

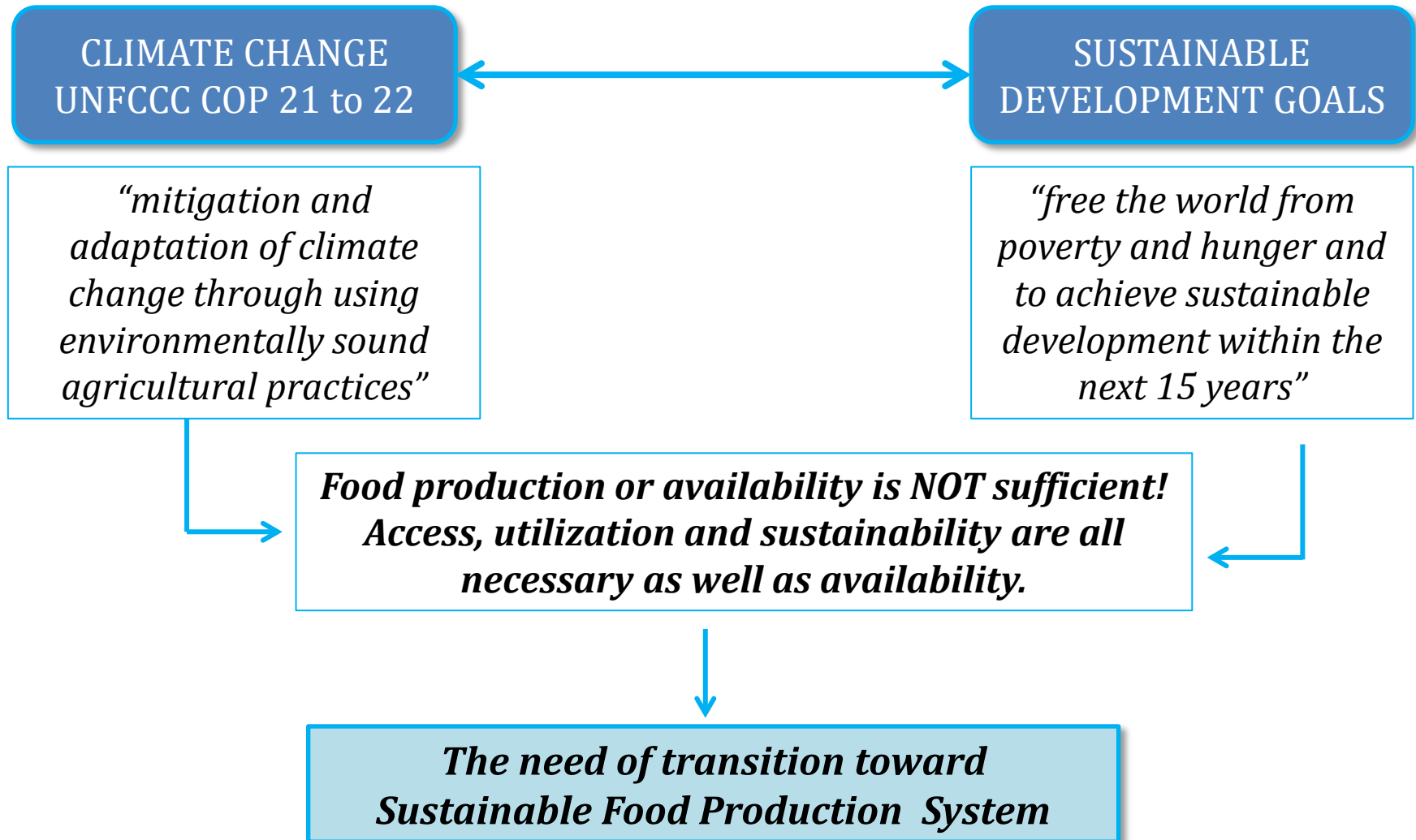


Agroecology as Key Approach to Improve Agriculture's Sustainability

Prof. Dr. Damayanti Buchori, M.Sc

**Workshop "Transition towards Sustainable Agriculture in the Context of the 2030 Agenda for Sustainable Development – Strategic Implementation, Follow Up and Review"
15 – 17 November 2016, Bogor, Indonesia**

International Context



Unprecedented Pressure

World Population Today
7,5 billion

Projected World Population
2050 : 9,2 billion (UN 2013)

Every day, agriculture
produces +/- 23.7 million tons
food (FAOSTAT, 2013)

By 2050, agriculture will need to produce 60 %
more food globally, and 100 % more in
developing countries, if it is to meet demand at
current levels of consumption.

