

# Synecoculture™ and Human Augmentation of Ecosystems: Project Overview



Sony CSL

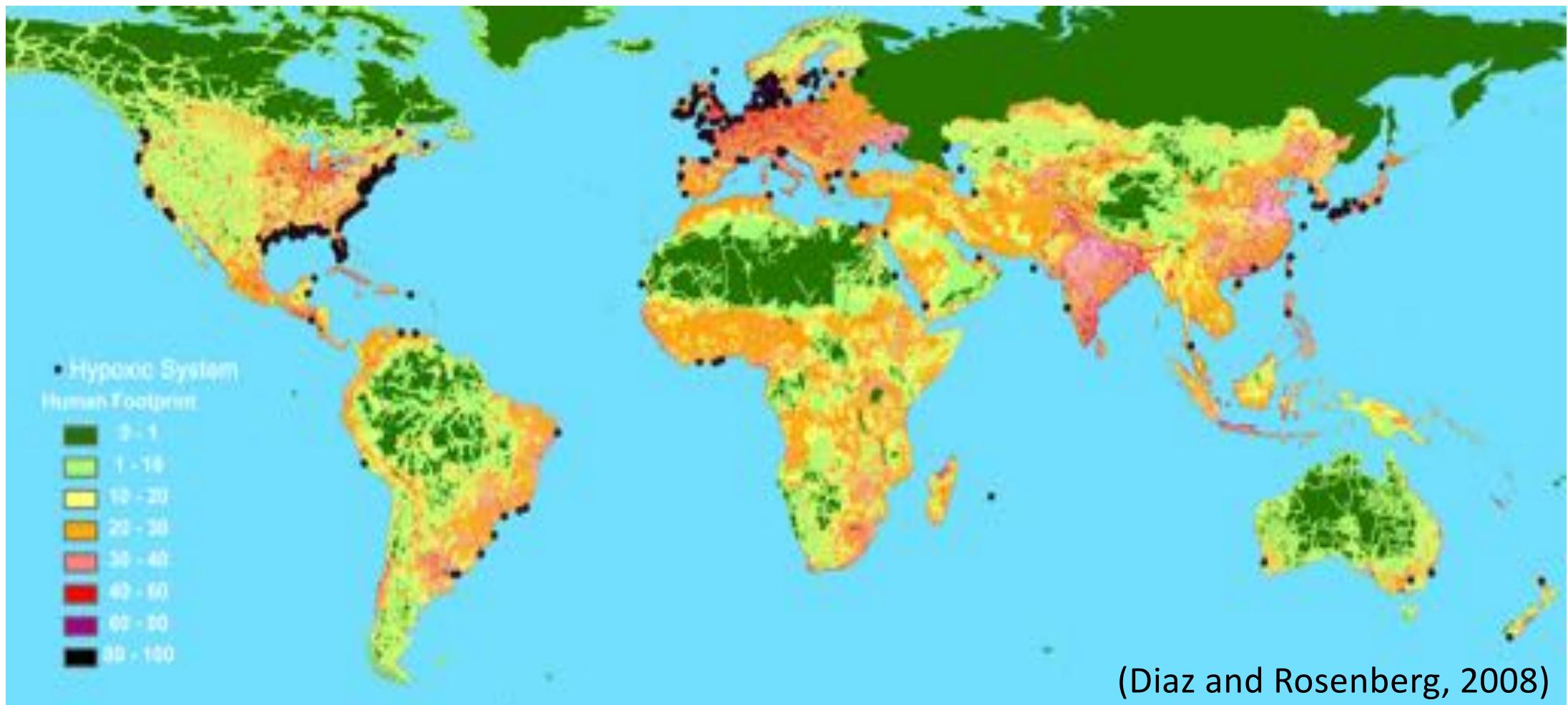


Sony CSL  
Synecoculture Association  
SynecO, Inc.

