CGIAR

Agenda item 3(b) iii

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The Third System Review: From Proposals to Practice

System Review Follow-up: Consultative Council Propositions on Science

The Consultative Council, meeting in Brussels on January 27-28, requested the CDC as well as TAC to prepare a number of reports on science-related issues, as follow-up to System Review recommendations. The table below indicates the status of each report by agenda sub-item.

Agenda sub-item	***Topic***	***Documentation***
3(b) i	Proposal on strengthening policy research and capacity building for policy research	CDC paper & TAC commentary attached
	Proposal on strengthening the existing gender analysis program	CDC paper & TAC commentary attached
	Proposal on new initiatives on global information sharing	Paper to be issued at MTM
	Proposal on new initiatives on capacity building	Paper to be issued at MTM
3(b) ii	Progress report on development of an institutional mechanism for holding patents, and update on IPR audits of Centers	Paper to be issued at MTM
	Proposal on terms of reference for the systemwide review of plant breeding	Paper to be issued at MTM
3(b) iii	Progress report on strengthening existing NRM networks	CDC paper & TAC commentary attached
	Progress report on improving the CGIAR's effectiveness in Sub-Saharan Africa	CDC to report at MTM
	Comment by FARA on improving the CGIAR's effectiveness in Africa	FARA to report at MTM

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Agenda item 3(b) i

CENTER DIRECTORS' COMMITTEE
NOTE ON POLICY RESEARCH

March 15, 1999

The Center Directors Committee presented its response on the 1998 CGIAR System Review Recommendation 7: Management Sciences and Policy Research to the CGIAR Consultative Council in Brussels, 28th January 1999.

Organize systemwide dialogues for policy makers

The CDC does not support the creation of a systemwide initiative on dialogues with policy makers because existing collaborative programs are already serving this purpose. Many fora for interacting with policy makers already exist, including the Global Forum and several national steering committees on a wide variety of CG priority areas. The CDC, therefore supports the thrust of the recommendation, but prefers to enhance the use of existing mechanisms.

Greater emphasis on social and management sciences and policy research

The CDC supports the greater emphasis on social and management sciences and policy research. The CDC does not endorse the establishment of a new initiative as Centers have available a wide range of support systems on these issues.

More training is needed on the management of complex organizations, both internally and with our partners. A systemwide activity funded by the Ford Foundation has requested the CDC to coordinate a programme of "Support to Organizational Change", using latest concepts for modern learning institutions. A highly successful series of leadership and management courses has been coordinated by the CG Secretariat for the training of Center staff. The CGIAR Gender and Diversity Programme, currently supported by the CDC on an interim basis, has provided invaluable capacity building and is now in the process of establishing itself at a CG Center.

IFPRI is recognized as the lead Center for policy research and should help ensure consistency and quality in policy research.

The CDC response was accepted by the Council; the CDC were then requested to write a short paper on this recommendation. The focus of this paper is on the policy issues because there was complete agreement on the management science issues.

Background

The 1998 CGIAR System Review (p. 11) for the first time included policy in the CGIAR mission statement. The CDC response to this recommendation, following recommendations from the TAC Stripe Review, calls for increased inter-center collaboration on policy research and training, with specific attention to six points. Before these points are addressed there is a need to clarify some conceptual issues.

Policy research involves research that is designed to help policy makers make better policy decisions related to key problems. As such, policy research should be problem driven. The scope of the research can relate to any or all of the stages of the policy process:

- problem diagnosis
- analysis of policy options
- policy formulation
- policy implementation
- monitoring of policy change

The main clients for policy research are policy makers, from global to local levels, as well as policy influencers such as the World Bank and other international institutions.

The types of policy-related issues will be driven by the problem and may include a range of topics such as property rights, access to credit, inputs, or markets, among others.

Systemwide dialogues for policy makers. The CDC agrees that the CGIAR centers and their partners need to enter into more effective dialogue with policy makers. However, the CDC does not consider a Systemwide Initiative to be the most effective way to facilitate that dialogue. Many fora for interacting with policy makers already exist, including the Global Forum and several national steering committees on a wide variety of CG priority areas. Some centers have already leadership responsibilities within the CGIAR in areas related to natural resource management (see CDC paper on Natural Resource Management research). They can also lead the system in policy dialogue related to these areas.

In addition, several systemwide and ecoregional programmes should strengthen their policy dialogue roles. For example, the African Highlands Programme should facilitate dialogue on soil fertility with policy makers in East Africa. The Systemwide Programme on Genetic Resources, the Systemwide Programme on Property Rights and Collective Action, and the Systemwide Livestock Programmes should all strengthen their efforts in policy dialogue.

Recommendations

The CDC recommends that a strengthened policy research agenda for the CGIAR includes the following:

1. More integration of the technological and policy dimensions of the CGIAR research agenda

Socio-economic and policy research is the other side of the coin to technological research. All research should be driven by problems of large magnitude, those that are currently, or in future will be of concern to policy makers. While some problems may suggest an emphasis on either technological or policy research, in most cases there are likely to be roles for both. In fact, there is likely to be synergism between the two as policy change can multiply the impact of technological research while technical change can greatly enhance the impact of policy research.

2. The comparative advantage of policy research in the CGIAR is the intersection of policy and technology

The CGIAR has a well-renowned expertise in agricultural technology research. The policy research dimension receives a minor share of resources and therefore is likely to have greatest impact if it is well linked to technological research.

3. Policy research targets clients at different scales (global, regional, national, and local)

While the CGIAR undertakes research on problems of an international scale, the driving forces and policy options for addressing these problems may lie at various scales including the local level. A global problem such as global warming through greenhouse gas emissions may therefore lead to policy research at the local level to understand incentives driving slash and burn systems. A problem affecting many countries at the national level could be lack of viable agricultural technologies for smallholder farmers for which research on national agricultural research systems may be warranted. An example of a local problem that affects numerous countries is soil erosion on marginal lands. Policy research to address this may involve the analysis of international, national, and local driving forces and their link to policies.

4. All CGIAR policy research activities must produce international public goods

This is equally important for policy and technology research. Because many policies are determined by national or more local governments, there could be a tendency for policy research

to become too location-specific. Policy research in the CGIAR must therefore meet one of the following criteria.

· policy science – generic research undertaken to improve understanding of the responses of individual farmers, farmer groups or institutions to policy changes;
· method development – development and application of new methods or innovative approaches;
· analysis of the impacts of global or multi-national policies;
· comparative studies of policy making or policy impact across several countries.

5. Strengthening the capacity of NARS to conduct policy research

Policy research as such is not part of the agenda of most NARS. While, many of our NARS partners want to expand into this area, they are hampered by tight government budgets and the lack of capacity of their existing staff. Many NARS also lack an understanding of the potential contributions of policy research or the way that policy research can complement technology research. The CGIAR centers should do more to enhance the capacity of the NARS and to increase awareness of the importance of good policy and policy research and its links with technology research.

