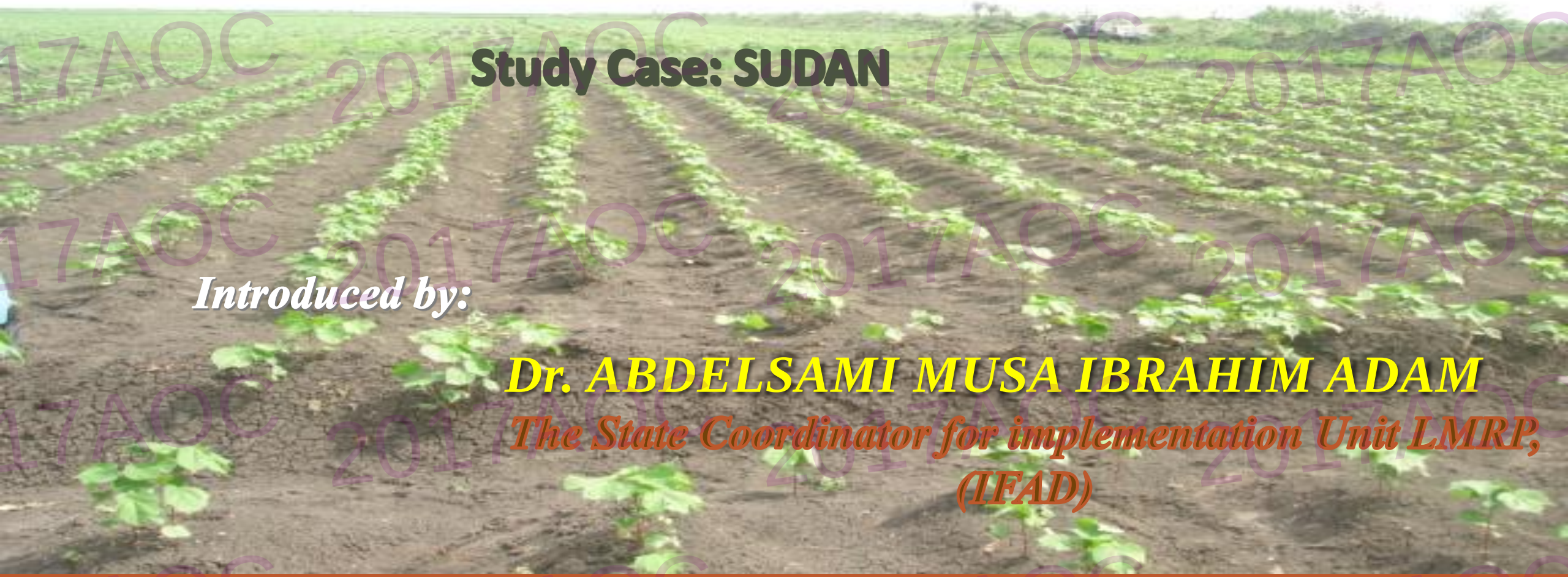
Challenges of Agricultural Resources & Environment



