

TEMPERATE AGROFORESTRY

A RESEARCH PERSPECTIVE

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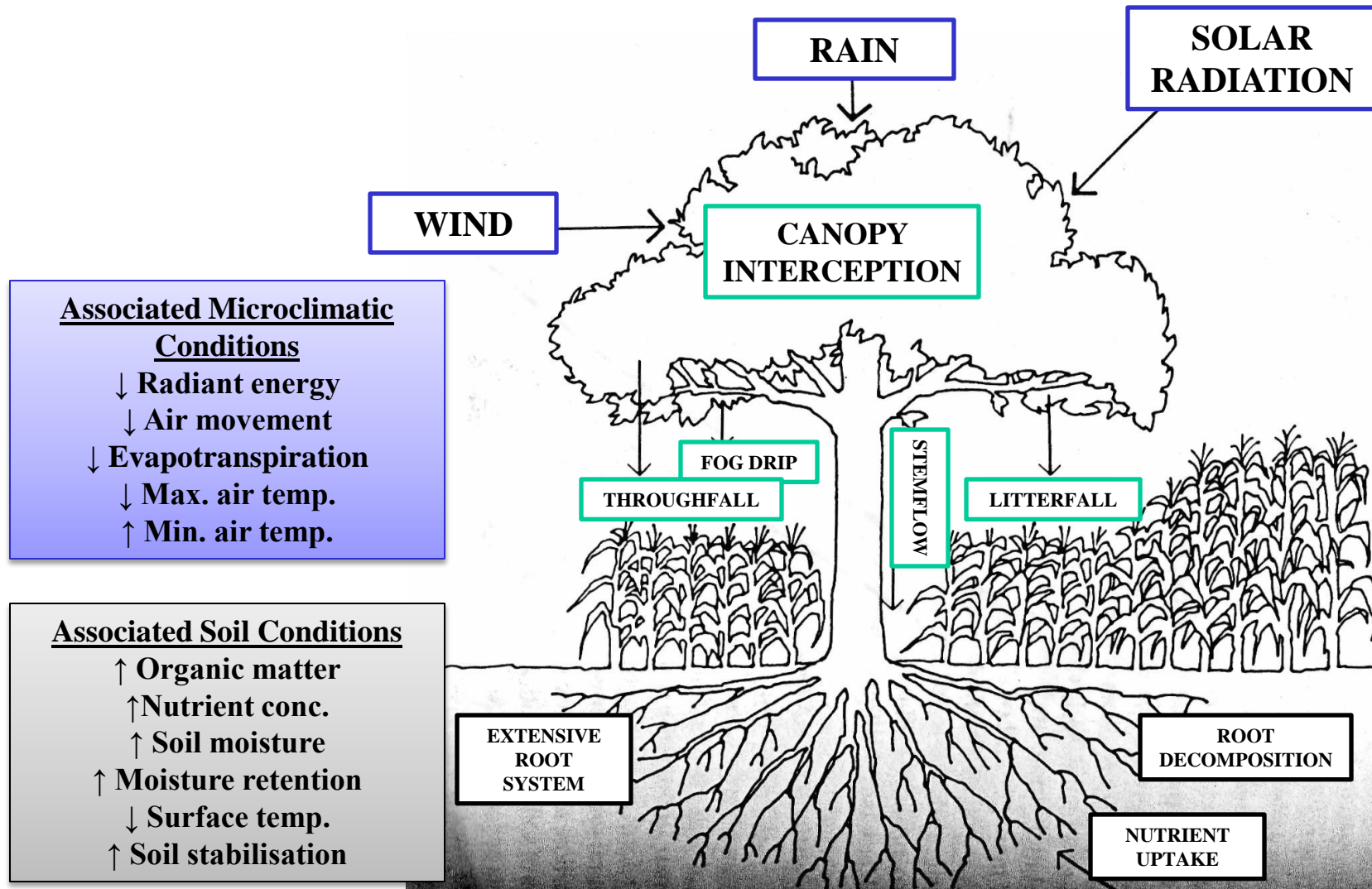
Wakelyns Agroforestry, Suffolk

