research questions, and creates a new division of labor between scientists and farmers. Other research suggests that preadaptive participatory R&D may reduce the costs of applied research, (see for example, Ashby, 1995; Berg, 1995; Thrupp, 1995; Sperling, 1995; Welzein, 1995). A recent study which set out to evaluate a cross-section

of experiences in different parts of the world with participatory research, found that there was too little evidence being collected on which to base an evaluation (Okali and Sumerg, 1995). Methodology development is needed to systematize approaches to this new division of labor, and to identify when it is advantageous. Investigation of the appropriate techniques to use in preadaptive participatory R&D can significantly improve the efficiency of the whole research process, and its relevance to users.

The CGIAR has been refocussing and restructuring its activities to address the interrelated issues of poverty alleviation, preservation of the natural resource base, and sustainable increases in agricultural productivity in developing countries. Simple production-only oriented technologies are no longer suitable within this more holistic perspective. CGIAR research has shown that it is possible to increase production while carefully husbanding the soil and water resource base and managing pests. However, the complex knowledge upon which such sustainable management practices are based must be synthesized in a way that farmers can readily adopt and modify them. We know little of what determines the acceptability of knowledge-intensive technologies or what approach may be the most efficient to developing and testing prototypes. Clearly a close working relationship with farmers should help us in understanding the issues impinging on the adoptability of these technologies and in their actual development.

Box 1. Benefits of upstream participatory R&D.

- Farmers participate in research priority-setting.
- In the early stages of technology development, concepts of what technology clients are likely to adopt are improved.
- Target environments for evaluating technology are defined more accurately together with farmers.
- Technologies are in users' hands, and adopted more rapidly.
- There are fewer, costly "white elephant" technologies on the shelf.
- Harnesses clients' knowledge and creativity to technology design.

Gender analysis is used in participatory research because it is necessary to determine which are the appropriate client groups to actively participate, and whether those participants need to be gender differentiated. Many of the available tools of gender analysis are a subset of participatory research methods (although not all gender analysis is participatory). More efficient, cost-effective diagnostic methods are needed which will serve as initial probes to determine the gender-specificity of a prototype technology in the early stages of research.

Researchers need sharper methods to understand when differentiating users by gender will be of critical importance; and farmers need tools to help them choose appropriate participants in a joint research effort.

A vital element in the restructuring of the CGIAR is the creation of new partnerships emphasizing broader participation of stakeholders in setting research priorities, and in the conduct of development-oriented research. During the ICW '95 meetings in October, discussion of the priority-setting process was concerned with the urgent need to enhance the impact of research on the well-being of the poor with particular attention to women. Achieving this goal will require building new partnerships not only with respect to institutional relationships, but also in terms of research methodology that promotes participation of gender-differentiated client groups in the process of technology design.

It is important that the CGIAR, as a role model for a participatory research process, have a demonstrated capacity to use methodologies which create a common ground for working with the NGO sector and among producer organizations involved with the poor, and especially poor women in developing countries. A systemwide program of participatory research and gender analysis will testify to a serious effort to "mainstream" these methods within the new CGIAR.

There is growing recognition of this need in several of the CGIAR Centers, expressed in some of the systemwide programs of research, and scattered experience which shows important benefits of upstream participatory R&D in accelerating the adoption of technology. However, current experimentation with this approach in the Centers is dispersed and often sporadic. In the absence of a mechanism for systematizing this research, there is considerable duplication of this fragmentary, *ad hoc* effort, resulting in lost momentum.

Duplication of effort in methodology development for preadaptive participatory R&D not only slows down the learning process, but also contributes to inefficient use of the very scarce capacity world-wide for innovation in these methods. As a result, although references to the need for participatory approaches and for attention to gender analysis are plentiful, there is a deficit of knowledge on how to incorporate these methodological approaches into early stages of technology design in a cost-effective way.

A coordinated, systemwide research effort can address some important opportunities for methodology development which will determine how quickly participatory research and gender analysis are incorporated into the mainstream of CGIAR research.

The outputs of this work are participatory techniques and guidelines for their use that are useful inside and outside the CGIAR. These products are truly "international public goods" requiring rigorous empirical research.

Innovative features of this proposal

- A rigorous assessment of the general indications that participatory research methods and gender analysis are important for success of technology design and adoption, will be conducted.

- This research will provide guidelines well-grounded in scientific research on the circumstances in which these approaches work and why, and the costs and benefits of different ways to operationalize them.

- The program will provide a working model in the CG of how to operationalize and mainstream the use of participatory research and gender analysis, and the capacity building and organizational innovations needed to do this. The systemwide program will be carried out in close partnership among the organizations - IARCs, NGOs, NARIs, Universities and grassroots organizations - that need to institutionalize capacity to use participatory research and gender analysis.

Genesis of this proposal

This proposal is the product of a seminar and planning meeting conducted from September 9-14, 1996 at Cali, Colombia which brought together an international group of fifty researchers and development professionals highly experienced in participatory research and gender analysis. They represented IARCs, NARIs, universities, NGOs and donors (see Annex I for participant list). These scientists and development practitioners from Asia, Latin America, Central America, Africa (east, west, south and north), South and Southeast Asia, the Middle East and Europe joined efforts to develop this research plan to address the priority methodological issues in participatory research and gender analysis. They defined the program goal, purpose and workplans for three working groups: plant breeding; natural resource management, and gender analysis.

This document synthesizes the recommendations developed by the participants in the planning meeting

Program Goal

To improve the ability of the CGIAR System and other collaborating institutions to develop technology which alleviates poverty, improves food security and protects the environment with greater equity.

Program Purpose

To assess and develop methodologies and organizational innovations for gender-sensitive participatory research, and operationalize their use in plant breeding, crop and natural resource management.

General Strategy

The strategy proposed for this program will be to integrate the proposed research on methodology development and organizational innovation and capacity building by the program into ongoing projects of the collaborating institutions. The Planning Meeting held by the systemwide initiative identified a promising body of initial work which can strengthened, further advanced, and united under this systemwide umbrella. Incorporating participatory research methods and gender analysis into ongoing research will enable partners to accomplish results by conducting systematic comparisons of new approaches in contrasting environments, to different types of technology development, and with diverse user and stakeholder groups. This will provide results on the use of these methods which command respect and ensure visibility.

The Systemwide program provide a framework for comparing results obtained from participatory research and gender analysis. This collaboration in comparative analysis will produce results not achievable by individuals or projects working in isolation. Box 2 shows pay-offs to joint efforts identified in the Planning Meeting. The introduction of participatory methods and gender analysis into ongoing research projects will involve training for this purpose, so helping to multiply capacity for use of the methods within NARIs, NGOs and other direct partners.

Box 2: Advantages of working together: perceptions of participants from IARCs, NARIs, NGOs and Grassroots Organizations in the SWI Planning Meeting

- Can develop guidelines for using methodologies and organization innovations on the basis of comparisons among technologies, user group, and agrosocioeconomic environment
- Can increase R&D capacity by joint work and accelerate a common learning process derived from sharing global experience.
- Joint work solidifies partnerships and the capacity to build them: this includes IARCs learning from NGOs.
- Joint work allows for more cost-effective divisions of research labor.

Background and Justification

Demand for Participatory Research and Gender Analysis

It is now well recognized that formal sector research, including that of the CGIAR, should be impact-oriented and focussed on utilization of results. Donors, research managers and scientists who are concerned about the extent and pace of impact are now increasingly articulate about the need for participatory approaches to achieve this goal.

Participatory plant breeding

Methodology to enable plant breeders to use participatory R&D in the preadaptive stages of research is perceived by IARCS, NARI's AND NGOs as needed to improve the impact of plant breeding in heterogenous environments.

The incorporation of participatory methods into plant breeding began in the mid-1980 by involving farmers in the evaluation of new materials. The gap between users' and breeders' criteria for acceptability of new plant types identified through participatory research is stimulating plant breeders to introduce user participation at earlier stages in applied research, to the point where farmers are selecting parents and individual plants from segregating populations. As a result, participatory methods are perceived by some plant breeders as comparable to biotechnology techniques in opening up new frontiers in breeding (Kornegay et

al., 1995; Ceccarelli et al., 1995; Zimmermann, 1995; Hardon, 1995; Iglesias and Hernández, 1994).

Drawing on these experiences, a workshop on "Participatory Plant Breeding Approaches" was sponsored by IDRC, IPGRI, FAO and the Center for Genetic Resources, the Netherlands in July 1995. The participants included plant breeders and social scientists from CGIAR, NARIs and NGO programs. They identified the need for alternative approaches to classical centralized plant breeding to address genotype-environment interaction in highly heterogenous environments, typically those in which resource poor farmers in developing countries are found. Because there are no established guidelines on how to achieve this, a number of research needs were identified.

Specifically, the workshop identified a need for comparative analysis of different approaches, including conventional as well as participatory, and for building on farmer or community breeder systems. This analysis is needed to guide choice of the most appropriate breeding approaches for different circumstances, and for different types of crop (self-pollinated, open-pollinated or clonally-propagated). The comparative analysis of methods should address their rate of success, the time it takes for materials to reach farmers, and the costs of different approaches. The workshop participants proposed that:

> "The CGIAR could play a major role in methodology development, and be able to transfer such methodology to the various partners in the processes. The CGIAR could establish an inter-center working group on participatory breeding methodology to provide some guidance in this, and to pool resources."
> (Workshop proceedings - IPGRI, 1995).

Box 3. Key issues to be addressed in participatory plant breeding.

- Can participatory plant breeding combine indigenous and scientific knowledge by working with farmers, in a way that maximizes genetic diversity and increases productivity?
- What are the most appropriate technical breeding strategies (including biotechnologies) for partnership between farmers' crop selection systems and formal breeding programs, to achieve this goal?

