FAO&Climate Change

The Food and Agriculture Organization (FAO) was founded in 1945 with the mandate to raise levels of nutrition and standards of living, to improve agricultural productivity and to better the condition of rural populations.

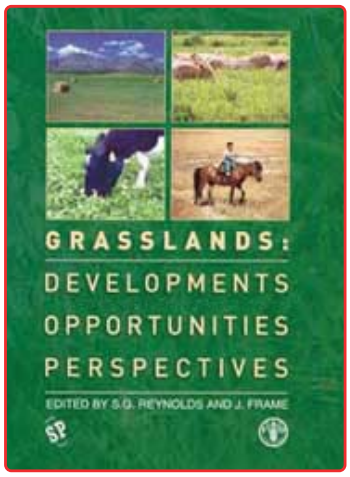
FAO contributes to international efforts to deal with climate change by assessing the available scientific evidence, participating in observing and monitoring systems, collecting unique global datasets and providing a neutral forum for negotiations and technical discussions on climate change and agriculture, forestry and fisheries. The Organization collects and analyses data and information in agriculture, forestry, fisheries, and land and water management at the regional and global levels; provides methods, models, concepts and definitions; and provides capacity building on climate change adaptation and mitigation issues.

Interdepartmental Working Group on Climate Change

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

FAO climate change publications

AGRICULTURE

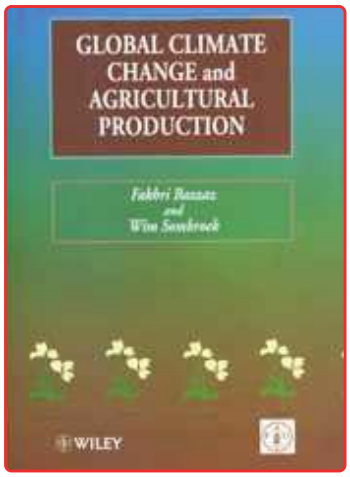


ISBN 92-5-105042-2

Grasslands: Developments Opportunities Perspectives. Rising atmospheric CO_2 and global climate change: responses and management implications for grazing lands (2005)

This book looks at significant current grassland problems and issues, and provides an insight into grassland productivity in diverse areas of the world, with their various production systems. There is a focus on recent technical advances and the prospects for further innovation, through twenty-one chapters by eminent grassland scientists, grouped into seven sections - forage germplasm; forage conservation; grass-based systems and organic production; climate change, biodiversity and biotechnology; geographical information systems; farmer and pastoralist participation; and regional developments. The book is timely in view of the expanding human and livestock populations, especially in arid and semi-arid environments, with the consequent pressure on the world's grasslands. Researchers, lecturers and students in grassland science and its associated disciplines will find the texts and references a valuable resource in their work. Land use advisers and policy-makers should find stimulus for new ideas in the debate on the future role of grasslands in feeding the Earth's population.

www.fao.org/ag/AGP/AGPC/doc/climate/morgan/intro.htm

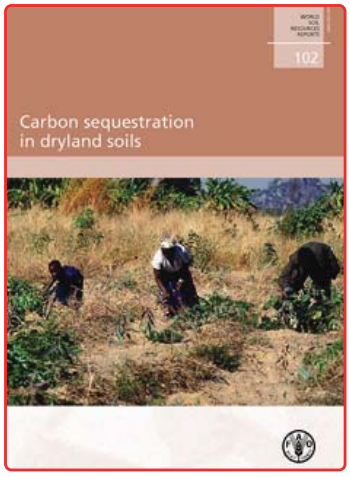


ISBN 92-5-103987-9

Global climate change and agricultural production (1996)

In its second Assessment Report (December 1995) the Intergovernmental Panel on Climate Change (IPCC), established by the World Meteorological Organization and the United Nations Environment Programme, concluded that 'the balance of evidence suggests a discernible human influence on global climate'. A change in climatic conditions will affect agricultural production systems the world over. Until now, the projections of the Food and Agriculture Organization of the United Nations (FAO) on the state of agriculture in the forthcoming decades, such as Agriculture: Towards 2010 (FAO and John Wiley, 1995) have not included the potential effects of any anthropogenic climate change at global and regional levels. Instead, they concentrated on the expected increase in human populations, their basic needs and aspirations for increased well-being, and the associated demands on natural resources, especially land and water resources, to provide them with the necessary food, fibre, animal feed, forest products and living space.

www.fao.org/docrep/w5183e/w5183e00.htm



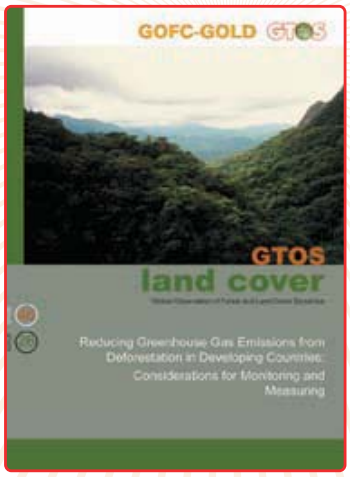
ISBN 92-5-105230-1

World soil resources reports 102. Carbon sequestration in dryland soils (2004)

This publication reflects part of FAO's work on soil carbon sequestration within the framework of its programme on the integrated planning and management of land resources for sustainable rural development. The report presents a comprehensive analysis of the scientific aspects and potential for carbon sequestration in drylands – some of the most soil-degraded and impoverished regions of the world. It is based on case studies carried out across different land-use and managaement systems in several distinctive dryland areas. The report includes an overview of the policies and clarification of the different economic incentives regarding soil carbon sequestration in order to determine how available resources can be used and specific programmes can be implemented to improve the food security and rural livelihoods in drylands.

www.fao.org/docrep/007/y5738e/y5738e00.htm

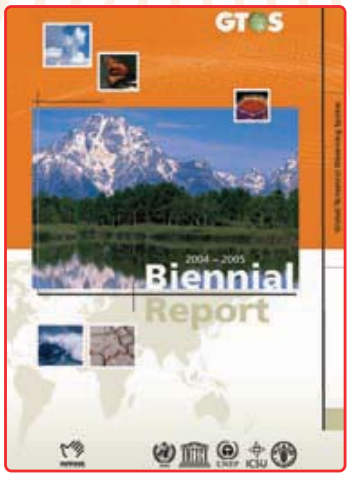
ASSESSMENT



GTOS Land Cover. Reducing Greenhouse Gas Emissions from Deforestation in Developing Countries: Considerations for Monitoring and Measuring (2006)

Official international discussions initiated at the 11th UNFCCC Conference of Parties (COP) in December 2005 focused on issues relating to reducing greenhouse gas (GHG) emissions from deforestation in developing countries. The resulting COP-11 decision established a process for submitting recommendations on implementation of policies to reduce GHG emissions from deforestation in developing countries and for examining related scientific, technical and methodological issues. This report highlights technical considerations for the measuring and monitoring of reductions in greenhouse gas emissions from avoided deforestation that need to be addressed in more detailed guidelines and protocols.

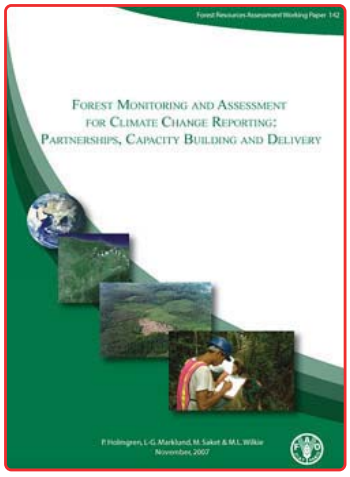
www.fao.org/gtos/doc/pub46.pdf



The Global Terrestrial Observing System (GTOS) 2004-2005 Biennial Report (2006)

The Global Terrestrial Observing System (GTOS) was established in January 1996 by its five co-sponsoring organizations in response to international calls for a deeper understanding of global change in the Earth System. The central mission of GTOS is to provide policy-makers, resource managers and researchers with access to the data they need to detect, quantify, locate, understand and warn of change (especially reduction) in the capacity of terrestrial ecosystems to support sustainable development. Since its establishment, GTOS has been working to improve the quality, the coverage and accessibility of terrestrial ecosystem data. GTOS is developing activities that focus on five issues of global concern: 1. Change in land quality. 2. Availability of freshwater resources. 3. Loss of biodiversity. 4. Climate change. 5. Pollution and toxicity. GTOS promotes: integration of biophysical and socio-economic geo referenced data; interaction between monitoring networks, research programmes and policy-makers; data exchange and application; quality assurance and harmonization of measurement methods; and collaboration to develop regional and global datasets.

