



Climate-Smart Agriculture: Overview





The Challenge

The new challenge for agriculture is emphasised by different organisations:

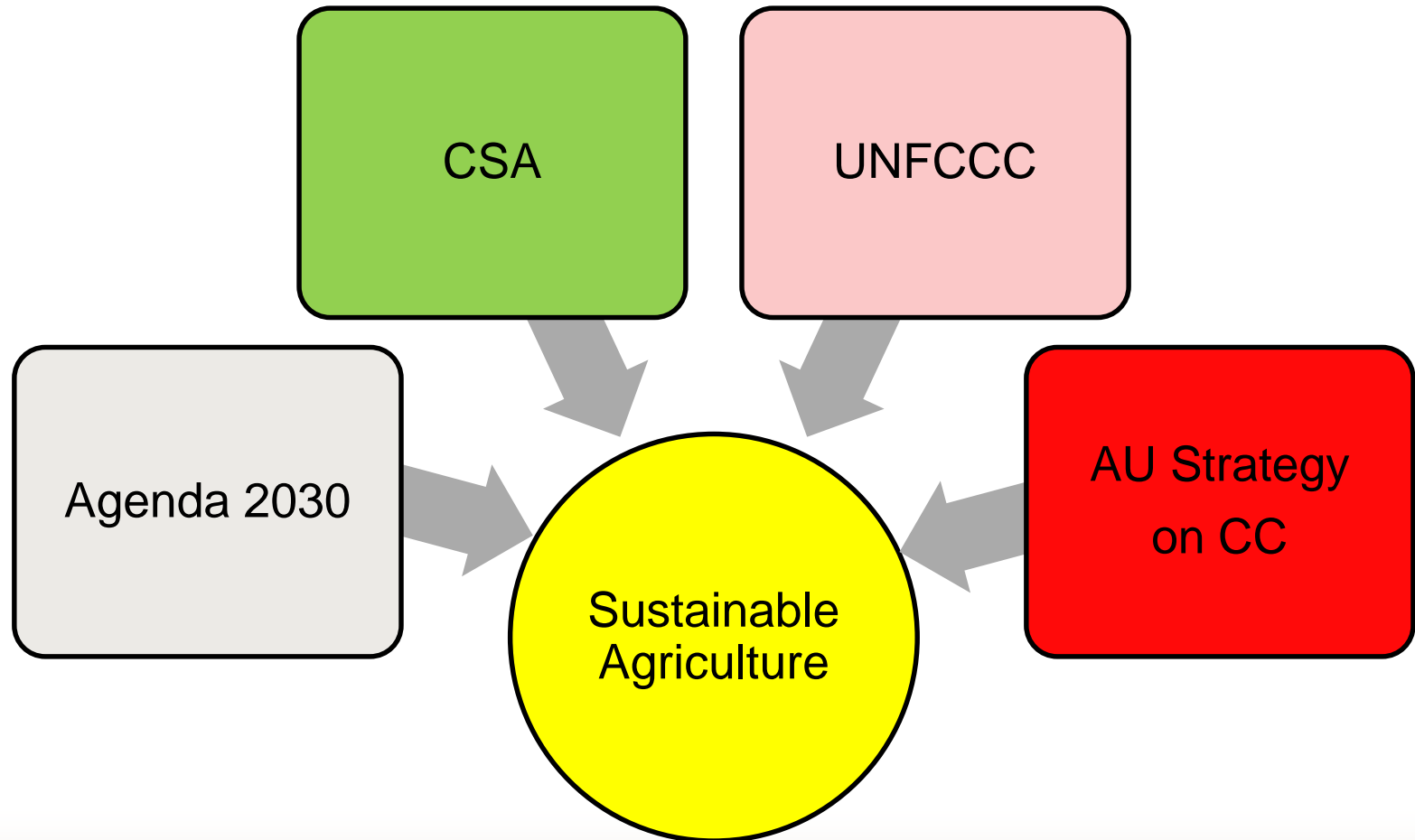
- in 2010 Committee on World Food Security (CFS) commissioned a study on climate change and food security
- Study on food and agriculture: future of sustainability – UN Committee on Sustainability Assessment 2012
- World development report 2008 (agriculture for development) and 2010 (development and climate change)
- UNDP green economy report (2011)



