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ORGANIZING TO ADVANCE SOLUTIONS IN THE SAHEL

Natural Resources in the Sahel

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Section 1

Sahelian agriculture

1. Sahelian agriculture

Agriculture holds insufficiently utilized assets including:

- diversity of ecosystems, a potential source of diversification of production;
- availability of cultivable agricultural land (24.6% or 2 hectares only of arable land per rural capita and less than 10% of irrigable land are developed);
- importance of the regional market of nearly a quarter of a billion consumers; and
- significant productivity gains, in those areas that have benefitted from sustained incentives and enjoyed good access to markets.

1. Sahelian agriculture (bis)

a. Agricultural production (cereals)

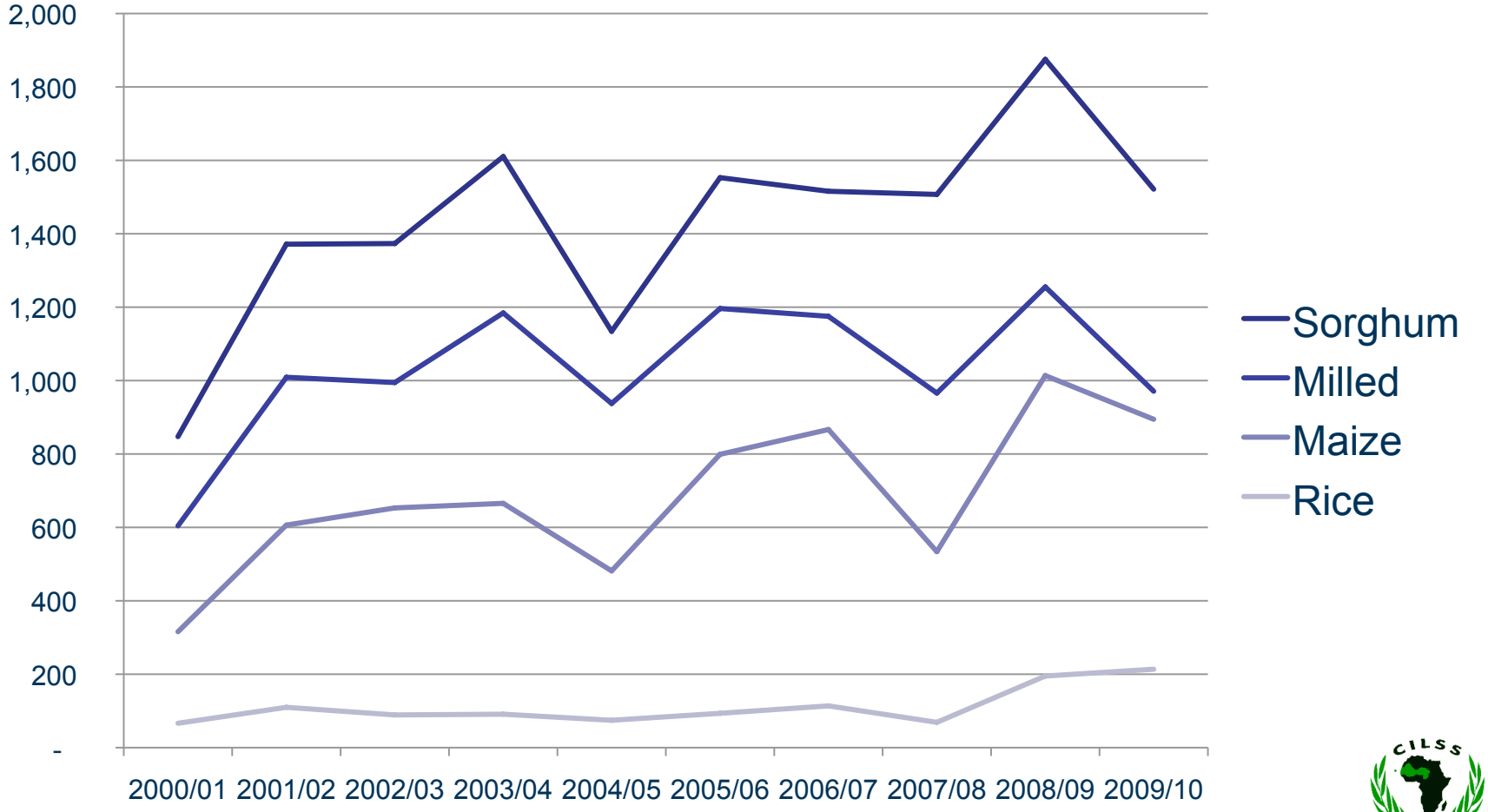
Food production has increased significantly since the mid-1980s.

