Ministry of Agriculture, Irrigation and Livestock

AGRICULTURE Economy AND CLIMATE CHANGE

Threats & Opportunities

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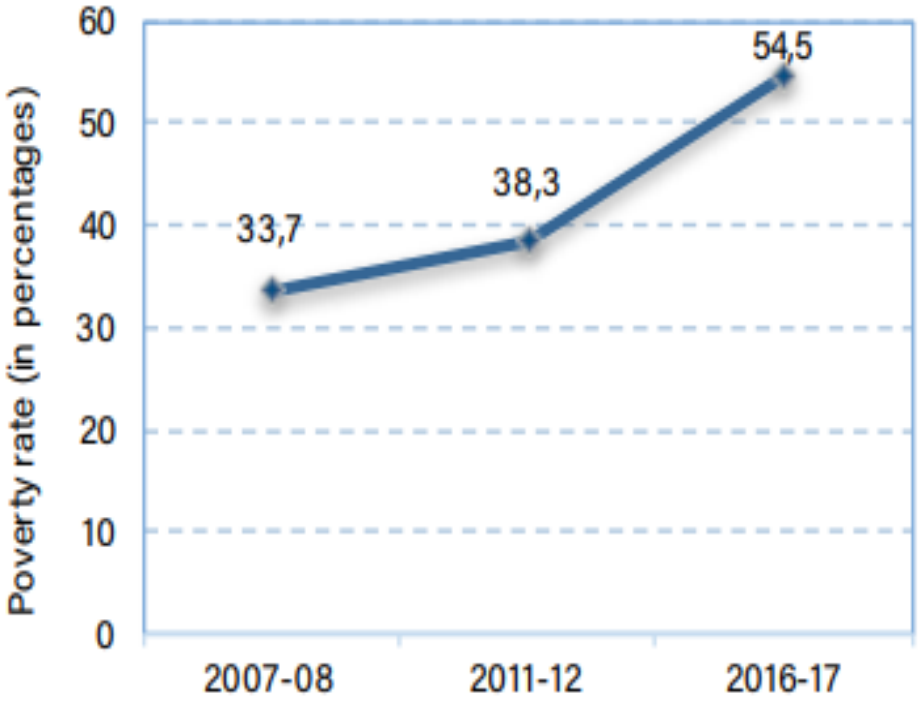
Ministry of Agriculture, Irrigation and Livestock

Key Indicators

- **Population 31.6 million,** (71.5% rural, 23.7% urban, 4.8% Kochi)
- **Employment** –to –Population ratio 41%, un-employment rate 23% (of which youth un-employment is 30.7%), under-employment rate 23.9%
- **Below poverty line** Population 54.5%,
- **Food insecure** population 44.6%,



Agriculture in Our Economy (1)

- Makes ¼ of National GDP
- Main source of income for 30%, and partial income for 50% of population
- Creates ~4 – 4.5 million jobs (on and off-farm) – over 60% workforce
- Agro-processing accounts for over 90% of total manufacturing.

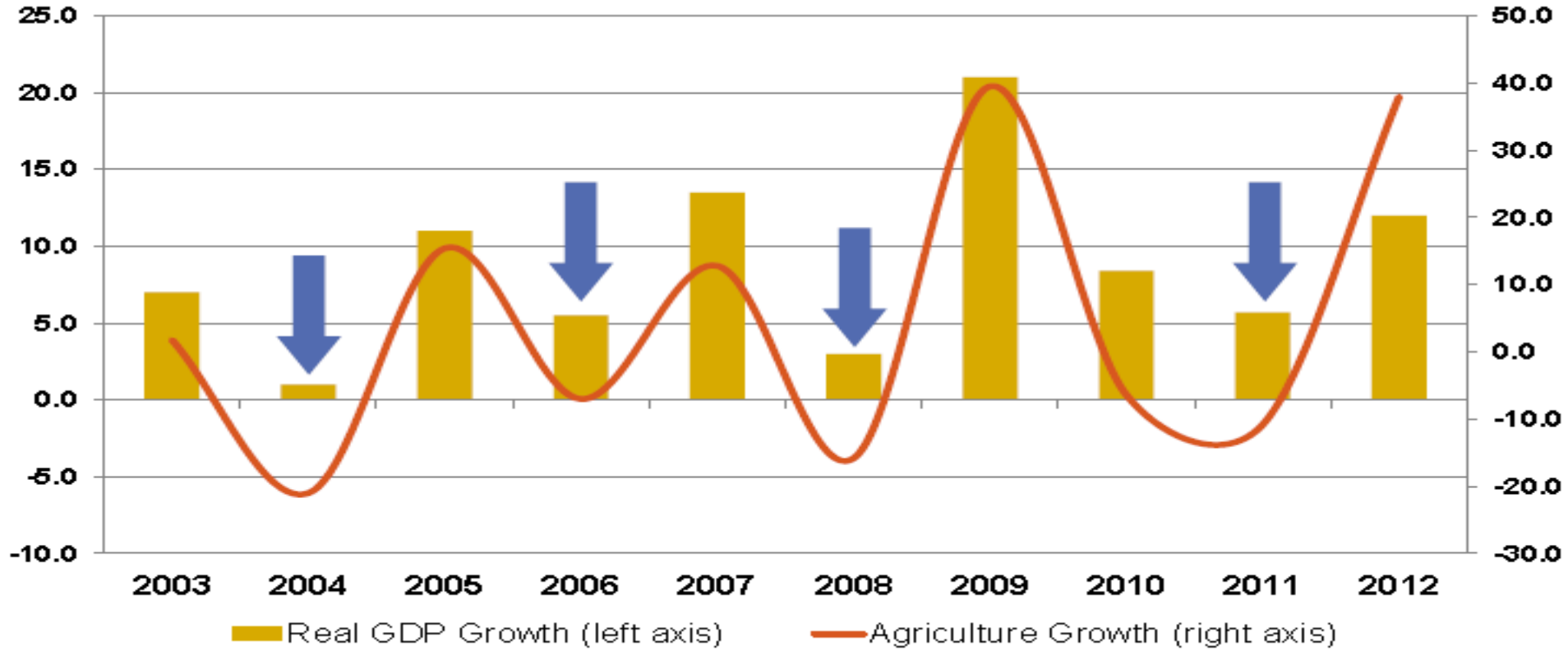
Agriculture in Our Economy (2)

