

Kommunikation und Beratung

Sozialwissenschaftliche Schriften zur
Landnutzung und ländlichen Entwicklung

80

Herausgegeben von Hermann Boland, Volker Hoffmann und Uwe Jens Nagel

Selection of Tropical Forages:

**Development and Implementation of a
Participatory Procedure and Main Results from
Honduras, Nicaragua and Costa Rica**

Luis Alfredo Hernández Romero



Bundesministerium für
wirtschaftliche Zusammenarbeit
und Entwicklung



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Bibliographic information published by „Die Deutsche Bibliothek“

Die Deutsche Bibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data is available in the Internet at <http://dnb.ddb.de>.

Typesetting and Layout

Luis Alfredo Hernández Romero

Graphics

Luis Alfredo Hernández Romero

Printing and Binding

f.u.t. müllerbader gmbh, Filderstadt

© **Margraf Publishers GmbH, Scientific books, 2007**

Kanalstraße 21; D-97990 Weikersheim

www.margraf-publishers.com; info@margraf-publishers.com

ISBN 978-3-8236-1512-5

D 100

ISSN 0947-0352



MARGRAF PUBLISHERS

Preface of the Editors

This book documents a fruitful co-operation between the International Center for Tropical Agriculture (CIAT), Colombia and the University of Hohenheim in Germany, focused on methods of participatory research. But in one way this book is different from the precursory research reports – which only applied participatory methods to get better results – as it deals mainly with the development and presentation of a full research methodology for varietal selection. The results about appropriateness of forage varieties regarding climates, purposes and target groups in this report are only a byproduct of the method development through action research, and prove that the methodology enables to create useful findings.

The difference from a usual handbook is the description of the development process that leads to the selection and adaptation of tools and the methodological setup, and to recommendations. The author shows, how longstanding interdisciplinary research, with participation of farmers, in three countries of Central America enables to upscale the methodological experiences gained.

Maybe professionals of participatory research do not really need this analytical framework. They might be able to develop their approach each time tailor-made, by combining existing tools and approaches, and even by creating new tools and methods. But how many agronomists and agricultural researchers - like in this case forage specialists and plant breeders – are professionals of participatory research? With this book, they get a clear guideline, and following the approach recommended, have best chances to get appropriate results. Based on the book, they might experiment with elements of this framework and gradually be enabled to do their research and development work more self-determined and with a next higher level of flexibility.

But novices need clear instructions on their way of experience that ends at an expert level, where the expert can do everything guided by internalized experience that is intuitive. And experts in this sense need no more to read method handbooks. Luis Alfredo Hernández shares his experience, developed and tested in three different countries, and offers it to colleagues, being agronomic researchers, plant specialists or plant breeders. And being one of them, helps him to apply the right vocabulary and to make the methods and tools of his analytical framework transparent and understandable. And he carefully avoids the temptation to write prescriptions, which would make a complex task too simple.

Maybe there are “more ways to get to Rome” as indicated in this book, but if you are not fully certain which one to go, take the indicated one by Luis Alfredo Hernández, and you can be sure to arrive.

We are happy to have this book in our series and offer this contribution to the debates on the why and how of farmer participatory research and participatory technology development.

For the editors, Volker Hoffmann

Preface of the Author

When I started to develop a tool for participatory varietal selection in the International Center of Tropical Agriculture (CIAT), I realized that this challenge requires farmers, research institutions, and technology designers to work together. It was convenient to integrate the different objectives of the farmers as natural breeders, the professional breeders, and national and international research programs. From the onset, I focused the study on how to co-develop a participatory model with mutual benefits for all actors involved. First of all, I had to rethink ways to arrange participatory techniques in a sequential form. Initially, all information was captured. Then, I tried to analyze mathematical techniques and understand the reasons why such a technique may be used, and what the results of the operation tell us about the data. This study extends my professional orientation towards the social sciences, from which I can draw the following lessons:

Faced with the complexity of the work with farmers, I learned how to work with them in terms of numbers of participatory evaluations, relevant information and feedback processes (farmers-researchers-farmers). Thus it took me considerable time not only to transfer farmers' knowledge into technical language but also to find a way how to enable them to evaluate new technological options.

The next lesson refers to building bridges of communication between farmers, research institutions and forage technology designers. This generated a culture of trust, participation, collective action and a norm of reciprocity. Higher levels of trust allowed farmers and researchers to learn from each other, share information and enjoy more positive relations.

The third lesson emerged when I tried to integrate farmers' perceptions into the conventional data of breeders or germplasm developers.

I believe that the participatory selection process integrated with conventional varietal selection had an institutional impact at the end of this study. I hope that people who are reading this book also gain a better hindsight regarding participatory models for selecting any kind of technology.

