

# 54th Commission on Population and Development Expert Group Meeting 28-30 October 2020

## **Food and agriculture systems – Addressing trade offs and exploiting synergies\***

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### *Content*

1. A synoptic view of food and agriculture systems
2. Alternative pathways (dynamic scenarios) for food and agriculture
3. Highlighting trade-offs
4. Addressing trade-offs through triggers (accelerators) of development



**Food and Agriculture Organization  
of the United Nations**

\* This presentation partially draws upon the FAO Report The future of food and agriculture – Alternative Pathways to 2050



# Food and agriculture systems: a synoptic view



SYSTEMS

Environmental systems  
Socio-economic systems  
Food and agricultural systems



DRIVERS



FOOD SYSTEM OUTCOMES

Natural resources state

Epidemics and pandemics

Climate change  
GHG emissions

'Blue Economy'

Pop. growth - urbanization

Econ. growth - macro stability

Cross-country interdependency

Big data property, control

Geo-political instability

Urban and rural poverty

Inequalities

Food and agriculture Prices

Technical progress

Public investment

Capital-info intensity

input-out. market concentration



SPECIFIC SUPPORTING SERVICES FOR FOOD AND AGRICULTURE  
e.g. logistics, credit, extension, veterinary, controls etc.

Wages and profits

Food security

Nutrition

Socio-economic well-being

Social stability

Other socio-economic outcomes

Land/water changes

Impacts on climate

Impacts on biodiversity

Impacts on pathogens

Net GHG emissions

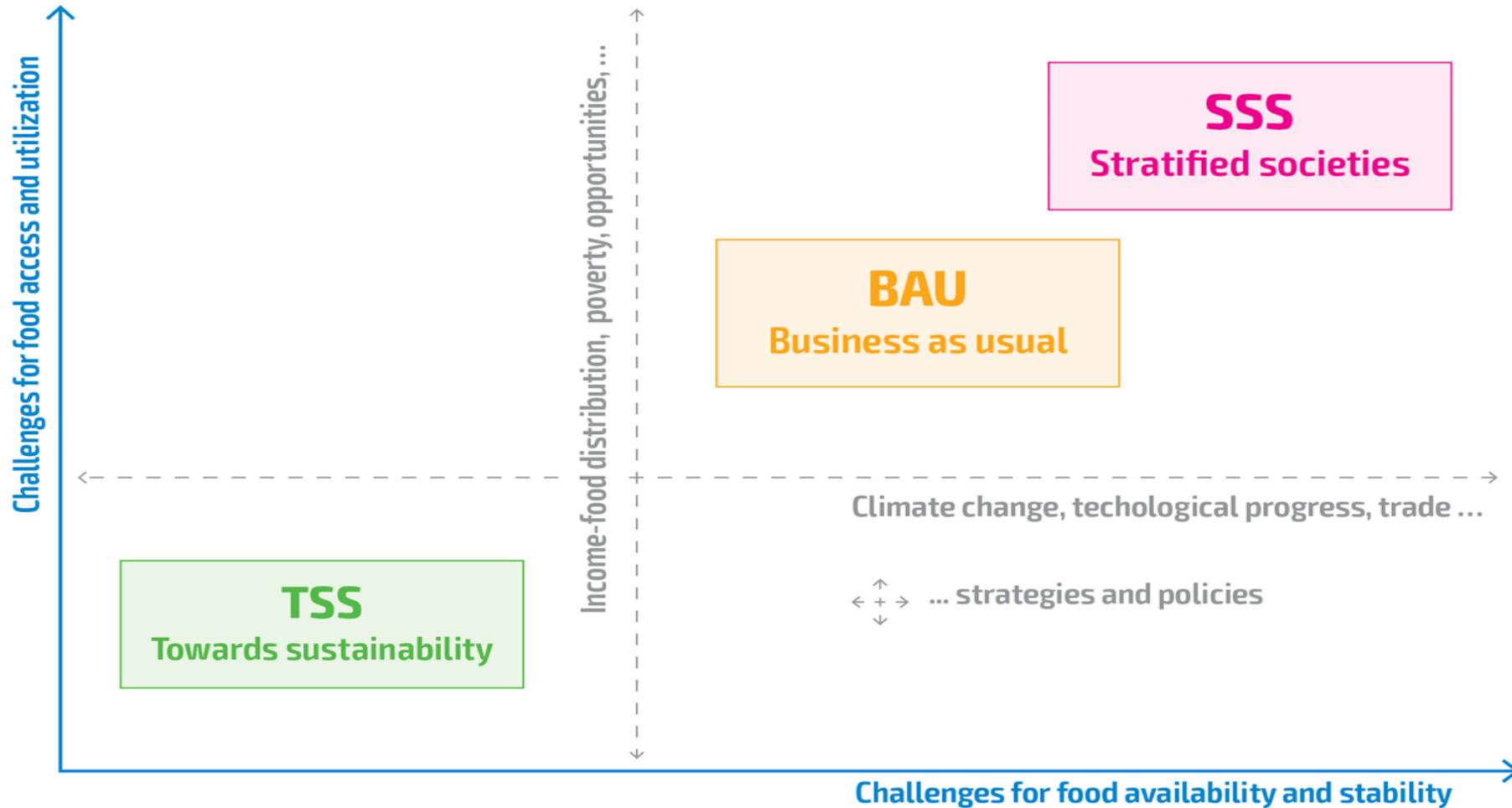
Other environmental outcomes

Uncertainties

Feedback