- **Agriculture land Covers** 7.9 m-ha (12%) total area of country (4.4 m-ha irrigated, and remain are rain-fed)
- **Annually irrigated area** are 2.1 m-ha (two crop/year 0.35 m-ha, one crop/ year 1.75 m-ha), one crop/every two year 1.2 m-ha (lack of irrigation water)
- **Very high inequality in land holdings** - majority (60%) of holdings are small (< 1ha) owning only 13% of the land and cultivating 22% of the crop land.
- **Forests cover** 2.86% (1.8 m ha) total areas of country, contributes to national GDP through timber, non-timber products and eco-services.
- **Rangeland**s cover 46.84% (30.1 m ha) total area of country, provision of animal feed, medicinal plants export (~167 million US$/year), conserving soil & water.

Agriculture in Our Economy (3)

- **Wheat** covers 57% of irrigated land (1.2 m-ha), accounts for ¼ Ag - GDP, creates 1.3 million jobs.
- **Horticulture** covers 14% of irrigated land (0.36 m-ha), accounts for 34% of Ag. GDP, creates 2 million job.
- **Livestock** with total number of 25 million, contributes to 15% of Ag. GDP, creates 1.1 million job.

The Agriculture Sector Drives Real GDP Growth



Agriculture GDP growth is drastically reduced in drought years, thus, irrigation is critical to sustaining high agricultural production.

Ecosystem Services

BASIC SUPPORT
(PLANET & LIVE)

- Nutrient cycling
- Soil formation
- Photosynthesis (Source of Energy)

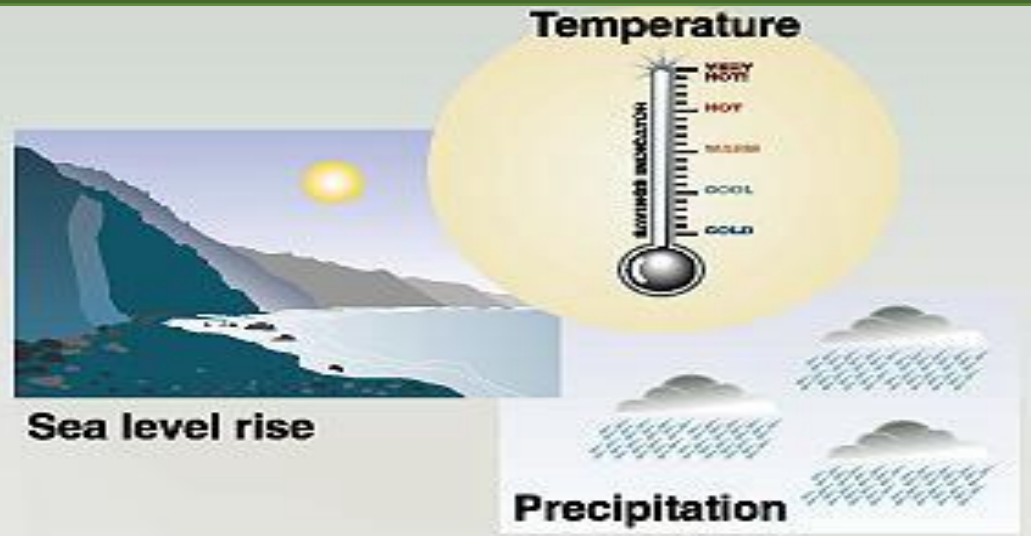
PROVISIONING
- ✓Food
- ✓Fresh water
- ✓Wood & Fiber
- ✓Fuel

REGULATING
- ✓Climate
- ✓Flood
- ✓Disease
- ✓Water purification

CULTURAL
- ✓Aesthetic
- ✓Spiritual
- ✓Educational
- ✓Recreational

Bio-diversity, food production, food security and sustainability are all connected elements

Potential Climate Change Impacts



Impacts on...