- Green Revolution using highyielding varieties , high external inputs = boosting 50 % production from 1975-2000 (WB 2007), 12 % growth in farming level areas.
- While supplies have been growing, current agriculture production and productivity is unsustainable.
- Current food production and distribution system are failing to feed the world : 850 millions (one of eight of world population) live with chronic hunger (FAO 2013).
- In 2010, majority hungry live in developing countries : 14,3 % prevalence of under-nutrition (FAO, IFAD and WFP, 2013)
- 60 % undernutrition are women, who make up 43 % agricultural labor force (ADB 2013)
- Degradation of agricultural lands, soil depletions, water scarcity , pollution, biodiversity loss, and impact of climate change

The Need of New Way

Pressure :

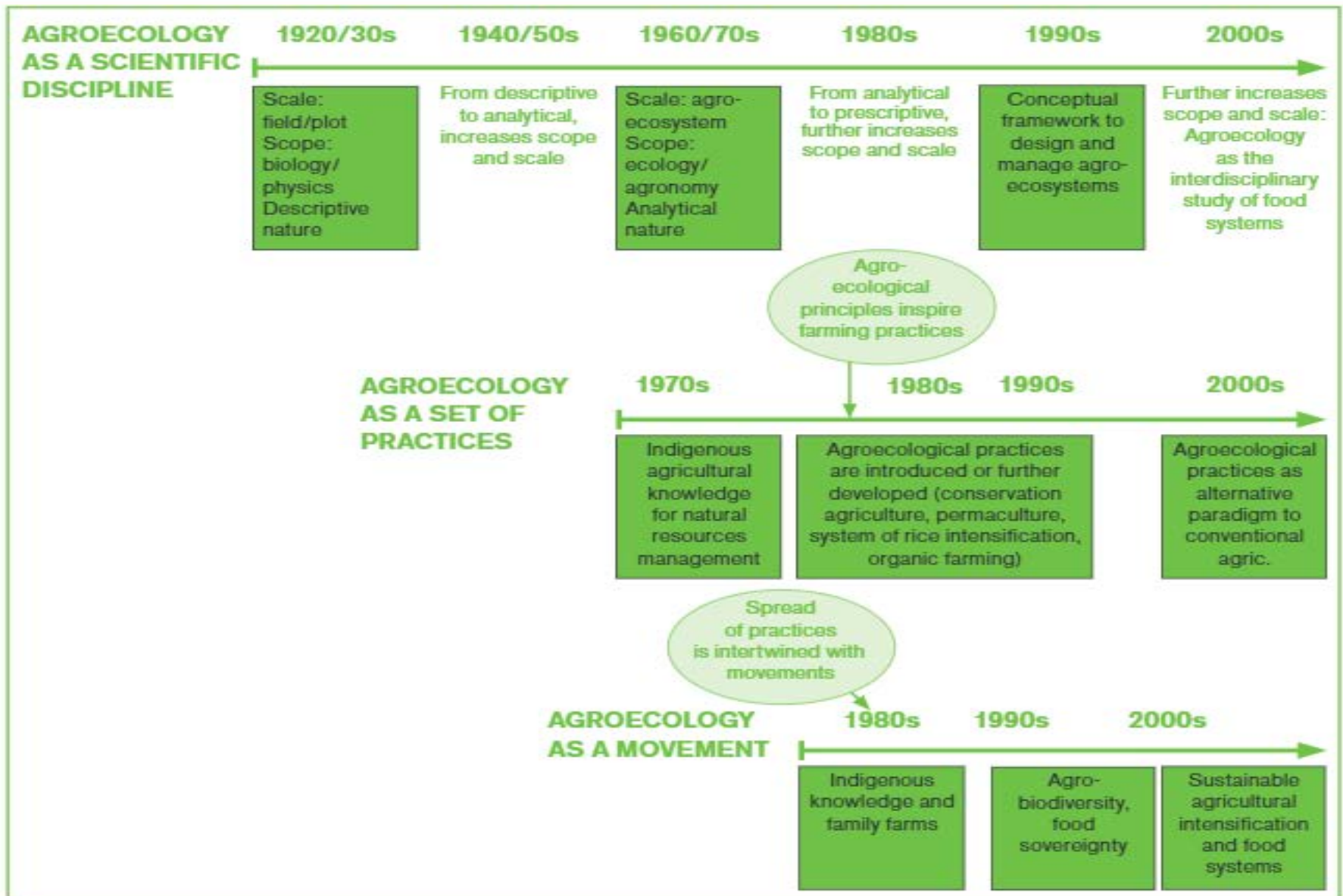
- Poverty, inequality, hunger and mal nutrition
- Inadequate diets and unsustainable consumption pattern
- Land scarcity, degradation and soils depletion
- Water scarcity and pollution
- Loss of biodiversity and degradation of ecosystem services
- Climate change