# The future of food and agriculture - alternative pathways (to 2050)

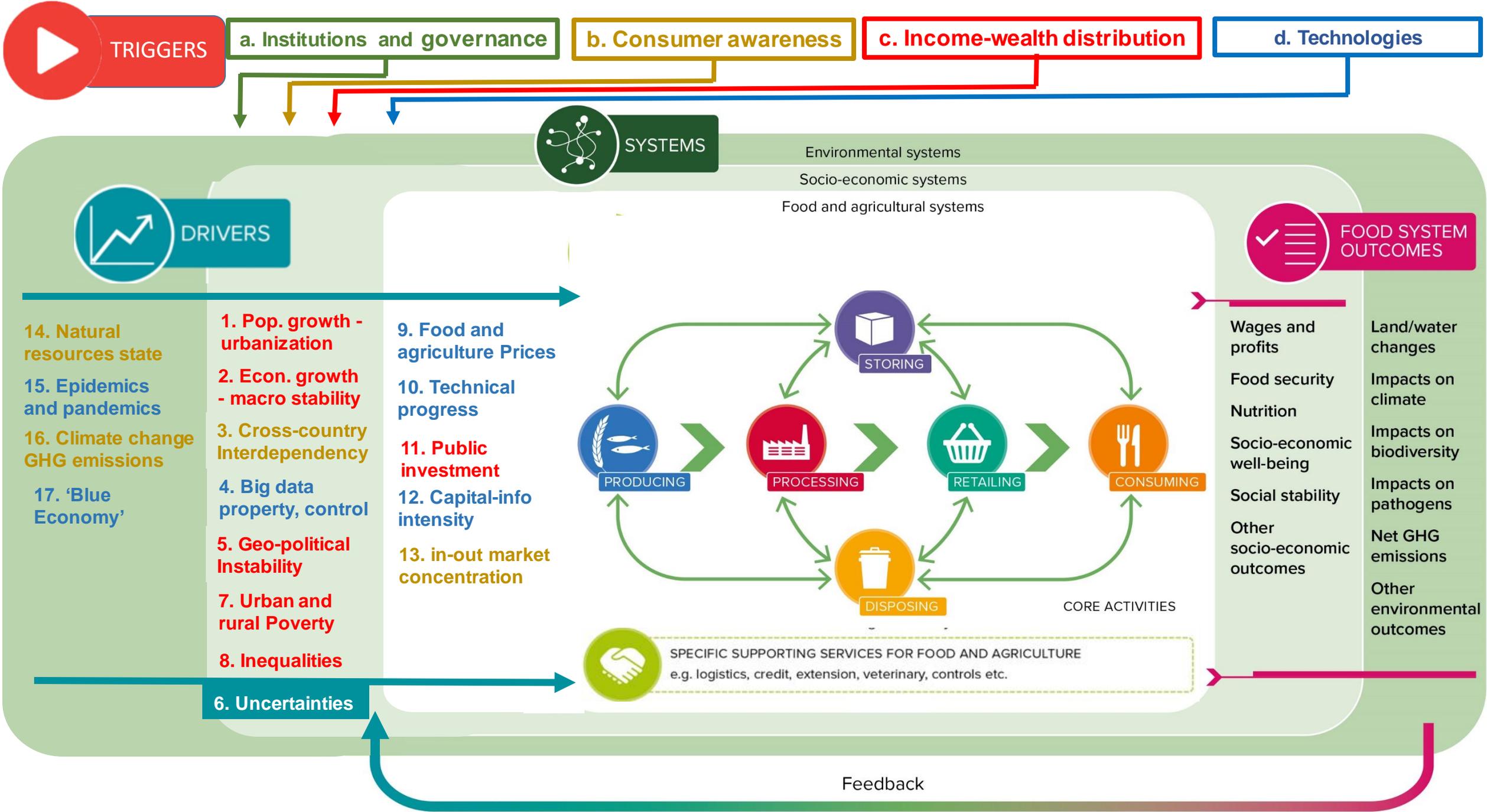


Alternative dynamic scenarios help highlight trade-offs (conflicting objectives) and synergies emerging while implementing Agenda 2030 and addressing related challenges



## (selected) Trade – offs in implementing agenda 2030

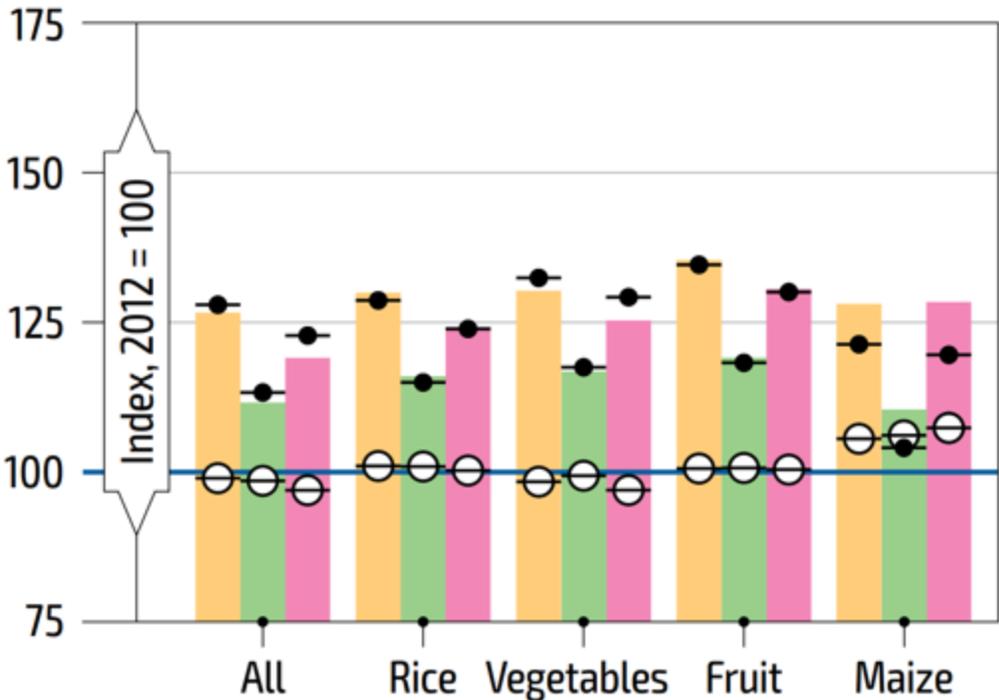
<b>Obyective 1</b>	<b>Obyective 2</b>
Achieving sustainable yields	Achieving food security and nutrition
Increasing output	Reducing GHG emissions
Sustainable yields	Minimizing land use expansion
Increasing Employment	Increasing wages
Increasing foreign currency inflows	Increasing economic diversification
Increasing food availability	Using biomass as renewable energy
Subsidizing unsustainable input use	Maintaing social stability
Funding social protection schemes	Funding public infrastructure and R&D
...	...