Its level is currently insufficient to meet the demand.

The region is largely deficient, particularly in rice and maize, even if productions were multiplied by 2.5 and 5 respectively between 1980 and 2007.

1. Sahelian agriculture (bis)

Evolution of cereals production in Burkina Faso 2000-2010



1. Sahelian agriculture (bis)

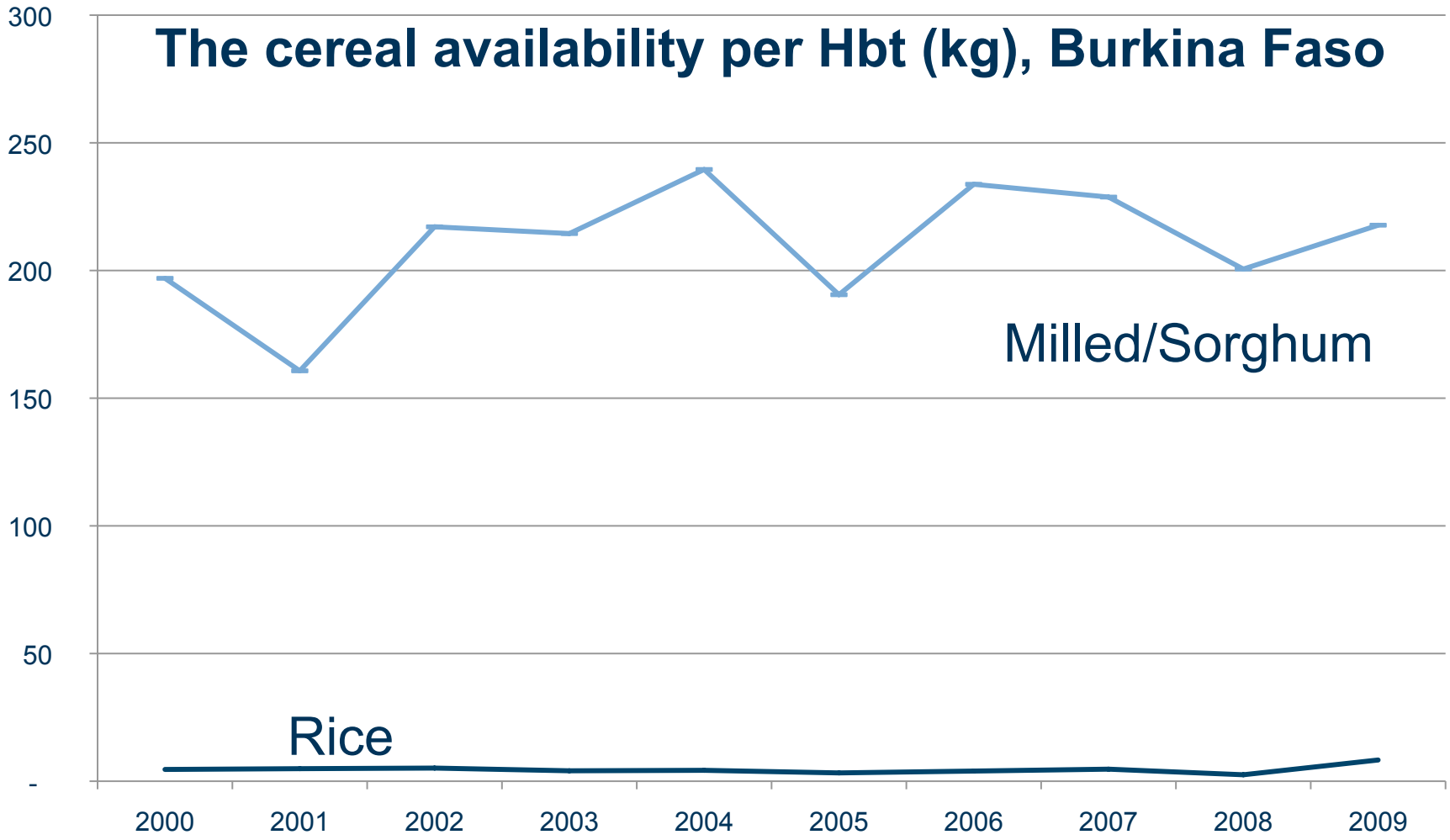
b. Food availability

Increasing yet insufficient food availability.

It increased from 2000 kcal/person/day in 1980 to 2900 kcal/person/day in 1985.

This increase is due to an increase in cereal and oilseed availability in Sahelian countries.

1. Sahelian agriculture (bis)



1. Sahelian agriculture (bis)

b. Food availability (bis)