Need for training of partners in participatory breeding was also identified by the workshop participants: for institutional breeders within the CGIAR, and in NARIs; and for NGO's, farmer organizations and seed producers, to improve the type of partnership which is integral to the new CGIAR:

"Many NGOs are already involved in such training activities at the local level, but often lack adequate knowledge and easy access to sources of information. Many institutional programmes see such activities as competing with rather than complementing their own efforts to strengthen and expand the institutional system of breeding and seed production. These problems are at the root of the often strained relationships between CGIAR centers, NARIs and NGOs. They call for fundamental changes in attitudes, with awareness training at all levels, especially at the level of institutional management." (Workshop proceedings - IPGRI, 1995).

At the September 1996 SWI Planning Meeting, the plant breeding working group took another step forward in defining the rationale for this interinstitutional collaboration. The group elaborated a framework for participatory approaches in plant breeding research, and highlighted the need for institutional models to support decentralized breeding on a broad scale. Participatory breeding needs better targeting to specific users and agrosocioeconomic environments, and new kinds of support services which ensure that resource poor farmers benefit from the products of participatory breeding, (eg. the seed sector) (See Fig. 3)

Box 4. Key organizational questions to be addressed for participatory plant breeding.

- What degree of decentralization of research is needed to reach resource-poor farmers
- What institutional arrangements can achieve this decentralization most cost-effectively?
- What strategies provide farmers with access to the products of participatory plant breeding: what should be the balance between the formal seed sector and farmer-led seed systems?

The need to better differentiate just *which users should participate in plant breeding* and to identify *which users and stakeholders actually benefit* when participatory plant breeding approaches are used was identified as one of the important methodological challenges for the systemwide program. In the SWI Planning Meeting the working group addressed the need for methodology to incorporate user differentiation and gender analysis into participatory plant breeding: ie. direct users, seed producers, processors and consumers. Only some ongoing participatory breeding projects incorporate gender analysis and user differentiation-- although it is recognized by most that women are often plant breeders in small farm production systems, responsible for domesticating wild species, selecting germplasm and saving seed.

Integrated Natural Resource Management Research

The application of participatory approaches (similar to that which occurred in plant breeding) is now underway in natural resource management (NRM) research in a broad array of organizations. A comparable disquiet is evident over the difficulty of achieving impact for this research in heterogeneous, fragile environments, with diverse client groups. In these fragile environments and the supposedly robust and more favorable production environments, the technologies required to sustain agricultural productivity growth require informed, sophisticated and often collective management decisions by farmers. Thus, a similar call for participatory approaches to address these difficulties is now being made.

As in plant breeding, participatory methods and gender analysis can be applied to NRM to harness local knowledge and users' criteria for acceptability (which may often be women's knowledge and criteria). These are important for the design of flexible or plastic NRM prototypes or management options. They are key as well to a process of involving diverse and less visible stakeholders.

Close linkage between farmers and researchers, and farmer involvement in the process of technology design has been identified as essential in soil-water natural resource management research (TAC, 1995, Annex 1:53; Greenland et. al 1994; SWNM initiative proposal). Case studies of participatory watershed management identify a participatory approach to technological innovation as well as to social organization as an important element of success (Pretty et al, 1995; Ashby and Beltran, 1996 forthcoming). This view was fully supported by participants in the September 1996 SWI Planning Meeting NRM working group.

The SWI Planning Meeting in September 1996 was the first opportunity for a group of NRM practitioners from the CGIAR and other institutions to analyze the need for collaborative work on development of participatory methods and gender analysis for natural resource management research. The NRM research working group focused on improving the management of resources, rather than material technologies. The group emphasized need for participatory experimentation, and the development of interactive databases which include indigenous knowledge about NRM, and which can be readily accessed by stakeholders (including farmers). Local capacity has to be enhanced through participatory approaches for analyzing resource constraints, monitoring change in natural resources and adapting technologies to changing environments.

Organizational innovation for participatory approaches was also identified by the NRM working group as a central issue needing further work. Different types of technology and resources have to be managed at different scales, by stakeholders with often diverse and even conflicting interests. A challenge in NRM research is to identify or help catalyze effective organizational arrangements at different scales, and to ensure inclusion of different user and stakeholder groups throughout.

Box 5. Key management and organizational questions addressed by participatory natural management research.

- How can capacity for user participation in monitoring dynamic resource trends at different scales (field, farm, community level and beyond) be enhanced?.
- What are appropriate ways to conduct participatory assessment or experimentation for the bulky technologies which are often characteristic of NRM?
- How should suitable strategies be developed for building participation in local organizations at the scale needed for resource management and which are themselves sustainable and include the full range of relevant stakeholders?

The NRM group gave high importance to the use and development of participatory methods in a learning process approach (see Fig. 1). Developing tools and guidelines in a learning process approach is particularly important in NRM because there are a range of complex trade-offs between conservation and productivity acceptable to farmers, and to other stakeholders in natural resource management. Acceptable solutions need to be negotiated, and are typically highly location specific. This makes the identification of technological as well as institutional recommendations difficult for centralized research and policy-makers. Instead, mechanisms methods and tools have to be provided that will enable stakeholders to develop locally acceptable recommendations.

The NRM group prioritized two main thrusts for future work:

- An assessment of the state of the art in applications of participatory research and gender analysis to NRM problems. This would define where the main opportunities are for further work, the types of NRM technologies and management options, and the types of environment.
- Conduct case studies of action research for comparative analysis of the process of implementing participatory approaches and gender analysis in the NRM research projects. This would involve monitoring a learning process approach, emphasizing capacity building and operationalizing new methods and organizational approaches. Comparative analysis of a variety of approaches will provide guidance to researchers and farmers on ways to build on their local knowledge, expand their management options, and develop processes for local and extra local management, organizational innovation and negotiation.

Relationship to Ecoregional Research

The CGIAR ecoregional concept involves multidisciplinary research on the sustainable improvement of agricultural productivity, to achieve demonstrated impact in common sites by joining efforts among institutions with complementary expertise.

This research program will forge a specialized resource for ecoregional initiatives to draw on. Integrating the proposed methodology development with ongoing CGIAR projects will include collaborative research in benchmark sites of ecoregional programs. This will bring world-wide expertise in participatory research to bear on ecoregional needs, and the training activities will strengthen the capacity-building function of ecoregional programs. Management support for coordinating this proposed program with NARIs will be sought through the ecoregional programs.

Use of participatory methods in CGIAR and collaborating national programs will help to promote effective communication and collaborative work with NGOs and grassroots organizations necessary to ecoregional partnerships.

Relationship to the CGIAR Program for Gender Analysis

At present, use of gender analysis in the CGIAR remains experimental, and "has not yet resulted in significant changes in research practice, although a few centers are making some progress." As a result the institutional commitment to main streaming gender analysis within the CGIAR Centers remains fragile (Report of Gender Program 1995:14-24).

Continuation of the CGIAR Gender program has been proposed to encourage, support and build on the progress to date. Recognizing that "gender analysis is one dimension of the user perspective in technology development and works best in this context" (CGIAR Gender program proposal, October 1995:1) the program of research proposed here would support and strengthen the effectiveness of efforts to institutionalize gender analysis in the CGIAR system in two ways.

- by providing the Gender Analysis program with an avenue for institutionalization which maintains its visibility and at the same time, links its activities firmly to core research activities of the Centers through a systemwide initiative.

- by linking use of gender analysis to effective demand among CGIAR scientists for preadaptive-adaptive as well as adaptive participatory R&D approaches to plant breeding and NRM research.

At the mid-term meeting of the CG in Jakarta in May, 1996, the Gender Analysis Program made the following proposal to the participants in the donor meeting on this SWI. The proposed systemwide program will incorporate the resarch-related, gender analysis functions of the CG Gender Program, while the management and staffing-related functions of that program would continue to be conducted by the CG Secretariat.

It is proposed here that the Gender Analysis Program will maintain a visible identity within the

systemwide program, with a separate budget to support capacity-building activities, and to contract the consultant who would manage its activities. These activities would continue to involve advising CG centers and their partners on the incorporation of gender analysis into their research programs, networking with IARC focal group members, as well as facilitating training, dissemination of training materials and consultancies for this purpose.

A new dimension of the Gender Analysis Program would be its membership of the Gender Analysis Working Group of the systemwide program, and participation of the consultant in providing methodological input and analysis by this group to the empirical research studies of the systemwide program. The gender program will continue to provide training and consultancies to CGIAR Centers on demand, whether or not these Centers are active particiants in other activities of the Systemwide program, as its resources and capacity permits.

Involvement of the CG Gender Analysis Program in implementing the core research agenda of the CG and its partners through this systemwide program, will provide the mechanisms for firm institutionalization of gender analysis in the CG with the inception of the Systemwide Program in 1997.

Expected Outputs of the Systemwide Program

The plan of work developed by the working groups in the systemwide initiative Planning Meeting identified six types of expected outputs:

1. Methods for participatory approaches in plant breeding developed and evaluated.

2. Methods for participatory natural resource management research assessed and developed.

3. Strategies for including gender-sensitive participatory methods in research assessed, developed and institutionalized.

4. Organizational innovations for institutionalizing participatory approaches operationalized and evaluated.

5. Capacity for participatory research and gender analysis further developed in the form of a critical mass of expertise in participatory research and gender analysis; innovative approaches to capacity building operationalized.

6. Procedures for building new partnerships among the IARCs, NARS, NGOs and farmer groups realized to utilize effectively complementarities among partners, and to accelerate learning about participatory research and gender analysis.

Program Strategy

The expected outputs will be achieved by integrating method development, organizational analysis and capacity building for participatory research and gender analysis (PR&GA) in a learning process approach (Figure 1). The elaboration and integration of these four elements is described in the section "Description of Expected Outputs". The learning process approach is a common strategy adopted by the SWI participants.

