Characterizing farms agroecological intensity in the Mekong region

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ASSET

What is Agroecology?

Agroecology supports the transformation of food systems to **achieve ecological, economic and social sustainability**

- **Improving resource** use **efficiency**

- **Strengthening the resilience** of agricultural and food systems

- **Securing social equity** amongst stakeholders

Tittonell, 2023

13 Principles of Agroecology
High Level Panel of Experts on Food Security and Nutrition (HLPE), 2019

Agroecology contribution to the SDGs

Si, Z., Dai, D. N., Chen, M. L., & Scott, S. (2024). Embedding global sustainable development goals in local agroecology initiatives: experiences from China. *Agroecology and Sustainable Food Systems*, 48(6), 821–847. https://doi.org/10.1080/21683565.2024.2336484

13 Principles of Agroecology
High Level Panel of Experts on Food Security and Nutrition (HLPE), 2019

An agroecology scoring method based on the "13 principles"

- Case study

- Agroecological status of **1,800 farms**

- Selected from 4 different provinces, and 3 different countries of the Mekong region
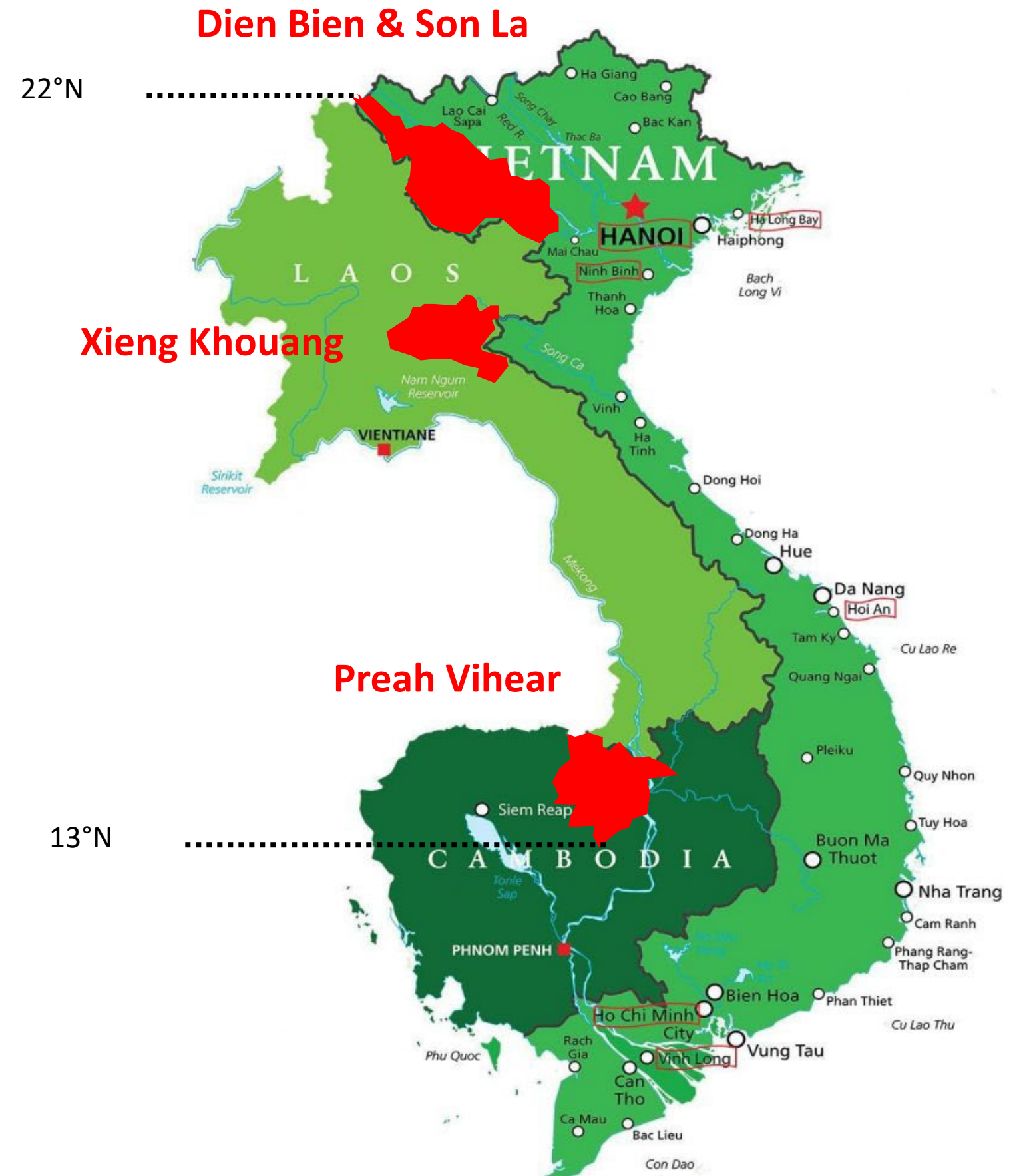
An agroecology scoring method based on the "13 principles":