The demographic challenge is to feed 85 million Sahelians in 2015, and 100 million in 2025, half of whom would be living in towns and getting their food supplies through the market. The moral issue is to ensure respect for the right to food for each individual, and therefore for the 17 million Sahelians who already suffer from hunger and malnutrition.

1. Sahelian agriculture (bis)

c. Degraded lands (as in Senegal, Burkina Faso and Niger)

Country	Arable lands (hectares)	Degraded lands (estimate %)
Sénégal	3, 805, 000	33 %
Burkina	9, 000, 000	11 %
Niger	14, 484, 000	27 %

Source CILSS 2004

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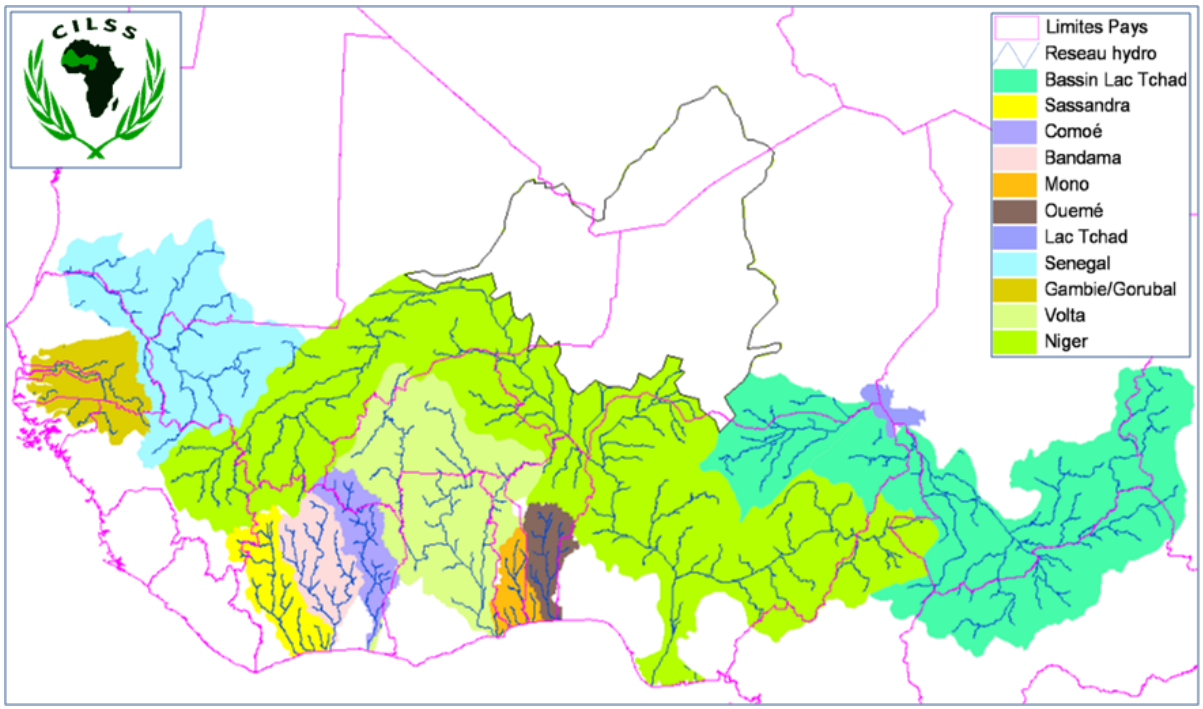
Section 2

