CFS 46
COMMITTEE ON WORLD FOOD SECURITY

Agroecological and other innovative approaches
for sustainable agriculture and food systems that enhance food security and nutrition

A report by the
High Level Panel of Experts on Food Security and Nutrition of the CFS

Project Team Leader: Fergus Sinclair

CFS 46
COMMITTEE ON WORLD FOOD SECURITY

The Project Team

CFS 46
COMMITTEE ON WORLD FOOD SECURITY

Introduction

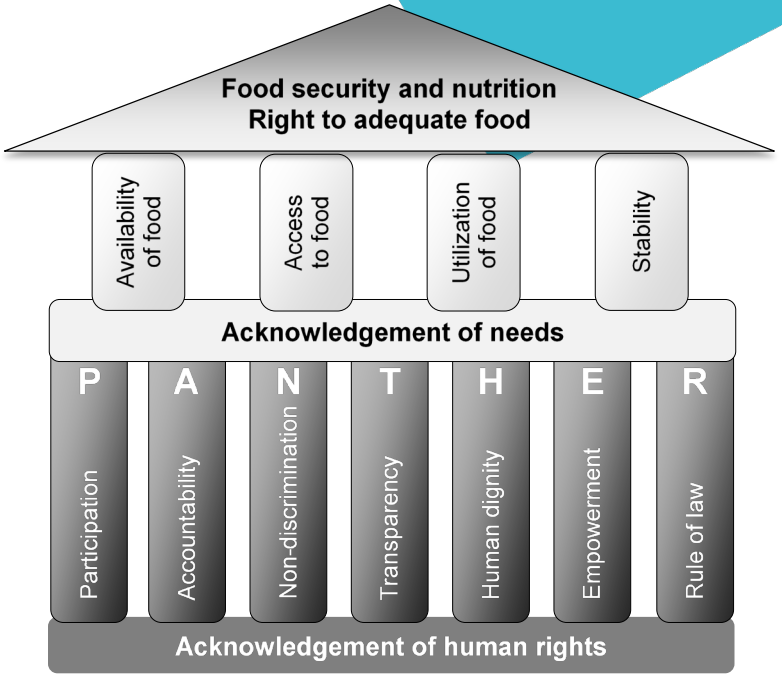
Current food systems result in **widespread malnutrition** and are a major driver of **exceeding planetary boundaries**.

Major transformation of food systems requires changes in consumption, production, processing, storage, transport and retail

Transformation happens via series of **transitions**

Agroecological approaches rising in prominence

Human rights basis for sustainable food systems - **PANTHER**



Agroecology

Dynamic concept,
from field and farm to whole food system:

- **Science** transdisciplinary.
- **Set of practices** harness ecological processes - generic principles, applied locally - no prescribed set.
- **Social movements** political, assert collective rights, advocate diversity in agriculture and food systems.

https://www.bondproject.eu/outstanding-practices-in-agroecology-2019-announced/

Transformational

Incremental

Level 5 Build a new global food system based on participation, localness, fairness and justice

Level 4 Reconnect consumers and producers through the development of alternative food networks

