CLIMATE CHANGE in SSA

An insidious threat to Agricultural Development

Detailed proposals for action and documents

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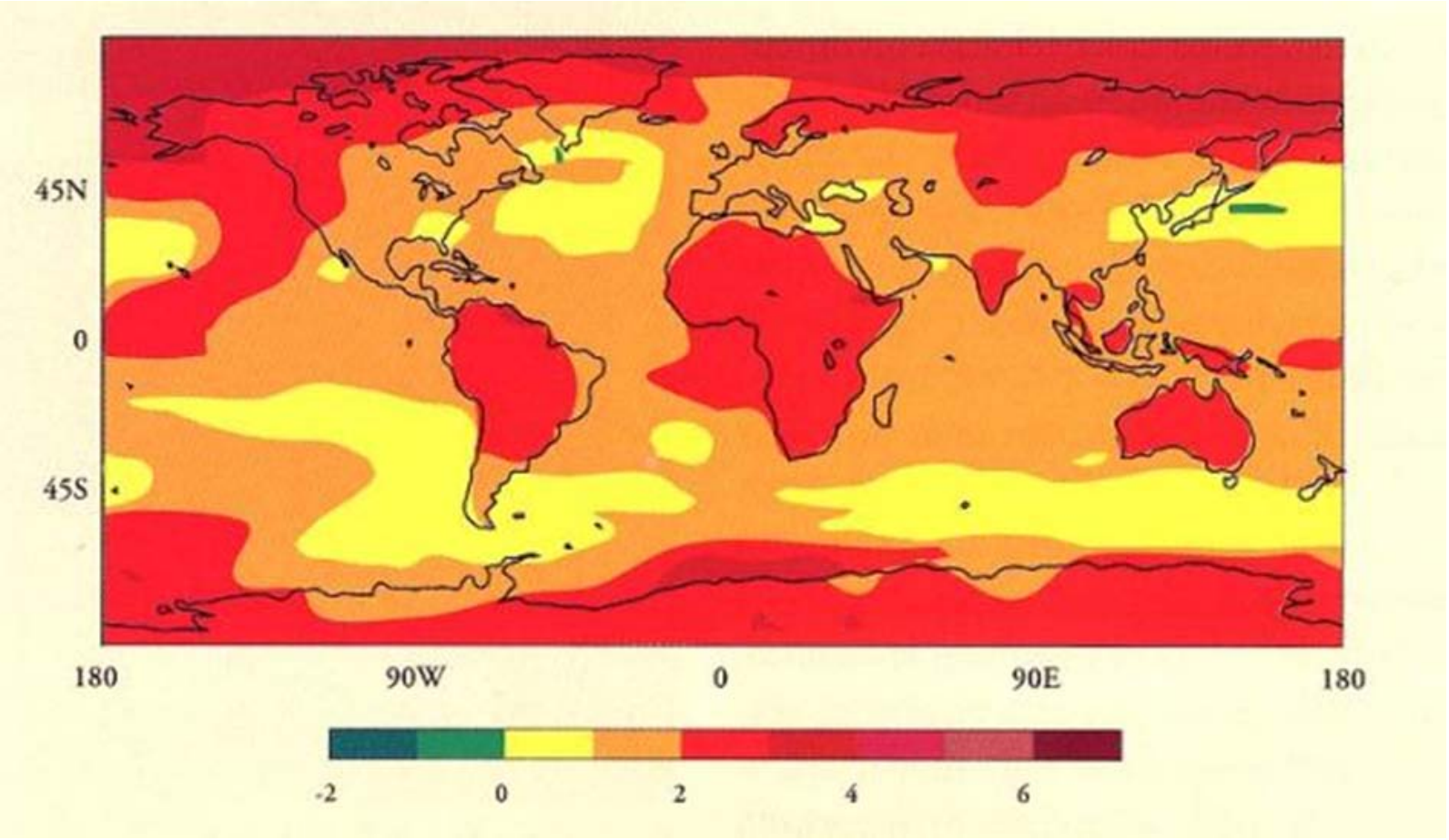
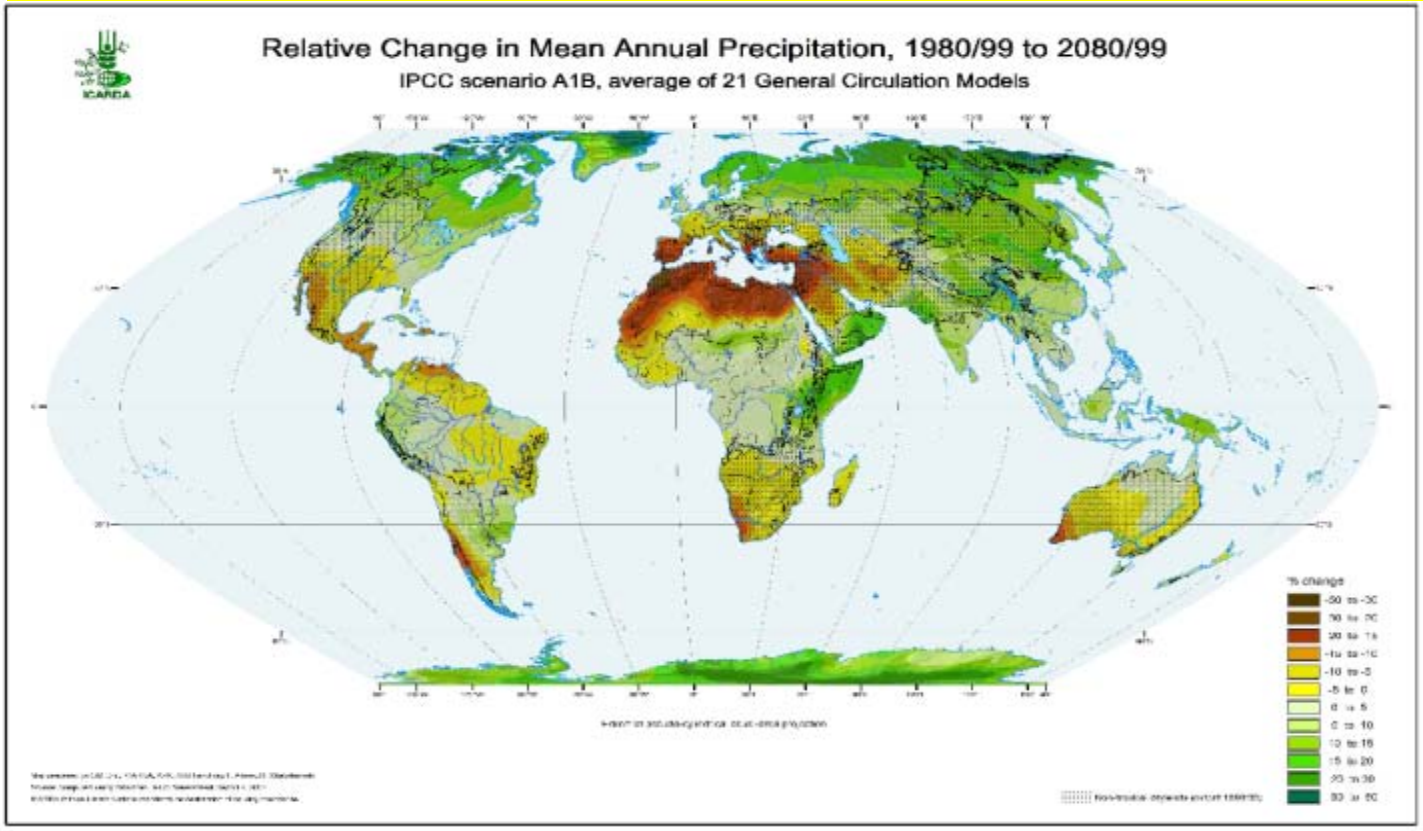
- IPCC Scenario A1B -
Average temperature increase in 2100 - ˚C



