STATUS AND PRIORITIES OF SOIL RESOURCES IN EAST AND CENTRAL AFRICA

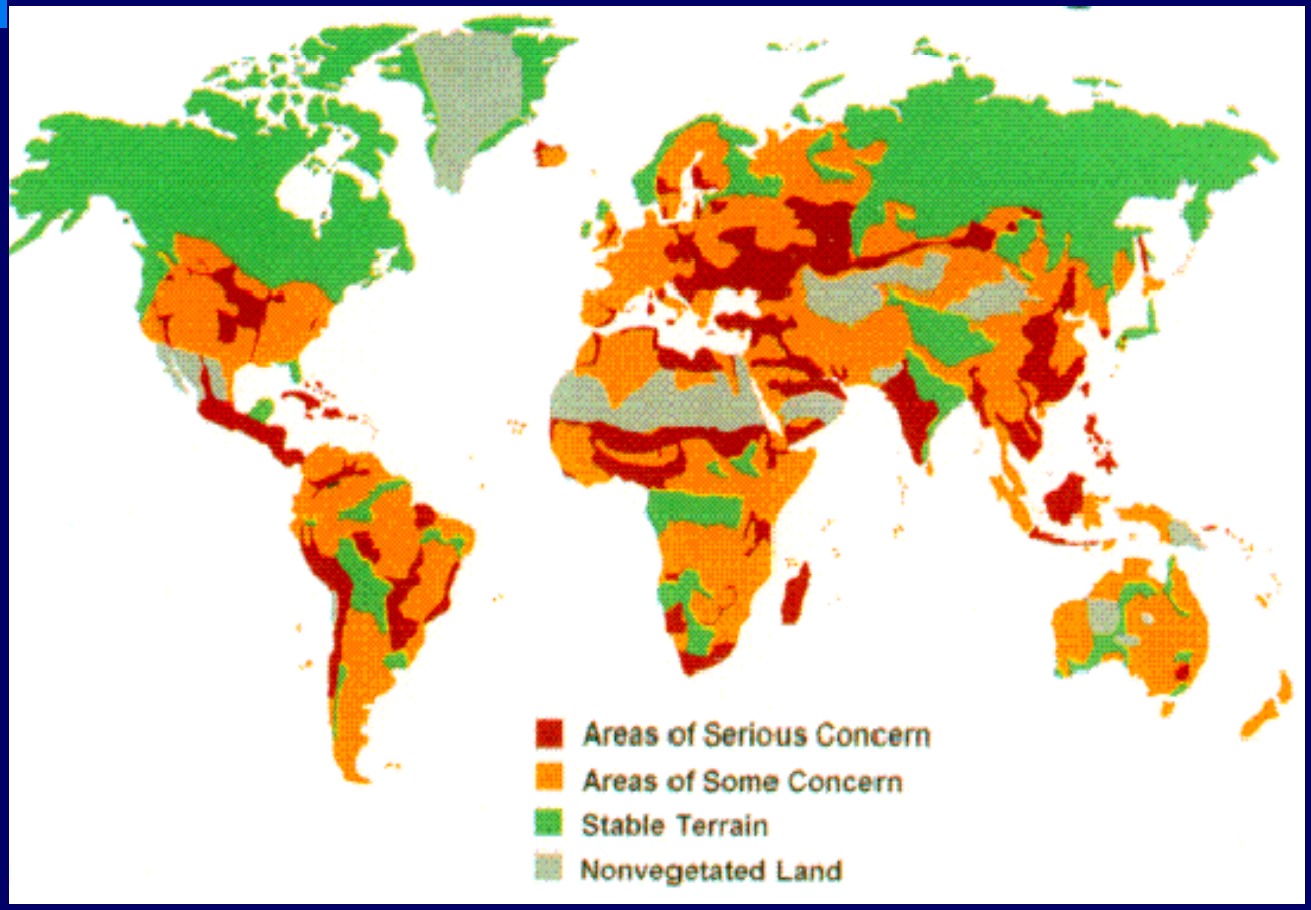
PRESENTATION OUTLINE

- Introduction
- Priority ranking of NRM thematic areas
- Priority ranking of NRM strategic interventions
- Proposed soils strategic interventions

INTRODUCTION

- Land degradation is a severe problem in the densely populated highlands of ECA
- Soil fertility degradation has been identified as the single most important constraint to food security in Sub-Saharan Africa (SSA)
- Restoration of soil productivity is a major challenge to national governments, regional bodies, research, development and donor communities (Sanchez, 2002).

