

ASSESSING THE TRAINING NEEDS OF GENETIC RESOURCE MANAGERS

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The rapid growth of the world population is creating a need for increases in the food supply. Genetic resources can play an important role in this, and one way of strengthening them is by improving the on-the-job performance of program leaders and scientists working in the area of genetic resources for food and agriculture. This Briefing Paper is based on the draft report titled "Training Needs and Organizational Constraints Assessment. Human Resource Development for Genetic Resource Managers." It describes the processes and findings of a training needs assessment that are expected to result in the production of a training module to meet the specific needs of program leaders.

After initially identifying training needs through a review of the literature and current practice, the team designed a questionnaire that was sent to 200 managers-leaders and scientists from 121 countries in four regions: Africa, Asia, Latin America and the Caribbean (LAC), and Central and West Asia and North Africa (CWANA). Part of the questionnaire identified the responsibilities and activities of the respondents. The program managers were also asked to list their training needs in order of priority and to rank topics from three alternative curricula in terms of their requirements. The results pinpointed the strong and weak points of current training courses and revealed some regional differences in the priorities and responsibilities of program leaders. The Briefing Paper ends with a series of recommendations based on the findings of the training needs assessment.

Introduction

The population of the developing countries is expected to rise to seven billion by the year 2025, requiring big increases in the production of food and other agricultural commodities. Genetic resources are important in meeting this increased demand, and they need to be strengthened. However, currently many genebanks are inadequate, and in some instances the loss

of plant genetic diversity in genebanks is as great as it is in the field. National programs to conserve, develop, and use genetic diversity are often underfunded and understaffed. In addition, research programs are under pressure as their resources decline.

The needs of individual program leaders and managers in genetic resources for food



and agriculture (GRFA) require special attention because they have primary responsibility for the day-to-day operation and long-term success of GRFA programs. Their performance is a function of their managerial knowledge and attitudes on the one hand, and technical knowledge and specific skills on the other. In addition, program performance is markedly influenced by the organizational constraints that affect the morale and output of the staff. Training programs must, therefore, respond to gaps in managerial and technical knowledge, attitudes, and skills in order to improve on-the-job performance.

This Training Needs and Organizational Constraints Assessment (TNA) is the first phase of a project titled "Human Resource Development for Genetic Resource Managers: Opportunities Available from the CGIAR Centers—Research Study and Course Development." The project is jointly implemented by the International Plant Genetic Resources Institute (IPGRI) and the International Service for National Agricultural Research (ISNAR) on behalf of the CGIAR System-wide Genetic Resources Program (SGRP). Its main objective is to assist the SGRP in promoting opportunities for program managers-leaders and scientists working in those

programs to develop and/or improve research-oriented capacity for policy development, leadership, and management in GFRA.

The TNA consisted of four phases. In phase 1, the main training areas were identified by analyzing existing training opportunities and materials at CGIAR centers, as well as the results of previous TNA exercises and the recommendations of the SGRP External Program and Management Review (EPMR) final report. In phase 2, three alternative curricula were developed for feedback from international agricultural research centers (IARCs), and national program leaders were identified to participate in the TNA exercise. The information obtained during these two phases was used to design the questionnaire in phase 3. The questionnaire served to review the functions and/or responsibilities of genetic resource program and research leaders, conduct job analysis and identification of job requirements in terms of competencies, and identify organizational constraints affecting the participants' managerial performance. Finally, in phase 4 content was selected and priorities were set for the content of the training module that is to be a major output of the project.

Processes and Findings of the TNA

The TNA focused on training needs related to policy development, leadership and management, and technical issues. A thorough analysis of existing literature, information gathered from the CGIAR centers, and the final report of the EPMR of the SGRP played an important role in its methodology.

Phase 1: Preparatory Work

The representatives of the SGRP were the core participants in the preparatory phase of the TNA exercise. Information was requested from 16 centers through surveys. The centers were asked to provide copies of training curricula, training materials, and training evaluations. Eight centers completed the questionnaire and one sent relevant materials but not the questionnaire.

Analysis of the data showed that all the responding centers are involved in human resource development (HRD) activities related to GRFA. Most of the IARCs were planning GRFA-related training for 1999. Six of the eight centers involve external trainers or consultants when delivering training programs. All except one conduct some type of training needs assessment. Seven centers have a training strategy and one was in the process of developing its strategy at the time of the survey. Four centers have conducted long-term follow-up, external review, or impact assessment of training activities.