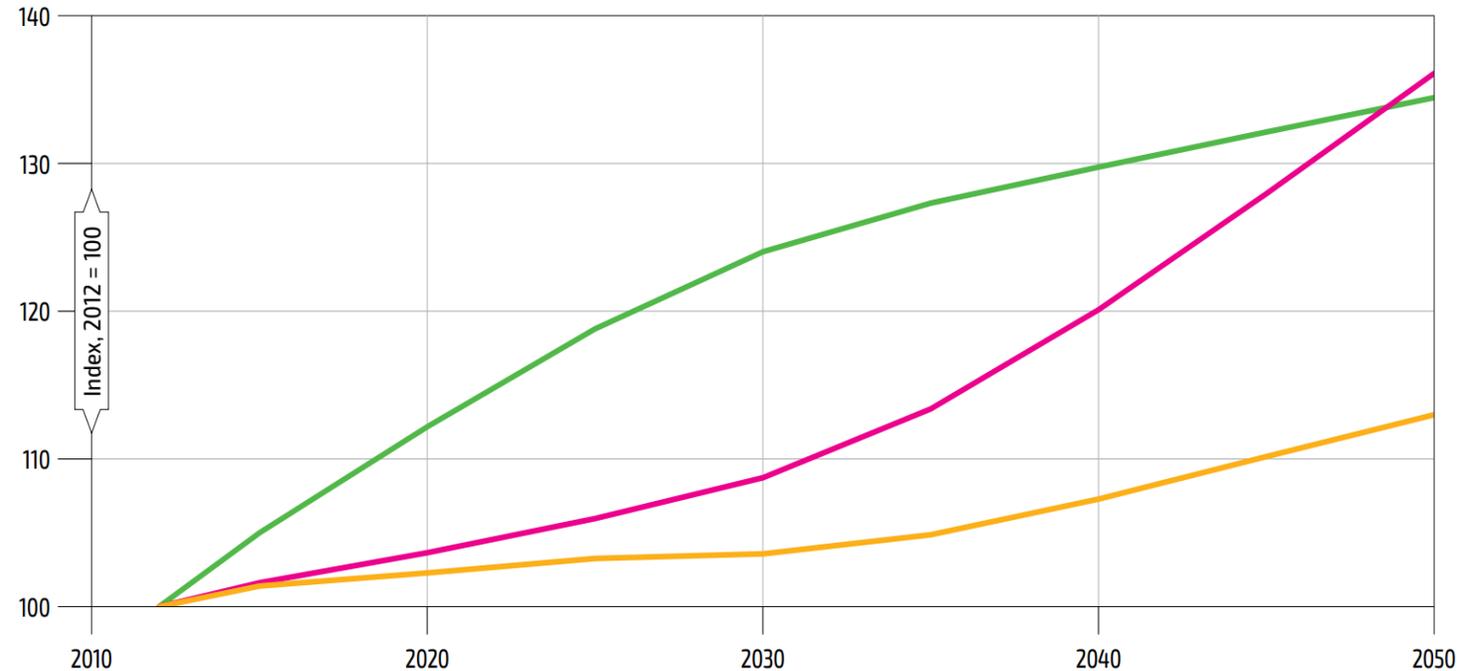


# Sustainable Yields – food prices trade-off

### Yield changes from 2012 to 2050 due to climate change and technical progress



### Global agriculture price index



- Technical change
- Climate change

Combined effects by scenario

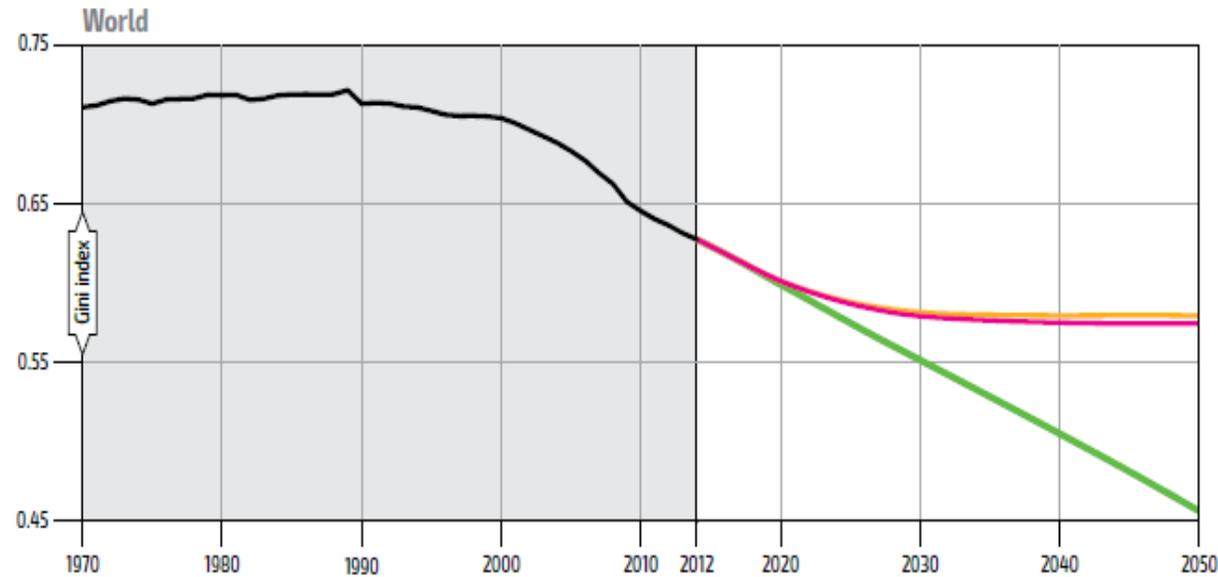
- Business as usual
- Towards sustainability