in 2010 FAO developed the concept of **Climate-Smart Agriculture (CSA)**

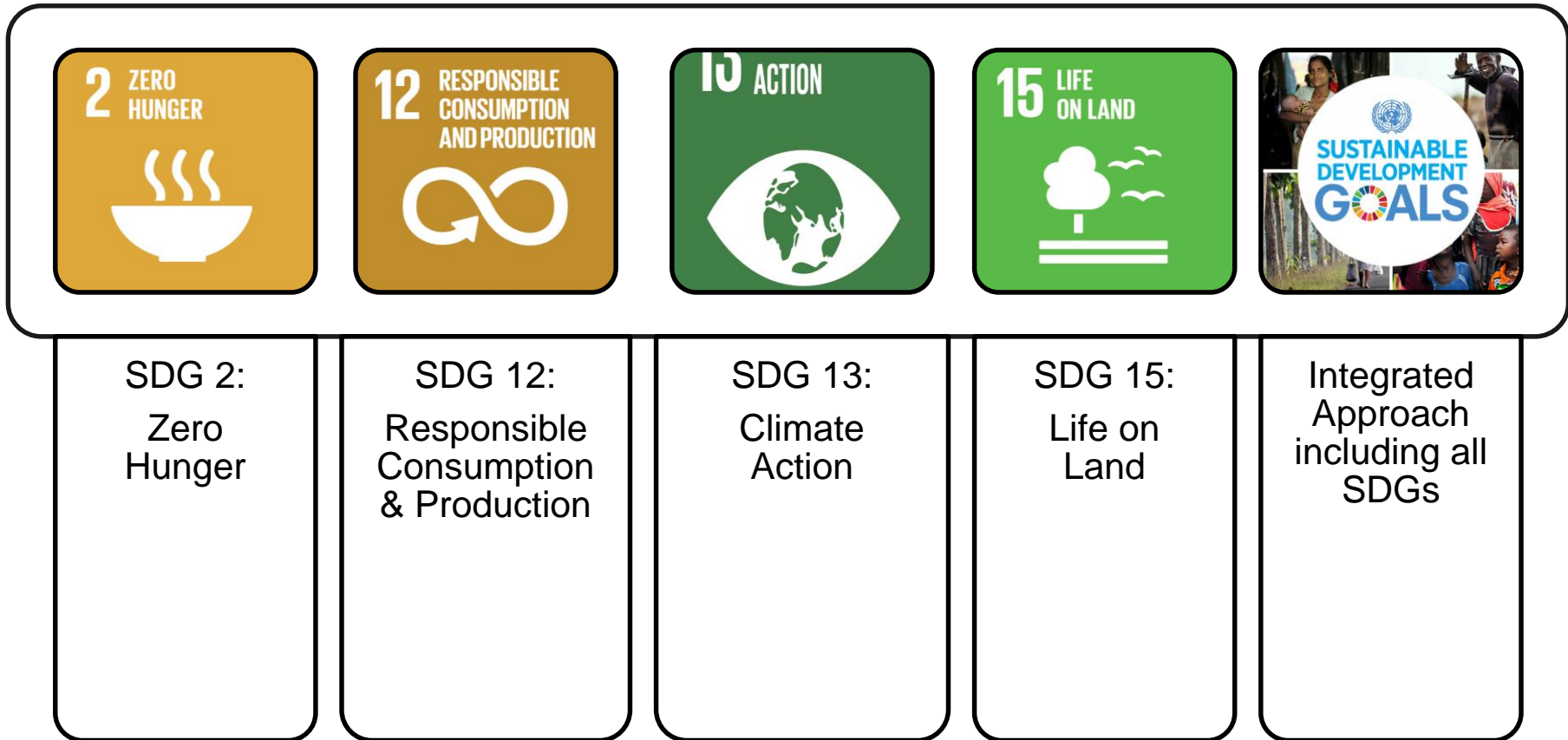


Addressing the Challenge



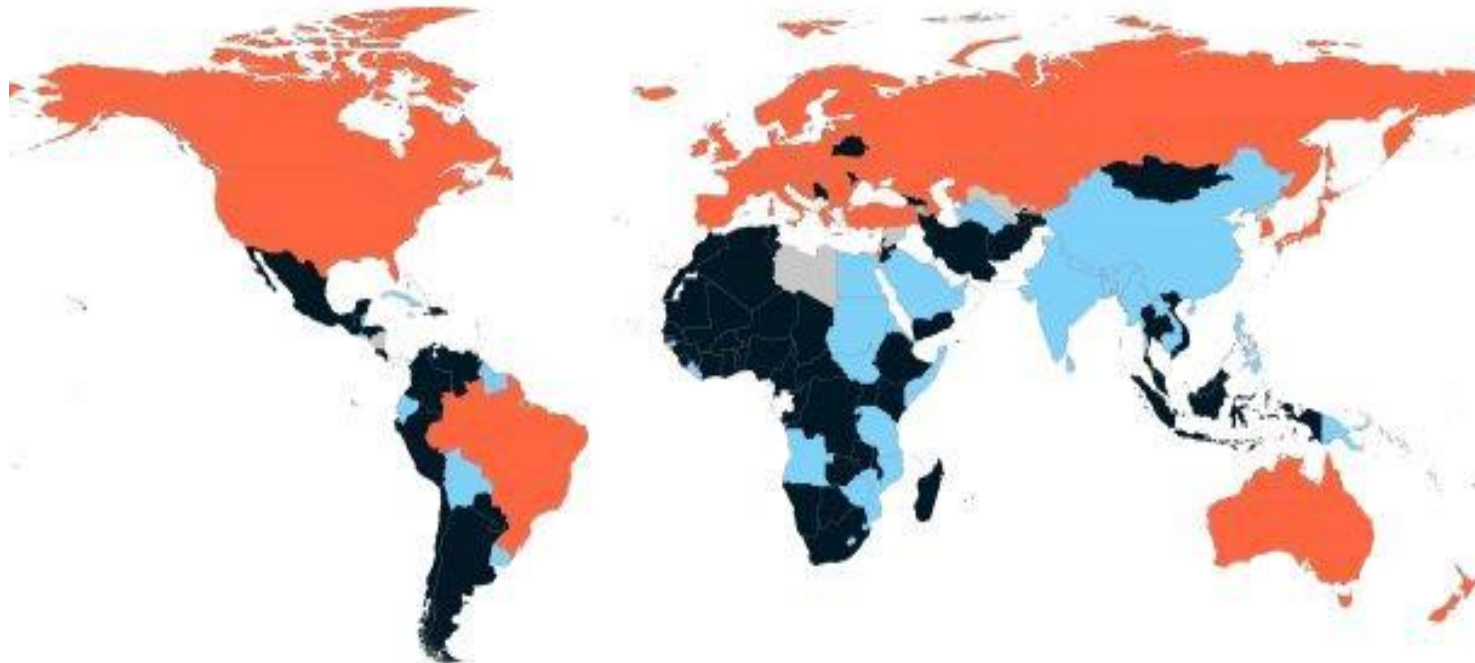


Agenda 2030 and Paris Agreement





The global framework: Agriculture & (I)NDCs



Agriculture in the INDCs

- Mitigation target and adaptation priorities include agriculture
- Mitigation target includes agriculture
- Adaptation priorities include agriculture
- No agriculture in INDC
- No INDC

Redants M, Shoun TB, Campbell S, Gregersen LE, Huyer S, Kurzin V, Madsen STN, Odiig MB, Vasilekou I. 2016. How countries plan to address agricultural adaptation and mitigation: An analysis of Intended Nationally Determined Contributions. CCAFS dataset version 1.1. Copenhagen, Denmark: CGIAR Research



April 28, 2016



Definition of Climate-Smart Agriculture (CSA)

CSA is an approach to help guide the management and transformation of agriculture for food security under the realities of climate change

It is composed of three main pillars:

1. Sustainably increase agricultural productivity and incomes;
2. Adapt and build resilience to climate change;
3. Reduce and/or remove greenhouse gases emissions, where possible.