Training is given in the following fields, among others:

- biodiversity and GRFA
- communication and information
- analysis of resources
- environmental responsibility
- individual management and leadership
- *in situ* and *ex situ* conservation
- HRD; priority setting
- intellectual property rights; *in vitro* conservation
- negotiation
- economics/marketing
- national policy analysis and development
- genebank management
- forest genetic resources
- livestock genetic resources
- ethnobotany/neglected germplasm
- germplasm documentation
- germplasm collection
- germplasm health

The preparatory phase also included analysis of previous TNA exercises. The training needs survey for Asia (East Asia, Pacific, South Asia, and Southeast Asia) conducted by IPGRI in 1995 found the following priorities for degree-level training in genetic resources (in descending order): characterization/evaluation (BSc, MSc, PhD), genetics (BSc), plant breeding (PhD), conservation (MSc, PhD), biometrics (MSc), biogeography (PhD). The last two were both fifth in priority. These priorities were consistent with the national priorities identified by institutions involved in the survey.

The IPGRI survey does not address research policy and management training needs, but there are other TNA exercises relevant to the needs of research program leaders. The following research management training priorities (in descending order) have been identified by two CGIAR centers, IWMI (Malaysia, 1989; Bangladesh, 1991) and ISNAR (Uganda, 1994; Kenya, 1996):

- monitoring and evaluation of research
- project preparation, proposal writing, and donor relations
- accessing, organization, and analysis of information
- decision making
- assessment of staff capacity to meet job needs and personnel management
- leadership
- resource accounting and procurement of goods and services
- influencing people
- conflict management.

The second and third activities were both second in priority and the last four were jointly fifth in priority.

Phase 2: Development of Alternative Curricula

The analysis in phase 1 was the basis for identifying the major objectives and areas of training courses, and for developing the contents of three alternative curricula to be included in the TNA questionnaire. Three major areas for training were identified: policy development (at national and institutional levels), leadership and management of research, and technical issues in GRFA research. These areas formed the components of the alternative curricula, which were discussed by SGRP members before being incorporated into the questionnaire.

Phase 3: The TNA Questionnaire

The questionnaire recipients included top managers, program leaders (university deans, departmental heads, and professors were placed in this category) and scientists. The major criterion for sample selection was that the respondents should clearly be research program managers-leaders in genetic resources.

The sample comprised 200 managers-leaders and scientists from 121 countries in four regions: Africa, Asia, Latin America and the Caribbean (LAC), and Central and West Asia and North Africa (CWANA). Questionnaires were sent by e-mail and fax to 50 participants in each region. A total of 72 (36%) responded. Of the 72 respondents, 24% were top managers of GRFA organizations and GRFA curators, 63% were GRFA program leaders, and 13% were scientists heading GRFA projects. Their level of experience as research program leaders varied: 44% had 0–5 years, 33% had 6–10 years, 11% had 11–20 years; and 5% had 21 years or more. The rest (7%) did not answer the questionnaire. The gender breakdown of the respondents was 79% male and 21% female.

Part 1 of the questionnaire was a **job analysis** that systematically examined the actual functions and responsibilities of the respondents. The aim of the analysis was not only to obtain data, but also to help participants analyze their jobs and develop a better understanding and awareness of the competencies needed to do their work successfully.

Analysis of the answers showed that, globally, the respondents spend the greatest amount of time on leadership and management (75.7%), followed by technical activities (69.1%), and policy development (59%). Regionally, the answers from Asia and CWANA are consistent with these findings. However, in Africa the major responsibilities are headed by the technical areas (82.9%), followed by leadership and management (75.9%), and policy (61.9%). Globally, 8.16% of the respondents did not respond to questions related to their responsibilities.

This study has identified the three highest **policy development** responsibilities in all regions as being institutional programs, national programs, and public awareness. A regional breakdown of this finding is presented in figure 1.

The three highest **leadership and management** responsibilities in all regions are planning, implementing, and evaluating research activities; leading research project preparation, supervising research work, and organizing collaboration; and documenting and disseminating information. This finding is presented by region in figure 2.

In **technical areas**, the three highest responsibilities in all regions are *in situ* and *ex situ* conservation; inventory (e.g., recording national cultivated plant genetic resources, wild relatives, ecosystems, and the traditional knowledge associated with them); and collection (e.g., of germplasm). This finding is summarized by region in figure 3.