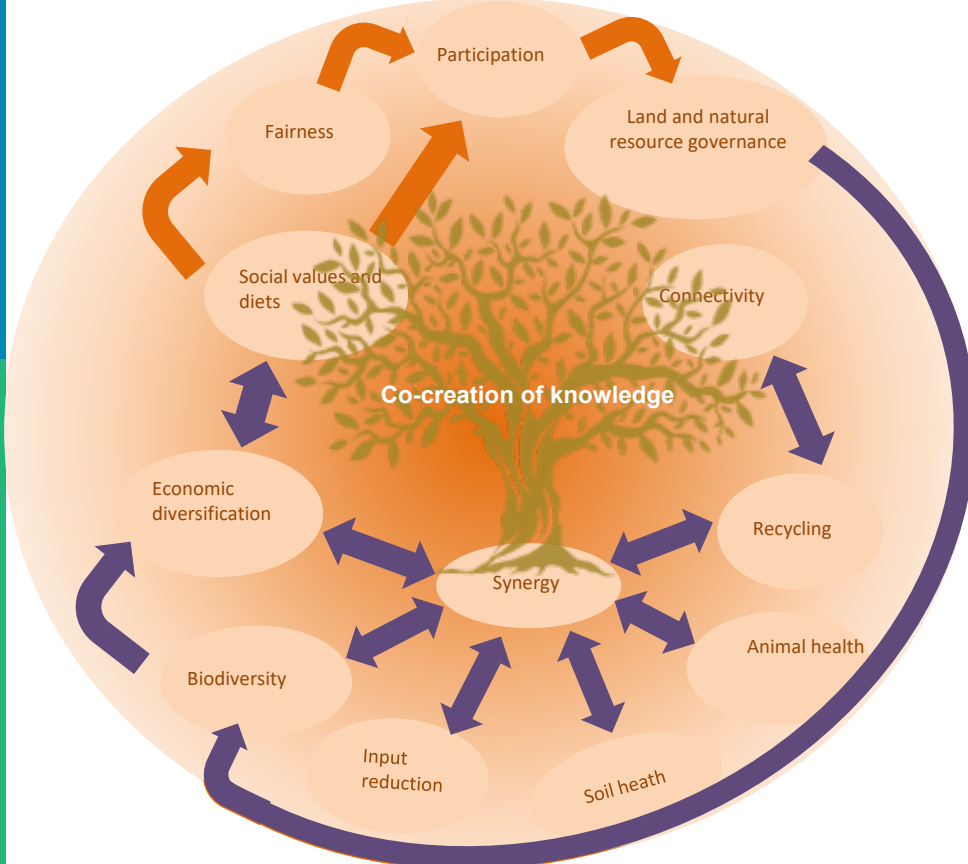
Level 3 Redesign agroecosystems

Level 2 Substitute conventional inputs and practices with agroecological alternatives

Level 1 Increase efficiency of input use and reduce use of costly, scarce or environmentally damaging inputs

Food system

Agroecosystem



CFS 46
COMMITTEE ON WORLD FOOD SECURITY

Innovation

Involves challenging the *status quo* (rules, institutions, practices).

How change happens (the process of innovation) is as important as the specific changes (innovations) that result:

- New technology, markets and institutions: emphasis now on democratizing and responsible innovation hence co-creation of knowledge.
- Innovation in agriculture is inherently localized.
- Approaches = widely practiced sets of principles and methods that foster the transition towards SFS for FSN, within an overarching philosophy and strategic vision for the future.
- Principles = statements which form a basis for a system of belief or reasoning which guide decisions and behaviour
  - Either normative or causative
  - Need to be fully explicit