A critical impact of temperature rise is the increase of evaporation.

Long Term changes in precipitation - % IPCC Scenario A1B = modest mitigation

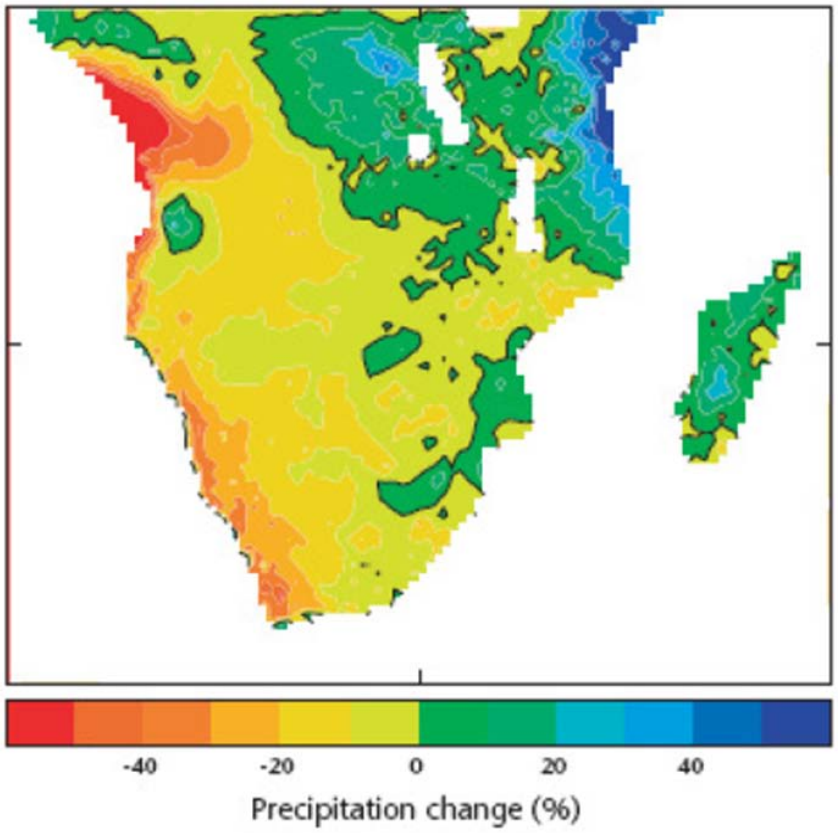
The drying up of the southern shore of the Mediterranean sea will be severe and massive and may affect the western side of Africa. Most of Southern Africa and Madagascar will dry up.



Change in mean summer rainfall over – A1B

Southern Africa for 2080

Only highlands and forest basins could be better off. The coast of Mozambique and Tanzania will be prone to strong cyclones