Health

Weather-related mortality
Infectious diseases
Air-quality respiratory

Agriculture

Crop yields
Irrigation demands

Forest

Forest composition
Geographic range of forest
Forest health

Water resources

Water supply
Water quality
Competition for water

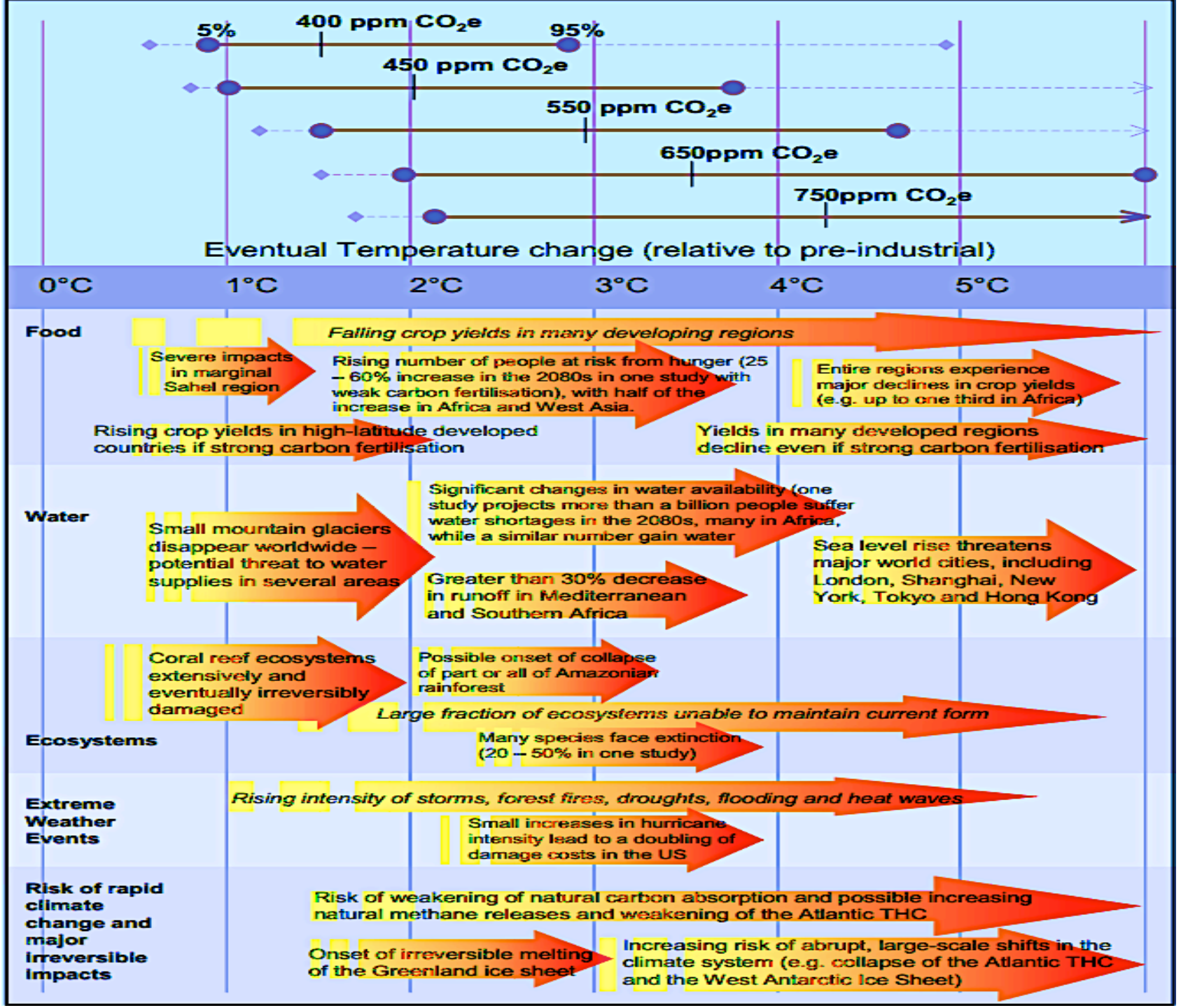
coastal areas

Erosion of beaches
Inundation of coastal lands
additional costs to

Species and natural areas

Loss of habitat and species
Cryosphere:

Eventual Temp. Change Impacts



Observed Climate Changes (1)

Average Temperature:

- increased by 0.13°C per decade since 1960,
- mean annual temperature has increased by 0.6°C since 1960,
- significant warming across all regions with average predicted increases of 2°C and 6.2°C by 2090s dependent on global emissions scenarios is expected.

Rainfall

- reduced by 0.5 mm per month (2%) per decade since 1960.
- Mainly decreases of around 2.7mm per month in spring rainfall.
- 2090s conditions will be generally drier (between 10-40 mm) over much of Afghanistan. Winters are expected to be significantly drier in the South.

Period of High Temp frequency of hot days and nights increased to 25 days per year. (seasonal variation).

Observed Climate Changes –Hazards (2)

Nearly all 34 provinces have been hit with one or more natural disasters, including flooding, landslides, drought, and extreme heat and freezing weather.

