Rogate R. Mshana/Otfried Ischebeck (eds.)

SUSTAINABLE DEVELOPMENT THROUGH RENEWABLE ENERGIES IN TANZANIA

CONTENTS

	P	Page
Preface		1
Contents		3
Foreword		7
mental Needs, Ed	relopment in Tanzania – Environ- conomic Conditions, Political Per he Engagement of Churches and	-
Hon. Frederick. T. Sumaye, MP, Prime Minister of the United Republic of Tanzania	Speech at the Official Opening of the Seminar	17
Rogate R. Mshana	Sustainable Development through Renewable Energies and Engagement of Churches / NGOs	27
Bernard J. Kasimila	Deforestation and Afforestation in Tanzania	35
Florence K. Ghamunga	Household Budget and Energy Budget of Rural Families in Tanzania	49
Ibrahim M. Kaduma and Soren V. Kaale	Experiences with Savings and Credit Schemes in Tanzania	59
Riyaz Haider	Studies and Programmes on Renewable Energies in Tanzania by the Government and NGOs	79
Arved von Breitenstein	Perspectives for Renewable Energies in Europe and Eastern Africa	87

CONTENTS

4

Part 2 : Field Studies on Experiences with Renewable Energies in Tanzania and in other African Countries

Introduction		97
Stephen E. Kitutu, Florence.K. Ghamunga and Noel R. Mollel	Field Evaluation on Renewable Energy in Tanzania	99
Anna Ingwe and Gertrud Kreuter	Biogas Plants and Solar Systems in the Vicinity of Dodoma	113
Massimo Serventi and Claudio Finizio	Wind Pumps in Kongwa District (Dodoma Region)	117
Soressa Ergena and Tadelle Deressa	Programmes and Experiences of EEMCY Renewable Energy Promotion in Ethiopia	123
Gerhard Mellinghoff	Report on Renewable Energies in Ghana	131

Part 3 : Small Rural Enterprises and Local Utilities for Lighting and Electricity

Introduction		147
Bernard Osawa	Dissemination and Experiences with Photovoltaic Systems in East Africa	153
Arved von Breitenstein	'Enterprises of Trust' – Sustainable Development through Renewable Energies in Local Utilities in Rural Areas	165
Thomas Mfugale	'Enterprise of Trust Electricity Distribution Service at Lupembe' (Mbeya Region)	179
Hande Mwanjela and Stefan Dräger	Introduction and Dissemination of Solar Lamps in the West Usambara Mountains - An Analysis of Market Potential and Frame Con- ditions	185
Olivier Augustin	The Ndolage Mini Hydro Power Project (Kagera Region)	203

Part 4: Dissemination of Biogas Plants, Improved Cooking Stoves and Solar Thermal Systems for the Safeguard of Trees and Forests

Introduction		211
Ghamunga Sudi and Harold Z. Ngowi	Experiences with the National Biogas Programme in Tanzania (1975–1997)	213
Justine Uiso and Charles Madelemo	MIGESADO: Dodoma Biogas and Alternative Energy Project - Activities and Experiences	227
Mary E. Laiser and Mary Bura	Comparative Study of Improved Cooking Stoves and Solar Cookers at Boay (Arusha Region)	233
Amon Kinyunyu and Geoffrey S. Mwiki	Experience with Production and Dissemination of Solar Cookers at Mpwapwa (Dodoma Region)	243
Otfried Ischebeck	Solar Thermal Energy for the Safe- guard of Wood Fuel and/or Imported Fuels	251
Stephen E. Kitutu	The 'Sunfire' Solar Collector Cooker at the Karatu Lutheran Centre (Arusha Region)	265

Part 5: Application of Renewable Energies in Dispensaries and Hospitals

Introduction		271
Y.K. Mkwizu and Thomas Ahnert	Experiences on Renewable Energy in Tanzanian Health Care Facilities	274
Stephen E. Kitutu and Otfried Ischebeck	Renewable Energies for Energy and Water Supply of a Hospital - The Case of Iambi Hospital (Singida Re- gion)	279
Hans Gilly	Renewable Energies for Wasso Hospital (Arusha Region)	301

6

Closing Speech by Hon. Bishop P. Mwamasika		309
Appendix		
Appendix 1	Climate Data in Tanzania: Solar Radiation, Temperature, Wind Speed, and Rain Fall	315
Appendix 2	Statistical Data on Deforestation in African Countries	326
Appendix 3	Symbols and Units; Abbreviations and Acronyms	329
Appendix 4	The Authors	333
Appendix 5	Participants of the Seminar: Sustainable Development through Renew- able Energies in Tanzania	337
Annendir 6	Literature	341