

COMMUNICATING SCIENCE TO SUPPORT CONSERVATION AND USE OF AGRICULTURAL BIODIVERSITY: A CASE STUDY

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ABSTRACT

To help bridge the gap between science and practice of conservation and use of agricultural biodiversity, a global partnership was launched in 2002. It sought to gather, distill, repackage and simplify technical information on conservation and sustainable use of agricultural biodiversity. The resulting output is a 675-page, 3 volume publication showcasing experiences in 33 developing countries. This sourcebook contains 75 articles and was based on the work of experts around the world including: policy makers, scientists, researchers, community workers, rural development activists and practitioners.

This project was mainly done electronically combined with a modified editors-artists writeshop, face-to-face working group meetings and an advisory group meeting.

The project built on and tapped the global pool of scientific knowledge in offering practical, field-tested concepts and methods, facilitated a collective effort among a wide range of institutional partners which includes the CGIAR centers, donors, NGOs and community-based organizations in mobilizing resources and expertise toward greater utilization of research outputs and developed an innovative product. Ongoing monitoring and evaluation have indicated diverse uses of the sourcebook as information source for further dissemination and field application.

INDEX TERMS

conservation and use, agricultural biodiversity, multi-stakeholder partnership, writeshop, sourcebook

INTRODUCTION

According to the Food and Agriculture Organization (FAO) "the future of agriculture depends on biodiversity". It further calls for the need to safeguard the diversity of nature since this is critical for world food security (<http://www.fao.org>). Over the past years, the international agricultural research community has generated enormous amounts of information on the conservation and sustainable use of agricultural biodiversity. However, this information is generally disseminated only within the scientific community and targeting specialized technical audiences.

While this information is of potential value to the development community, it remains inaccessible to non-technical audiences who are at the forefront of efforts to support local

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conservation and use of agricultural diversity. These key intermediate users include NGO workers government extension workers, program managers, donors, trainers and educators.

In China (Wang 1996) for example, the print media played a big role in introducing hundreds of improved crops and animal varieties as well as equipment that have substantial effect in improving yield, quality and returns of agricultural products. He further concluded that the more print media are used for science communication, there is substantial progress in their high output, high quality and high return (3-H) agriculture. However in the Philippines, Velasco (1998) identified scarcity of materials on science and technology (S&T) was identified as one of the problems in the promotion of science and technology. Content analysis of print and broadcast media revealed low coverage of S&T compared with entertainment, politics and sports. Meanwhile, De Hoogh and Campilan (2003) reviewed the handbooks produced by a Southeast Asian program on plant resources. These handbooks, featuring the diversity of economically useful plant species in the region, were found to be mainly used by researchers, academic and training professionals. To expand the publications' readership and usefulness, they recommended the development of derived information products containing further simplified information for specific target audiences.

The importance of publication in capacity building was supported by a study conducted by Siri and Andrade (1999) in Latin America. The study revealed that the greatest impact of the publication (i.e. on program monitoring and evaluation) was on the motivation and capacity of both individuals and organizations. The users of the publication have developed favorable attitudes, knowledge and skills particularly related to planning, monitoring and evaluation. Impact on organizational performance was also reported on changes mainly to enhanced relevance of research projects and programs.

To help bridge the perceived gap between science and practice, a global multi-stakeholder partnership was launched in 2002, seeking to gather, distill, repackage and simplify technical information on conservation and sustainable use of agricultural biodiversity. The output is a sourcebook that offers concise and practical information, presented in non-technical language and highly illustrated format.

The global partnership

Facilitating this global initiative in science communication is the Users' Perspectives With Agricultural Research and Development (UPWARD). UPWARD is an Asia-wide network of research and development professionals seeking to promote involvement of farmers and other user groups in agricultural research and development.

