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Experiences of smallholder farmers in the Eastern Region of Paraguay



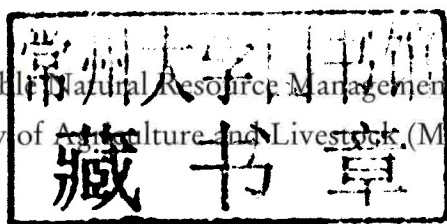
Integrated Crop Management Vol. 18-2013

Forest Management and Conservation Agriculture

*Experiences of smallholder farmers in the
Eastern Region of Paraguay*

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**PLANT PRODUCTION AND PROTECTION DIVISION
FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
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FOREWORD

This publication is a summary of the experiences lived during the seven years (2003-2010) of implementation of the Sustainable Natural Resource Management Project (PMRN), managed by the Ministry of Agriculture and Livestock (MAG) and supported by German Technical and Financial Cooperation (GIZ and KfW).

The PMRN operated in seven Departments in the Eastern Region of Paraguay, attending some 17 000 smallholder families in aspects related to the recuperation and management of degraded soils and the production and management of forestry systems. The Project was implemented under various modalities of technical assistance, described in this document, which determined the success of the execution of the measures being promoted, both in the activities related to soil as well as forestry.

The implementation of this Project and the active participation of the technicians in their day-to-day contact with the farmers, contributed to the confirmation of the obsolescence of the actual production systems. The introduction of Conservation Agriculture as a production concept for the smallholder farmer, changed to a large extent the dynamic of the farms attended. This resulted in good yields both for home-consumption and commercial crops, a reduction in the costs of production, the generation of higher incomes, an improvement in family diet, and lastly the firm establishment of smallholder families.

This book benefited from the active participation and collaboration of the Project and MAG for the elaboration of the contents and many of the aspects mentioned are the result of a workshop held in 2010. This had the aim of compiling the experiences accumulated in the different areas of action of the aforementioned technical staff, and to shape them in this document. In this way it can serve as a legacy for future generations of extensionists dedicated to the difficult, but at the same time agreeable and satisfying, job of rural extension.

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The authors of the original, Paul Borsy, Rafael Gadea and Esteban Vera Sosa make the following statement:

To save space and make for more fluid reading we have not differentiated between the genders. So that instead of “he/she” we have opted for the masculine as the classical generic term on the understanding that all references to that gender always represent both men and women. We emphasize the importance of not using language that discriminates between men and women.

ACRONYMS AND ABBREVIATIONS

AGEC-ECO	German Consultants
AZPA	Paraguayan Sugar Company
BCP	Paraguayan Central Bank
BNF	National Development Bank
CA	Conservation Agriculture
CAH	Agricultural credit for equipment
CECOPROA	Marketing centre for associated producers
CGR	Comptroller General of the Paraguayan Republic
CIF	Forestry degree course
cm	centimetre
CODIPSA	Company for the development and industrialization primary products
COVEPA	Smallholder farmers neighbourhood cooperation
COVESAP	Neighbourhood cooperation of San Pedro
DAP	Draught animal powered
DBH	Tree diameter at breast height
DEAg	Directorate of Agricultural Extension
DIA	Directorate of Agricultural Research
DINCAP	National Directorate for Administration and Coordination of Projects
EU	European Union
FCA	Faculty of Agrarian Science
FDC	Smallholder Development Fund
Gs	Guaraníes (4600 = US\$1.00)
GIZ	Deutsche Gessellschaft für Internationale Zusammenarbeit
GM	Green manure
GMCC	Green manure cover crop
hp	Horse power
IASA	Industrial Oils SA
IDB	Inter-American Development Bank
IICA	Inter-American Institute for agricultural Cooperation
IMAGRO	Agricultural income tax
IMO	International Mennonite Organization
INDERT	National Institute for Agricultural and Land Development
INFONA	National Forestry Institute
IPTA	Paraguayan Institute for Agricultural Technology
IRPC	Small contributors' income tax
IVA	Value added tax
KfW	Kreditanstalt für Wiederaufbau
l	litre