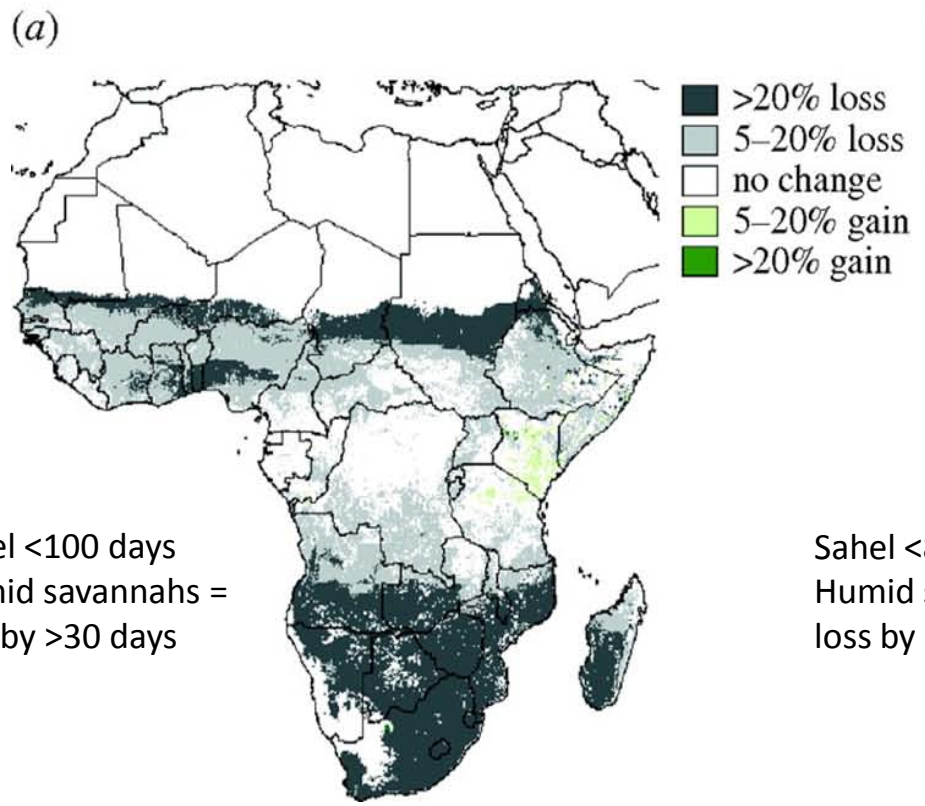


Model output from PRECIS

Length of growing period in the 2090's compared with present

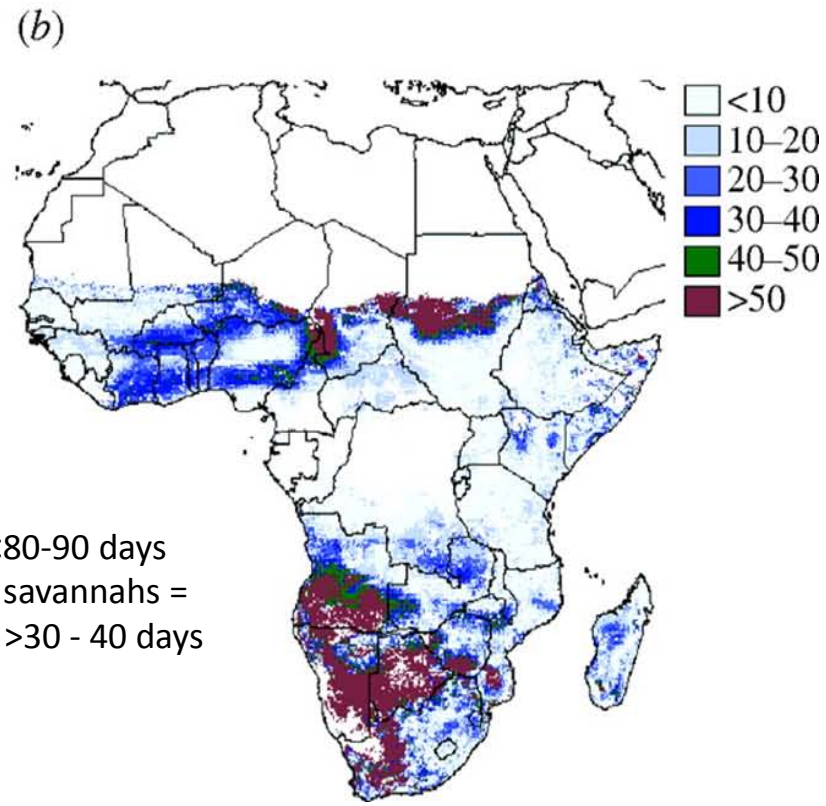
Important needs for shifting crop distribution and varietal maps