FAO, 2013: Climate-Smart Agriculture Sourcebook





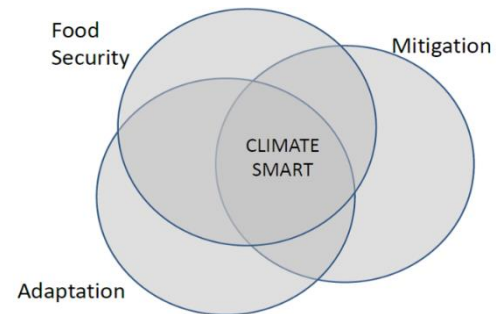
Climate-Smart Agriculture



Source: <http://www.fao.org/climatechange/climatesmart/en/>

„Agriculture that sustainably increases productivity, resilience (adaptation), reduces/removes GHGs (mitigation), and enhances achievement of national food security and development goals“

FAO, 2010: „Climate-Smart“ Agriculture - Policies, Practices and Financing for Food Security, Adaptation and Mitigation.





CSA Concepts and Technologies





Climate-smart agriculture (CSA)

- Approach for transforming and reorienting agricultural systems to support food security under the new realities of climate change.
- Climate change threats can be reduced by increasing adaptive capacity of farmers, increasing resilience and resource use efficiency.
- CSA is not just about new technologies, it is combining indigenous knowledge, common agricultural practices and appropriate new technological developments for agriculture to increase sustainably production efficiency – to ensure food security for future generations.
- Knowledge and information is available but a giant task still remains: closing the gap between research and application on farm level and for policy and decision making – knowledge translation for different users.





Old vine in new bottles? What is new?

- Synergies and trade-offs in local context between adaptation, mitigation and productivity benefits
- Inclusion of mitigation (sequestration of CO₂ in soils, reduced emissions of greenhouse gases);
- Inclusion of services and tools – climate insurance, climate services, etc.
- Provision of funds to finance CSA (e.g. through green climate fund – GCF, REDD+); but not clear to what extent GCF and REDD+ funds can be used to finance CSA activities;
- Emphasis on climate change projections and forecasts as basis for formulation of National Adaptation Plans (NAP) and measures;
- Increasing importance of insurances to cover loss and damage.



Critical issues, though this is changing

(mainly raised by NGOs and CSOs and developing countries)

- Strong focus on mitigation and carbon markets
- Danger of small-scale farmers to focus too much on carbon certificates rather than improving resilience
- Incorporation of CSA in carbon markets benefits large-scale agriculture enterprises at the cost of smallholders who will receive less money for promotion of sustainable agricultural initiatives
- Very much focused on climate at the costs of biodiversity
- CSA approach is often used synonymous with sustainable agriculture, although it may be part of it only



Increased demand

- Population growth
- Dietary changes



Sustainability

- Availability of land
- Pressure on natural resources & ecosystem services

**CSA Pillar 1:
Sustainably increase agricultural productivity and
incomes**



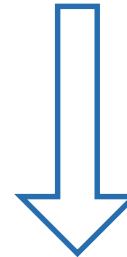
Changes in the nature and the geographic distribution of environmental conditions, e.g.:



Affecting:

- Temperature
- Rainfall amounts and distribution
- Extreme weather events (droughts, storms, floods)
- River flows
- Sea levels
- Ocean temperature and acidity

- Growing conditions of crops, livestock, fish, trees
- Ecosystems services
- Livelihood of people, often the poorest



**CSA Pillar 2:
Adapt to climate change and build resilience**



CSA Pillar 3: Reduce/remove GHG emissions, where possible

- Achieving the Paris Agreement requires action in agriculture sectors
- Many developing countries have committed to mitigation in agriculture sectors
- Agriculture sectors potential for adaptation-mitigation synergies recognized and for mitigation as co-benefit of adaptation