The water situation

2. Water Resource in West Africa: Availability, management institutions, and impact on food production

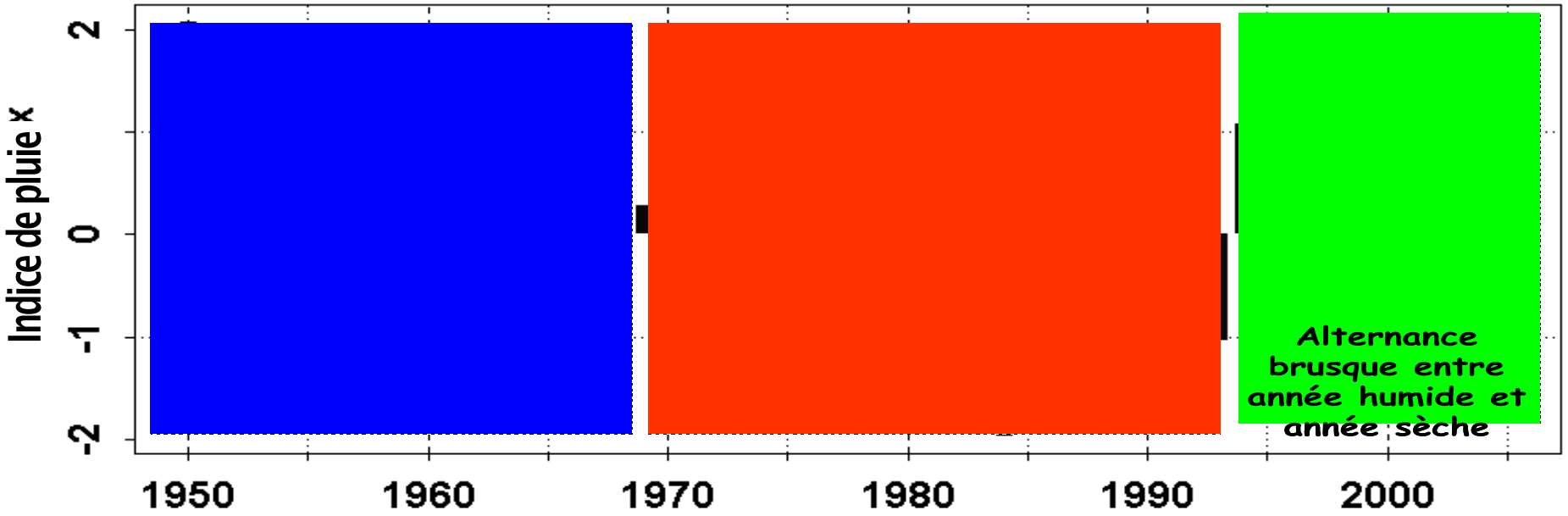


Some particularities

- ***Transboundary* river basins** in the region; High interdependence between countries (e.g., Niger and Mauritania, more than 90%);
- ***Transboundary* aquifers** (e.g., *Iullemeden*, *Taoudeni)*
- ***Very low level* of surface control**, only *5%*;
- ***High spatial and temporal variability***