- Stratified societies

**While moving towards sustainability, food prices might increase significantly** if the entire range of production costs is taken into account through the adoption of sustainable technologies that provide comparatively lower yields

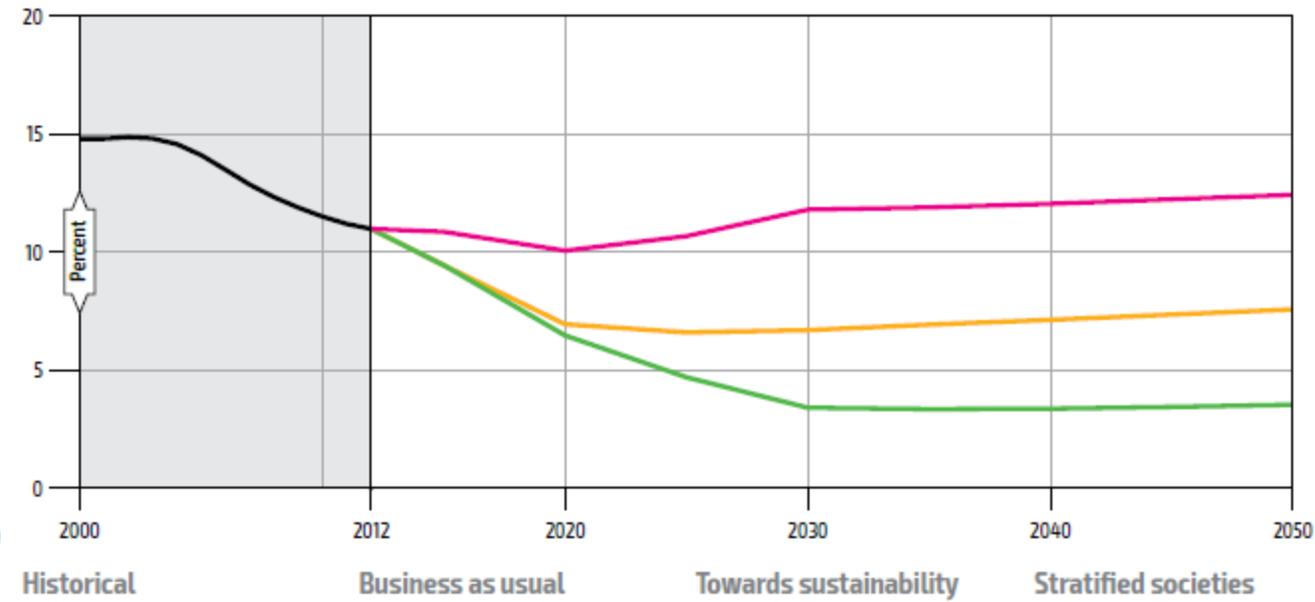
# Addressing Sustainability – food prices trade-off