AREAS OF MAJOR CONCERN FOR SOIL DEGRADATION.



LAND AND BIODIVERSITY DEGRADATION

DEGRADED RANGELANDS IN KENYA

CHAIN REACTION OF DEGRADATION

More people:

→ **more crops & livestock on marginal lands**

→ **Soils and biodiversity degraded**

INTRODUCTION

- All the ECA countries depend largely on agriculture and the new “Vision for African Agricultural Research” developed by FARA and its member organizations calls for an annual growth rate of 6% in agricultural productivity by 2020 in order to achieve sustainable development in general (FARA, 2003).

INTRODUCTION

Key factors causing low agricultural productivity, widespread poverty and food insecurity in the region include

- soil erosion caused by cultivation on steeply sloping terrain
- mining of soil fertility through continuous cultivation with limited application of inorganic or organic sources of soil nutrients
- deforestation and overgrazing of rangelands
- insufficient nutrient replacement

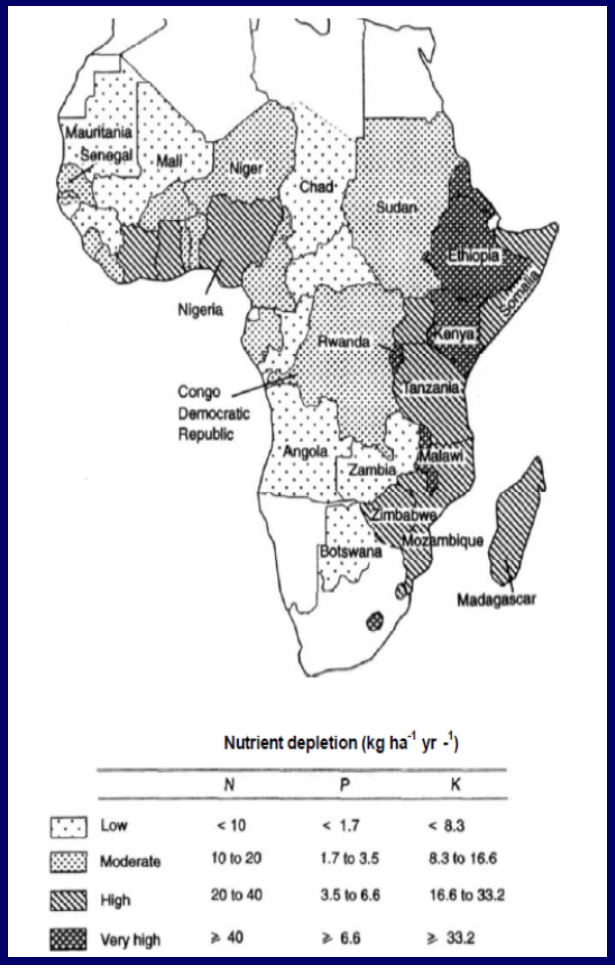
INTRODUCTION

- Assessments of nutrient stocks and nutrient flow studies in the region have shown large negative balances for major nutrients in many locations and farming systems
- N, P, and K balances for 13 countries in SSA had negative trend with about 200 million ha of cropland having lost 660 kg N ha-1, 75 kg P ha-1 and 450 kg K ha-1 in the last 30 years with high to very high depletion rates in ECA
- Use of fertilizer in the region is among the lowest in the world, with average applications of only 9 kg per ha

FERTILIZER USE IN SELECTED COUNTRIES (KG/HA)

COUNTRY			
	2000	2006	2008
Netherlands	578	323	269
USA	105	119	103
South Africa	51	54	50
Kenya	32	33	33
Malawi	16	41	-
Tanzania	6	7	6
Mozambique	4	5	0
Uganda	0.4	1.4	3.4

Classification of soil nutrient balances for the arable land of sub-saharan africa.



