

One plus one equals three: maximizing participation in plant genetic resource networks

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Summary

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Involving stakeholders in decision-making is widely recognized as important, although many organizations find that effective participation is often difficult to achieve. This article describes a comparative case study of participation in four genetic resources management networks. The study analyzed the networks and compared them with three well-known models that relate to organizational development, decision-making and participation. The article briefly introduces the models and then presents major findings and conclusions. In order for members to participate effectively in decision-making, processes and structures must be created which facilitate member involvement. For example, regular meetings that focus on decision-making can be held or representational structures established in cases where the membership cannot meet regularly. Clear and agreed-upon principles and objectives must also be negotiated at the outset and operating plans developed based upon them. Members should be expected to make tangible contributions to the network as a way of establishing and maintaining ownership. In order to promote member participation, networks must achieve a careful balance between external and internal funding and support, so that agendas are not driven more by external than by internal forces. In conclusion, the article presents a checklist for the consideration of networks that want to engage better their membership in decision-making.

Key words: case study, management, network, participation

Overview

Effective participation by a wide range of stakeholders in decision-making is considered to be essential for any public or private sector organization facing complex decisions, rapidly changing management environments and declining resources (Bradford and Cohen 1998; FAO 1998a, 1998b; PCSD 1997). Institutions such as the World Bank (1996), the Food and Agriculture Organization (1999), and many government agencies (Daniels and Walker 1996; LaVoy and Charles 1998;) have adopted more participatory management in the interest of improved performance. The potential benefits of improved participation are (PCSD 1997):

- Equal or better outcomes can be achieved at lower costs.
- Self interests can be advanced in ways that are consistent with the interests of other parties.
- Multi-stakeholder ownership of the process, outcomes and measures of success can be built which can lead to positive changes in policy and practice.
- Comprehensive geographic and sectoral solutions to complex problems can be achieved.

As agricultural research increasingly focuses on addressing complex problems such as sustainable development and

Résumé

Un plus un égalent trois : comment optimiser la participation au sein des réseaux de ressources phylogénétiques

Pour tout organisme, l'implication de l'ensemble des acteurs dans le processus décisionnel revêt une importance capitale. Or, il est souvent difficile d'obtenir une participation effective de ces derniers. Le présent article décrit une étude de cas comparative portant sur la participation au sein de quatre réseaux de gestion de ressources génétiques. Cette étude analyse les réseaux et les compare à trois modèles de référence en matière d'organisation, de prise de décision et de participation. L'article comprend une brève présentation des modèles et expose leurs principaux résultats et conclusions. Pour que les membres participent réellement au processus décisionnel, il faut créer des structures et un mode de fonctionnement facilitant leur implication. Par exemple, il est possible d'organiser régulièrement des réunions consacrées à la prise de décision ou de mettre en place des structures représentatives lorsque les membres ne peuvent se réunir régulièrement. Des principes et des objectifs clairement définis et acceptés doivent être fixés dès le départ. Les plans mis en œuvre doivent s'appuyer sur ceux-ci. Pour pouvoir s'intégrer et continuer à faire partie d'un réseau, une contribution tangible sera exigée. Afin d'encourager la participation, les réseaux doivent tendre vers un équilibre entre les contributions externes et internes sous forme d'aide et de financement. De cette manière, les orientations ne seront pas davantage influencées par des forces externes que par les membres du réseau. En conclusion, l'article établit une liste des points importants destinés à stimuler la participation au processus décisionnel au sein des réseaux.