Scenario A2



Sahel <100 days
Humid savannahs = loss by >30 days

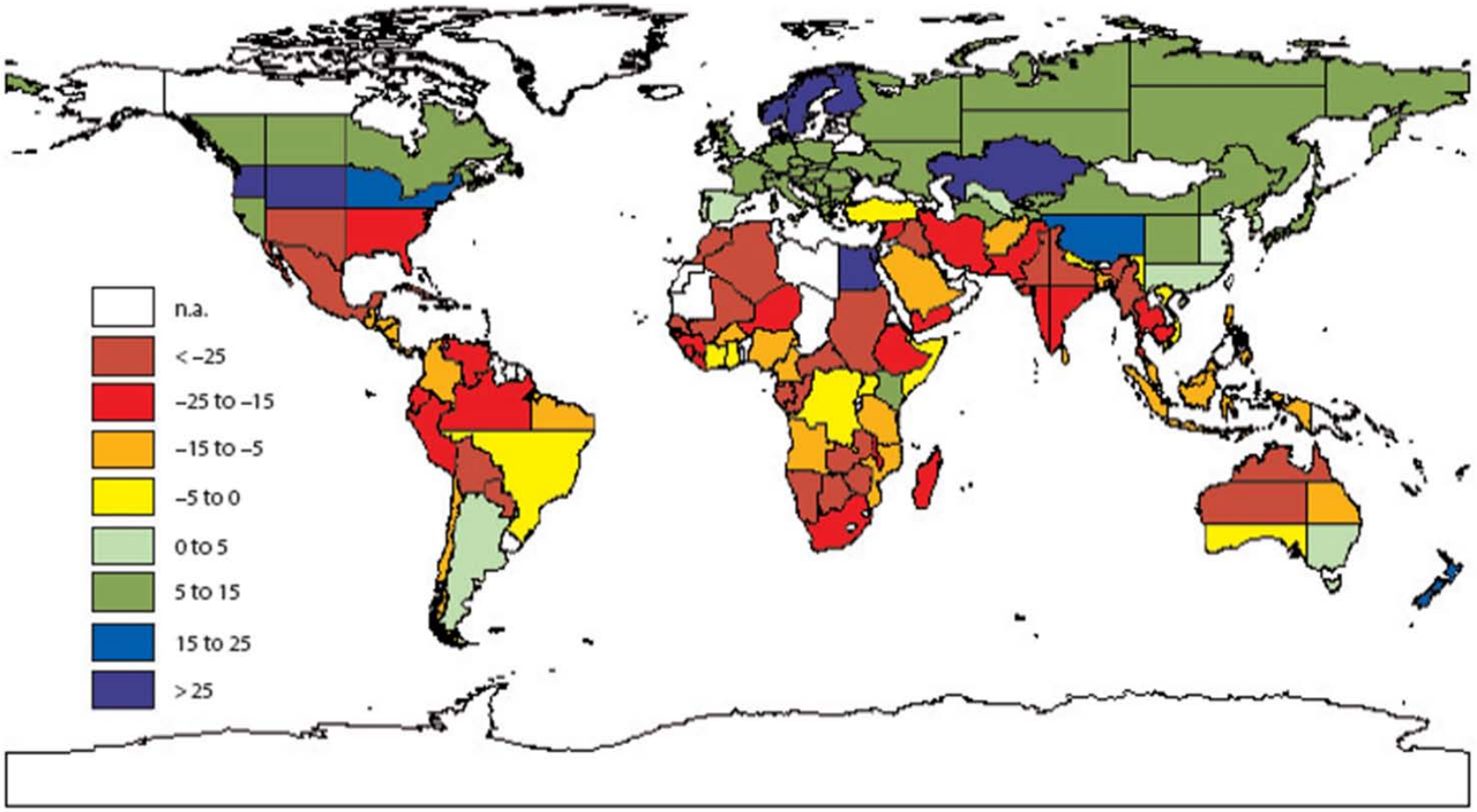
Scenario A1F1 - % loss



Sahel <80-90 days
Humid savannahs = loss by >30 - 40 days

Impact of CC on agricultural productivity by 2080 with carbon fertilization (%) – Model A1B

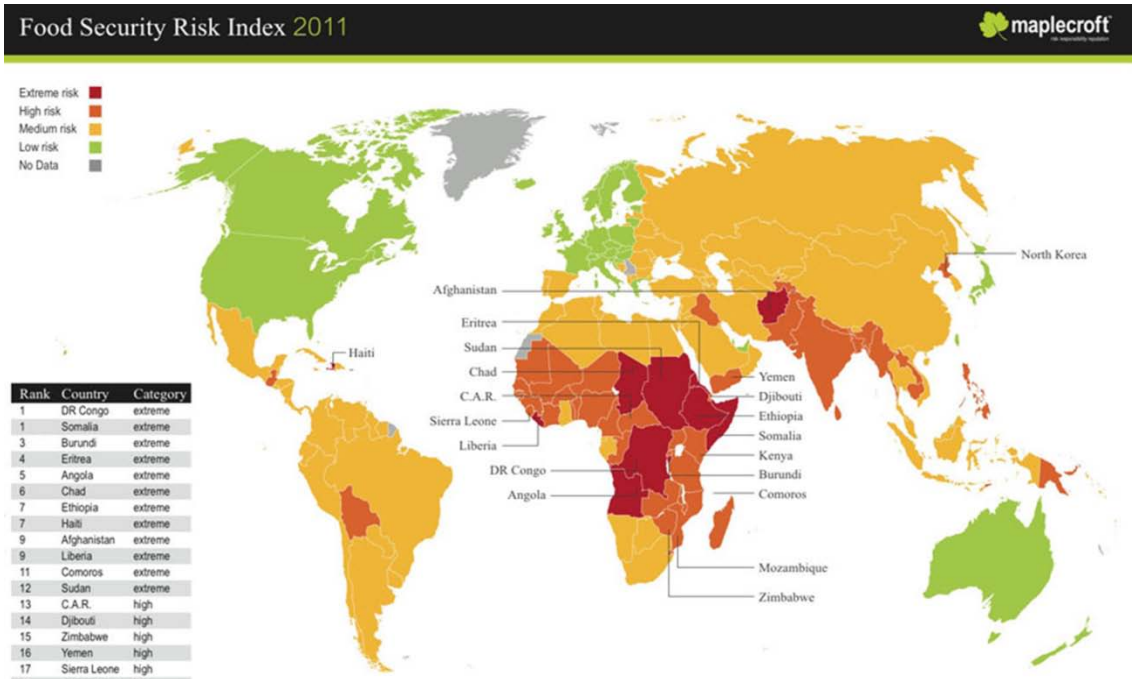
Source: W. Cline – Global Warming and Agriculture - 2007



Farming systems and techniques will shift and change to address this change model.

Food security risk index – 2011 (FAO)

A sensitivity issue



Rank	Country	Category
1	DR Congo	extreme
1	Somalia	extreme
3	Burundi	extreme
4	Eritrea	extreme
5	Angola	extreme
6	Chad	extreme
7	Ethiopia	extreme
7	Haiti	extreme
9	Afghanistan	extreme
9	Liberia	extreme
11	Comoros	extreme
12	Sudan	extreme
13	C.A.R.	high
14	Djibouti	high
15	Zimbabwe	high
16	Yemen	high
17	Sierra Leone	high
18	Mozambique	high
19	North Korea	high
20	Kenya	high

Africa is the largest food insecure area and has the largest population of hungry people.

Food security = highest ranking component in development agenda

Food production could not face demand for food

Huge changes happened in production to consumption systems in last 30 years.

SSA Millions	Mouths to feed	Agricultural population	Consumer/ agric people
1980	369	258	***1.43***
2010	820	382	***2.15***
Growth	2.22	1.48	***1.50***

The cropped area doubled, production per capita dropped, imports soared

SSA – source FAO	1980 – M t	1980 – kg/cap.	2008 – M t	2008 – kg/cap.
Cereal production	51	***138.1***	109	***139.7***
Net Cereal imports	3.9	***10.4***	20.4	***24.9***
Food imports	10	***27.3***	33	***42.2***
Food exports	8.7	***23.6***	11.2	***14.4***
Exports industrial crops	3.8	***10.2***	5.7	***7.3***