CFS 46
COMMITTEE ON WORLD FOOD SECURITY

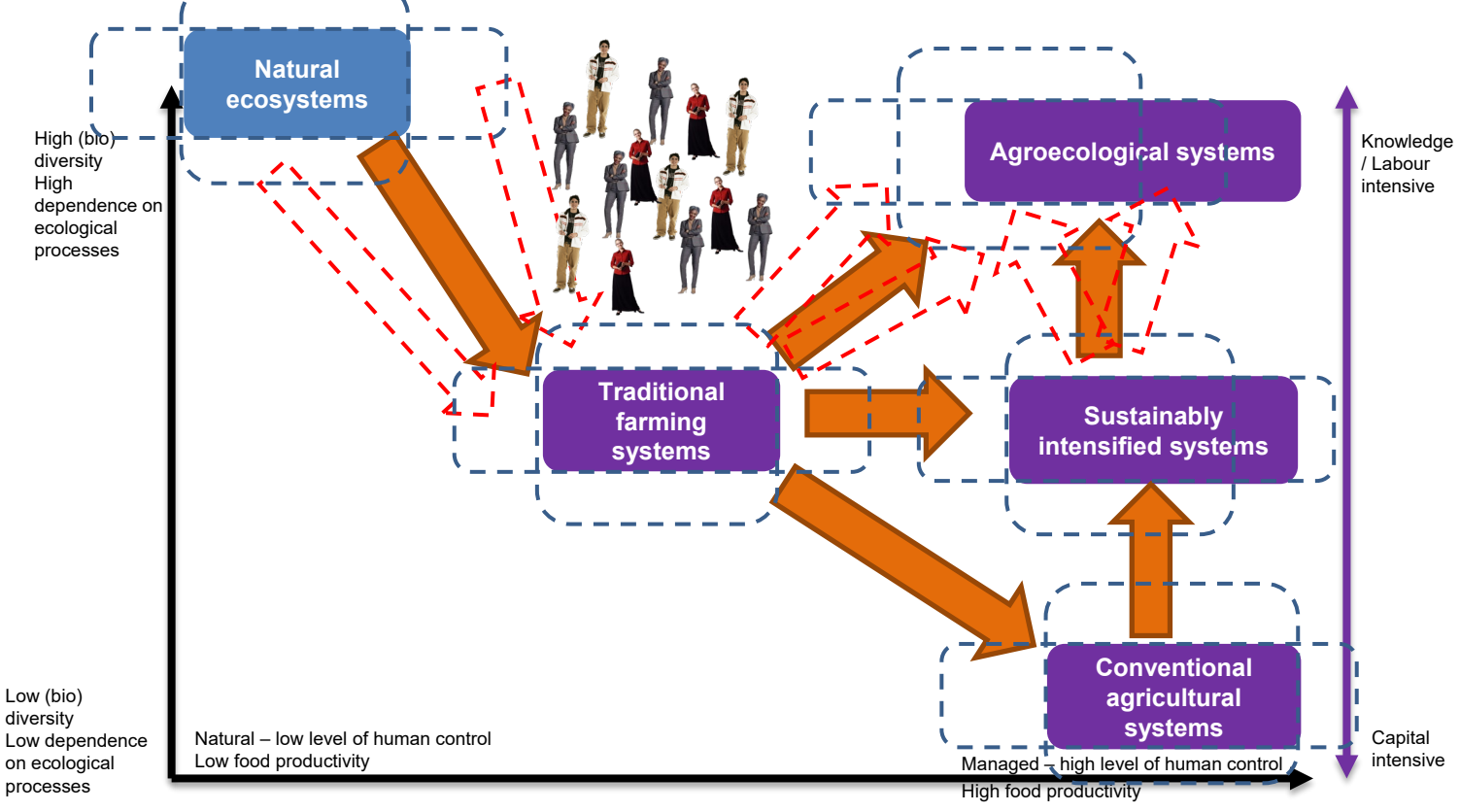
Innovation approaches

- **Sustainable intensification and related** approaches (*incremental*)
  increasing production per unit of land

- **Agroecological** and related approaches (*transformative*)
  input reduction, natural processes and addressing power asymmetries

Approaches overlap, their **convergence and divergence** is evident from analysis of their principles.

There are many transition pathways
from different starting points, in different contexts.