The CDC suggests that building capacity for policy research by the CGIAR should concentrate on Africa and on selected countries in South Asia and Southeast Asia. This is because it is these locations where rural poverty is most severe and the impact of policy research could be greater.

The comparative advantage of the CGIAR centers needs to be considered relative to other training provided by the Centers and alternative suppliers of policy training and capacity building, especially international organizations such as the World Bank and regional programmes such as ECAPAPA in East Africa, SADC in southern Africa and CIRES in West Africa. Collaborative research programmes among CGIAR centers and NARS provide excellent opportunities for targeted training and capacity building on policy. IFPRI has key roles to play, especially in advanced analytical techniques.

6. New partnerships for policy research

In many countries, the policy research capacity is in national institutions that are not traditional collaborators for the CGIAR centers. Policy research organizations such as the African Center for Technology Studies and universities also have generic expertise on policy research. Linkages with such organizations should be pursued.

One of the major strengths of the CGIAR system is its strong links with national partners, particularly in the agricultural sector. However, other institutions, such as the World Bank, conduct policy research in related areas and the comparative advantage of the CGIAR must be identified following discussions with these key actors.

Within the CGIAR, it is recognized that IFPRI has developed a strong capacity in undertaking policy research in a number of thematic areas and will therefore play a leading role in research and capacity building. But other centers may have comparative advantages in some of the important policy research areas at other scales such as identifying priority policy problems and research on formulation or implementation of policy, given their long-term presence in developing countries.

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TAC Comment on CDC Paper on Policy
(SRP Recommendation 7)

The System Review offered a set of recommendations about the CGIAR's role in policy research (Recommendation 7). These recommendations were considered by the CDC. TAC has the following observations to make on Recommendation 7 and on the CDC's responses to these recommendations.

The System Review's recommendation on policy research contains five components:

1. Increase emphasis on social and management science and policy research

The CDC agrees and TAC considers that this is indeed a most welcome recommendation. Based on information from the recent Stripe Review on Policy and Management, TAC, however, recalls that the share of the total budget going to social science research in the CGIAR is already quite large, and that it continues to rise. TAC's recommendation is consequently that increased emphasis should not be achieved at the cost of diverting resources from other CGIAR activities, but through changes in the mix and quality of scientists, and improvements in the productivity and quality of social science, in particular through more efficient linkages across the System.

TAC also notes that, in the current practice of CGIAR Centres, "social science" is very often reduced one-sidedly to economic research, while sociological and socio-anthropological research on farmers, livestock producers, fishermen, etc., is insufficient. Several recent EPMRs have revealed that the socio-cultural (non-economic) variables relevant to centres' activities are overlooked and that the System's capacity for social research is as a consequence not fully up to its mandate and objectives. Therefore, TAC strongly supports the System Review's timely recommendation that centres need to increase their emphasis on high quality social research broadly defined, implying the need to achieve greater diversity of social scientists compared to current staffing practices.

By contrast to research in social science, research in management science has recently been under-subscribed. In addition to current challenges, there are important new questions that management science needs to address on behalf of the System, particularly in the domain of the relationship between IPR (intellectual property rights) and IPG (international public goods), new forms of partnership with the private sector, and the joint management of productivity gains in agriculture and natural resource conservation. Greater emphasis on management science through modestly increased budget appropriations is indeed desirable.

2. **Strengthen policy analysis research**

The CDC agrees with this recommendation. Not to distort budget allocation, TAC again prefers that greater strength comes as a consequence of higher quality and higher productivity, not of higher budget appropriations.

3. **Policy formulation and analysis should be carried out with selected developing countries**

Policy analysis and formulation done in the CGIAR is rarely, if ever, conducted other than cooperatively with national partners. This has been an important philosophical principle for CGIAR research. From a practical standpoint, policy research almost always requires access to information that can only be obtained through collaboration with nationals. And, collaborative research has been used as a training device in fulfilment of the CGIAR's objective of strengthening NARS.

The CDC agrees with this perspective, noting that work at the country level is necessary for policy analysis. The trend toward building regional economic spaces in much of the developing world requires CGIAR attention to policy research at that level as well. TAC observes that working at the national levels may sometimes run counter to the international public goods mandate of the CG, but possibly for the better. As the CDC observes, the way this dilemma has been resolved in the past is to conduct policy research at the national level, but with the following perspectives:

- The policy issue is generic. Hence research contributes to policy science.
- The objective of the analysis is the development of methods with broader applicability.
- The issue analysed is global or multinational.
- The national analysis is part of a multicountry project allowing the opportunity to conduct comparative analysis.

Policy advice needs to be done at the national level and availability of policy as an international public good may be of no effect to induce policy reforms. Bad policies at the national level are rarely the product of ignorance, but of the national political economy, blocking the demand for policy information. Hence, analysis of policy "bads" and of policy alternatives needs to be developed at the national level. The System Review's observation that policy formulation and analysis need to be carried out with selected developing countries is consequently correct.

In TAC's opinion, the notion of international public goods as the only instrument for the CGIAR to achieve its goals may need to be reviewed for its implications for policy and management research as well as for work on biological innovations. National-level policy research that leads to outcomes important for CGIAR objectives may be warranted when the accumulation of experience over such projects is likely to transform national results into international public goods, even when accumulated experience involves different research programmes.

4. **The CGIAR should organize Systemwide dialogues for policymakers at regular intervals**

While endorsing the need for CGIAR Centres to enter into effective dialogue with policymakers, the CDC does not support the creation of a Systemwide initiative for this purpose. This proposition had already been rejected by TAC's Stripe Review on Policy and Management in answer to a question by TAC to this effect. There already exist a number of collaborative instruments for policy dialogue. As the CDC suggests, the Global Forum might serve this purpose. Ad-hoc initiatives with multi-centre participation are currently being used successfully, for instance IFPRI's 2020 Project and CIAT's forthcoming conference on technology and poverty. As the CDC observes, several of the existing Systemwide and ecoregional programs can also strengthen their policy dialogue roles.

The view that policy research is principally done for policy makers is, in TAC's opinion, too narrow. Among other things, policy research is conducted to bring into the policy process the participation of a broad constituency that includes citizens and their multiple layers of organizations, policy analysts, international development agencies, etc. Policy dialogues must encompass these broader constituencies.

5. **IFPRI should launch a special programme in collaboration with others to strengthen the capacity for collaborative policy research and formulation in countries with a gap between potential and actual yields.**

The principle is well taken and the issue deserves being brought to the attention of IFPRI. Gaps between potential and current yields are often large as a consequence of inadequate or incomplete policies. The same applies to gaps in implementing the results of NRM approaches. Full return to investment in research is prevented by existence of these gaps. However, TAC prefers to leave it to the discretion of the centers how this can best be addressed. Clearly, there is no single programme that will resolve this problem, and ad-hoc solutions need to be skilfully designed for each particular case.