Resumen

Uno más uno son tres: Fomento de la participación en redes de recursos fitogenéticos

Se reconoce generalmente que es importante la participación de los interesados en la toma de decisiones, aunque para muchas organizaciones es a menudo difícil conseguir una participación efectiva. En este artículo se describe un estudio comparativo de participación en cuatro redes de gestión de recursos genéticos. Las redes fueron analizadas y comparadas con tres modelos bien conocidos que relacionan el desarrollo organizativo, la toma de decisiones y la participación. El artículo presenta brevemente los modelos y expone a continuación los resultados y conclusiones principales. Para que los miembros participen efectivamente en la toma de decisiones, hay que crear procesos y estructuras que faciliten su implicación. Por ejemplo, pueden celebrarse reuniones regulares orientadas a la toma de decisiones, o establecerse estructuras representativas en los casos en que los miembros no puedan reunirse regularmente. Hay que negociar también desde el comienzo principios claros y consensuados, sobre cuya base se desarrollarán los planes operacionales. Se supone que los miembros han de aportar contribuciones tangibles a la red como manera de establecer y mantener la propiedad. Para promover la participación de los miembros, las redes deben equilibrar cuidadosamente la financiación y el apoyo externos e internos, de manera que los programas no sean impulsados más por fuerzas externas que internas. En conclusión, el artículo presenta una lista de control para que la consideración de las redes que deseen una mejor participación de sus miembros en la toma de decisiones.

poverty alleviation, participation in terms of collaboration and communication becomes increasingly essential (Hawtin 1991). Agricultural research networks are an important mechanism to engage stakeholders—including scientists, farmers and others—to increase the effectiveness and efficiency of agricultural research.

Networks are, in theory, the ultimate in participatory organizations, in that their purpose is to bring together the resources, knowledge, staff and facilities of interested stakeholders to solve problems that are too complex or large for any one individual or institution to solve alone. Strong networks attract and hold members because they provide immediate and tangible benefits, potentially including resource and information-sharing among members, minimizing duplication of efforts, and linking isolated scientists with colleagues around the world (Eyzaguirre 1996). Effective member participation is a necessary condition of effective networks since networks are by definition based on the interest and active participation of the membership.

In spite of the potential benefits of participation, many organizations find that involving stakeholders in decision-making is a complex and difficult task. One author suggests that participatory management has entered into the “realm of political correctness, which means that no one can say what he or she is thinking” about the topic (Argyris 1998). This inhibits discussion of limits to participation as a part of a management strategy, or considerations of how participation might change throughout the life of an organization or of a particular project or initiative. It has also led to confusion about what participation means, absence of serious discussion about how organizations can become more participatory, and a lack of precision about the benefits and drawbacks of participation. Participation has become a “warmly persuasive word...never used unfavorably” by its proponents but frequently viewed either with suspicion by the people who are the objects of participatory programmes or poorly carried out by organizations that propose to be more participatory in their decision-making processes (Hildyard et al. 1998).

A study carried out during the summer and fall of 1999 explored the topic of participation in decision-making within four agricultural research networks concerned with the conservation and use of plant genetic resources in which the International Plant Genetic Resources Institute (IPGRI) is the coordinating institution (Watts 2000). The networks studied were:

1. The Lusophone Initiative
2. International Forest Tree Seed Research Network
3. Coconut Genetic Resources Network (COGENT)
4. European Cooperative Programme for Crop Genetic Resources Networks (ECP/GR)

Methods and models

Participation within networks is a complex topic, since many individuals and institutions may participate directly or indirectly in decision-making. To capture this complexity, the study used a case study approach and qualitative methodology. Data were collected from interviews with key informants, network coordinators and network members, and from network documents and reports.

The case study approach is sometimes criticized because case studies are not always designed and conducted rigorously, and do not provide the basis for statistical generalization of the results to other cases (Yin 1994). These criticisms can be addressed by ensuring a sound theoretical basis for the research design and the comparison of findings to existing theory. For this reason, three theories were used in this study: (1) Greiner's theory of organizational development (Greiner 1998), (2) a model of participation based upon Biggs' work (Biggs 1989; CGIAR 1999) and (3) a framework of management decision-making (Bradford and Cohen 1998; Gray 1989; Peters 1987; Plucknett et al. 1993).

