Harvesting together:

the International Development Research Centre's support for research on agrobiodiversity (results and challenges)

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Harvesting together: main points

This review looks at the major achievements of and identifies key emerging challenges for IDRC's programming in the field of agricultural biodiversity. Five formative assessment questions guide the analysis of 44 projects supported in the period 1992-2000:

1. To what extent have project proposals funded under the Biodiversity Theme (1992-1997) and SUB program initiative (1998-) corresponded to the core programming elements: a beyond (narrow) conservation focus, use of a participatory methodology, inclusion of a user-differentiated social analysis, and consideration/analysis of policy linkages and alternatives?
2. What has been the added value of the programming support (i.e., the results that surpass individual projects)?
3. What have been the promising approaches and methodologies for doing this?
4. Are there issues that have remained poorly understood?
5. Are there methodological questions that have remained unanswered?

Research supported has led to a better understanding of how farmers's (local/indigenous) knowledge, skills and practices relate to diversity dynamics. New methodologies to study agrobiodiversity dynamics and to strengthen local capacities to maintain/increase diversity have been developed. Challenges include documenting and analysis of longer term trends, integrating sounder social/gender analysis, and paying more systematic attention to resource tenure and its links with diversity and livelihoods.

In particular through the joint, innovative efforts of researchers, farmers, technicians and extensionists, very promising results are produced in terms of adding economic, socio-cultural and/or ecological value to agrobiodiversity. Two major, both ethical and methodological challenges are to integrate a more thorough (self) assessment of participation as a means to this value adding (identifying good practice), and the need to systematically and transparently define ex ante how researchers, farmers and others partaking in research perceive, decide about and share access to resources, benefits and costs.

Support to the analyses of genetic resources- and related policies, policy processes and policy alternatives has been modest. However, it

is noteworthy that a large number of the supported projects/program have contributed to putting and keeping agrobiodiversity, local/indigenous knowledge and rights (including farmer rights) on the agendas of international and national policy and law making bodies/organizations.

The emerging key research and development challenges identified are:

- ✓ How to better link local (community-based) agrobiodiversity conservation and improvement activities with changes at the international and national policy levels (such as the Convention on Biological Diversity, the Food and Agriculture Organization of the United Nation's Undertaking on Plant Genetic Resources, and the World Trade Organization-Trade Related aspects of Intellectual Property Rights agreement), so that the global context supports the diversity of local contexts and the local informs and guides the global?

- ✓ How to better bridge agrobiodiversity conservation and sustainable agricultural/rural development? Or, how to focus not on crops and crop diversity per se, but on the women and men, their knowledge, skills and (adaptive) livelihood management practices who maintain and depend on the variety of agricultural resources on-farm and off-farm?

- ✓ How to create more space and support for (institutionalize) adaptive, participatory learning research and natural resource management approaches and processes that allow the stewards of biodiversity to better deal with heterogenous and changing agro-ecosystems?

Contents

1. To the field

Diversity. What difference does it make?
Cary Fowler and Pat Mooney, *Shattering: food, politics, and the loss of genetic diversity* 1990: 41

The sustainable use of biological resources is a matter of global concern. Distinct types and varieties of plants, animals and micro-organisms are vital for our food and health security. Biologically diverse ecosystems provide essential, although often poorly appreciated, environmental services that make life possible. Variety among species is crucial for the development of agricultural, pharmaceutical, and technological innovations. Genetic variability within plant and animal species is the base for resistance to diseases, pests, and climatic stresses. Women and men farmers, gatherers and fishers in rural communities around the world have been and continue to be the stewards of the greater share of this diversity. However, pressures on these resources, and on the people and the social systems that rely on them, are significant. Sources of biodiversity are under threat and disappearing in many regions (Fowler and Mooney 1990; FAO 1998: 30-40, Thrupp 1998: 21-37; Secretariat of the Convention on Biological Diversity 2001).

Building on a considerable body of applied research supported in a number of fields during the 1970s and 1980s (agriculture, fisheries, forestry, nutrition, health), staff at the International Development Research Centre developed the Biodiversity Theme in 1992. This initiative was a part of the government of Canada's response to the United Nations Conference on Environment and Development (UNCED, better known as the Earth Summit), in particular to Chapter 14 of Agenda 21 that includes a program area on "the conservation and sustainable utilization of plant genetic resources for food and sustainable agriculture." The Biodiversity Theme outlined broadly how IDRC perceived the biodiversity challenge, its approach to dealing with this challenge, a number of thematic areas (agrobiodiversity, wild biodiversity, intellectual property rights, indigenous knowledge) and related programmatic objectives (IDRC 1995). In 1997, following an organizational restructuring process at IDRC, the Theme became a more coherent (and operationally more autonomous) Program Initiative named Sustainable Use of Biodiversity (IDRC 1997). Currently, this Program initiative is in the second year of the second program cycle (2000-2004; http://www.idrc.ca/SUB).

From 1992 to today, IDRC's approach to supporting research on the sustainable use of biodiversity has been based on three complementary components or thrusts: 1) Carefully documenting and understanding of biodiversity use from a people perspective with a focus on the causes of loss of biodiversity (genetic erosion) and its consequences; 2) Designing and supporting efforts that give or add value to biological resources as a contribution to improving livelihoods and to counterbalance genetic erosion; 3) Designing and implementing management and policy alternatives that link equity with the sustainable use

of biological resources.[1] In terms of people and geographic focus, IDRC has given priority to stress prone, fragile ("unfavourable") agro-ecosystems inhabited mostly by the poorer and more marginalised farmers. It is also in these systems that various centres of agro-biological diversity are located.

Recognizing the key role of farmers and farmers' knowledge in the management and maintenance of biological diversity and hence, their central role in the provision of food and livelihood security, **agricultural** or **agrobiodiversity** was chosen as a key programming entry point.[2] Agrobiodiversity is a broad concept that includes a variety of biological diversity components from the level of agro-ecosystems to crop varieties to genes in plant and animal species. Stewards, users, and others with a stake in agrobiodiversity assign a number of values to it including ecological, economic, socio-cultural, and political ones. It is important to note that these values are not set in stone, time nor space wise. Therefore, identifying what agrobiodiversity means and to whom is key.

From an ecological perspective, agrobiodiversity can be seen as a function of an agro-ecosystem necessary to support and protect human lives, and providing the inputs for evolution. The loss of agrobiodiversity leads to a reduced capacity of ecosystems to continue producing ecological services and renewable natural resources, and also reduces the capacity of the system to deal with change (i.e., it will lead to decreased resilience), directly affecting the management of the system by farmers. As a result, the spaces for the creation and recreation of farmer knowledge and experimentation (constituting elements of cultural and social diversity; Prain, Fujisaka and Warren 1999), essential for agrobiodiversity conservation, evolution and improvement, could be reduced.

