

# Synecoculture™ and Human Augmentation of Ecosystems: Project Overview

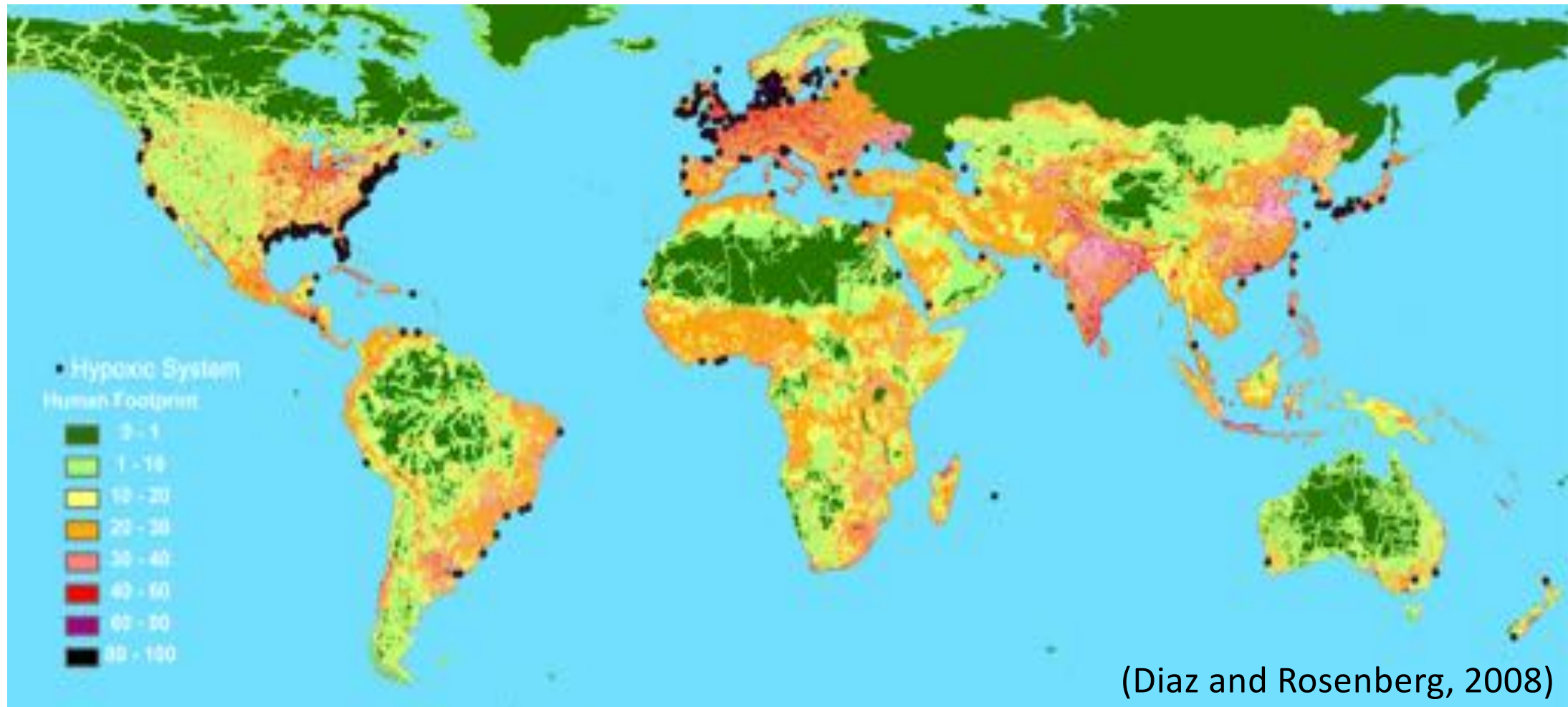


Sony CSL  
Synecoculture Association  
SynecO, Inc.