Numerous typologies have been applied to networks by various researchers (Faris 1991; Haverkort et al. 1993; IPGRI 1997; Plucknett et al. 1993; Smutylo and Koala 1993). What many of these typologies have in common is not their classification schemes *per se*, but their description of networks as evolving through a sort of life span, or series of development phases. The notion of organizational evolution was first proposed in the 1950s by Haire (1959) and has been applied by various authors since that time to both private and public sector organizations (Gupta and Chin 1994). This work has practical application, since organizations tend to behave in characteristic ways in each developmental stage. For example, the ability to recognize the developmental stage and understand the likely future progression of an organization could help managers formulate effective strategies, identify risks and opportunities, and manage organizational change.

An article by Greiner originally written in 1972 and updated for recent publication (1998) describes the organizational life cycle as having five phases that correspond generally to a growth in size and an aging of the organization. Figure 1 presents the typology in visual form.

Decision-making also changes as the organization evolves through time. In the early stages, the organization is an informal grouping of people brought together by technical interest and entrepreneurship. Later, the organization goes through phases of centralization and decentralization, and structures and controls develop and change. Table 1 describes how different management dimensions are expected to change as the organization evolves.

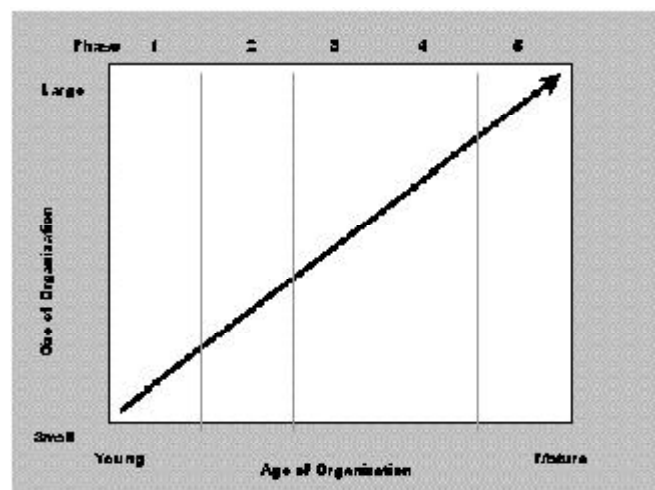


Figure 1. Greiner's Phases of Organizational Development.

Table 1. Summary of Greiner's Model of Organizational Development

	Phase 1 Creativity	Phase 2 Direction	Phase 3 Delegation	Phase 4 Coordination	Phase 5 Collaboration
Organizational structure	Informal	Centralized and Functional	Decentralized	Line staff and product groups	Matrix of teams
Management style	Individualistic, technical entrepreneurs	Directive, capable business manager	Delegative	Oversight	Participative
Emphasis	Creating a product and a market	Growth in number of employees and budget	Field to field contacts, increase in customer responsiveness	Increased efficiency of allocation of resources	Rapid problem-solving and reorientation
Communication	Informal and frequent	Formal and impersonal by title and position	Infrequent, from top to bottom of the organization	Through reports, planning systems and reviews	Focused on problem-solving and social controls
Management relationships	Little or no differentiation between organizational levels	Upper managers set direction and lower managers carry it out	Greater responsibility delegated to field level; higher-level managers manage by exception based on periodic field reports	Headquarters staff initiate company-wide programmes of control and review; capital expenditure carefully parceled out	Key managers work together to focus on major problems

The four networks were selected for study because they were believed to represent different organizational development phases, from newly forming to mature. Table 2 describes how each network was initially classified.

Models that describe participation tend to characterize participation in organizational decision-making as being shared to varying degrees between key stakeholders. The study employed a model adapted from Biggs (1989) and CGIAR (1999) in which IPGRI as the coordinating institution of each network was considered to be one party in the decision-making process and the network membership the other party. Participation in decision-making was characterized as involving each party to a greater or lesser extent (Table 3).