Masa Funabashi

SynecO

Land: biodiversity loss by agricultural land conversion  
Sea: hypoxic system (dead zones) in coastal area







[https://www.google.co.jp/search?q=large-scale+agriculture&espv=2&biw=1680&bih=847&source=lnms&tbm=isch&sa=X&ved=0CAYQ\\_AUoAWoVChMI0OLyt6XDxwIVRaKUCH25gA33](https://www.google.co.jp/search?q=large-scale+agriculture&espv=2&biw=1680&bih=847&source=lnms&tbm=isch&sa=X&ved=0CAYQ_AUoAWoVChMI0OLyt6XDxwIVRaKUCH25gA33)

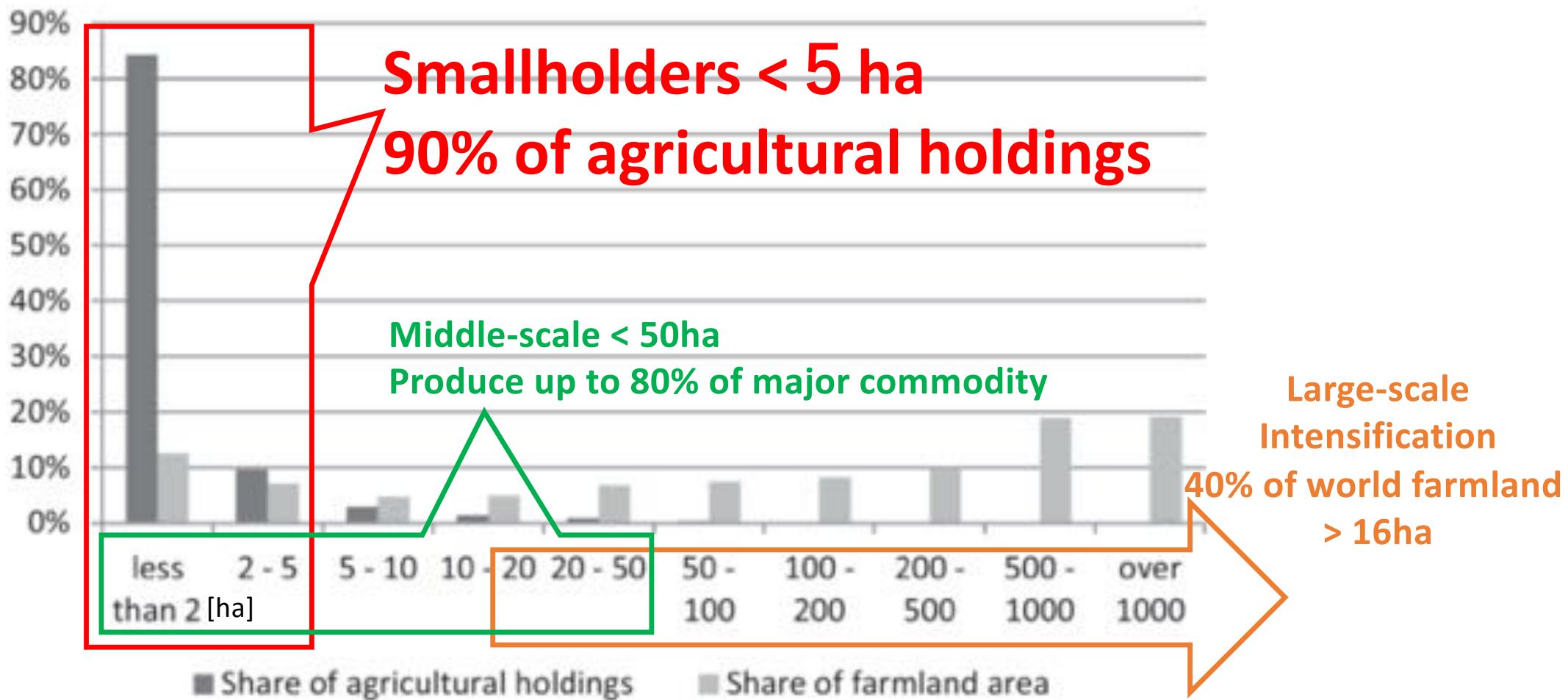


Figure 7. *Distribution of farms and farmland area by land size classes, 106 country sample. Sources: Authors' compilation using FAO (2001, 2013).*