www.fao.org/gtos/doc/pub40.pdf

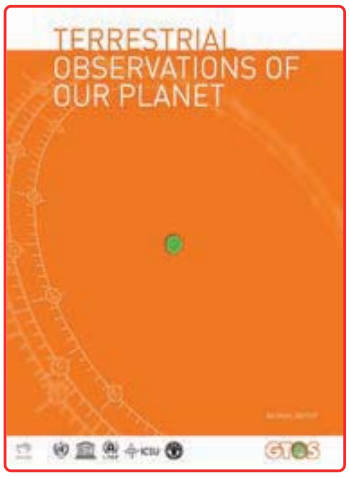


Forest Resources Assessment Working Paper 142. Forest Monitoring and Assessment for Climate Change Reporting: Partnerships, Capacity Building and Delivery (2007)

This working paper was prepared in light of the upcoming Conference of the Parties of the UNFCCC in December 2007 to inform about the status and ongoing efforts in the field of forest monitoring, assessment and reporting at national and international levels. Part I is a review of partnerships between FAO and countries for building capacity and supporting implementation of forest monitoring, assessment and reporting, to meet requirements at national and international levels. At national level, FAO works with countries to establish long-term and robust monitoring systems, based on systematic field sampling and data collection. At international level, FAO supports countries to report to the Global Forest Resources Assessments, which is the leading global reporting process on forests, their management and use. Part II presents basic requirements for national forest monitoring systems, seen from a broader policy context. It reviews the current status in countries with respect to two variables that are important for climate change reporting – forest area changes and forest carbon stock.

www.fao.org/docrep/010/k1276e/k1276e00.htm

FAO climate change publications



Terrestrial Observations of our Planet (2008)

As is now well-known, the increase in atmospheric CO2 concentrations, as well as other greenhouse gases, due to human activity, has produced concerns regarding the energy balance of the global atmosphere, and this shift in balance will cause global patterns of temperature to increase and precipitation to change — the broad outlines are that wet areas will get wetter and dry areas will get drier. What is less well known is just how daunting the task is of stabilizing climate change. Stabilizing emissions does not stabilize the concentration in the atmosphere, and even after achieving stabilization of CO2 in the atmosphere, climate will continue to change, with both ocean and land temperature continuing to rise for decades, and sea levels continuing to rise for centuries. The world has therefore already a future "pre-committed" to warming on account of carbon dioxide that humans have already added to the atmosphere.

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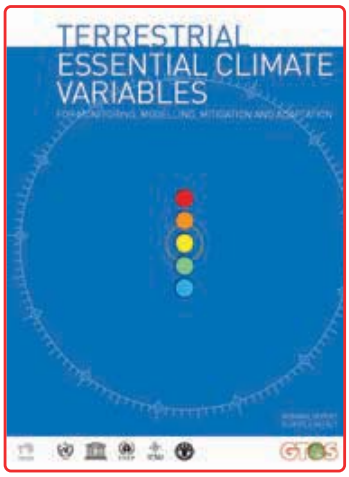
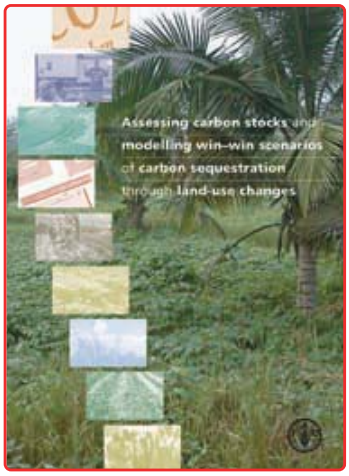


Terrestrial Essential Climate Variables for Monitoring, Modelling, Mitigation and Adaptation (2008)

13 terrestrial Essential Climate Variables (ECVs) were identified by the Global Climate Observation System (GCOS) Implementation Plan as observations needed to meet the needs of the United Nations Framework Convention on Climate Change (UNFCCC) and its Parties. The report summarizes why these observations are important for climate change monitoring, modelling, mitigation and adaptation. It reviews the major current activities and networks undertaking the observations and highlights future strategies and requirements. The document also includes details of the activities of the Global Terrestrial Observing System (GTOS) in developing a terrestrial framework and the identification of standards for the ECVs to ensure data compatibility at the regional and global level.

www.fao.org/gtos/doc/pub52.pdf



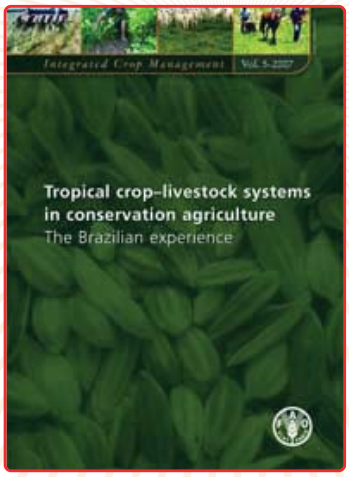
Assessing carbon stocks and modelling win–win scenarios of carbon sequestration through land-use changes (2004)

This publications presents a methodology and software for assessing carbon sequestration that were developed and tested in pilot field studies in Mexico and Cuba. The models and tools enable the analysis of land use change scenarios in order to identifyin a given area (watershed or district) land use alternatives and land management practices that simultaneously maximize food production, maximize soil carbon sequestration, maximize biodiversity conservation and minimize land degradation. The objective is to develop and implement win-win" that options that satisfy the multiple goals of farmers, land users and other stakeholders in relation to food security, carbon sequestration, bodiversity and land conservation.

www.fao.org/docrep/007/y5490e/y5490e00.htm

ISBN 92-5-105158-5

BIODIVERSITY



ISBN 9789251056929

Tropical crop-livestock systems in conservation agriculture. The Brazilian experience (2007)

Combining ecological sustainability and economic viability while maintaining or improving agricultural productivity has long been a matter of concern for FAO, as has reducing negative environmental impacts. Conservation agriculture, which aims for zero tillage with the maintenance of a surface mulch to protect the soil surface and increase biological activity in the topsoil, is increasingly becoming recognized as an effective system of crop production that protects the soil from erosion while reducing the overall use of agrochemicals. Vast areas of forest have been cleared in the tropical areas of Brazil for establishment of pastures that become unproductive once the native fertility of the soil is exhausted; this leads to yet more forest clearing for new pastures. However, rotating pastures with field crops and resowing is one of the most effective ways of maintaining them in a state of high productivity, thereby reducing the need for more clearing. This publication describes how pasture, fodder and livestock production have been integrated into conservation agriculture systems in Brazil's tropical zones.

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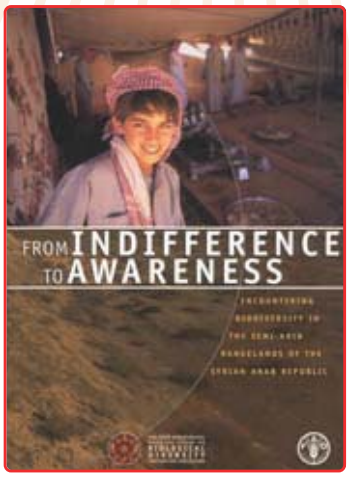

ISBN 92-5-105054-6

From Indifference to Awareness.
Encountering biodiversity in the semi - arid rangelands of the Syrian Arab Republic (2003)

Since February 1996, Syrian and international technicians have been working together to promote the conservation and sustainable use of the natural wealth of the semi-arid rangelands of the Syrian Arab Republic. The purpose of this publication is to describe and explain this work to the Syrian public in a way which enables them to understand why it is being done and what it hopes to achieve.

www.fao.org/docrep/006/y5097e/y5097e00.htm

BIOENERGY

ISBN FAO 92-5-105042-2

A review of the current state of bioenergy development in G8 +5 countries (2007)

Bioenergy sits at the intersection of three of the world's great challenges - energy security, climate change, and poverty reduction - and has received an enormous amount of attention in the past few years. Joint work on these issues is vital considering that together, the G8 +5 Countries account for about 55 percent of the world's population, 70+ percent of global GDP, and about 72 percent of world energy-related and industry CO2 emissions (excluding deforestation). Bioenergy statistics are inadequate and not up to date. They are essential to understand the dynamics of bioenergy systems; evaluating the role played by different types of biofuels in the energy sector and supply sources; assessing the share of biomass used (directly and indirectly) for energy purposes; assessing the role of biofuel in GHG inventories; and formulating sound policies. According to the best data available, bioenergy provides about 10 percent of the world's total primary energy supply (47.2 EJ of bioenergy out of a total of 479 EJ in 2005, i.e. 9.85 percent). Most of this is for use in the residential sector (for heating and cooking) and is produced locally. In 2005 bioenergy represented 78 percent of all renewable energy produced.