m	metre
m ³ AP	Alto Paraná cubic meter. A local measure of the volume of timber logs
MAG	Ministry of Agriculture and Livestock
MH	Ministry of Finance
MIC	Ministry of Trade and Industry
NT	No-till, direct seeding
PES	Payment for environmental services
PBG	Good Government Programme
PMRN	Sustainable Natural Resource Management Project
PRNT	Relative neutralizing capacity (of lime)
PRODESAL	Programme of assistance for the development of smallholder cotton producers
PRONAF	National programme of family farm support
REDD	Reducing Emissions from Deforestation and Forest Degradation
REDIEX	Network of investment and export
RUC	Unique taxpayers register number
SEAM	Environment secretariat
SENAVE	National service of seed quality and health
SIGEST	Integrated management system for agricultural and rural development
TA	Technical assistance
TRNP	Total relative neutralizing power
UNA	National University Asunción
US\$	US dollars
UTI	Territorial unit of intervention
UTT	Outsourced technical extension units



SUMMARY

This book is a richly detailed account of a forestry, agroforestry and Conservation Agriculture (CA) project for smallholder farmers in eastern Paraguay. Initiated in 2003 it now supports some 17 000 smallholder farm families. The project channels financial resources to farmers organized in committees to enable them to acquire inputs (including machinery) for CA, native forest management, reforestation and agroforestry as a means of diversification, long-term income and natural resource conservation. Implementation has not been without some teething problems and these are examined in detail in order to avoid or minimize them in future, similar projects.

Farmers were organized into associations, or committees, in order to better plan, receive technical assistance and financial incentives, gain access to credit, and buy and sell inputs and farm products on advantageous terms. The basic concept was to consider the farmer as a business person and to smooth the path from individual production towards the formation of profitable strategic alliances.

The CA practices promoted, (and adopted) include the selection and performance of green manure cover crops (GMCCs). Both research station results and many on-farm case studies show the value of leguminous and other GMCCs in weed control and yield increases. Details are given of their performance, management, advantages and disadvantages. The use of tools and machinery has contributed greatly to the development of family agriculture. Implements adopted include: subsoilers, knife rollers, lime-spreaders, direct planters. Other inputs include lime, fertilizers and herbicides. Mono-cropping is one of the main reasons for disease build up in smallholder farms and rotations are a basic pillar of CA. The rotations established by the project are based on maize production and crops that farmers consider to be their important cash crops; these are associated with summer and winter GMCCs. Finally, some farmers' committees asked for orientation on organic CA and so this aspect was included in the technical assistance package.

The association of animal production with CA crop production is an interesting proposition for the family farm as a source of both improved family nutrition and income earning potential. The synergies between CA production with animal feeding is discussed as is the integration of small livestock and cattle into the farming system.

Forestry and agroforestry are major components of the project and the establishment of nurseries as a business is dealt with in detail. Nurseries then allow degraded (and other) land to be reforested and existing forests to be rehabilitated. Species selection, sites and spacings are all examined as is the management of the forest (pruning and thinning). Native forest

management requires sustainable extraction to maximize income and ensure future exploitation. Agroforestry is considered to be a fundamental part of the integrated process of conservation and improvement of the soil. Different systems are considered, including: agro-fruit forestry; agro-silvo-pastoral; wind-breaks and living fences. Forest products are described and assessed, starting with firewood and charcoal through to timber logs and sawing. There are also non-timber forest products such as medicinal plants, honey, fruits and animal protein and the raw materials for organic phyto-sanitary products. Ecotourism also becomes a possibility with well managed forests in attractive locations.

Of very high importance are the economic, social and ecological impacts of the project components and these are given high priority with analyses of the impacts on yield and labour, adoption, diversification, farmers' perceptions, adaptation and innovation, impact on family income and on the environment. Throughout, the story is enriched by detailed case studies of real farmers' situations.

The final two chapters of the book deal with the lessons learnt and the factors contributing to success or failure. During the execution of the project several difficulties arose and were dealt with. These were a mix of political, administrative, technical and organizational factors. By dealing openly with these questions the authors hope to raise awareness of the importance of the work and its political, social and economic impacts. At the same time the experiences and challenges and how they were dealt with should be useful in the design, planning and execution of future projects. Success factors include: organizational consolidation; group homogeneity; management leadership; permanent technical assistance; positive on-farm results; the technology package; and the quality of the management team. Some of the negative factors include: desertion; skeptical neighbours; absence of leadership and lax operation of the committees; intermittent technical assistance; poor selection of participants, lack of effort; lack of training; erroneous beliefs about CA; poor resource management; and the creation of a dependency culture.

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