Figure 1. Program Strategy - A learning Process Approach

Develop innovative approaches for using PR & GA in preadaptive-research

↗ ↘

Compare and evaluate existing and new approaches to PR & GA

Introduce and evaluate innovations required to operationalize PR & GA approaches

↖ ↙

Conduct capacity building needed to catalyze change in practice

Organization of the Systemwide Program

The program of work required to achieve the expected outputs identified by the participants in the SWI Planning Meeting exceeds the individual capacity of any one of the cooperating institutions. The research program has been designed to be implemented through collaboration among IARCs, NARIs, NGOs and grassroot organizations. This collaboration demands transparent and cost-effective organization. Principles of organization were developed by the "Partnership" task force at the SWI Planning Meeting and endorsed by the participants.

Organizational principles include:

- **Decentralized partnership** among IARCs, NARIs, NGOs and GRO's which are a locus of *practitioners* of participatory research. Practitioners introduce applications of the methods into their ongoing plant breeding and/or natural resource management projects, consistent with their priorities, using the agreed-upon common strategy and workplan for comparing applications across different fields.

- **Three working groups: participatory plant breeding; participatory natural resource management research; and gender analysis.** Working groups involve practitioners from IARCs, NARIs, NGOs, GRO's and indigenous research systems in implementing studies consistent with the common workplan developed in September 1996. Working groups include a mix of biophysical and social scientists. Working group members need to meet face to face in periodic research workshops, or site visits; and to select members to contribute to the systemwide seminars.

- **Planning Group** composed of eight elected members:

  - Three representatives, one elected from each of the three working groups;
  - Four representatives elected from each of the four stakeholder groups in the initiative: NARIs, NGOs, IARCs (not including the convening center) and donors;
  - One member from the Convening Center.

The Planning Group was mandated to obtain input from the working groups to finalize guidelines for the inclusion of projects in executing the workplan and to define the information exchange and capacity-building strategy for the program. A steering committee, elected from members of the planning group, is responsible for operational tasks delegated by the Planning Group and includes: one representative each from the working groups, and the Convening Center.

- **Management of the program.** Overall execution, coordination and technical and financial reporting will be the responsibility of the implementing agency for the

program, CIAT. The main CGIAR partners will be IRRI, CIMMYT and CIAT and ICARDA. CIAT has assigned a staff member to support the program's coordination.

- **Projects** submitted for membership by participants in the working groups and screened by the Planning Group for consistency with Program Guidelines (shown in Box 6), will be the mechanism for carrying out the plan of work described in detail below and in the work breakdown diagrams in Figures 3 and 4.

- **Resource allocation**. The workplan designed by the working group participants will be the mechanism for allocating grants to the Systemwide program. These funds will be allocated to activities in the workplan by members' representatives in the Planning Group. Grants to the program will be used to cofinance ongoing projects to execute elements of the Program's Workplan . Working group members may seek additional funding for projects with Program endorsement, and assistance, and will manage these resources themselves.

Box 6: Proposed criteria for inclusion of projects in the systemwide program.*

Project proposals should specify:

1. Participatory approach: plan for how the project will work with farmers' organizations or groups of farmers.

2. Interinstitutional linkages: involvement of at least two institutions.

3. Clear agreement from all partners on the resources each will allocate to the project.

4. Explicit consideration of gender representation (of partners) and gender issues in the proposed research.

5. Plan to involve men and women in implementing the research.

6. Strategy for getting access to multidisciplinary teams which take into account social science and natural science skills.

7. Plan to build on farmers' skills.

8. Clearly-defined time frame.

9. Monitoring and evaluation plan.

10. Clear definition of the roles of partners in research and capacity building.

11. Statement of what project will offer to the systemwide program.

12. Statement of what project expects from the systemwide program.

13. Statement of resources available and resources required.

14. Plan for sustaining project activities at community level after phasing out of project.

* Task Force on "Partnership", Systemwide Initiative Planning Meeting 9/14/96

Activities

Scientific conferences and information exchange

International seminars and papers for this will be the main mechanism for reporting progress on the workplan. The systemwide Planning Meeting in September, 1996 was preceded by a three day seminar in which participants in the plant breeding, natural resource management and gender working groups assessed the "state of the art", formulated methodology development needs and defined organizational concerns (see Proceedings of the International Seminar on Participatory Research and Gender Analysis for Technology Development, 1996-forthcoming). Working groups will conduct regional workshops to help partners monitor empirical studies, exchange results of work in progress, adjust research methods together, and visit sites. Regular email bulletins and information newsletters circulated thrice yearly have been proposed by the seminar participants as important for ensuring active exchange among globally-dispersed field researchers.

Dissemination of guidelines for using participatory approaches and gender analysis

The publication and distribution of results will include regular international seminars and working group proceedings; manuals on specific methodologies; results of empirical studies in journal and book form to a broad audience including Centers, NARIs, NGO's and grassroots organizations.

Capacity Building

Participants in the SWI Planning Meeting identified capacity building as an integral part of the general strategy for the proposed program. Capacity building activities will involve the following:

- Monitoring and evaluation of the operationalization of novel, gender-sensitive participatory approaches in plant breeding and NRM research in a learning process approach. This will involve capacity building among the participants in these empirical efforts, and will generate lessons to be shared in the systemwide working groups and international seminars.
- In the course of implementing empirical studies, working groups will identify common needs for training in participatory research approaches and gender analysis. The program coordination will help organize and fund inputs for this training, using resources of the program for this purpose. Every effort will be made to "piggy-back" training and workshops onto partners' events organized for their ongoing projects.
- Consultancies on participatory approaches or gender analysis will be supplied, drawing on resources donated to the program and expertise marshaled by the systemwide

program. Demand for and supply of technical advice will be identified through the working groups in the course of conducting the empirical studies and may include requests from entities not actively involved in these studies. The program coordination will help network requests for technical advice with providers, through the working group members.

Empirical studies

The plans (see Fig. 3 and 4) developed by the Working Groups include two types of empirical studies to assess and develop participatory approaches and gender analysis for preadaptive plant breeding and NRM research. One involves controlled comparison of different strategies, ie the same breeding populations are managed with and without farmer participation. This enables breeders to evaluate the changes in genetic variation, as well as the degree of acceptability and rates of adoption which result from the classical and participatory breeding approaches. A second approach involves case studies selected for action research and process monitoring: methodology development integrated with capacity building for participatory NRM research lends itself to this approach.

Some of the key components of the empirical studies include:

- **Identification and differentiation among the relevant user groups** to determine who should participate and at what stages of the research process. Better methods are needed for assessing ex-ante, if there will likely be a differential impact of a proposed feature of a technology for different users: men or women; market or subsistence-oriented farmers; producers or consumers.

- **Participatory ex ante evaluation** of alternative technologies including indigenous practices, to obtain feedback from diverse users and stakeholders about their different criteria for acceptability. Participatory evaluations can be carried out in existing on-farm trials, experiment stations, in farmers' fields, or in broader community resource management units and can involve numerous contrasting types of user groups. The extent to which farmer knowledge helps to reorient technology design can be assessed. Method development is needed to enable farmers and scientists to evaluate the potential acceptability of prototype technological options in early stages of research.

- **Experimentation to test selected technological options**: experiments conducted in the early stages of research, may include treatments designed, managed and analyzed with user participation alongside researcher-managed treatments. Methods are needed for participatory experimentation with large, diverse breeding populations, and with resource management at the landscape scale or in complex situations which defy replication.

- **Indigenous experimentation** is an important component in the methodology development studies. Monitoring local farmer experimentation provides a check on the validity of information obtained from ex-ante evaluations, and in experiments. It may also open up avenues for redirecting research altogether. In plant breeding this involves study of the local use of biodiversity and farmer' own breeding strategies. In natural resource management this involves monitoring farmer-introduced resource conservation practices and the evolution of management strategies. Methods need to be developed for participatory monitoring of indigenous experimentation by local people and for defining entry points where formal science might strengthen farmers' own research capacity.

- **Innovation to assess and test which organizational options** facilitate cost effective participatory approaches and gender analysis; and which facilitate scaling up these efforts.

- **Gender analysis for comparison of results** obtained with and without the participation of women in a specific context provides empirical evidence of the effects of including gender analysis on the design of the technology, on feedback to researchers about user preferences, and on rates of adaptation and adoption of the resulting technologies.

- **Cost-benefit analysis** can be carried out to assess the quality and quantity of human resources and other support costs required for different approaches, including conventional, participatory and indigenous experimentation. Participatory approaches to provide this feedback need to be developed and the concept of costs and benefits needs to be broadened to include social as well as grassroots criteria.

- **Monitoring of rates of adaptation and adoption** in the different user groups are monitored to provide data on the distribution of benefits of the different approaches. Participatory monitoring and impact assessment methodologies are needed which can rapidly feedback information to partners about farmer adaptations which can be readily incorporated into technology design, to improve adoption and impact.

- **Operationalizing new practice through capacity building and institutionalization.** Strategies for motivating stakeholders to use participatory approaches and gender analysis, as well as for enhancing their capacity to do so need to be built into the conduct of the research itself. Action-research is an iterative process whereby all partners learn by doing. Early attention to capacity-building facilitates institutionalization of relevant results.

- **Development of a framework for comparative analysis of results from empirical studies.** A common framework for comparative analysis of the empirical studies is being developed jointly by the researchers involved in the Initiative. One goal is to identify the circumstances which render participatory approaches more or less useful

and to generate widely-applicable guidelines for the use of the methodology. An explicit focus on site, crop, technology characterization will help define which participatory methods and organizational forms give the best results under what type of circumstances.

Some elements of a common framework are illustrated in Box 7.