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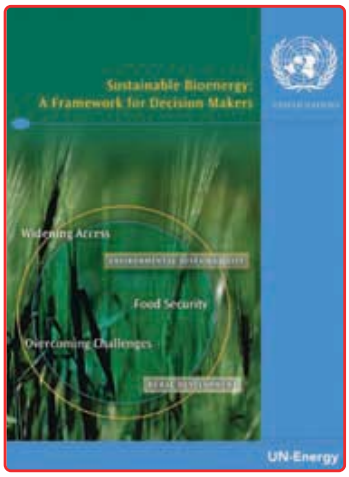
FAO climate change publications



Sustainable Bioenergy: A Framework for decision makers (2007)

UN-Energy seeks to structure the approach to the current discussion on bioenergy. "Sustainable Bioenergy: A Framework for Decision Makers" is the contribution of the UN system to the issues that need further attention, analysis and valuation, so that appropriate trade-offs can be made and both the energy needs of people met and the local and global environment adequately protected.

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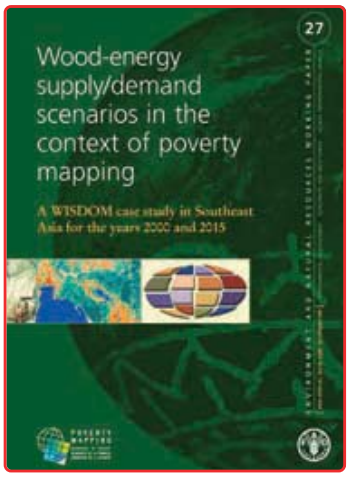

Wood-energy supply/demand scenarios in the context of poverty mapping. A WISDOM case study in Southeast Asia for the years 2000 and 2015 (2007)

Current (2000) and projected (2015) woodfuel consumption patterns and supply potentials in continental Southeast Asia are analysed and mapped applying the Woodfuel Integrated Supply/Demand Overview Mapping (WISDOM) methodology. Combined with poverty data, the study helps define areas where poor rural and suburban populations that depend primarily on woodfuels for their subsistence energy supply are likely to suffer severe shortages, adding an indicator to the mapping of extreme poverty and a new tool for poverty alleviation policies and forestry and energy development planning.

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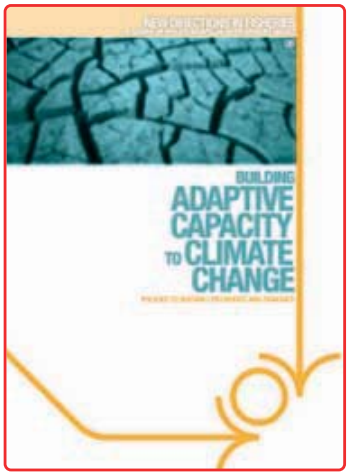
ISBN 978-92-5-105710-0

FISHERIES



Building adaptive capacity to climate change – Policies to sustain livelihoods and fisheries (2007)

Fisheries ecosystems and fishing-based livelihoods are subject to a range of climate-related variability, from extreme weather events, floods and droughts, through changes in aquatic ecosystem structure and productivity, to changing patterns and abundance of fish stocks. Resource users and managers face continued challenges in responding to this variability. Human-induced climate change, which is likely to increase the frequency and magnitude of variability as well as potentially causing major shifts in ocean system productivity and surface fresh water availability, is going to make adaptation more difficult and costlier. There is increasing concern that, although climate outcomes cannot be precisely predicted, the shift in probability towards greater climate challenge is becoming clearer. Unless changes can be anticipated and brought rationally into local, national and international coping response, many of the world's development aims will be gravely compromised.

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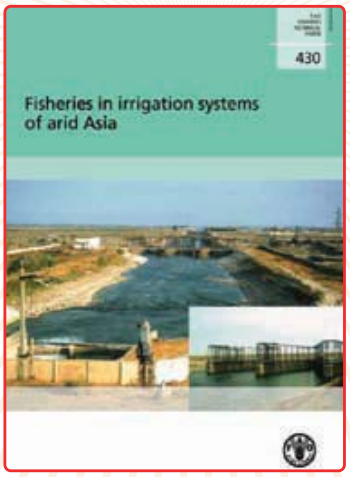
ISSN 1817-2679



ISBN 92-5-105047-3

FAO Fisheries Technical Paper 430. Fisheries in irrigation systems of arid Asia (2004)

This Fisheries Technical Paper is a companion to the Report of the FAO Expert Consultation on the Use of Irrigation Systems for Sustainable Fish Production in Arid Countries of Asia (FAO Fisheries Report No. 679). The consultation was held at Almaty, Kazakhstan, from 25 to 29 September 2001. This document brings together twelve papers that review the present use of irrigation systems for fisheries in the countries of the arid belt of Asia, from Turkey to China. The individual papers deal with the following countries and areas: Xinjiang Uygur Autonomous Region (China), India, the Islamic Republic of Iran, Kazakhstan, Kyrgyzstan, Mongolia, Pakistan, Turkey and Uzbekistan. While some countries in the arid belt are well advanced in the field of fish production from waterbodies of irrigation systems, others are experiencing major difficulties arising from recent changes in their political and economic systems, particularly Mongolia and the countries of Central Asia. Such countries require major assistance. The document includes a summary of recommendations and proposals for further action, as formulated by the expert consultation.

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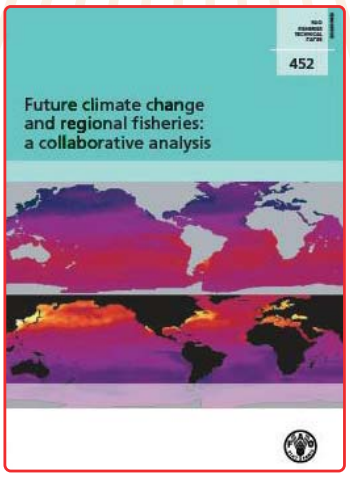

ISBN 92-5-105016-3

FAO Fisheries Technical Paper 452. Future climate change and regional fisheries: a collaborative analysis (2003)

First, issues of global change versus global warming are discussed. The larger perspective is presented of Earth as a warm, wet planet, that experiences frequent cold periods via climate history graphics of Earth's recent million years of climate variation, from paleoclimate research. The hydrological cycle is described, and its relevance to fisheries is made clear. Climate-related dynamics have had serious consequences in evolution of species, society and fisheries variability. Both production variabilities and changes in vulnerability due to constant dynamics of ocean motion effects are described. The records available for major fisheries are interpreted as we understand them from a century of in-depth research and analysis of various proxies, in particular, bioindicators. The history of climate as it relates to fisheries is addressed. The various spatial and temporal scales that are reflected in fisheries responses are described in an attempt to isolate weather from climate, or other events. Regional ecological responses to climate change are reviewed.

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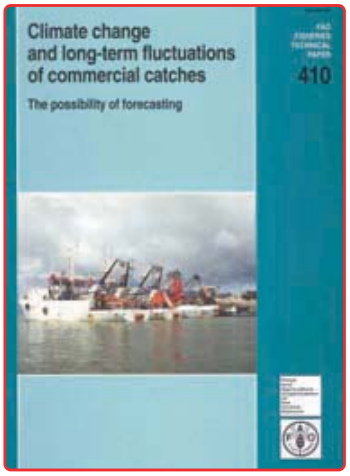

ISBN 92-5-104695-6

FAO Fisheries Ttechnical Paper 410. Climate change and long-term fluctuations of commercial catches: the possibility of forecasting (2001)

The main objective of the study was to develop a predictive model based on the observable correlation between well-known climate indices and fish production, and forecast the dynamics of the main commercial fish stocks for 5–15 years ahead. Populations of the most commercially important Atlantic and Pacific fish species - Atlantic and Pacific herring, Atlantic cod, European, South African, Peruvian, Japanese and Californian sardine, South African and Peruvian anchovy, Pacific salmon, Alaska pollock, Chilean jack mackerel and some others - undergo long-term simultaneous oscillations. Total catch of these species accounts for about 50% of total fish harvest over Atlantic and Pacific. It was found that the dynamics of global air surface temperature anomaly (dT), although in correlation with the long-term dynamics of marine fish production, are of poor predictive significance because of high inter-annual variability and a long-term trend. The Atmospheric Circulation Index (ACI), characterizing the dominant direction of air mass transport, is less variable and in closer correlation with the long-term fluctuations of the main commercial stocks ($r = 0.70$-0.90).