Agroforestry: a multifunctional land-use system

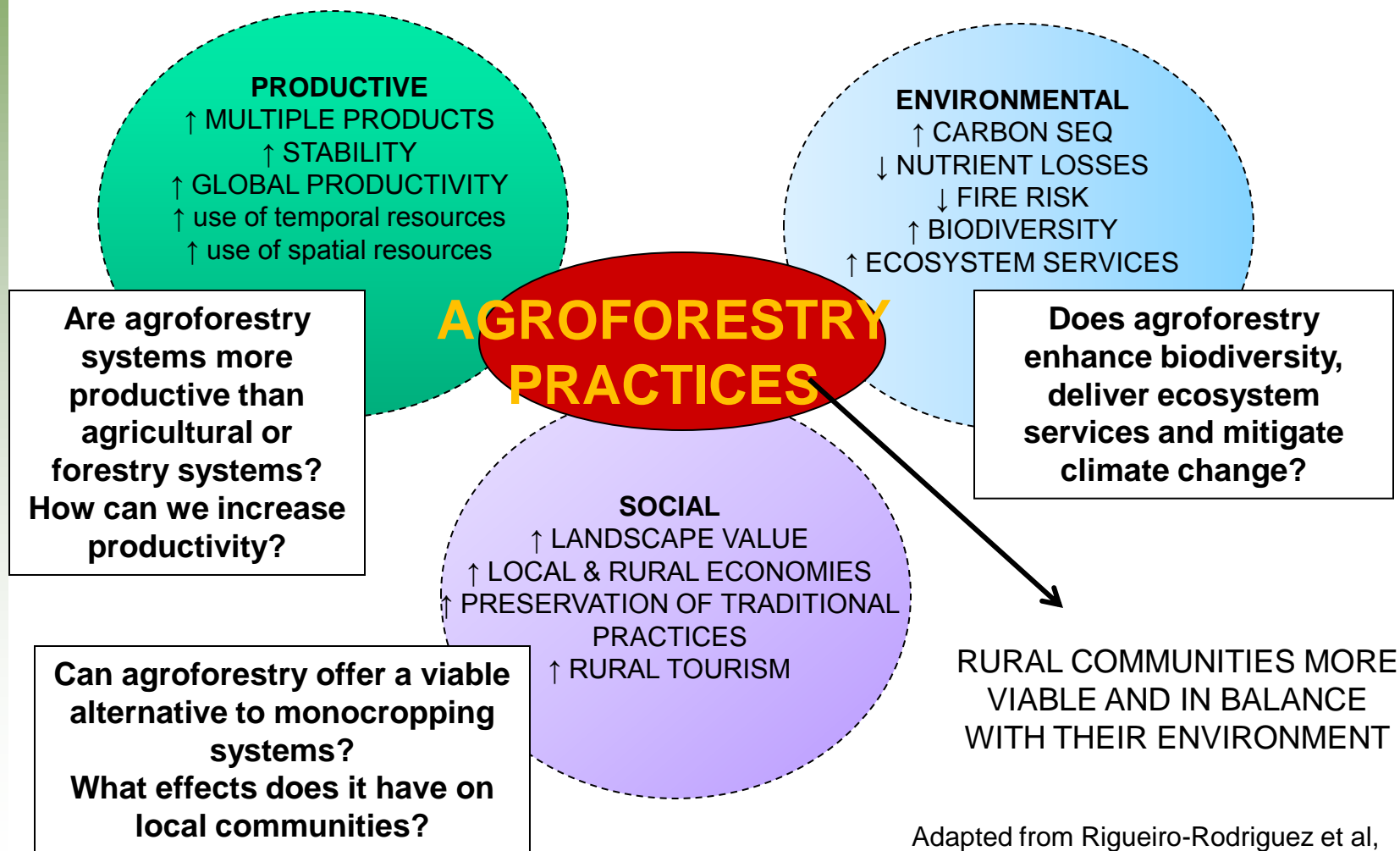
“Land-use systems in which woody perennials (trees, shrubs etc.) are grown in association with herbaceous plants (crops, pastures) or livestock; there are usually both **ecological and economic interactions** between the trees and the other components of the system” **Lundgren, 1982**



Understanding Interactions: a complex dynamic system



Productive, environmental and socio-economic benefits of agroforestry



Adapted from Rigueiro-Rodriguez et al, 2009 Agroforestry in Europe

Research approaches

Component research:

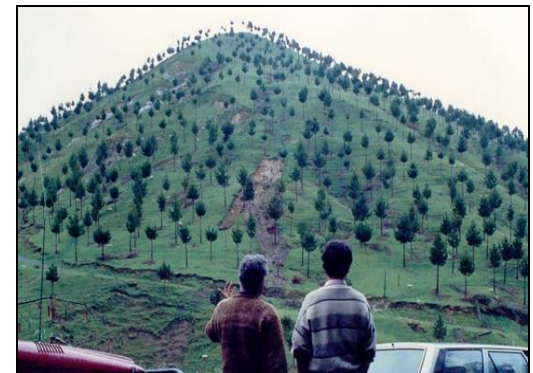
- understanding interactions

Systems research:

- silvopastoral and silvoarable trials
- management effects
- land equivalent ratios

Landscape-scale research:

- ecosystem services and biodiversity
- watershed effects



Key research findings

- **In silvoarable systems, crop yields can exceed monocropped controls**
- **In silvopastoral systems, livestock production is enhanced due to shade and shelter effects**
- **Productivity is highly influenced by management**
- **Agroforestry delivers a wide range of ecosystem services including water and soil quality regulation, nutrient capture, soil stability, climate change mitigation and biodiversity enhancement.**

Future research directions

- **Total productivity to include delivery and evaluation of ecosystem services**
- **Increasing productivity (management, species choice)**
- **Organic agroforestry: nutrient cycling, animal welfare, pest and disease regulation, N-fixing**
- **Tree/crop/animal interactions**
- **Climate change mitigation/adaptation**
- **Agroforestry and biofuels**
- **Landscape effects – wildlife corridors**



Silvo-poultry system,
Sheepdrove Organic Farm