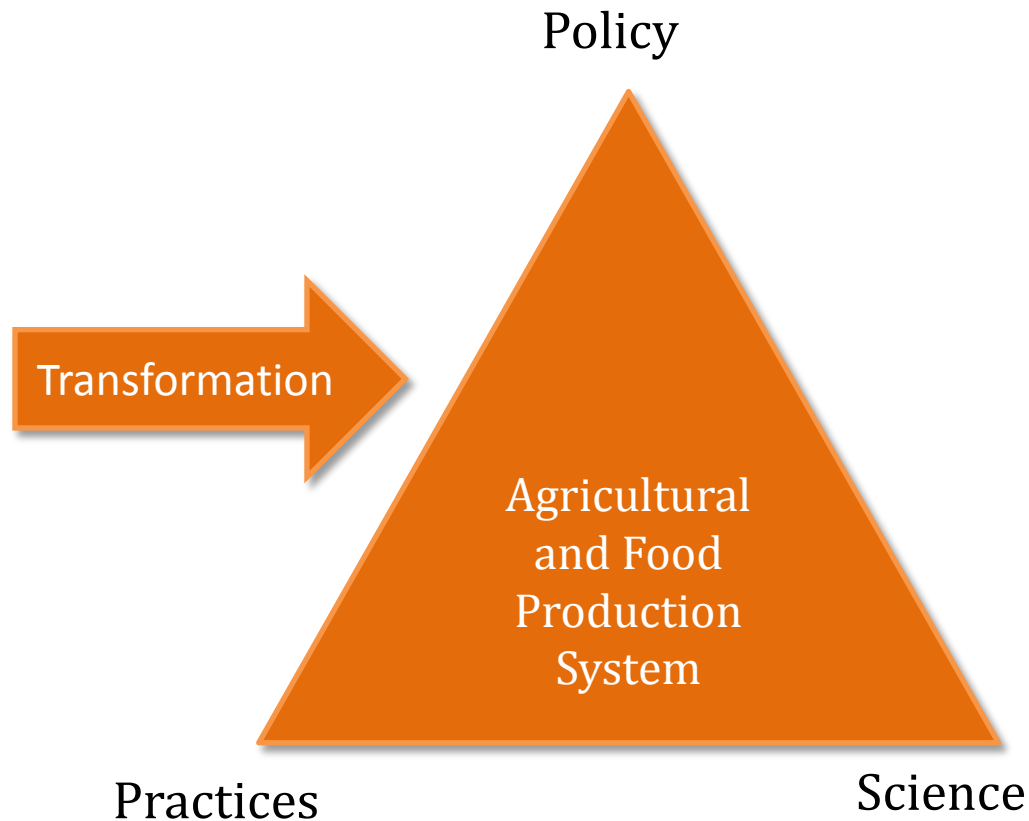
Sustainable
Development Goals ?

- Past agricultural performance is no longer a guarantee of future returns
- Sustainable food and agriculture system must be managed in a way that maintain ecosystem function to support current as well as future human need
- Small-scale producers (men, women and local communities) should have control over their livelihood and equitable access to resources which they use in sustainable way

What is Agroecology?



Transforming Food System with Agroecology



- AGROECOLOGY is a way of redesigning food systems, from the farm to the table, with a goal of achieving ecological, economic, and social sustainability (Gliessman, 2016)
- Transdisciplinary, participatory, and change-oriented research and action, agroecology links together science, practice, and movements focused on SOCIAL CHANGE