Table 2. Typology of networks by age, size and organizational structure

Phase	Network	Age (yrs)	Size	Organizational structure
Phase 1 Creativity	Lusophone Initiative	4	8 countries	Informal
Phase 2 Direction	Forest Seed Research Network	8	22 research institutes	Centralized and functional
Phase 3 Delegation	COGENT	13	36 institutes	Decentralized and geographical
Phase 4 Coordination	ECP/GR	22	40 member countries	Line staff and crop-based or thematic subnetwork

Table 3. Character of network participation

Types of participation	Character of participation
Strongly IPGRI-led	Decisions are made by the network coordinating institution without organized input from network members.
Moderately IPGRI-led	The network coordinating institution consults with the membership to understand and assess the membership's ideas, opinions, priorities or knowledge that relate to the decision. The host institution makes the decision, which may or may not reflect the perspectives of the members who were consulted.
Shared decision-making	The network coordinating institution and members share in decisions through organized communications mechanisms. Neither party dominates the decision-making and neither party has the right to revoke jointly made decisions.
Moderately member-led	Network members make decisions in consultation with the coordinating institution. Members have the right to revoke a decision and the right to consider the opinions, priorities, ideas and knowledge of the coordinating institution or not in their decision-making.
Strongly member-led	Network members make decisions without organized input from the coordinating institution.

Finally, rather than looking randomly at participation, it was examined as each network carried out four key management functions where broad stakeholder participation is thought to be particularly essential (Plucknett et al. 1993; Bradford and Cohen 1998; Peters 1987; Gray 1989):

1. Establishing overarching principles.
2. Implementing activities consistent with the principles.
3. Monitoring and evaluating the work of the network.
4. Interacting with important external clients.

Major findings

Hundreds of institutions and individuals participate directly or indirectly in the four networks studied. Participants include: individual member scientists, member institutions, network coordinators, secretariat staff, technical advisors, the host institution, funding institutions or donors, cooperating institutions, beneficiaries, political supporters, governmental officials, and individuals or groups within the civil society of member countries.

One of several principles considered to be important to networking success is the strong self-interest among members to be involved in the network activities (Plucknett et al. 1993). In all networks, members confirmed the benefits to participation, including:

- Facilitated access to information, training, materials and resources
- Efficiencies of scale achieved by pooling resources
- Ability to overcome obstacles of political borders which are problematic to plant genetic resources research in which germplasm or knowledge must be shared across political boundaries
- Funding support received as a result of participation in the network.

Some scientists also reported being positively evaluated through a formal employee evaluation process in their home institutions because of their participation in the network.

Network members in all four networks expressed a strong personal commitment to the work carried out by the network. Many members have been working in the field of study for many years and are recognized as international experts. They contribute knowledge and expertise gained from their own work, and infrastructure and materials from their own laboratories to help carry out the work of the network. Many are willing to undertake extra work in addition to their normal workloads to carry out network activities because of their interest in the work and their conviction about its importance.

Members in all networks make in-kind contributions to the network's activities. In-kind contributions take the form of laboratory facilities, supplies, hardware or the salary of participating staff. In some cases, countries organize or support network training programmes or meetings. The developed country members of the International Forest Tree Seed Research Network normally contribute all expenses associated with their network-related research, including travel to network meetings. One scientist estimated that he contributed approximately 5% per year of his time to network activities, another scientist estimated that he contributed approximately 20%. Similar contributions were reported by COGENT and ECP/GR members.

In some cases, members make financial contributions to the network. ECP/GR members are required to pay dues that support network secretariat and coordinator services and member travel to network meetings. Network-related research activities are carried out within the research programmes of each member country, without external funding resources. ECP/GR is the only network studied whose members pay dues of any kind. The dues vary among the members based upon their ability to pay as determined by the UN General Assembly Assessment Rate, which considers gross national product, debt burden and other criteria. Dues-paying member countries participate as steering committee members, in crop working groups and other network activities.