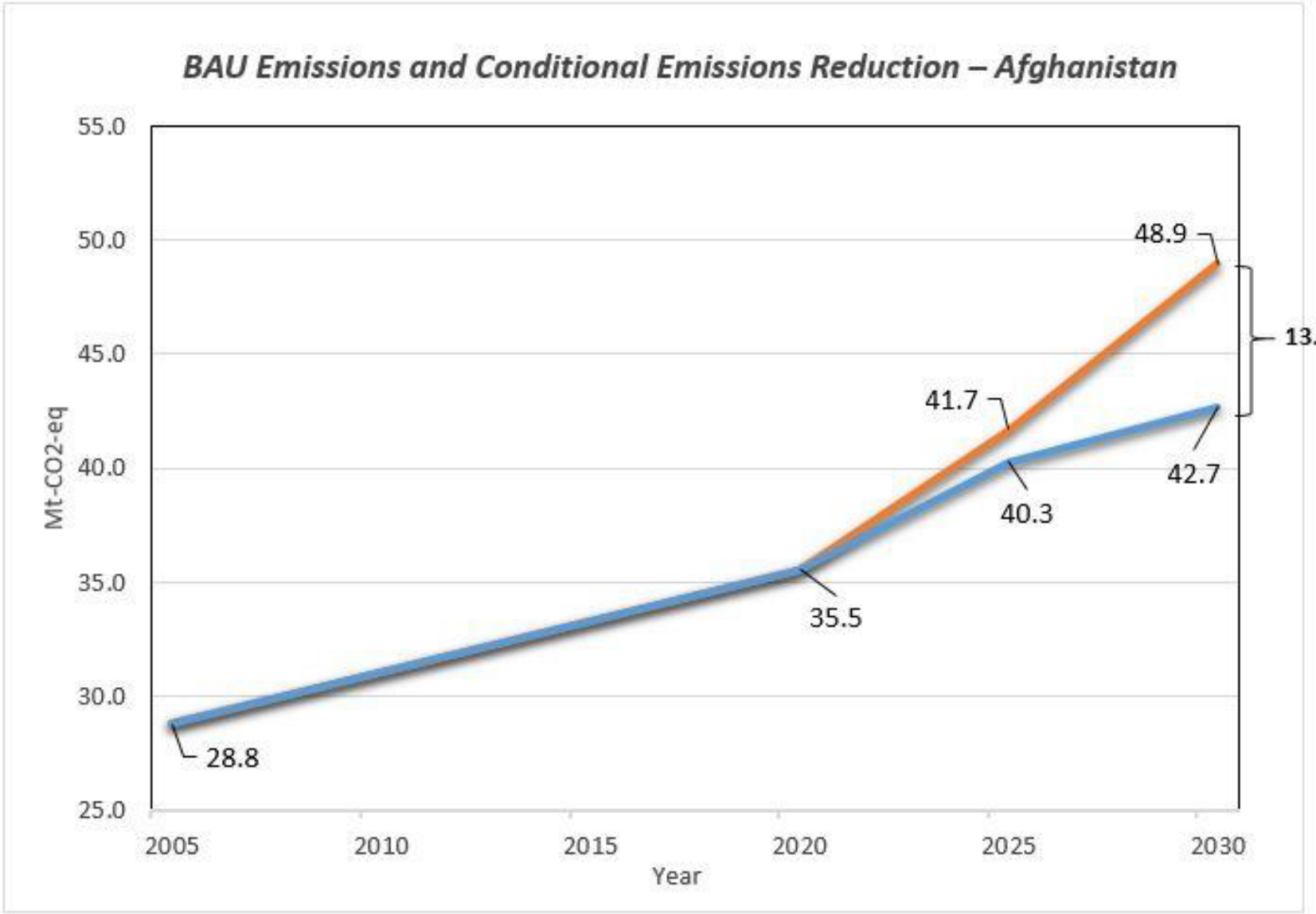
Drought

- Rate and incidents increases,
- Currently suffering the most severe drought, characterized by large areas with little to no precipitation
- Desertification and Land Degradation process intensified that causes for reduction of vegetation cover, flood, land sliding, etc.

Floods:

- Floods due to untimely rainfall and a general increase in temperature.
- Floods impacts may by amplified due to more rapid spring snow melt as a result of higher temperatures,
- combined with the downstream effects of land degradation, loss of vegetative cover and land mismanagement.

