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Introduction to FAO work on Agroecology

Animal Production and Health Commission for Asia and the Pacific (APHCA) session
7 November 2019, Kuala Lumpur

Global & Regional context:

Why is Agroecology relevant?

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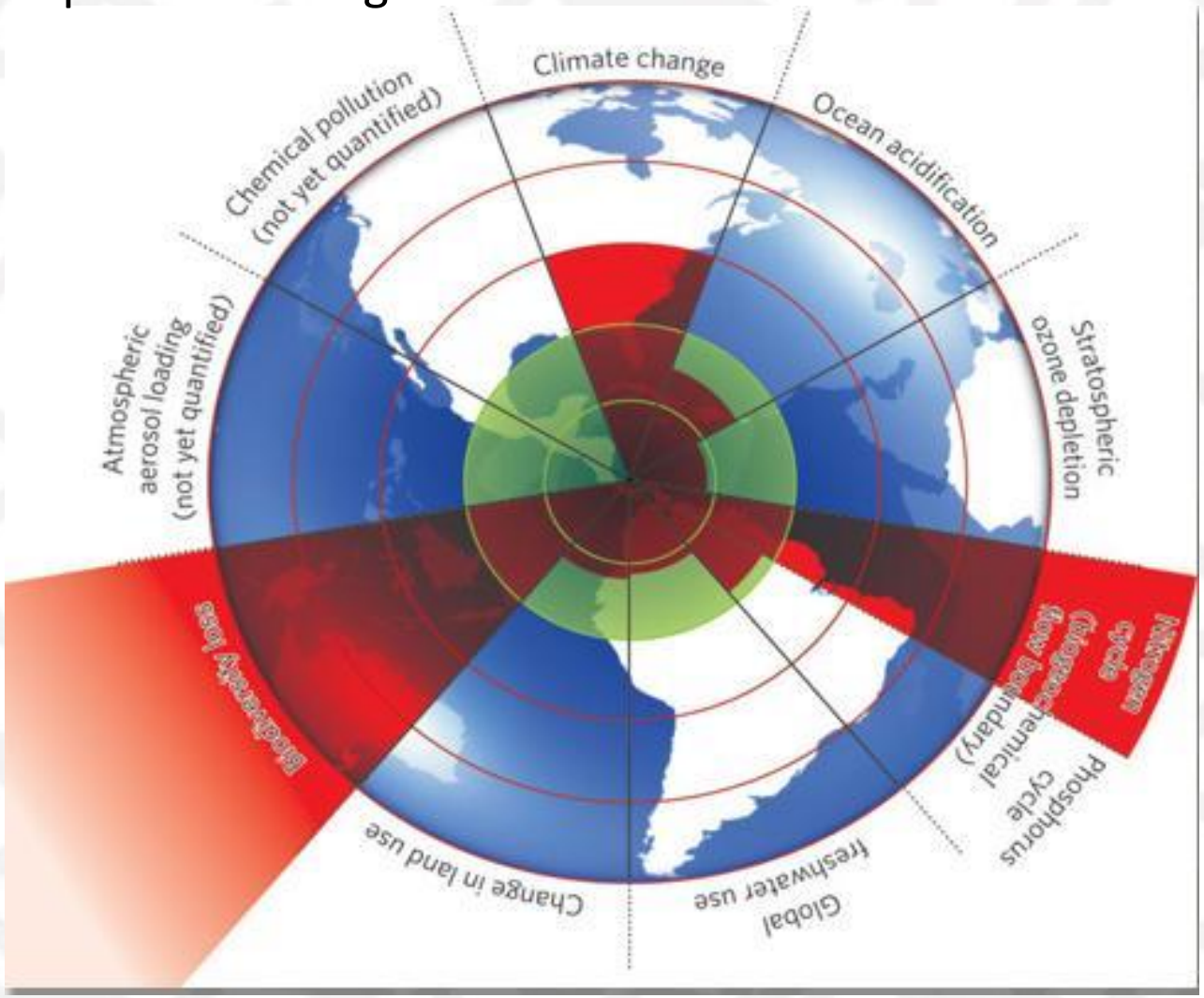
THE GLOBAL CHALLENGE

In the next 35 years we expect complex and interconnected challenges that will put an unprecedented pressure on agriculture:



- Population increase projections; over 2.6 billion people overweight; poor diets, increased agricultural markets concentrations; conflicts and migration; rural poverty
- Competition for natural resources (land, water, energy)
- Consequences of climate change

→ **Current agricultural production system** based on intensive inputs and productivity can **no longer be a sustainable option**

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THE ASIAN CONTEXT

- Important **changes in Food Systems** due to rapid economic growth, increasing population and demographic shifts, rapid urbanization, rural and urban transformation, changing food consumption behavior and climate change

- Important challenges to address in regards to
  - **Nutrition**: triple burden (malnutrition, obesity, hidden hunger)
  - **Food Safety**: growing distrust of consumers towards food quality and food safety due to regular food scandals
  - **Biodiversity loss**: rapid economic growth at the expense of the environment (IPBES, 2019)
  - **Climate change**: systemic risk to achievement of food security and to natural systems that support agriculture sector (IPCC reports)
  - **Youth**: lack of interest for agriculture / lack of fulfilling job opportunities