**GHG
reductions –**

**Key
elements:**

**Resource Use Efficiency
Improved management**

**Combining reduction of emission
intensity with productivity
increase**

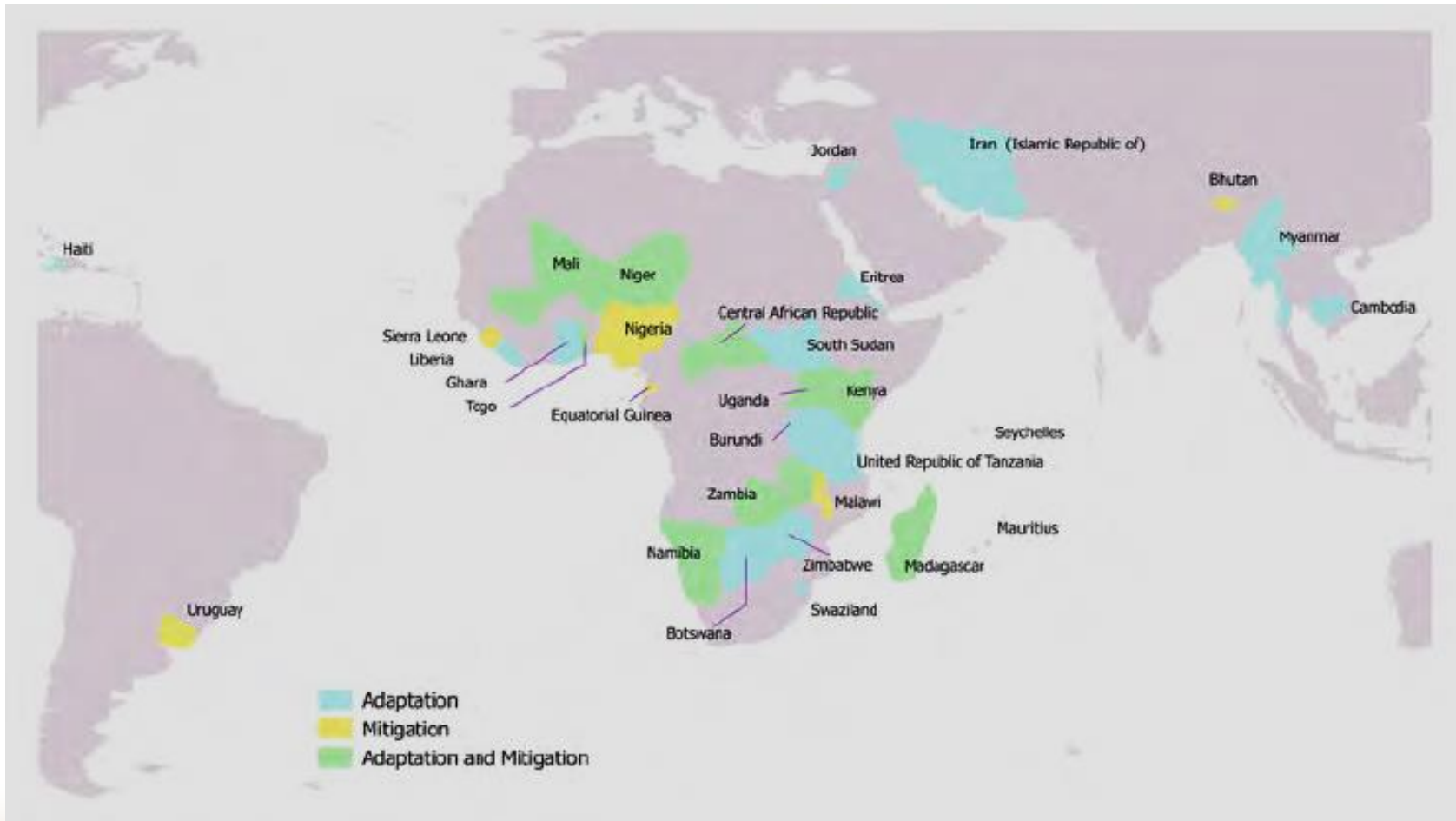


Major Stakeholders

- FAO: MICCA-Project (Mitigation of Climate Change in Agriculture); FAO-Adapt
- World Bank
- CCAFS (CGIAR Research Programme on Climate Change, Agriculture and Food Security)
- CSA partnership: CCAFS, FAO, The Global Mechanism, IFAD, World Bank, WFP and UNEP
- Africa CSA Alliance
- CFS (Committee on World Food Security)
- HLPE (High Level Panel of Experts on Food Security and Nutrition)
- NGOs und Civil Society Organisations (CSOs)
- Private sector (e.g. companies that promote integrated pest management and targeted fertiliser application)



Country commitments: More than 30 countries explicitly refer to CSA in their INDCs





CSA in German Development Cooperation



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Food Security
under Climate Change



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Sustainable increase of
**Agricultural
Productivity**

Adaptation
of agriculture to climate
change (Resilience)