**Improving income distribution** across countries through **better governance** and other development triggers allows achieving much lower food insecurity despite increasing food prices

Gini index of per capita income: Historical and projected



Prevalence of undernourishment: Historical and projected



Historical

Business as usual

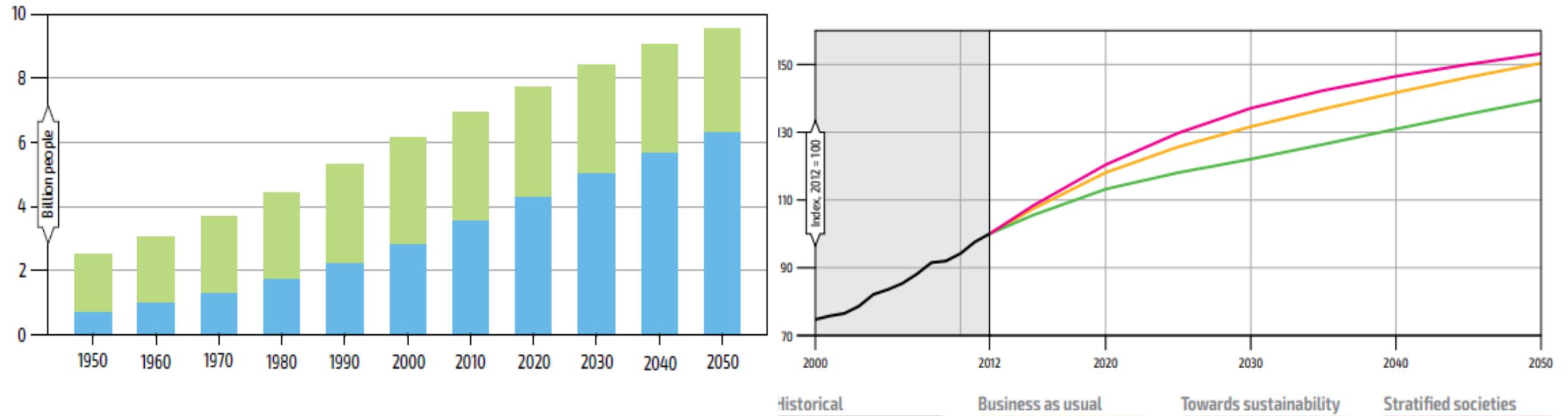
Towards sustainability

Stratified societies

# Agriculture output – GHG emissions trade-off

Given to population (and average income) growth there is the need to expanding agricultural output. At the same time there is the need to reduce GHG emissions of food and agriculture sector

Total global agricultural output (2012 = 100)