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

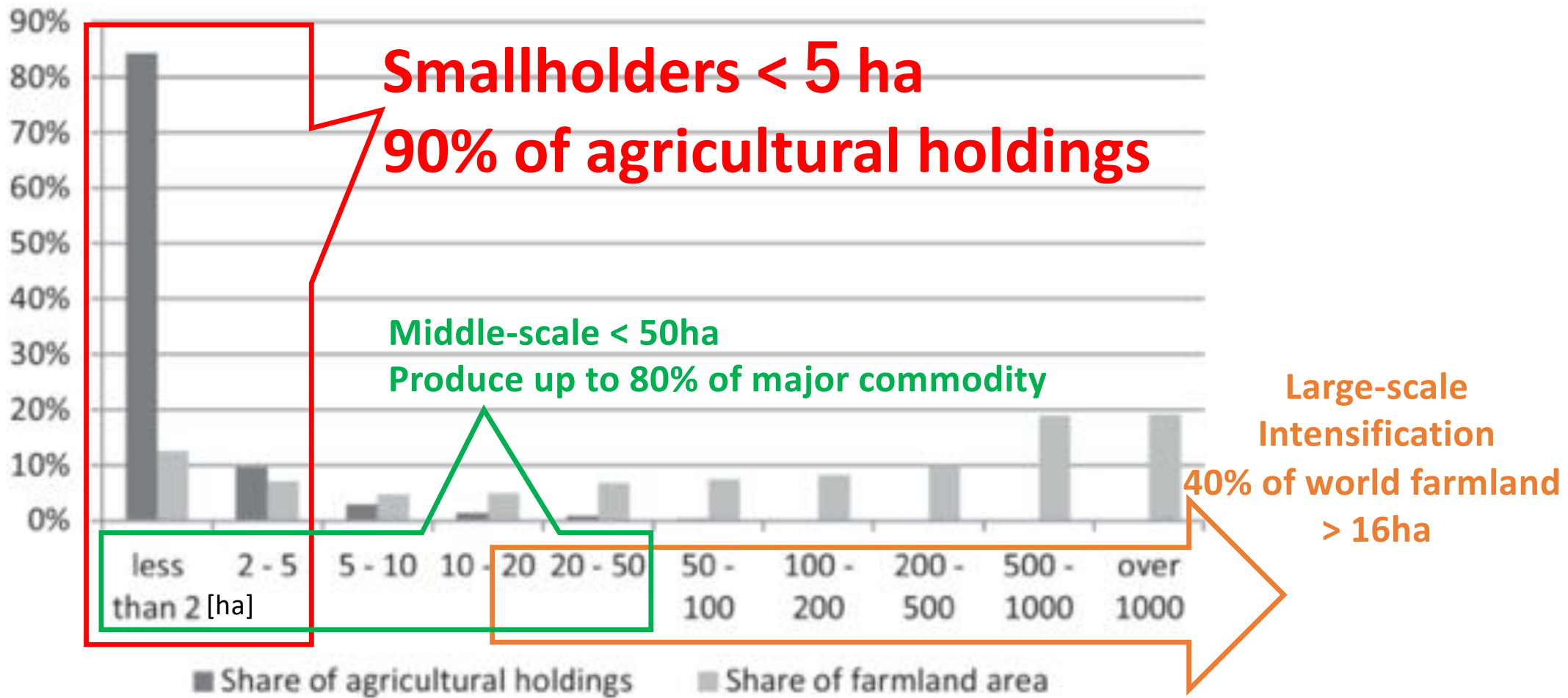


Figure 7. *Distribution of farms and farmland area by land size classes, 106 country sample. Sources: Authors' compilation using FAO (2001, 2013).*