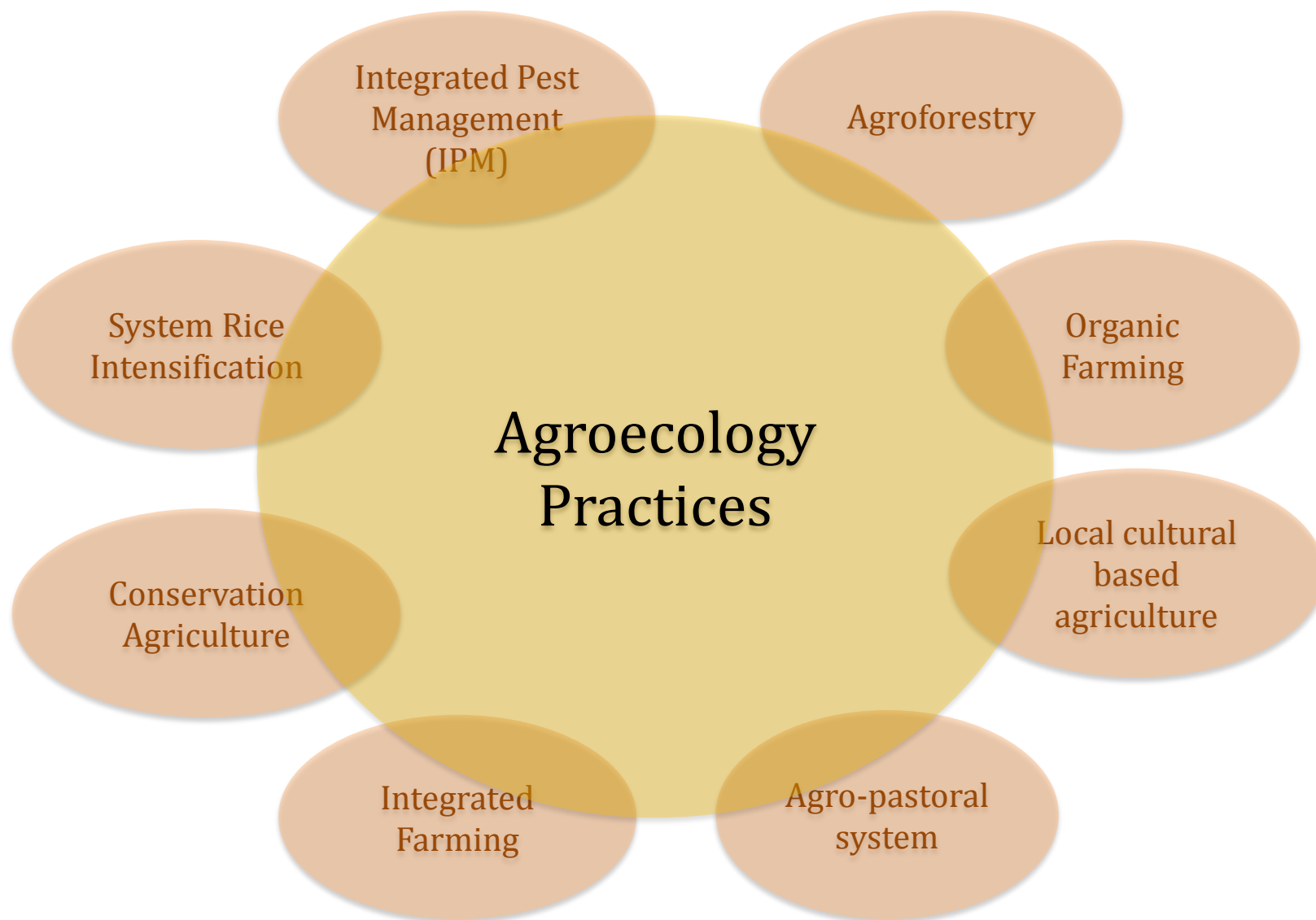
AGROECOLOGY AS THE “NEW” APPROACH

- ▣ Agroecology is not new at all, particularly in Asia and the Pacific region
- ▣ Base on the adaptation of agriculture to local conditions, natural cycles and inclusive needs
- ▣ Practicing by Asian small-scale food producers across the region, including peasants, fisher folks, pastoralists, urban communities, indigenous peoples, women’s organizations, youth and others
- ▣ Although they do not systematically use the term “Agroecology”

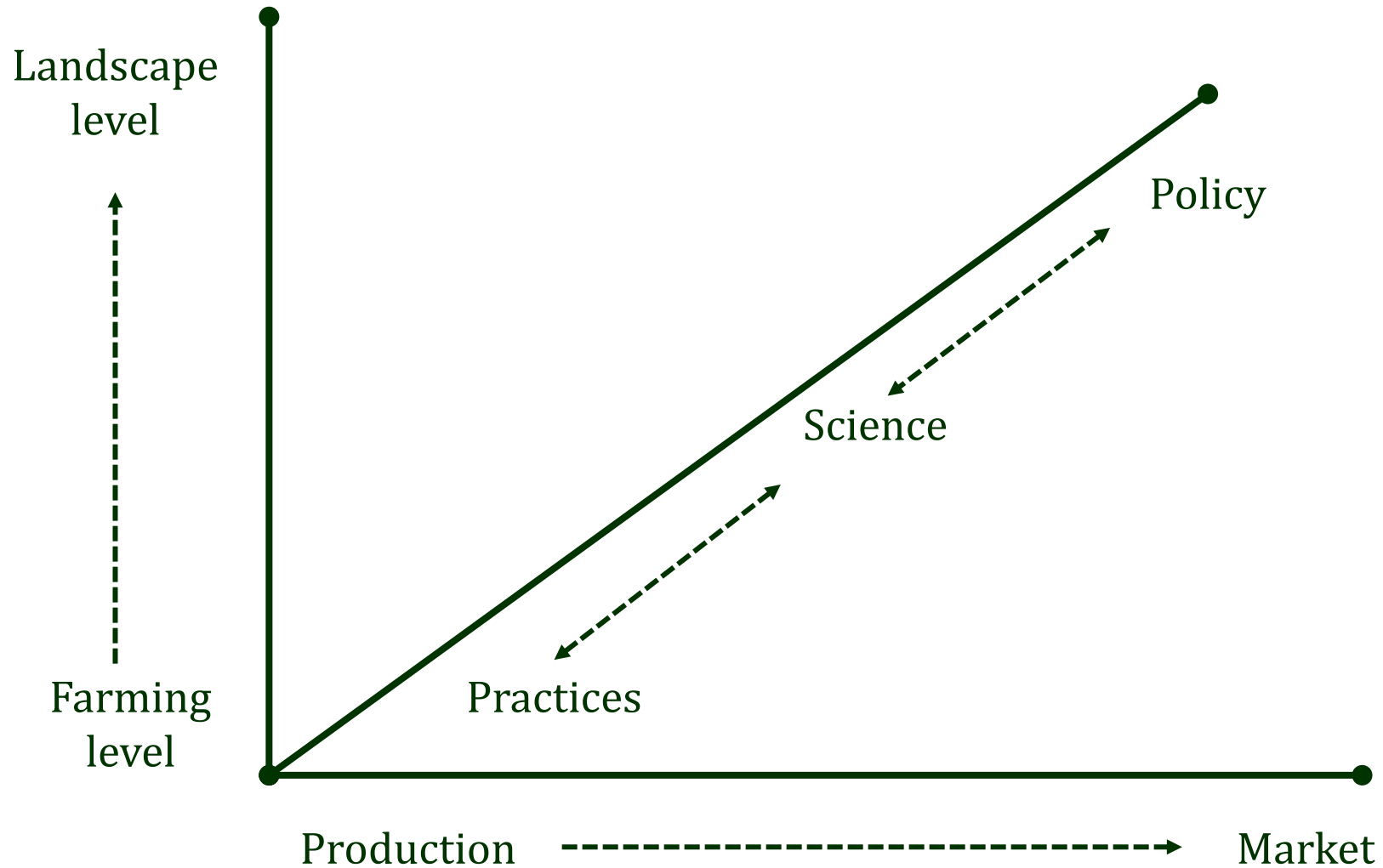
Key Elements :

