IN AFRICA

TOWARDS AN INTERACTIVE METH

EDITED BY

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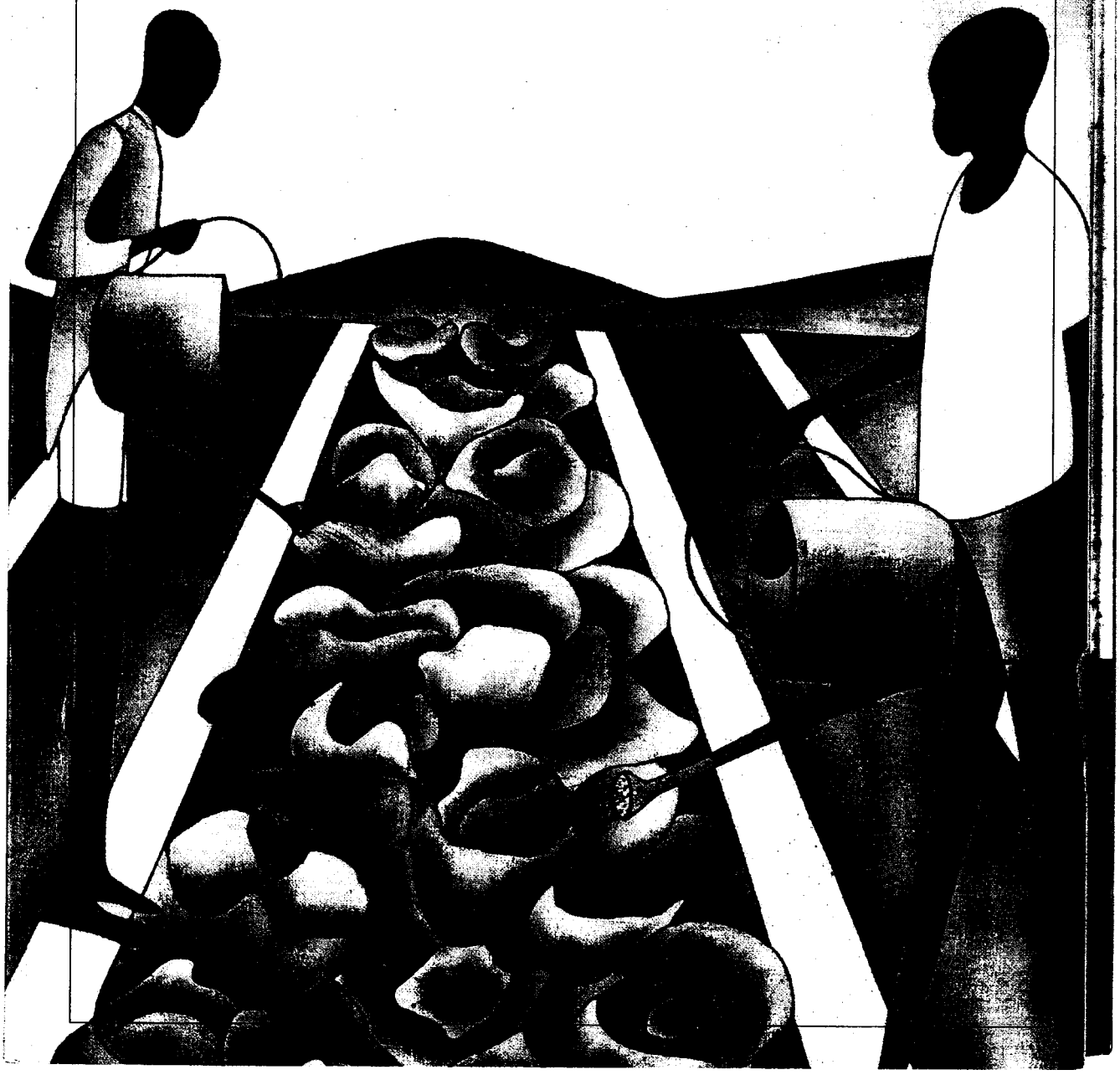

IRRIGATION DESIGN IN AFRICA

Irrigation design in Africa

Towards an interactive method

Jan Ubels and Lucas Horst (eds.)

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List of abbreviations

FAO	Food and Agriculture Organization
IHE	International Institute for Hydraulic and Environmental Engineering, The Netherlands
ISRA	Institut Sénégalais de Recherches Agronomiques, Senegal
NFIF	National Farm Irrigation Fund, Zimbabwe
PIU	Provincial Irrigation Unit, Kenya
PIV	Périmètre irrigué villageois (French, irrigated village scheme) Senegal
SAED	Société d'Aménagement et d'Exploitation des terres du Delta et des vallées du Sénégal et de la Falémé, Senegal
USAID	United States Agency for International Development
WARDA	West Africa Rice Development Association
WAU	Wageningen Agricultural University, The Netherlands

Preface

This book seeks to modify the method for designing irrigation systems. A design is not a goal in itself. Rather, it is the use that is made of a system that matters; for farmer and engineer, government and donor. Up to now, irrigation design has been the domain of engineers and been regarded as being concerned mainly, if not only, with the 'nuts and bolts' needed to build a technical system. The use made of a system is therefore not easily turned into a design consideration.