# Synecoculture – 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

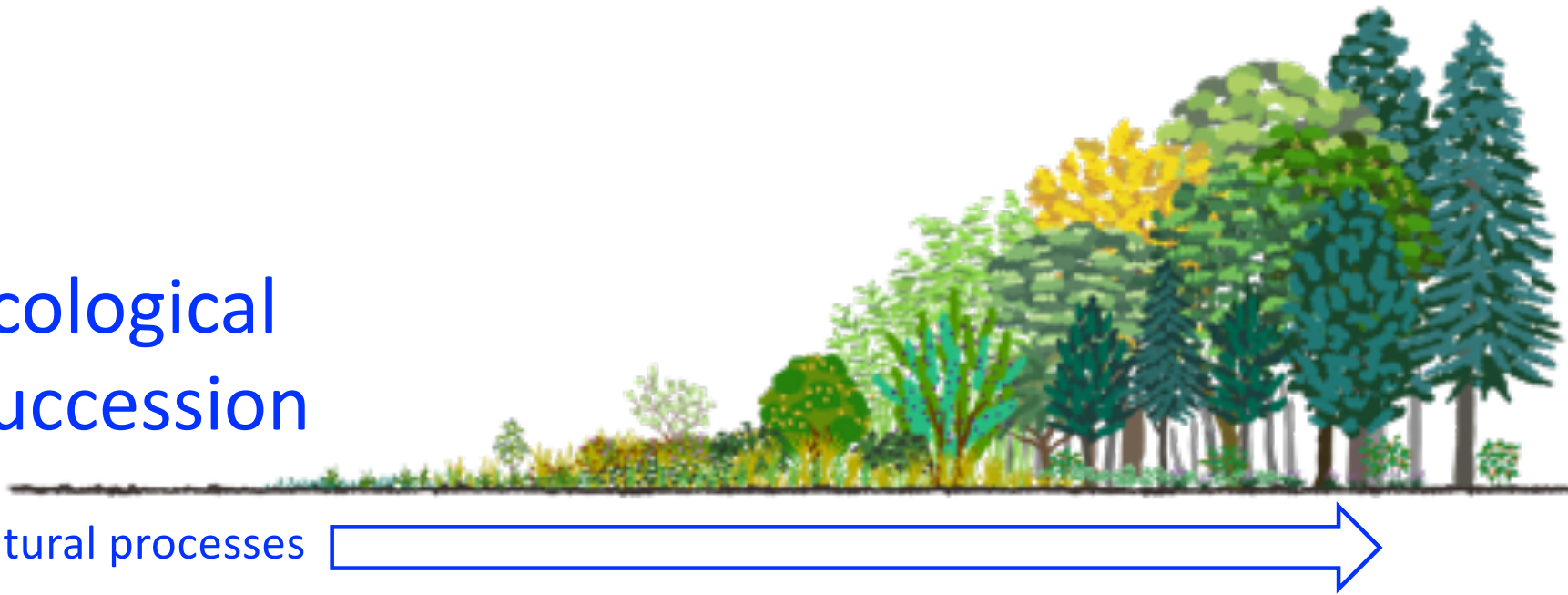
Photo: Ise synecoculture farm 11/2010





# Ecological Succession

Natural processes





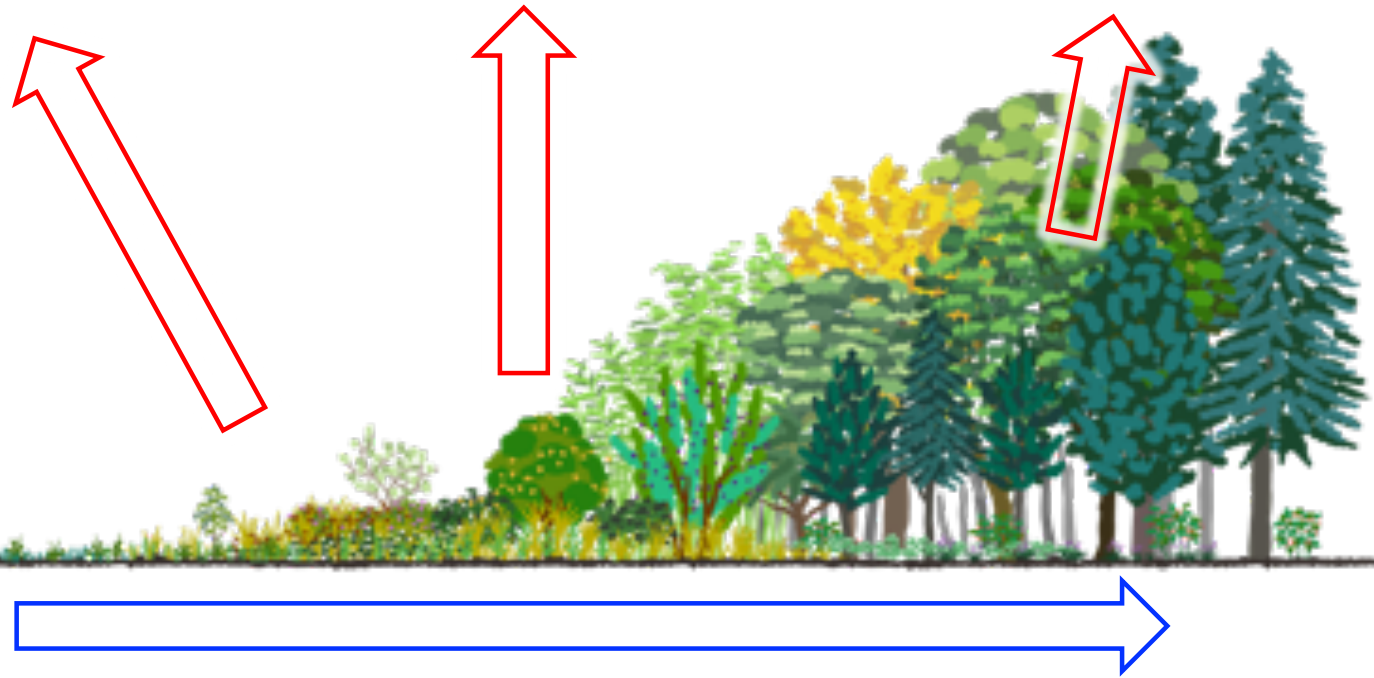