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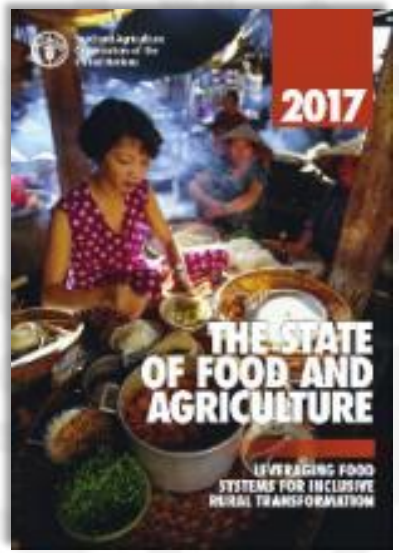
AGROECOLOGY

An answer to the transformative call for our food and agricultural systems

"New areas are still being cleared for agriculture at record rates, even with successful intensification. Current techniques are reducing damage only at the margins.

***We need an integral approach that agroecology can offer**. FAO is committed to explore all the potential of agroecology in this regard."*

***Source**: FAO Director General Statement*
Regional Symposium on Agroecology for Sustainable Agriculture and Food Systems for Europe and Central Asia. Budapest, Hungary, November 2016



*"Going beyond input use efficiency and input substitution, agroecology seeks to **harness key ecological processes,** such as the recycling of nutrients and synergies among the components of **agrobiodiversity**."*

***Source**: FAO. 2017. The State of Food and Agriculture 2017*

What is Agroecology?

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A **polysemic concept** with over **30 definitions** adopted by government, Academia and CSOs (FAO website, AgroecologyLex)

Applies **ecological concepts & principles** to optimize **interactions** between plants, animals, humans and the environment while taking into consideration **social aspects** needed for a **sustainable and fair food system**

Based on **bottom-up** and **territorial** processes, helping to deliver **contextualized solutions** to local problems.

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- AE innovations are based on the **co-creation of knowledge**, combining science with the traditional, practical and local knowledge of producers
- By enhancing their autonomy and adaptive capacity, AE empowers **producers** and **communities** as key **agents of change**
- Emphasizes **social equity** (job creation & gender aspects)
- Promotes **local markets** and **direct consumer-producer exchanges** (value addition & diverse diets)