The deficit of support to agriculture generates sensitiveness

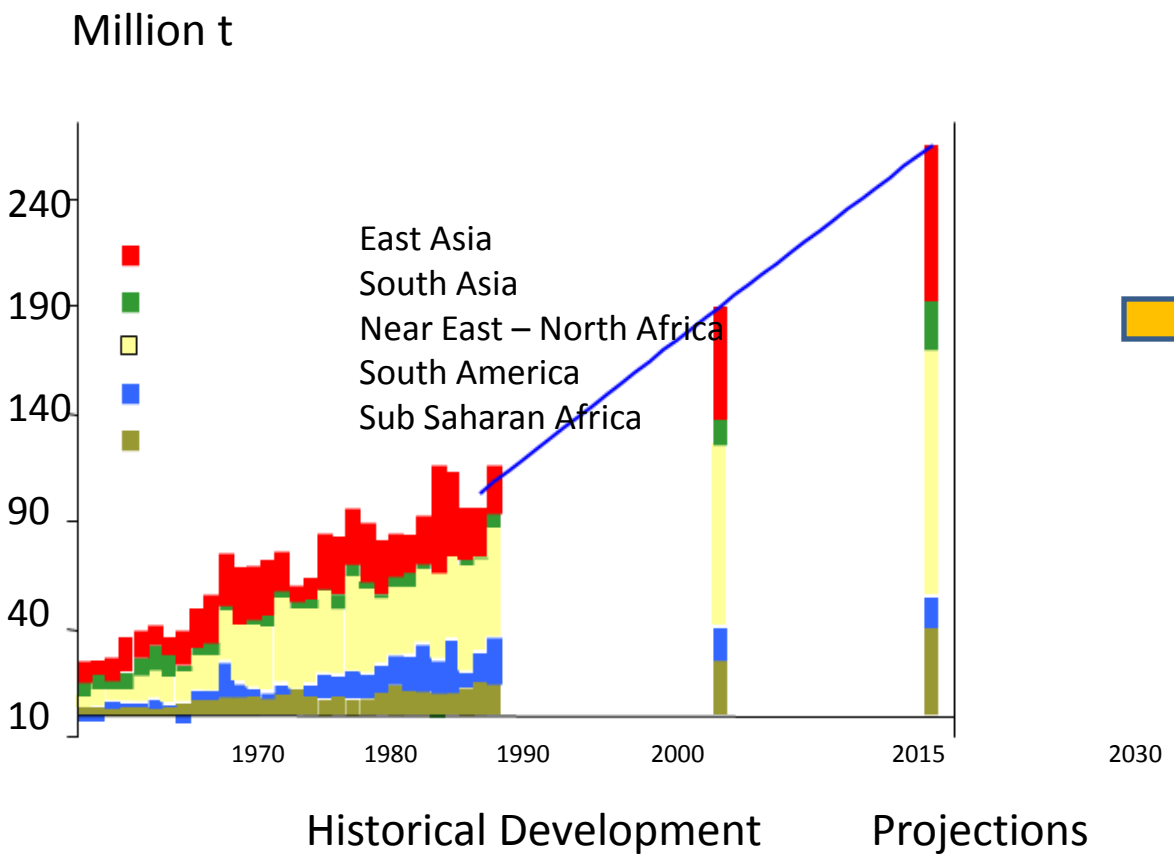
Farmers did better while farm size stagnated

Kg produced/ Agricultural people	1985	2008	Change %
Cereals	210.9	256.7	+ 22
Beans + Peas	15.6	23.9	+ 53
Oil Seeds	14.3	24.7	+ 73
Tubers + Bananas	355.9	540.6	+ 52
Fruits + Vegetables	78.8	103.0	+ 31
Perennial food crops	239.8	207.3	- 14
Non food crops	7.6	8.6	+ 13
Total average mass	922.9	1.164.8	+ 26
Ha cropped/ 10 agricultural people	**3.490**	**3.806**	**+ 9**

Small size of farm holdings is a factor of sensitiveness

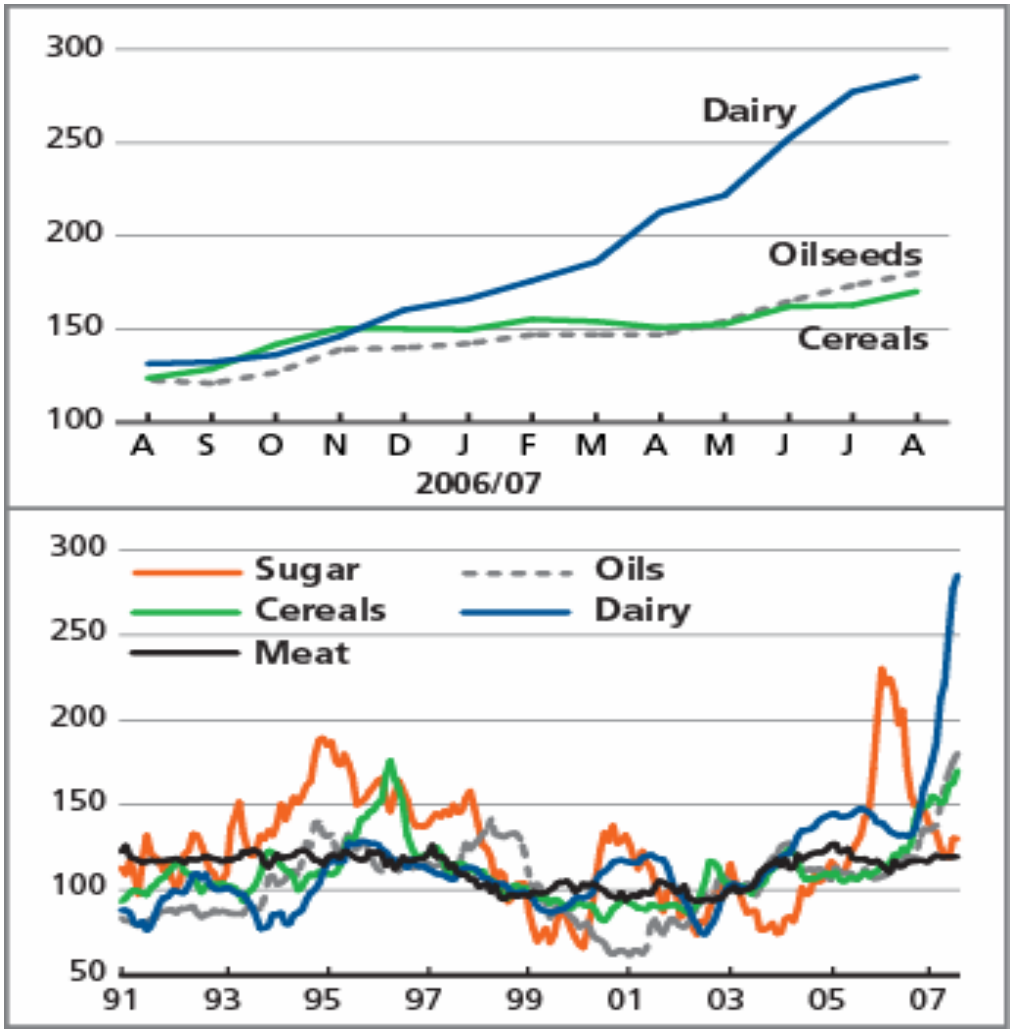
Cereal imports of developing countries 1970-2030

Sub-Saran Africa is in competition for cereal imports.
Availability for next 20 years may not follow past trends.