Primary data collection features

- Each principle characterized by different variables

- From a farmer household (HH) survey, including:

  - General household characteristics

  - Sales and Income

  - Collective action, Knowledge and Practice

  - Land uses and crops

  - Livestock

  - Quality of life, Gender equity, Perception of farming & Food security

  - Housing characteristics & Household equipment

  - Subsidies and Credits

An agroecology scoring method based on the "13 principles"

- Association of different variables & scores for each principle

AE principles	Number of variables		Score
1. Recycling	· Water conservation AE practices (0 to 2) · Soil fertility AE practices (0 to 2)		0 to 4 -> 0 to 1
2. Input reduction	· Weeds control AE practices (0 to 2) · Pest and disease control AE practices (0 to 2) · Soil fertility AE practices (0 to 2) · Use of concentrates from the farm (0 to 3)		0 to 9 -> 0 to 1
3. Soil health	· Soil conservation AE practices (0 to 2) · Soil fertility AE practices (0 to 2)		0 to 4 -> 0 to 1
4. Animal health	· Lack of feed (0 to 1) · Access to water (0 to 1) · Use of traditional treatments for parasites (0 to 1)		0 to 3 -> 0 to 1
5. Biodiversity	· Variety of NTFP products collected (0 to 2) · Variety of crop species grown (0 to 2) · Variety of animal species raised (0 to 2) · Use of local seeds/breeds (0 to 2)		0 to 8 -> 0 to 1
6. Synergy	· Use of synergic practices for fertility, weeds or pest & disease control (0 to 1) · Use of farm production and resources to feed the ruminant (0 to 1)		0 to 2 -> 0 to 1
7. Economic diversification	· Sum of farm income generating activities (0 to 2) · % of income from the 2 main sources of income (0 to 2) · Number of HH members with different income-generating activities (0 to 2)		0 to 6 -> 0 to 1

An agroecology scoring method based on the "13 principles"

- Association of different variables & scores for each principle

AE principles	Number of variables	Score
8. Co-creation of knowledge	• Exchange of agricultural products, equipment, or animals (0 to 1) • Time self-evaluation to acquire new knowledge and improve skills (0 to 1) • Collaboration with other people (0 to 1)	0 to 3 -> 0 to 1
9. Social values and diets	• Proportion of the food consumed self-produced by the household (0 to 1) • Self-evaluation of working hours distribution across family members (0 to 1) • Lack of food during the past year (0 to 1) • Important decisions made in consultation with spouse/other family members or not (0 to 1) • Proportion of products from crops, vegetables or fruits that are sold raw (0 to 1)	0 to 5 -> 0 to 1
11. Connectivity	• Knowledge of the main final destination of the crops sold (0 to 1) • Knowledge of the main final destination of the animals sold (0 to 1) • Relation with buyers (Regular sales, Inputs (sold), Technical advice/training, Market information) (0 to 1)	0 to 3 -> 0 to 1
13. Participation	• Membership in group/cooperative/organization or village organization (0 to 2) • Activity in any union (0 to 1) • Household members involvement in any advocacy work (0 to 1)	0 to 4 -> 0 to 1