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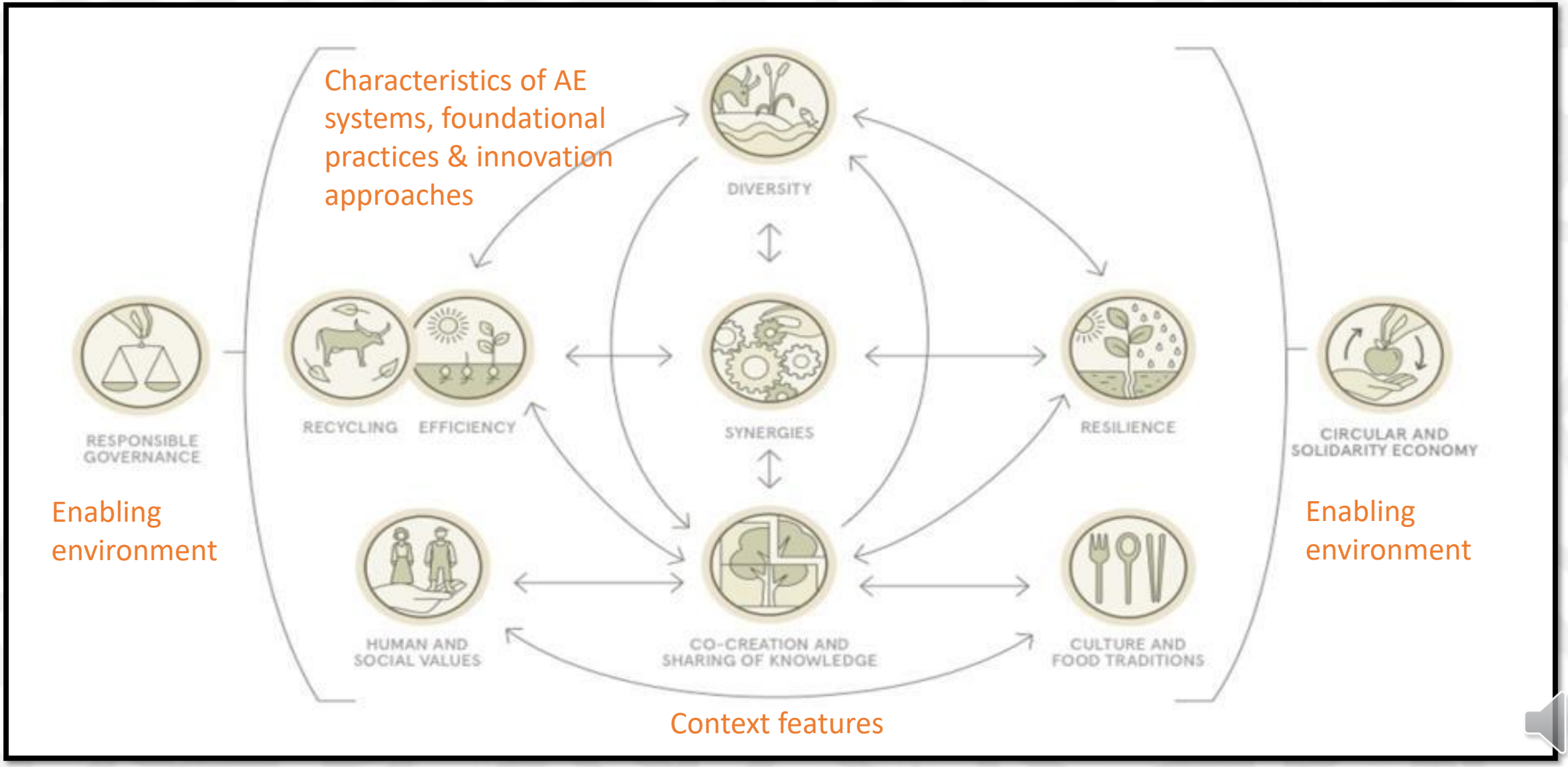
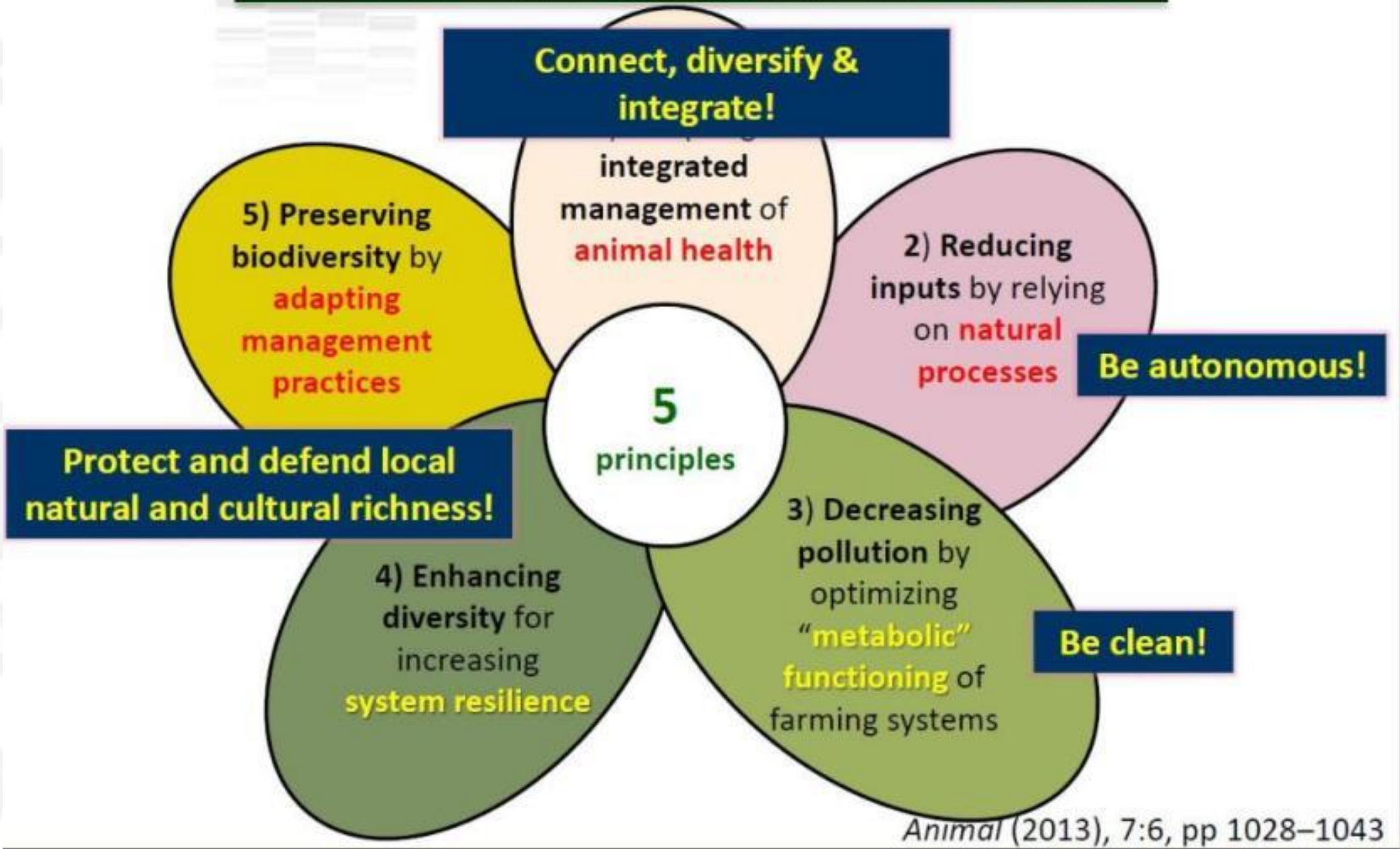
10 ELEMENTS OF AGROECOLOGY



What’s about Agroecology and Livestock Production?