- Integrated and holistic approach rooted in and arising from local community and cultural practice
- Autonomy is a pillar
- Innate capacity for adaptation and resilience to climate change, natural disasters, economic, environmental and other shocks
- Founded on a rights-based approach
- Women’s knowledge, values, vision and leadership are central.

The Eight most significant agroecological practices in Indonesia



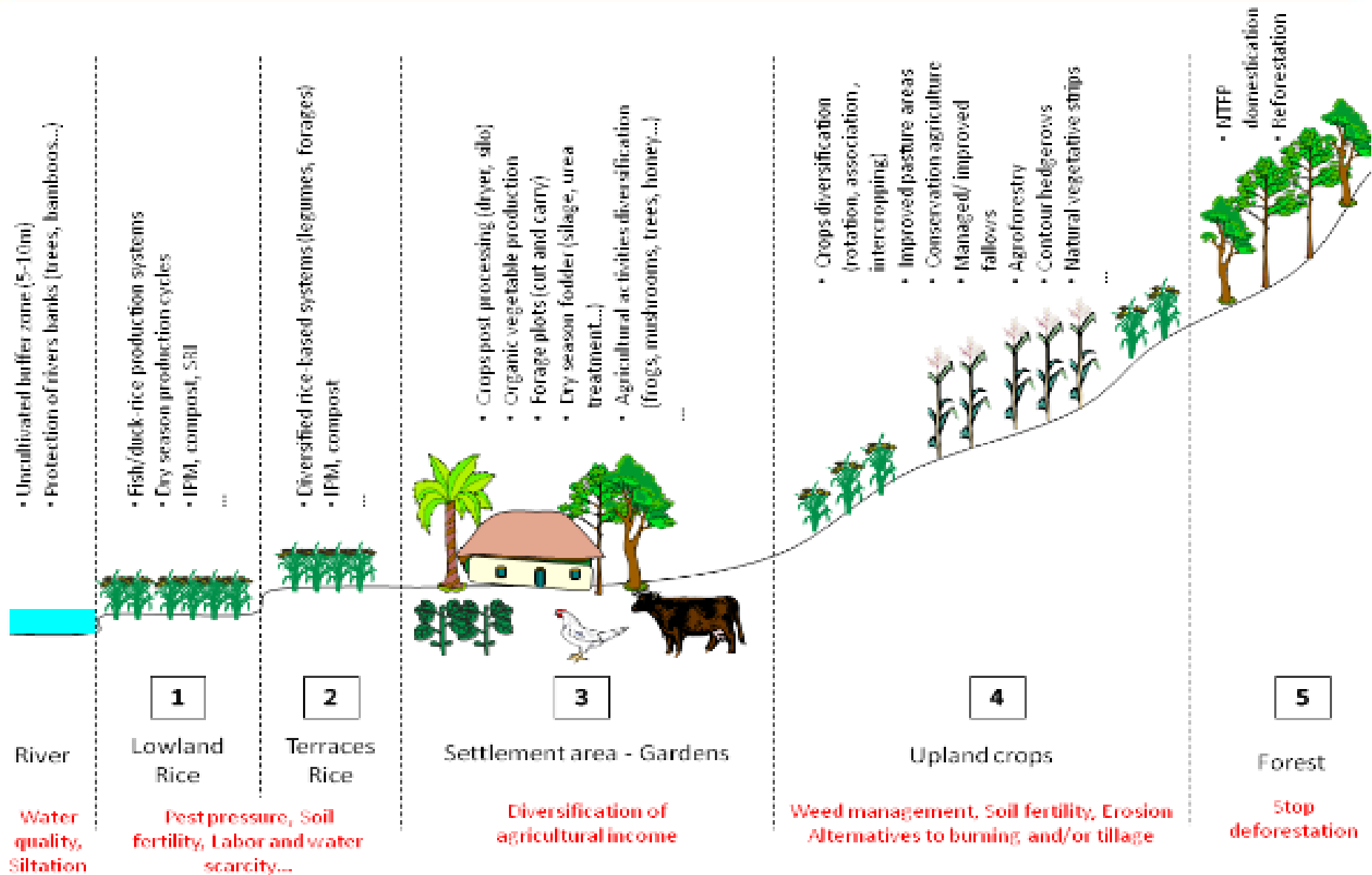
Agroecology Approach

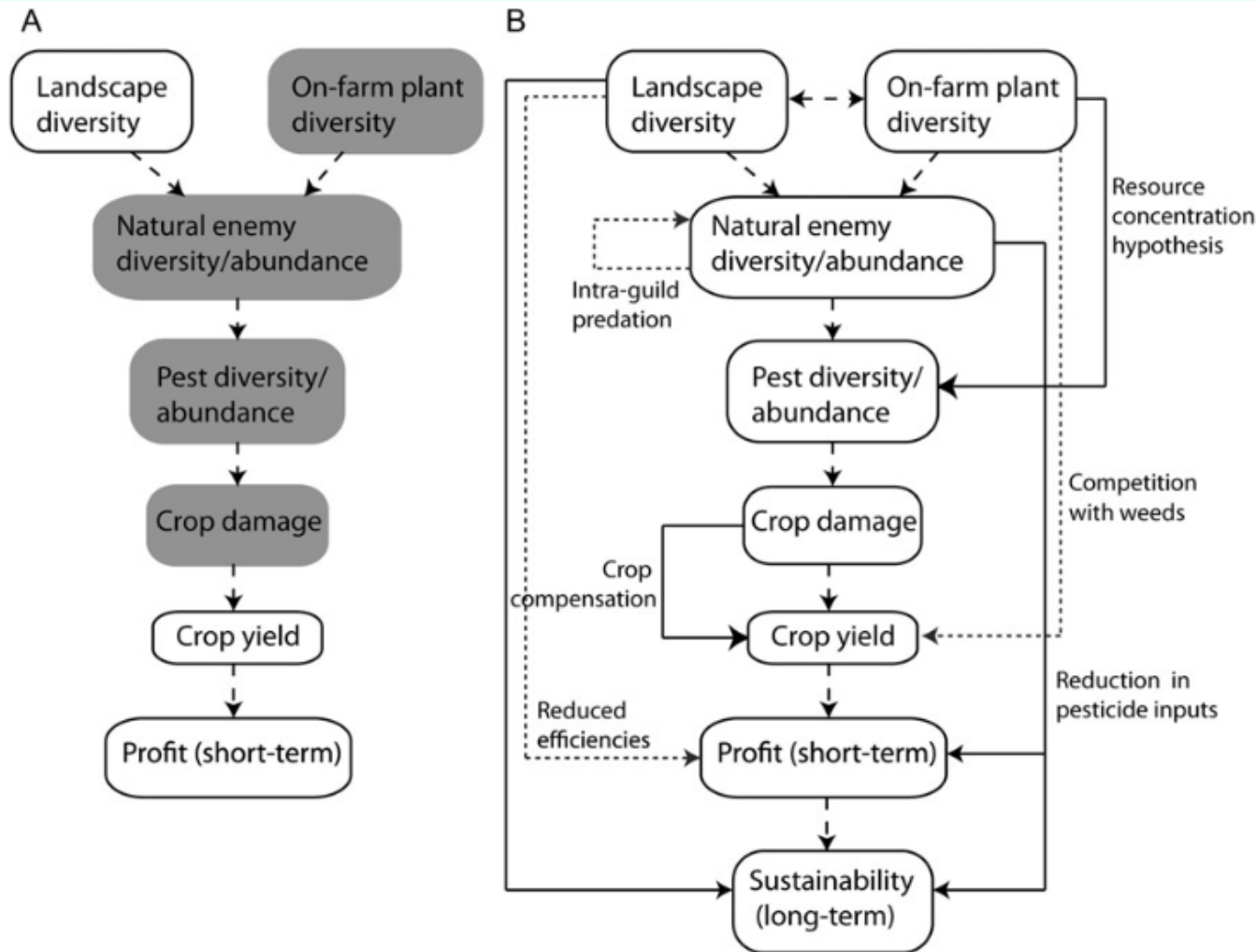


From Farm to Landscape

- ❑ Redesign the agroecosystem so that it functions on the basis of a new set of ecological processes
- ❑ Adoption landscape approach as new paradigm of regional conservation
- ❑ Continual learning and adaptive management
- ❑ Multiple scales and multi-functionality
- ❑ Multi-stakeholders approach
- ❑ Integrating agroecological practices to spatial and regional development planning

Perspective of agroecological approach at landscape level (CIRAD 2015)





The traditional simplified view of the relationships between biotic components of agroecosystems (A) generally ignores some of the complex feedback loops (solid and dashed grey lines) and interactions between species that make up more realistic agroecosystems (B). Network studies to date have focussed on a narrow set of relationships, usually between plants, pest arthropods and their natural enemies (shaded grey on A)

Ecosystem services are the benefits provided by modified and natural ecosystems to human beings

Provisioning services

These include food and services for human consumption, ranging from food, fibre, fire wood, livestock, raw materials, genetic resources, ornamental resources and medicinal resources.