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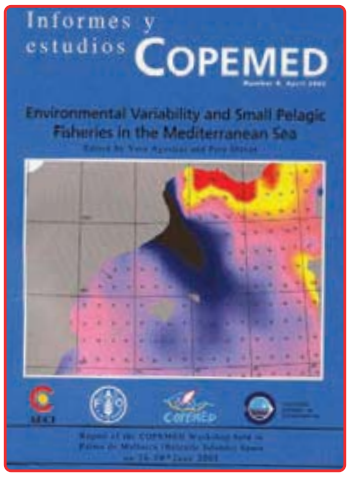
FAO climate change publications



ISBN 84-931742-8-9

Environmental variability and small pelagic fisheries in the Mediterranean Sea; Report of the COPEMED workshop held in Palma de Mallorca, Spain (2001)

The importance of the relationship between environmental and fishery variability has been repeatedly addressed in the Mediterranean. Understanding the mechanisms that govern year to year fluctuations in abundance as well as year class strength of Mediterranean fishes is essential for the assessment and management of this resource. Correlations between environmental variables and variations in the spatial and temporal distribution of fish populations in the Mediterranean have been addressed. The relationship between environmental forcing and different stocks of fish has not, however, been clearly identified. There are a number of challenges that present themselves when attempting to move this subject forward. Amongst them: 1) poor dialogue between fishery scientists and oceanographers 2) limited access to data and information 3) data of differing spatial/chronological scales.

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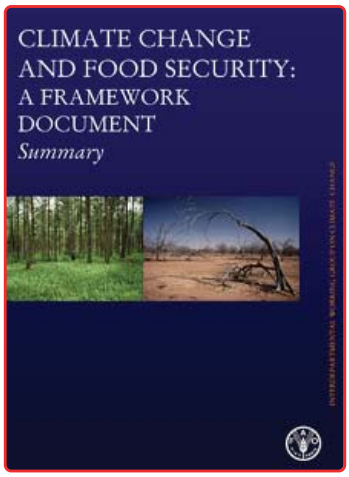
FOOD SECURITY



Climate change and food security: A framework document (2007)

Food security exists when all people at all times have physical or economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. To achieve food security, all four of its components must be adequate. These are: availability, stability, accessibility and utilization. A food system is a set of dynamic interactions between and within bio-geophysical and human environments that influences both activities and outcomes all along the food chain (production, storage and processing, distribution, exchange, preparation and consumption).

Food security is the outcome of food system performance at global, national and local levels. It is often directly or indirectly dependent on agricultural and forest ecosystem services, e.g., soil and water conservation, watershed management, combating land degradation, protection of coastal areas and mangroves, and biodiversity conservation.

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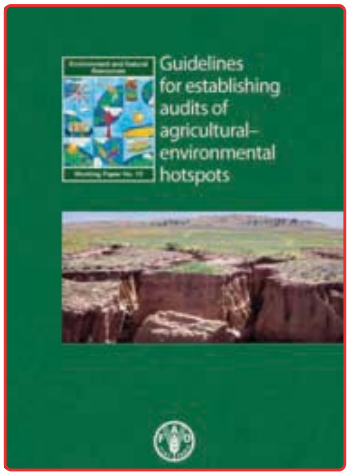


Guidelines for establishing audits of agricultural-environmental hotspots (2003)

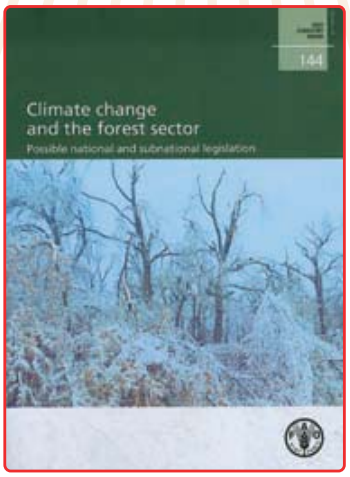
Starting in 1999, the Food Insecurity and Vulnerability Information and Mapping Systems (FIVIMS) Secretariat in FAO has published an annual report on global food insecurity and vulnerability (see: http://www.fao.org/DOCREP/005/Y7352E/Y7352E00.HTM). The report, - The State of World Food Insecurity, known as SOFI - assembles, analyses and disseminates information on who are the food insecure, where they are located, and why they are food insecure, nutritionally vulnerable or at risk. The Environment and Natural Resources Service (SDRN) of the Sustainable Development Department, FAO, hasbeen involved through the preparation of maps and analyses. As food insecurity can often be correlated with difficulties in making proper use of natural resources, it was considered that it would be useful to produce regular analyses about areas where ecological processes or agricultural production are disrupted due to conflicts between environment and agriculture. Such areas are termed agricultural-environmental hotspots, or Ag-Enhotspots. The emphasis is thus on non-optimal functioning of ecosystems, agriculture, or both. "Environment" includes natural, social, economic and cultural aspects.

www.fao.org/docrep/006/y5086e/y5086e00.htm

FORESTRY

FAO Forestry Paper 154 – Integrating climate change into forest policy and legislation – Responding to the international framework (2008)

Forests have a critical role in climate change mitigation and adaptation, as recognized by the United Nations Framework Convention on Climate Change and its Kyoto Protocol. This publication tracks the development of international policy and law related to forests and climate change. It provides examples of countries' efforts to integrate climate change considerations into existing or new legal and policy instruments on forests. It also discusses issues that national and subnational legislative bodies may have to consider in addressing climate change mitigation and adaptation in relation to forests. This publication updates and expands upon FAO Forestry Paper 144, *Climate change and the forest sector: possible national and subnational legislation* (2004).

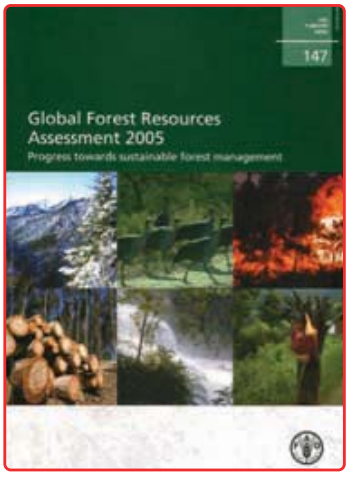


FAO Forestry Paper 144 – Climate change and the forest sector – Possible national and subnational legislation (2004)

Climate change presents the world with a daunting problem. Emerging science suggests that humans may be about to cause a major change in world climates. The economic and ecological stakes are high. In an ideal world, mature science would guide policy and legal reform. In the real world, it is not always possible to have the luxury of certainty and the comfort of strictly rational decisions based on scientific insight. Responding to the challenge will require pioneering efforts in science, politics, pollution control, forest management and law. This publication examines the development of international law of climate change and discusses issues that national and subnational legislative bodies may have to consider regarding climate change mitigation and forests.

www.fao.org/docrep/007/y5647e/y5647e00.htm

ISBN 92-5-105200-x



FAO Forestry Paper 147 – Global Forest Resources Assessment 2005 – Progress towards sustainable forest management (2005)

We have high expectations of the world's forest resources. They are to provide renewable raw materials and energy, maintain biological diversity, mitigate climate change, protect land and water resources, provide recreation facilities, improve air quality and help alleviate poverty. At the same time, forests are affected by fire, air pollution, pests and invasive species, and are the primary targets in many countries for agricultural and urban expansion. Competing interests in the benefits of forest resources and forest land are omnipresent, and the need for a sound basis for analysis and conflict resolution has never been greater. The process of global forest resources assessment (FRA) has responded to this challenge. By adopting the concept of sustainable forest management as a reporting framework, FRA is now well placed to provide a holistic perspective on global forest resources, their management and uses. Beyond the conventional production and environmental dimensions of forestry, FRA now includes parameters that are important to forest dwellers and rural poor people, such as the value of non-wood forest products and trends in fuelwood removals. By addressing the thematic elements of sustainable forest management, FRA has evolved into an instrument that is indispensible in international negotiations and arrangements related to forests, and for clarifying the relationship of forestry to sustainable development.

www.fao.org/docrep/008/a0400e/a0400e00.htm

ISBN 92-5-105481-9

FAO climate change publications

ISBN 92-5-105671-4

FAO Forestry Paper 151 – Fire management global assessment 2006 (2007)

Fire management is an essential part of sustainable forest management. This publication complements the Global Forest Resources Assessment 2005 (FRA 2005) as an in-depth thematic study on the incidence, impact and management of forest fires in different regions of the world. It was developed from 12 regional papers prepared within the framework of the Global Wildland Fire Network of the United Nations International Strategy for Disaster Reduction. It provides the best estimate of the global fire situation to date and gives a good indication of the scale of the impact of vegetation fires on society, on the economy and on the environment. This global assessment will be of interest not only to fire specialists, but also to policy-makers, forest managers and those involved in collecting reliable and current information on fire in different types of vegetation. It is an important contribution to FAO's efforts to enhance international cooperation in fire management.