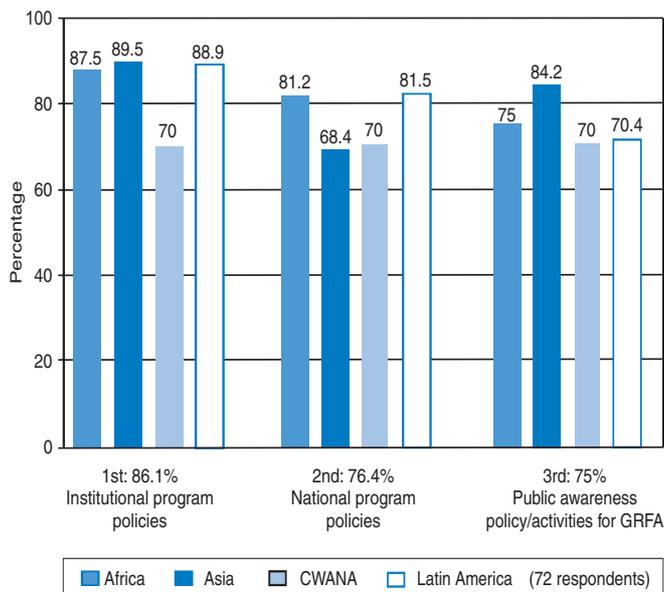


Figure 1. Policy issues in managing research in genetic resources. Highest responsibilities (by region).

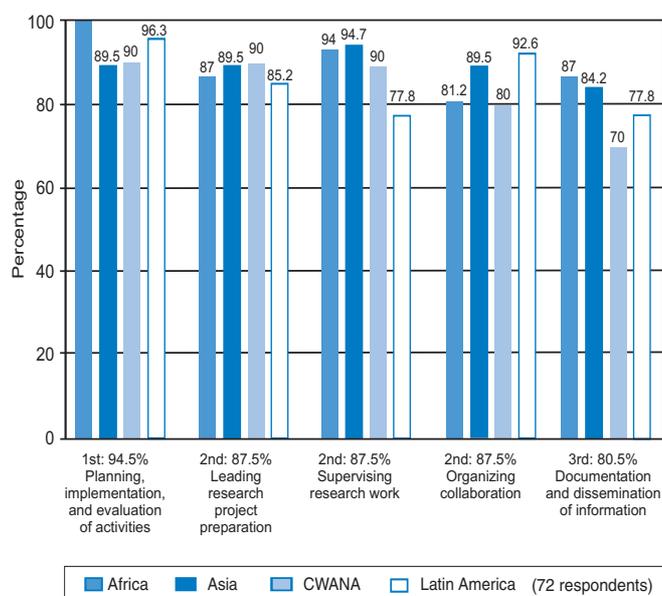


Figure 2. Leadership and management issues. Highest responsibilities (by region).

Program leaders reported playing an active role in policy analysis and development as well as scientific research. They also lead activities related to public awareness. However, approximately 15% of the program leaders did not indicate involvement in leadership and management of research as a major activity. This suggests that some program leaders are either unaware of their role as leaders and managers, or they are immersed in research activities that divert their attention from management activities.

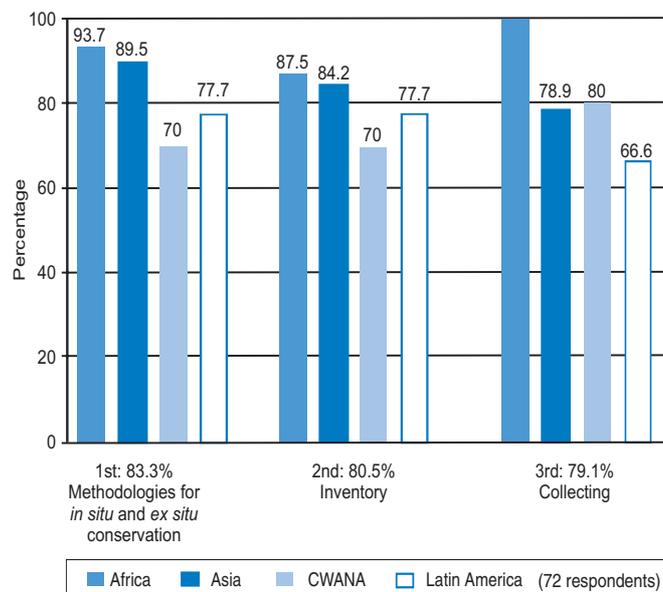


Figure 3. Technical issues. Highest responsibilities (by region).

Highly significant regional variations were found in major activities of the program leaders. In Africa, they have many different responsibilities in policy development, leadership and management, and technical research. In Africa and CWANA, all program leaders are simultaneously engaged in scientific research. However, in Asia and LAC, they are more likely to have only a management or supervisory role in scientific research. Finally, program leaders are active in public awareness in Africa, Asia, and CWANA, but not in LAC—possibly because this activity may be the responsibility of administrative support staff.