Regulating services

These include ecological processes such as gas regulation, climate regulation, disturbance regulation, water regulation, water supply, erosion control and sediment retention.



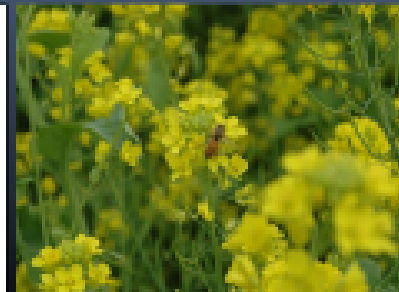
Cultural services

Agriculture provides cultural services such as aesthetics, recreation through conserving field-boundary vegetation or by planting native trees.



Supporting services

Supporting ecosystem services are pollination, biological control, carbon accumulation, mineralization of plant nutrients, soil formation, nitrogen fixation.



Ecosystem Services

Source: Oral presentation prepared for the regional symposium in Asia and the Pacific by Dr Harpinder Sandhu.
Flinders University

From Production to Market

- ▣ Developing alternative practices (use of nitrogen-fixing cover crops, nutrient recycling practices and technologies, biological control agents, shift to reduced or minimal tillage)
- ▣ Making market work for small-scale producers and re-establish a more direct connection between those who grow our food and those who consume it.

Science-Policy-Practices

- ❑ Agroecology as social movement for social change :
 - Building local capacity and empowerment
 - Strengthening local institutions
 - It's about changing the hearts and minds of people
 - And building critical mass of people together, globally
- ❑ Enhancing agroecological science to transform policy and practices
 - Re-orientation of agriculture research and education
 - Linking agroecological science to support small-scale producers and engage policy and decision making process at national and local
- ❑ Policy framework for agroecological transformation
 - Up-scaling agroecological practices to policy and programs
 - Indonesia assessment of agricultural gains, technology and policy toward transition to sustainable agriculture

Mainstreaming agroecology: Challenges and policy options

CHALLENGES

Agroecological practices are locally-specific and knowledge and management-intensive:

- Adoption requires access to skills and information, strengthening of local knowledge, incremental learning and links to social networks
- Extension advice should be context-specific and creative and respond to farmer demand rather than imposing standard solutions

Thinking in systems and systemic change requires a holistic understanding of competing objectives

POLICY OPTIONS

Ensure that **research priorities and funding** are re-directed to strengthen research on agroecology and incorporate ecological principles into agricultural science curricula and research

Pursue **a new approach to generating and disseminating knowledge** – a shift is needed from top-down research and extension to bottom-up approaches and local innovation:

- The identification of the problems should be an integral part of research, development and implementation and be achieved through participatory processes that involve farmers and local communities
- Scientific research should incorporate local practices and indigenous traditional knowledge
- Extension services should be decentralised
- Farmer-to-farmer exchanges and grassroots extension methods should be facilitated

Agricultural research should follow an **interdisciplinary approach** that integrates ecology, natural resource management, socio-economic and cultural aspects

Mainstreaming agroecology: Challenges and policy options

Market failures:

- Agricultural subsidies and protectionist trade policies keep the costs of unsustainable production models low
- The positive externalities of agroecology are not recognised in the prices farmers receive, whereas the environmental costs of 'conventional' practices are paid for by the state and taxpayers
- Non-commodity outputs (such as environmental services) of farming are not recognised or are under-produced because their market price is distorted or non-existent

Lack of access to natural resources and insecure land tenure discourage practices that require investment in assets and knowledge and co-operative behaviours, such as agroforestry and soil conservation schemes

Re-orient national and international trade policies:

- End subsidies to agriculture in industrialised countries and manage supply to ensure that public support does not lead to over-production and dumping
- Agree on the valuation and incorporation of externalities in national and international markets, especially in view of trade liberalisation

Re-orient agricultural and rural development policies:

- Value multi-functionality of agriculture and farmers' roles in the stewardship of ecosystem by providing appropriate incentives and creating markets for ecosystem services (including landscape conservation)

Re-orient/introduce policies to support small-scale farming:

- Secure equitable rights of access and use for land, water, forests, common property resources and seeds
- Encourage the formation of farmers' groups and co-operatives

Mainstreaming agroecology: Challenges and policy options

The strong influence of vertically integrated and highly concentrated agri-business corporations on agricultural research and food policies limits small-scale farmers' capacity to link independently with markets and access demand-led research and extension