Assessing the field

After nine years of research support by IDRC to a variety of post-UNCED biodiversity initiatives (programmes, projects, conferences, workshops) and at the beginning of the second phase of the Sustainable Use of Biodiversity (SUB) programming cycle, program staff currently responsible for the implementation of the SUB program considered it worthwhile to take stock in terms of learning about what has been done.[3] To do so, the

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[1] The 3 objectives of the Convention on Biological Diversity are: conservation of biological diversity, sustainable use of components of biological diversity, and fair and equitable sharing of benefits arising out of the use of genetic resources (Secretariat of the Convention on Biological Diversity 2001: 5).

[2] The second major programming entry point has been medicinal plants. For a review of IDRC's support to this field, see Danna Leaman and Carolyn Switzer (forthcoming).

[3] The SUB team is made up of program officers and research officers located in Ottawa, Montevideo, Cairo, Dakar, Nairobi, New Delhi and Singapore.

SUB program team formulated five guiding, formative assessment questions:[4]

1. To what extent have project proposals funded under the Biodiversity Theme (1992-1997) and SUB program initiative (1998-) corresponded to the following core programming elements: a beyond (narrow) conservation focus, use of a participatory methodology, inclusion of a user-differentiated social analysis, and consideration/analysis of policy linkages and alternatives?
2. What has been the added value of the programming support (i.e., the results that surpass individual projects)?
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Answers to these questions are *to be used by the SUB program team as an input for decision-making about future programming directions.*

It is useful here to say a few words about how we perceive programming to take place at IDRC. In our view, programming is the result of a dynamic and complex mix of reactive (responding to demands) and active (steering demand) efforts or forces operating inside and outside the organizational boundaries of IDRC. Over time, the Biodiversity program has developed incrementally and by no means in a linear fashion. It has experienced frequent ups and downs due to uncertainties in the wider international development policy arena (e.g., fiscal crises, changing policy priorities, political crises and natural or environmental disasters) and due to uncertainties within IDRC itself (e.g., ups and downs in funding, new rules and procedures, staff changes, struggles and conflicts among staff). As Patton (1978: 124-127) has argued, this may be a more common feature of programs and organizations at large than often assumed or acknowledged. The importance of this observation for our review is that it is unrealistic to assess the progress of the program as if it were a straight and highly rational journey from a to z. Instead the program has taken shape as a result of a multitude of interactions and adaptations. From this we deduct that it is important to look at what is actually ”implemented,” in our case, the kind of projects approved and supported by program staff.

Taking this perspective on programming into account we address the guiding assessment questions through a two-components review of the *kind* of projects IDRC has supported/is supporting over the nine eight years in the program area of agrobiodiversity as part of the overall SUB program. These components are: a) mapping and analysing the key features of projects in terms of objectives, approach and methodology (we call these program inputs) and b) reviewing the project results obtained to date as building blocks for achieving IDRC’s biodiversity programming objectives (we call these the program outputs).

[4] Formative evaluation focuses on improving and enhancing programs throughout the life of a program (Patton 1978: 81).

Six sections following this introduction. Sections 2 and 3 describe the approach and methodology. Sections 4, 5 and 6 present the results of the input and output mapping and analyses. Section 7 concludes the paper in the form of a number of reflections and suggestions.

2. Selecting materials

Our review questions are not dissociated from program objectives. Although over the nine years the precise formulation of these objectives has changed somewhat, these objectives remain clearly tied to the three thrusts identified above. The "early on" objectives (as expressed by the IDRC Biodiversity Theme statement published in 1993 following discussions held in 1992) were:

- Analyse farmer knowledge about the properties and uses of genetic resources and to develop ways of using this for the benefit of the farmers involved.
- Encourage new participatory paradigms in genetic improvement which balance diversity with productivity; develop approaches for in-situ conservation and; improve linkages between formal sector breeding and farmer breeding.
- Critically evaluate changes in Intellectual Property Rights in living organisms and analyze their impacts on innovation, diversity and the distribution of benefits and; support international efforts to determine the impact of Intellectual Property Rights on the implementation of the Convention on Biodiversity.

The most recent stated objectives are (1st IDRC Sustainable Use of Biodiversity Program Initiative Prospectus approved in 1996):

- To promote the use, maintenance and enhancement of the knowledge, innovations and practices of indigenous and local communities to conserve and sustainably use biodiversity
- To develop incentives, methods and policies that facilitate the development of strategies for the conservation and enhancement of in situ agricultural and aquatic biodiversity; and the participation of communities in their design and implementation
- To support the creation of models and legislation that recognize the rights of indigenous and local communities to genetic of resources and to the equitable sharing of benefits of the use of these resource sin the context of the intellectual property regimes

These two sets of objectives have been addressed by researchers in the field and program staff through three series of interrelated research questions concerning the management of agrobiodiversity. These questions are formulated in the context of experiences gained from efforts characterized by top-down and non-participatory approaches to crop conservation and improvement. These experiences indicate that it has been difficult to cope with fragile agro-ecologies, variable socio-economic conditions, imperfect seed supply systems, production systems that rely heavily on minor crops, and crisis and disaster situations (McGuire, Manicad, Sperling 1999: 13-14). The three series of questions are (see also, Voss 1996, Prain and Bagalanon 1998):

Questions dealing with (in-situ) crop conservation, and with crop improvement: What are viable practices, mechanisms or incentives to strengthen in-situ conservation under conditions of agro-ecological and socio-economic change? Is it technically possible to obtain sustainable yields using (participatory) improvement strategies which would increase productivity while maintaining or increasing cultivated diversity? What levels of increase can be attained this way compared with conventional approaches? How would the potential to do this and the methods vary according to open pollinated, self pollinating, and vegetatively propagated crops, and according to agro-ecology (favourable, unfavourable environments)?

Questions dealing with participation and bridging indigenous/local and scientific knowledge: Could a more meaningful participation of users in the research cycle, particularly by women and men farmers in marginalized agro-ecosystems, contribute to the improvement of the productivity of landraces while maintaining or increasing diversity? Under what conditions? Could productivity be increased/diversity maintained or increased with sufficient speed to keep up with population growth?

Questions dealing with institutions, laws and incentives: If it is technically feasible, what kind of policy changes (norms, regulations, incentives, organization of research) would be required?

3. Crossing materials (methodology)

This review is based on a systematic, in-house review and analysis of:

1) IDRC funded project related documents such as proposals, progress and final reports, research papers and other publications.

A total of 44 project and project support activities have been included in this review, 38 directly funded through Biodiversity/SUB, five through the Food Systems under Stress theme and one through the MINGA program initiative (with a strong agrobiodiversity component and objectives similar to the Biodiversity/SUB program). 11 of these 44 are second phase proposals; hence, another way to count the total number would be to say that 33 initiatives have been funded. Several are multi-site or "multi-project" projects or programs, e.g., the Community Biodiversity Development and Conservation program (CBDC), IPGRI's in-situ conservation of agricultural biodiversity project, the Participatory Research and Gender Analysis program of the Consultative Group on International Agricultural Research (CGIAR PR/GA), and the Using Diversity program in South Asia. We have mapped the multiple projects where possible (in particular, according to crop type and agro-ecosystem). For the list of projects by year of approval, see the annex.[5]

[5] Two other projects were educational videos: "Seeds of change" (1992) and "Last plant standing" (1997). We did not include these in the review.