Study Case: SUDAN

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Presentation Outlines

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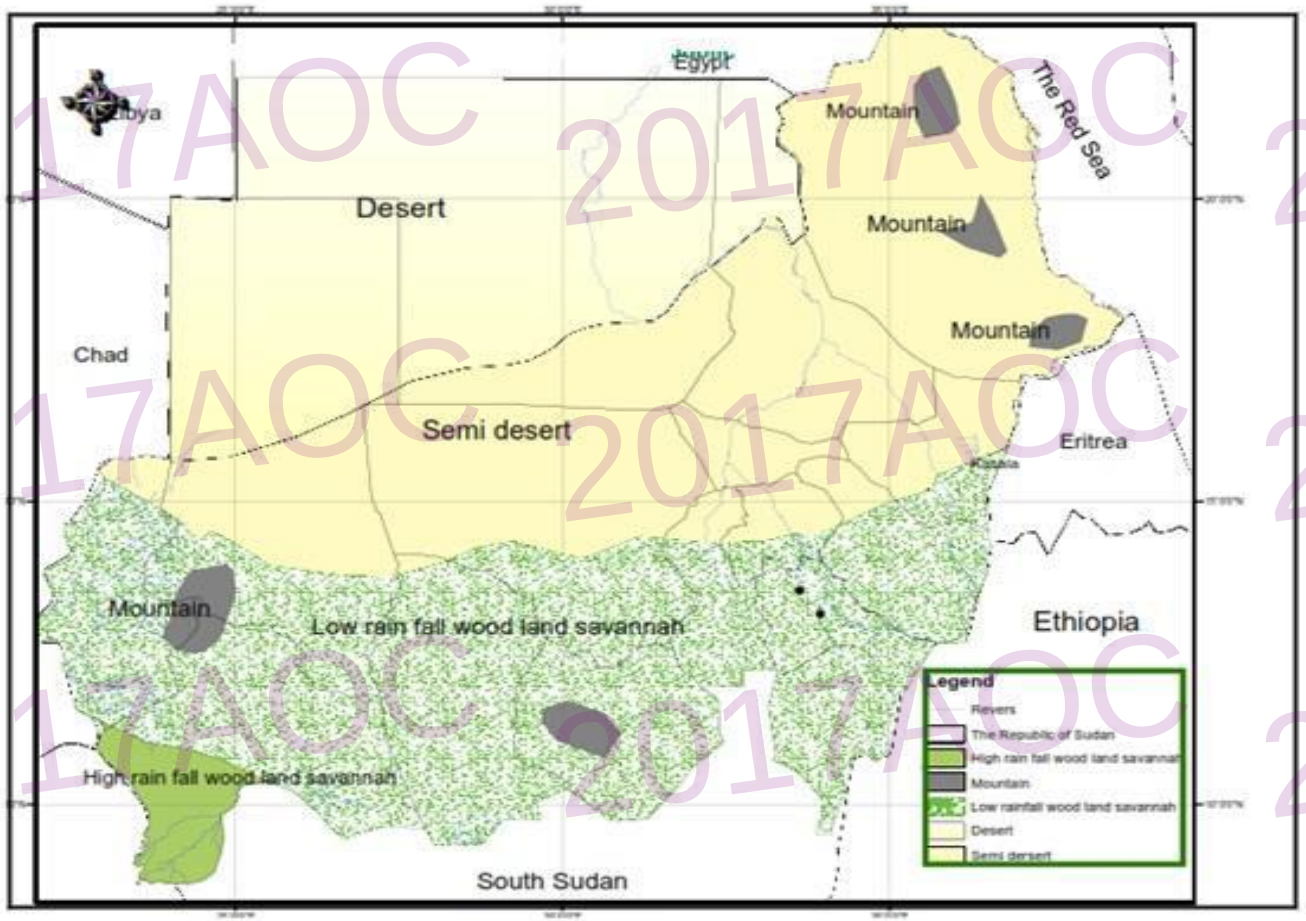
Agro- Ecological Zones of Sudan

A. Sudan lies in northeast Africa between latitudes 40° and 22°north and longitudes 22°and 38° East. The country is traversed by the River Nile and its tributaries which have varying degrees of influence on irrigated agriculture and livestock production systems.

B. There are also a large number of seasonal rivers and water courses; large ones, such as the Gash and Baraka, originate within the Ethiopian highlands, form two inland deltas in Sudan, and are important for flood irrigation agriculture.

C. Also, there is a vast resource of groundwater, estimated at about 9000 billion m^3, which has a varied distribution, quantity and quality in different parts of the country, with the Nubian Sandstone aquifer the most important.

Ecological classification of vegetation cover of the republic of Sudan



Ecological zones

Harrison and Jackson (1958) have distinguished the following three main ecological zones:

Desert Zone

It receives an annual rainfall of zero to 75 mm and is only used for short periods by camels and sheep in good years of rainfall.

The Semi-Desert Zone

This zone Covers the northern parts of North Darfur, West Darfur and North and West Kordofan, the northern limits of the White Nile, Gezira, Khartoum, Gedarif, Kassala, Red Sea, River Nile and the Northern states. Annual rainfall varies from 75-300 mm.