A medium term serious exposure

Recent volatility for international food prices



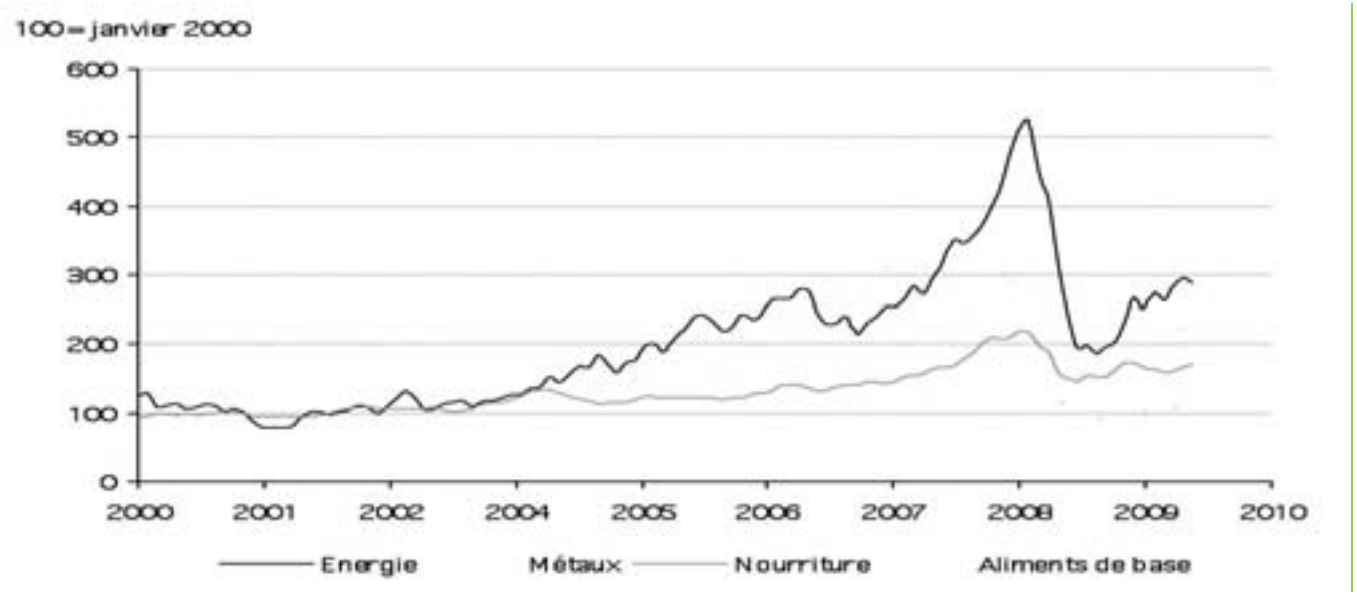
Source = FAO Food Price Index

- **Sharp increase of food prices in 2008 badly hit poor consumers.**
- **It drove also prices for locally produce food**
- **It did not help farmers get better income**