# Synecoculture

Introduction of edible species

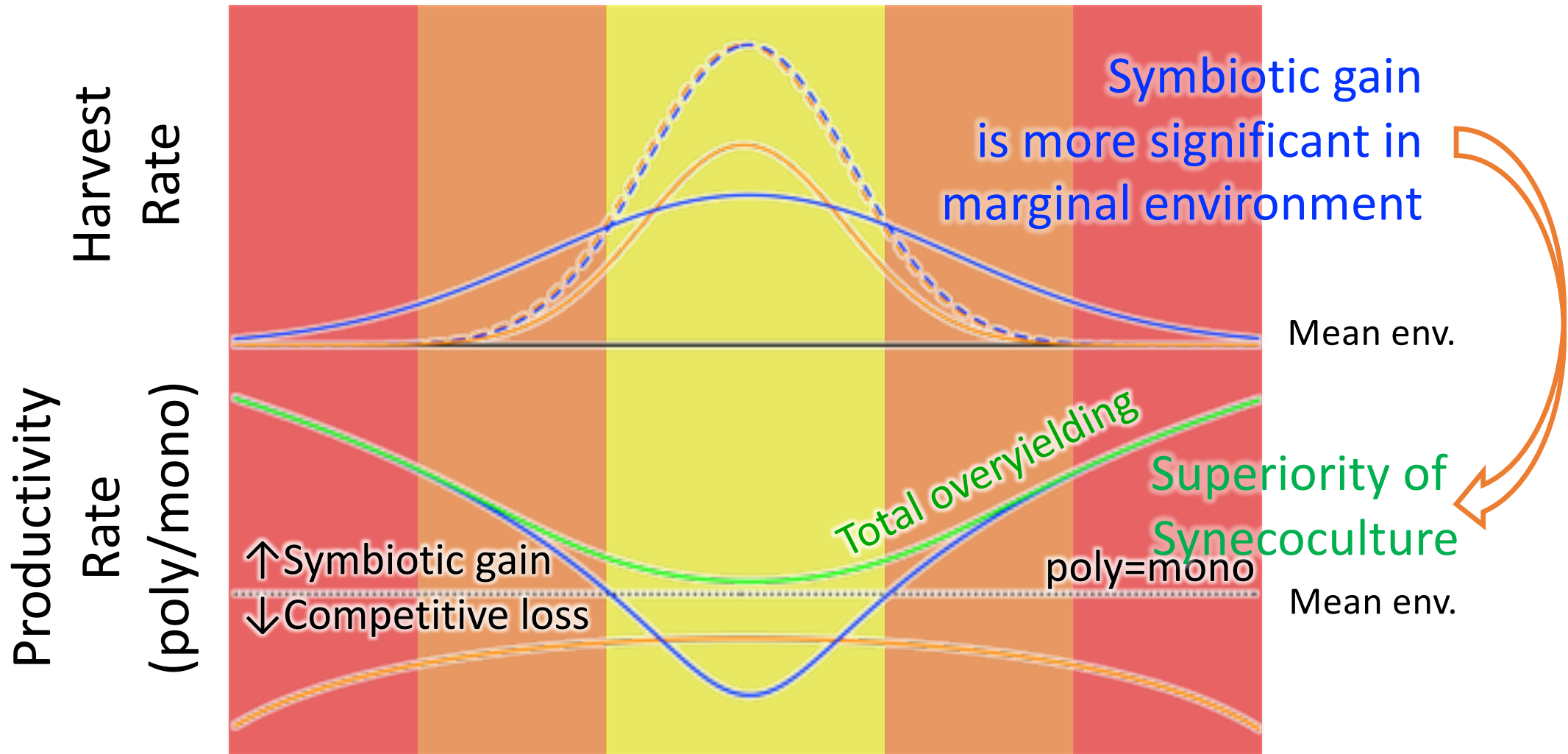


# Ecological Succession

Natural processes



# IMPEO: Integrated Model of Physiological and Ecological Optima





4/2015 Mahadaga pilot farm, Burkina Faso



Images: AFIDRA