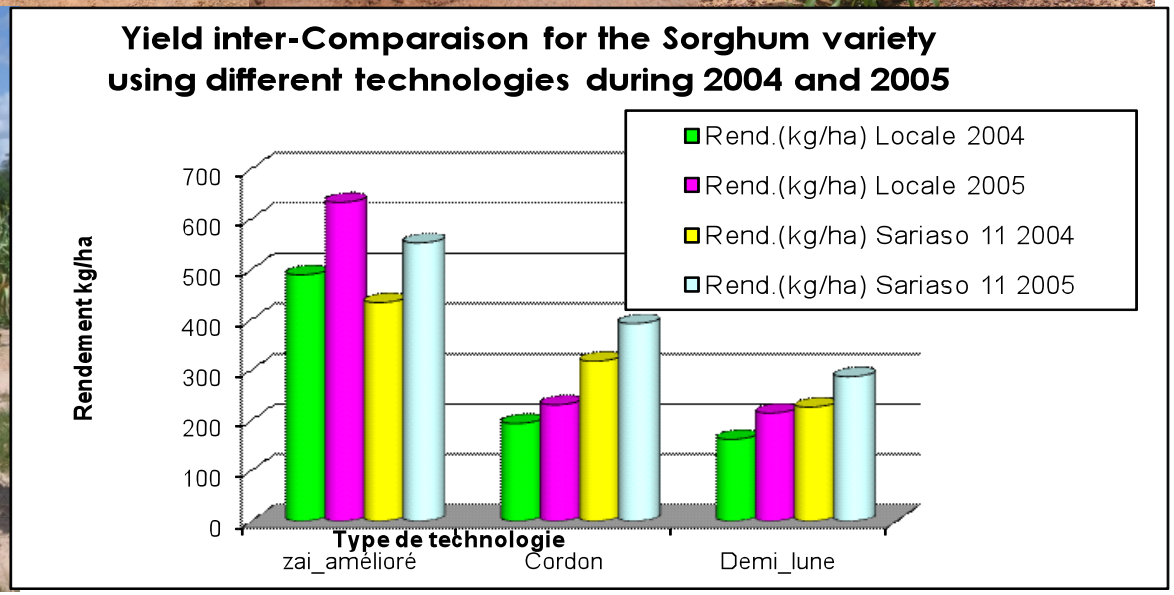
- **Institutions:** regional (e.g., CILSS/AGRHYMET), river basin organizations (e.g., NBA,OMVS,VBA,OMVG,CBLT), national hydrological and hydraulic services.
- **Missions:** better knowledge and continuous monitoring of water resources, early warning on hydrological extremes (inundation, severe low water level, water pollution, …); promote implementation of IWRM, assessment of future climate impact on water resources.

Sahel: 3 periods punctuated by increased rainfall variability



- **1950 to 1969** : persistence of humid years
- **1970 to 1993** : persistence of +20 dry years. This drought had no equivalence in its spatial dimension: it struck the entire region without exception.
- **As from 1993** : phenomenal changes between very humid years and very dry years (**disturbance**!) making the inter-annual forecasts even more difficult!

Development and promotion of good practices in terms of soil and water conservation techniques to increase food production



Soil and water conservation techniques (Zaï, half-moon, Stone bunds) are assessed to be successful experience in the Sahel and constitute relevant strategies in terms of adaptation to climate variability and change.

Lake Chad has been shrinking

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Section 3

The Migration / Population

The Migration/ Population

Understanding trends in migration and climate-related conflicts in the Sahel:

- **Migration southwards, to the cities and the coast**. In 2009, the total number of people living in urban areas worldwide has exceeded that of rural areas. What would a pastoralist go to do in a town?
- **By 2050, a 25% increase in urban population.** the traditional temporary and seasonal migratory patterns of many farmers, pastoralists and fishermen are increasingly replaced by more permanent movements southwards and to urban areas.