In its commentary, the CDC recommends that a strengthened policy research agenda for the CGIAR should include the following:

(1) More integration of the technological and policy dimensions of the CGIAR research agenda. And (2), focusing on the comparative advantage of policy research in the CGIAR which is at the intersection of policy and technology.

TAC agrees that policy research at the center level should be largely guided by this comparative advantage principle. However, this view of the role of policy research as an instrument for the CGIAR to achieve its mission is much too narrow. Centers have addressed policy issues in the macroeconomy, trade, the performance of markets and institutions, the delivery of public goods and

services, and the management of poverty which are all fundamental for poverty reduction, food security, and sustainable resource management. Following the CDC's perspective, this observation suggests a useful guideline for the division of labour in policy research between IFPRI and other centers.

(3) Policy research should target clients at different scales (global, regional, national, and local). And (4), policy research needs to be pursued at several imbedded levels: global, regional, national, and local.

With the rapid trends toward both the globalization (international agreements) and the decentralization (toward municipalities and localities) of governance, this range of inter-related levels of policy analysis indeed becomes increasingly important. The first two levels of analysis by nature create international public goods. The latter two only do so if organized as generic or comparative multicountry projects. As discussed above, it may be more cost effective not to restrict every policy research project done at the national and local levels to narrowly satisfy the test of international public good if the project is useful to achieve the CGIAR's goals. Overcoming national public "bads" requires specifically national and local level research since these are the levels at which policy decisions are made. Cumulative learning to generate international public goods from local and national policy research will gradually occur through informal or systematized accumulation of results.

(5) Strengthen the capacity of NARS to conduct policy research

TAC very much agrees with this recommendation. Policy research needs to be done nationally and on a continuing basis, requiring local expertise that is very often missing or of inadequate quality. Training in policy research by the CGIAR needs to be carefully designed in relation to the multiple other sources of training in policy analysis and it has to be complementary to the CGIAR's research mandate. However, still at the moment, IFPRI's perspective is that "training and capacity strengthening activities will be undertaken only as part of food policy research projects or research collaboration" (IFPRI, 2000-2002 Medium-Term Plan). Given the very special expertise in policy research at IFPRI and the immense needs for greater national and local capacity in high quality policy analysis, TAC sides with the CDC in suggesting that there are high returns from additional efforts at strengthening the capacity of NARS to conduct policy research.

(6) New partnerships for policy research

Partners in policy research do indeed need to be sought beyond the traditional NARS, with caution to identify where the CGIAR's comparative advantages lie relative to that of other actors such as the World Bank. As the CDC indicates, this is valid not only for IFPRI but also for all centres' undertakings in policy research. TAC sees this as an excellent suggestion. The forthcoming TAC report on partnerships should help provide guidelines as to how to develop these new partnerships and use them effectively to achieve CGIAR's objectives.

Agenda item 3(b)i

Center Director's Committee
Note on Gender in Agriculture

March 15, 1999

The 1998 CGIAR System Review made a recommendation regarding women in agriculture:

> "The CGIAR organize an International Network for the Technological Empowerment of Women in Agriculture. The network should promote a common platform for action at the country level by national, bilateral, international, non-governmental, private-sector and women's organizations" (Recommendation # 9).

The Center Directors Committee presented its response to the CGIAR Consultative Council in Brussels, 28 January 1999. The CDC responded that it did not support the establishment of an additional network, based on the belief that the combination of the CGIAR Systemwide Program on Participatory Research and Gender Analysis (PRGA)and the CGIAR Gender and Diversity Program provides a comprehensive platform to address gender staffing and gender analysis issues.

This paper describes current status and action plans of the gender analysis (research) and gender staffing (human resources policy) capacity of the CGIAR.

The Difference between Gender Staffing and Gender Analysis

Gender Staffing and Gender Analysis are two distinct areas of endeavor. Gender Staffing efforts aim to strengthen the recruitment and retention of highly qualified women professionals and to create work environments that are equally supportive of the productivity, advancement, and job satisfaction of women and men.

Gender Analysis is a research methodology that enables research scientists to take into account the special needs, constraints and responsibilities of women in technology development. Use of gender analysis as a research tool is basic to technology development aimed at poverty alleviation and the empowerment of poor rural women through their participation as users in the process of technology development. Household food security, particularly among children in poor countries, is vitally affected as women make up an increasing proportion of the rural poor (the "feminization of poverty).

Poor rural women's participation in the early stages of technology design ensures that new technologies are appropriate to their needs and can be adopted rapidly.

Gender Staffing in the CGIAR

The CGIAR has had a Gender Staffing Program since 1991. Recently, key stakeholders agreed to broaden the Program to include other dimensions of diversity in identity groups, such as race and ethnicity. The new Program will begin in June 1999.

Current Status. The current Gender Staffing Program supports efforts of the CGIAR centers and their boards to strengthen the recruitment and retention of highly qualified women scientists and professionals and to create work environments that are equally supportive of the productivity, advancement, and job satisfaction of women and men. A gender equitable work environment is defined as one that:

- includes and supports both men and women;
- stimulates their fullest productivity and satisfaction in their professional and personal lives;
- harnesses men's and women's diverse skills, perspectives and knowledge
- values diverse contributions and ways of working.

To support the centers, the Program provides information, funds, technical advice, consultancies, and training. The Program focuses on five areas: recruitment, spouse employment, leadership and management development, gender issues in the workplace, and information dissemination. The Program also serves the members (donors) of the CGIAR by providing information to increase understanding of gender issues and their relevance for organizational performance, monitoring and reporting on changes within the centers, and channeling funds to key leverage points for change.

Members of the CGIAR have advocated greater attention to gender staffing for reasons of both equity and organizational effectiveness. First, they recognized the historically low participation of women as compared to men in the centers. Women represented only 11% of all internationally recruited staff across all centers in 1991. Yet, both the numbers and percentages of women in the disciplines relevant to the centers have increased dramatically in recent years. To ensure high quality staff, it was recognized that the centers needed to tap effectively into this expanding pool of talent.

Second, the centers are increasingly engaged in partnerships with a wide range of organizations, including non-governmental organizations and local organizations where women's participation is often high. Gender diversity was seen as a potential asset in fostering these partnerships. Third, many donors saw cultural and gender diversity in staffing as an asset that can strengthen organizational performance by broadening the pool of skills, talents, perspectives, and ideas within the centers. And finally, given the humanitarian mandate of the CGIAR, its concern for equity, and its international character, it was thought that the centers should provide leadership in creating work environments that are gender equitable and culturally pluralistic.