(if possible) **Mitigation**
of GHG emissions from
agriculture



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Components of CSA



Enhancing the **policy-framework** for CSA



Capacity Development for CSA



Financing mechanisms for CSA



Improvement of **climate-specific data** in agriculture

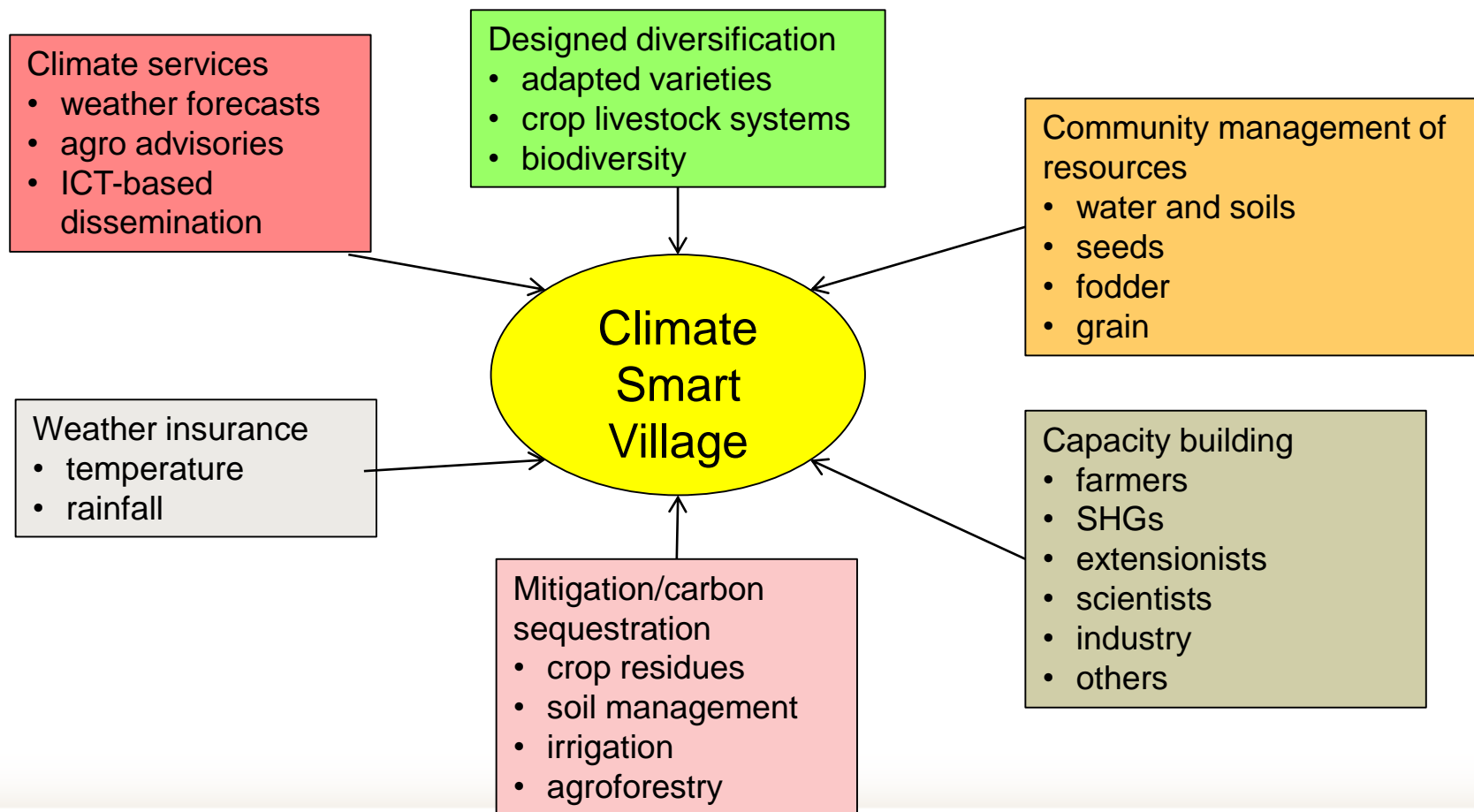


Fostering CSA at **local level**





“Climate-smart” villages: engage multiple stakeholders necessary for support





Climate-smart practices in smallholder agricultural production

Crop management	Livestock management	Soil and water management	Agroforestry	Integrated food energy systems
<ul style="list-style-type: none"> • Intercropping with legumes • Crop rotations • New crop varieties (e.g. drought resistant) • Improved storage and processing techniques • Greater crop diversity (agrobiodiversity) 	<ul style="list-style-type: none"> • Improved feeding strategies • Rotational grazing • Fodder crops • Grassland restoration • Manure treatment • Improved livestock health • Animal husbandry improvements 	<ul style="list-style-type: none"> • Conservation agriculture (e.g. minimum tillage) • contour planting • terraces and bunds • planting pits • water storage (e.g. water pans) • alternate wetting and drying (rice) • dams, pits, ridges • improved irrigation (e.g. drip) 	<ul style="list-style-type: none"> • Boundary trees and hedgerows • nitrogen fixing trees on farms • multipurpose trees • improved fallow with fertiliser shrubs • woodlots • fruit orchards 	<ul style="list-style-type: none"> • Biogas • production of energy plant • improved stoves



Synergies in **Crop production**

- **Agricultural Input Management** (fertilizer management, pesticides, herbicides)
- **Residue Management** (building up soil humus)
- **Cropping Patterns** (shifts, diverse patterns)
- Cultivar Selection (climate stress tolerance, salt tolerance, high biomass, biodiversity friendly)
- Tillage (zero tillage, CA, strip tillage)
- Rice Cultivation Options ([SRI](#) System of Rice Intensification, [ICM](#) - Integrated Crop Management)





Synergies in **Livestock production**

- Pastoral lands and grazing management (Range Management)
- Livestock production (feed, breeding, manure management)
- Biogas production (60% CH₄, 40% CO₂)





Synergies **Aquaculture and Fisheries**

- Promoting sustainable fish farming (e.g. rice - fish culture)
- Developing countrywide maps that depict areas for shore protection
- Encouraging coastal and watersheds basin management approach linking land-use practices to marine and fisheries resources conservation



ridge to reef approach

- Establish fisheries biodiversity network to identify and monitor species that will be affected by climate change