Afghanistan - INDCs

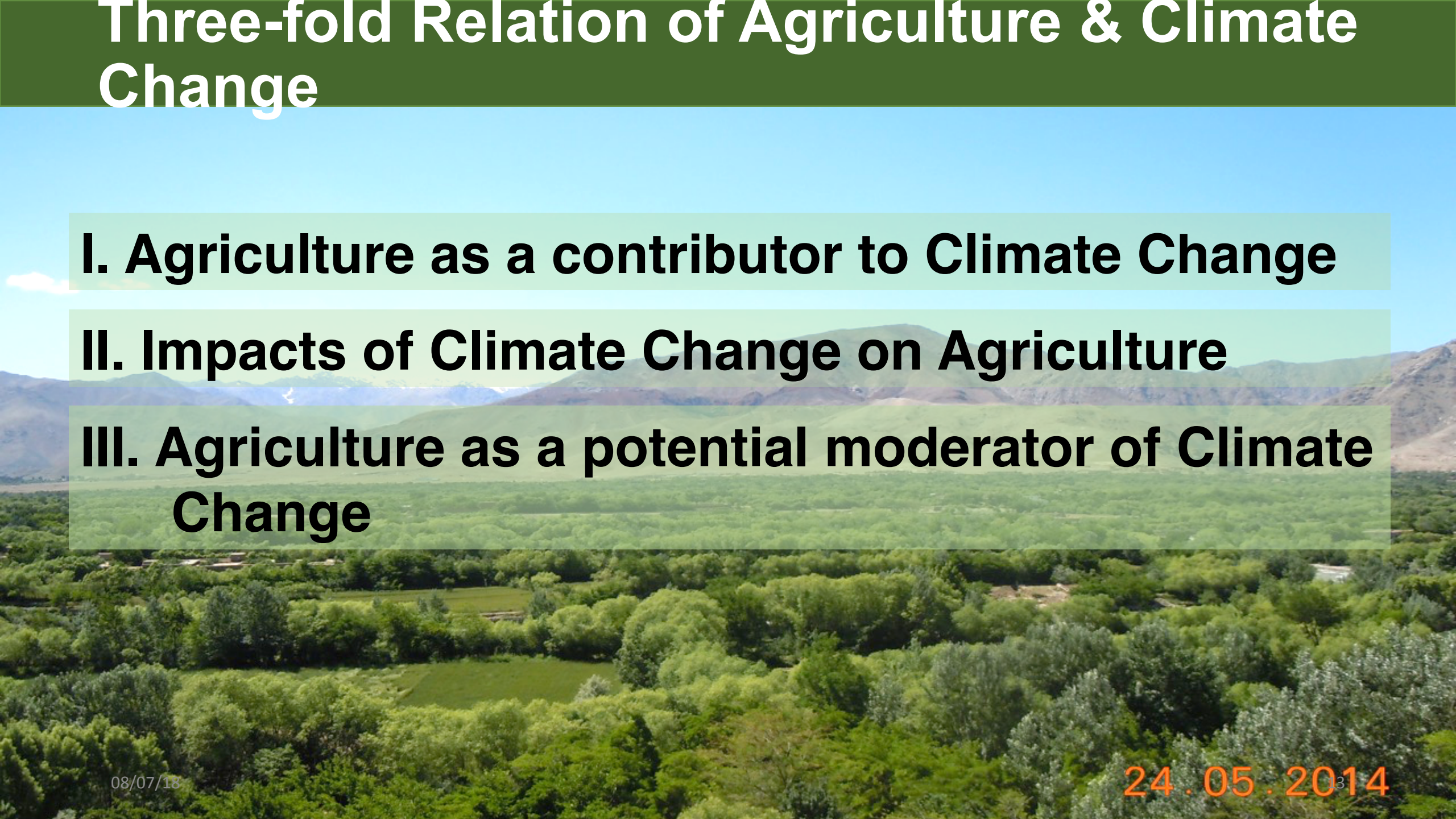


Three-fold Relation of Agriculture & Climate Change

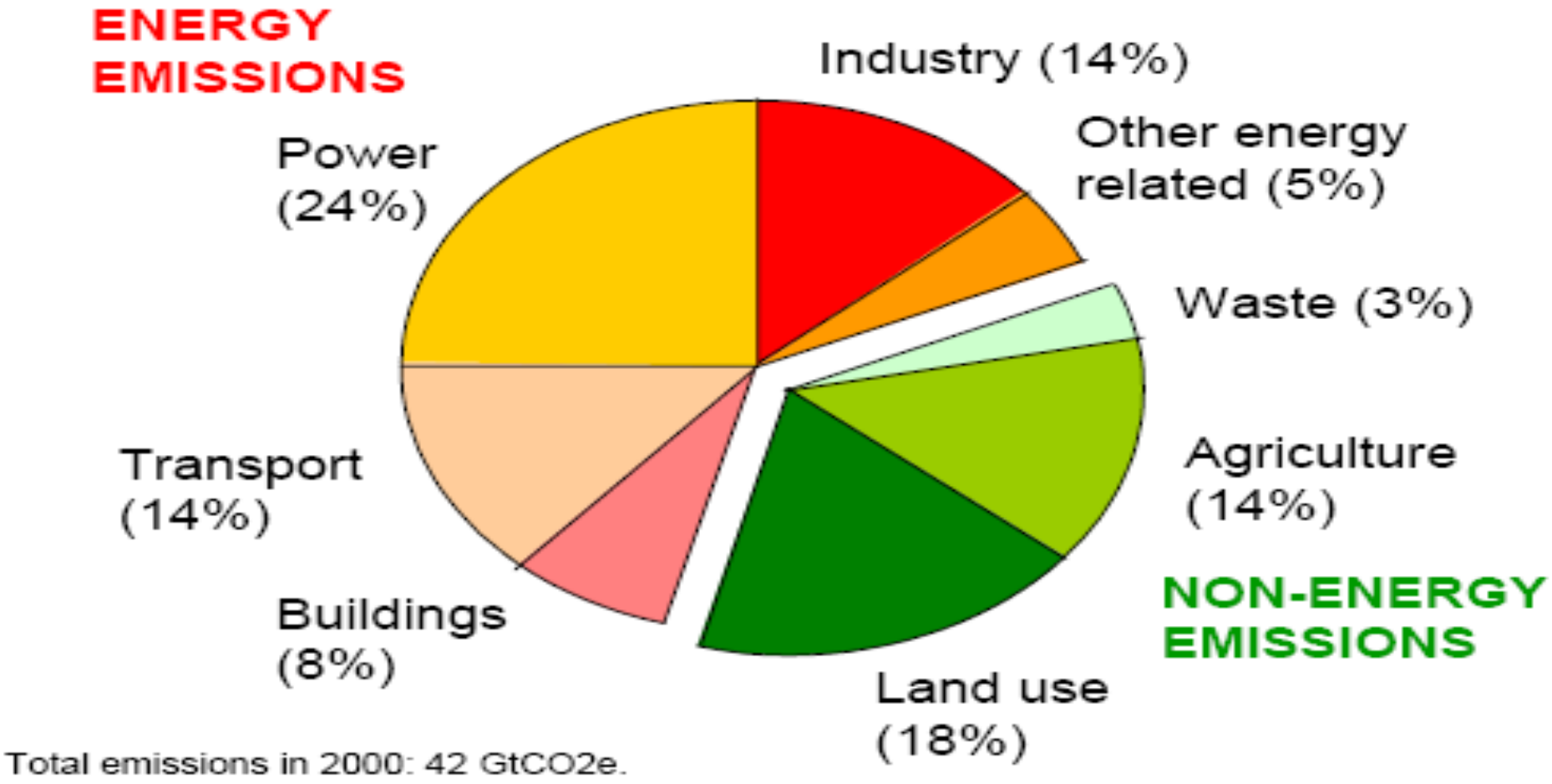
I. Agriculture as a contributor to Climate Change