As important as member participation is to the success of the network, IPGRI also plays a critical role as the coordinating and hosting institution. IPGRI's mandate is to advance the conservation and use of plant genetic resources for the benefit of present and future generations (CGIAR/TAC 1997). However, IPGRI is not directly responsible for management of genetic resources. Rather, IPGRI promotes the conservation and sustainable use of plant genetic resources by serving as a "facilitator and catalyst" of action taken by others. Because of this *modus operandi*, IPGRI must accomplish its mandate in collaboration with national programmes and others, and networks are one tool that it uses to collaborate with its partners.

Several studies of network effectiveness confirmed that strong network coordination is an important component in successful networks (FAO 1991a; Plucknett et al. 1993; Smutylo and Koala 1993). In the cases of the networks studied, network coordinators are IPGRI staff members. ECP/GR and COGENT coordinators work essentially full-time on network-related activities; while the Lusophone Initiative coordinator spends approximately 35% of his time on network-related matters. Key activities of network coordinators include:

- Organizing network meetings, training programmes and other activities.
- Collecting and distributing information among network members.
- Developing project proposals for external funding support.
- Bringing IPGRI technical expertise to bear on network research.
- Preparing reports to IPGRI, network members and donors.
- Drafting plans of work and other proposals for network consideration.

In addition to its coordination role, IPGRI contributes critical expertise and resources to assist the networks in carrying out its work. IPGRI also contributes financial and administrative resources and attracts international, regional and local political support to the networks because of its stature as an international agricultural research institution.

Decision-making authority is shared to different degrees between members and IPGRI within the four networks studied. The ECP/GR is entirely funded by the membership and its work is implemented within the existing budgets and structures of the member organizations. This creates a member-led organization that is responsive to member will, so much so that ECP/GR's work is limited by the constraints of the budgets and resources

that members are willing to commit to the network from their own national budgets.

COGENT, on the other hand, evolved from a small network managed by a steering committee that devoted resources to it part-time, to a professional organization with a full-time coordinator and staff and a large set of projects. The focus of the network on attracting and securing external funding enables the network to carry out an ambitious programme of activities and maintain a full-time staff. However, this approach has taken the direction of the network out of the hands of the membership and put it more firmly into the hands of professionals who have the time and institutional support to develop and manage large funding proposals.

The Lusophone Initiative has not been formally established as a network, and has not progressed beyond the earliest development phase. At the present time, it tends to be IPGRI-led, since it does not have management structures in place to provide a means for members to participate in decision-making and it is supported largely by external funding grants managed by IPGRI.

The International Forest Tree Seed Research Network has not developed its own objectives, actions, structure and function independent from the IPGRI project that funds it. The second phase of the project includes funding to develop a strategy for the future of the network after the project ends. However, so far, the ability of the project members to coalesce as an independent network has not been tested.

Two factors influence the ability of members to participate in network decision-making. One is the balance of external funding to member contributions and the second is the existence of structures within the network that facilitate member participation.

External funding was an essential ingredient in the success of most networks, especially in the start-up phase. In the cases of the Lusophone Initiative, the Forest Seed Research Network and COGENT, IPGRI plays a critical role in bringing important external financial resources to support the activities of the network. Among other things, seed money is used to sponsor planning meetings and the international travel of network participants, and to bolster existing research programmes in member countries. ECP/GR operates on little or no external funding, which limits the network's activities to those that are supported by membership dues. ECP/GR would undertake additional activities if additional funding were available.

However, excessive external funding support can be detrimental to network success for two reasons. First, external support can undermine the sense of self-reliance of the network and cooperation among members. Secondly, external support often dries up, leaving the network without the resources necessary to operate in cases where alternative funding sources or self-support have not been established.

One way to address potential problems of external funding is to ensure that members make tangible contributions in the form of membership dues, in-kind contributions, providing facilities for meetings or training, staff salary to participate in network activities, newsletter subscription fees and other mechanisms. Once a system of member contribution is established, the ownership of the network is no longer theoretical, but is based upon a real investment on the part of network members. Other studies

also emphasize the importance of member financial contributions to the network, including FAO 1991a, Haverkort et al. 1993, Plucknett et al. 1993, Starkey 1997.