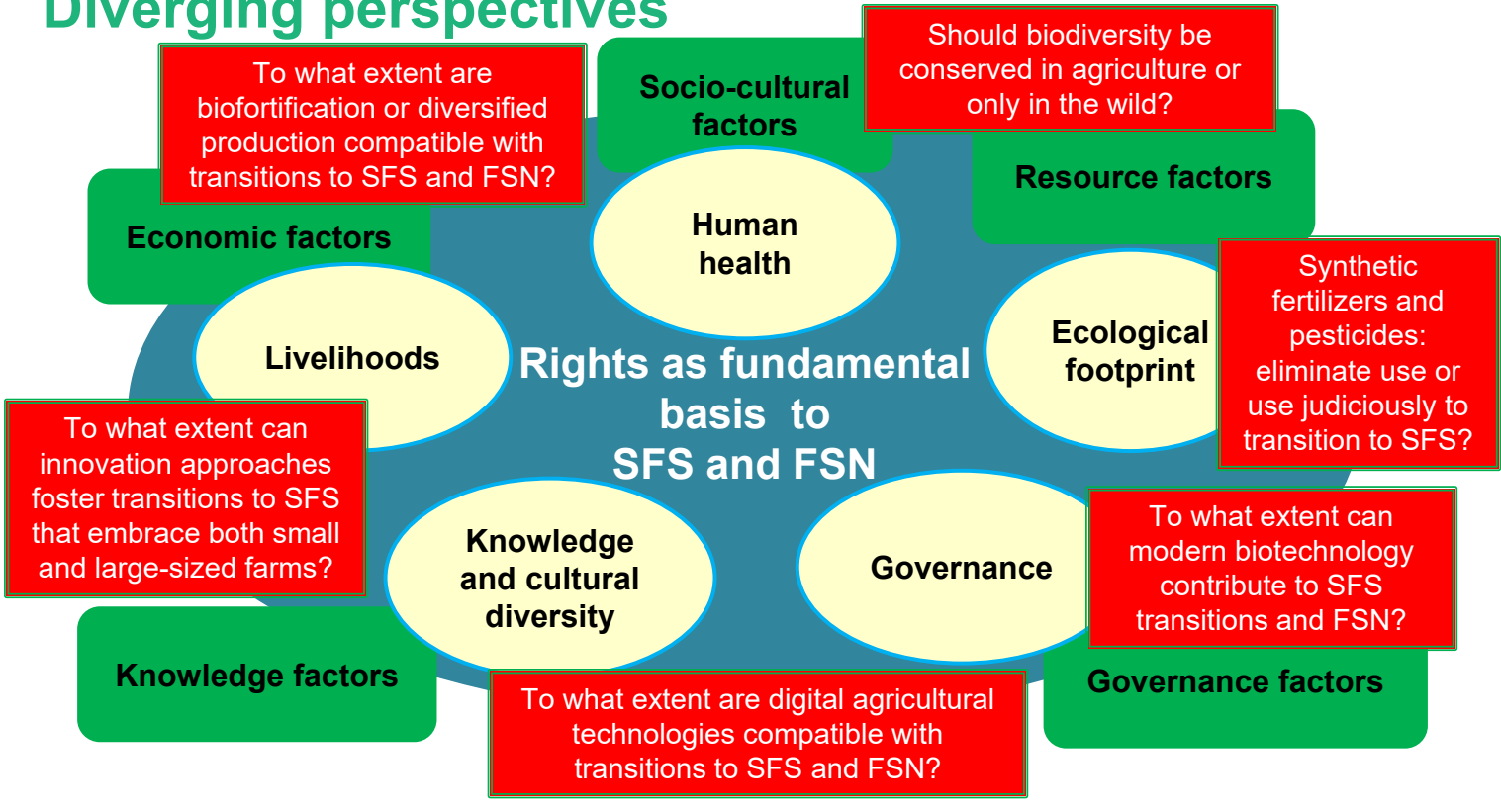

Natural ecosystems
Agroecological systems
Traditional farming systems
Sustainably intensified systems
Conventional agricultural systems
High (bio) diversity
High dependence on ecological processes
Low (bio) diversity
Low dependence on ecological processes
Natural – low level of human control
Low food productivity
Managed – high level of human control
High food productivity
Knowledge / Labour intensive
Capital intensive

CFS 46
COMMITTEE ON WORLD FOOD SECURITY

Augmenting the SFS for FSN framework

1. Consider adding "agency" as a 5th pillar of FSN
2. Consider adding a fourth operational principle of sustainable food systems of **ecological footprint** which connects consumption (*including all externalities*) to sustainable capacity to produce BUT need to add the degradative or regenerative nature of production processes.

Diverging perspectives



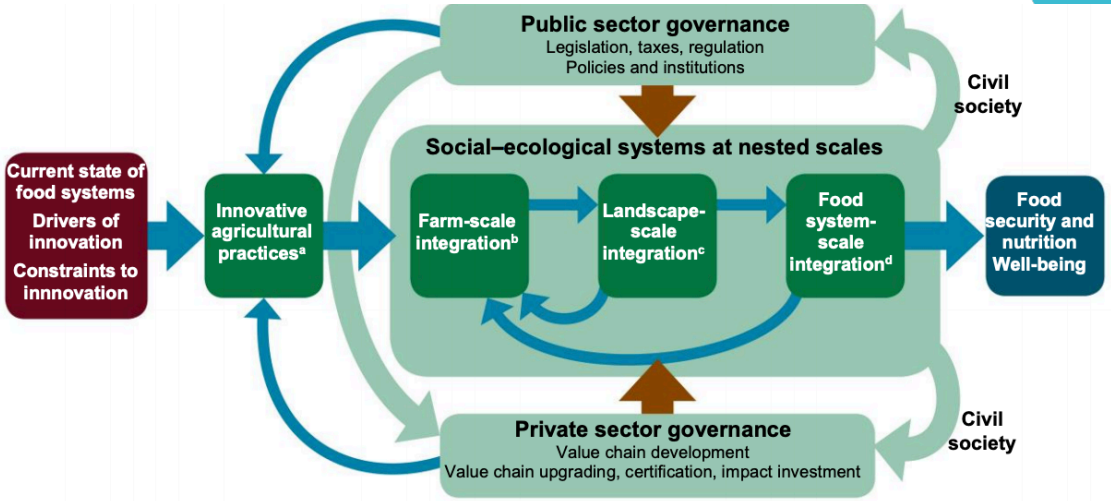
CFS 46
COMMITTEE ON WORLD FOOD SECURITY

What was learnt from analyzing diverging perspectives

- Divergence more around **how** technology is accessed, **used and controlled** rather than the fundamental nature of technologies themselves
- **Moralization** of food
  increases motivation of policy makers to act
  but makes it more difficult for this to be done on the basis of evidence
- There is **need for clarity** on asserting *normative starting points* for transitioning to SFS for FSN *and then causative mechanisms* **to achieve transitions in different contexts**
- **Understanding the basis and nature of controversies**
  helps **get beyond divisions**