The CGIAR Gender Staffing Program has supported the centers in five areas: recruitment, spouse employment, leadership and management development, gender issues in the workplace, and information dissemination. The Program began with a diagnosis of gender staffing issues in the centers and awareness-raising workshops for senior managers. The Program subsequently developed resource materials, services and policy guidelines for system-wide use, as well as undertaking pilot projects with individual centers on specific topics, such as improved recruitment practices, spouse employment options, sexual harassment policy and gender in the workplace.

Annual funding for the Program has ranged from $200-240,000 per year, with core staffing of a 2/3 time Program Leader and a 1/3 time Program Assistant, and six to eight consultants. The Program is coordinated by the CGIAR Secretariat and is implemented by the Center for Gender in Organizations at the Simmons Graduate School of Management. An Advisory Panel of six senior managers from the centers, as well as the senior management specialist in the CGIAR Secretariat, have guided the Program on priorities and monitored program delivery. The Program has been linked directly to the centers through a network of Gender Staffing Focal Points–managers or senior staff in each center responsible for providing leadership within the centers in addressing gender-staffing issues.

Significant progress has been made since 1991. The number of female internationally recruited staff increased by more than 20 percent, and female nationally- recruited professional staff by 150 percent. However, the proportional representation of women in professional and scientific categories (16%) is still well below the 25-30 percent level of estimated supply and the 35 percent level that research suggests is necessary for a minority group to have a significant voice and influence in shaping the work and work environment of an organization. The centers have also begun to

systematically incorporate the knowledge, tools, and strategies for creating a gender-equitable environment into the fabric of their policies, management systems, and work practices.

Feedback from the centers in 1998 indicates that the Program has been highly appreciated. Over the past six years, it has provided services to all centers. It has given intensive support for consultancies, technical assistance, action research, or small grants to 10 centers. The remaining six centers have benefited from system-wide products, such as guideline papers and the newsletter and in terms of support for recruitment searches or subsidized opportunities for management training.

To review the CG system's experience and to make strategic decisions about future initiatives to address gender-staffing issues, an Inter-Center Consultation was held with ISNAR in The Hague in April 1998. Twenty-five managers and scientists from across the system, as well as four distinguished resource persons with recognized expertise in gender and staff diversity, participated in the Consultation. Each center representative came to the Consultation having carried out extensive discussions with staff and managers in their centers about priorities for future work on gender and broader staff diversity issues. The Inter-Center Consultation concluded that good progress had been made on identifying best practices for formal policies and management systems, but recognized that adoption and implementation remain quite variable across the centers. More learning and work need to be done on organizational culture and informal practices. Leadership and management commitment to creating work environments supportive of gender diverse staff need to be revitalized. Continued investment needs to be made in strengthening the skills and knowledge of the internal change agents – both managers and staff—responsible for guiding and promoting effective organizational change.

There is also now strong support among the centers to extend work on organizational change beyond gender, to other diverse identity groups within the centers, among both nationally and internationally recruited staff. The centers believe that the more diverse staff composition and more intensive reliance on collaborative partnerships expected in the next century calls for new skills and approaches, to manage—and benefit—from this diversity. To deliver a dynamic, effective and efficient program of research and outreach, the centers will need to value and integrate into the core work of the organization the varied perspectives, experiences and approaches that members of different identity groups bring to the work place.

Action Plan. The unanimous consensus of the Consultation was that the next phase of work should continue to consolidate and develop the work on gender, but also broaden the scope incrementally to include other aspects of staff diversity, such as culture, race and ethnicity, among both nationally and internationally recruited staff. The group also recommended unequivocally that a central program should be maintained to support center efforts, with the centers themselves taking a greater role in shaping and guiding the Program. The Consultation also generated the goal, strategies, and priorities for future work. From the centers' perspective, the clear aim of this next phase of work is to institutionalize the leadership, skills and knowledge, management tools and processes, and internal capacities to ensure that they can effectively manage staff diversity and harness its full benefits for achievement of their missions within the next five years.

The key elements of the strategy for future work on gender and staff diversity recommended by the Inter-Center Consultation are strongly supported by the centers and were endorsed by all key stakeholders within the CGIAR -- members, the Center Directors Committee, the Committee of Board Chairs, and Center Deputy Directors Committee at ICW 1999. An Advisory Board for the new Program has been established with representatives from all the major constituencies, including the NARS. A funding proposal has been developed for the new Program and half of the required funding has been secured, including a $200,000 contribution from the Center Directors Committee.

A new Program Leader is currently being recruited. The new Program is expected to be launched in June 1999. Stakeholders strongly felt that the Program base should move from Washington to a Center located in the developing world, and the first decision of the new Advisory Board was, through a competitive bidding process, to select ICRAF headquarters in Nairobi as the new base. The next phase of work builds directly on the objectives, priorities, strategies, and activities developed by representatives from the centers at the Inter-Center Consultation. It, thus, reflects the centers' commitment to continue to work actively on gender staffing and broader diversity issues, their desire to continue to receive conceptual and technical assistance and services from a central

Program, and the activities that they believe will be most important to institutionalizing enhanced knowledge and skills for managing staff diversity to improve organizational performance in the future.

Gender Analysis in the CGIAR

The PRGA systemwide Program mainstreams gender analysis and participation of stakeholders, in particular poor rural women, into core research areas of the CGIAR – plant breeding, crop improvement and natural resource management research, through:

- Research to bring together the best empirical evidence on the impact of using gender analysis in technology development and institutional innovation, and to develop gender-sensitive guides for implementing effective stakeholder participation in research
- Capacity building to increase knowledge and skill for using gender analysis and stakeholder participation in research, based on practical learning experiences in ongoing research projects
- Information dissemination to increase awareness among senior and middle management of IARCs and NARS, donors, scientists and partners in development-oriented institutions of the impact of gender analysis and the institutional support needed for mainstreaming its use.

Current Status. Gender Analysis is a research methodology that enables scientists to differentiate the special needs, constraints, responsibilities and rights of women in agriculture from those of other stakeholders, and the impact of technical change on women. Use of gender analysis and the involvement of women as well as men is basic to technology development and institutional innovation intended to benefit rural women and the poor. Gender analysis, together with the analysis of other differentiating characteristics within and among stakeholders in an innovation, can help insure that technologies are useful and used.

It is more effective to integrate than to isolate gender analysis as a research approach. Therefore, gender analysis is a central component in the Program's research, capacity-building and partnership development activities.

Gender analysis alone is not sufficient. Analyzing differences in demand or preference among stakeholder groups, and then involving them in research and development (R&D) is a key to successful innovation. Once the extent to which women and/or men are known to have a stake in new technologies or management strategies, they must be appropriately involved in R&D process. For this reason, the PRGA program links gender analysis to the effective involvement of diverse groups of stakeholders in the process of technology development and institutional innovation.