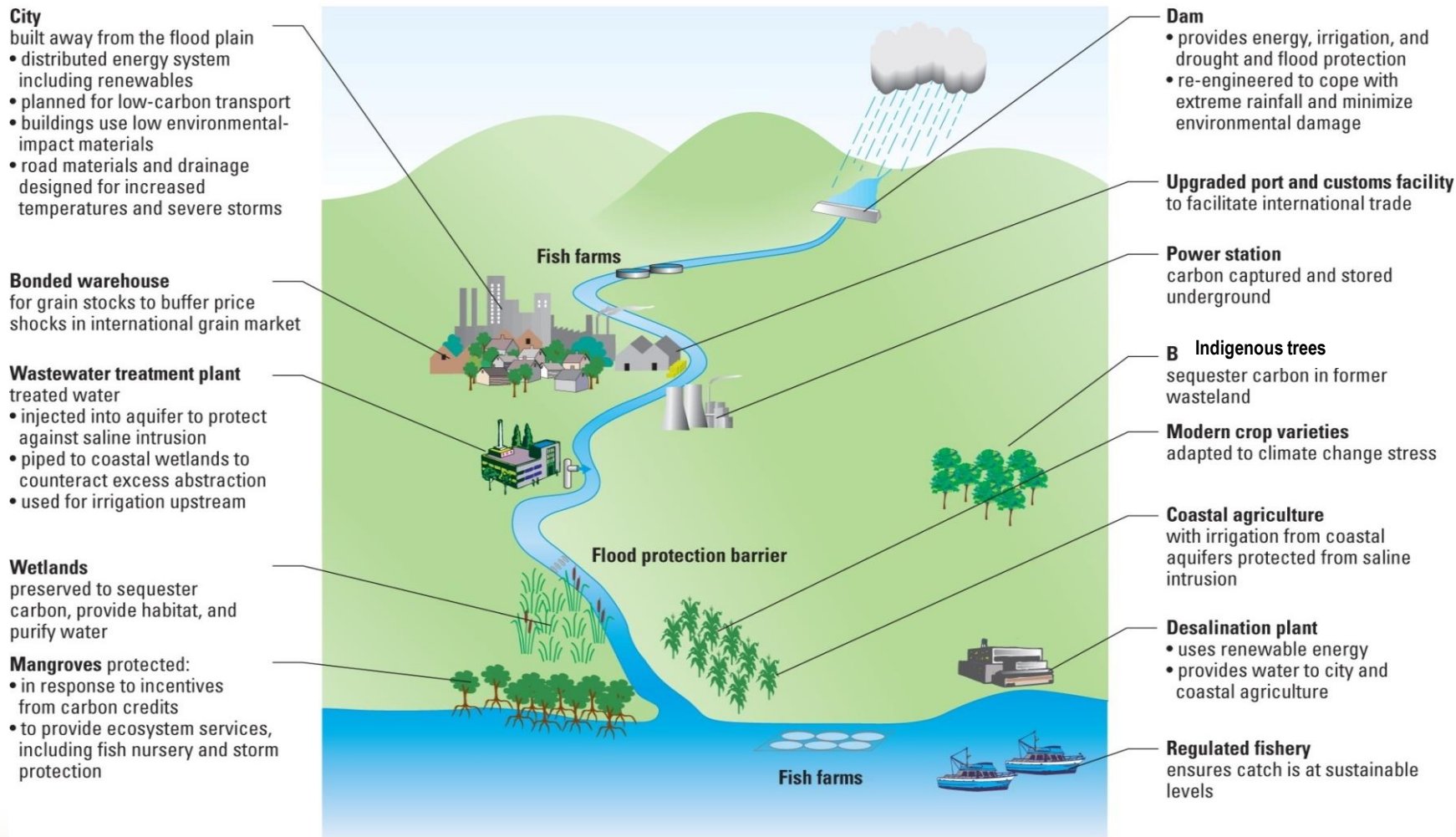


Synergies at **Landscape Management Level**

- Agrobiodiversity (genetic diversity, plant species richness, conservation of soil fauna and flora)
- Agroforestry (increased resilience, nitrogen fixing)
- Organic Agriculture (Mitigation potential depends on organic farming system: (0.4 t – 11 t Carbon/ha/year))
- Ecosystem and sustainable Approaches (sustainable agriculture, sustainable forest and landscape management, conservation agriculture, precision farming, climate smart agriculture)



An ideal climate-smart landscape of the future





Steps in planning CSA measures

- Vulnerability assessment (target groups)
- Identification of adaptation measures
- Identification of measures for reduction of emissions
- Identification of potential for carbon storage
- Elaboration of an action plan (integrated planning: including agriculture, forestry, fisheries and water) at different levels – local, watershed, regional
- Explore possibilities for “carbon finance” (NEPAD, GCF...)
- If possible link to climate risk insurances
- Provision and dissemination of timely climate information to farmers



Thank you and hope to see you again!