Box 7. Example of elements of a common framework for comparative analysis

- Parameters to compare sites and projects.
  - typology of technologies to be contrasted eg. short-term productivity (varieties) vs. long-term conservation (NRM) technologies.
  - typology of agroecosystems or environments eg. highly heterogeneous vs. uniform; favored vs. unfavored;
  - typology of indigenous crop development and natural conservation systems.
  - distinguishing features of local institutional context: eg strong local groups and community cohesiveness vs. weak or absent local groupings
- Parameters for methodology assessment across fields of research.
  - techniques of participatory research and gender analysis to be used in different situations.
  - stages of the learning process to be compared (Figure 1).
  - types of stakeholders who need to be directly and indirectly involved
  - variables to be monitored to assess costs and rates of success.

Workplan

Five year workplan

Each of three working groups in the Systemwide Initiative Planning meeting developed a workplan showing outputs (or expected outputs), activities and indicators of progress. The proposed activities address the six expected outputs presented in summary form earlier, which are now described in detail and related to the proposed outputs (shown in each section below in italics); and activities of the working groups, shown in Figures 3, 4 and 5 at the end of this section.

Description of expected outputs

1. Assessment and Development of Participatory Approaches to Plant Breeding.

Workplan Outputs

- *Assessment and development of effective participatory methods in plant breeding, with focus on:*
  - *farmers' breeding*
  - *plant selection (segregating lines)*
  - *variety selection (fixed lines)*

- *Beneficiary groups more accurately involved & targeted in participatory breeding through methods development for involving direct & indirect stakeholders.*

Most of the existing applications of participatory approaches in plant breeding involve farmers in relatively downstream selection of advanced lines or finished varieties. Preadaptive participatory research in breeding is an area where methodologies are still incipient. At present it is difficult to say what degree of user participation is appropriate, at what level of the breeding process, and for which environments. To develop methodological guidelines targeted at specific crops (ie. self pollinated, open-pollinating, clonally-propagated) and contexts, the proposed program will conduct empirical studies along the lines described above. One set of case studies will explore how most effectively to involve farmers in the formal research process, a second set of cases will look at the role of scientists in strengthening farmers' own breeding efforts.

Empirical studies involve farmers in selecting parents, in making selection from segregating populations, in evaluating advanced lines on-station or on-farm, and in decisions about seed production of preferred varieties. At each stage in this process the different selections made by breeders, men and women farmers can be contrasted. Once farmer selection strategies are understood, ways in which breeders can enhance these can be developed. The risks of early farmer involvement as well as the potential benefits (e.g. in terms of production, yield stability and genetic diversity) will be examined on a stage by stage basis. In some crops (eg. rice, cassava) use of biotechnology tools such as molecular markers can be important for linking farmers' knowledge with advanced breeding techniques.

The program will collaborate with ongoing breeding programs and involve a cross-section of IARC/NARI/NGO/Farmer Groups: eg. rainfed rice; pearl millet, barley, beans, maize; maize/beans in association; cassava. The participatory plant breeding group has already received signals of interest from potential collaborators in Ethiopia, India, Nepal, the Philippines and Syria.

Box 8. Specific outputs from methodology development in participatory plant breeding.

- Participatory research methods and gender analysis tools suitable for integrating farmer crop development systems with advanced breeding techniques.
- Participatory breeding strategies refined for a cross-section of species, with guidelines on appropriate breeding populations, field techniques, and suitable biotechnology tools.
- Knowledge and skills of rural men and women specialized in germplasm management are recognized, strengthened and linked to research.
- Varieties acceptable to farmers which incorporate traits derived from local land races and global germplasm.

2. Methods assessed and developed for participatory natural resource management research.

Workplan Outputs

- *Synthesis of the state of the art in applying PR/GA approaches in NRM research for different types of technologies comparing three scales of management (field, community and watershed).*
- *Improved crop and natural resource management strategies incorporating better use of existing and new PR/GA methods at different scales of management developed and disseminated.*

It is important to note that the NRM working group is at a different stage in the development of their workplan from the participatory plant breeding group. The NRM researchers within the SWI need a period to analyze and critically assess available evidence and insights for applying PR/GA to natural resource management subfields, some of which operate at very different scales: the field, farm, community, and the watershed. This work needs to be facilitated through email exchanges, systematic literature review, and commissioned papers on specific organizational and methodological challenges. Conference for the purpose can be piggy-backed onto already scheduled regional meetings in Africa, Asia and Latin America.

Some of the toughest methodological challenges for participatory NRM research concern how to link farmers' knowledge and interests with those of other stakeholders at different scales: field, farm, community, and supra-community, including the watershed. NRM technologies

(e.g. soil conservation practices, nutrient management, integrated pest management) are often knowledge-based, requiring collective management decisions and practices. The knowledge and management intensity of these technologies requires that farmers participate early in the design of prototypes as well as in their location-specific fine-tuning. Farmer involvement helps researchers to understand how stakeholders perceive tradeoffs between production and conservation, and the acceptable allocation of costs and benefits to different stakeholders.

In designing a workplan for comparative analysis, the NRM working group agreed that a focus on *resource user management* was essential. As the management scale widens, the number and diversity of stakeholders (including external stakeholders) is likely to increase, as is the need for collective or negotiated actions and resolution of possible conflict over resources. Innovative organizational arrangements, methodology for participatory resource monitoring by users as well as researchers in the short and long-term, and increased capacity of resource users to adapt to changing circumstances were seen as priority areas for further work in the proposed program.

The NRM working group took emphasized the use of a learning process approach (Fig. 1) in which improvements in participatory methods and in organizational capacity are operationalized and analyzed together. To start this process of mutual learning, the NRM working group identified as the first task an inventory and assessment of current uses of participatory research and gender analysis in NRM research. The discussion of these concrete experiences at more focused regional meetings will promote a shared understanding of problems and a baseline for further research. This state of the art synthesis will be the first output of the NRM Working Group. From this base, the working group will specify cases which will systematically develop, test, and compare participatory approaches in different contexts.

Box 9. Specific outputs from participatory NRM method development.

- Current practice in applying gender analysis and participatory approaches to NRM research synthesized to identify method gaps.
- Methods assessed and developed for user participation in design of knowledge-intensive technologies.
- Methods for participatory resource monitoring by stakeholders at field, farm, community and watershed scales.
- Methods assessed and developed for encouraging collective action, conflict resolution and negotiation at different scales.
- Technologies acceptable to farmers for increasing productivity while protecting the environment.

3. Strategies for including gender-sensitive participatory methods in research assessed, developed and institutionalized.

Workplan Outputs

- *Effective methods and capacity developed for using gender analysis.*
- *The costs and benefits of using gender analysis in technology development assessed.*

Inclusion of a gender perspective and gender analysis into the core research programs of the CG is a central objective of this program. The Gender Working Group will a) intergrate gender analysis, capacity building and the development of novel approaches to gender analysis into the empirical studies conducted on plant breeding and NRM; b) systhesize the implications for gender analysis of results from the empirical studies, with respect to its impact on technology design adoption, targeting poor rural women, and research planning; c) contribute to capacity building, provision of technical advice, and dissemination of results on gender analysis to a broad audience of IARCs, NARIs, NGOs and GROs through the systemwide program activities for this purpose.

Women play a vital role in agriculture and food security in developing countries. Research on time budgets has shown that women work longer hours than men in every country studied. Women account for more than half of the labor required to produce the food in Asia, and as much as three-fourths of the labor in Africa. They are fully in charge of post-harvest operations, seed selection and preservation, and food processing activities. With increasing male migration in search of non-farm employment, women's role as farm managers has been growing.

Women's knowledge of agricultural practices, and the constraints to increasing their productivity need to be incorporated into planning: this includes involvement of women in selection and evaluation of improved germplasm; seed management practices; appropriate mechanical technologies; and management of natural resources.

Methods are needed which will enable user groups to rapidly assess for themselves, what type of people among them should participate in technology development. Rapid self-diagnosis needs to be made of the relevance of different attributes, such as wealth, age, gender, or particular expertise and the need to have separate or mixed groups of participants for reliable user input to a given technology. In some regions, appropriate methods must be developed to engage women's participation where this is a new experience or there are specific constraints. In NRM research, methods need to be assessed for identifying diverse stakeholders, including different kinds of women, and bringing them into the relevant design of technology options, organizational arrangements and approaches to capacity building.

Other methods are needed to enable users to monitor gender-differentiated effects of introducing new germplasm or resource management practices. Participatory diagnosis, monitoring, and assessment of the likely differential impact of technologies being tested on a user group could provide powerful feedback to research in a low-cost fashion. It is also an essential component of the learning process.

Comparison of results obtained in PB and NRM projects with and without the application of gender-sensitive participatory research methods will provide empirical evidence of the utility or value added of identifying and including particular groups. Researchers need cost-effective ways to validate, and assess the usefulness of such information obtained from a participatory process in terms of successful technology design and adoption (reaching the right users), targeting particular groups (such as poor rural women), and in achieving welfare and social equity objectives. Streamlining this process, so that it is reliable and replicable is essential for adoption of such methods by NARIs.

4. Organizational innovations for institutionalizing participatory approaches operationalized, and evaluated.

Workplan Outputs

- *Effective organizational forms for operationalizing participatory breeding identified and developed in the research process.*

- *User access to products of participatory breeding assured through identification of effective organizational forms and links to supporting seed services.*

- *Organizational capacity to use PR/GA methods in NRM research improved with a focus on: farmers, local institutions, individual scientists and extension workers, and research and extension institutions.*

Effective use of participatory approaches and gender analysis not only requires appropriate methods, but also suitable organization. The organizational requirements of participatory research need to be examined for two reasons. First, user participation suggests that research may have to be decentralized to incorporate different user groups. Second, successful adoption of NRM technologies may depend less on the technologies *per se* that on organizational innovations in the way stakeholders collectively manage their resources.