- The PRGA Program focuses on mainstreaming gender/stakeholder analysis principles, methods and tools in the core research areas of the CGIAR --plant breeding and natural resource management-- so that their use will become an integral part of research within the CGIAR System.
- The Small Grant Program in participatory plant breeding (PPB) and participatory approaches to natural resource management research (NRM) gives special attention to integrating the use of gender analysis into the research process and to involving diverse groups of stakeholders in carrying out research.
- The Program's capacity-building is designed to build the skills and to install partnership principles needed to integrate gender/stakeholder analysis and participation in research
- The Program's information dissemination and public awareness activities make the needs of men and women innovators and users of technology visible.
- The Program develops criteria with which to assess the extent to which gender analysis and user involvement in the research process has been achieved and what impact it has had.
- The Program places a priority on the development of technologies and institutional innovations that benefit and empower rural women

Action Plan

Review achievements to date. A review of the PRGA Program's achievements in the CGIAR, undertaken by H. Feldstein, was started in 1997 and will be available in March, 1999. At the same time the achievements by other institutions such as UNIFEM and the International Technology Development Group (ITDG) to empower women through agricultural technology are being summarized. Specific attention is being paid to:

- Sources of information on technology that has already been developed by women and/or for use by women;
- Changes in women's responsibilities that this technology covers (e.g. land preparation, planting, weeding, pest & disease control, post harvest-storage)
- Research in progress specifically to develop agricultural technology for women or by women
- Gaps in technology design or supply specifically for women

As sources of information are identified or documents prepared, these will be posted on the PRGA Website. Annual reports and further information on PRGA Program partnerships and activities may be found at **Error! Bookmark not defined.**.

Identify and analyse women's changing demand for agricultural technology. A dynamic assessment of changing needs of women to provide regular feedback to technology design in CG and NARS is required. This will be addressed through a network of rural women's focus groups, some of which will be associated with the Program's Small Grant Program; commissioned papers; and workshops to synthesize input from focus groups and interpret main trends, the first of which has been designed by IRRI.

Promote empowerment of rural women through participation in technology development and information exchange. This is integral to the PRGA Program's work in progress. Specific additional actions needed to strengthen this program and promote further the empowerment of women are proposed in the concept note available from CIAT.

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TAC Comment on CDC Paper on Women in Agriculture
(SRP Recommendation 9)

TAC strongly supports the spirit of the System Review Panel's Recommendation 9 (R9) to strengthen efforts towards the empowerment of women in agriculture. Given the priority concern for poverty alleviation, TAC attaches particular importance to the identification of specially disadvantaged groups in rural communities, and to attention to their specific needs.

The CDC paper 'Gender in Agriculture', designed to address R9, has two major components. The first describes the CGIAR Gender and Diversity Programme. This is mainly concerned with staffing issues within the System and, in TAC's view is not directly relevant to the concern expressed by the System Review Panel. The second component describes the Systemwide Programme on Participatory Research and Gender Analysis (PRGA), centered at CIAT, which does already have considerable experience in methods of empowering rural women through participation in technology design and information exchange. The Programme has recently been submitted to an internally commissioned external review, carried out by an international authority on the topic, but the results were not available at the time of writing this commentary. In addition, the achievements of non-CGIAR institutions on the empowerment of women through agricultural technology are being summarized.

At TAC 76 (March 1999), CIAT made available to TAC the concept note mentioned in the CDC paper. It shows in more detail how it is proposed to strengthen the PRGA, in response to R9. In TAC's view, the activities described are a logical development of the PRGA's ongoing work and could potentially make a major contribution to fulfilling the need pointed out by the System Review.

TAC therefore invites CIAT to present the results of the PRGA review to the Committee, along with the summary of the related work of other institutions. At the same time, TAC encourages CIAT to develop fully the project proposal described in the concept note 'Technology Development for Empowering Women in Agriculture' for TAC's review and recommendation to the Group. TAC would then be in position to inform the Group whether additional measures are required to ensure that the concern expressed by R9 is adequately addressed.

Agenda item 3(b)iii

CENTER DIRECTORS' COMMITTEE
NOTE ON INTEGRATED NATURAL RESOURCE MANAGEMENT

March 15, 1999

The 1998 CGIAR System Review recommendation number 5 included a number of proposals for strengthening Integrated Natural Resource Management (INRM) research. The Center Directors Committee presented the following response on Recommendation 5 to the Consultative Council at its meeting in Brussels in January, as follows:

- **The CDC does not endorse the establishment of an additional network for INRM, but strongly supports the proposed conceptual framework and the need for increased support of ongoing INRM activities in the CGIAR**.
- INRM should be seen as an approach that permeates the entire CGIAR, as a pillar of equal importance to integrated gene management (IGM). INRM is not amenable to being addressed through a single "international network". In fact this reductionist proposal runs counter to the more desirable objective of organizing research around natural resource management problems in a demand-driven way.
- The CGIAR has already invested heavily in establishing INRM-type ecoregional consortia and systemwide programmes, such as Livestock, Soil/ Water, and Alternatives to Slash and Burn. These programmes focus on the relationships between the resilience of the natural resource base on one hand, and poverty reduction and food security on the other. The next logical step for the CGIAR should be to reap full advantage of the time and financial investments made in these established programmes by providing sustained support.
- Emphasis should be made on scaling-up the research from the plot or farm scale to the watershed/village, national, regional and global scales. National, regional and global concerns such as carbon sequestration, greenhouse gas emissions, agrobiodiversity, deforestation, desertification and depletion of coral reefs should become a more explicit part of the CGIAR agreed agenda.
- The CDC strongly supports the Review's emphasis that technological research should go hand-in-hand with policy research at the same geographical scale. INRM is by definition interdisciplinary and highly participatory.
- INRM consortia based on ecoregions or problem areas should be operated through the leadership of the Centers already responsible. The CDC Committee on Sustainability and the Environment (CSE) will take explicit leadership for a system-wide sharing of experiences, approaches, results and ways to control the high transaction costs of INMR partnerships. The CSE will take the initiative to ensure increased cohesiveness and synergies of INMR between centers and with partners.
- Considerable confusion is associated with the use of the term "INRM" in the CGIAR. The CSE will also work on clarifying concepts and terminology.
- The suggestion about joint preparation of national agricultural research strategies must not imply that CG centers develop strategies for our NARS partners.

The Council accepted the CDC response and requested the CDC was to prepare a paper elaborating on these issues. The CDC discussed these issues further at its retreat in The Hague at the end of January and agreed upon the following statement on INRM for submission to the TAC meeting in Rome in March.

CGIAR RESPONSE TO THE SYSTEM REVIEW RECOMMENDATIONS ON INRM

Background

In the past the CGIAR has principally focused on natural resource management (NRM) issues in the context of food security. For instance the CGIAR can claim major achievements in the fields of integrated pest management. However there is a broad set of NRM issues, beyond food security, where the CGIAR has not in the past been a major player. The high level of connectivity within all natural resource management systems has made it difficult to demarcate the priority areas of NRM research for the CGIAR.