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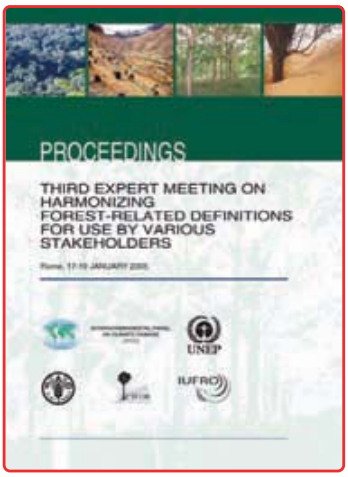

Proceedings, Third expert meeting on harmonizing forest-related definitions for use by various stakeholders (2005)

The Third Expert Meeting on Harmonizing Forest-related Definitions for Use by Various Stakeholders was organized by the Food and Agriculture Organization of the United Nations (FAO) in collaboration with the Center for International Forestry Research (CIFOR), the Intergovernmental Panel on Climate Change (IPCC), the International Union of Forest Research Organizations (IUFRO), the International Tropical Timber Organization (ITTO) and the United Nations Environment Programme (UNEP) at FAO Headquarters in Rome, from 17 to 19 January 2005. The meeting was a follow-up to the Second Meeting, organized by the same bodies in Rome from 11 to 13 September 2002.

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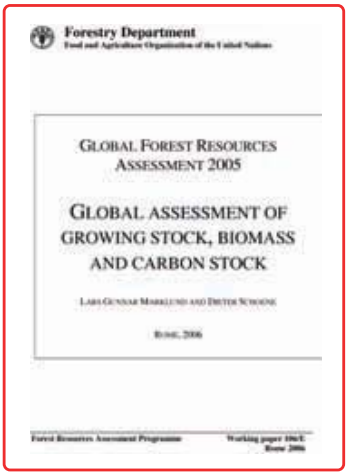

Forest Resources Assessment Working Paper 106. Global Forest Resources Assessment 2005. Global assessment of growing stock, biomass and carbon stock (2006)

In 2006, FAO published the main report of the Global Forest Resources Assessment 2005 (FRA 2005), which provides data on a wide range of forest variables for three points in time (1990, 2000, 2005). The FRA 2005 main report includes global estimates and analyses of growing stock and carbon stock, but does not provide detailed information on the methodology applied and the assumptions made in order to make these estimates. The purpose of this working paper is to give a detailed explanation of the methods used for making the global estimates of growing stock, biomass and carbon stock based on the country submissions to FRA 2005. It includes all the assumptions and calculations made in order to make the estimates. It also includes a discussion of the reliabilty and plausiblity of the estimates.

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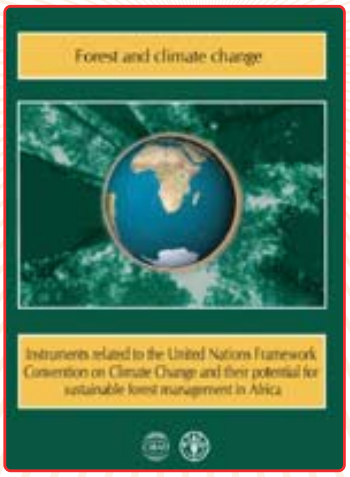

Forests and Climate Change Working Paper 1 – Instruments related to the United Nations Framework Convention on Climate Change and their potential for sustainable forest management in Africa (2003)

Forests play major roles in climate change. They contribute carbon emissions when destroyed or degraded and they suffer from changing climate, drought and extreme weather. Managed sustainably, they can provide a unique environmental service by removing excess carbon from the atmosphere, storing it in biomass, soils and products. In addition, sustainably produced wood fuels offer an environmentally benign alternative to fossil fuels. During the 7th Session of the Conference of the Parties to the UN Framework Convention on Climate Change in Marrakech, Morocco, in 2001, governments agreed on the final framework for implementing the Kyoto Protocol, which obligates industrialized countries to reduce their net greenhouse gas contribution by country-specific, fixed amounts.

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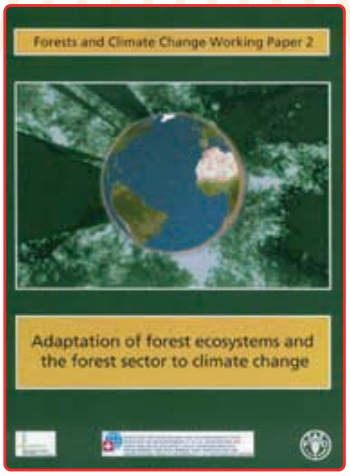

Forests and Climate Change Working Paper 2 – Adaptation of forest ecosystems and the forest sector to climate change (2005)

Issues regarding land use, land-use change and forestry have being receiving increased attention in the multilateral negotiation process on climate change. Remarkable progress has been made in discussions of definitions and methodologies and in capacity building for the inclusion of forestry activities in the mitigation of climate change. While most efforts have been directed to mitigation measures, less attention has been given to the development of practical tools for analysing vulnerability and options for adapting forest ecosystems to climate change, particularly at the national and local levels in developing countries.

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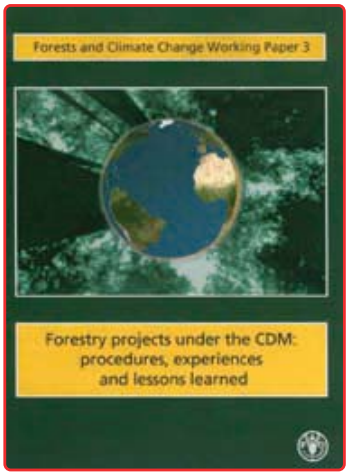

Forests and Climate Change Working Paper 3 – Forestry projects under the CDM procedures, experiences and lessons learned (2005)

This paper provides guidance on how to formulate new baseline and monitoring methodologies for CDM A/R (Clean Development Mechanism, Afforestation and Reforestation) projects. The analysis puts together lessons learned from baseline and monitoring methodologies which were submitted for approval so far and helps project developers to avoid mistakes made in those earlier methodologies.

Under the Kyoto Protocol, industrialised countries and countries with economies in transition (Annex I countries) have committed themselves to greenhouse gas (GHG) emission targets. The goal can be achieved either by activities within the country or by purchasing emission credits. As a consequence, an international market for GHG credits has been developed.

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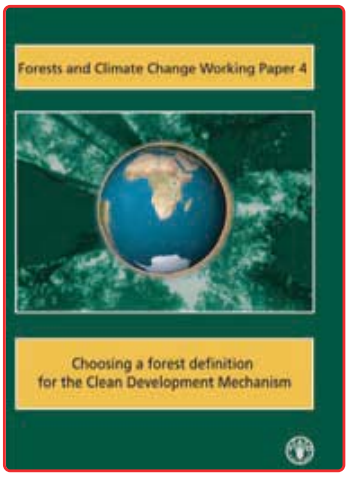

Forests and Climate Change Working Paper 4 – Choosing a forest definition for the Clean Development Mechanism (2006)

Developing countries must define "forest" before they can host afforestation and reforestation projects under the Clean Development Mechanism of the Kyoto Protocol. To do so, they must chose country-specific values from a range provided in the Marrakech Accords for minimum area, crown cover and tree height. Good practice involves choosing also a minimum strip width. Definitions in the Marrakech Accords and in the 2003 IPCC Good Practice Guidance leave some ambiguities.

Existing country definitions of "forest" do not contain all or, sometimes, any quantitative parameters; simply adopting them for the CDM is not an option. Therefore, all developing countries vying for forestry projects under the CDM will have to choose parameter values. Only few have done so up to now.

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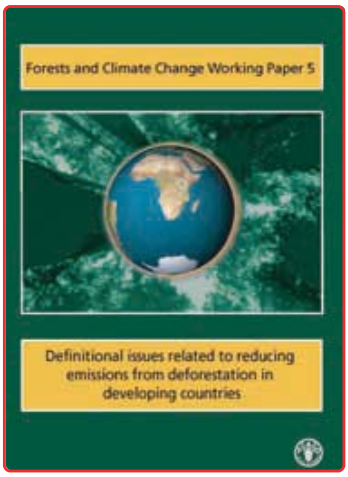

Forests and Climate Change Working Paper 5 – Definitional issues related to reducing emissions from deforestation in developing countries (2007)

The paper provides background on definitional issues related to reducing emissions from deforestation in developing countries (RED-DC). It reflects the FAO presentation on "Definitional issues, including those relating to links between deforestation and degradation" given during a UNFCCC-organised workshop on RED-DC, held from 30 August to 1 September 2006.