1) Five ecological principles

(*Dumont et al., 2013; inspired from Altieri, 2002*)



Animal (2013), 7:6, pp 1028–1043

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AGROECOLOGY APPLIED TO TEMPERATE & TROPICAL RUMINANT SYSTEMS

Production per unit area or per animal	Production can slightly decrease per unitary component but at farm level, diversification of production increases overall farm yields, ES and profitability to farmers
Use of inputs	Systems less dependent on chemical inputs and use more on-farm produced inputs through recycling
Link to local environment	Use diversity to strengthen adaptive capacity and resilience
Biodiversity & Ecosystem Services	AE as part of a land sharing approach with functional links with ES. Biodiversity considered as both a resource (that provides ES to farmers) and an output. Scaling up AE would benefit from payment for environmental services
Animal selection goals	Selection on a number of productive and adaptive traits (i.e., breeding for robustness). Animal genetic resources and local breeds offer opportunities to adapt animals to their local environment
Role of technology	Technology facilitates the collection of individual-based information and can be used to monitor every component of the system to increase its overall efficiency. Technology needs to remain accessible to smallholder farmers
Knowledge transfer	Mainly bottom-up, as AE places strong value on local knowledge. Farmer-to-farmer networks also play a key role in information transfer
Labor	More time to supervise and observe the system. Labour productivity can thus be lower than in industrial systems
Market	Selling in niche markets allows benefiting from the added value created on the farm

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KEY OPPORTUNITIES FOR LIVESTOCK TO CONTRIBUTE TO THE AE TRANSITION

- By eating fibrous feeds (e.g. grass and straw) and waste (e.g. swill), livestock make use of biomass that humans cannot eat and increase natural resource use efficiency.
- Animal mobility within and between agroecosystems and landscapes transfers nutrients, biomass and water in the form of animal manure, and moves people's assets in times of disasters such as floods or drought.
- Manure is rich in nutrients and organic matter, which are key to the physical, chemical and biological properties of healthy soils
- Good livestock management practices increase plant biodiversity in grasslands, which in turn enhances productivity, resilience, and other ecosystem services
- Livestock are part of climate solutions, through reducing enteric methane emissions and deploying diverse livestock resources to increase resilience on farm.

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Concept of AE as an **overarching umbrella** under which many different approaches can exist as long as they are moving towards **sustainable food systems**

- **Production practices**: e.g. Agroforestry, Livestock-Crop Integration, SRI, IPM, Rice-Duck or Rice-Fish farming, Conservation agriculture…
- **Environmental dimension**: Biodiversity, Climate Resilience…
- **Economic dimension**: PGS, Farmer's markets, Value addition…
- **Social dimension**: Farmers organization, Social movements, Focus on decent work…

FAO’s Outreach on Agroecology

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OVERALL APPROACH

- **Raising awareness** and **building capacities**
- Generating **evidences** & Strengthening **credibility** (Scaling Up AE initiative, Global Knowledge Product on AE)
- **Mainstreaming** across current and future projects & Building **alliances**

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FAO's Agroecology Knowledge Hub

- Constantly updated with FAO and external content
- Publication of resources, experiences and events on agroecology
- Agroecology monthly newsletter
- Databases on agroecology:
  - **AgroecologyLex** - Selection from FAOLEX Database on country legislation, agreements and policies on agroecology
  - **Agroecology Knowledge Hub database** - Repository of publications, articles, courses and multimedia resources on agroecology

http://www.fao.org/agroecology

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Tool for Agroecology Performance Evaluation (TAPE)

- **To produce global and harmonized evidence** (information and data) on the multi-dimensional performance of agroecological systems in order to inform policy-making and to support the process of transition to Agroecology

- **Build knowledge** and **empower producers** through the collective process of producing data and evidence on their own practices;
- **Support agroecological transitions** at different scales and in different locations by proposing a diagnostic of performances over time and by identifying areas of strengths/weaknesses and enabling/disabling environment;
- **Inform policy makers** and **development institutions** by creating references on the multi-dimensional performance of Agroecology and its potential to contribute to the SDGs

The tool can be used by governments, farmers, scientists and extension workers

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An overview of TAPE

STEP 0

DESCRIPTION OF SYSTEMS AND CONTEXT

Primary and secondary information:
- Production systems, type of household, agroecological zones
- Existing policies (incl. climate change)
- Enabling environment

STEP 1

CHARACTERISATION OF AGROECOLOGICAL TRANSITIONS (CAET)

On farm/household/territory survey:
- Describe current status
- Based on 10 elements of agroecology with descriptive scales
- Can be self assessment by producer

STEP 1bis

TRANSITION TYPOLOGY

Statistical and/or participatory clustering to reduce sample size if large number of observations in CAET

STEP 2

CRITERIA OF PERFORMANCE

On farm/household/community survey:
- Measure progress and quantify impact
- Addressing 5 key dimensions for policy makers and SDGs
- Time/cost constraints: keep it simple!