As a global effort, the project has involved:

- 115 authors representing 90 international and national research organizations, NGOs, donor agencies, universities and community-based organizations in 27 countries (Table 1). Most of the contributors came from Asia followed by Europe. Africa, Latin America and North America were under-represented. Most of the contributors were development workers, researchers, scientists and policy makers from non-government organizations, research institutions and universities comprising around 75% of the contributors.
- Key institutional partners including international agricultural research centers (i.e. International Potato Center and International Plant Genetic Resources Institute), donor

agencies (i.e. International Development Research Centre and German Agency for Development Cooperation) and NGO (Southeast Asia Regional Initiatives for Community Empowerment). The International Potato Center is a non-profit institutions engaged in research and related activities on potato, sweetpotato, Andean root and tuber crops and natural resources and mountain ecologies while IPGRI is an autonomous international scientific organization mandated to advance the conservation and use of genetic diversity for the well-being of present and future generations. IDRC is a public corporation is mandated to help developing countries use science and technology to find practical, long term solutions to the social, economic and environmental problems they face while GTZ is works to improve the living and working conditions of people in partner countries and sustains the basis of life. SEARICE is involved with community-based conservation, development and utilization of plant genetic resources and in policy advocacy and lobbying work related to the issues in agricultural biodiversity, biotechnology, intellectual property rights and access to genetic resources.

- A 13-member international advisory committee to ensure the product meets scientific standards and quality, consisting of scientists and experts in agricultural biodiversity from institution like Wageningen University, MS Swaminathan Research Foundation (MSSRF), Local Initiatives for Biodiversity Research and Development (LIBIRD), IDRC, CIP, GTZ and IPGRI. The group was tasked to assist in: 1) defining the substantive focus of the sourcebook, 2) developing the topical structure and outline, 3) identifying potential contributors, and 4) reviewing and providing comments on draft documents. Members of the advisory group were chosen on the basis of their expertise and experience in agricultural biodiversity conservation, and their willingness to support and participate in the production of the sourcebook.
- A production team consisting of 15 editors, graphic artists and illustrators.
- Four resource persons actively involved in agricultural biodiversity conservation and use for the writeshop.
- A six-member core working group fully engaged in the project from conceptualization to sourcebook finalization and distribution.

THE SCIENCE COMMUNICATION PROCESS

The participatory writeshop process was pioneered by the International Institute for Rural Reconstruction (IIRR) to develop sourcebooks on various subjects ranging from agriculture to natural resource management and participation (Gonsalves and Caminade 2001). According to Gonsalves and Caminade, this kind of workshop that allowed IIRR to produce 30 sourcebooks offers the following advantages: 1) it allows ideas to be validated by a range of individuals with diverse skills, organizational affiliations and backgrounds; 2) it provides opportunity for pretesting the text and illustrations; 3) generate products that gain wider acceptance, use and ownership; 4) it allows development of networks that continue to be active after the writeshop; and 5) provides a crash course on the writeshop theme. However, this approach is relatively expensive, particularly in bringing together a large group of contributors and production team for a two-week writeshop.

Table 1. Geographic and institutional affiliation of contributors.

A. Regions	Percent (%)	B. Institutional Affiliation	Percent (%)
Asia-Pacific	51	Non-government organizations	40
Europe	29	International research institutions	20
Africa	9	University/Academe	16
North America	8	National/local research institutions	9
Latin America	3	Donor and policy-making institutions	8
		Others (freelance consultants)	7

This project took advantage of the efficiency of electronic communications to reach more people and organizations involved in conservation efforts from different regions of the world. This approach is combined with a modified editors-artists writeshop, face-to-face working group meetings and an advisory committee meeting.

The project can be divided mainly into three main phases: a) Planning and compilation of materials; b) Production; c) Finalization, distribution, and monitoring and evaluation (Figure 1).

Planning and compilation of materials

A Philippines-based working group (WG) was formed to prepare and review the initial list of topics, themes, and contributors. The initial list was then forwarded to the advisory group (AG) for discussion, comments and suggestions. The international advisory group was formed to provide technical support in planning and implementing the publication process.

After the framework, guidelines, and process were finalized with the AG, solicitation of interest was facilitated by the WG mainly through e-mail. The invitation letter explicitly indicated the copyright-free and semi-technical nature of the publication. The tentative outline of the sourcebook, time frame, publication process and guidelines in writing the draft papers were already included in the first communication with potential contributors. A sample article was provided to give the contributors an idea of what the final article would look like in terms of content and format. However, contributors were given the opportunity to modify the topics initially identified by the WG and AG for them to write.