Globally, respondents gave almost equal importance to leadership and management, and knowledge of policy development: 81.6% chose leadership and management, and 79% knowledge. However, in Asia and Latin America the respondents considered knowledge more necessary than leadership and management. Three areas of knowledge were identified as being important in policy development: policies on processing and storing germplasm, maintaining data, interacting with those responsible for quarantine research; the design of national plans; and national policy on growing, testing, and evaluating samples of germplasm.

The responses also suggest that, globally, **attitudes** to work related to leadership and management, and policy are very important for successful performance: 89% of the respondents chose the former and 85.4% the latter. In performing their **policy development** activities, leaders-managers are expected to demonstrate innovation, organization, knowledge, and accuracy. Knowledge of research planning, priority setting, monitoring and evaluation of research, in addition to motivating staff, is of the highest priority. For **leadership and management**

activities, the highest priorities were given to the following attitudes: understanding, good communication, inspiration and encouragement, conviction, and commitment.

Respondents were also asked to provide their **job descriptions**, but only 25% were able to do so. Terms of reference are the basis for an employer's evaluation of the performance of employees. They help improve the staff's responsibility, develop motivation and commitment, and facilitate supervision. The low response suggests either that the respondents are unaware of the importance of the relation between a job description, job performance, and training, or that they do not have a job description.

Phase 4: The Content of the Training Module

The TNA participants were asked to pick from a list their 10 most important needs for the improvement of their performance as GRFA leaders. They could add new topics to the list if necessary. These individual selections were then compiled and weighted. Topics given first priority were rated 10 points, those given second priority, 9 points, and so on. The scores assigned to the individual responses in each group were then added up for a total group score for each topic listed. The results were compared with the three proposed curricula to identify the distribution of the topic priorities within the alternative curricula. Table 1 presents the results.

The results suggest that ISNAR's list of topics in Curriculum 3 meet the participants' expectations better than the other two proposals do. ISNAR's proposal concentrated on policy development and leadership and management. Feedback from IARCs also indicates that the centers would like a greater emphasis on these two areas.

The TNA participants also provided 29 additional topics. Eleven of these were related to policy development, two to leadership and management of research, and 16 to technical research. These topics should be studied carefully and taken into consideration while designing other training modules on genetic resources.

In the area of **policy development**, participants from Africa and Asia identified national policy and strategy for genetic resources as their first and second priorities. Latin American participants chose strategy for genetic resources as their first priority, and national policy and program development as the second one. CWANA respondents gave equal importance to strategy for genetic resources and biodiversity. Latin American and African participants ranked intellectual property rights higher than biosafety policy and environmental responsibility. The most popular topic, placed either first or second in all four regions, was national policy and program development.

In the area of **leadership and management**, the global priorities were (in descending order) research program formulation, priority setting, project planning, leadership and decision making, and genebank management. However, at the regional level only Africa had the same priorities as those at the global level. This information is very important for guiding those who work in partnership with GRFA managers-leaders and scientists in the regions.

In the **technical research area**, the most popular topic, coming either first or second in all the regions, was conducting a genetic resources survey. Generally, there was a balance of priorities among the four regions. However, the highest priority of Latin American participants, with a weighted score of 214, was methodologies for *in situ* and *ex situ* conservation. The results also indicate that advanced methods in molecular biology and GIS are priorities. Both were included in the alternative curriculum based on suggestions from the SGRP-EPMR.

Organizational Constraints

There is a common and mistaken belief in developing countries that training can solve all problems within an organization. To help the participants recognize and avoid this mistake, the TNA provided them with an opportunity to identify the organizational constraints that affect their performance. These constraints are external to, and independent of, the capabilities of the

Table 1. Distribution of TNA Topic Priorities within the Three Alternative Curricula

Areas	Topics proposed	Curriculum 1 SGRP-EPMR	Curriculum 2 CGIAR centers	Curriculum 3 ISNAR team
Policy	9	2	1	6
Leadership and management	14	1	2	11
Technical	12	5	7	-
Total #	35	8	10	17
Total %	100%	22%	29%	49%

staff, and overcoming them requires other kinds of intervention than training. Organizational constraints are identified through an institutional assessment, while competencies are identified by means of an individual/staff assessment. The results of these two distinct assessments provides the management of organizations with clear guidance on how to approach both training and nontraining interventions. These two kinds of interventions are complementary and must be implemented simultaneously to ensure the effectiveness of training programs and maximize their positive impact on the performance of the organization. In addition, when the interventions are implemented, the level of staff motivation increases and their frustration tends to disappear.