STEP 3

ANALYSIS AND PARTICIPATORY INTERPRETATION

On farm/household/community :
- Review CAET results, explain with context, enabling environment
- Review Performance results and explain with CAET
- Analyze contribution to SDGs

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STEP 1: CAET - Diversity

Index	0	1	2	3	4
Crops	Monoculture (or no crops cultivated)	One crop covering more than 80% of cultivated area	Diversified number of crops	Diversified and balanced number of crops adapted to local and changing climatic conditions	High number of crops varieties and species well adapted to local and changing climatic conditions. Spatially diversified farm by multi-, poly- or inter-cropping functional to other productive activities within the agroecosystem
Animals (including aquaculture)	No animals raised within the agroecosystem	One species only or covering more than 80% of the animals in the farm (or good number of species but low in number or not well adapted to local conditions)	Good number of animals of more than one species	Good number of animals of different breeds and species adapted to the local and changing climatic conditions and functional to other productive activities within the agroecosystem	High number of animals of several breeds and species (including domesticated pollinators and aquaculture) well adapted to local and changing climatic conditions and functional to other productive activities within the agroecosystem
Trees (and other perennials)	No trees (nor other perennials) in the agroecosystem	Few trees (and/or other perennials) in the agroecosystem (or good number of trees of one species only)	Good number of trees (and/or other perennials) of more than one species	Good number of trees (and/or other perennials) of different species functional to other productive activities within the agroecosystem	High number of trees (and/or other perennials) of several different species integrated and functional to other productive activites within the agroecosystem
Diversity of activities and products enhancing resilience of rural livelihoods	One productive activity only (e.g. selling one crop only)	Few productive activities linked to a very small number of crops/animals	Diversified number of productive activities linked to more than one crop/animal	Diversified number of productive activities and services linked to a high number of products	Many productive activites linked to different products and services (crops, livestock, trees, selling, exchanging, ecotourism, little industry, etc.). Specific attention to enhance biodiversity.