# Reversal of Ecological Regime Shift

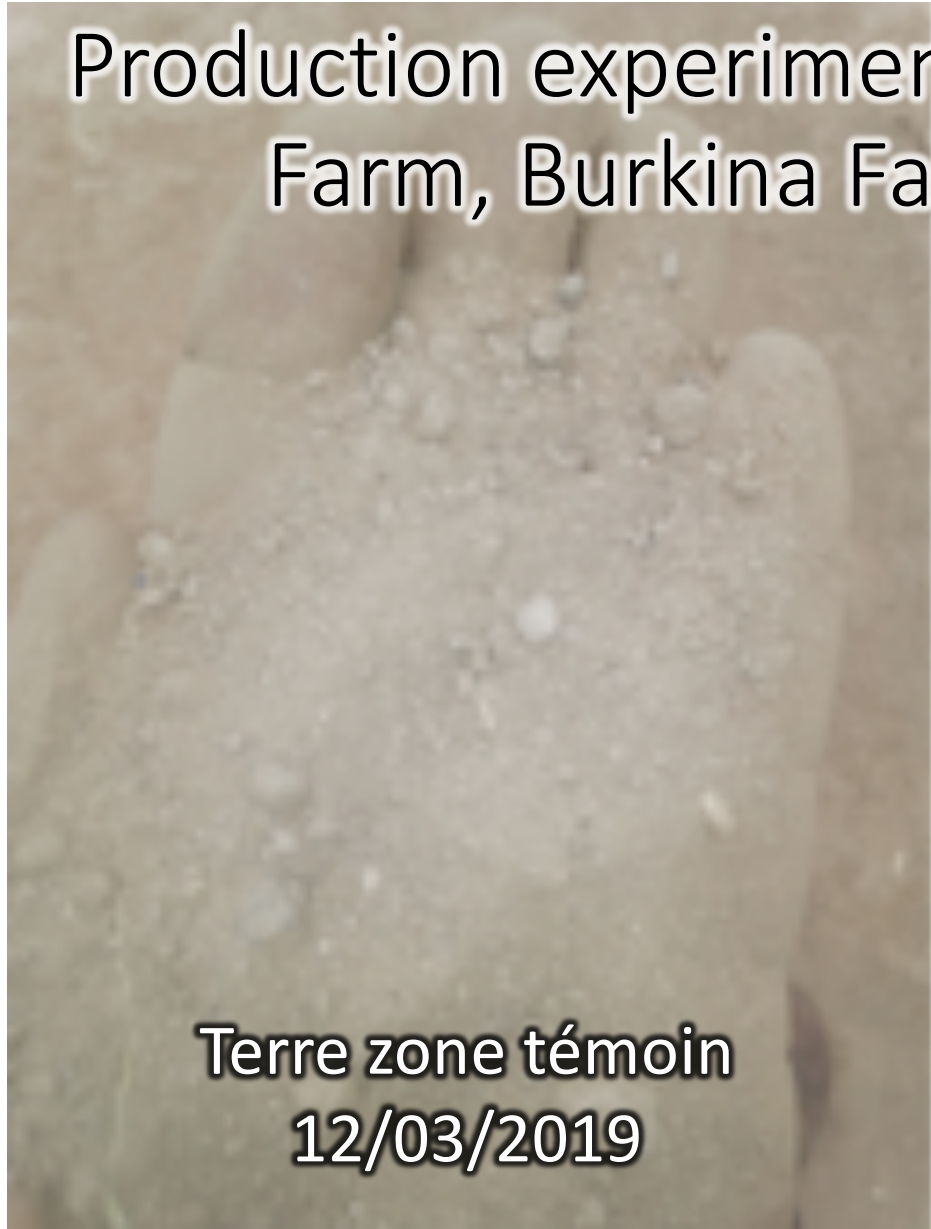


Desertified land

**1 year of Synecoculture**

Edible forest

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: **10 m<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