The Migration/ Population

Understanding trends in migration and climate-related conflicts in the Sahel (bis):

- **Environmental migrations associated with sudden disasters:** Floods can cause the loss of livestock, agricultural land and crops, homes and critical infrastructure such as water supply systems and irrigation systems.
- **Conflicts related to climate and scarce natural resources:** The recurrence of drought, combined with economic and social factors, has contributed to conflicts between certain rural populations (pastoralists, sedentary farmers and fishermen) through diversification of their livelihood practices and the search for fertile land and water.

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Section 4

Natural resources management

4. Natural Resources Management

Complex natural resource management systems combining customary structures, rules and laws inherited from the colonial era and reforms undertaken by successive governments over the decades 1980-1990 (lack of connections and duplication of these three elements were serious obstacles to a sound management of natural resources).

- **Livelihoods based on forest products:** a large portion of the Sahelian population depends on forest resources to supplement their main activity such as farming, stockbreeding or fishing. The key role of forest products: firewood and charcoal (85% of total energy consumption).

4. Natural Resources Management (bis)

- Forests also contribute to the survival of livestock during the dry season.
- The non-timber products (shea butter, rattan, gum arabic) and the wildlife resources (wild game) play an important role in food, medicines, and the constitution of revenues of local populations.

Observation: The participatory forest management through the empowerment of Forest Management Groupements (men & women) on forest management sites, increases revenues by 40% for women and 36% for men. The major part of revenues derives from the sale of firewood.

4. Natural Resources Management (bis)

About 80 percent of the developing countries population use non-timber Forest Products (NTFPs) as medicines and food. Women in low-income households are generally those that rely more on NTFPs.

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Section 5

The relationship between natural resources and food security

5. Relationship between natural resources and food security

a. Effect of the availability and Natural Resources management on the productivity and agricultural production

- poor rainfall, land degradation, insufficient use of mineral and organic fertilizers, the under-equipment, land overexploitation, overgrazing, inadequate technical training, etc.
- land tenure systems (land acquisition and ownership systems)

5. Relationship between natural resources and food security (bis)

b. Effect of the agricultural production techniques on the availability and quality of Natural Resources

- inadequate production techniques,
- overgrazing, etc

In years of low agricultural production / food insecurity (mainly due to low rainfall) people fall back on the exploitation of natural resources (abusive wood exploitation, charcoal production, overgrazing, etc.), which in turn contributes to the desert encroachment and droughts more likely.

5. Relationship between natural resources and food security (bis)

b. Effect of the agricultural production techniques on the availability and quality of Natural Resources (bis)

The forests degradation (deforestation) is therefore a serious threat for the livelihoods of millions of West Africans. Indeed, the sub-region loses 599,000 hectares of forest lands annually which correspond to an annual rate of 1.48%.

Conclusion: Some determinants of food security in the Sahel

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Regional food supply:

- Heavy dependency on the environment: Climate Change (at least 95% of food production is rain-fed), predators like the migrant locusts that the sahelian countries fall victim to.
- Factors affecting agricultural productivity and the stability of the food supply (Degradation of natural resources & soil fertility; accessibility to factors of production particularly for the small farmers; low market impact (processing, marketing), etc

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Conclusion: Some determinants of food security in the Sahel