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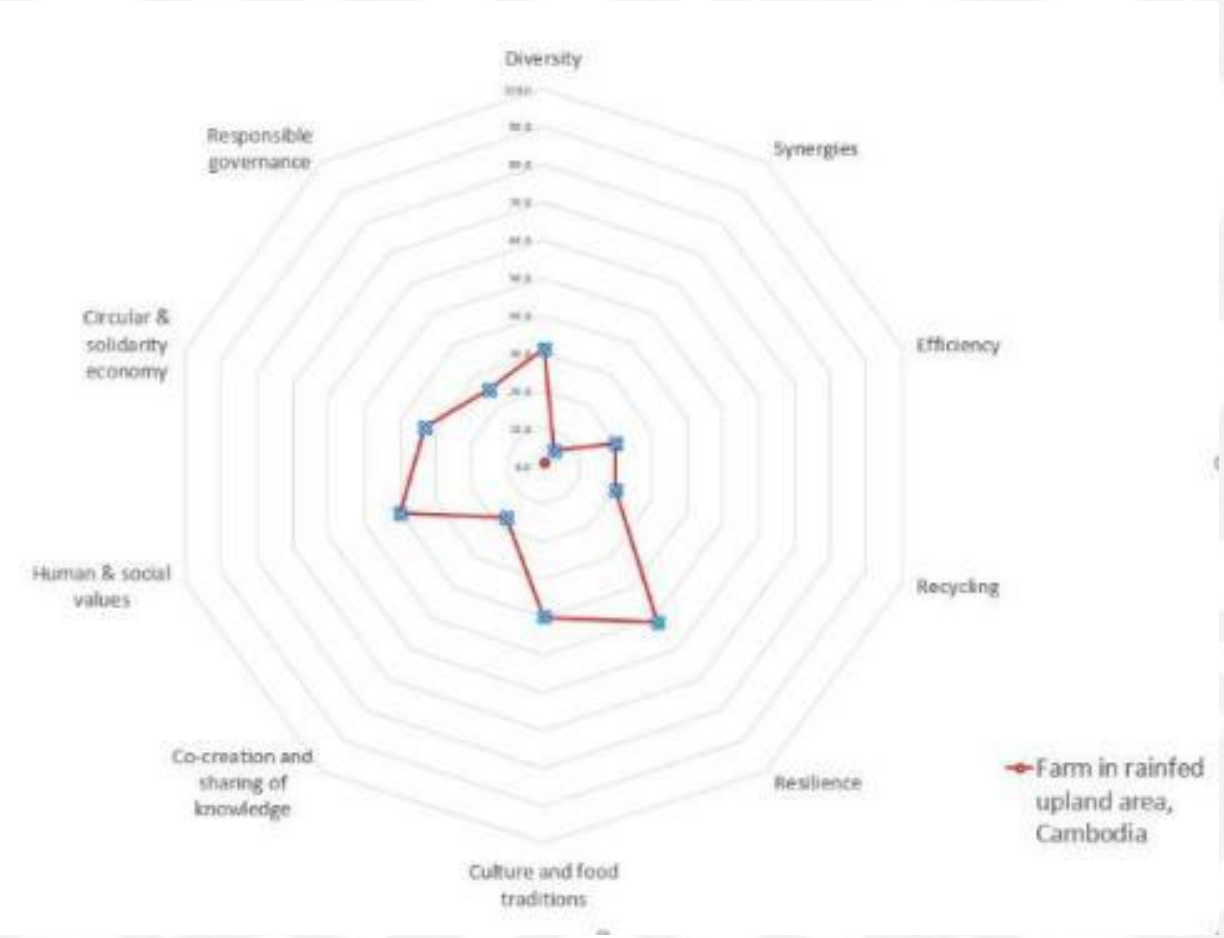
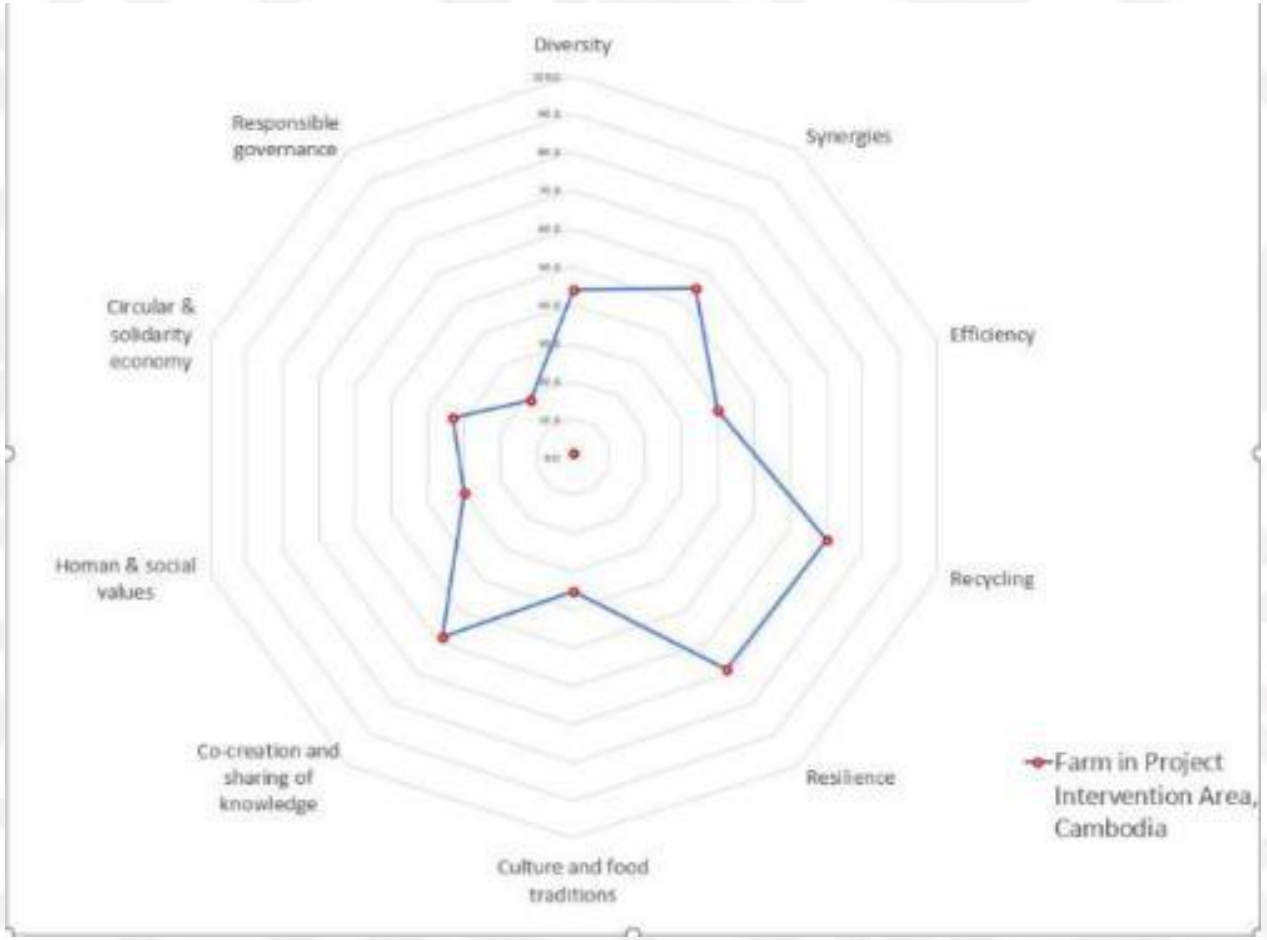
STEP 1 CAET : Example of application in Cambodia



Average CAET results: **28.3**
Farm rain fed upland area (Battambang)



Average CAET results: **45.3**
Farm rain fed upland area, project intervention area (Battambang)

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STEP 2: Core criteria of performance

Main dimension	#	Core criteria of performance	Proposed method of assessment in survey	SDG	SDG indicators
Governance	1	Secure land tenure (mobility for pastoralists)	Type of tenure over land: property, lease + duration, verbal, not explicit (SDG 1.4.2, 5.a.1 and 2.4.1 sub-indicator 11) Existence and use of pastoral agreements and mobility corridors	1 2 5	1.4.2 2.4.1 5.a.1
Economy	2	Productivity	Farm output value per hectare (SDG 2.4.1 sub-indicator 1) Farm output value per person	2	2.3.1 2.4.1
	3	Income	Outputs - inputs - operating expenses – depreciation + other income (SDG 2.4.1 sub-indicator 2)	1 2 10	1.1.1, 1.2.1 and 1.2.2 2.3.2, 2.4.1 10.2.1
	4	Added value	Net income +rents +taxes +interests – subsidies	10	10.1.1 10.2.1
Health & nutrition	5	Exposure to pesticides	Quantity applied, area, toxicity and existence of risk mitigation equipment and practices	3	3.9.1 3.9.2 3.9.3
	6	Dietary diversity	Minimum Dietary Diversity for Women - FAO & FHI (2016)	2	2.1.1, 2.1.2, 2.2.1, 2.2.2, 2.4.1
Society & Culture	7	Women's empowerment	Abbreviated Women's Empowerment in Agriculture Index, A-WEAI (IFPRI, 2012)	2 5	2.4.1 5.a.1 5.a.2
	8	Youth employment	Access to jobs, training, education or migration (SDG 8.6.1)	8	8.6.1
Environment	9	Agricultural biodiversity	Relative importance of crops varieties, livestock breeds, trees and semi-natural environments on farm (SDG 2.4.1 sub-indicator 8.1, 8.6 and 8.7)	2 15	2.4.1 2.5.1
	10	Soil health	SOCLA agroecological method to assess soil health, based on 10 indicators (Nicholls et al., 2004)	2 15	2.4.1 15.3.1