The vegetation is valuable for grazing and its distribution is more related to soil types rather than rainfall. The characteristic dominant woody species are Acacia sp. While the dominant grass cover is a mainly annual with a few perennials.

Woodland Savanna

This is the largest ecological zone and it covers large expanses in Kordofan, Darfur and the Blue Nile states. The annual rainfall varies from 300-800 mm. Some valuable grazing areas are found in Southern Darfur and Kordofan states.

Desertification in Sudan

Sudan with its large area and diversified ecosystems reflects different types of land use. The intensive use of the available resources has led to the appearance of the problem of desertification.

Causes and Extent of Desertification

- **Overgrazing**
- **Deforestation**
- **Over cultivation, Cultivation of Marginal Lands and Irrational Use of Heavy Machinery**
- **Bush Removal and Unplanned Burning.**

Priority projects for combating desertification

- Promotion environmental awareness among all parties at different levels.
- Promotion and rational management of rural water sources through proper distribution of water points, (hafirs) and boreholes.
- Improvement and rehabilitation of degraded rangelands through reseeding, nurseries, enclosures, and rehabilitation of vegetation cover especially in the marginal areas between latitudes 10^{o} and 18^{o} N.
- Development of forest cover and afforestation through dune fixation, shelterbelts, community forests, enclosures and greening of public utilities and rehabilitation of gum Arabic belt.
- Concentration on vertical expansion of agricultural production to decrease pressure on natural resources through integrated research programmes.

Priority projects for combating desertification

- Protection of the Nile basin and its tributaries against gullying and sand encroachment.
- Conservation and development of wild life through enhancing care of the national reserves and establishment of new reserves and forest areas to protect the wild life and tourist villages with cooperation and coordination of respective authorities.
- Development and provision of energy alternatives and optimizing energy use through use of Biogas, solar and wind energy and utilizing of agricultural residues, molasses blocks, electricity and expanding use of improved stoves.

Key non-climatic factors contributing to vulnerability of rural communities in Sudan (NAPA 2007)*

- *Deep poverty levels*
- *Lack of income diversity*
- *Lack of agricultural inputs*
- *Resource mismanagement*
- *Land over-cultivation*
- *Fragile land/water resources*
- *Poor soil fertility*
- *Deforestation*
- *Natural resource conflicts*
- *Poor extension services*
- *Community displacement*
- *Poor sanitation/health services*

* Sudan National Adaptation Programme of. Action (*NAPA*) is a product of the effort of many institutions and individuals

State of Sudan's forests

- Forest cover: 20 million ha (29% of Sudan area)
- Reserved forests = 12.5 million ha (Average annual reservation rate 1.5 million) (17% of target)
- Annual deforestation rate= 550 000 ha
- Average annual afforestation rate = 6% of annual deforested area
- Forest protection (4 000 kilometer of fire lines annually)

Role of Sudan's forests in national economy

- 71% national energy consumption
- 30-70% feed for national herds
- 15% employment opportunities in rural areas
- 17% country's hard currency non—petroleum export earnings
- Total Forest contribution to 1.2 billion SDG (FAO 2005)
- 3.3 of GDP (ministry of finance)
- environmental services; ecotourism etc.

Salient features and characteristics of Sudan's forests

Mostly protective (desertified/semi-desertified North; fragile lateritic iron stone soils dissected by thousands of khors and wadis that drain into the various streams and tributaries of the W Nile water catchments and the forestry resources constitute a forest cover on the mounting slopes and the undulation terrain are of great value to the stability of the environment, water quality, etc

Unevenly distributed

Salient features and characteristics of Sudan's forests

- Have vital and prominent roles in Integrated agro-silvo-pastoral production systems (crop and animal production)
- environmental effects extend beyond administrative and political boundaries
- Exist in remote, marginalized regions where services are usually not available
- Support the majority of rural population which are mainly poor

Between 2008 and 2016 agriculture sector's contribution to GDP averaged 30 percent

- Provides a livelihood to about 65% of the population
- Employs about 57% of the national labor force
- Provided approximately 23% of export earnings in 2015 with livestock alone providing 19%