10/2016 Fada N'Gourma

2/2018 Université de Ouaga 1

# 5 African Symposia on Synecoculture



Sony CSL



Burkina Faso  
Government



Embassy of Japan  
in Burkina Faso



AFIDRA



CARFS

Local NGOs

6/2017 Fada N'Gourma



United Nations  
Educational, Scientific and  
Cultural Organization



COMPLEX SYSTEMS  
DIGITAL CAMPUS



11/2018 Tunis



# Synecoculture farms in the Sahel



# Synecoculture farms in the Sahel

Search Facebook:  
#Synecoculture

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Biodiversity big data

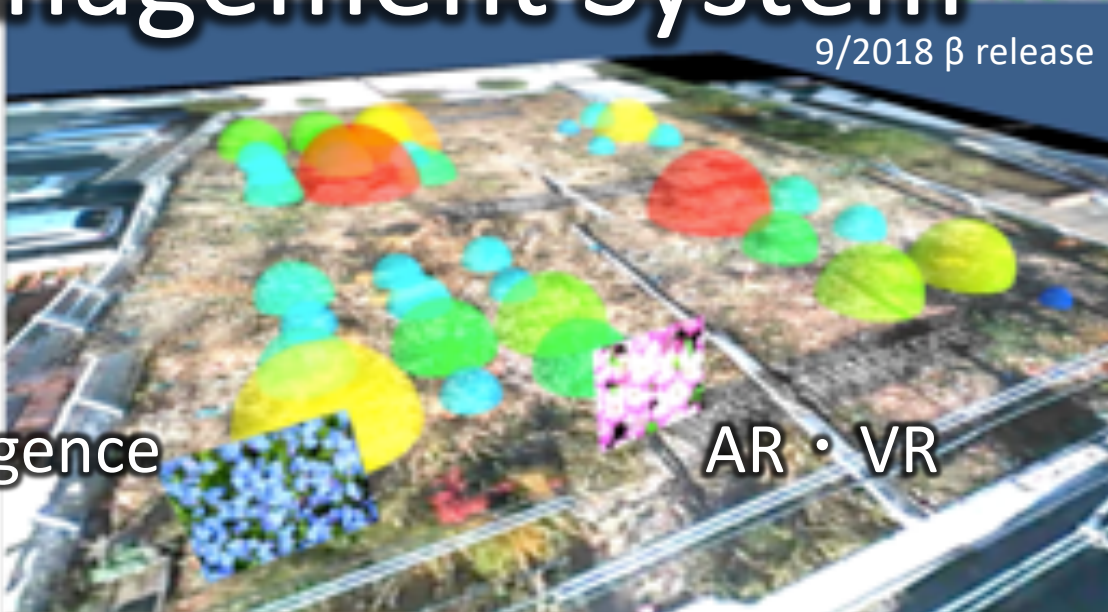
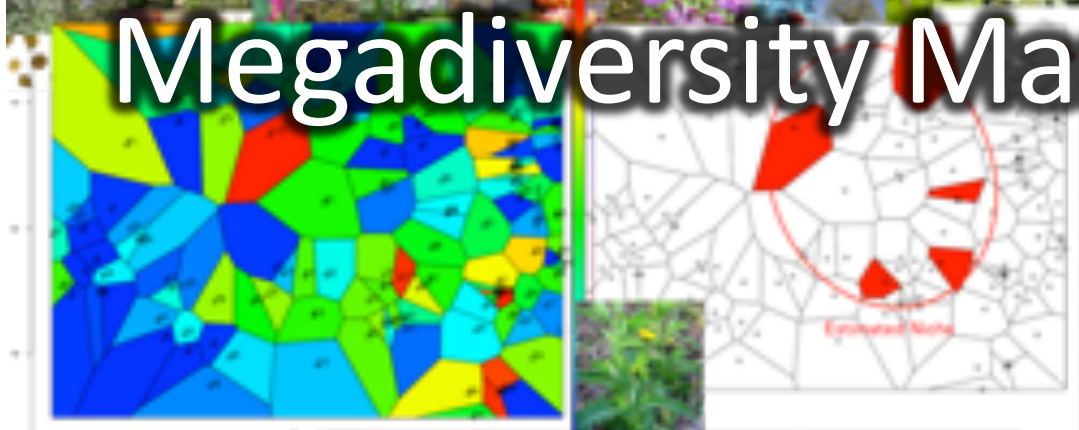
Exploration Interface