By making the design pivot on use, we would be compelled to systematically consider the social and economic factors that play a role in the use of irrigation systems. These are not easily identifiable. Farmers' objectives, the division of labour between the sexes, patterns of farmer collaboration, financial management capacities, availability of external services and inputs, market opportunites and obstacles for agricultural products, are only some of the many factors that directly influence the use made of an irrigation system. Moreover, such social and economic factors do not straightforwardly relate to technical choices. In this book an approach is proposed that allows analysis and discussion of the interrelations between socio-economic and technical factors.

Although design was taken as the starting point, the observations may also be useful to analyze the linkages between technical and social factors in operation and maintenance, in studying performance, in developing more comprehensive irrigation policies, in planning, guiding and monitoring projects and programmes.

The target group of this publication consists of field workers, policy advisors, technicians, community development workers, donor officers, consultants and implementors involved in irrigation development. The contents may interest researchers and trainers also. It aims to bridge some of the conceptual gaps faced in understanding irrigation in specific social environments.

The texts in this book are a result of the international workshop on design of sustainable farmer-managed irrigation in sub-Saharan Africa, held in Wageningen, the Netherlands, in February 1990. At its closure, eleven participants went into seclusion each seeking to draft chapters that would focus on one aspect of the use of irrigation systems. These chapters were to be based on both their own

contributions and the contributions of other participants to the workshop. The chapters were later edited for publication in this book.

The book would not have been possible without the papers written for the workshop, the discussions held and the insights gained. The authors who contributed to this book therefore owe much to all the other participants of the workshop. Originating from eight African and four European countries, they brought together a gamut of practical experiences, analyses and opinions which have laid the basis for this book. This is apparent also from the many quotations from papers written for the workshop.

We express our gratitude especially to Sylvester Povel. As the main organizer of the workshop, he has brought in his many years of experience in farmer managed irrigation development in Eastern Africa and urged the Department to link up its research insights with the daily reality of projects. Without his enormous and multi-faceted effort, this book would not have been possible.

We also thank all other people who have devoted their creativity and perseverance to the preparation of the workshop: Michael de Bont, Paul Hoogendam, Wim Kloezen, Peter Mollinga, Ton Meijers, Jaap-Jan Speelman, and Pieter van der Zaag. A special word is directed towards Joke Heynekamp for her secretarial support, precision and gentle collaboration and Maarten van Bentum for his criticism of the final draft.

Mention should also be made of senior and junior researchers of the WARDA project on water management in the Senegal valley who contributed to the lines of thinking in this book. Frans Huibers, Boubacar Fall, Ibrahima Dia and Geert Diemer merit special mention. The latter two were the first to promote the idea of an international workshop, in 1986. Because social science studies had yielded insights mainly in irrigation's impact on society, they proposed that in this workshop society's impact on irrigation was be studied and that the lead to be taken by engineers. Diemer also helped us edit and produce the book.

Many other people have in one way or the other contributed to the workshop and the book. The most important ones are the farmers, fieldworkers and engineers, whose daily work and experiences are the source and subject of each and every paragraph of this book.

Through this book we hope to contribute to the art of designing sustainable irrigation by bridging some gaps between engineering idiom, farmer language and socio-economic concepts.

October 1992,
Wageningen

Lucas Horst
Jan Ubels

CHAPTER 1

Tuning irrigation systems to their social environment

Towards an improved design method

SUSAN MINAE AND JAN UBELS

1.1 Introduction

Nowadays, the implementation and management of most irrigation schemes in Africa routinely involve socio-economic components. The design of the technical provisions however is still regarded as the monodisciplinary domain of the engineer. Socio-economic components have not yet fully entered the methods and concepts that engineers bring to the design job. Their conceptual tool kit has remained much the same over the past two decades. In many of the schemes studied in this book, for instance, no comprehensive methods or concepts were applied that assured the mutual adjustment of technical shape and social environment. Socio-economic data were used, but only to set boundaries for a design process which centered around technical considerations.

This book is an attempt at contributing to a perspective that allows that adjustment: essentially a change in thinking about what design is about. The focus is shifted from the physical system to the use that is made of it. The primordial criterion for a water distribution system, for example, is not whether the hydraulic characteristics of the canal network are technically optimal in view of the water requirements and the water resources. The crucial issue is whether the water distribution system fits the organizational capacities and patterns of the users in terms of communication and group decision-making. Only in that case the technical optimum becomes an issue.

In this introductory chapter we sometimes give a description of conventional design method that some may find inaccurate and perhaps even a bit caricatural. The aim is to show that technical engineering idiom and reasoning still dominate the design process even when social and economic information is collected.

Comparison of modern and farmer-managed irrigation development in Africa suggests a close link between the physical system and social environment. Features of the physical system seem to influence the social patterns arising around it while, turned around, characteristics of local society appear to determine the shape of the system and the use that is made of it (Gray 1963. Fleuret 1985, Diemer and van der Laan 1987, Horst 1989, Diemer and Ubels 1991). This