The crisis revealed the susceptibility of African food systems

Increasing energy and food prices

Energy price tripled in 10 years – Food prices increased by 80%

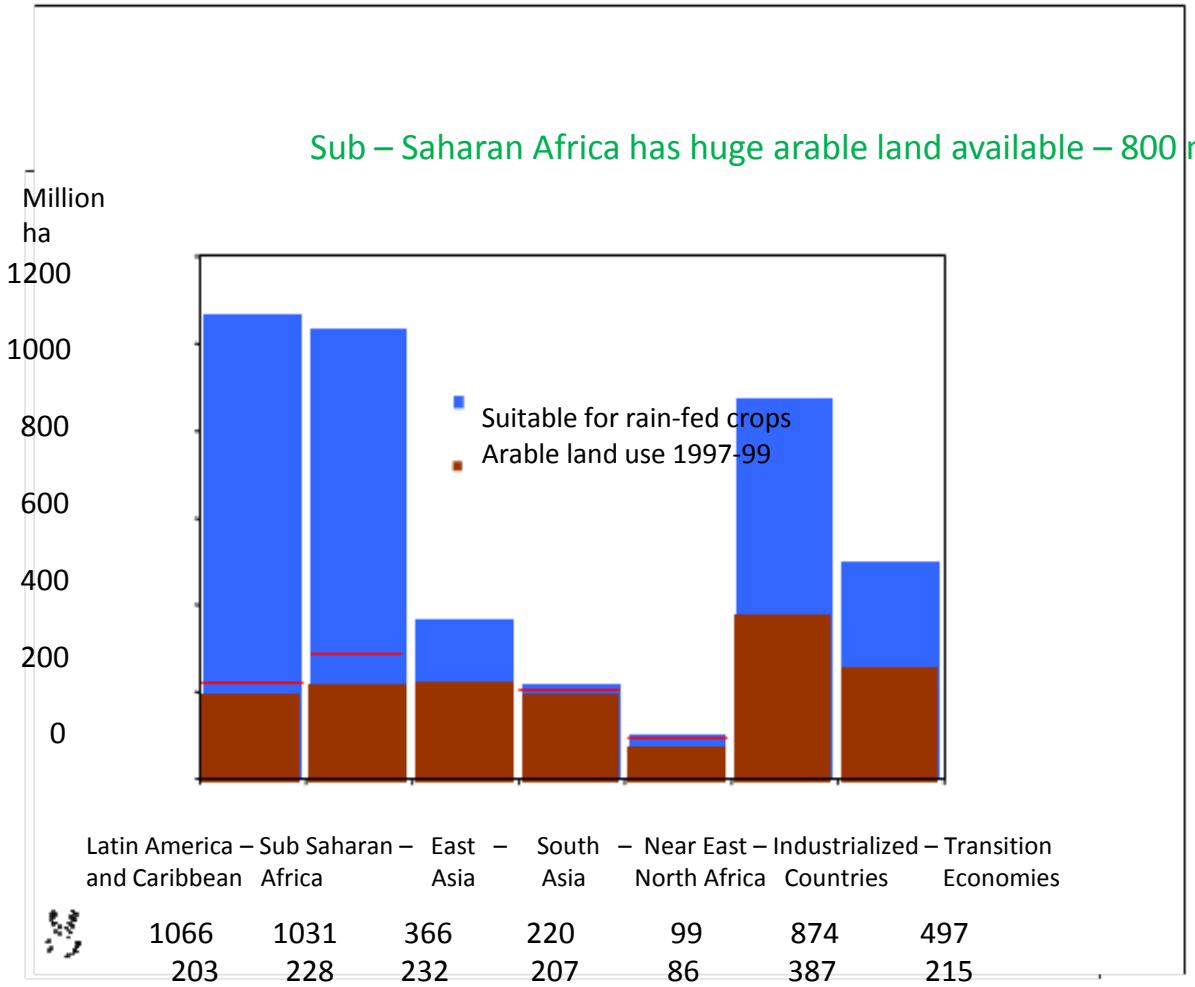


Both trends compose a major exposure to African economies

Land development potentials

ADAPTIVE CAPACITY

Sub – Saharan Africa has huge arable land available – 800 million ha



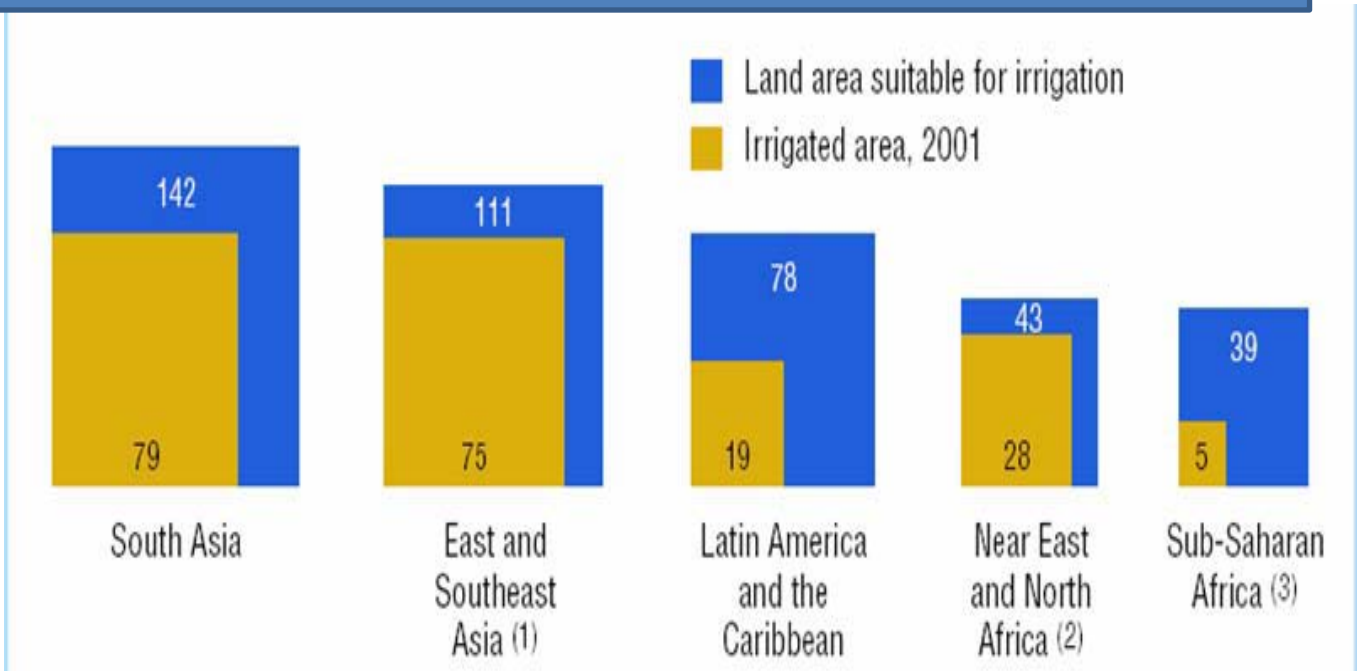
Extending cropped area for larger farms with adequate mechanization

ADAPTIVE CAPACITY

Irrigation Potentials

Huge expansion potential for irrigation

But potential is 1/3 of potential in South Asia for 3 fold more landmass.



- Plans for irrigation development at national and watershed level;
- Budget for irrigation infrastructure agreed upon;
- Water-users associations promoted; WATER EFFICIENCY FIRST
- Water pricing regulated.

Land use revisited – Greening organized

- National land use plans revisited;
- Decentralization provides rights for land development to communities within national plan orientations;
- Legal framework for participatory land use planning;
- Forests and rangelands legislation adapted;
- Land investments budget mechanisms established;
- Public – private – collectivities funding facilitated;
- Payments for ecological services organized;
- Massive greening plans formulated and implemented;
- Entrepreneurship for natural resource use supported.

Effort driven by scientific knowledge

Institutionalization of decentralized/ participatory Land Use Planning

Proposed principles

People first and participatory action plans
Government planning and budget on priority setting
Decentralization and subsidiarity
Institutional development – the rule of law

- ✓ Local land use plans orienting reforestation, greening and water harvesting;
- ✓ Agricultural expansion plans for enlarged and intensified farming;
- ✓ Community management of the commons based on fees for use;
- ✓ Settlement of wind screens and agro-parks sheltering crops;
- ✓ Community budget for land management based on users fees.

Impact

Sound use of natural resource; improved employment; Increased production; increased income; less poverty

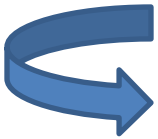
Promotion of innovative land rights

For individuals, groups, collectivities

Proposed principles

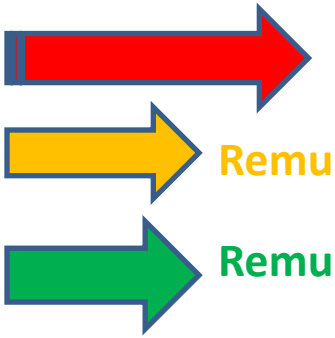
People first and participatory action plans

- Supporting the fair extension of intensified farming;
- Supporting the promotion of water harvesting on slopes;
- Supporting the harvest of spilled water in waterways;
- Promoting local markets for harvested water;
- Promoting afforestation for timber and non timber products;
- Promoting the production of fodder and feed
- Promoting the development of agro-forestry
- Promoting the development of aquaculture.