In the late 1980s and early 1990s there was considerable discussion within the CGIAR on the questions of achieving better "integration" of NRM research and on the pros and cons of broadening the CGIAR agenda. This led to the inclusion of IWMI, ICLARM and ICRAF in the CGIAR and to the establishment of CIFOR.

The TAC 1992 "Review of CGIAR Priorities and Strategies" study concluded that there could be major benefits from integrating the natural resources research of CGIAR centers at the ecoregional scale. The 1994 Stein Bie report on the CGIAR response to Agenda 21 concluded that the CGIAR should expand its agenda to address a number of environmental and NRM issues which UNCED had identified as international priorities. The 1995 Lucerne ministerial level meeting emphasized NRM and environment as legitimate objectives of the CGIAR but was not explicit about how they should be addressed. It should be noted that UNEP became a co-sponsor of the CGIAR at this time. TAC subsequently reviewed these issues in its "Priorities and Strategies for Soil and Water Aspects of Natural Resources Management Research in the CGIAR" (1996).

Increased attention to NRM issues within the CGIAR coincided with a period of funding crises and downsizing of many centers. This prevented the centers from fully responding to the challenges and opportunities for NRM provided by, inter alia, ecoregional approaches. In 1997 the CDC initiated a study of experience with ecoregional research and this led to the CDC report "Progress in the Ecoregional Initiatives" (1998) which reaffirmed the view that major NRM issues could best be addressed through centers working together in priority ecoregions and in an integrated manner. This was consistent with the trust of the System Review recommendations.

The reality is that the CGIAR has been responsive and dynamic in responding to many INRM concerns. However, the overall visibility of INRM research in the CGIAR is low and this may have led to the perception that not enough is being done. The two pillars of the CGIAR as proposed by the System Review contrast sharply in their visibility. The integrated gene management pillar is highly visible while the INRM pillar does not share the same high profile.

The CDC believes that the term INRM is not sufficiently understood in a uniform way to all CGIAR stakeholders.

Natural resources can be defined as those that are generated by natural bio-geochemical processes and solar energy that yield useful flows of services to humankind. The natural resources the CGIAR focuses on are soil, water, atmosphere, animals and plants. Integrated natural resource management research in the CGIAR consists of the manipulation of these natural resources within the context of agriculture, forestry and fisheries in a systems approach. There is a need to adopt this broad definition of INRM research and to establish the comparative advantage of the CGIAR within this very large research domain.

INRM research in the CGIAR consists of managing these natural resources to support the CGIAR mission of: contributing to food security and poverty eradication through research promoting sustainable agricultural development based on the *environmentally sound management of natural resources***.**

Working at Multiple Scales

INRM research takes place at multiple spatial scales: global, ecoregional, watershed and farm/household. It often also deals with time scales longer than those of conventional agricultural research in order to promote long-term sustainability. The CGIAR works at the following spatial scales using different mechanisms.

- **Global scale**. The CGIAR is increasing its involvement in the global INRM debates. It is a major provider of analysis to a number of inter-governmental natural resource conventions or fora. It contributes to a number of policy dialogues as described in the CDC paper on policy research. The CDC has allocated the lead responsibility in dealing with the following post-UNCED initiatives to specific centers:

  - Biodiversity: IPGRI
  - Desertification: ICRISAT
  - Forests: CIFOR
  - Climate change: ICRAF
  - Mountains: CIP
  - Coastal marine resources: ICLARM
  - Water resources: IWMI

- **Ecoregional scale**. Much of the CGIAR INRM research is conducted through inter-center collaboration in priority ecoregions. The current understanding of the ecoregional approach is that it is research conducted in "agroecological zones geographically defined and addressing major environmental issues and employing multiple scales in time and space." The CGIAR at present has a number of systemwide and ecoregional programmes, which fit this definition, as shown below with the convening centers indicated in brackets.

Systemwide Programmes:

- Plant Genetic Resources (IPGRI)
- Alternatives to Slash and Burn Agriculture (ICRAF)
- Livestock (ILRI)
- Global Mountain Initiative (CIP)
- Soils (CIAT)
- Water (IWMI)
- Integrated Pest Management (IITA)

Ecoregional Programmes:

- Andean mountains-CONDESAN (CIP)
- African Highlands (ICRAF)
- Rice-Wheat Consortium--Indo-Gangetic plains (ICRISAT)
- Latin American Hillsides (CIAT)
- Latin American Lowlands (CIAT)
- West and Central Africa Humid-Subhumid-EPHTA (IITA)
- West Asia -North Africa drylands (ICARDA)
- Inland valleys of West Africa (WARDA)
- Desert Margins Initiative (ICRISAT) *not implemented*

Most ecoregional programmes operate at the community/watershed scale at selected benchmark sites.

- **Farm-Household Scale**: Another important area of INRM work is at the household/farm level. Most CGIAR Centers emphasize INRM priorities in the areas of farming systems, IPM, nutrient management, etc.

Action Plan

1. The CDC believes that the CGIAR can best contribute to INRM and broader environmental objectives by strengthening ecoregional research capabilities and particularly by reinforcing intercenter cooperation at key ecoregional benchmark locations.
2. The CDC proposes to strengthen its Committee on Sustainability and the Environment (CSE) by including center scientists who are leaders in INRM research. CSE will continue to be chaired by a DG, with additional DG's as members. It will take responsibility to assure the implementation of a strengthened INRM pillar in the CGIAR by the centers.
3. The CDC recognizes that there are major gaps in the research coverage of current ecoregional programmes, for example measurement of carbon sequestration and greenhouse gas emission in many ecoregions. A gap analysis in the form of a matrix of systemwide and ecoregional environmental issues will be undertaken by CSE.
4. The CDC also recognizes that locally, nationally and internationally resources tend to be spent on addressing symptoms of environmental degradation rather than understanding the underlying causes. We believe that a strong case can be made for donors to shift resources away from palliative "environmental protection" and towards investments in research to understand the underlying cause of natural resource degradation.
5. Centers believe they should further exploit their ability to address NRM issues beyond the confines of individual countries. There are potential opportunities to look at cross border environmental issues (large watersheds, for example).
6. The CDC proposes a number of immediate steps to strengthen INRM research in the CGIAR.

- Further studies of relationships between natural resource depletion and poverty.
- Case studies of the economic, social and environmental returns from INRM research.
- Better understanding of the relationships between natural resource depletion and both sectoral and extra-sectoral policies. For example the impacts of agricultural policies on forests and fisheries; of land degradation policies which focus on soil erosion and ignore soil nutrient depletion and soil fertility policies which focus exclusively on fertilizers.
- The need to bring INRM issues fully into the NARS agenda and to build NARS capacity in INRM research.
- The special need to strengthen INRM research in sub-Saharan Africa, where poverty and resource degradation are most acute

- Incorporation of appropriate climate change and biodiversity research issues in the research agendas of the CGIAR centers.