2) IDRC programming related reports such as the Biodiversity Theme progress reports (1993-94-95), annual SUB progress reports (1996-2000), SUB reports to IDRC's Board of Governors (1998, 1999), and SUB's external review report (1999).
3) Articles published by IDRC about projects and the Biodiversity program (REPORTS, REPORTS Online, Briefing).
4) Publications (books, proceedings, videos, CR-roms).
5) Personal field experience of the author, and numerous field visits to projects by the author and colleagues.

The project inputs will be classified based on the following six criteria grouped under three core elements which are considered central to the Centre's agrobiodiversity research approach:

The goals:
✓ the kind of goals: focus on crop productivity, crop diversity, empowerment

The environment:
✓ the propagation nature of the crop (open pollinated, self pollinating, vegetatively),
✓ the nature of the environment or agro-ecosystem (favourable, unfavourable),
✓ a policy analysis component, with a focus on intellectual property rights, indigenous knowledge, diversity maintenance, or related topics such as tenure, aor research on incentives, institutionalization, the organization and management of research.

The kind of farmers and their roles:
✓ the nature and degree of farmers' participation (consultative/collaborative/ collegial, and the decision-making moment or stage in the research cycle: from early to late stages),
✓ user differentiated analysis (gender, class, age, ethnicity or a combination).

In order to see possible changes and program evolution over time, we have also analysed projects grouped in two program periods, 1992-1996 (the 1st phase of the Biodiversity programming at IDRC), and 1997 to now (the 2nd phase of the programming).

Program achievements or results to date will be looked in a variety of ways. First, we discuss how projects relate to/have addressed the three main components or thrusts that the Biodiversity program has set out: documenting diversity, adding value, and policy alternatives (see page 2) . Of special interest here is to see if any "added value" has been produced, i.e., direct or indirect spin-offs of the sets of projects under each thrusts (grouped geographically, thematically, or time-wise; note that most projects address two or three of the components). Second, we will look at specific results under these three thrusts, using the following criteria derived from the expected Biodiversity program and individual project results:

- new insights/knowledge generated
- research and advocacy methodology development and innovation

research capacity building and empowerment
- new or stronger cross-sectoral/inter-stakeholder partnerships created
- clear research responsiveness to user needs
- policy changes (including more equitable property rights) and related resource re-allocations

Third, to illustrate outputs, we highlight the specific achievements of a number of projects.

Due to a number of reasons, we do not review impacts or the longer term and often indirect results obtained (i.e., research efforts are but one of the factors contributing to change), such as crop diversity erosion halted or increased (time and/or space wise), significant crop production gains, enhanced food security, improved livelihoods, and increased equity in benefit sharing. Projects have not reported or have not been able yet to determine impacts. Measuring impact also implies dealing with the so-called attribution factor, i.e., the need to sort out if and what contribution the research has made compared to or in conjunction with other factors.

4. Sowing (an analysis of selected inputs)

In terms of regional distribution, the 44 projects cover: Latin America and the Caribbean with 15, Asia with 10, Africa and the Middle East with 9, and 10 global projects (with sites on more than one continent); if we add the 2 videos, the global projects number 12. As can be observed, some concentration of projects has taken place in LAC, in particular in Central America (Mexico, Honduras, Nicaragua, Costa Rica); another subregion of some concentration of projects is South Asia (India, Bangladesh, Nepal). West Africa as subregion is poorly represented. Time wise, projects were approved as follows:

year of approval	# of projects
1992	1
1993 (BIO Theme)	9
1994	4
1995	5
1996	8
1997 (SUB Prospectus)	7
1998	3
1999	4
2000 (SUB Phase 2)	3
Total *	44

* Note: total includes 11 Phase 2 proposals.

The following tables present the results for each factor, added by a brief comment.

CROP TYPE

Open pollinated (maize, sorghum)	4
Self pollinated (rice, beans)	6
Clonally reproduced (potatoes, sweet potatoes, cassava, yams)	1
Various (OP, SP, CL, others)	20
Farming systems (field, milpa, homegardens)	4
Other (vegetables, fruits, spices, medicinal plants)	3
Total *	38

* Note: one project carried out 3 sub-studies which are counted separately. The policy analysis studies are excluded from the count.

As can be seen, projects deal with all the three major crop propagation types and with a clear focus on the major staple crops (rice, beans and maize, and to a lesser degree sorghum). A large number of projects are not focussed on a single crop, but on two or more crops (combinations of open pollinated, self pollinated, clonally reproduced and/or other crops). Four projects deal not with single cropping systems, but focus on "farmer fields" or farming/multi-cropping systems (e.g., the IPGRI in situ conservation project), and on homegardens (the CATIE project in Central America). A few projects deal with (indigenous) vegetables.

AGRO-ECOSYSTEM

favourable	1
unfavourable	23
both	14
Total *	38

* Note: Unfavourable refers to agro-ecological areas with harsh climatic conditions, unfavourable soils and/or rugged landscapes. Projects with multiple sites are counted only once with the exception of the project that carried out 3 sub-studies. The eight policy analysis studies are excluded from the count.

Not surprisingly, the majority of projects are executed in unfavourable agro-ecosystems. However, work is underway in at least 14 multiple sites, including both favourable and unfavourable areas, in some cases to be able to compare methodology and results in these 2 categories of sites. The work underway in favourable areas seems to contradict SUB's programming focus, but likely reflects a recent interest to also explore how participatory approaches may be of use under more favourable conditions. (See also Weltzien/Smith, Meitzner, Sperling, 2000: xii, who observe that participatory approaches

are tried out in less marginal areas to deal with: counterbalance uniformized cropping systems/expand intra-crop diversity; areas with inadequate seed supply systems; and areas with very diverse user preferences or needs for very specific, "niche" products.)

CROP DEVELOPMENT GOALS

increasing productivity and diversity	14
maintaining diversity, and (some) empowerment	5
increasing productivity, and (some) empowerment	3
increasing productivity and diversity, and empowerment	14
Total *	36

Note: empowerment refers to increasing the (research, negotiating) capacities of users; in other words, participation as a goal.

22 projects focus on productivity and/or diversity; eight of those have some element of empowerment as well (sometimes more implicit than explicit). 14 projects aim ambitiously to deal with diversity, productivity, and empowerment as a core element of the initiative.

PARTICIPATION

from early to late: consultative	11
from early to late: collaborative	8
early consultative to late collaborative	5
both consultative and collaborative	5
exploring or comparing/assessing approaches	5
Total *	34

Note: Consultative means researchers firmly keep research decision making in their hands. Farmers contribute by providing land, labour, and ideas, but have no say in how the work is carried out. Collaborative means researchers and farmers discuss research steps and jointly come to decision making. Early refers to the design and planning stage of a research process; late to the implementation and monitoring and evaluation phases of the cycle.