II. Impacts of Climate Change on Agriculture

III. Agriculture as a potential moderator of Climate Change

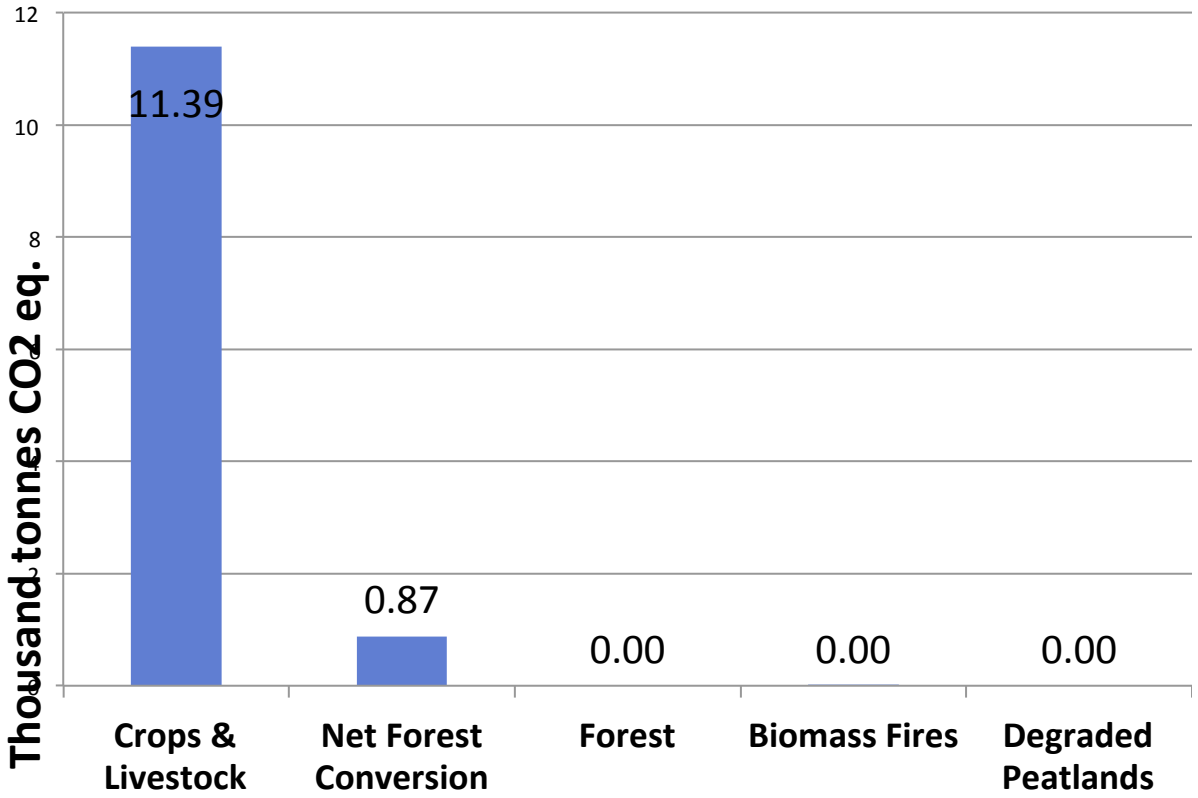


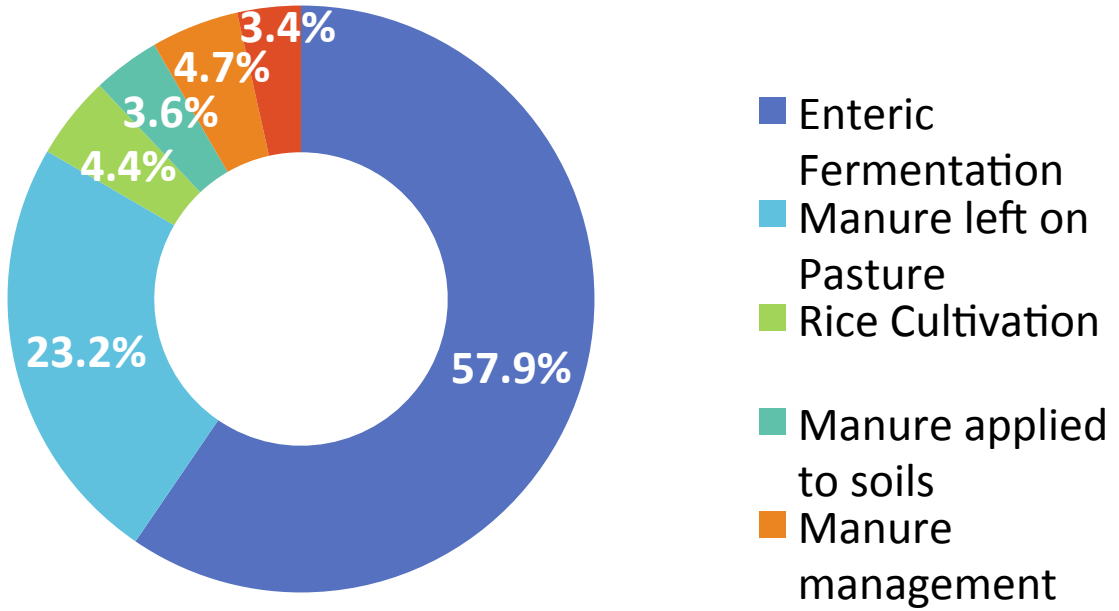
Global GHG Emissions by Source



Total emissions in 2000: 42 GtCO2e.

1. Agriculture Contribute to Climate Change





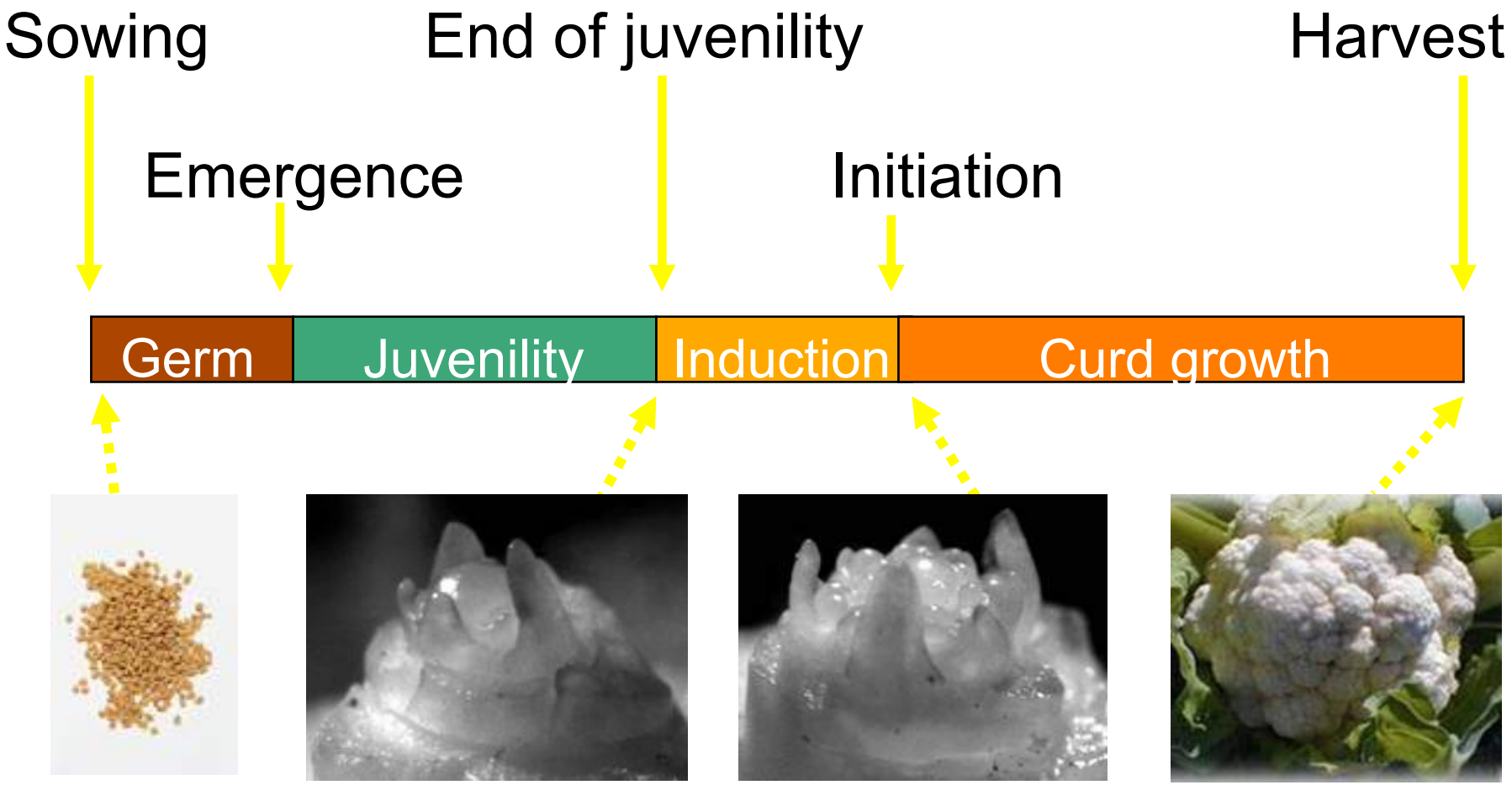
Sources and Share of emissions from agriculture and land use in Afghanistan, 2001-2011