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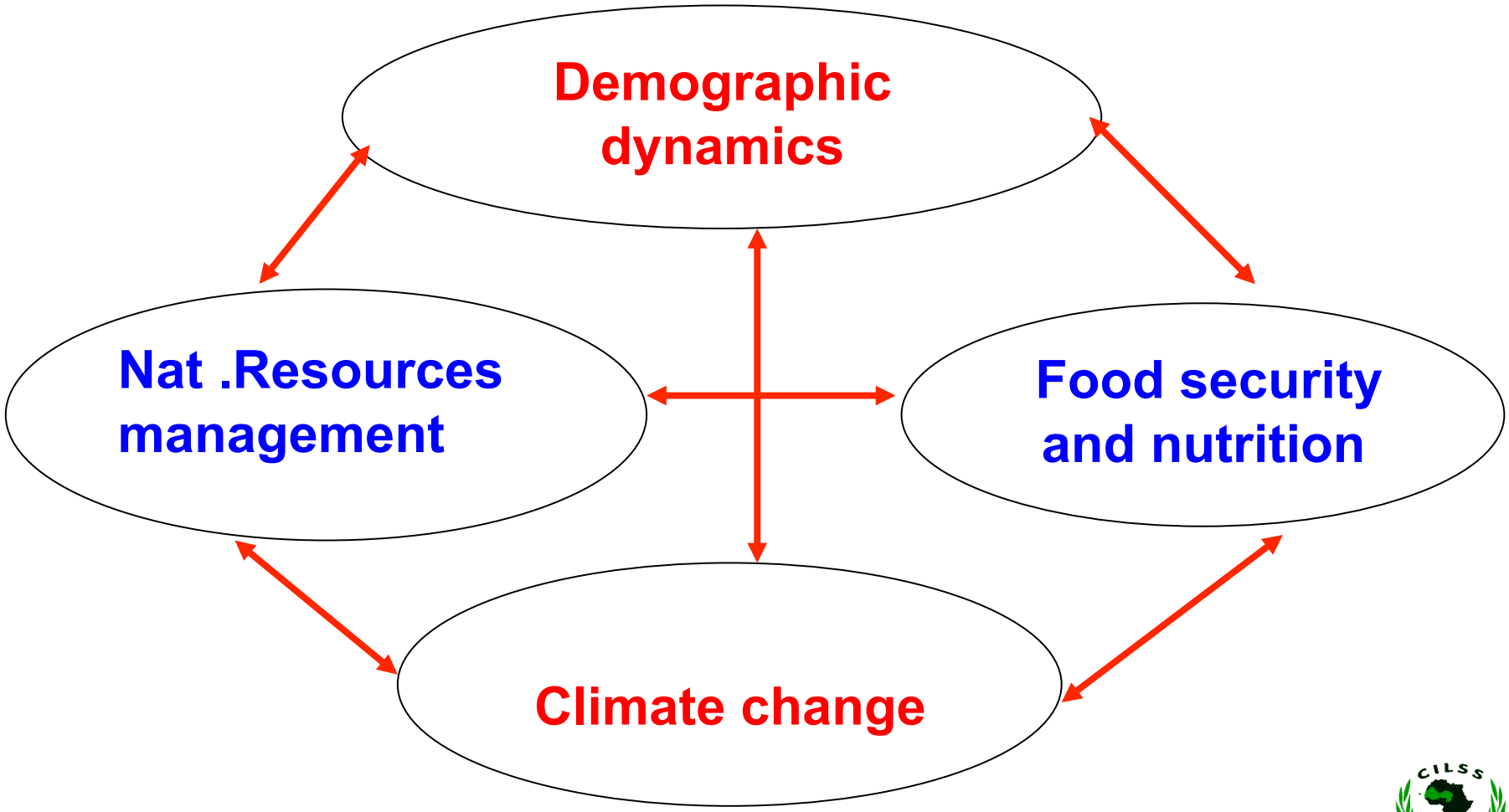
Conclusion: Some determinants of food security in the Sahel

Regarding demand: Demand is increasing very quickly: Even if the region is witnessing an increase in food production, it should be taken into account that the number of people to feed seems to have increased fast.

In the countries of the Sahel for example, the population was multiplied by about 2.4 between 1980 and 2010 (from 33 to 78 million). Regarding cereal production, it was multiplied by 1.95 (from 10.90 to 22 million tonnes).

Interdependence between population dynamics, natural resource management, food security and climate change



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