# Syneccoculture – Megadiversity Agriculture

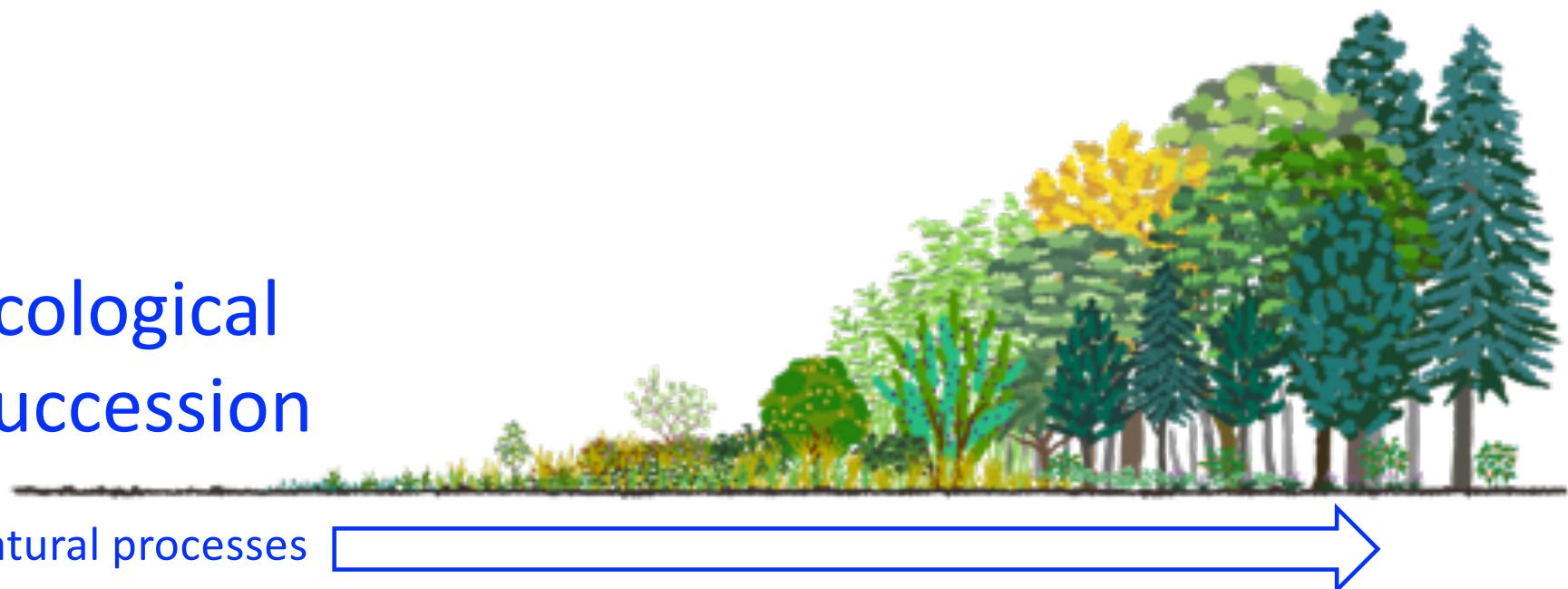
- 
- Self-organization of densely mixed polyculture
  - 200+ useful plant species in 1000 m<sup>2</sup>
  - No tillage/fertilizers/chemicals
  - Diverse vegetation strategies for efficient management