Of the respondents, 56.6% experience the institutional constraints listed in the questionnaire, while 36.6% do not face the constraints. There was no response from 6.8% of the sample. A total of 54.9% respondents experience the operational constraints, 34% do not. There was no response from 11.1% of the sample. The results

suggest that the organizational constraints at national level are perceived by the participants as having a higher impact (70.8%) on their performance than the ones at institutional (56.6%) and operational (54.9%) levels. These results should be taken only as indicators, since the number of organizational constraints offered at national and operational levels was low in comparison with the list offered at the institutional level.

Regionally, organizational constraints at national level are higher in Latin America (81.5%) and CWANA (70%) than in Africa (68.8%) and Asia (57.9%). Organizational constraints at the institutional and operational levels received the lowest percentages in Latin America (54.9% and 50%, respectively). In Asia, the performance of respondents is least affected by organizational constraints. However, a relatively high percentage of participants from Asia did not respond to the questions on organizational constraints. This could suggest that the respondents from Asia found it difficult to answer questions on organizational constraints.

Recommendations

In the area of **training intervention**, we recommend the following:

- The SGRP should advise national programs to design a short- and long-term training plan reflecting the results of the TNA exercise. This would also reinforce the results of the 1995 study by IPGRI for long-term degree training.
- The highest priorities identified in the TNA should be translated into a training module for research program leaders titled “Managing Programs for Genetic Resource Conservation and Use.” This project enables the design of one 10-day training module. However, an additional module should be developed to respond to the other priorities in policy and management and leadership areas as identified by this study.
- This project should not be stopped after the module has been tested. Instead, planning should begin for a further phase involving the training of trainers for the implementation of the training module in developing countries.
- The follow-up method “Manager Action Plan Approach” should be included as an integral part of

the training program so that the content and process of training in genetic resource conservation and use can be further improved. This would also ensure that the module leads to capacity building in the national programs.

- The TNA results in the technical area should be considered by the CGIAR centers very seriously, and the centers should provide training programs covering the technical priorities identified by this study. CGIAR genetic resource program leaders should keep in mind that the highest organizational constraint identified at the operational level was an *inadequate number of competent researchers* in the regions. New training modules should also be developed to implement training activities if the existing programs do not cover the needs of the TNA participants.
- Information and documentation was one of the highest priorities identified in this study. IPGRI has a strong training manual on this subject titled *Guidebook for Genetic Resources Documentation and Genebank Management System (GMS)*, Software User’s Guide, by K.A. Painting, M.C. Perry, R.A. Denning, and W.G. Ayad (1995). This manual could be updated and translated into a module for the training of trainers.

- The members of the SGRP should produce a training module not only for use in formal training events, but also as a tool for program leaders in genetic resources to use in their everyday work with their teams and partners.

In the area of **nontraining intervention**, the recommendations are the following:

- The SGRP should encourage top managers of national programs to solve and/or minimize, through appropriate nontraining interventions, the organizational constraints identified in this TNA exercise. All organizations that participated in this study should receive a copy of this report.
- The constraints that are under the control of national programs and that do not require heavy funding should be addressed soon in order to avoid further loss of existing capacity within the national programs for genetic resource research.
- National programs should take advantage of the training modules produced in the SGRP project to train research leaders/managers. This would help to overcome the problem of insufficient competent researchers at the operational level.
- National programs should review and improve the job descriptions of genetic resource program leaders in order to strengthen the evaluation process and encourage improved performance.

This briefing paper is based on the CGIAR-SGRP report titled "Training Needs and Organizational Constraints Assessment. Human Resource Development for Genetic

- There is an urgent need to promote communication and coordination among CGIAR centers involved in genetic resource research and training. Improved linkages between IARCs and national programs as well as between national programs and their stakeholders are important for addressing organizational constraints and responding to the training needs identified in this study. Special strategies and mechanisms for this should be defined and discussed among IARCs and national programs, and implemented and evaluated.
- The SGRP project members should continue to share among themselves, and to forward to the project team, training materials and modules that are planned or in the process of being developed. We strongly recommend that existing materials that are suitable for responding to the needs of genetic resource program leaders be used in the training module.
- Finally, CGIAR centers involved in the SGRP should carefully plan, implement, and evaluate training programs that respond to the needs of national programs, and involve them in all aspects of the preparation of training modules and materials. This partnership must include follow-up to training programs in order to sustain efforts to build capacity in genetic resources.

Resource Managers." Copies of this report are available to developing-country national agricultural research systems. Please write to ISNAR at the address on page 8.

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