Nutrient depletion (kg ha^{-1} yr $^{-1}$)

	N	P	K
Low	< 10	< 1.7	< 8.3
Moderate	10 to 20	1.7 to 3.5	8.3 to 16.6
High	20 to 40	3.5 to 6.6	16.6 to 33.2
Very high	⩾ 40	⩾ 6.6	⩾ 33.2

INTRODUCTION

- Extensive areas of salt-affected soils exist in Sudan, Ethiopia, Tanzania and Kenya, especially in irrigation projects.
- These soils require reclamation to enhance productivity.
- Large areas of most countries in the region also have Vertisols. These soils are inherently fertile but have poor drainage and workability problems.
- Minimizing these constraints would enhance soil productivity.

INTRODUCTION

- Past research has generated soil fertility technologies with potential for increasing rural incomes and food production.
- However, uptake and utilization of these technologies has been low

MAJOR CHALLENGES

- How to reverse degradation of soil through the development of integrated and sustainable practices for managing soil, soil water and nutrients
- How to enhance adoption of best-bet integrated soil fertility management technologies
- How to build the capacities of researchers, extension officers, farmers and other stakeholders to package and disseminate ISFM knowledge, information and technologies

OPPORTUNITIES

- Update soil resource data bases to facilitate specific management decisions at farm, national and sub-regional levels
- Develop, validate and disseminate improved ISFM packages
- Enhance decision-support systems based on improved knowledge and information management practices for different soil types with focus on problematic soils such as acid soils, salt affected soils and Vertisols.

PRIORITY RANKING OF NRM THEMATIC AREAS

RANK	THEME	MEAN SCORE (%)
1	Improved water productivity and management in agricultural systems	70.90
2	Enhancing sustainable management of forestry, agro forestry and biodiversity for improved livelihoods and environmental services	70.00
3	Managing the productive potential of soils	67.70
4	Institutions and governance for sustainable NRM	66.10
5	Managing fragile and dryland ecosystems for sustainable livelihoods	65.70
6	Adaptation to climate variability and mitigation of climate change	65.40

PRIORITY RANKING OF NRM STRATEGIC INTERVENTIONS

RANK	STRATEGIC INTERVENTION	SCORE (%)
1	Promote utilization of integrated soil fertility management technologies for major food and high value crops	61.10
2	Enhancing water productivity for multiple use	60.20
3	Integrated watershed management in major river basins	60.20
4	Up scaling best-fit water harvesting, storage and delivery technologies and practices	59.40
5	Up-scaling and out-scaling of successful innovations and community empowerment in NRM	57.20

PRIORITY RANKING OF NRM STRATEGIC INTERVENTIONS

RANK	STRATEGIC INTERVENTION	SCORE (%)
6	Developing and adapting technologies and innovations to combat the risk of desertification	56.50
7	Mainstreaming technologies and innovations in forestry and agro forestry resource management for sustainable livelihoods	56.00
8	Support formulation of appropriate incentive systems to accelerate adoption of and sustainable investment in best-fit innovations for natural resource management	55.50
9	Domestication of high value agro forestry species and conservation of forest genetic resources	54.90
10	Responding to emerging climate change mitigation-related markets (carbon, biofuels, environmental services) to benefit rural	54.50

PRIORITY RANKING OF NRM STRATEGIC INTERVENTIONS

RANK	STRATEGIC INTERVENTION	SCORE (%)
11	Develop and promote technologies, policies and practices for adaptation to climate variability	54.30
12	Management of problematic soils for improving agricultural productivity	53.70
13	Establish and respond to the influence of globalization, trade liberalization and markets on natural resource management and innovation systems	52.20
14	Promotion of economic instruments for sustainable forest resource management	51.80
15	Advancing policies, institutional innovations and capacity for sustainable and equitable management of forest ecosystems and agro forestry best practices	51.20
16	Promoting options for	51.00

PROPOSED SOILS STRATEGIC INTERVENTIONS

- Promoting utilization of integrated soil fertility management technologies for major food and high value crops
- Management of problematic soils for improving agricultural productivity
- Management of cropping and conservation tillage systems

IMPROVED LAND, NUTRIENT AND WATER MANAGEMENT

UP-SCALING WATER HARVESTING AND INTEGRATED NUTRIENT MANAGEMENT TECHNOLOGIES

THANK YOU