Special effort was made to: 1) cover previously unpublished and lesser-known work through secondary materials and literature search in websites and printed materials and; 2) translate original contributions written in other languages like Spanish and Thai, to English. Contributions submitted were then evaluated, consolidated and divided among the WG. The WG gave comments and guides to editors on which parts of each paper needs to be highlighted.

Out of the 77 paper contributions submitted, 72 papers made it to the printed version of the sourcebook. Some papers were dropped, merged or split into several papers.

Production of materials

Two writeshops were held to repackage the contributions under the close guidance of the WG. A pool of editors, illustrators and lay-out artists helped in repackaging contributions selected

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by the WG. Each editor-illustrator worked on a number of articles which were then forwarded to the lay-out artists. During the initial phase of the writeshop, the editors presented one or two repackaged papers as a test run to guide them in repackaging the remaining papers. Second drafts were produced based on comments from the working group. These were further edited by the managing editor prior to sending to authors for feedback and comments. The second writeshop aimed to repackage additional papers to fill the gaps in the existing compilation in terms of topics, sectors and issues.

A sample repackaging of one of the original paper from a conference proceedings was done as follows: a 16-page article, written as pure text in an 8.5 x 11 inches bond paper was repackaged to produce a 6 page-article in an 8.5 x 75 inches booklet containing texts with cartoon illustrations in an attractive lay-out. The content was synthesized by the editor reducing details in the repackaged paper and highlighting important information in boxes (eg. case experiences and statistical information on rice production) guided by the notes from the working group.