In terms of the prospects for decentralizing research, the systemwide working group on participatory approaches in plant breeding recommended study of the alternate divisions of labor within the breeding process. These studies will assess the cost-effectiveness of different organizational forms. The implications of increased involvement of different partners also need to be assessed: for instance, what might be the advantages or constraints for each

collaborator if farmers groups or NGOs take a lead role in adaptive research to permit a vastly increased scale of testing? Other questions which urgently need to be answered include: the extent of decentralization required for a particular crop and locale; the financial and logistical means by which decentralization can be achieved; the implications of decentralization for research quality; the implications of decentralization for the design of technology support services, eg. seed multiplication.

Participatory natural resource management needs to build on local organizational capacity to manage collective resources and to monitor resource trends. Local structures, whether indigenous or introduced may provide the key to scaling up location-specific efforts to achieve the large coverage demanded by watersheds. hillsides or desert expanses. Methodology development involves providing tools to define exactly what scale of resource management is functional and to strengthen the development of durable organizational mechanisms at that scale.

Box 10. Specific outputs from analysis of organizational innovations and links within a participatory research perspective

- Identification of cost-effective organizational forms for different kinds of decentralized plant breeding research
- Options for organizational innovation and links for managing natural resources at different scales
- Strategies for strengthening and catalyzing local and durable organizations which can lead site-specific management of resources
- Analysis of the ability of the formal and informal seed sector to deliver the products of participatory plant breeding
- Strategies for scaling up knowledge-intensive technology development and ensuring its spread

5. Capacity for participatory research and gender analysis enhanced and innovative approaches operationalized: a critical mass of expertise in PR/GA developed on the basis of practical expertise.

The systemwide Planning Meeting adopted a learning process and capacity-building approach to developing participatory research and gender analysis. This capacity-building approach to experimentation contrasts markedly with participatory rural appraisal (PRA) methods in which a "tool kit of techniques" is used in local communities mainly to extract research information needed to plan subsequent experiments or development projects.

Capacity-building activities include: operationalising novel methods, training and workshops on participatory approaches and gender analysis consultancies to provide technical advice on methodologies, and the international seminars in which participants report progress on the workplan and exchange results. These are described in the section on activities earlier in this document.

The systemwide program will use donations to the program to finance the international seminars and training - including training of trainers - to multiply capacity for participatory research and gender analysis. This training will be integrated to every extent possible with other courses and workshops of the participating institutions, and will be open to a broad audience.

Each of the three working groups (plant breeding, NRM and gender analysis) will conduct workshops and may provide consultancies to support the implementation of the common workplan. For example, the NRM Working Group proposes to conduct four regional workshops and one global workshop to carry out the synthesis of the state of the art in applications of participatory approaches and gender analysis to NRM research (Table 2.)

6. Procedures for building new partnerships among the IARCs, NARS, NGOs and farmer groups realized to utilize effectively complementarities among partners, and to accelerate learning about participatory research and gender analysis.

The proposed Systemwide Program is a collaborative research effort among diverse partners. The advantages of joining resources are many: from the outset, formal science will be effectively integrated with farmer-based experimentation, organizational as well as technical options can be explored through this program.

IARCs, NARIs, NGOS and grassroot organizations are developing a model for working together effectively and ethically. The program will provide a mechanism for involving grassroot client groups and organizations in research priority setting, technology development and program evaluation with the CGIAR and its partners.

Through the planning group, they are formulating guidelines for research partnership jointly defining organizational procedures; setting research priorities, and will evaluate success at the program and project level together.

Figure 2: **Project Overview**

Systemwide Initiative on Participatory Research and Gender Analysis for Technology Development and Institutional Innovation

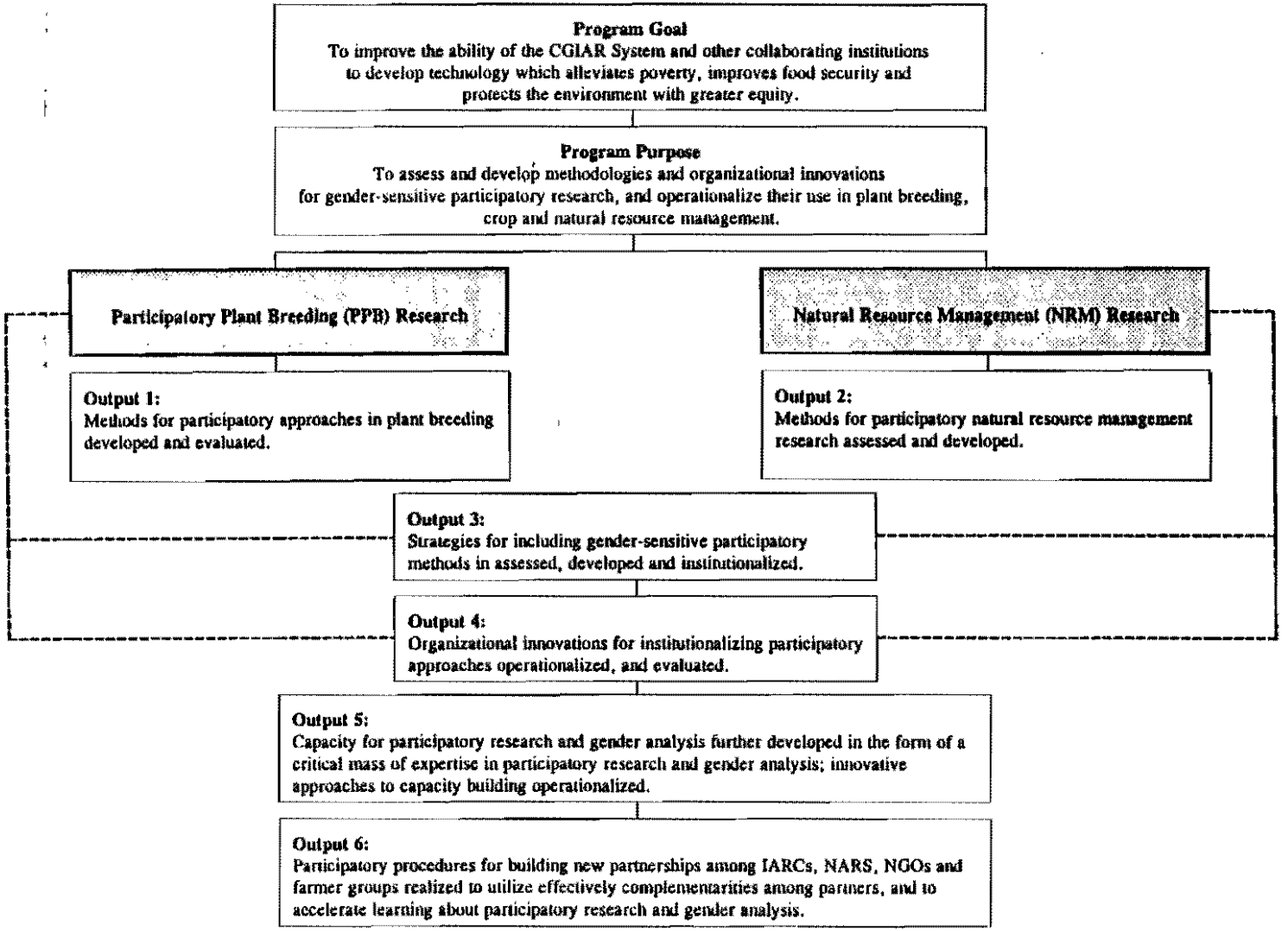

Figure 3.

Systemwide Program on Participatory Research and Gender Analysis for Technology Development and Institutional Innovation

Work Breakdown Structure for Participatory Plant Breeding Working Group

Outputs	Effective participatory methods in plant breeding assessed and developed, with focus on: - farmer's breeding - plant selection (segregating lines) - variety selection (fixed lines).	Beneficiary groups in participatory breeding through methods development for involving direct & indirect stakeholders accurately involved and targeted.	Effective organization forms for operationalizing participatory breeding in the research process identified and developed.	User access to products of participatory breeding assured through identification of effective organizational forms and links to supporting seed services.
Activities	Inventory and compare existing participatory methods across crops and environments Identification and comparison of existing strategies for strengthening farmer breeding (in reference to self-pollinated, open and vegetatively propagated crops) Implementation of experimental research for comparing classical breeding approaches to participatory plant selection and participatory variety selection in reference to the 3 crop types Impact assessment of impact of various participatory strategies in 3 crops types and diverse environments with respect to goals as: yield stability, production, genetic diversity, and other farmer objectives Dissemination of results & relevant methods by crop type, environment and according to priority goals Identification of opportunities for institutionalizing relevant participatory breeding methods, by crop type, environment and according to priority goals	Revision of diagnostic methods for assessment of stakeholder preferences for plant varieties in short, medium & long term Assessment of methods to involve users in plant breeding differentiated by type, including, for example, by gender, wealth and end-use (consumers, processors, seed producers) Analysis of social and economic impacts on different users of various participatory plant breeding methods Analysis of the costs of alternative participatory methods for involving different users in plant breeding Revision of methods for assessing indirect stakeholder roles/needs Synthesis of findings on how to involve hidden and indirect stakeholders in participatory approaches Synthesis of case study findings on how to resolve conflicts among diverse users and stakeholders in germplasm resources Publication of guidelines on the cost-benefits ratios of different approaches to involving and targeting differentiated users	Inventory and comparison of different divisions of labor among farmers and breeders in the breeding process Revision of the ways existing breeding programs organize and fund links with farmers Identification of promising links and innovations Monitoring and evaluation by partners of organizational innovations (including cost-benefit analyses of different links and forms) for participatory breeding Formulation of guidelines for decision-makers on promising organizational forms Revision of communication tools for improving farmer-scientist interaction	Assessment of various methods and tools for understanding local seed systems Identification of strategies for strengthening local seed systems Revision and development of methods to link participatory approaches in breeding with local seed systems and markets Identification of incentives and roles of CBOs and NGOs in enhancing seed and seed information flow Exploration of constraints & opportunities to include products of participatory breeding in the existing regulatory frameworks

Figure 4.