CFS 46
COMMITTEE ON WORLD FOOD SECURITY

Influence of public and private sector governance mechanisms on innovation

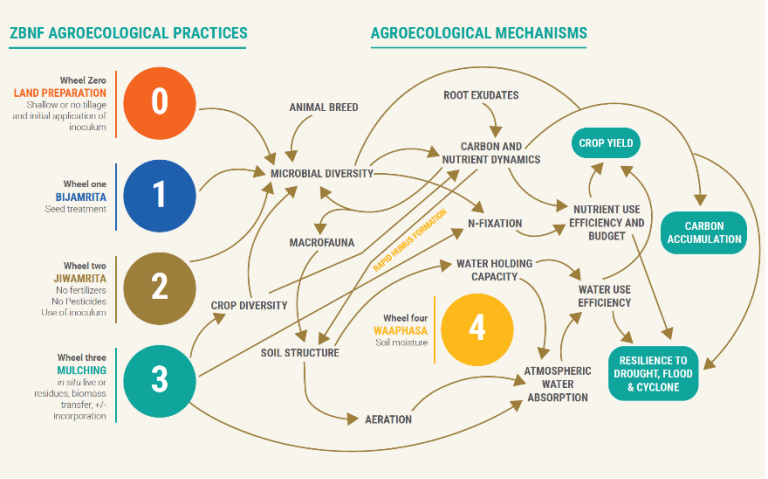


[a] With performance measures related to their purpose, evaluated across contexts

[b] Total factor productivity and resilience of livelihoods

[c] Provision of multiple ecosystem services – land equivalent ratio multifunctionality

[d] From production through to consumption – ecological footprint


ZBNF AGROECOLOGICAL PRACTICES
AGROECOLOGICAL MECHANISMS
Wheel Zero
LAND PREPARATION
Shallow or no tillage and initial application of inoculum
0
Wheel one
BIJAMRITA
Seed treatment
1
Wheel two
JIWAMRITA
No fertilizers
No Pesticides
Use of inoculum
2
Wheel three
MULCHING
in situ live or residues, biomass transfer, +/- incorporation
3
Wheel four
WAAPHASA
Soil moisture
4
ANIMAL BREED
ROOT EXUDATES
CARBON AND NUTRIENT DYNAMICS
CROP YIELD
MICROBIAL DIVERSITY
NUTRIENT USE EFFICIENCY AND BUDGET
CARBON ACCUMULATION
N-FIXATION
MACROFAUNA
RAPID HUMUS FORMATION
WATER HOLDING CAPACITY
WATER USE EFFICIENCY
CROP DIVERSITY
SOIL STRUCTURE
ATMOSPHERIC WATER ABSORPTION
RESILIENCE TO DROUGHT, FLOOD & CYCLONE
AERATION

CFS 46
COMMITTEE ON WORLD FOOD SECURITY

Key actions to foster transitions

1. **Take into account and value the diversity of food systems** and their contexts across scales when developing transition pathways
2. **Broaden performance metrics** for food systems
3. **Recognize improvement of ecological footprint** as an operational principle for transitioning to more sustainable food systems
4. **Encourage integration of transdisciplinary science and indigenous knowledge** to support local innovation; and,
5. **Consider the emerging importance of 'agency'** as a possible fifth pillar of food security and nutrition

CFS 46
COMMITTEE ON WORLD FOOD SECURITY

Areas of recommendations

1. PROMOTE AGROECOLOGICAL AND OTHER INNOVATIVE APPROACHES TO FOSTER TRANSFORMATION OF FOOD SYSTEMS
2. SUPPORT TRANSITIONS TO DIVERSIFIED AND RESILIENT FOOD SYSTEMS
3. STRENGTHEN SUPPORT FOR RESEARCH AND RECONFIGURE KNOWLEDGE GENERATION AND SHARING TO FOSTER CO-LEARNING
4. STRENGTHEN AGENCY AND STAKEHOLDER ENGAGEMENT, EMPOWER VULNERABLE AND MARGINALIZED GROUPS AND ADDRESS POWER INEQUALITIES IN FOOD SYSTEMS
5. ESTABLISH AND USE COMPREHENSIVE PERFORMANCE MEASUREMENT AND MONITORING FRAMEWORKS FOR FOOD SYSTEMS