An agroecology scoring method based on the "13 principles"

- Association of different variables & scores for each principle

- Two principles, i.e. "Fairness" and "Land and natural resources governance" not included for the agroecology (AE) scoring (as implying data not collected at the HH level)

- 15 farm types built based on Principle Component Analysis (PCA) on farms main characteristics
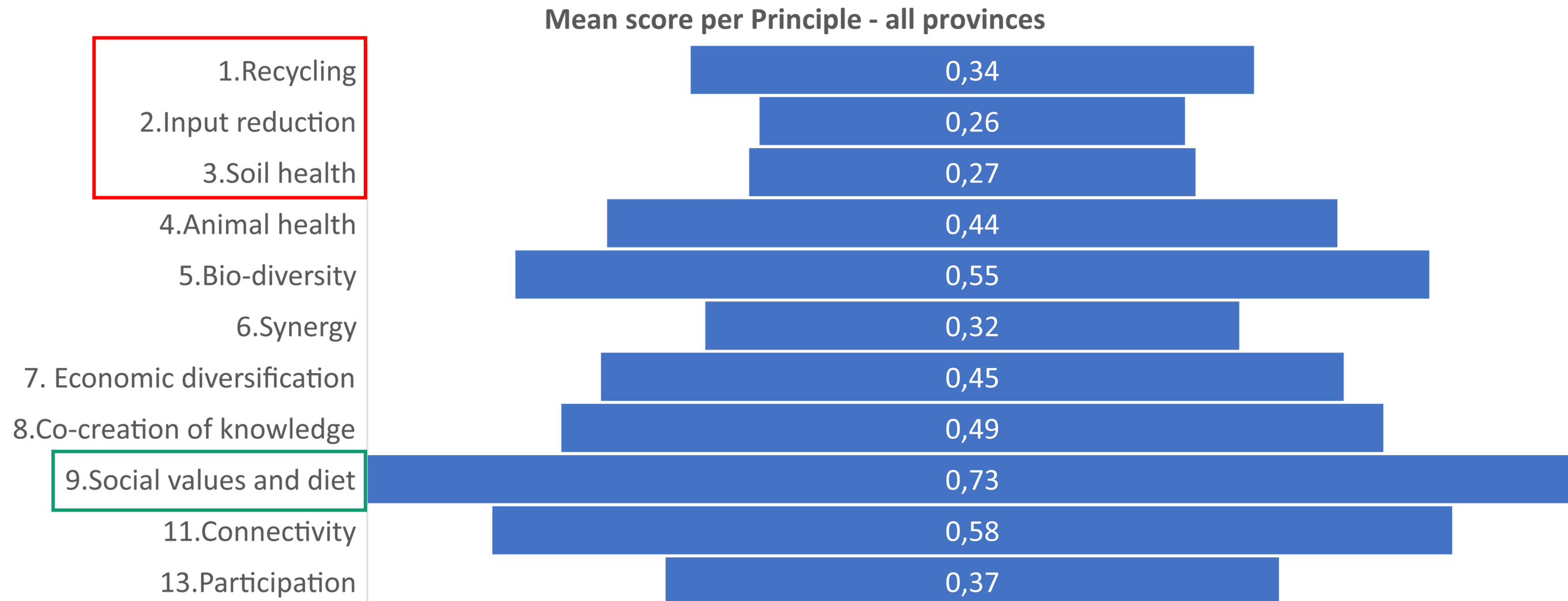
An agroecology scoring method based on the "13 principles"