The overall conclusion of the CDC is that the CGIAR has great potential in the field of INRM. The extent to which this potential is realised will depend largely on the incorporation of this action plan, with TAC approval, into the research agendas of the Centres. The System Review clearly sees INRM as an area of great potential impact. However, the full capacity of the CGIAR as a major provider of knowledge and understanding of integrated natural resource management can only be realized if adequate resources are made available for this purpose.

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TAC Comment on CDC Paper on Integrated Natural Resources Management (SRP Recommendation 5)

The paper is an excellent start to a System response to Recommendation 5 of the Systemwide Review.

The CGIAR is facing an increasing array of challenges concerning integrated natural resources management (INRM). The growing scarcity of water supplies, ongoing loss of soil, continued deforestation and the apparent lack of success in dealing with them in much of the developing world have led to a questioning of past NRM efforts. The concern of short- and long-term climate change and their associated instabilities are adding yet new dimensions to the CGIAR environmental programme.

- TAC agrees with the SR Recommendation 5 that there is need for strengthening and for increased clarity and focus of INRM work in the CGIAR, and that INRM activities should be under regular assessment and update. This should be based on ecosystem science, the understanding of ecosystems as suggested in Recommendation 5 (attached). There is need for establishment of a conceptual framework for INRM.

- TAC agrees with the CDC and the CBC that there should not be an additional Systemwide network established for INRM, but that it should remain a part of a sustainable production systems effort. The two are inextricably linked.

- TAC endorses the CDC recommendation that the CDC Committee on Sustainability and the Environment (CSE) will take leadership for Systemwide sharing of experiences, approaches, results, and ways to control the high transaction costs of INRM partnerships. TAC will work with the CSE in that endeavour.

- TAC will work with the CSE to incorporate appropriate areas of global climate change work in the INRM portfolio.

- TAC will work with the CDC to rapidly implement lessons learned from its ongoing review of ecoregional programmes, due for completion in late 1999, to increase the effectiveness of ecoregional methodologies as an INRM tool. It is agreed that these ongoing programmes can serve as platform for much of the System's NRM work.

- TAC will work with centers to increase their use of production ecology as a tool in INRM work within the framework of sustainable production systems.

Discussion

The definition of natural resources given by CDC is a useful beginning point:

"Natural resources can be defined as those that are generated by natural bio-geochemical processes and solar energy that yield useful flows of services to humankind." The natural resources the CGIAR focuses on are soil, water, atmosphere, animals and plants.

The CGIAR has broadened the "returns" from NRM that it works with from an exclusive focus on crop yield in the 1960s to a wide range of goods and services derived by farmers and local communities. The beneficiaries of those services are understood to be the ecosystem itself, crops, animals and local communities. Since the CGIAR deals primarily with human-managed systems, it is appropriate to always consider beneficiaries. A people-centred definition is critical to the CGIAR goals of increasing food security and to the elimination of poverty. Services rendered through INRM must be improved. This has been a shortcoming of much previous NRM work.

The manipulation of natural resources within the context of agriculture, forestry and fisheries includes the commitment of human, economic, and institutional resources. To be successful, the primary benefits of natural resources management must go to those providing these inputs. To the farmers first, then the community and nation. This use of natural resources to provide services, within the framework of human-managed systems, is the basis for INRM, and illustrates the impossibility of separating them either conceptually or programmatically.

It was TAC's view of the artificiality and subjectiveness of that separation that led to their combining in the agreed logframe as Purpose 1 "NARS develop improved production systems which will effectively raise productivity while conserving biodiversity, land and water."

It is understood that the major efforts in preserving genetic diversity of the CGIAR are a part of NRM, but are handled in separate programmes within the system. This is reflected in the approved logframe as output 2, which, along with its indication, is stated as follows:

Output 2:	Germplasm of selected species and their wild relatives for priority crops, livestock, trees and fish are collected and managed, and procedures for germplasm conservation are developed and made accessible to NARS and other partners.
	Indicator
2.1	For CGIAR-mandate species a sufficient number of accessions to represent genetic diversity of species and wild relatives are conserved and managed *ex-situ* according to CGIAR policy as well as evolving international standard and agreements with respect to acquisition, storage, characterization, documentation, regeneration and distribution.
2.2	Other priority species (as determined by scientific need) are conserved and managed *ex-situ* according to international standard and agreements with respect to acquisition, storage, characterization, documentation, regeneration and distribution.
2.3	Appropriate strategies, techniques and relevant information with regard to reliable, efficient and effective *ex-situ* germplasm conservation are accessible to users.
2.4	Improved methods and tools for assessing and monitoring critical processes and functions within and between ecosystems that affect the *in-situ* emergence and maintenance of biodiversity have been researched and tested with users.
2.5	Strategies and guidelines for *in-situ* management of biodiversity in agricultural, forest, aquatic and rangeland ecosystems have been developed and tested with users. (*Aspects of quantity, time, and location/region will have to be specified for each project separately.)*

The enhancement of goods and services provided through natural resources management (productivity) is defined under output 3, which is purposefully constructed to maintain their integration. It is assumed that productivity must be sustained or increased by any direct investment in stabilizing natural resources.

Output 3	Management practices and research methodologies for sustainable production systems and for natural resource conservation are accessible to NARS and other partners.

Indicator

3.1 Productivity-increasing, resource conserving practices are accessible to NARS and other partners which have the demonstrated capacity to:

a) Increase or sustain and stabilise productive of agriculture, aquatic and forestry production.

As illustrated by the ability to: produce larger quantity and/or higher quality products, reduce year-to year production variability, improve safety in use of inputs, increase output per unit of labour, shift farms towards a market driven economy, make maximum use of biological methods to enhance productivity, reduce the impact of factors that limit production, or make available post-harvest processing and marketing methods to add value to raw products and reduce post-harvest losses.

b) Conserve and make better use of natural resources and reduce degradation of or improve water, soil, and air quality.

A*s illustrated by the ability to: reduce soil loss, increase soil quality, increase water use efficiency, improve water harvesting in arid and semi-arid ecosystems, maintain water tables, hold chemical loading to low levels, maintain surface and groundwater standards at locally acceptable levels, maintain air quality, reduce greenhouse gas emissions, properly manage effluents from agricultural, forestry and aquatic systems, make improved use of low quality water for aquaculture, or maintain genetic diversity in agricultural forestry, and aquatic systems.*

c) Enhance the quality of life.

A*s illustrated by the ability to: reduce drudgery, provide increased quality and quantity of food for families, increase farm gate income, and create new employment opportunities.*

3.2 Reduce the direct and indirect adverse effects of agriculture on the health of producers and their communities.

3.3 Research methodologies are developed and accessible for regional organizations and networks of NARS that enhance collaborative and participatory development of integrated management practices for agricultural, forestry and aquatic systems.