Acknowledgments

At this point I would like to thank a few key people for helping me write this book. I am deeply grateful to Clair Hershey and Carlos Iglesias, former breeders with the CIAT Cassava Program in Colombia, who made it possible for me to develop a model of participatory varietal selection of cassava.

I was fortunate that the Participatory Research in Agriculture Program (IPRA) and the Forages Program at CIAT accepted my developing the participatory research model within the forage framework. Conducting this research was a challenging experience - not only from a scientific standpoint but also from a very personal perspective. It gave me the opportunity to validate and adapt participatory varietal selection in cassava to the selection of forage options. I want to thank Michael Peters who made it possible for me to carry out this research and for his invaluable assistance, ideas and support. Also a big thanks goes to my colleagues of the CIAT Forages Program, Belisario Hincapié, Luis

Horacio Franco, Gerardo Ramírez and Beatriz Arenas, who always had an open ear for me and helped me get information and write this dissertation.

Without the support of the Bundesministerium fuer Wirtschaftliche Zusammenarbeit und Entwicklung (BMZ), the CIAT Rural Innovation Institute (RII), IPRA, the System-Wide Program on Participatory Research and Gender Analysis (PRGA), and the Forages and Human Resources Development Funds (FDHR), it would not have been possible to gain experience at the University of Hohenheim. It was a great experience, and I gained plenty of knowledge that improved the perspective of this PhD study. The encouragement provided by representatives of these institutions is deeply appreciated.

Undoubtedly, one the most important experiences came from farmers' communities in different contexts of Latin America that helped bridge social networks among their ecosystems and research institutions in different countries.

In Germany, I wish to thank my professors Drs. Volker Hoffmann, Rainer Schultze-Kraft, and Werner Doppler at the University of Hohenheim and for their training modules, which were extremely helpful to familiarize myself with other topics of participatory research. The support, orientation and a temporary office within the Department of Agricultural Communication and Extension, offered to me by Dr. Maria Gerster, is gratefully acknowledged. Many thanks to Professors Volker Hoffmann and Rainer Schultze-Kraft, as well as to my friends Stefan Canz and Guy-Erick Akouègnon for their contributions to an earlier draft of my thesis.

And finally, I would like to thank my children Jonathan and Michael and my wife Amelia for having supported me throughout this challenge.

Luis Alfredo Hernández Romero, Cali, Colombia, September 2007

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List of acronyms and abbreviations

ARI	Advanced research institution
BMZ	Bundesministerium für Wirtschaftliche Zusammenarbeit und Entwicklung
CFA	Correspondence factorial analysis
CGIAR	Consultative Group on International Agricultural Research
CIAL	Comité de Investigación Agrícola Local
CIAT	Centro Internacional de Agricultura Tropical, Colombia
cv.	Cultivar
DfID	Department for International Development, UK
DICTA	Dirección de Ciencia y Tecnología Agropecuaria, Honduras

DIM	Dimension (indicator of the association in the data)
DM	Dry matter
ECOTRÓPICA	Ecosistemas tropicales fundación Costa Rica
FA	Factor analysis
FDHR	Forages and Human Resources Funds
FSH	Forages for Smallholders Project (CIAT)
INTA	Instituto Nicaragüense de Tecnología Agropecuaria
IPRA	Participatory Research in Agriculture, CIAT
LAC	Latin America and the Caribbean
LR	Logistic regression
MAG	Ministerio de Agricultura y Ganadería, Costa Rica
M&E	Monitoring and evaluation
m ²	Square meters
masl	Meters above sea level
mmt	Millions of metric tons
NGO	Nongovernmental organization
NARI	National agricultural research institution (Honduras, Nicaragua, Costa Rica)
MAGFOR	Ministerio Agropecuario y Forestal, Nicaragua
NAS	National Academy of Sciences
ODI	Overseas Development Institute, UK
PC	Principal component
PCA	Principal component analysis
PPB	Participatory plant breeding
PM&E	Participatory monitoring and evaluation
PR	Participatory research
PRGA	Systemwide Program on Participatory Research and Gender Analysis, HQ at CIAT
PRODESSA	Proyecto de Desarrollo de San Dionisio, Nicaragua
PVS	Participatory variety selection
R&D	Research and development
RII	Rural Innovation Institute, CIAT
SAS	Statistical Analysis System
SEA	Southeast Asia
SERTEDESO	Servicios Técnicos para el Desarrollo Sostenible, Honduras
SL	Sustainable livelihoods
SPSS	Statistical Package for the Social Sciences
SSA	Sub-Saharan Africa
SSD	Statistically significant difference
UNDP	United Nations Development Programme