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Non exhaustive list of advance criteria

Main dimension	Advanced criteria	Possible methodologies for assessment	SDG
Economy	Resilience	Self-evaluation and Holistic Assessment of climate Resilience of farmers and Pastoralists (SHARP)	1 2 8
Health & nutrition	Food security & nutrition	- Food self-sufficiency ratio: production x100/(production +purchases -sales) - Nutritional value of agricultural production	2 3
Society & Culture	Decent work	Decent Work Indicators for agriculture and rural areas (FAO, 2015)	8
Environment	Water	-Water use efficiency (e.g. LEAP guidelines for livestock) -Water pollution (e.g. LEAP guidelines on nutrient use)	3 6
	Climate change mitigation	- GHG emissions (e.g. Ex-Act, GLEAM-i, Cool Farm tool) - Carbon sequestration (under development for the Global Livestock Environmental Assessment Model / GLEAM) - GTAE Memento pour l'évaluation de l'agroécologie (Levard et al., 2019)	13

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Way forwards and next steps for TAPE

- Disseminate TAPE to FAO decentralized offices & partners, provide trainings upon request (eg Vietnam & Laos)
- Test TAPE in selected countries with partners (Cambodia/ALiSEA, China/CSA network)
- Use on-line tool for data collection and populate the global database
- Validate / revise TAPE based on feedback from tests
- Publish TAPE and on-line data collection tool

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SUSTAINABLE DEVELOPMENT GOALS

working for Zero Hunger

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IFAD
Investing in rural people

United Nations Decade of FAMILY FARMING 2019-2028

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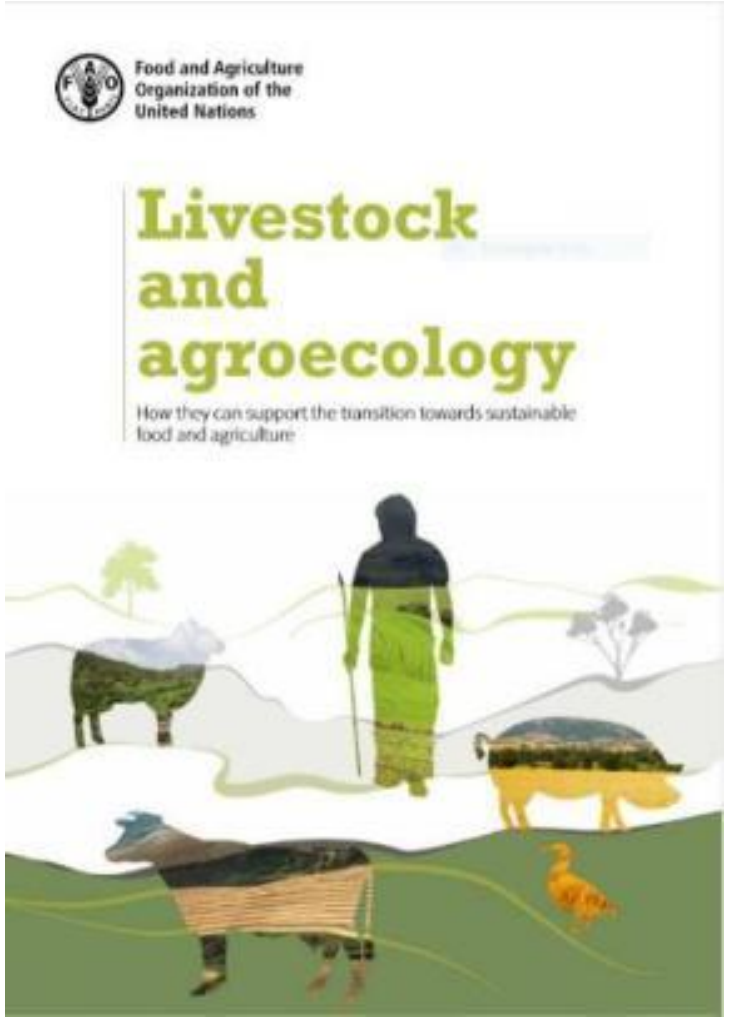