Maybe surprisingly, but closely related to the findings concerning crop development goals, 11 projects use basically a consultative participatory approach, in which farmers or other stakeholders do not have a direct influence on the project nor the decision making power to direct the project in one way or another. 5 projects have gradually moved from a consultative to a more collaborative approach, and another five (the multi site programs) are characterized by both approaches. (Only) 8 projects have a collaborative nature throughout allowing farmers a real say in the course of the research process. (See also Weltzien/Smith, Meitzner, Sperling, 2000: xii, who in their review of 48 projects conclude

that the “degree of participation within formal-led PPB was overwhelmingly consultative...”) Interestingly, 5 projects aim to compare different forms of participation (e.g., the CIMMYT maize project in Mexico, this is also one of the goals of the PRGA program).

ANALYSIS of USER or SOCIAL DIFFERENTIATION

no analysis	15
by gender*	18
by gender and another variable*	11
Total	44

*Note: Not always done very thorough nor systematically.

Although in theory now generally accepted as a very important feature of sound research, 15 projects do not have a built in a user-differentiated analysis, and those that do have such a feature, focus primarily on gender differences. 11 projects also address other possible differences based on age, class, caste or ethnicity, in more or less systematic and thorough ways. (See also Weltzien/Smith, Meitzner, Sperling, 2000: xv, who observe that “the treatment of gender as analytical variable has been generally weak in participatory plant breeding.” They do not even refer to the other analytical categories considered to being relevant in PPB research.)

POLICY ANALYSIS

no analysis	27
100% policy project	8
crop development with a policy analysis component*	9
Total	44

*Note: The 8 projects with a policy analysis component deal to varying degrees with policies concerning intellectual property, indigenous knowledge, seed systems, commercialization and marketing.

Although a large number of projects state that they aim to have some kind of impact on policy making and policy makers, only nine have an explicit policy analysis component as a complement to the crop improvement component(s); policies studied include IPRs, pricing and marketing, and certification (organic production). Eight projects deal exclusively with policies at the national or international level (e.g., the Crucible project), but in turn have very weak or no direct links with crop improvement work carried out at the field/community level.

RECIPIENTS

CGIAR centre or international centre	11
national agricultural research organization or university	8
NGO	12
formal network	3
coalition *	10
Total	44

*Note: Coalition refers to two or more organizations that formally have agreed to work together on a project and who both receive funding, e.g., a university and a NGO. All 44 projects have been counted as sometimes the recipient(s) in phase 2 projects has/have changed.

In terms of the relative share of the total number of projects a more or less balanced picture can be seen here; maybe the 12 NGOs draw the attention as compared to the 8 NARS. In terms of the number of potential recipients, there is a clear bias toward the CGIAR centers (there are only 16 such centres compared to hundreds or thousands of NARS/universities or NGOs).[6] Interestingly, there are ten coalition projects in which two or more different organizations have teamed up to lead the research.

The second part of the analysis is a comparison over time of the nature of the approved projects, in % of projects. The results are presented in the table below.

[6] Thanks go to Louise Sperling for pointing this out. Historically, IDRC has had and continues to have strong links with the CGIAR system. I think this partially explains the heavy weight of CGIAR centres as recipients.

input factor	1992-1996 (% of projects, n= 27 of which 6 policy projects)	1997 to date (% of projects, n=17 of which 2 policy projects)
goals		
Productivity+Diversity	43	21
Productivity+Empowerment	14	0
Diversity+Empowerment	14	7
P+D+E	29	71
crop type		
Open pollinated	9	13
Self pollinated	13	20
Vegetatively	4	0
Various (OP/SP/CL plus other)	43	67
Farming system	17	0
Other	13	0
agro-ecology		
Unfavourable	70	47
Favourable	4	0
Both	26	53
participation		
Consultative Early-Late	40	21
Collaborative Early-Late	25	21
From consult to collaborative	10	21
Both consult. and collabor.	15	14
Assessing approaches	10	21
user differentiation		
Yes	41	76
None	59	24
policy analysis		
Yes	41	35
None	59	65
kind of implementing organization		
International/CGIAR	26	24
NARS or university	11	29
NGO	33	18
Network	7	6
Coalition	22	24

Comparing the two periods, a few changes can be discovered, in particular concerning the goals, the nature of participation, and the inclusion of a user differentiated analysis. Concerning the goals, projects in the second phase have a more ambitious nature combining productivity, diversity and empowerment goals (several of the Phase 2 projects move more toward including an empowerment objective). We also observe that projects become more participatory (in particular in the later stages of the research cycle). More

projects are paying attention to user differentiation (particularly, analysing gender). Projects focussing on policies or with a policy analysis component show a slight decrease in number. NARS have become more numerous as recipients to the detriment of NGOs.

5. Harvesting (an analysis of selected outputs)

Thrust one: documenting

In general, projects have dedicated much time and effort to document and characterize existing crops and cropping systems (including local or indigenous knowledge about these) covering grains, root crops, legumes, spices, forages, and so called "uncultivated" or "wild" foods. Several projects have also documented and analysed dynamics and trends over time and in space, but the depth and quality of the results vary considerably. The higher quality projects have been those that have systematically researched the interrelations between the human factors (knowledge, skills, needs and interests expressed through gender, age, class, ethnicity) and the biophysical factors at crop, cropping system, and landscape levels. A number of projects have focussed on single crops in one or more regions in a country or in a number of countries, e.g., sorghum in two regions of Ethiopia (see highlight 1 below); barley in Syria, Morocco and Tunisia (see highlight 2 below); maize in Mexico (CIMMYT 1999), and in China (CCAP 1999); rice in India, and in Nepal; potatoes in Peru.

Project example: Factors maintaining sorghum landrace diversity in Ethiopia

This study, first done in 1992-1993 and currently further expanded (2000-2001), documented through observations, surveys and interviews the vast taxonomical knowledge of Ethiopian farmers and confirmed their role in the maintenance of sorghum landrace diversity in the north Shewa and south Welo regions, as a means to reduce the risk of homogenization. In addition, the study documented farmers' knowledge about storage conditions and duration of sorghum landraces and the action to be taken to reduce losses due to pests. The research focusses on the dynamics and trends over time and in space of crop diversity, farmers' selection criteria at field, community and agroecosystem level (from a gender perspective), and on the biotic, abiotic and societal variables that influence diversity use and management *(Teshome 1996, 2000; Teshome et al. 1999)*.

Other projects have dealt with cropping systems, such as home gardens in a number of countries in Central America (Lok 1998), and in Chile; the frijol tapado (slash/mulch bean) system in two regions of Costa Rica (Melendez, Briceño, Vernooy 1999); the milpa slash and burn system in Mexico integrating maize, beans, squash and chili pepper (IPGRI 1999); and indigenous vegetables gardens in Kenya, and in Zimbabwe. A few have studied integrated crop-animal systems, such as the diverse fish-rice systems in the Mekong delta region in south Viet Nam.