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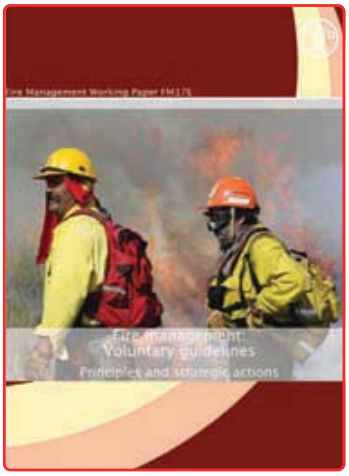

Fire Management Working Paper FM17E
Fire management Voluntary guidelines – Principles and strategic actions (2006)

The present voluntary guidelines set out a framework of legally non-binding principles and internationally accepted strategic actions. They address the cultural, social, environmental and economic dimensions of fire management at all levels. In accordance with recommendations of the International Wildland Fire Summit in October 2003, the Ministerial Meeting on Sustainable Forest Management in March 2005 and the FAO Committee on Forestry (COFO), also in March 2005, FAO has been coordinating a multistakeholder process to prepare the principles and actions as part of a global strategy for international cooperation in fire management. The global strategy also includes: an assessment of fire and its impacts; an assessment of current networks, partnerships and other areas of cooperation among fire management entities; and a plan for implementation. Implementation is seen as a voluntary, open and inclusive process that will benefit people, resources, assets and the environment. The principles will aid in the formulation of policies, laws and regulations, while the strategic actions will enable holistic approaches to fire management. Preparation of the guidelines involved a core technical group and expert consultations with selected member countries, private-sector associations and non-governmental and intergovernmental organizations. The draft was available on the Internet for public review and comment by all interested parties.

ftp://ftp.fao.org/docrep/fao/009/j9255e/j9255e00.pdf

Planted Forests and Trees Working Papers FP37E.
Responsible management of planted forests – Voluntary guidelines

The quest for sustainable forest management has received considerable attention in international negotiations. The Rio Declaration, United Nations conventions – the Framework Convention on Climate Change, Convention on Biological Diversity and Convention to Combat Desertification – the United Nations Forum on Forests and other international processes, meetings and key publications have recognized the critical role of forestry in achieving sustainable development. Planted forests, established through afforestation or reforestation, have a particularly important role to play in providing a wide range of goods and services. There is increasing public awareness that wood products have advantages over competing products made of other materials (cement, plastics and metal) in that wood is renewable, energy efficient and environmentally friendly if managed responsibly.

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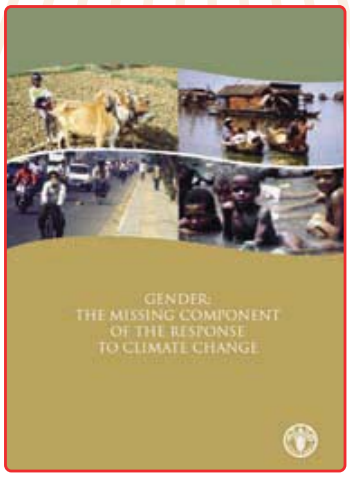
GENDER, EQUITY AND SOCIAL ISSUES



Gender: the missing component of the response to climate change (2006)

This report analyses the gender dimension of climate change and the policies enacted to mitigate and adapt to its impacts with the aim of developing gender sensitive approaches with regards to mitigation measures, adaptation projects and national regimes. The framework of the study is represented, on the one hand, by the scientific assessment of climate change, with its impacts and associated effects on human and natural systems, and, on the other hand, by the international response to this challenge. The findings show that the gender aspects have generally been neglected in international climate policy. This is a major concern given the emphasis of policymakers on general equity issues. It is only during the last few years, on the occasion of the sessions of the Conference of the Parties (COP), COP-8 (held in New Delhi, in October 2002) and COP-9 (held in Milan, December 2003), that gender was tangentially broached. The lack of attention to gender issues according to some authors can be considered as the result of the perceived need felt by negotiators to focus their attention, and the limited available resources, on more universal issues.

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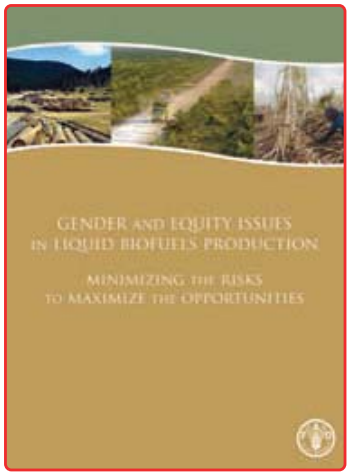

Gender and equity issues in liquid biofuels production minimizing the risks to maximize the opportunities (2008)

The production of liquid biofuels such as bioethanol and biodiesel is rapidly increasing in developing countries, due mainly to the establishment of large-scale biofuel feedstock plantations. This results in potential socio-economic benefits, particularly in terms of agricultural employment, as well as risks, which tend to be context-specific. The objective of this paper is to discuss the potential gender-differentiated risks of liquid biofuels production and identify research and policy strategies to better understand and address them. The potential environmental and socio-economic risks that may arise from the establishment and operation of large-scale plantations for the production of biofuels are considered. In addition, some potential risks for food security resulting from an increase in food prices due to the growing use of agricultural crops for biofuels production are discussed. The paper provides some specific recommendations for future research, such as conducting field-assessments to generate sex-disaggregated data for testing the hypotheses discussed in this paper. It also offers a number of alternative policy options for reducing the risks and maximizing the opportunities of biofuels production, such as establishing international rules to ensure that this production is environmentally sustainable and pro-poor.

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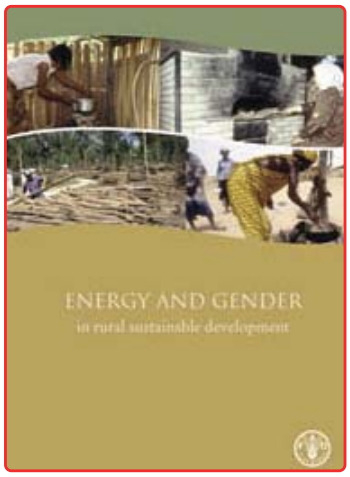

Energy and gender issues in rural sustainable development (2006)

It is FAO's view that increased access to energy sources in rural areas and the development of new bioenergy1 sources can contribute to achievement of the Millennium Development Goals relating to the eradication of extreme poverty and hunger, improvements in health, education, and environmental sustainability, as well as gender equality and the empowerment of women. FAO's Committee on Agriculture has identified the great potential of bioenergy for supporting new rural infrastructure and employment opportunities, and has also recognized that an integrated multidisciplinary approach is needed for its new Bioenergy Programme to address the social and economic objectives set out in the MDGs. A focus on gender issues is particularly important in this context since many of the world's poorest people are women living in rural areas in developing countries who are currently dependent on subsistence agriculture to feed their families, and who are disproportionately affected by the lack of modern fuels and power sources for farming, household maintenance and productive enterprises.

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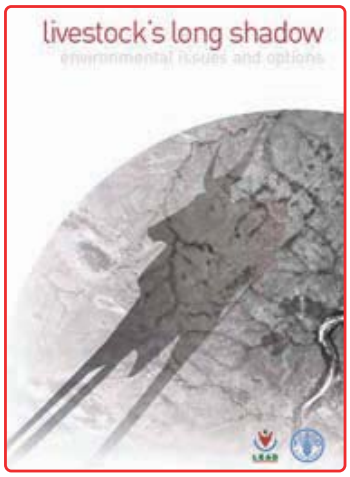
LIVESTOCK



ISBN 978-92-5-105571-7

Livestock's long shadow - Environmental issues and options (2006)

This report aims to assess the full impact of the livestock sector on environmental problems, along with potential technical and policy approaches to mitigation. The assessment is based on the most recent and complete data available, taking into account direct impacts, along with the impacts of feed crop agriculture required for livestock production. The livestock sector emerges as one of the top two or three most significant contributors to the most serious environmental problems, at every scale from local to global. The findings of this report suggest that it should be a major policy focus when dealing with problems of land degradation, climate change and air pollution, water shortage and water pollution, and loss of biodiversity. Livestock's contribution to environmental problems is on a massive scale and its potential contribution to their solution is equally large. The impact is so significant that it needs to be addressed with urgency. Major reductions in impact could be achieved at reasonable cost.

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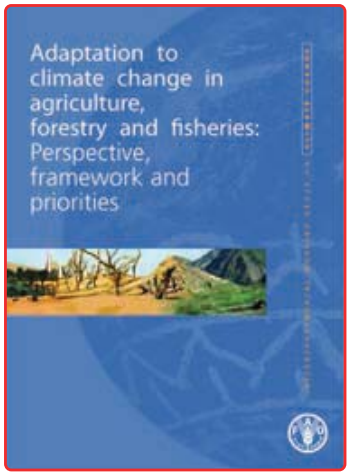
NAIROBI WORK PROGRAMME



Adaptation to climate change in agriculture, forestry and fisheries: Perspective, framework and priorities (2007)

The United Nations Framework Convention on Climate Change (UNFCCC) provides that all Parties must formulate and implement national or regional programmes containing measures to facilitate adequate adaptation to climate change (Art. 4.1.b). It lists specific domains in particular need of adaptation, namely coastal zones, water resources, agriculture, and areas affected by drought and desertification, as well as floods. Article 4.8 complements this list with e.g. small island countries, countries with forest areas liable to forest decay, countries prone to natural disasters, and countries with fragile ecosystems, including mountain ecosystems. The croplands, pastures and forests that occupy 60 percent of the Earth's surface are progressively being exposed to threats from increased climatic variability and, in the longer run, to climate change. Abnormal changes in air temperature and rainfall and resulting increases in frequency and intensity of drought and flood events have long-term implications for the viability of these ecosystems. As climatic patterns change, so also do the spatial distribution of agro-ecological zones, habitats, distribution patterns of plant diseases and pests, fish populations and ocean circulation patterns which can have significant impacts on agriculture and food production.