ECP/GR demonstrates that requiring members to pay dues firmly engages the membership in the functioning of the network. However, the transferability of the ECP/GR member-funded model to other networks may be limited. An FAO study of 24 networks found that no network was entirely self-funded and that only five raised funds through membership dues (FAO 1991b).

However, in the event that countries cannot make cash contributions, dues can be paid through recognition of the value of in-kind contributions. In the cases studied, network members already make significant in-kind contributions in all networks. However, ECP/GR is the only network that recognizes and accounts for in-kind contributions by allowing countries to pay the local costs of organizing network meetings in lieu of paying membership dues. Each Steering Committee meeting hosted by a country is considered to have a value of US\$10 000 and each crop working group meeting a value of US\$5000. This method places a monetary value on local contributions of organizing and hosting meetings. It also engages network members in providing important services to the network, involves members in planning and managing network meetings, and encourages the participation of members who would otherwise have difficulty raising cash contributions within their government's limited budget.

The structure and organization of the network affect the ability of the members to participate in decision-making. Some problems in this area that inhibited participation among the networks studied include:

- Lack of definition of the parameters of membership.
- Lack of clear definition of membership obligations and authorities.
- Lack of regular meetings of the membership.
- Meetings which did not address organizational issues or serve as decision-making fora.
- Weak mechanisms for representation of subgroups in decision-making.

Since most network members are geographically separated from each other in different countries and regions of the world, networks must take deliberate actions to promote interaction and employ a number of mechanisms or tools to do so. Some of the mechanisms used by all four networks to different degrees are summarized in Table 4.

Conclusions

1. In order for decision-making to be shared more widely, processes and structures must be created which can serve as the mechanisms by which network members can participate. For most networks, this means that network members or their representatives must meet regularly in order to make decisions. Each member country could represent itself on a network steering committee convened regularly for decision-making. Alternatively, a representational structure could be employed whereby subgroups are defined and representatives selected from them to serve on a network steering committee. In order for this approach

Table 4. Mechanisms of participation

Mechanism	Purpose	Major participants
Exploratory consultations and studies	To explore an organizational or technical topic for possible action by the network	<ul style="list-style-type: none"> • Consultants • IPGRI • Participating National Programmes • Network Coordinator
CGIAR-related institutional mechanisms	To engage high-level political, technical and financial support	<ul style="list-style-type: none"> • CGIAR Technical Advisory Committee • IPGRI management or Board of Trustees • National Programmes
Inter-institutional agreements	To formally engage external parties and members in the work of the network	<ul style="list-style-type: none"> • Member National Programmes • Donors • IPGRI management • Network Coordinator
Founding meetings	To establish guiding principles and approach	<ul style="list-style-type: none"> • Potential members • IPGRI as host institution • Scientific community • Potential donors
Steering committee meetings	To engage the governing body of the network, if one exists, in decision-making, information-sharing and consultation	<ul style="list-style-type: none"> • Steering Committee • Network Coordinator
Participatory research	To engage farmers and other ultimate beneficiaries in the work of the network, either through information, consultation or decision-making	<ul style="list-style-type: none"> • Network members • Network beneficiaries

to be effective, regular subgroup meetings must be convened to allow for decision-making and selection of subgroup representatives. Representatives should be given sufficient budget, resources and authority to engage subgroup members in the work of the network.

2. To increase member participation, network members should negotiate clear objectives and principles, and then establish operating plans based upon them. Networks should establish founding agreements that describe working principles and operating plans that translate principles to actions. An example of the successful establishment of working principles can be found in the ECP/GR network. ECP/GR donors and members agreed in the beginning that the network should be self-supporting and that external donor support would be phased out. This agreement was carried out as planned and support for the network was shifted to the membership. ECP/GR members meet together at the beginning and end of established work phases to assess accomplishments and establish objectives for the next period of time.