In doing so, several research modalities have been employed, such as the small grants mechanism -under the umbrella of a common research theme, but with a wide variety of individual projects and methodologies. Example, the Using Diversity program including much documentation/characterization research on rice, vegetables and spices, "uncultivated" foods, livestock and fodders, slash and burn systems. Another modality has been the multi-country research program with a shared research approach/framework, methodology and networking functions (to varying degrees and intensities). Example, the IPGRI In-situ program (strong on documentation/ characterization, some research on adding value, see: IPGRI 2000; Jarvis, Sthapit and Sears 2000), and the CBDC program (mixture of documentation/characterization and adding value, some policy oriented work).

Project findings indicate that in many places the maintenance of diversity is usually a response to environmental, ecological and economical uncertainties and fragilities, and /or making use of niche conditions, and integral to people's cultural identities (all of which -conditions, identities and uncertainties- are not fixed in stone though). Diversity and farmers' knowledge about diversity dynamics in many places continues to be crucial, and well-alive, but cropping systems and crops are also under (increasing) pressure due to market forces, science (e.g., the introduction of a limited number of hybrid varieties and subsequent replacement of more diverse mixes of traditional varieties), migration, "modernization," and in some areas, warfare and/or natural disasters such as hurricanes (Fleury 1999). Resource tenure also has emerged as a key factor in relation to diversity dynamics and the space farmers have to maintain/increase varieties, but more detailed research would allow a better understanding of differences and possibly, the identification of entry points for action.

Several projects also highlight that women play a key role in the management of diversity; however, more systematic and rigorous attention to the diverse roles of women and men and the gender differentiated impacts of changes in diversity remains needed. The engendering of research requires going beyond the breakdown of data by sex.

Several innovative approaches and tools for detailed analysis of trends at various levels, crop, field, and systems level have been developed, and several examples exist of approaches and tools that have "travelled" from one site to another (from researcher to researcher, farmer to farmer, sometimes with the active involvement of IDRC program staff). Examples: the CIAL methodology developed by CIAT in Colombia travelled to Honduras, Nicaragua, and most recently, elements of it made the move to Cuba. Elements of the CG-Maize Mexico project jumped to China. In Nepal, neighbouring research site villagers picked up research elements and started their own experiments. Following successful work in Morocco, Syria and Tunisia, ICARDA is building on experience gained and lessons learned in other countries and environments, Jordan and Yemen.

Thrust 2: adding value

A large numbers of projects, in particular those entering into a second phase, have combined thrust 1 with one or more research efforts to add value to existing diversity (thrust 2). Some have done this following an extensive documentation/characterization period, others have done so from the very start of their research process, taking on an action-oriented approach (note that considerable variety exists among projects in the nature of this action focus). A wide range of forms of participation in the different research cycle stages has been employed, covering broadly the consultative to collaborative range. In situ mass selection and limited backcross (e.g., IPGRI 2000), and various forms of participatory varietal selection (PVS) and participatory plant breeding (PPB) have been employed in order to retain/improve/expand genetic materials. Some of these efforts gained international recognition, e.g., the Community Biodiversity Conservation and Development Network (CBDC) was recommended by FAO's State of the World's Plant Genetic Resources for Food and Agriculture as a model for in-situ conservation approaches (FAO 1998: 171). The CIAL or local agricultural research committee methodology developed by CIAT in Colombia has spread all over Latin America and more than 250 farmer groups are carrying out experiments to increase crop diversity, improve productivity, and conserve soil and water (Ashby et al. 2000; see also Humphries et al. 2000 for the CIAL movement and experiences in Honduras).

Project example: Pioneering efforts: Participatory barley improvement in North Africa and the Middle East

Supported by BMZ/GTZ-Germany and IDRC, ICARDA pioneered a research effort in Morocco, Syria and Tunisia, experimenting with a novel breeding approach for barley improvement in the low potential, marginal rainfall environments of these three countries. The project brought together breeders and women and men farmers to work side by side, to learn from each other, and to join efforts aimed at fulfilling the needs of poor farmers living and working under harsh conditions.

Major findings and results include (ICARDA 2000):
- selections on stations, even when made by farmers, are very different from those made in farmers' fields as a consequence of large Genotype x Environment interactions; three new varieties identified and one new variety proposed for official registration.
- farmers use selection criteria not previously acknowledged nor used by national breeding programs.
- the importance to identify women's selection criteria (and see when and why they differ from men's criteria).
- farmers warmly welcomed the possibility to select among a large number of lines; some farmers have started seed increase of selected varieties.
- farmer participation can be introduced successfully in reluctant research environments.
- breeders working together with farmers have adopted new ideas and attitudes, becoming supporters of a participatory approach; the approach has been integrated in the national breeding program.

In 2000, ICARDA and five national partner organizations, started a new project in Jordan, building on the experiences gained in the North Africa (ICARDA 2001).

Two international workshops that took place in 1996 co-organized by IDRC, in India and Holland respectively, played an important role in catalysing new and innovative

collaborative efforts in the field of crop biodiversity. At the India workshop, plant breeders, scientists and policy activists assessed thinking and practice in South Asia about agricultural biodiversity, recognized that they shared a number of ideas and interests, and explored convergence among perspectives and avenues for collaboration (Sperling and Loevinsohn 1996). In Holland, a dynamic group of like-minded researchers and staff from the CGIAR system, the FAO, European government agencies, a number of NARS, and donor agencies met to explore common issues, interests, and methodologies (to take stock of participatory plant breeding efforts deployed by plant breeders, conservationists, and social scientists), and to develop ideas for cooperation and to stimulate further research and practice in decentralized, participatory plant breeding (Eyzaguirre and Iwanaga 1996).

Follow up to the India workshop led to the creation of the "Using agricultural diversity" small grants program in 1997. The Using Agricultural Diversity Award helps grassroots organizations and scientists working with farmers in South Asia to undertake applied research on the use of agricultural diversity, including wild herbs, crops and livestock, to meet the needs of farm households and to protect the environment. The award encourages research collaboration, exchanges, and dissemination of information among the formal and informal sectors on practical means to enhance the sustainable use of agricultural diversity by farm households. The Holland workshop planted the seed for the CGIAR system-wide Program on Participatory Research and Gender Analysis (PR/GA), first constituted unofficially in the second half of 1996 and formalized as a CGIAR program in 1997.

A limited number of projects have focussed their efforts on linking in-situ and ex-situ conservation and strengthening or improving seed production systems through mechanisms such as seed fairs and seed banks, e.g., CBDC in Zimbabwe, and UBINIG's work in Bangladesh. Some have this element on the agenda, but are still in the early stages of the process, e.g., the projects in Cuba and China. The frijol tapado project in Costa Rica also studied and tried to broker options for the commercialization of the tapado beans as certified organic produce, both in the country and abroad -an example of trying to add value from the demand side. However, a more systematic approach to look at and deal with (unfair) trading practices, market linkages, and alternatives (e.g., organic or ecologically certified produce) has been missing.