Systemwide Program on Participatory Research and Gender Analysis for Technology Development and Institutional Innovation

Work Breakdown Structure for Natural Resource Management Working Group

Outputs	Synthesis of the state of the art in applying PR/GA[1] approaches in NRM research for different types of technologies across three scales of management[2] compared.	Improved crop and natural resource management strategies incorporating better use of existing and new PR/GA methods at different scales of management developed and disseminated.	Organizational capacity to use PR/GA methods in NRM research improved with a focus on: farmers, local institutions, individual scientists and extension workers, and research and extension institutions.	Effective methods for involving gender differentiated and other direct and indirect stakeholders in NRM developed
Activities	→ Inventory and assessment of use of current PR/GA methods in NRM research. → Inventory and assessment of use of current institutional arrangements for participation of different users in NRM research and practice → Identification of constraints to including specific user groups in NRM research and decision-making → Inventory and assessment of methods and indicators for determining impacts of PR/GA methods → Regional workshops based on initial inventories of active projects to compare and assess PR/GA methods and organizational arrangements. → Global workshop of practitioners to identify the method gaps and prioritize areas for refining and developing PR/GA methodology with respect to specific types of NRM technology and scales of management → Identification and selection of a number of cases for methodology development and capacity building and comparative analysis (partners, sites, technologies, scale, regions)	→ Development and assessment of new methods for participatory resource monitoring by stakeholders at field, farm, community, watershed and other scales → Testing and development of new mechanisms for joining resource user experimenters with each other and with formal science in NRM → Experimentation with the development and testing of bundles of NRM options by researchers and local users → Development of participatory methods which improve resource users analytic tools and concepts for understanding and managing resource processes → Evaluation of the use of free versus controlled experimentation of NRM technologies. → Development of improved methods for operationalizing PR/GA at a large scale for broad coverage in natural resource management → Regional workshops for practitioners to compare, integrate, and contrast different PR/GA methods and strategies for NRM research. → Experimentation with technology options and organizational arrangements to reduce conflict over resources → Evaluation of different strategies for incorporating diverse stakeholder interests into collective action. → Publication of guidelines for improved PR/GA approaches and organizational arrangements for NRM research	→ Development , implementation and evaluation of new options for institutional innovation and strengthening of local organizational arrangements for PR/GA methods for NRM → Experimentation with resource user- and researcher-generated methods for exploring and reducing resource conflicts. → Monitoring of farmer to farmer, locality to locality exchange and extension of PR/GA approaches within and beyond the study area. → Comparison of the costs and benefits of farmer to farmer and conventional scaling up of the results of participatory NRM research. → Promotion of farmer representation on decision-making committees in research and extension organizations. → Provision of guidelines for decision-makers on promising organizational options for strengthening the use of PR/GA methods of NRM research → Training of trainers and researchers in PR/GA approaches for NRM research → Monitoring and evaluation by partners on-going arrangements for collaborative NRM, decision-making and implementation.	→ Inventory and assessment of methods from current practice to identify and include different users in NRM research → Development and testing of new methods for including different types of users in NRM research and decision-making. → Assessment of the costs and benefits of including different types of users to technology development in NRM. → Assessment of the costs and benefits of involving particular users, such as poor rural women or other marginal groups in participatory NRM.

[1] PR/GA refers to the use of gender analysis to identify types of users by gender, wealth and other variables, and participatory methods inclusive of different types of users.

[2] Three scales of NRM are (a) field and farm level, (b) community,, and ® beyond community, for example watershed management.

Figure 5.

Systemwide Program on Participatory Research and Gender Analysis for Technology Development
Work Breakdown Structure for Gender Analysis Working Group

utputs	Effective methods and capacity for using gender analysis developed.	The costs and benefits of using gender analysis in technology development assessed.
ctivities	→Assessment of current practices for including different types of users at different stages of PB and NRM (including variables such as gender, wealth, location, direct and indirect stakeholders). →Identification of constraints and method gaps to effectively include different types of users, particularly less visible stakeholder, in participatory research and in organizational arrangements for PB and NRM. →Monitoring and evaluation of new approaches for including specific types of users in PB and NRM. →Comparison of costs and benefits of including different users at preadaptive and adaptive stages of technology development in PB and NRM, and in different contexts. →Contribution to guidelines for use of PR/GA methods. →Publication of guidelines and case studies on effective inclusion of different users in technology development. → Provision of training and technical assistance on gender analysis through consultancies to a broad audience. → Work with selected institutions to install permanent capacity for gender analysis.	→Comparison of the costs of including gender analysis. (Did it improve design?) →Assessment of the impact of gender analysis. (Did it improve adoption?) →Assessment of the use of gender analysis and gender sensitive participatory methods to effectively target PB and NRM technologies to particular types of users, especially poor rural women and other marginal groups. (Did it improve targeting?) →Assessment of the costs and benefits of including different types of users in local decision-making or implementing institutions for PB and NRM. (Did it improve research planning?) →Contribution to published guidelines and case studies on the effective inclusion of gender analysis in PB and NRM technology development. → Contribution to training courses, workshops and seminars to disseminate results.

Workplan, 1996

Completed:

- TAC approved a Systemwide Initiative in March, 1996.

- The first Systemwide Seminar was convened September 1996 to define expected outputs of the initiative and define the institutional and organizational procedures for CGIAR, NARIs and NGO collaboration. A first meeting of the three global working groups was held (participatory approaches in plant breeding and natural resource management and the gender analysis groups). Key methodological and organizational challenges have been defined; specific activities have been proposed, and elements of a comparative framework have been suggested.

- The Planning Group (duration of one year) was formed in September 1996, with eight elected members linked by e-mail.

- The proposal for the systemwide initiative was finalized and submitted to donors. The proposal incorporates recommendations of the systemwide Planning Meeting.

- The proposal is being submitted to TAC for consideration.

Workplan, 1997

- Planning Group finalizes guidelines for project submission and formally solicits and endorses projects which fit within the workplan. Coordinator is recruited. CIAT appoints a core-funded senior staff members as coordinator.

- Activities in the first year will begin with the activities listed under the first output planned by each working group in Figure 3, 4, and 5.

Expected Impact

Impact in CGIAR System, NARIs, NGOs and GRO's

This systemwide effort will provide widely-applicable guidelines for the use of participatory R&D approaches to technology design in both preadaptive-adaptive and adaptive research, based on rigorous empirical assessment of its potential in two fields which are central to the agenda of the IARCs, NARIs and NGOs. Strategy for main streaming use of these methods in the CGIAR and beyond can be clearly defined, and given significant momentum by this work. Achieving the participation of users -- especially women -- in the process of technology

development will enhance the capacity of the CGIAR and NARIs to work effectively with other types of institutions to benefit the poor.

Box 11. Participatory Plant Breeding and Varietal Evaluation projects which will benefit from system-wide methodology development

	Site / Regions				Institutions	
Species	**Africa**	**Asia**	**LAC**	**Selection**	**IARCs**	**NARS**
Barley	√			Lines; seg pop.	ICARDA	NARIs
Beans/maize	√		√	Lines/composite	CIAT/CIMMYT	EMBRAPA
Cassava	√		√	Seg. pop.	CIAT/IITA	EMBRAPA/CBN
Forages		√		Accessions	CIAT/IRRI	NARIs
Maize		√		Composite	--	NGOs
Pearl Millet		√		Population	ICRISAT	--
Potato			√	Clones	CIP	CONDESAN
Rice		√		Lines	IRRI	NARI, NGOs
Various	√	√	√	Landraces	--	Community-based, NGO's, CGN Wageningen

Incorporation of participatory methods and gender analysis into ongoing projects of the collaborating Centers, NARIs and NGOs will provide concrete demonstration of the pay-off to applying these methods, as well as a critical mass of people experienced in their use. This is vital to achieving progress in consolidating scientific credibility for gender analysis and user participation which goes beyond rhetoric about their importance.

Empirical assessment of methods for preadaptive-adaptive participatory plant breeding will help to guide breeders' choice of the most appropriate breeding approaches for different circumstances by clarifying the relative advantages of conventional, participatory and indigenous crop breeding strategies. Pooling resources among different institutions in a systemwide effort will greatly accelerate this methodology development.

Clear guidelines for decentralizing research using participatory approaches with current institutional arrangements or new partnerships will improve the cost-effectiveness of research and enhance its impact. Further explicit attention to local organizational arrangements within NRM specifically will open up possibilities not yet sufficiently explored for supporting durable, farmer-based, resource management systems.

By situating this work in a framework for comparative analysis of methodological and organizational issues which are common to other fields of research where use of participatory methods and gender analysis is less developed, the proposed program will maximize spill-over from one field to another, promoting economies of scale in methodology development. The proposed program of work can be expected therefore, to accelerate the process of learning about how to use participatory approaches and gender analysis effectively in preadaptive-adaptive plant breeding and NRM research.

Expected impact for men and women farmers

Gender analysis gives visibility to "the forgotten farmers," the rural women in developing countries who use and conserve germplasm, and manage natural resources. Preadaptive-adaptive and adaptive participatory approaches give them a voice in the definition and prioritization of research problems, and in the design of technologies to meet their needs. Bringing gender analysis and participatory methods into the mainstream of public sector research will scale up the visibility of women as users of technology, and allow their voices to be heard. This is vital to achieving impact which benefits poor people, both poor women and the families whose livelihood depends upon them.

Participatory methods and gender analysis also have the potential to strengthen indigenous systems of knowledge generation, of crop development, and of natural resource conservation. Strengthening these systems, as opposed to displacing or discrediting them, is often vital to a process of technology development which promotes sustainable production increases and natural resource conservation.

Box 12. Impact of gender analysis of proposed systemwide program.