# Megadiversity Management System

9/2018  $\beta$  release

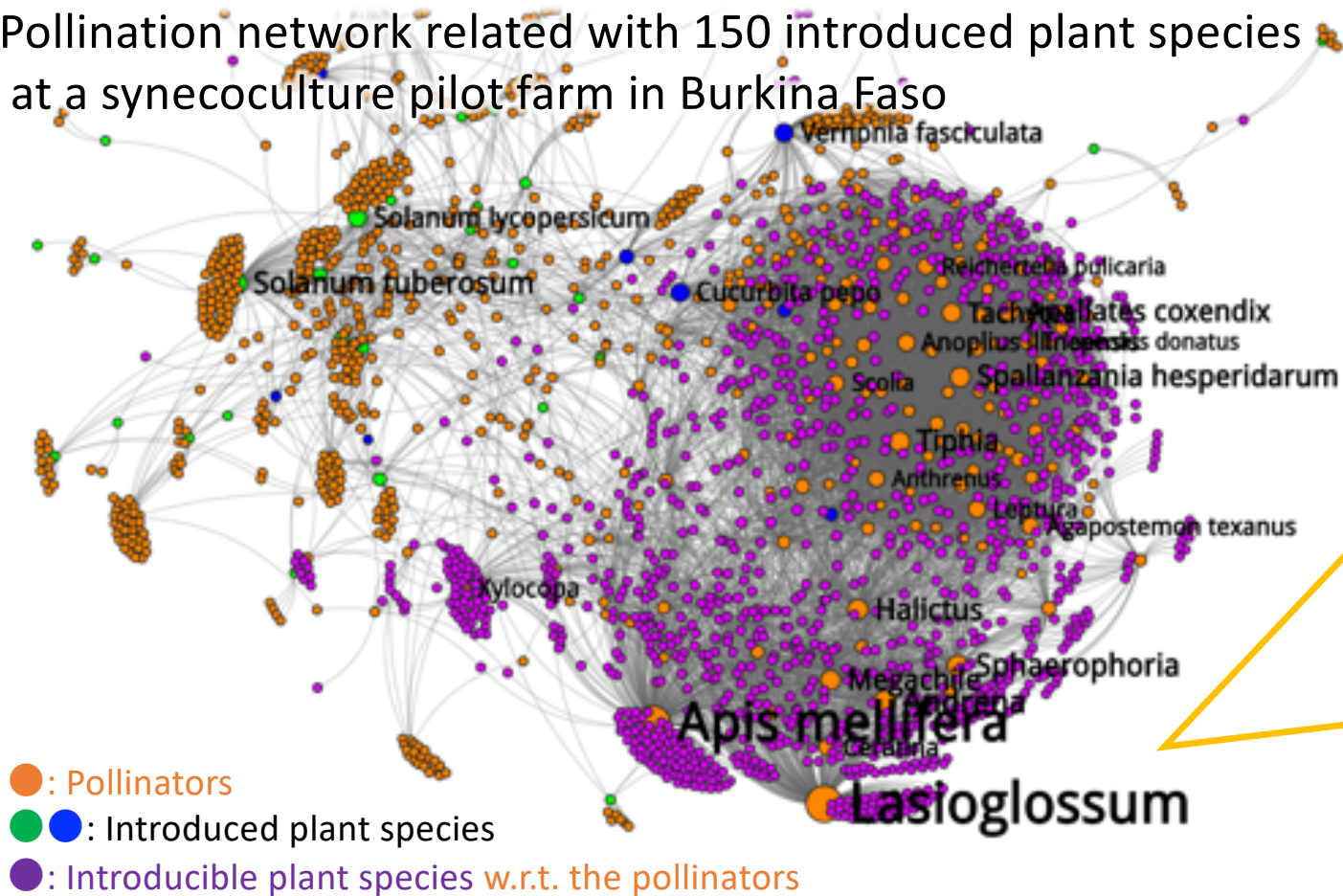
Machine Learning, Artificial Intelligence

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



Visualization by Project Explorer



# Enhancement of Regulation Services with ICTs



*Vernonia fasciculata*



*Psidium guajava*



*Desmodium*



*Potentilla*



*Curcubita pepo*



*Eupatorium*



Introduced hub plant species



Introducible hub plant species

Visualization by  
Project Explorer

## 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.sonycscl.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).