As with the work accomplished under thrust 1, it is worthwhile observing that the program has supported research minded or oriented organizations pertaining to a variety of categories, i.e., grassroots (e.g., under the Using diversity program), NGO's (e.g., members of the CBDC program, Li-Bird in Nepal, IPCA in Honduras, UBINIG in Bangladesh), NARS (INCA in Cuba, CCAP and GMRI in China, Can Tho University in Viet Nam, the University of Costa Rica, the University of Guelph and Ottawa University in Canada), international centers (e.g., CATIE in Costa Rica), and CGIAR centers (e.g., CIAT, ICARDA, IRRI, IPGRI, CIMMYT). Through *learning by doing* and more specific training activities projects have contributed significantly to the strengthening of Individual and organizational research, documentation, and management skills.

As highlighted above by the example of the work on barley by ICARDA, several of the supported projects truly represented pioneering endeavours (and often risky adventures for the leaders and staff involved!) within these categories of organizations, within the particular organizations, and in some of the countries where these efforts got underway. The projects with the organizations belonging to the NARS in Cuba and China where participatory approaches in the field of maize and bean breeding were simply unheard of, present other examples. The PR/GA program and its members have made some important strides into changing research policies within the CGIAR. A key step forward has been the recommendation made in 2000 to the CGIAR Technical Advisory Committee by an advisory group that participatory plant breeding becomes an organic part of each centre's breeding program (Duvick et al. 2000). Another sign that the innovative work underway at least is getting recognition was shown when the ICARDA team headed by Salvatore Ceccarelli won a prestigious CGIAR publication award last year, Ceccarelli et al. 2000). More profound changes, however, proceed slowly.

Through efforts to collect and synthesize research issues, project approaches and methodologies at the global level, the PR/GA program has produced a number of important, comprehensive reports that discuss the technical and institutional issues in participatory plant breeding from formal plant breeding and farmer plant breeding perspective (McGuire et al. 1999, Weltzien/Smith et al. 2000). The Program also has produced detailed guidelines for developing participatory plant breeding programs/projects (Plant Breeding Working Group 1999). The insights presented in these reports capture the cumulative experiences of many teams and projects. Based on its global in-situ program, IPGRI is working on a training guide for in-situ conservation on-farm that details the factors to deal with in designing and implementing a program to support in situ conservation of crop genetic diversity (Jarvis et al. 2000). Others have produced extensive training materials for a specific methodology, e.g., CIAT's series on the CIALs.

It is still early to determine the impact on farmers' livelihoods and the effectiveness or viability (i.e., what works best when and where?) of the variety of all the efforts being tried out, although in many projects the facts that farmers have become to play a key role in the research process and that (new) cultivation options have been introduced or enlarged, can be singled out as early positive results. One important constraint identified by several projects has been the lack or non-existence of a supportive policy environment; this is not to say that frequently agricultural or other policies are actually frustrating or blocking innovations. The projects focussing on the 3rd thrust have studied policies influencing agricultural biodiversity in more detail -and some have come up with proposed alternatives (incentives, regulations, legislation), and we discuss these next.

Thrust 3: policy analysis and alternatives

We recall that about 25% of the projects reviewed have significant policy analysis components. Projects include "stand alone" policy studies (100% policy focussed) at the national level, e.g., the development of sui-generis legislation on IPR patents in Zimbabwe,

at the regional level, e.g., plant breeders rights in Latin America, and at the global level, e.g., the work of the Crucible Group on a series of issues pertaining to rights, laws and legislation. The other kind of policy studies has been done as part of programs with a major share of the research work done under thrusts 1 and 2, in particular the CBDC program that has an international policy program component coordinated by RAFI, and the PR/GA program that is doing some policy research around questions of intellectual property rights.

The projects in Zimbabwe and Viet Nam have produced significant inputs for the national policy and legislation design and drafting processes; and the work in Zimbabwe is also part of an effort by the Organization of African Unity to draft model legislation for its member countries. Studies done and actions undertaken by RAFI, and by the Third World Network (and its members) have dealt with issues related to bio-piracy, the protection of indigenous knowledge, and farmers's rights, in relation to international policy making bodies such as the Convention on Biodiversity, the World Trade Organization/Trade-Related Aspects of Intellectual property Rights, the FAO and the International Undertaking, and the International Union for the protection of New Varieties of Plants (RAFI 1998). Their efforts have contributed to raising broader awareness, putting issues of importance on the agendas, and bringing the voices of indigenous peoples to the negotiations table.

Project example: The Crucible initiative

The Crucible project ((a crucible is a boiling pot used to distill diverse elements) brought together individuals from around world working in various sectors (government, academic, corporate, civil society) to critically discuss issues and formulate policy recommendations related to the use, conservation, and ownership of plant genetic resources. Results of these discussions -characterized by *both* consensus and disagreements- were first published in 1994 under the book title "People, plants and patents: the impact of intellectual property on trade, plant biodiversity, and rural society" (the text contains 28 recommendations). Following a new series of discussions, insights and recommendations were updated and published in 2000 in the book "Seeding solutions: policy option for genetic resources: people, plants and patents revisited" (including a total of 15 recommendations). In 2001, a third publication will be produced outlining legislative options, both conventional and sui generis, for national governments, for the conservation and exchange of germplasm, the protection of indigenous and local knowledge, and the continued promotion of biological innovations.

However, weaknesses in the policy work have come to light, at the project level, but importantly also at the (IDRC) program level. It has proven difficult to be link local level users' perspectives and interests with macro policies and to do so in a sociologically inclusive manner (how to assure that all stakeholders have a say; e.g., how to better link researchers with extension agents). Longer-term policy impact monitoring studies are missing including the analysis of policy disincentives. Integration of analyses at different levels has been complicated (e.g., see for a study on Nepal, Gauchan, Subedi, Shrestha 2000: 188-193). Most significantly, thrust 3 work under way has so far not successfully been interfaced with work done or underway under the thrusts 1 and 2. Although growing in number and strength there is not yet a very strong critical mass of researchers involved (or willing to get involved) with policy making and implementation debates and processes.

6. Post-harvest synthesis of program outputs

The second part of the output mapping deals with specific (expected) results, as formulated by the biodiversity program (SUB 2000: 42-45) and individual projects. The section is divided in two: the first discusses outputs or the more short term and direct results produced by research efforts, grouped under the following:

- new insights/knowledge generated (e.g., resource and resource use assessments, valuation of local/indigenous knowledge)
- research and advocacy methodology development and innovation (approach, e.g., interdisciplinarity, good practice principles, gender-sensitive analyses)
research capacity building and empowerment (e.g., local strategies for in situ conservation)
- new or stronger cross-sectoral/inter-stakeholder partnerships created
- clear research responsiveness to user needs
- policy changes (including more equitable property rights) and related resource re-allocations (incentives, agreements, regulations, legislation)

Projects have generated a wealth of knowledge about local plant genetic resources and resources uses -often in far-away, difficult to access and little known places, making a significant contribution to the awareness and understanding of the importance of agro-biodiversity. This knowledge covers the three cropping types, the three continents, a number of agro-ecozones, and a variety of indigenous systems. Together, projects have contributed to put agrobiodiversity on the international research agenda as a broad topic of interest (e.g., Brush 2000; Friis-Hansen and Sthapit 2000), and this includes the agendas of donor organizations that fund “development” and/or development research.