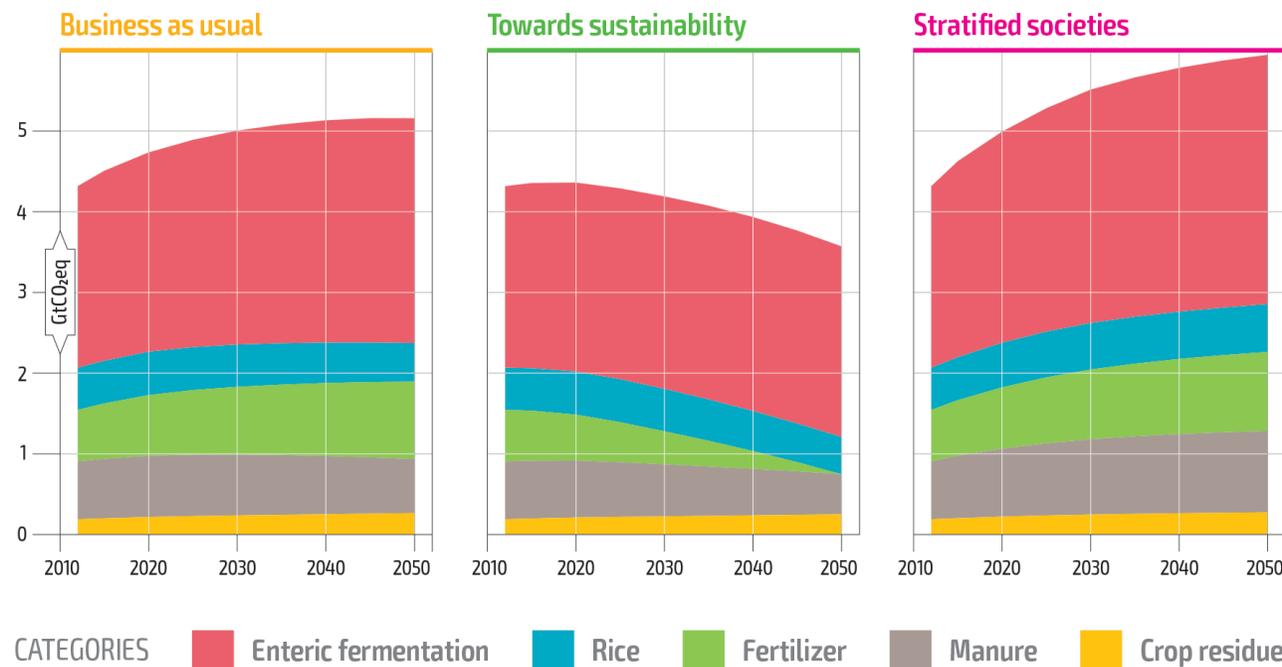
# Addressing Output – GHG emissions trade-off

Increasing consumer awareness together with other triggers of development (including governance) helps to contain food systems' GHG emissions while avoiding prescriptive diets

Per capita animal products consumption (Kcalories/day)

REGIONS	index, 2012 = 100					2050		
	1961	2012	2050			2050		
	HISTORICAL	BASE YEAR	BAU	TSS	SSS	BAU	TSS	SSS
High-income countries	669	796	830	700	841	104	88	106

Global GHG emissions for selected activities





## (selected) Trade – offs in implementing agenda 2030

Obyective 1	Obyective 2	Trigger (accelerator)
Achieving sustainable yields	Achieving food security and nutrition	Improved income distribution
Increasing output	Reducing GHG emissions	Consumer awareness
Sustainable yields	Minimizing land use expansion	Technology (intensification)
Increasing Employment	Increasing wages	Governance (Action track 4, SDG 16.4: Illicit financial flows)
Increasing foreign currency inflows	Increasing economic diversification	Governance (Selective openness + all of the above)
Increasing food availability	Using biomass as renewable energy	...
Subsidizing unsustainable input use	Maintaing social stability	...
Funding social protection schemes	Funding public infrastructure and R&D	...
...	...	...



## Concluding remarks

To achieve SDG targets there is the need to:

- Ensuring that interventions on food and agriculture systems be grounded on solid **impact models** (theories of change), from diagnoses through **triggers and causal links to desired transformations**
- *“Ensuring the **full exploitation of the Agenda 2030 framework**, including targets neglected so far, that in many situations may become instrumental (intermediate objectives) to trigger transformative processes”*

(quotes from the ongoing FAO foresight process)