3. Networks may need to add structure in order to build flexibility and responsiveness. For example, ECP/GR operates in 3 to 5-year phases. At the beginning of each phase, the membership has an opportunity to decide for itself the goals, activities and budget for the phase; then the work is implemented, and an assessment of success is carried out at the end of the phase. At the beginning of each phase, countries are able to determine whether or not they wish to continue to make the investment in the network. In addition to defining operating periods, the parameters of membership and coordinator and host institution responsibilities should also be defined.

4. Network members are likely to feel a sense of ownership in the network by literally buying into the network

through concrete and formal member contributions. For example, each member country could be required to pay dues based on a scaled assessment, or make other substantial in-kind contributions toward the network in lieu of cash payment of dues. For example, in addition to hosting meetings, network coordination or secretariat services might be rotated among the participating organizations as a means of capturing in-kind contributions as well as sharing responsibilities and authorities. The value of these services should be defined and member dues reduced according to services provided.

5. External funding should be designed to meet the needs of the network and its members. To ensure that this happens, network members should be closely engaged in decision-making related to external funding. For example, a steering committee might be charged with the authority to make decisions and negotiate proposals for external funding. The coordinator would play a supporting role.

Grants and projects could be designed so that external funding could reside in the member institutions, rather than at the host institution of the network. This would place accountability onto the membership and pull the membership into the role of collaborator and partner since they negotiate and sign the funding agreement.

A foundation could be established to accept grants in the name of the network. The network steering committee chair would sign grants, rather than having the grants become contracts between IPGRI and the external third party, which tends to exclude the network membership.

Networks that rely on project-based external funding should consider tapping each project to help support the costs of coordination and decision-making meetings among the network members, in addition to supporting research activities.

Finally, donors and international organizations might be offered a special category of membership as a part of a larger strategy to define membership and establish payment mechanisms. For example, donors, foundations and international organizations might be charged membership dues but not allowed voting rights.

Looking toward the future

This study focused on participation of the network membership and IPGRI as the network coordinating institution. A participatory approach to decision-making does not advocate minimizing or eliminating either one party or another. Rather it recognizes both parties as being necessarily engaged in solving genetic resource research and management problems.

The study did not find that any network is currently practising truly shared management as theorized by the models. Therefore the networks might not be as effective in their participation as they could be. However, Greiner's organizational development model predicts that the networks will move toward more shared management over time. The model provides some assurance that lesser and greater degrees of participation can be expected and are appropriate throughout the life of a network.

However, the experiences of the networks themselves—confirmed by findings from the business, public administration and international development sectors—indicate that effective, broad-based participation is an essential ingredient to achieving the overarching goal of all of the networks: genetic resources better conserved and put to use to benefit humanity. Addressing and achieving this complex goal requires an international effort sustained over time, and resources, ideas and commitment from several different sectors, including researchers, international organizations, farmers, donors and others.

Networks that want to better engage their membership in decision-making should consider the following checklist derived from this study and several others (FAO 1991a; Haverkort et al. 1993; Plucknett et al. 1993; Starkey 1997).

1. Are the purpose and objectives of the network clearly defined and agreed upon by the members?
2. Are the terms of membership defined?
3. Are there effective means by which network members are involved in network management and decision-making, either directly or through representation?
4. Does an authoritative founding document exist for the network that defines the problem and a strategy for addressing it?
5. Does a realistic work-plan exist that is agreed upon by all the participants and contains concrete activities that will be undertaken by the members?
6. Do regular meetings take place which serve as fora for collaborative problem-solving, including establishing or validating overall principles and work programmes as well as sharing scientific concerns and research results?
7. Does the network expect, provide the means for, and recognize the contribution of resources (staff, facilities, membership dues, etc.) by network members?
8. Is external funding balanced by resources contributed by network members?

9. Is external funding channeled toward activities that help the network meet its goals, objectives and established programme of work?

10. Is the network's existence based on continuing commitment by an external donor that may not be available on a long-term basis?

11. Does the network have mechanisms for assessing the changing needs of the members and evolving in response to those changing needs?

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