Together, projects have developed a series of new methodologies to study agrobiodiversity and to strengthen local capacities to maintain/increase diversity -these methodologies combine participatory and non-participatory elements, interdisciplinarity, on-farm and on-station experimentation, and to varying degrees, a user differentiated (primarily gender) analysis. Methodologies and tools have been documented fairly well and can relatively easily be accessed by those interested. As noted already, in some countries and organizations, teams have pioneered or are pioneering these new methodologies. In these circumstances, projects are truly showcases, often drawing considerable attention and frequently, critical scrutiny. Institutionalization of methodologies (and approaches) has been put explicitly on the agenda of a few initiatives, most notably the PR/GA program of the CGIAR. Some have achieved to integrate an innovative methodology on the national research agenda, e.g., CIMMYT in Mexico, ICARDA in Morocco and Tunisia. Several other projects are aiming to influence national research agendas in the near future, e.g., projects in Ethiopia, Jordan, China and Cuba. The Crucible project is on its way to become an independent initiative (“secretariat”).

A number of initiatives have forged new partnerships -sometimes a feature that goes unnoticed. These efforts are not only changing research practices, but also laying the groundwork for future changes and longer term results and impacts, e.g., towards more

user-responsive research. The CBDC program has been a remarkable innovator in this area.

Over the last decade, a large number of the IDRC funded projects/program have contributed to putting and keeping agrobiodiversity, local/indigenous knowledge and rights, farmer rights on the agendas of international and national policy and law making bodies/organizations, including research organizations such as the CGIAR and the NARS in several countries. Alternative regulations, agreements, and (model) laws have been formulated, proposed and advocated for. However, as we have suggested earlier, much work remains to be done in this field.

7. Seeds of change, seeds of hope

> Evaluation research does not provide final answers,
> but it can provide direction.
> Michael Quin Patton, *Utilization-focused evaluation*
> 1978: 180, italics in original

The data and analyses presented in the previous sections bring us to the concluding part of this paper. We emphasize that concluding here does not mean a verdict about whether or not IDRC should continue supporting agrobiodiversity research. Our assessment is that key issues and questions have been addressed/are addressed (in ongoing work) in a significant and meaningful way. Sticking to the analogy used throughout this paper we consider that results to date represent a very valuable collection of seeds of change among which pockets of seeds of hope stand out. The seeds of change are leading the way to evolving research and development challenges and issues. We identify three main ones that IDRC could pursue meaningfully to further make a (modest) contribution to innovation in the field. The seeds of hope are out there to be planted, tested and tasted across the globe, with the caveat that where necessary rights are to be accounted for. There maybe a (minor) role for IDRC to support research into how best this could be done instead of funding the actual adoption and adaptations in specific sites.

Studies have made/are making a contribution to a better understanding about how farmers's knowledge, skills and practices -different farmers in different localities (women, men, poor, rich, old, young)- impact on or relate to diversity time and space wise, but a) deciphering longer term trends remains difficult (short term projet cycles do not help much) (see also Long, Cromwell, Gold 2000) and b) assessment of the effects of project interventions (e.g., through PVS or PPB) is ongoing and/or made complicated by other interfering forces (not necessarily brought about by the project). Apart from the need to improve the assessment of diversity and diversity change, our review indicates that a challenge remains to do sounder social/gender analysis and to integrate this analysis into the biological work or vice versa. More systematic attention to resource tenure and its links with diversity and livelihoods remains a challenge as well.

Across the organizational spectrum and in particular through the *joint* innovative and risky efforts of researchers, farmers, technicians and extensionists, very interesting and promising results are produced in terms of adding economic, socio-cultural and/or ecological value to agrobiodiversity, process and product wise. Two major, both ethical and methodological challenges are to integrate a more thorough (self) assessment of participation as a means to this value adding (identifying good practice), and the need to systematically and transparently define *ex ante* how researchers, farmers and others partaking in research work perceive, decide about and share access to resources, benefits and costs. These challenges by definition become part of the policy making arenas, those dealing with research planning and management (e.g., supportive of participatory approaches) *and* those tackling natural resource access, use and management including indigenous knowledge and intellectual property rights.

However, as research evaluation specialists have pointed out (e.g., Patton 1978), although not always to receptive ears, policy making processes are slow, complex, and political in nature whether they are played out at the local, national or international levels. Our support to research efforts into policy matters, processes and policy alternatives has been more modest and "incidental," although the work done by the Crucible group and the "Crucible methodology" are both seeds of change and seeds of hope.

Attempting to synthesize the above we distill the following emerging *key research and development challenges or issues*:

- ✓ How to better link local (community-based) agrobiodiversity conservation and improvement activities with changes at the international and national policy levels (such as the Convention on Biological Diversity, the Food and Agriculture Organization of the United Nation's Undertaking on Plant Genetic Resources, and the World Trade Organization-Trade Related aspects of Intellectual Property Rights agreement), so that the global context supports the diversity of local contexts and the local informs and guides the global?

- ✓ How to better bridge agrobiodiversity conservation and sustainable agricultural/rural development? Or, how to focus not on crops and crop diversity per se, but on the women and men, their knowledge, skills and (adaptive) livelihood management practices who maintain and depend on the variety of agricultural resources on-farm and off-farm?

- ✓ How to create more space and support for (institutionalize) adaptive, participatory learning research and natural resource management approaches and processes that allow the stewards of biodiversity to better deal with heterogenous and changing agro-ecosystems?

Annex: Classified projects table

The following table lists selected projects analysed by inputs (note: Not included are projects dealing with“wild biodiversity,” forest species and NTF’s, medicinal plants, and aquatic species.)

Period	Title	Recipient	Crop type	Agro-ecosystem	Goals	Participation	User differentiat	Policy analysis	Other funding
92-93	Factors maintaining sorghum landraces diversity, Ethiopia	NARS	sorghum (OP)	unfavourable	D + P	E-L: consultat	none	none	no
93-95	Recuperating genetic resources for home gardens, Ecuador	NGO	homegardens	unfavourable	D + P	E-L: consultat	none	none; impact expecte d	no
93-95	Indigenous seed selection, storage, and breeding, the Philippines	NGO	rice, legumes	unfavourable	D + P	E-L: consultat	gender, ethnicity	none	no
93-95	Farmers’ knowledge and diversity in rootcrops (small grants), the Philippines (UPWARD)	Network	rootcrops (CL)	unfavourable	D + P + E	E-L: consultat E-L: collabor	gender, social organization	none	no
93	Women and biodiversity of foodcrops and medplants Africa	NGO	other: medplants & uncultivated	both	D + E	E-L: collabor	gender + age	none; impact expecte d	no
93-94	Impact of plant breeders right, Latin America	CGIAR/int ernatonal	-	-	-	-	impacts on seed companies, breeding institutions, farmers, consumers	IPR; links with biotech	no