Photo: Ise syneccoculture farm 11/2010



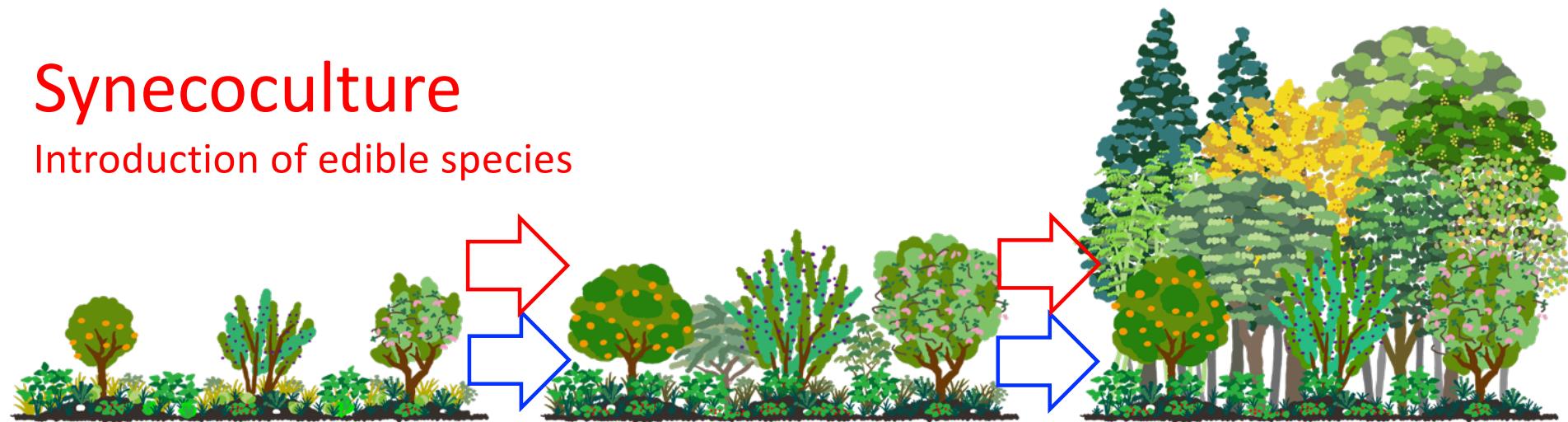
# Ecological Succession

Natural processes



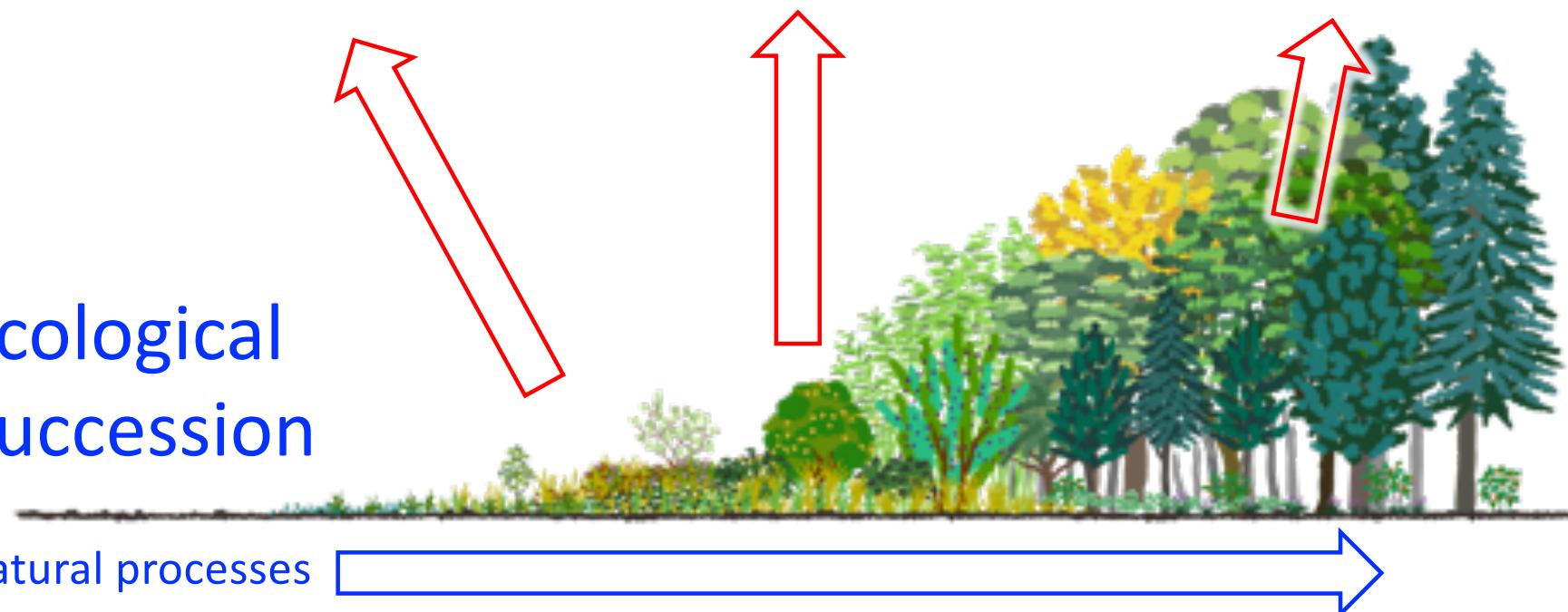
# Synergoculture

Introduction of edible species

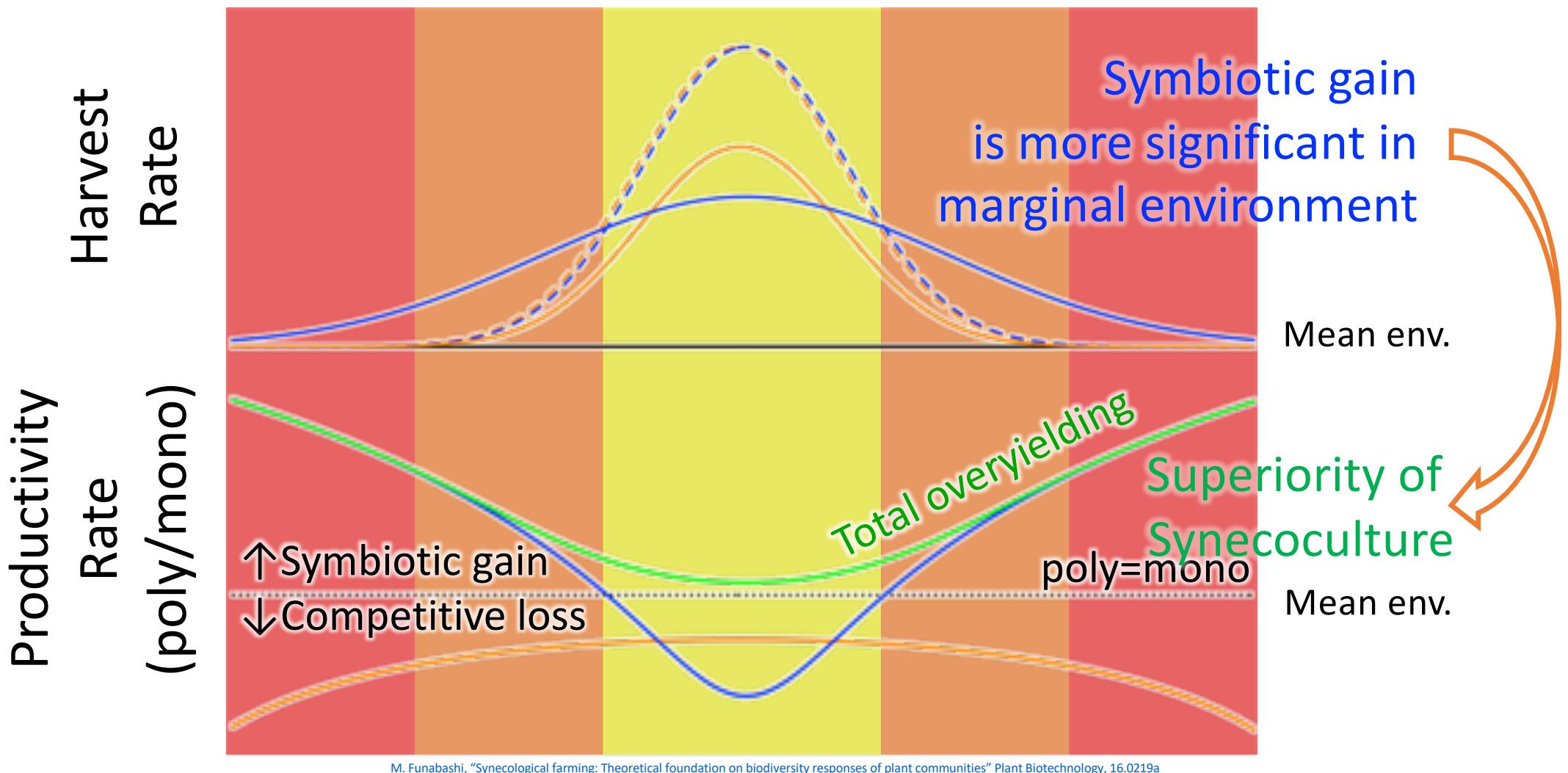


# Ecological Succession

Natural processes



# IMPEO: Integrated Model of Physiological and Ecological Optima







4/2015 Mahadaga pilot farm, Burkina Faso

Images: AFIDRA