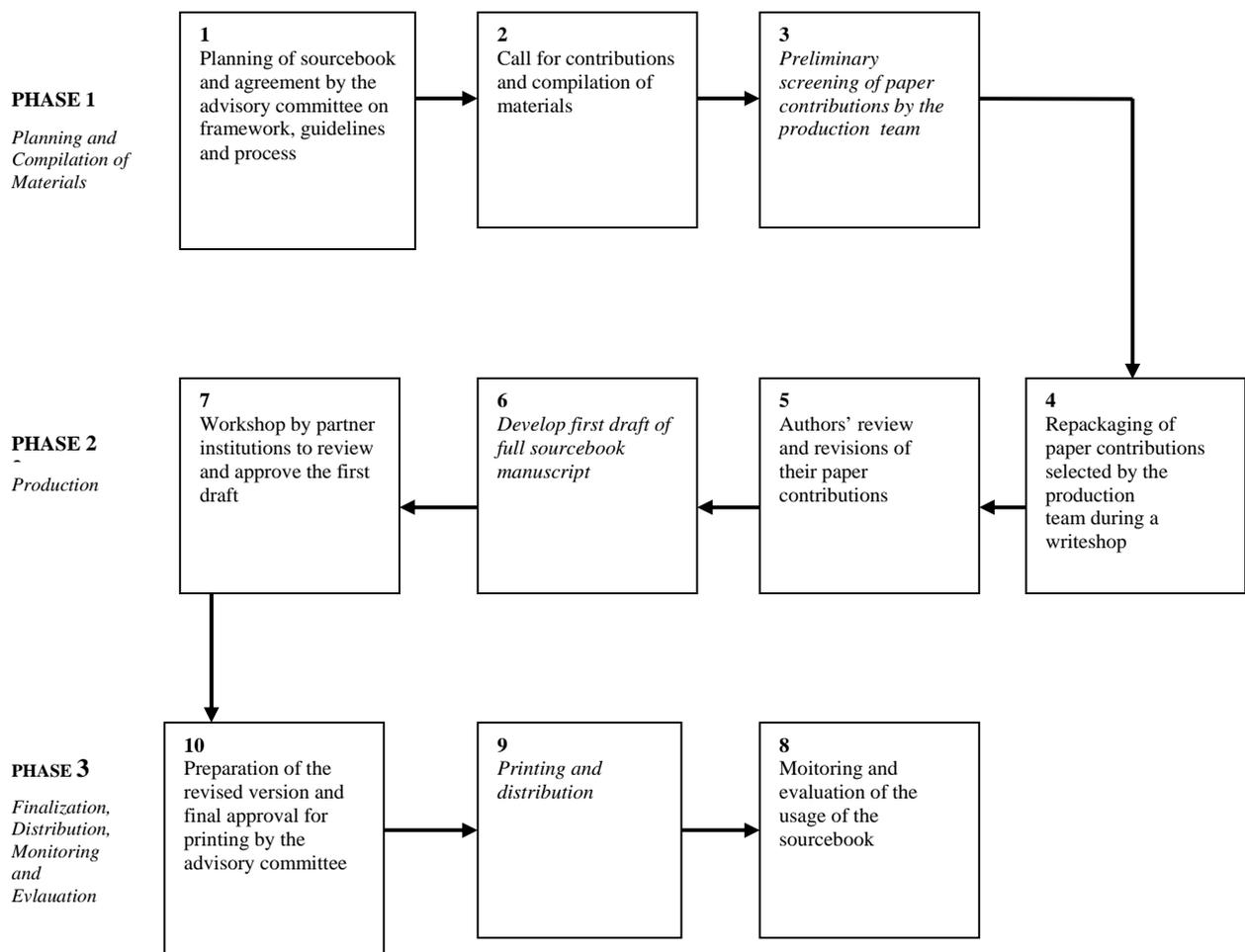


Fig. 1. Science Communication Process.

A pre-testing of individual articles was done by development communication (DevCom) graduate students from the University of the Philippines at Los Baños. Analysis of individual

components or sections of each article contribution was evaluated for message clarity and appropriateness of symbolics. Groups of respondents corresponded to the sourcebook target user groups. Suggestions for revision were submitted to the production management.

The repackaged papers were sent back to contributors. Authors were given two to three weeks to comment on the 2nd drafts for subsequent revision by the production team. Specific comments were solicited from the authors in-terms of lay-out, terminology, artwork and content. Based on author's comments, each article was revised again and compiled. The whole compilation was sent to the advisory group for preliminary review in terms of content, lay-out, artwork and form prior to the partners' meeting. During the partner's meeting, comments of the advisory group were addressed and consolidated. A few additional papers were added to fill in the gaps of unrepresented topics in the compilation. The final packaging from a single volume to a 3-volume set including the specific subsections in each volume was finally decided during the meeting.

Finalization, distribution and monitoring and evaluation

A major revision in terms of layout was made towards the camera-ready copy of the 3-volume publication. Repackaging of additional papers and incorporating of comments from partner institutions were carried out during this period.

Promotional efforts were undertaken through fliers, website announcements, e-groups and newsletters, and displays in workshops and conferences. Feedback on use was monitored by UPWARD.

The product, first released in 2003, is a 675-page, 3-volume publication packaged in a simple but attractive box. It consists of 75 articles featuring experiences from 33 developing countries written in non-technical language, with simple layout and accompanying cartoon illustrations. The first volume addresses concepts in conservation; the second volume covers field-tested practices in conservation and the 3rd volume tackles issues in creating an enabling environment for conservation.

A downloadable, on-line version of the sourcebook was made available through the UPWARD website (<http://www.eseap.cipotato.org/UPWARD/Abstract/Agrobio-sourcebook.htm>), including hyperlinks from the website of collaborating organizations. A CD-ROM compilation of the PDF files was likewise prepared and sent to IDRC and GTZ. Individual articles or combinations of articles can be chosen for downloading to suit their specific needs.

To partially defray printing costs, the 3-volume set is sold at US\$15. Complimentary copies have been distributed to individuals and organizations in developing countries.

In response to demand from non-English speaking readers in Latin America and Africa, A Spanish edition was released in mid-2004 while a French edition is in press.

Initial information on the distribution of copies of the English version is shown in Table 2. Most of the copies were distributed by UPWARD in Asia and the Pacific and some were distributed in other regions. These copies were distributed to contributors, advisory committee members, libraries, resource centers, academe, universities, people and

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organizations working on agricultural biodiversity and conservation either as complimentary copies or sold at discounted price. No systematic gathering of data has been done on the distribution of partner organizations like IDRC, GTZ, SEARICE and IPGRI to date.

Some of the recommendations for improving upon similar activities are the following: 1) ensuring balanced contributions from developing and developed countries; 2) keeping the composition of advisory committee members to an optimum number between 6-8 to provide diverse perspectives; 3) preliminary screening of contributions prior to the writeshop process; and 4) pro-active monitoring of publication usage.

Table 2. Sourcebook distribution profiles of the English version.

