



THE WORLD BANK

A COLLABORATIVE PROGRAM OF AFDB,
FAO, IFAD, IWMI, AND THE WORLD BANK

Investment in Agricultural Water for Poverty Reduction and Economic Growth in Sub-Saharan Africa

Synthesis Report



**A COLLABORATIVE PROGRAM OF AFDB, FAO,
IFAD, IWMI, AND THE WORLD BANK**

Investment in Agricultural Water for Poverty Reduction and Economic Growth in Sub-Saharan Africa

Synthesis Report



THE WORLD BANK
Washington, DC

Contents

<i>Foreword</i>		ix
<i>Acknowledgements</i>		xiii
<i>Acronyms and Abbreviations</i>		xv
<i>Glossary</i>		xvii
<i>Executive Summary</i>		xxi
Chapter 1	Rural Poverty and Agricultural Water Development in Sub-Saharan Africa	1
	1.1 The Millennium Development Goals, Agricultural Growth, and Rural Poverty	1
	1.2 Agricultural Water, Growth, and Farming Systems	4
	1.3 Agricultural Water: The Global Picture and Sub-Saharan Africa	6
Chapter 2	Profile of Agricultural Water Development	9
	2.1 Agricultural Water Management Typology	9
	2.2 Agricultural Water Development Characteristics	11
	2.3 Water Managed Crops and Productivity	15

Chapter 3	Investment Performance and Development Impact	27
	3.1 Performance of Irrigation Projects	27
	3.2 Are Irrigation Investment Costs Higher than Elsewhere?	34
	3.3 Experience of Design and Implementation	36
	3.4 Performance of In-Field Rainwater Management for Dryland Crops	39
	3.5 Agricultural Water Projects and Poverty Reduction	41
	3.6 Environmental and Health Aspects of Agricultural Water Projects	48
Chapter 4	The Changing Institutional Context	53
	4.1 Transboundary Water	53
	4.2 Strategic Planning and Agricultural Water	55
	4.3 Policy Reforms and Agricultural Water Development Strategies	58
	4.4 Role of the Public and Private Sectors in Agricultural Water	65
	4.5 Sector-Wide Approaches	67
	4.6 Decentralized Development	70
	4.7 Management of Publicly-Financed Irrigation Schemes	71
Chapter 5	Development Potential, Market Demand, and Investment Opportunities	77
	5.1 Physical Potential for Agricultural Water Development	77
	5.2 Current Region-Wide Development Proposals	82
	5.3 Market Demand and Economics of Investment	83
	5.4 Possible Investment Opportunities	88
	5.5 Choices Facing Governments at the Country Level	92
Chapter 6	Lessons and Recommendations for Engagement in Agricultural Water	95
	6.1 Farm-Level Profitability, Viability, and Sustainability	95
	6.2 Opportunities for Further Public and Private Investment	96

6.3 Designing and Implementing Better Investment Projects	99
6.4 Institutional Reforms	104
6.5 Strategic Vision	107
<i>References</i>	111
<i>Maps</i>	119
<i>Summary Tables</i>	125
<i>Annexes</i>	147

Boxes

2.1 In Mali, Irrigated Rice with Higher Value Cash Crops and Irrigated Rice Monoculture are Expected to be Profitable	21
2.2 Improving In-Field Rainwater Management in the Semi-Arid Areas of Niger	23
2.3 Horticultural Growth and the Poor in Kenya	24
3.1 The Failure of Public Large-Scale Irrigation Schemes in Nigeria	32
3.2 Successful Public Large-Scale Irrigation in Mali: The Office du Niger	33
3.3 Irrigation Considerably Enhances Farm Incomes, Livelihoods, and Employment Opportunities at Irrigation Schemes in Tanzania and Zimbabwe	45
3.4 Women and Treadle Pumps for Fruit and Vegetable Production in Tanzania	48
3.5 In Nigeria Large-Scale Irrigation, National Procedures Are Not Adequate to Protect the Environment or Reduce Social Harms	50
3.6 Engineering Schistosomiasis Control into Irrigation	51
4.1 Kenya Begins Cooperation with Lake Victoria Riparians on Environmental Issues	54
4.2 Recent Irrigation Strategies are In Line with a Market-Driven Approach	57
4.3 Reforms Under the Agriculture Sector Development Strategy, Tanzania	59
4.4 Supporting Policy Reform in Tanzania	60
4.5 Farmer Empowerment through Farmer Field Schools in Kenya	62