# Reversal of Ecological Regime Shift

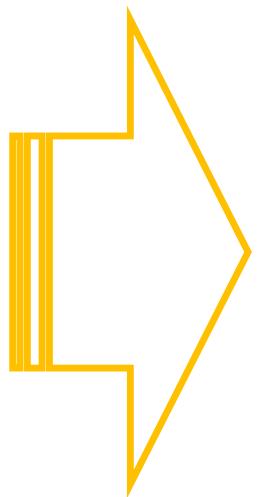


# Production experiment at Mahadaga Synecoculture Farm, Burkina Faso, 2015/6-2018/5 (3yrs)

Terre zone témoin  
12/03/2019



Terre de la zone de synéco  
12/03/2019





## Experiment in Burkina Faso

- Productivity: **1000 Euro/month/500 m<sup>2</sup>**
- **20 times** the GNI per capita of Burkina Faso
- **50 times** absolute monetary poverty threshold: **10m<sup>2</sup>** of synecoculture field can produce minimum wage
- **40–150 times** productivity than conventional farming
- **1% population** practicing Synecoculture will lift the entire population above the poverty threshold

7/2016

10/2016 Fada N'Gourma



2/2018 Université de Ouaga 1



# 5 African Symposia on Synecoculture



11/2018 Tunis

# Synergoculture farms in the Sahel



# Synergoculture farms in the Sahel

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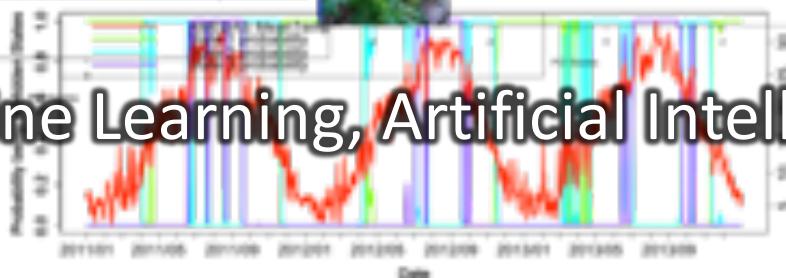
Biodiversity big data