Partner Organizations	No. of allocation per partner institution	No. of copies distributed, given and sold	Region of distribution	No. of countries
UPWARD	1300	407	Asia Pacific	14
			Europe	8
			Africa	4
			Latin America	4
			North America	2
			Middle East	1
IDRC	200	not available		
GTZ	200	not available		
SEARICE	200	not available		
IPGRI	100	not available		

DISCUSSION ON SOURCEBOOK USE

The multiple usage of the sourcebook by different individuals and organizations from different places shows its relevance in the promotion of agricultural biodiversity conservation and use. Some examples of the sourcebook's wide and diverse uses to date are the following:

- The sourcebook was mainly used as primary source of teaching materials for local and international training. InWent from Germany bought 100 copies of the sourcebook which will be used as primary teaching material for its Annual International Course on Agrobiodiversity and Poverty Alleviation. This course is conducted in English to 25 trainees worldwide. This sourcebook was also used in several farmers' training and trainers' training conducted in different countries like Zimbabwe and India.
- The sourcebook was also used as teaching materials for graduate students in several agricultural colleges and universities in China, India, Zimbabwe and Netherlands. Three chapters of the sourcebook were used as part of the core reading materials of MA and PhD students of Rural and Development Studies in China Agricultural University (CAU), Beijing, China. A course reader on Community-based Natural Resource Management was produced using several articles from the sourcebook.
- Several articles were included in FAO Links Project's training manual entitled "Building on Gender, Agrobiodiversity and Local Knowledge both in hard copy and CD-ROM (forthcoming) as reading materials.
- Used to produce promotional materials, e.g. Booklet in Marathi "*jaivik vivihata*" for teachers and students for environmental orientation to school education. This is a project of the Ministry of Human Resources Development of the Government of India targeting approximately 500 recipients.

- It has been distributed in meetings and conferences to promote agricultural biodiversity concerns and issues, e.g. World Social Forum, India; Farmers' Technical Conference, Vietnam; and International Farmers' Technical Conference, Malaysia. These meetings have been attended by NGO workers, researchers and farmers from different parts of the world.
- Other uses include: individual articles in newsletters (e.g. Soil Fertility Newsletter); individual articles uploaded in websites (e.g. Ecoagriculture); proposal preparation (SADC and IDRC) and writing papers for publications and conferences.
- It has been distributed to different libraries and resource centers worldwide. However, no systematic follow-up has been made regarding use.
- This project has been nominated by CIP for the 2004 CGIAR Science Award for Outstanding Communications.

The project has also evolved an approach for participatory sourcebook development. This approach has been used as guide in similar efforts such as the following

- 1) Development of a 3-volume sourcebook on Participatory Research and Development for Sustainable Agriculture and Natural Resource Management. This just came out of the press and was published by UPWARD and IDRC.
- 2) Development of sourcebook in Integrated Crop Management (ongoing) also a project of UPWARD.
- 3) Development of a publication on Community-based Natural Resource Management (CBNRM) by project partners of IDRC in Asia.
- 4) Development of a sourcebook on Enhancing the Poor's Access to Land and Common Property Resources (working title) produced by the Asian NGO Coalition.

CONCLUSION

This sourcebook project provides an excellent example of a participatory collaborative process of repackaging complex information to make this readily accessible in a useful format to a wider non-technical audience. This unique initiative has successfully:

1. Tapped the global pool of scientific knowledge in offering practical, field-tested concepts and methods to development workers involved in local conservation activities.
2. Facilitated a collective effort among a wide range of institutional partners which includes the CGIAR centers, donors, NGOs and community-based organizations in mobilizing resources and expertise toward greater utilization of research outputs.
3. Developed an innovative product that combined the: a) technical expertise of researchers in critically reviewing available research-generated information, b) creative abilities of communication professionals in designing a user-friendly sourcebook, and c) continuous feedback from its target readers.

The initial information on usage of the sourcebook as primary teaching material in trainings (local and international) and graduate courses, and as references to write papers for conferences, publication and project proposals on agricultural biodiversity shows the multiple uses of this publication. However, there is still a continuing challenge of monitoring utilization of the sourcebook and evaluating long-term impact on practice of agricultural biodiversity conservation and use at the field level.

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