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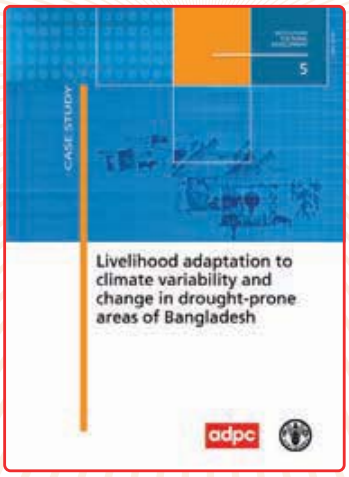

ISBN 978-92-5-105602-8

Livelihood adaptation to climate variability and change in drought-prone areas of Bangladesh (2006)

The impacts of climate variability and change are global concerns, but in Bangladesh, where large numbers of the population are chronically exposed and vulnerable to a range of natural hazards, they are particularly critical. Agricultural production is already under pressure from increasing demands for food and the parallel problem of depletion of land and water resources caused by overuse and contamination. The impacts of climate variability and change cause additional risks for agriculture. Within this context, FAO and the Asian Disaster Preparedness Center (ADPC) are guiding a project to assess livelihood adaptation to climate variability and change in the drought-prone areas of Northwest Bangladesh. The project specifically looks at: characterization of livelihood systems; profiling of vulnerable groups; assessment of past and current climate impacts; and understanding of local perceptions of climate impacts, local coping capacities and existing adaptation strategies. This report summarizes the project methodology developed and successfully tested during 2005/06; it discusses interim findings and recommendations resulting from the ongoing pilot learning process.

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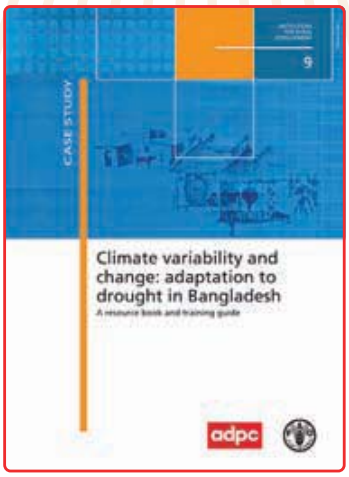

ISBN 978-92-5-105782-7

Climate variability and change: adaptation to drought in Bangladesh. A resource book and training guide (2007)

The impacts of increasing climatic variability and change are global concerns but in Bangladesh, where large numbers of people are chronically exposed and vulnerable to a range of natural hazards, they are particularly critical. This resource book, Climate variability and change: adaptation to drought in Bangladesh, has been tested and prepared as a reference and guide for further training and capacity building of agricultural extension workers and development professionals to deal with climate change impacts and adaptation, using the example of drought-prone areas of Bangladesh. It also presents suggestions for a three-day training course that would be readily adaptable for any areas of Bangladesh affected by climate-related risks. The information presented on climate change adaptation would enable participants to prepare, demonstrate and implement location-specific adaptation practices and, thus, to improve the adaptive capacity of rural livelihoods to climate change in agriculture and allied sectors.

www.fao.org/docrep/010/a1247e/a1247e00.htm

Training modules for climate and flood forecast applications in agriculture. Enhancing early warning systems for disaster preparedness and mitigation in the agriculture sector in Bangladesh (2005)

These training modules on climate and flood forecast applications in agriculture were developed for the Food and Agriculture Organization (FAO) of the United Nations to build the capacity of the Department of Agriculture Extension (DAE) of the Government of Bangladesh to interpret probabilistic climate and flood forecast information, translate these into location-specific impact outlooks, prepare locally relevant response options, and communicate these to vulnerable farming communities to reduce disaster risks in agriculture. These training modules, designed based on a training need assessment of DAE functionaries at the national, district, sub-district (upazilla), and block levels, provide the base material for the training workshops for DAE at each level. The workshop program for each level is designed around participants' needs.

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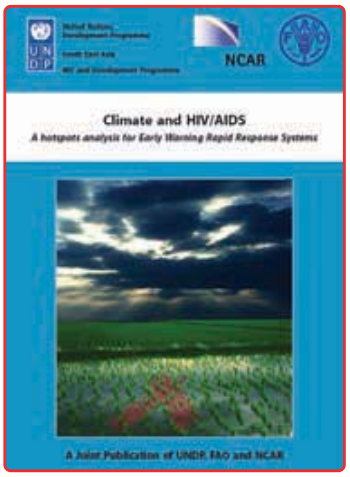
FAO climate change publications

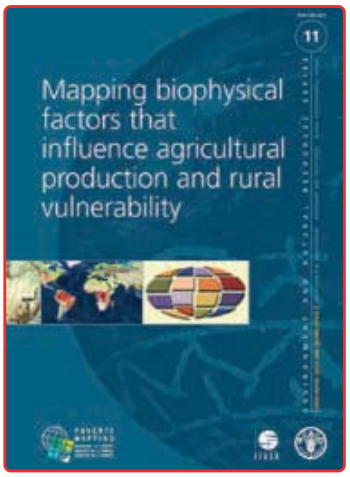


ISBN 974-92327-6-3

Climate and HIV/AIDS – A hotspots analysis for early warning rapid response systems (2004)

The current profusion of literature on future climate change impacts contains little about HIV/AIDS. For instance, the authoritative report by WHO/WMO/UNEP (2003) only mentions that there is, currently, an apparent increase in many infectious diseases, including some newly circulating ones (HIV/AIDS, Hantavirus, hepatitis C, SARS, etc.). The report indicates that the increase refects the combined impacts of rapid demographic, environmental, social, technological and other changes in our ways of living. A second recent UN report (Kovats *et al.*, 2003) just mentions AIDS as a background factor in current mortality. Similarly, two recent UNAIDS reports (UNAIDS, 2002; UNAIDS/WHO, 2003) have hardly any mention of climate or weather, though drought is listed twice in the first. The transmition of HIV from person to person through sexual contact or other means (mother to child, blood transmission, sharing syringes used for injectable drugs) may be climate independent.

www.hivpolicy.org/Library/HPP000938.pdf



Mapping biophysical factors that influence agricultural production and rural vulnerability (2007)

This monograph is part of a series of reports that explain how techniques of spatial analysis can be used to investigate poverty and environment links worldwide. It combines rural population distribution data contained in the global rural population database for the year 2000 with methods and results of the "Global agro-ecological assessment for agriculture in the 21st century", in order to estimate the distribution of the world's rural population by agricultural suitability class, land-use category and type of farming system.

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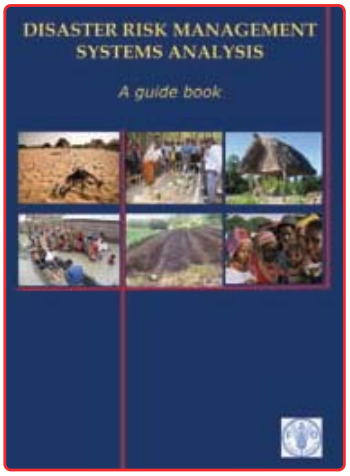

Disaster risk management systems analysis. A guide book (2008)

With mounting international concern at the rising frequency and severity of natural hazards and disasters, in part due to factors related to climate change, there is increased impetus in many countries to put in place policy, legal, technical, financial and institutional measures that will reduce the destructive effects on the lives and livelihoods of individuals and communities. These concerns were intensively debated during the World Conference on Disaster Reduction, held in Kobe, Hyogo Prefecture, Japan, 18-22 January 2005. The Hyogo Framework for Action (HFA), adopted by the Conference, seeks the outcome of "The substantial reduction of disaster losses, in lives and in the social, economic and environmental assets of communities and countries". In order to achieve the stated outcome by 2015, the HFA emphasises a shift from reactive emergency relief (which nonetheless remains important) to pro-active disaster risk reduction (DRR) in the pre-disaster stages by strengthening prevention, mitigation and preparedness. A related approach that is gaining widespread support is that of disaster risk management (DRM) which combines, through a management perspective, the concept of prevention, mitigation and preparedness with response.

www.fao.org/docrep/010/ai504e/ai504e00.htm

Good Practices for Hazard Risk Management in Agriculture. Summary Report Haiti Project Phase I (2007)

FAO funded the regional TCP "Assistance to improve Local Agricultural Emergency Preparedness in Caribbean countries highly prone to hurricane related disasters" in Cuba, Grenada, Haiti and Jamaica to "assist governments of participating countries to support the food security of small farmers operating in the most hazard prone areas by improving institutional frameworks and technical options for hurricane-related disaster preparedness, emergency response and post-emergency agricultural assistance". The proposed approach was to use a Participatory Rural Appraisal - PRA/based qualitative research paradigm. The current section summarizes the project implementation outcome in Haiti during Phase I, June 2006 - January 2007.