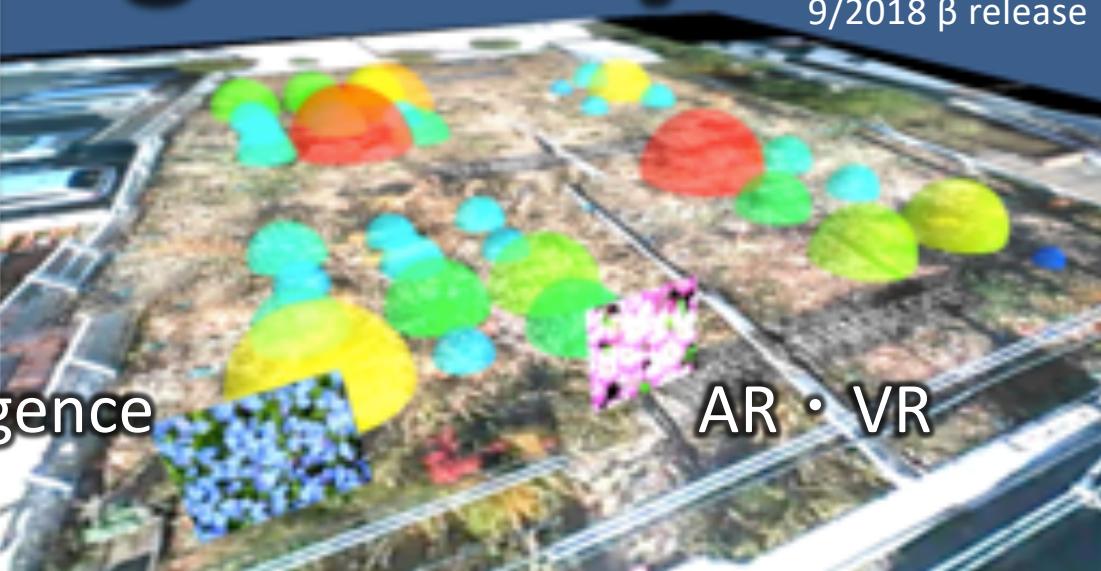
Exploration Interface

# Megadiversity Management System

9/2018 β release



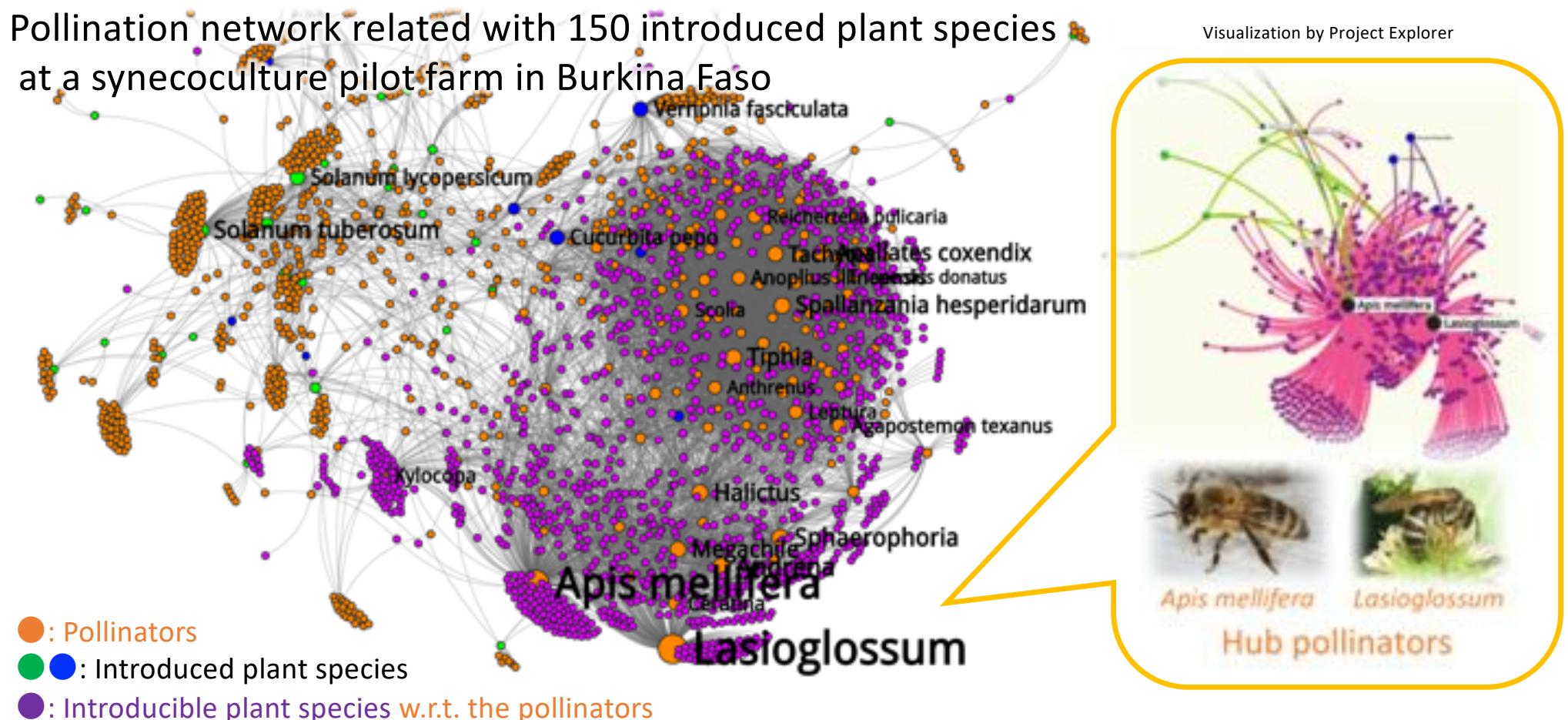
Machine Learning, Artificial Intelligence



AR • VR

# Field management with Information and Communication Technologies (ICT)

Pollination network related with 150 introduced plant species at a synecoculture pilot farm in Burkina Faso



# Enhancement of Regulation Services with ICTs



*Vernonia fasciculata*



*Psidium guajava*



*Cucurbita pepo*



Introduced hub plant species



*Desmodium*



*Potentilla*



*Eupatorium*



Visualization by  
Project Explorer

Introducible hub plant species

## New Company Founding: SynecO, Inc.

Will promote businesses specializing in Synecoculture™ and other technologies related to augmented ecosystems

# SynecO

SynecO's main business initiatives will comprise the following :

- Supporting education/literacy regarding Synecoculture & augmented ecosystems
- Consulting on the implementation of Synecoculture & augmented ecosystems in places facing ecological degradation, including abandoned farmland and regions where desertification is advancing
- Assessment & consulting on ecosystem evaluation, design & management in urban development/office construction
- Supporting the introduction and management of augmented ecosystems within care/welfare facilities, public spaces, etc.

# References

- Websites:
  - SonyCSL Synecoculture project website: <https://www.sonycsl.co.jp/tokyo/407/>
  - UniTwin UNESCO CS-DC e-lab website: <https://www.elab-ose4el.net/>
  - Centre Africain de Recherche et de Formation en Synécoculture: <https://www.facebook.com/carfs.org>
  - Synecoculture Association: <https://synecoculture.org/>
- Articles :
  - M. Funabashi “Human Augmentation of Ecosystems: Objectives for food production and science by 2045.” *Nature Partner Journal Science of Food*, 2018
  - M. Funabashi “Augmentation of Plant Genetic Diversity in Synecoculture: Theory and Practice in Temperate and Tropical Zones.” in *Genetic Diversity in Horticultural Plants, Series: Sustainable Development and Biodiversity* (SpringerNature, 2018).