- Visibility and credibility of gender analysis reinforced by identification of its payoff to upstream research activities of the CGIAR.
- Dissemination accelerated by formation of a critical mass of people from different disciplines, experienced in the use of gender analysis for technology development.
- Use by NARIs catalyzed through joint projects and empirical evidence of impact on core plant breeding and NRM research programs.

Program evaluation

Progress in methodology development and organizational innovation will be assessed annually by Program's Planning Group, through independent consultants; Working Group technical reports; and papers on comparative analysis presented in the Systemwide Seminars. Indicators of progress and impact have been identified by the PB, NRM and Gender Analysis Global Working Groups (Tables 1, 2 and 3). Partner institutions will involve IARCs, NARIs, NGOs, farmers and other stakeholder groups in project-level monitoring and evaluation.

Program evaluation of the entire initiative will be scheduled near the mid-term point (about 2 years) and at the completion of the Initiative (5 year point). Representatives from all major partner groups will be invited to participate (CGIAR, NARIs, NGOs, Donors and other stakeholders). Community evaluations of the program at each project site will be synthesized and integrated into the central evaluation findings.

Program Evaluation

Table 1. Outputs and Indicators of Participatory Plant Breeding Working Group

OUTPUTS	INDICATORS
1. Assessment and development of effective participatory methods in plant breeding, with focus on 3 types: - farmer's breeding - plant selection (segregating lines) - variety selection (fixed lines)	1.1 Methodology guidelines published for all three approaches. 1.2 Methods in use in at least four cases involving National programs and NGOs (at least one case) for each type 1.3 Publications disseminated on the field level results of the use of such methods. 1.4 Workshops to exchange results conducted.
2. Beneficiary groups more accurately involved & targeted in participatory breeding through methods development for involving direct & indirect stakeholders	2.1 Published guidelines on the cost-benefits of different approaches to involving and targeting differentiated users 2.2 Synthesized findings on how to involve hidden and indirect stakeholders and how to resolve conflicts among diverse groups 2.3 Evidence available that PB products are more user-differentiated 2.4 Evidence available that indirect stakeholders, such as extension have been involved.
3. Effective organizational forms for operationalizing participatory breeding identified and developed in the research process	3.1 Ways existing breeding programs organize and fund links with farmers reviewed and documented 3.2 Reports available on organizational options for participatory breeding along with cost-benefit analyses of these 3.3 Guidelines for decision-makers on promising organization forms 3.4 Capacity-building through training and consultancies provided.
4. User access to products of participatory breeding assured through identification of effective organizational forms and links to supporting seed services.	4.1 Synthesis of case studies on how to strengthen local seed system 4.2 Published analysis on the role of the formal seed system in PB approaches 4.3 At least 2 channels identified which move PB products rapidly to different users

Program Evaluation

Table 2. Outputs and Indicators of NRM Working Group

OUTPUTS	INDICATORS
1. Synthesis of the state of the art in applying PR/GA approaches in NRM research completed	1.1 Inventory and assessment of available methods for PR/GA in NRM research completed and available as a working paper. 1.2 Up to four regional workshops held to compare currently used PR/GA methods 1.3 One global workshop held to identify the constraints and gaps in PR/GA approaches and to define the focus and determine priorities for next phase of research. 1.4 Proceedings of workshops published and disseminated.
2. Improved crop and natural resource management strategies incorporating better use of existing and new PR/GA methods developed and disseminated	2.1 Workshops conducted at up to 6 research sites to incorporate gender analysis and gender sensitive participatory methods into project activities 2.2 Guidelines prepared on methods for scaling up of NRM options and participatory NRM methods. 2.3 Up to ten experiments on how resource user and researcher experimentation fit together conducted and evaluated. 2.4 Up to three community based and 3 researcher based resource monitoring tools tested, compared, and results ready for dissemination 2.5 Up to four regional workshops for practitioners to compare PR/GA methods and strategies held 2.6 Guidelines for PR/GA methods and organizational strategies published
3. Organizational capacity to use PR/GA methods in NRM research. improved with a focus on: -farmers -local institutions -individual scientists and extension workers, and -research and extension institutions	3.1 Research results and guidelines comparing new options for organizational innovation for different types of technologies and different management scales are published. 3.2 Three case studies of organizational change for improving the effective participation of different stake holders are completed and synthesized. 3.3 New local networks for collective resource monitoring and action are formed. 3.4 Farmer representation in research decision-making fora increased. 3.5 Training of trainers and research partners conducted for new NRM research partnerships.
4. Effective methods for involving gender differentiated and other direct and indirect stakeholders in NRM developed	4.1 A comparison of the costs and benefits to technology design and adoption of different levels of participation and the inclusion of different types of users across types of NRM and scales of management is compiled and published as a working paper. 4.2 Guidelines for the involvement of different users in different types of NRM and scales of management are published.

Program Evaluation

Table 3. Gender Working Group Outputs and Indicators

OUTPUTS	INDICATORS
1. Effective methods and capacity developed for using gender analysis and involving direct and indirect stakeholders in PB and NRM	1.1 Guidelines are published on the use of gender analysis and the effective inclusion of different types of users in PB and NRM technology development 1.2 Gender analysis and guidelines for inclusion of different types of users are included in published PB and NRM participatory guidelines 1.3 A synthesis and case studies on the effectiveness of gender analysis and methods for including different users across technology development in PB and NRM is published
2. The costs and benefits of including PB and NRM assessed.	2.1 A comparison of cost benefit ratios for adoption of PB and NRM technologies by including different types of users completed and disseminated. 2.2 A comparison of cost benefit ratios for targeting particular types of users for PB or NRM technologies are completed and disseminated. 2.3 Guidelines on the costs and benefits of including gender analysis and different types of users in participatory PB and NRM technology development are included in the published PB and NRM guidelines.

Table 4. Proposed Budget (in US $):
Systemwide Program on Participatory Research and Gender Analysis for Technology Development and Institutional Innovation

Line Item	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1. Methods and organizational links for participatory plant breeding						
Communications	500	1,000	1,000	1,000	1,000	4,500
Workshops	25,000	26,000	27,000	28,000	29,000	135,000
Empirical studies 1) CG	275,000	303,500	315,500	327,500	340,000	1,561,500
2) Other Institutions	275,000	303,500	315,500	327,500	340,000	1,561,500
Community funds	40,000	83,000	87,000	90,000	94,000	394,000
Publications	0	0	15,000	0	25,000	40,000
Consultants	25,000	25,000	25,000	25,000	25,000	125,000
Total 1.	**640,500**	**742,000**	**786,000**	**799,000**	**854,000**	**3,821,500**
2. Methods and organizational linkages for participatory NRM						
Communications	500	5,000	5,000	6,000	6,000	22,500
Workshops	80,000	26,000	27,000	28,000	29,000	135,000
Empirical studies 1) CG	0	303,500	315,500	327,500	340,000	1,286,500
2) Other Institutions	0	303,500	315,500	327,500	340,000	1,286,500
Community funds	0	83,000	87,000	90,000	96,000	356,000
Publications	0	0	15,000	0	25,000	40,000
Consultants	50,000	50,000	50,000	50,000	50,000	250,000
Total 2.	**130,500**	**746,000**	**790,000**	**804,000**	**861,000**	**3,334,500**
3. Gender analysis for participatory research						
Communications	500	500	500	500	500	2,500
CG Gender Analysis Program	100,000	100,000	100,000	100,000	100,000	500,000
Support to other institutions: Empirical studies, training and dissemination	30,000	50,000	57,000	58,000	58,000	253,000
Total 3.	**130,500**	**150,500**	**157,500**	**158,500**	**158,500**	**755,500**
4. Capacity building						
Systemwide seminars	0	54,000	0	54,000	58,000	166,000
Publications	0	0	0	0	35,000	35,000
Short courses	40,000	60,000	0	0	0	100,000
Follow-up training	0	0	36,000	36,000	0	72,000
Trainer's workshops	0	0	36,000	0	36,000	72,000
Total 4.	**40,000**	**114,000**	**72,000**	**90,000**	**129,000**	**445,000**
5. Project Coordination	48,000	45,000	45,000	45,000	45,000	225,000
Communication	500	500	500	500	500	2500
Total 5.	**48,500**	**45,500**	**45,500**	**45,500**	**45,500**	**227,500**
Grand Total	**990,000**	**1,798,000**	**1,851,000**	**1,897,000**	**2,048,000**	**8,584,000**

Budget Notes

The grant request has been approved by TAC for US $0.9 million for 1997, pending final TAC approval of the initiative as a systemwide program which will be requested in November, 1996.

1. Resource allocation procedures

The Planning Group has been mandated by the participants in the SWI Planning Meeting held in September, 1996, to finalize guidelines for the inclusion of projects in executing the workplan and to work on funding the Program. It is envisaged that once the funding available for 1997 is designated by donors, the Planning Group will solicit proposals from ongoing projects such as those in Annex 2, with respect to how these projects would link up with the SW Program. The Planning Group will allocate resources for 1997 to those projects which best contribute to the overall workplan, using criteria developed by the Planning Meeting participants.

The Planning Group expects to allocate funds received by the Systemwide program to ongoing projects or research programs which demonstrate capacity to cofinance activities in the Program's workplan, rather than to initiate new projects.

A portion of the funds donated to the program will be used to support and encourage partnerships among different types of orgnaizations for the implementation of the workplan. Therefore, the line item for empirical studies specifies amounts for CG and other institutions.

Projects receiving support from the Program will be members of the Working Groups together with other interested practitioners, who have joined the Program through the first International Seminar, or who may wish to do so in the future.

Partner institutions will also seek funding for projects with the endorsement of the Systemwide Program, in addition to donations made through the Participatory Research and Gender column of the CGIAR matrix. Such additional grants, made to partners, will contribute to the implementation of the proposed workplan, but will be administered by the recipient institutions.