2. Agriculture Sector Vulnerability to Climate Change

- **Increased temperatures and changes in rainfall** patterns, resulted to increased soil evaporation, reduced river flow from earlier snow melt, and less frequent rain during peak cultivation seasons will impact upon agricultural productivity and crop choice availability.
- **Crop failure** due to water shortages and the amount of potentially productive land left uncultivated will likely both increase.
- **Less attractiveness of water intensive staple crops** to farmers, with a likely increase in the attractiveness of those that are more drought hardy.
- **Agricultural economy by 2060 likely to have become marginal** without significant investment in water management and irrigation. The existing irrigation system is operating at a low efficiency rate of about 25 per cent.

2. Agriculture Sector Vulnerability to Climate Change

- **Difference in crop growth seasons**, changes in practices and transfer of new adaptive technology. Likelihood of pests, diseases and crop-weed competition increase.
- **Decreased biodiversity** and extinction of species
- **Food security,** population growth by 2042 over 9 billion, amount and nutrition value of food is concern, while cconsumption per head increase (grain to meat). This impact heavily upon those dependent on the agricultural economy.
- **Environmental degradation** reduces the availability of animal feed (rangelands)
- **Glaciers and snow melt** is high recent studies indicated that Afghanistan lost (13.4 % - 395 sq KM) between 1990 – 2015.
- **Crop yield:** Increase up to 20% in E and SE; decrease up to 30% in S and - central Asia by 2050; hunger risk gets higher (Indian Metrology Dept.



Phases of Plant Growth Effects by Climate Change

(Sources: USDA Global Change Task Force, 2010; Walthall et al, 2012)

What Crop Production Need?

3. Agriculture As Part of Solution

- Increasing carbon sequestration; Reforestation / Afforestation / Rangelands mgt. land mgt./tillage's organic farming, Rotations with cover crops, Agroforestry etc.
- Reduce agrochemicals (e.g., N fertilizers); green manure, shift of cropping patterns
- Livestock management and Changing demand (from meat/dairy to veggies)
- Increase water management (systems efficiency), and Promote eco-friendly energy use of technology.
- Improvement of bio-diversity, research on species,
- Early awareness and provision of climate information services.
- Integrated Planning for management of natural resources
- Promote public-private partnership

MAIL Strategic Focus as Solution

Factors of Production

Irrigation

Soil & Forests & Pastures

Agriculture Inputs & Seed

Farming Technology & Machinery

Research & Extension

Commodity Focus

Wheat

Horticulture

Industrial Crops (Saffron, cotton, soybean)

Livestock (Meat, Dairy, Poultry, Fishery, …)

Rice, feed, other grains & Pulses

Enabling Growth & Sustainability

Pest Management

Animal Health

Quality Control

Agriculture Credit

Private Sector Support (+Ag Parks, PPP)

Livelihoods

Food Security & Nutrition
Resilience & SGR
Counter Narcotics
Job Creation
Women Empowerment