93-99	Community Biodiversity Development and Conservation program	coalition	OP + SL + CL	both	D + E + P	E: consultatative L: more collab	gender (some more, some less)	IPR; IK; doing researc h	yes
93-95	Socio-economics and biodiversity of homegardens, Central America (CATIE)	CGIAR/int ernational	homegardens	both	D + P	E-L: consultative	gender and age	none	no
93-97	Sustainable hillside agriculture, Colombia (CIAT)	CGIAR/int ernational	OP + SL + CL	unfavourable	P + E	E-L: collab (CIAL method)	gender (not systematically)	none; impact expecte d	yes
93-96	Improvement of slash-mulch system, Costa Rica/UoGuelph	NARS	frijol tapado system	unfavourable	P + D	E-L: consultative	gender, class, age	none; impact expecte d	no
94-98	Alternative legislation on IPR's : the Crucible project	NGO	-	-	-	-	-	IPR; sui generis legislati on	yes
94-95	Intellectual property legislation, Zimbabwe	NGO	-	-	-	-	-	IPR; sui generis	yes
94-96	Biodiversity research and capacity building for Third World Network	(NGO) network	-	-	-	-	-	IPR; IK; biotech; sui generis	no

94-97	Participatory farmer research for sustainable hillside agriculture, Honduras/UoGuelph	coalition	OP + SP + CL	unfavourable	P + E	E-L: collabor (CIAL method)	gender	none	no
95	Using diversity (workshop)	coalition	various	both	D + P	-	-	no	no
95	Participatory plant breeding (international workshop)	coalition	OP + SP + CL	unfavourable	P + D + E	various approaches reviewed	gender	IPR; research policy in CGIAR	yes
95-2000	Indigenous vegetables for food security, Zimbabwe	NGO	indigenous vegetables	both	P + D + E	E-L: mostly consultat	gender	some attention	yes
95-99	Protecting the biodiversity of the Americas	coalition	-	-	-	-	-	national laws , access, use, compensation	yes
95-96	Systemwide program on participatory research and gender analysis	coalition	to include OP, SP, CL	unfavourable	P + D + E	to assess various approaches	to assess gender and other variables	IPR	yes
96-99	Farmer participation in barley breeding, Morocco and Tunisia (ICARDA)	CGIAR/International	SP	unfavourable	P + D	E-L: collaborative	gender	none; impact expected	yes
96-97	Participatory plant breeding in high altitude villages, Nepal (3 studies)	NGO	SP (2x) vegetables	fav (1x)/unfav (2x)	D + E	E-L: mix of consult and collab	gender, ethnicity	none; impact expected	no

96-98	CG Maize diversity conservation, Mexico (CIMMYT)	CGIAR/international	OP	unfavourable	P + D	E-L: mostly consultat	gender	none; impact expected	yes
96-98	Using diversity awards program (South Asia)	NGO	all kinds	both	D + P + E	various approaches used	gender, class, age (not all small grants)	none; impact expected (some awards)	yes
96-98	Scientific basis of in situ conservation of agrobiodiversity (Mexico, IPGRI)	CGIAR/international	Mexico: OP + SP + other; Other countries: farm fields (OP, SP, CL, others)	Mexico: unfavourable; Other: favourable, unfavourable	Mexico: D + E; Other: D + E, + P in some	All countries: E-L: mostly consultative	-	none	yes
96-97	Intellectual property and IK (workshops in Panama and Malaysia)	NGO	-	-	-	-	-	IPR; IK; sui generis	no
96-99	Sustainable hillsides, Phase 2 (Nicaragua, Honduras, Colombia, CIAT)	CGIAR/international	OP + SL	unfavourable	P + E	E-L: collabar	gender	some (agricultural policies)	yes
96-98	Improvement of slash/mulch Phase 2, CRica/UoGuelph	NARS	frijol tapdo system	unfavourable	P + D	E-L: collaborat	-	markets and prices; organic certification	no

97-2000	Program for the protection and promotion of biodiversity and community rights	(NGO) network	various	both	D + E	-	-	access to PGR; IPR and IK	no
97-2001	The Crucible project Phase 2	coalition	-	-	-	-	-	IPR; sui generis	yes
97-98	Sui-generis legislation on IPRs, Phase 2, Zimbabwe,	NARS	-	-	-	-	-	IPR; sui generis	no
97-00	Participatory farmer research, Phase 2, Honduras/UoGuelph	coalition	OP + SP	unfavourable	P + E + D	E-L: collabor (CIAL method)	gender	none	yes
97-2001	Participatory plant breeding for rainfed rice, India (IRRI)	CGIAR/international	SP	unfavourable	P + D	E-L: consultative	gender, ethnicity	none	yes
97-00	Systemwide program on participatory research and gender analysis, Phase 2	coalition	8 PPB small grants: OP, SL, CL	unfavourable	P + E + D	E-L: various types of collabor	gender	IPR; research policy in CGIAR	yes
97-2001	Agrobiodiversity and indigenous knowledge, Malawi	NARS	various (cowpea, sorghum, vegetables, fruits)	both	P + D	E-L: both consultative and collabor	gender	none	yes
98-01	Gender, genetic resources and indigenous minorities, Nepal	NGO	various	unfavourable	D + E	E-L: from consul to more collab	gender, ethnicity	none; impact expected	no

98-ongoing	Food security in south Asia: enhancing community capacity to generate knowledge and influence policy (Using diversity Phase 2)	NGO	various	both	D + P + E	various	gender, ethnicity	yes	no
98-02	CG participatory plant breeding for maize, Phase 2, Mexico (CIMMYT)	CGIAR/international	OP	unfavourable	P + D, some E	3 types of participation to be assessed	gender	none; impact expected	yes
99-02	Participatory plant breeding for barley in rainfed areas, Jordan (ICARDA)	CGIAR/international	SP	both	P + D, some E	2 types to be assessed	gender	none; impact expected	no
99-02	Introducing PPB for strengthening agrobiodiversity, Cuba	NARS	OP + SP	both	P + D + E	E-L: collabor (CIAL kind of method)	gender	none impact; expected	no
99-02	Farmer-based strategies for enhancing community seed wealth, Bangladesh	NGO	various	unfavourable, favourable	P + D	E-L: from consul to collab	-	none; impact expected	no
99-03	Community Biodiversity Conservation and Development, Phase 2	coalition	OP + SL + CL	both	D + P + E	E-L: mostly collaborative	gender	IPR; IK	yes
00-03	Scientific basis of in situ conservation, Phase 2, Mexico (IPGRI)	CGIAR/international	Mexico: OP + SP + other	Mexico: unfavourable	D + E + P	E-L: mostly consult, some collaborative	gender	markets and agr. policies	yes
00-02	Exploring crop development and biodiversity enhancement: maize in Southwest China	NARS	OP	both	P + D	E-L: from consul to collab	gender	none; impact expected	yes

00-01	Spatial and temporal dynamics of sorghum biodiversity management, Ethiopia	NARS	SP	unfavourable	D + P	E-L: consultat	gender	maybe; impact expected	no

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