As evidenced by: broader utilization of emerging research methods such as biotechnology, agroecology, GIS, and modelling (production and hydrologic, inter ail participatory research); better extrapolation of knowledge and technology from research sites to agroecologically equivalent production areas; improved regional co-operation through better design and execution of research conducted at multiple sites; or improved technology transfer among NARS.

Note: The relative emphasis of indicators and outputs will vary according to specific outputs and approaches for individual projects.

Production ecology as a tool for integrating productivity and natural resources management

Center "retooling to manage the sustainability of ecosystems" is focused on, but not limited to the science of production ecology.

> An ecosystem (as mentioned in Recommendation 5, attached), existing in a geographic location, is a complex biological and physical infrastructure, in which energy and nutrients are captured and transformed by micro-organisms, plants and animals. It can be as small as a handful of soil, a field, a farm, a forest, a lake, community or the planet itself. Organisms interact with each other in the process of generating flows of energy, nutrients and complex plant and animal products. Production ecology is the science of describing and managing those interactions and flows to achieve desired output, either of goods or services. In short, in agriculture or aquaculture, it is the managing of biological processes for high productivity and for environmental quality. Production ecology is equally useful at high flow rates for tightening flows for efficiency and extremely high yields, and for mobilising and containing nutrients under conditions of scarcity. It is useful irrespective of input levels.

It should be understood that all production systems of forestry, fisheries and agriculture are based on management of carbon stocks and flows. Carbon is a regulator of soil quality, of nutrient flow and of the efficiencies of control of other natural resources. The stocks of natural capital, including that of carbon in the production system, must be maintained at optimum levels for the environment and for the stage of development that the production system represents. Winkelmann (CGIAR Activities and Goals: Tracing the Connection, Dec., 1998, p. 14) presents a useful summary of CGIAR views on maintenance of stocks. This is a major point of intersect with global climate change interests.

There is significant scope for use of production ecology (agroecology) to enhance research within INRM. A useful discussion of this was presented in the paper "Towards defining a pro-poor natural resources management strategy in the CGIAR", the conclusions and recommendations from the CGIAR-NGOC Consultation on NRM, October 22-23, 1998. While agroecology is especially useful for broadening the NRM services provided to poor farmers, TAC stresses that it applies across the board to all production systems. The science of production ecology is evolving rapidly in many ARIs. The work of IRRI in its landscape-level IPM work is especially noteworthy (IRRI, 1997-1998. Biodiversity: Maintaining the Balance (60 p). This report focuses mainly on pest management, but is a good start. The understanding and enhancement of biological processes to increase productivity and improve environmental quality is equally effective at containing and improving efficiency of flows at high flow rate and input use as it is at mobilising nutrients and increasing efficiencies at low rates. It applies to all systems, not just to those of poor farmers. Traditional practices discussed in the CGIAR-NGOC papers were developed under low-resource conditions to optimize local resource use. They usually have a sound ecological basis. The understanding of the underlying processes is essential to their improvement and spread.

> As a practical matter, a small number of relationships and flows tend to predominate farmer concerns (economic or environmental) in a particular environment and socio-economic setting. In densely settled landscapes, high productivity agriculture must contain nutrients and crop and animal residues at high flow rates from soil to crop or animal and back to soil, both to avoid loss and contamination of surface and ground water. The need for pesticide use must be reduced. In many systems carbon stocks are at sub-optimal levels for production efficiency and natural resource protection. The building of carbon stocks, along with reduction in emissions of methane and nitrous oxide are a part of the CGIAR role in improving atmospheric quality. In some systems water capture and management predominates. Production ecology provides understanding and allows concentration on those key processes and relationships that are determined to be critical. It is an "integration" science.

Production ecology science, the understanding of processes, flows and relationships, is a key component of the international public goods dimension the Centers can and should bring to INRM partnerships. It will help guide the improvement and application of the many alternative production and landscape management technologies.

Specific Comments on the "Action Plan"

The points stated are on target. A note of caution is suggested in undertaking "further studies of relationships between natural resource depletion and poverty". As part of the TAC "Study on CGIAR Research Priorities for Marginal Lands", Dr. Sohail Milik conducted a rather thorough literature search of such studies, concluding that there is no clear evidence of a consistent linkage, the multiplicity of causes of poverty seems to obscure a clear relationship. If an a particular ecoregion such a relationship were to be shown, it might add urgency to work there, but the science and ultimate technologies to be used in alleviation of both poverty and degradation are unlikely to be changed by the relationship. Is it worthwhile to try to prove or disprove the hypothesis?

Finally, INRM requires an increasing range of partners. Most implementation is done at the farm and community level. Community involvement is critical. Most successful INRM has a significant civil sector component, often, but not always, involving organizational skills of NGOs. The Centers must continually review their partnership alliances as they intensify their INRM research. They must reassess the format of their output flows to meet the needs of NARIs as well as civil sector groups whose linkage to NARIs is often tenuous.

Annex I

From "Comments of Working Groups on the Recommendations of the System Review Report"

RECOMMENDATION 5	
The Panel recommends that the CGIAR enhance its research methodology by adopting an integrated natural resource management approach. Further, the organization of an International Network for Integrated Natural Resource Management will link productivity research with the environmentally sound management of natural resources. The network should be based on, among other things: ∑ Centers that are retooled with sciences needed to manage the viability and sustainability of ecosystems; ∑ a definition of the corresponding methods at different spatial scales, particularly at local levels; ∑ adoption of precision farming techniques in relation to tillage, irrigation, nutrient supply and pest and post-harvest management; ∑ development of indicators for measuring sustainability; ∑ development of sustainable systems of management for aquatic resources; ∑ joint preparation of national agricultural research strategies by respective NARS and a consortium of IARCs; and ∑ development of more bottom-up, demand-driven projects.	WG1: **(**Proposed for CGIAR endorsement) "The Panel recommends that the CGIAR enhance its research methodology by adopting an integrated natural resource management approach. Further, the organization of international networks for Integrated Natural Resource Management will link productivity research with the environmentally sound management of natural resources. The network should be based on, among other things: ∑ Centers that are retooled with sciences needed to manage the viability and sustainability of ecosystems; ∑ a definition of the corresponding methods at different spatial scales, particularly to local levels; ∑ adoption of knowledge intensive farming techniques in relation to tillage, irrigation, nutrient supply and pest and post-harvest management; ∑ development of indicators for measuring sustainability; ∑ development of sustainable systems of management for aquatic resources; ∑ joint preparation of national and regional agricultural research strategies by NARS, regional and global fora, and a consortium of IARCs; and ∑ development of more bottom-up, demand-driven projects, in partnership with NARS; ∑ development and implementation of new methodologies for ecoregional research including GIS, explorative and extrapolative approaches; and ∑ a widened food security basket through inclusion of minor and underused millets, grain legumes, tubers, and other crops in relation to cropping systems approach."