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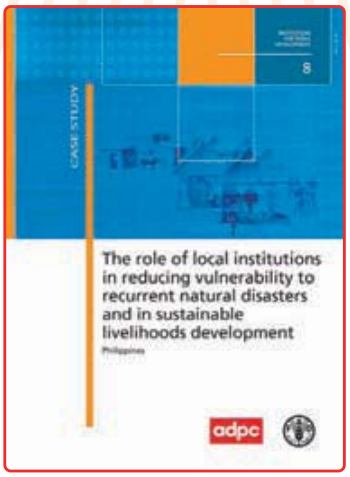
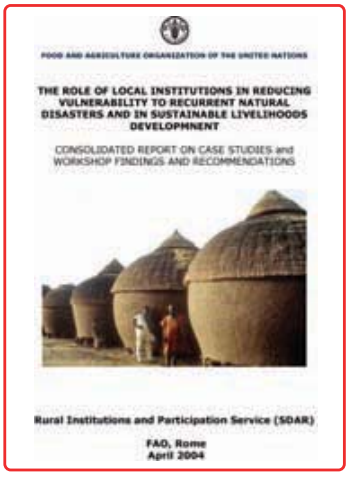


The role of local institutions in reducing vulnerability to recurrent natural disasters and in sustainable livelihoods development - Philippines (2006)

This case study was commissioned by the FAO Rural Institutions and Participation Service. Its in-depth look at the situation in a disaster-prone area of the Philippines contributes to the understanding of the impact of local institutions on the design and implementation of disaster risk management strategies, as well as the role of local authorities in building community social capital for disaster prevention and preparedness. This understanding will provide insight and guidance on how disaster risk management at local level can be strengthened and integrated better into development strategies.

www.fao.org/docrep/009/a0879e/a0879e00.htm



The role of local institutions in reducing vulnerability to recurrent natural disasters and in sustainable livelihoods development (2004)

Global data indicates that in the last decade natural disasters occurred more frequently than in the past and were more destructive. While recognizing that assistance in the response phase of a natural disaster remains important and needs to be enhanced at all levels, there is an increased recognition that the ultimate aim of natural disaster management strategies should be to reduce the vulnerability of local communities (and countries) to natural hazards, through the implementation of more effective prevention and preparedness measures, and integration of risk management into long-term development planning. FAO has clearly signaled that long-term development objectives should not and cannot be set aside during emergencies and decided to further strengthen its policy advisory and technical activities in countries that are especially prone to natural hazards with a view to ensuring that disaster risk management (DRM) is a key consideration within sustainable agriculture and rural development (SARD) policies and programmes in such countries.

www.fao.org/docrep/007/ae190e/ae190e00.htm

FAO climate change publications

The role of local institutions in reducing vulnerability to recurrent natural disasters and in sustainable livelihoods development - Vietnam (2003)

This case study on the role of local level institutions in reducing vulnerability to recurrent natural disasters and in sustainable livelihoods development in high risk areas is written for the Food and Agriculture Organization (FAO) to contribute to the understanding of the role of local institutions and organizations in the design and implementation of disaster risk management strategies, as well as the role of local authorities in building community social capital for disaster prevention and preparedness. This understanding will provide insight and guidance on how disaster risk management may be integrated into development strategies.

www.fao.org/docrep/007/ae080e/ae080e00.htm

The role of local institutions in reducing vulnerability to recurrent natural disasters and in sustainable livelihoods development. Case study - Assessing the role of local institutions in reducing the vulnerability of at-risk communities in Búzi, Central Mozambique (2003)

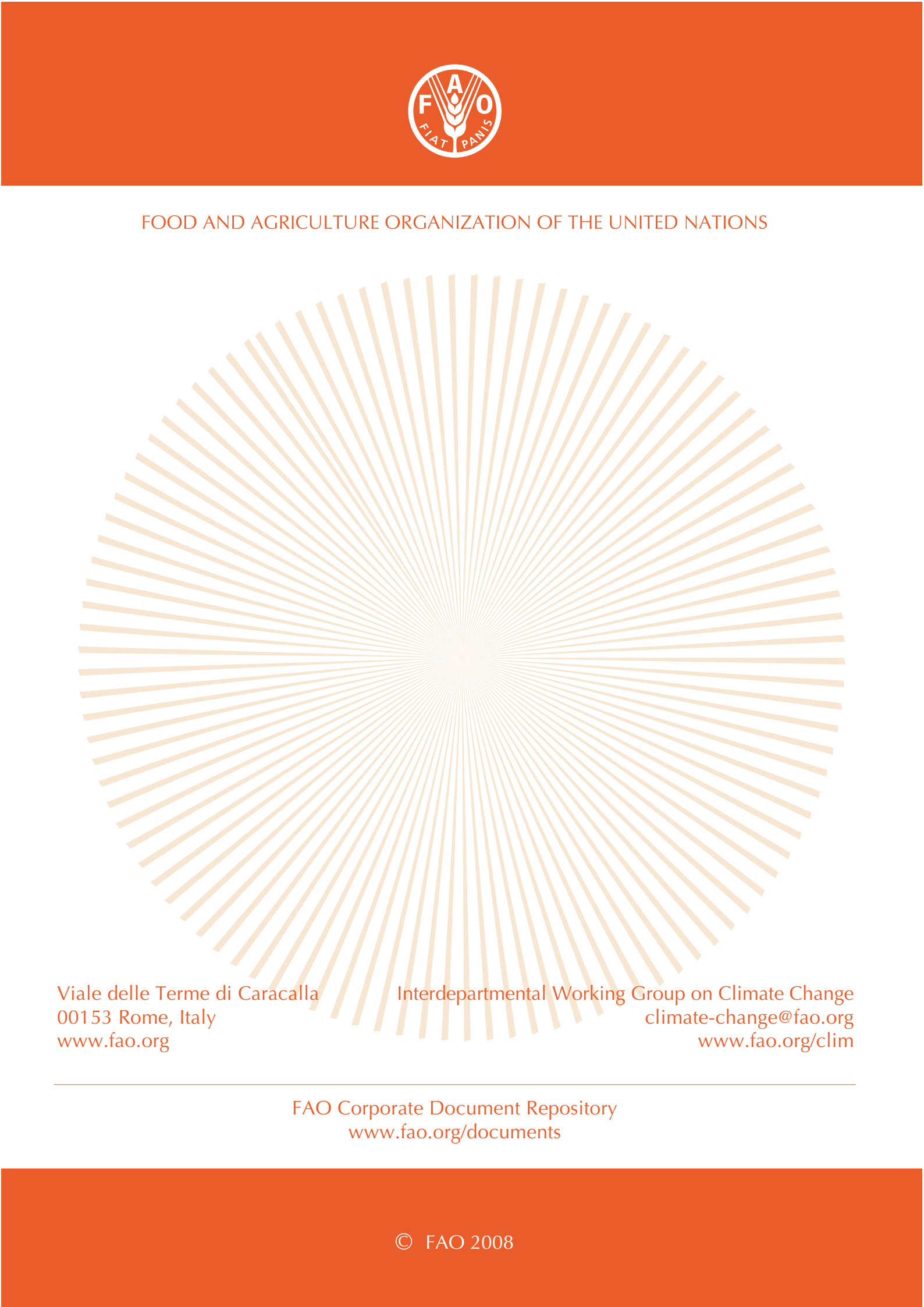
This study aims at understanding the role of local institutions and organisations in reducing people's vulnerability to natural hazards. It was based in Búzi District, where two villages, namely Munamícua and Boca, were selected for the fieldwork. Both sites still reflect the impact of the events of 2000 in the highly vulnerable livelihoods of their households. The research methodology involved multidisciplinary methods and techniques. Data was gathered from a number of institutions before the fieldwork was conducted.

www.fao.org/docrep/007/ae079e/ae079e00.htm

Sharing lessons – Hazard Risk Preparedness in Agriculture: Good Practice Examples from South and South East Asia (2007)

In the recent past, most Asian countries have greatly improved their capacities to monitor hazards and to warn, evaluate and provide emergency relief to victims of disasters. As a result, the number of lives lost to disasters such as floods, storms and extreme temperature has decreased significantly. However, the vulnerability within the agriculture sector has continuously increased due to its high level of exposure.

ftp://ftp.fao.org/docrep/fao/010/ah831e/ah831e.pdf



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