New land rights should facilitate women's development.

Certification + remuneration for ecological services



Certification by registered agents is a pre-requisite for financing.

Remuneration should be supported through users fees in communities .

Remunerations could be backed by adequate Carbon Trade arrangements.

- for conservation farming;
- for climate smart agricultural intensification;
- for increasing water productivity;
- for sustainable fodder production on rangelands;
- for sustainable agro-forestry systems;
- for developing wind screens and other sheltering initiatives;
- for conserving/ developing biodiversity;
- for GHG saving bio-energy development.

Innovative Production Chains
Value addition for mitigation efforts

Entrepreneurship supported and backed by technological and economic research

- For water harvesting and supply to farming;
- For fodder and feed production from commons;
- For timber marketing from greening efforts;
- For non timber products from greening efforts;
- For bio-energy generation from greened areas;
- For bio-energy generation from agro-wastes.

Markets finance C fixation and reduction of GHG emissions.
Markets established/ regulated for harvested water

Innovative Production Chains
Sharing risks, investments and returns

Shift from actual segmentation within production chains through contractual arrangements backed by fiscal policies;

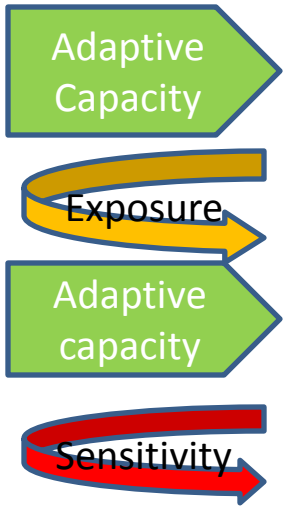
- Organize risks sharing between farmers, processors and commercial agents through insurances for agriculture;
- Organize inputs supply chains through contractual farming with public guarantees for the respect of contracts by parties;
- Organize public- private co-funding for agricultural infrastructures
- Organize innovation development platforms involving concerned stakeholders backed by public institutions (Research + extension)
- Promote quality and competitiveness – support to marketing
- Support negotiations for improved shares of return to farmers within production chains

On Farm investment program

- Access to land within contract for mechanization + intensification
- Market development in connection to production chains
- Promotion of contract farming (prices and delivery conditions)
- Food security stocks linked to marketing through warrantage
- Local rural infrastructures (roads and bridges, water, storage)
- Encouragement to diversification of farming systems
- Support to the promotion of agro-forestry/ conservation farming
- Support to shift from extensive livestock systems to integrated livestock- cropping systems – reducing methane emissions
- Crop and livestock index based insurance systems
- Agricultural credit backed by insurance systems
- Extension providing education, information and problem solving

Adaptation to climate change is inserted into a steady process of agricultural development and fuelled by combined Public and Private Investment reducing poverty, backed by institutional progress.

On farm biodiversity and vegetation cover



Large diversity of vegetation cover and large biodiversity

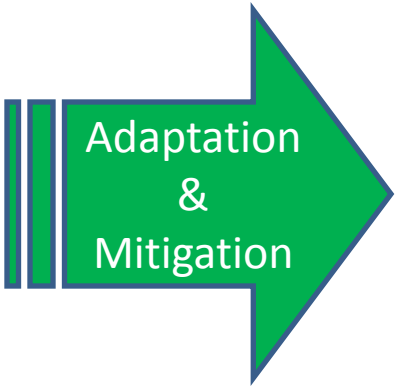
Deforestation and land degradation

Large agro-biodiversity and conserved soil fertility

Concentration on few species and breeds

Plant nutrients depletion

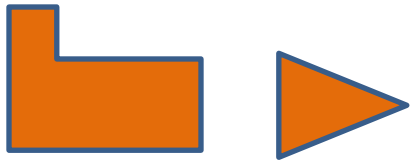
MITIGATION in agriculture is made of **- increased CO2 trapping**
- limitation of GHG emissions



Tree plantations to reduce wind, sun exposition , temperature
Vegetation cover to slow water flows on slopes and drains
Agro-forestry and conservation farming for trapping carbon
Multi- cropping and multi- cultivar systems to dilute risks
Fodder and feed production and stocks to secure livestock
Forests conservation/ rehabilitation = timber + non timber products

Research and development supported

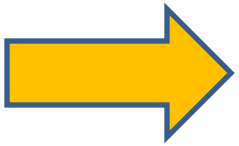
- Public budget for AR&D to reach 2% of state agriculture budget.
- Technical agricultural development institutes [TIADI] may push for local farming and territory development, extending research work by Universities and agricultural research institutions.
- TIADs will be owned by farmers' organizations and private sector of production chains and subsidies by government and donors.
- TIADs will certify adaptation and mitigation processes, supervise land use planning development and the design of investments and local infrastructures.
- TIADs will advise local and provincial governments for allocation of investments budgets to agriculture.
- TIADs would cooperate with extension institutions and NGOs.



Need for additional human resource

Farmers' organizations involved

- In applied research and development institutions
- In land use planning and extension of farming domain
- In the design/ planning of agricultural infrastructures
- In the local organization of farmers' equipment programs
- In the progress of production chains and regulation of prices
- In the substitution of imports by national production
- In the design of greening + water harvesting programs
- In the development/ management of food security stocks
- In the certification of contributions to adaptation /mitigation
- In the design of payments for ecological service



Strengthen farmers' organizations

Policy support

- **Risks management through:**

  Early warning and information

  Safety nets; food security stocks; pests/diseases control; insurance

- **Investments** (harnessing water, roads, communication)
- **Institutions and enabling environment :**

  Poverty alleviation by rural development programs

  On farm investment programs

  Land greening and biodiversity conservation programs

  Contractual development of production to consumption chains

- **Negotiating fair relationships with international markets**

  Food imports (quantities and price)

  Inputs procurement

Strengthening capacity for policy

Increased financing capacity for states

THANK YOU

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