2. Working groups on PPB and NRM research

a. Funding is requested for tow international working groups to carry out the workplan in Figures 3 and 4, for the assessment and development of participatory approaches and gender analysis in PB and NRM research.
b. Funds are to support email networking among participants in the working groups and workshops, which will be organized regionally for the exchange of methodology to

support the implementation of the empirical studies.

c. Funds for empirical studies are for research activities in the workplan.

d. Community funds are to provide rotating funds for farmers and GROs to conduct and continue participatory research activities when appropriate, after the termination of this Program and its constituent projects. These funds will also assist farmers and community participating in Program evaluation and in planning meetings.

3. Gender Analysis

a. Funds are requested to support the involvement of the CG Gender Analysis program's research activities in the systemwide program, including consulting, technical advice and networking on research-related issues with IARCs.

b. Additional funds provided for the Gender Working Group will add to the CG Gender Analysis Program's IARC network, the participation of non-CG institutions with expertise in the area. Gender Working Group members will also be members of the Plant Breeding and NRM Working Groups. Funds are requested to enable the Gender Working group network by email, and to support non-CG institutions in contributions to the workplan that are uniquely related to strengthening the integration of gender analysis into the overall workplan.

4. Capacity Building

a. Funds are requested for bi-annual systemwide seminars at which the working groups will present to each other and to a wide audience of interested practitioners in the field, results of work in progress.

b. Funds will be used to add support to training events of the working group members, so that these can include modules on participatory research and gender analysis. Using the same strategy, the program will conduct follow-up training and training for trainers for the same purpose after two years to consolidate capacity built this way.

c. Publications by the Program will be papers from the systemwide seminars. Commercial publication will be sought for the write-up of the guidelines and case studies based on the empirical research conducted by the working groups.

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Annex 1.

Examples of Projects with which the Proposed Program will Work

The following summaries of ongoing projects involving the cosponsoring IARCs and their institutional partners are examples of the type of projects with which the proposed program will collaborate. This collaboration requires additional support provided through the program, to add capacity to the relevant partners in each ongoing project to carry out the workplan developed at the SWI Planning Meeting, September 9-14, 1996.

Project Overviews

1. Introduction and conservation of improved genetic diversity in farmers' fields

Institutional Partners: CIAT; Colombian Institute for Agricultural Research (CORPOICA); Instituto Nacional de Investigación Agraria (INIA), Perú; the Associación para el Desarrollo Rural de Cajamarca (ASPADERUC), a Peruvian NGO; the PROFIZA network of national bean breeders in the Andean region; CONDESAN, a consortium of Andean research and development institutions which includes CIAT and CIP.

Overview: Collaboration with the systemwide initiative will aid these breeding programs in their search for a strategy which will combine science-based and farmer-based genetic improvement, at a regional or agroecosystem level, in a model that can be adapted to other regions and other crops.

Two types of crops will be involved: vegetatively propagated cassava and self-pollinated common beans. Presently ongoing studies of farmers' varietal selection criteria will be expanded to better understand how farmers use, maintain and discard genetic diversity. Gender analysis will be a tool in determining the appropriate types of farmers to involve in the evaluation, collection and selection for different traits. Data will be integrated with GIS analysis to understand the spatial distribution of local genetic diversity, types of users and their preference structures.

Strategies will be tested for bringing a broad range of germplasm in the early stages of the breeding process to farmers' fields and involving farmers in their selection. Germplasm will be drawn from segregating progenies from the recombination of elite materials from CIAT's extensive collections as well as local landraces. At the same time these progenies will be evaluated within the normal breeding programs of the participating national and international partners.

The viability of alternative approaches to *in situ* conservation with farmer participation will be assessed, involving for example, farmer managed nurseries or conservation through breeding

with valued landraces. Research will compare differences in the selective pressures that farmers and professional breeders working alone, and working together, exert on the local genetic resources in these two crops; to characterize the advantages and disadvantages of different approaches to participatory breeding and in situ conservation.

It is hypothesized that a broader range of genotypes will be selected within a given ecosystem with farmer involvement, creating a mosaic of genetic diversity at the field, farm and community level. Effects of conventional and different strategies for farmer participation on genetic diversity will be monitored, as wells as the relationship of the resultant genetic diversity on yields, quality traits and the incidence of abiotic and biotic constraints to production.

The field work on cassava for this study will be initiated by CIAT and CORPOICA in the north coast of Colombia, and is expected to have an important methodological spin-off within a short time for related breeding work, linked to the semi-arid regions of Africa in a collaborative project with EMBRAPA, Brazil and IITA. The field work on beans will be carried out in Cajamarca, Perú - a center of diversity of common beans.

Duration: Five years.

Total value of the project: US $1,600,000 of which 50% is contributed by existing core of the partner institutions.

2. Maize diversity and conservation and utilization - A farmer-scientist collaborative approach

Institutional Partners: CIMMYT (executing agency); Mexican National Institute for Research on Forestry, Agriculture and Livestock (INIFAP); Mexican National Agricultural College (Chapingo) and Post-graduate School (Montecillos); NGOs involved in biodiversity conservation and agricultural/rural development in Mexico; ejido and farmer's groups; collaboration with the McKnight Foundation funded project in the state of Puebla, Mexico.

Overview: Participation in the proposed systemwide program will enable the collaborating research program to develop and evaluate alternative methods for farmer involvement in improving maize landraces *in situ* and the conservation of diversity in maize in *ex situ* banks, which should be useful to farmers and maize breeders worldwide. The project involves innovative methodology development to merge farmers' knowledge of the strengths and weaknesses of locally grown folk varieties with professional breeder's knowledge of global germplasm resources, to improve the usefulness of folk varieties and thus the conservation of valued traits. Cultivars collected with farmer involvement as well as new ones resulting from participatory breeding will be preserved at CIMMYT and other Mexican genebanks. Gender analysis will be an essential tool for establishing the value of different traits and genetic material, for impact assessment and for determining what types of farmers should participate in

different aspects of the work; collection, evaluation, breeding, monitoring and dissemination. A review and comparative analysis of selected techniques for participatory breeding and monitoring of genetic diversity will be carried out, together with the development of a strategy to disseminate these techniques to different types of users. The development of methodology for evaluating the impact of the farmer-scientist collaborative approach will be integral to the research. The field work for this project will be located in four sites in Mexico, the center of origin of maize, and which today contains more maize diversity that any other part of the world, with 80% of its maize area planted to local landraces.

Duration: Six years

Total value of the project: US $4 million

3. Farmers and Breeders: Building a partnership for rainfed rice

Institutional Partners: IRRI, the Indian Council for Agricultural Research (ICAR), the International Rainfed Lowland and Upland Rice Research Consortia

Overview: Involvement with the proposed systemwide program will enable this project to test and evaluate a number of alternative strategies for bringing farmers into the generation of improved rice varieties for more than 50 million hectares of rainfed environments. Farmers will be provided with diverse plant populations for evaluation and selection, with respect to adaptation to stresses and increased productivity in contrasting subecosystems. These gene pools will include segregating populations, dihaploid lines, advanced breeding lines and composite populations.

Methodology development will include the examination of the results of farmer involvement in the selection of these different sources of genetic materials, and the advantages and disadvantages of alternative approaches to harnessing the complementary skills of farmers and breeders through farmer participation in this selection process. It will also involve attention to traits selected or easily detected by farmers. It is in these cases that the tools of biotechnology, such as tagged genes and molecular markers, may be applied in the farmers' fields during the selection process. Particular attention will be given to developing applications of biotechnology which farmers can understand and use for selection and varietal deployment.

The project also involves the widespread dissemination and implementation of the most efficacious strategies identified, in partnership with NARIs, NGOs, Universities and farmers' organizations in eastern India, northeastern Thailand and the southern Philippines.

Duration: Three years.

Total value of the project:

4. Participatory natural resource management research in the drylands The case of Southern Tunisia

Institutional Partners: ICARDA, Syria in collaboration with the Insitut des Regions Arides (IRA) under the umbrella of the Dryland Resource Management Project (DRMP).

Overview: There is a growing concern among the developing Mediterranean countries on the degradation of natural resources (soil, water and natural vegetation) and its potential impact on the sustainability of agricultural development. As a result of rapid population growth and higher income levels, food demand continues to rise, thus exerting a mounting pressure on the limited land and water resources. Traditional resource management systems, where communities played a vital role, are weakening or disappearing due to social changes. Traditional conservation practices, such as terraces, are being neglected and abandoned, thus causing accelerated soil erosion and siltation in dams. Expansion of cultivation into the marginal lands, which were traditionally reserved for grazing, is increasing soil erosion by wind and water. Other environmental impacts of land degradation include the loss of natural bio-diversity which affects future crop improvement.

Policy makers in Tunisia, as in many countries in the region, are concerned about the effects of natural resource degradation on rural poverty and associated social problems. There is a direct linkage between resource degradation and poverty. Also, the impact of water shortage on the country's future development is of particular concern to Tunisian policy makers. Hence, they are very keen to enhance the conservation and efficient utilization of water resources in any way possible.

The institutional partners have initiated an inter-disciplinary and participatory resource management research under the umbrella of Dryland Resource Mangement Project (DRMP). While the participatory approach is necessary to ensure that the perspectives and views of individual land users, who will ultimately make the resource management decisions, are heard and their solutions incorporated into the research process. Users' participation will enable researchers to understand why observed actions are being taken and assist in identifying the causes of degradation.

The approach emphasizes a watershed perspective, where groups of farmers using a micro-watershed are identified, and collective group action on practices for overall improvement as well as individually selected practices are identified and evaluated. The step-by-step approach of the participatory methodology used to elicit farmers' perspectives, understand their problems and allow their selection of solutions will be clearly documented. The significance and contribution of the participatory methods to the success of the research process will be demonstrated. The applied participatory approach involves the collaboration of different partners, including farmers, researchers, development agencies, NGOs, farmer organizations, community leaders and policy makers at different levels.