Challenges and Opportunities to Address Agricultural Growth

Sudan has the opportunity to design a livelihood approach, as well as commercial approach to developing livestock subsector …

Strategic national objectives for the livestock subsector are:

(1) Becoming more nationally self-sufficient (dairy development);

(2) Improving exports of live animals and meat (cattle, small ruminants); and

(3) Ensuring access to low-priced animal protein (poultry and egg production)

Main challenges affecting productivity of Sudan's crop subsector are …

- Low use of improved varieties.
- Low use of fertilizer and other purchased inputs.
- A weak human capital base.
- Deficiencies in infrastructure.
- Poor agricultural services.
- Unfavorable business climate.

The Main Messages …

- ✓ **Private sector–led production and marketing system, and financial services** can help to build thriving upstream (input and service supply) and downstream (agro-processing) industries.
- ✓ **Support producer organizations**—organized producers of crops as well as livestock—would benefit from agricultural services, marketing of agricultural products, and from economies of scale.
- ✓ **For agriculture to catalyze transformative growth and reduce poverty, without depleting the natural resources that sustain agricultural livelihoods**, Sudan requires a strategy that is not narrowly focused on agriculture.
- ✓ **Reforms initiated in the past have often been incomplete**, unclear, inconsistent, or partially reversed, sending very mixed signals.

Charting the way forward – specific recommendations …

1. Improve coordination in the policy and institutional environment.
2. Develop a more favorable business climate.
3. Improve land governance to attract and sustain agricultural investment.
4. Improve natural resource management for sustainable agricultural productivity:-
   - ❖ Develop a long-term institutional vision for a coordinated natural resources framework.
   - ❖ Re-examine the roles of natural resource institutions.
   - ❖ Develop participatory land-use planning and clear procedures for securing rights.

Charting the way forward – specific recommendations …

- ***Natural resources and livestock*** **–**improve the productivity and sustainability of pastoral production systems using local governance of resources
- Adopt international water resource management principles and practices
- ***Natural resources and smallholder farming*** - provide economic incentives for agroforestry, farm forestry and community forestry in mixed farming enterprise
- ***Natural resources and semi-mechanized rainfed farming*** - the policy and legal framework should support agricultural intensification
- ***Natural resources and irrigated agriculture*** - the Nile water balance requires further analysis in the context of an IWRM approach

Charting the way forward – specific recommendations …

5. **Improve Crop Productivity -** invest more in crop improvement R&D and seed supply, as well as the provision of agricultural services, including credit and quality control/regulatory
6. **Raising livestock productivity for livelihoods and value chain development** – policy and investment strategy to enhance the benefits for livelihood-oriented livestock keepers and for commercial-oriented businesses
7. **Strengthening marketing and value chain development -** strategic value addition, geographically targeted investments in livestock value chains, partnership with federal and states governments, and private sector
8. **Strengthening agricultural services** - promote a better division of public and private sector responsibilities for providing goods and services

Charting the way forward – specific recommendations …

- ***Reforms to strengthen the agricultural research system -*** a clear national policy or stable institutional framework for prioritizing, funding, coordinating, and conducting research
- ***Improve funding for agricultural research -*** diversify mechanisms for fund agricultural research, include options for contractual, competitive and user funds sources
- Diversify and broaden the focus of research – increase emphasis on downstream research activities (post-harvest value addition, agribusiness, and marketing, for example), financial services, and organizational skills
- ***Reforms to strengthen agricultural extension -*** improve the delivery of extension services by diversifying the sources of extension advice and through participatory approaches

Charting the way forward – specific recommendations …

- ***Improve the financial sustainability of agricultural extension services -*** adopt policies and mechanisms for pluralistic funding - appropriately set user fees for larger farmers
- ***Hold extension agents accountable to clients -*** the government should ensure that competition is introduced into service provision
- ***Diversify the national extension strategy -*** develop new skills relating to the management of post-harvest activities to add value (processing, storage, preservation, packaging), and marketing
- ***Strengthen rural financial services -*** Policy reforms for the financial sector should pave the way for the private sector to assume primary responsibility for providing financial services

THANK YOU