4.6	Win-Win Partnerships for Market Links in Zambia, Zimbabwe, and Niger	63
4.7	Kenya Needs IWRM to Manage Irrigation Expansion	64
4.8	Public Private Partnerships in Agricultural Water	68
4.9	Decentralized Agricultural Water Development without Empowerment	71
4.10	Swaziland's Innovative Approach to Water Service Provision and Cost Recovery	73
4.11	Examples of Poorly Handled Transfer of Irrigation Management	74
4.12	Examples of Successful Irrigation Management Transfer	76
5.1	Run-of-the-River Improvements Are Not Enough for Rice Development in Tanzania	79
5.2	Competing Demands for Water in Tanzania	80
5.3	Why Economic Viability Is Imperative for Agricultural Water Investments	86
5.4	Taking Account of Livestock in Agricultural Water Investments	88

Figures

1.1	Sub-Saharan Africa is the Poorest Region in the World	2
1.2	Population Growth in Sub-Saharan Africa Has Exceeded the Growth of Both Overall and Agricultural GDP so that the Population Has Become Poorer	2
1.3	Area Expansion Has Been the Biggest Source of Agricultural Growth by Far in Sub-Saharan Africa	3
1.4	Sub-Saharan Africa Has a Far Lower Share of Its Arable Land Under Irrigation than Other Regions	6
1.5	World Bank Lending for Irrigation and Drainage in Sub-Saharan Africa Is Only One-Half of Levels 20 Years Ago	7
2.1	Agricultural Water Management Typology	10
2.2	Water Managed Area by Type ('000 hectares)	13
2.3	Paddy Yield in Madagascar, Mali, and Indonesia	18
5.1	Irrigation Potential in Sub-Saharan Africa	78
5.2	Breakdown of Dams by Geographical Zone	81

Tables

2.1	Area in Sub-Saharan Africa under Agricultural Water Management by Type	12
2.2	Harvested Irrigated Crop Area in Sub-Saharan Africa ('000 ha)	16
2.3	Percentage of Total Irrigated Production (2005 figures)	17
2.4	Paddy Yields in Sub-Saharan Africa, South Asia, and East Asia (kg/ha)	17
2.5	Madagascar: Effect of Water Management on Paddy Yields (kg/ha)	19
2.6	Madagascar: Regional Comparison of Irrigated Paddy Yields	19
2.7	Returns to Irrigated Rice Production in Sierra Leone	20
3.1	Rates of Return on Externally-Financed Irrigation Projects in Sub-Saharan Africa, 1970–1999	28
3.2	Comparison of Selected Projects at Completion and Subsequent History	29
3.3	Average Unit Cost of 'Successful' Projects 1970–1999 (constant 2000 terms)	35
4.1	Investment and Working Capital Requirements for Intensive Irrigated Production in Kenya	61
5.1	CAADP Program for Investment in Agricultural Water to 2030	82
5.2	Projected Regional Net Trade in Cereals in 2030 (tonnes)	84
5.3	Projected Water-Managed Production in 2030 ('000 tonnes)	85
5.4	Indicative Summary of Opportunities to Invest in Agricultural Water Development	90

Although the world as a whole is roughly on track to reach the MDG targets, Sub-Saharan Africa is unlikely on present trends to do so. If nothing changes, the absolute numbers of poor in the region will continue to increase and by 2015 close to one-half of the world's poor will live in Sub-Saharan Africa.

It is generally recognized that agricultural water could make a substantial contribution to poverty reduction and economic growth. Yet, there has been less agricultural water development to date in Sub-Saharan Africa than in any other region.

This report summarizes past experience of agricultural water investment in Sub-Saharan Africa. The report analyses the contribution to date of agricultural water management to poverty reduction and growth in the region, the reasons for its slow expansion and apparently poor track record, as well as the ways in which increased investment in agricultural water management could make a sustainable contribution to further poverty reduction and growth.