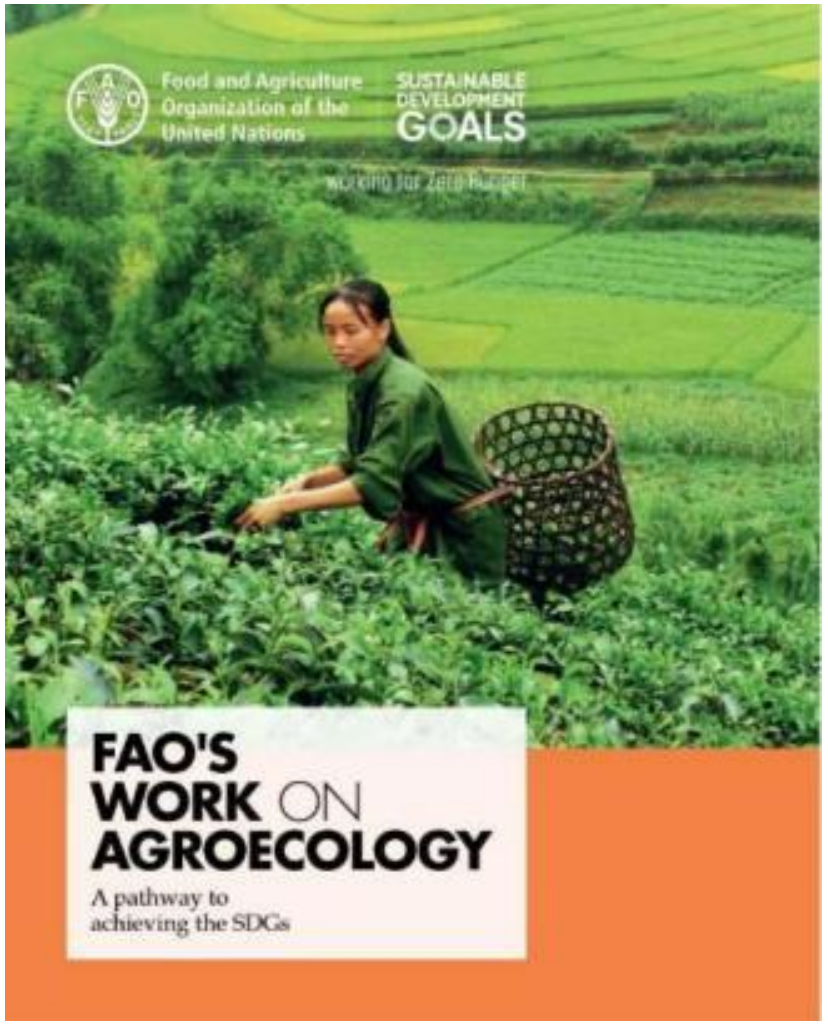

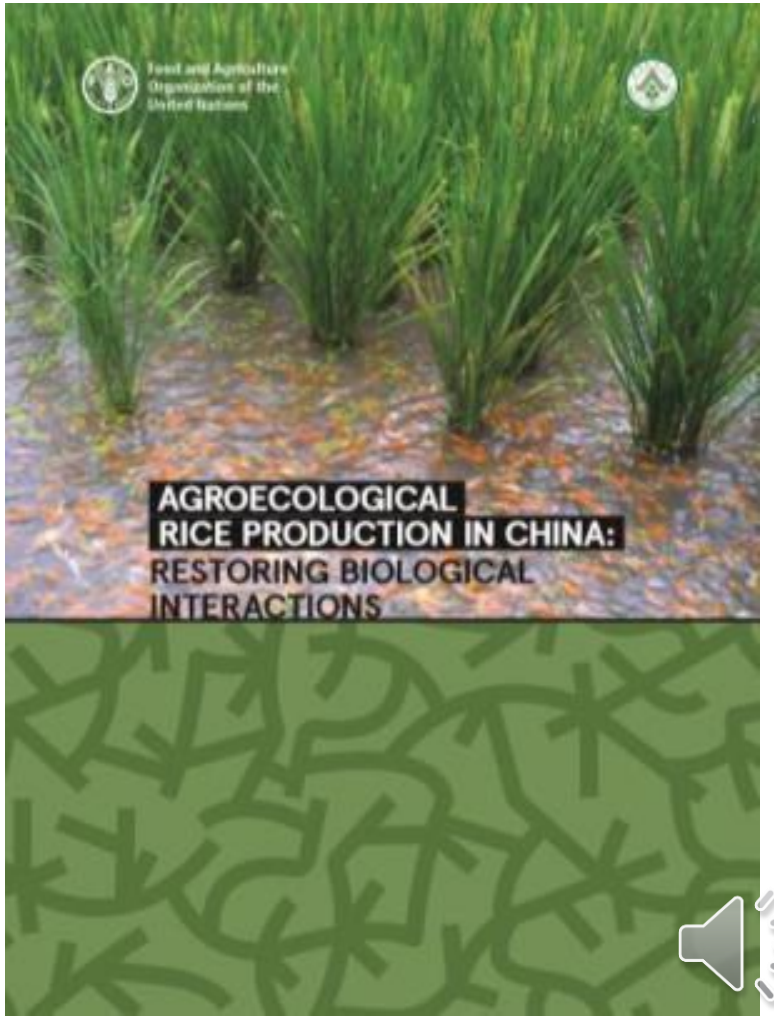

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Thank you!

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