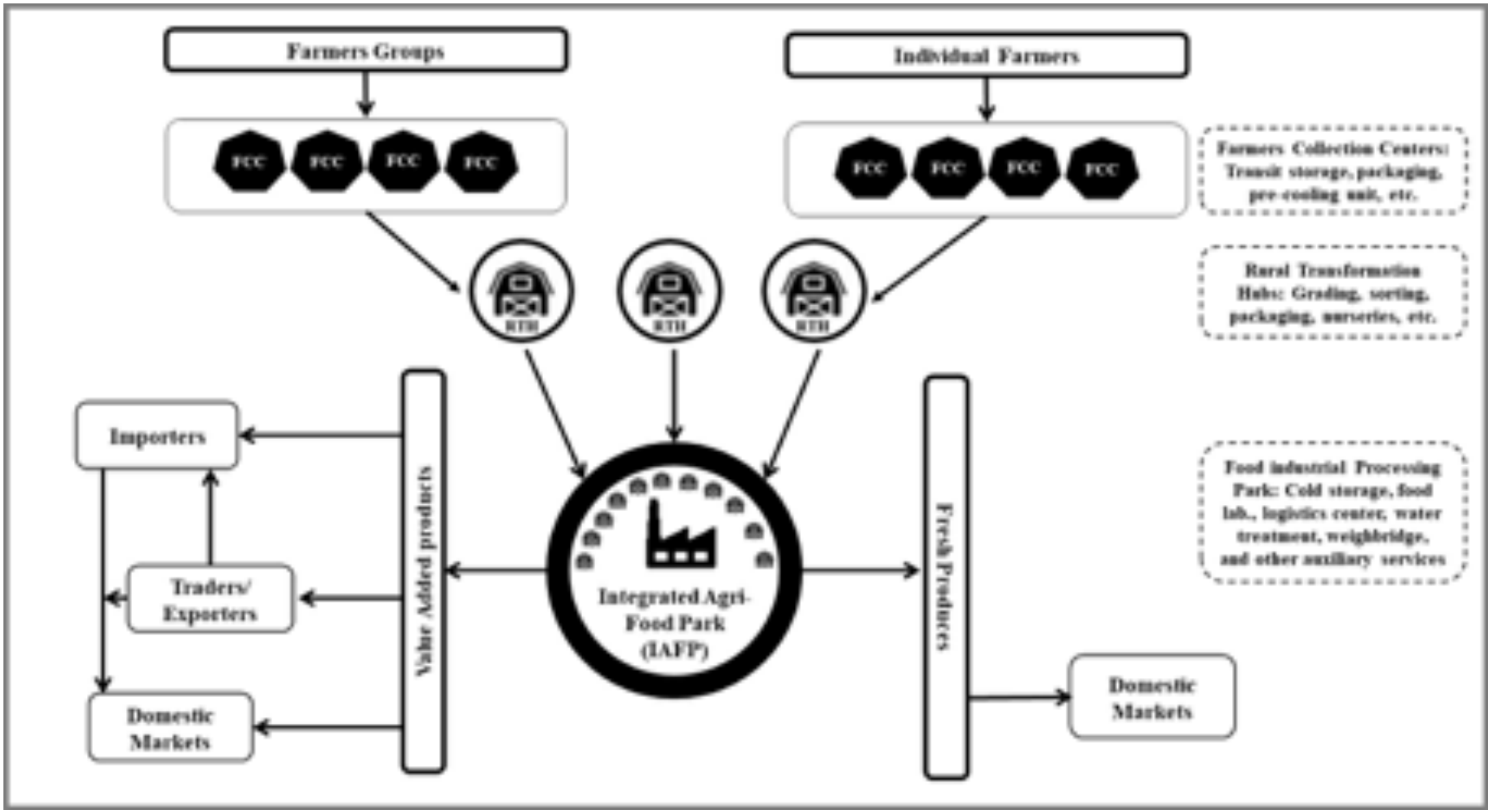
Institutional

Statistics, GIS and Info
Policy & legal Framework
Reform & CBR

STRATEGIC SECTOR PRIORITIES

1. IMPROVING IRRIGATION SYSTEMS
2. INCREASED WHEAT PRODUCTION
3. HORTICULTURE VALUE-CHAIN
    1 High Value Horticulture Crops and Vegetables
    2 Industrial Crops and Medicinal Plants
4. LIVESTOCK DEVELOPMENT
5. CLIMATE-SENSITIVE NATURAL RESOURCE MANAGEMENT
6. FOOD AND NUTRITION SECURITY, AND RESILIENCE BUILDING
7. INSTITUTIONAL REFORM

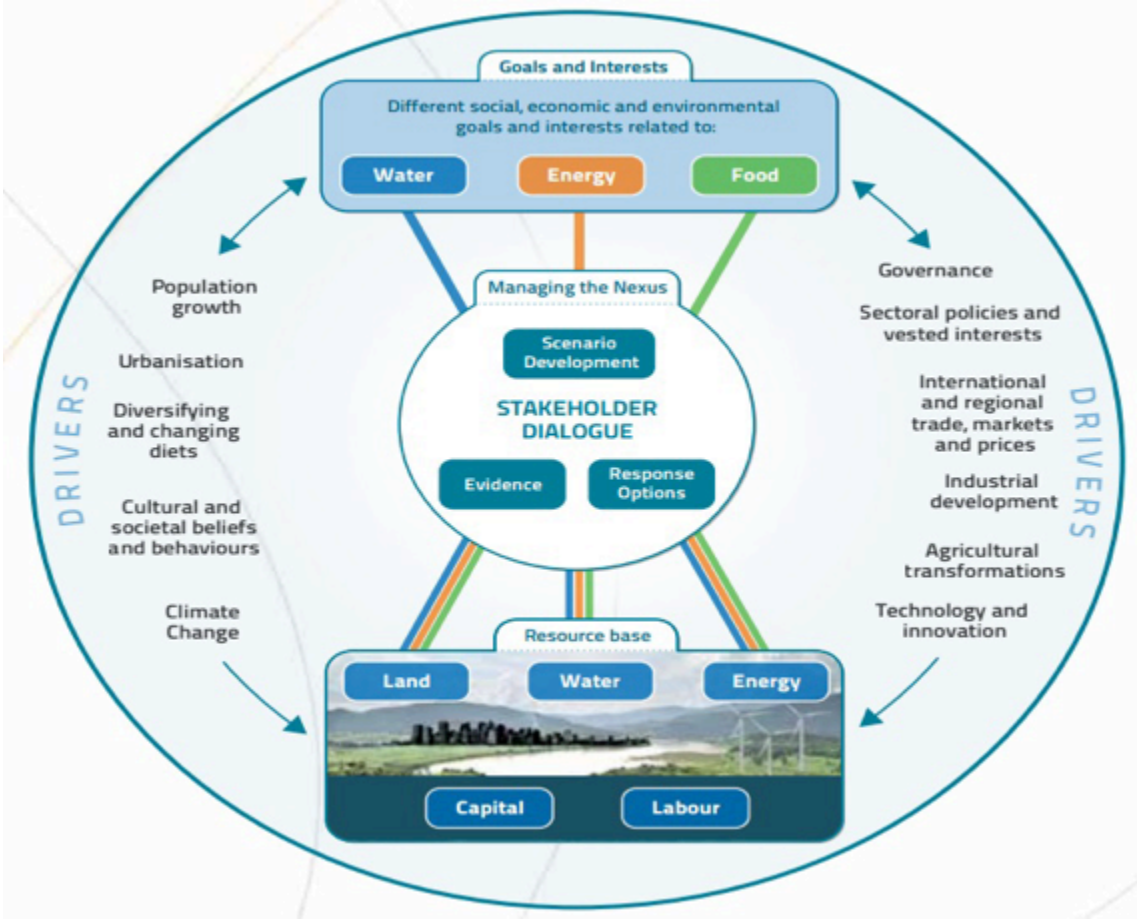
Agribusiness Charter



Way forward

Water, energy and food are inextricably linked.

WEF Nexus implementation Approach is required to transform from a sector-by-sector approach to policy, science and practice, towards an approach considers interactions between water, food and energy, for brining synergy.



Thank you!