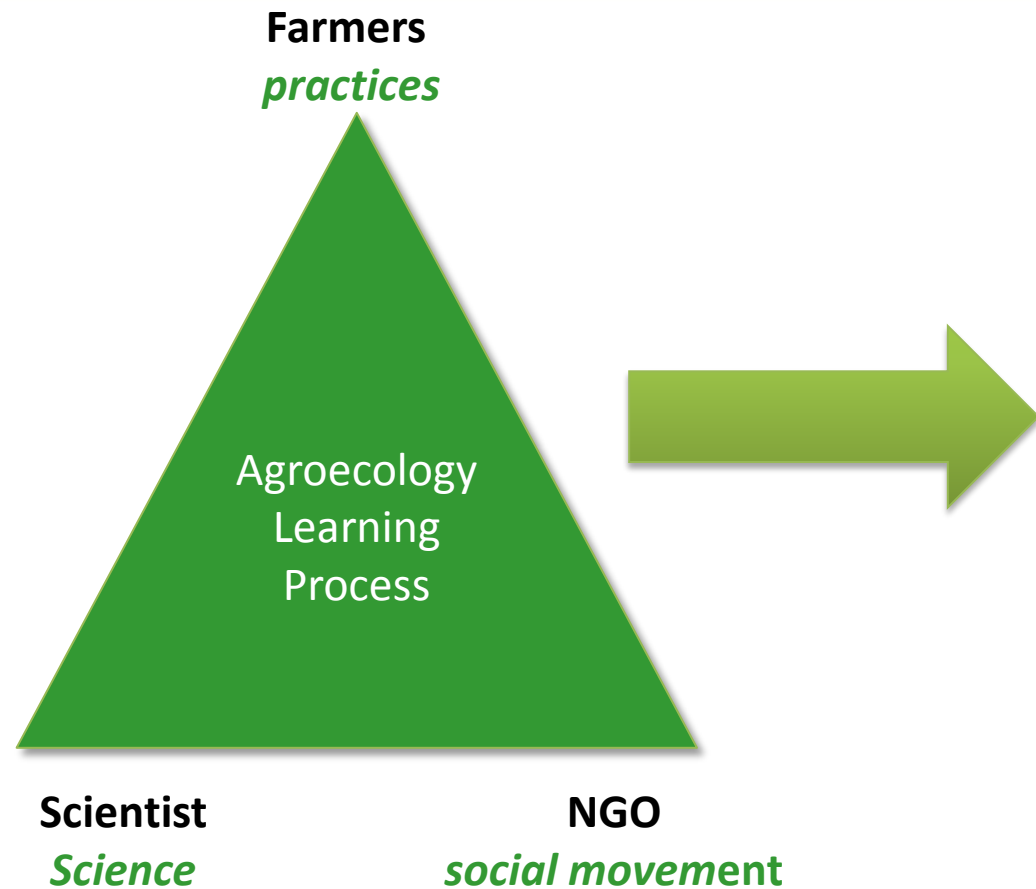
Provide adequate incentives and technical assistance to support small-farmers and small and medium sized enterprises in the creation of **local 'agroecological business models'** that can make appropriate inputs and technologies available in the market

Erosion of traditional cultural values and institutions and traditional knowledge (TK)

Promote policies that strengthen indigenous cultures and local organisations **and protect the knowledge and rights of farmers and pastoralists** to save and improve seeds and share benefits from the use of traditional crop and livestock varieties

Scientist-NGO-Farmers Learning Model

Experience of Plant Clinique IPB and Nastari Foundation (2005)

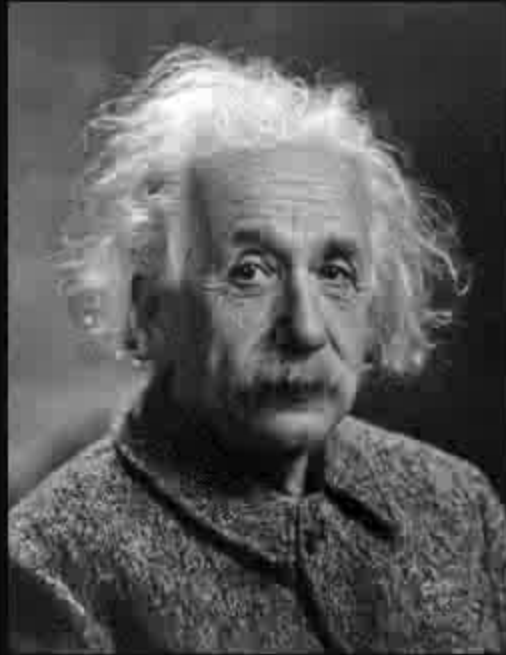


Upscaling FFS to agricultural community learning : more inclusive, wider topics and more stakeholders

Objectives :

- Maintain the relationship and network of IPM (community IPM)
- Identification problem and finding solution at local (*action research*)
- Local stakeholder engagement (local goverment, university, other potential social groups etc) – inclusive learning
- Participatory traning and consultation (*collaborative learning*) base on local agricultural problem

Agroecology and Future



We can't solve problems by using the same kind of thinking we used when we created them.

(Albert Einstein)

izquotes.com