



International Year of Cooperatives

Agri-Photovoltaic & the Cooperative model: Mutual benefits



Motivation

We are Agricultural Economics students and share the passion of advancing just and sustainable land use methods. Therefore, we are currently analysing the potential for mutual benefits between the cooperative model and the Agri-Photovoltaic (Agri-PV) technology from a theoretical perspective.

Research Question and Methodology

Research Question:

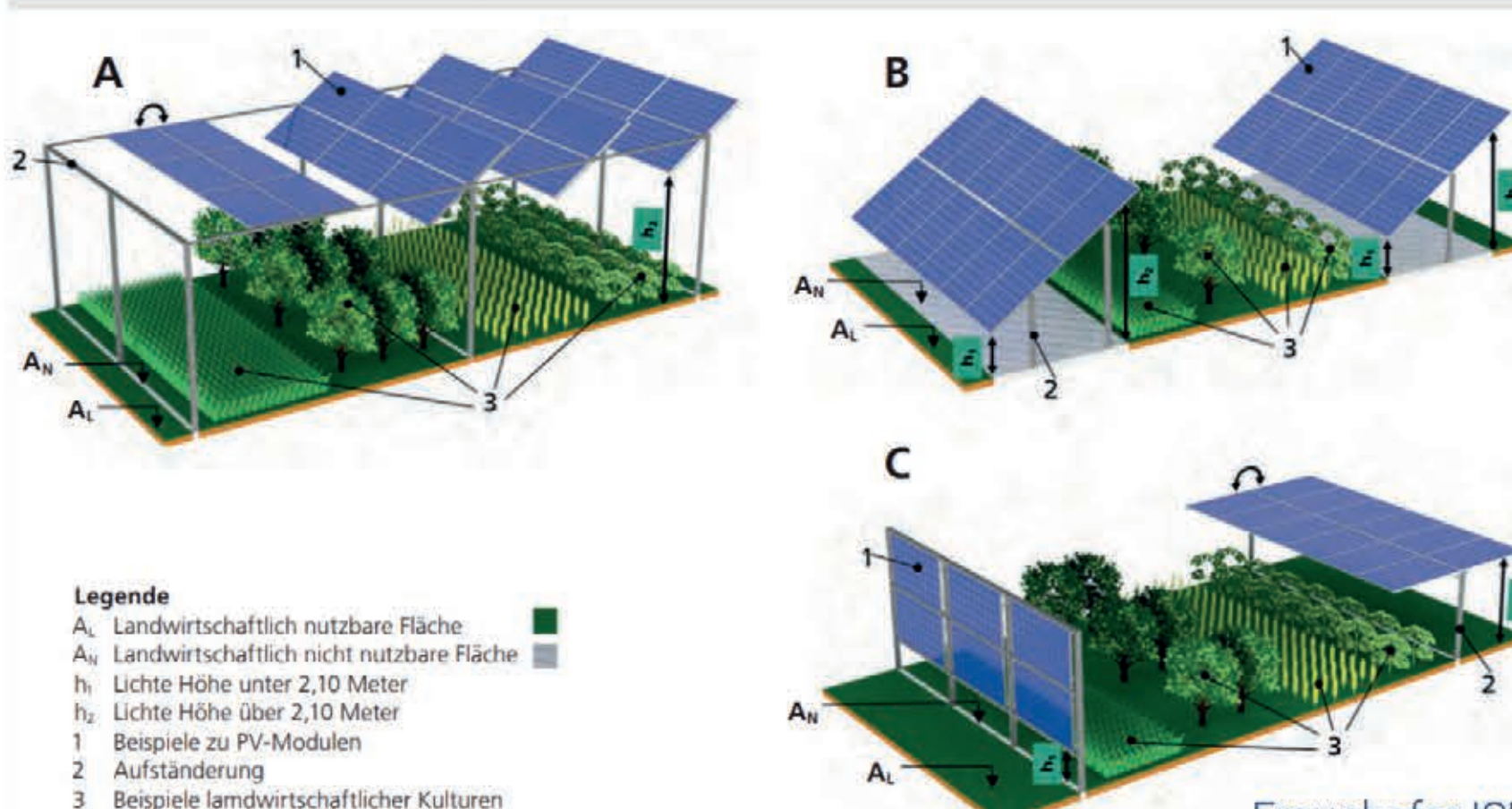
- How can the cooperative model and Agri-PV systems complement each other, and what potential synergies exist between them?

Methodology:

- Literature Review:
 - Focus on Agri-PV research. Questions: Which potentials and requirements are mentioned?
- Thematic Analysis:
 - Summarizing cooperative principles
- Linking results of the Literature Review and the Thematic Analysis
- Connecting findings to SDGs

Introduction: What is Agri-PV?

- Simultaneous use of agricultural land for agricultural outputs and solar energy production
- Aims to resolve land use conflicts between energy and agriculture and increase land use efficiency¹
- Various mounting systems adapted to agricultural production purposes (figure)¹



1. Potentials and requirements of Agri-PV

1.1 Potentials

- Energy self-sufficiency
- Increased rural economic development
- Income diversification (resilience)²
- Climate change adaptation (storm)¹

1.2 Requirements

- Long term planning
- Large investments
- Political guidance (e.g. legal framework)
- Community support
- Strong collaboration and partnerships³

2. Principles of the Co-op Model

As presented by the International Cooperative Alliance (ICA)

- Voluntary and Open Membership
- Democratic Member Control
- Member Economic Participation
- Autonomy and Independence
- Education, Training and Information
- Cooperation among Cooperatives
- Concern for Community

3. Agri-PV requirements and Co-op principles

- (2.) and (4.) provide long-term vision over short term profit (compare to GmbH or Ag) while including economic dimension (compare to e.V.) which are required for long term planning
- (3.) and (5.) pooling of resources allows for required expertise, land and finances which are needed for the size of investments
- (2.), (4.) and (7.) value driven decision making and community concern allow for community support
- (6.) enables political lobbying and regional collaboration

3. Co-op model and Agri- PV potentials

- Public and political image benefits for Co-ops as leaders of sustainability transition
- Increased autonomy in poly crisis by diversified incomes, increased profitability and off-grid electricity supply
- Establishment of economic clusters in rural areas can increase member economic participation and foster cooperation among cooperatives

Regarding mismatch of the two models:

- Large Co-ops match Agri-PV requirements better but perform lower in Co-op principles e.g. (2.) and (4.)⁴
- Smaller Co-ops tend to profit more from Agri-PV potential but lack requirements

4. Connection to SDGs

- SDG 7: Agri-PV has potential to transform the clean energy transition with 1 TW of PV capacity if only 1% of EU's agricultural area is utilized³
- SDG 13: Alleviate drought/ storm effects by improved microclimate and wind protection¹
- SDG 15: Reduced pressure on land and thereby providing more land for biodiversity protection³

Conclusion

- Lack of literature which links both themes except for Bauknecht (2025)
- Many connections to concepts from other presentations (e.g. Energy sharing)
- Transformative power of both concepts can lead to comprehensive change when both are combined
- Resilience and independence seem to be the most mutually enabling elements
- Conflicting findings highlight need for further research.

Find our sources under:



HOW TO BUILD A BETTER WORLD? IN SEARCH FOR COOPERATIVE TRANSFORMATION