- Example of farm types in Dien Bien (DB) district, DB Province, Vietnam
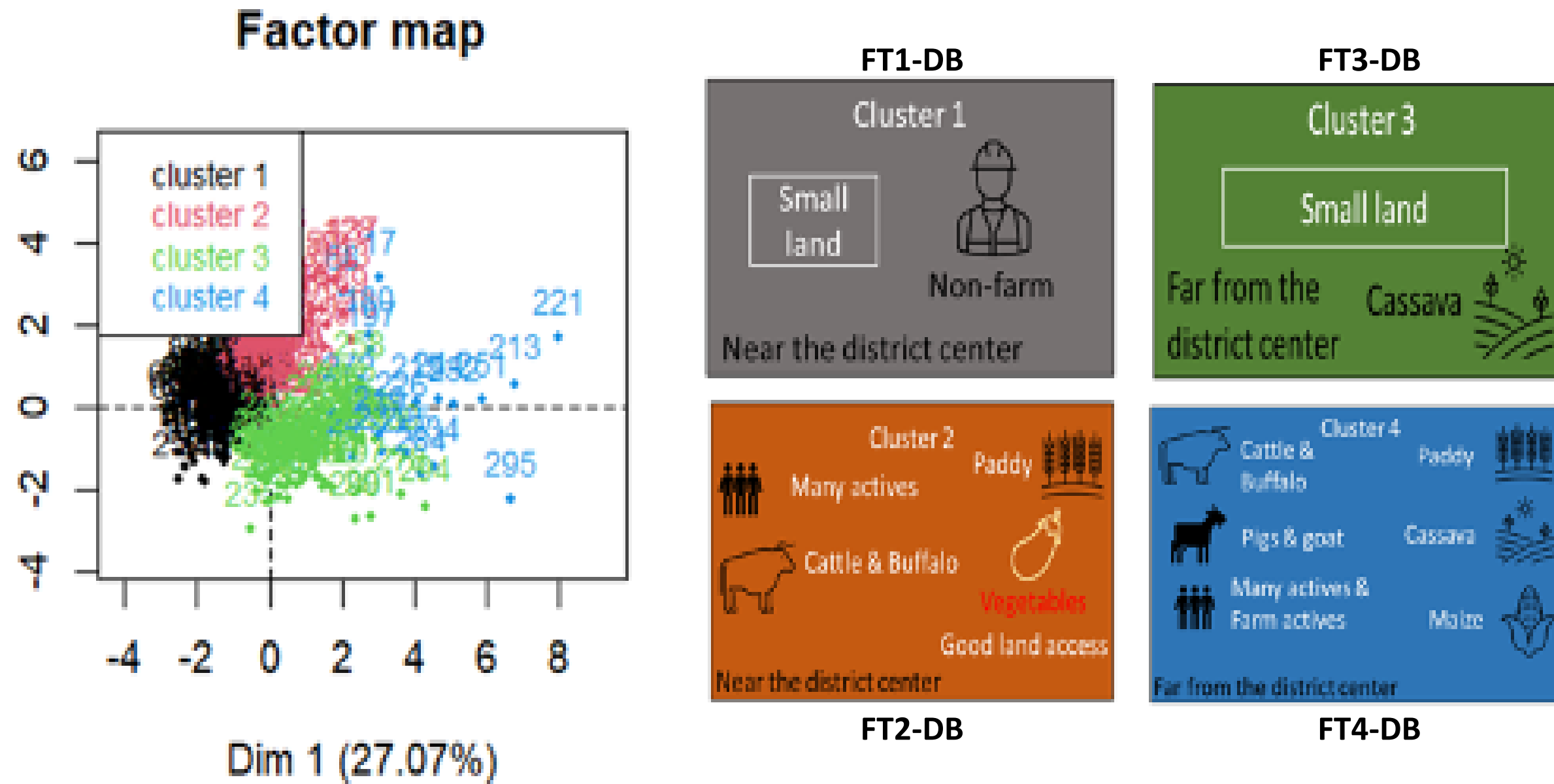
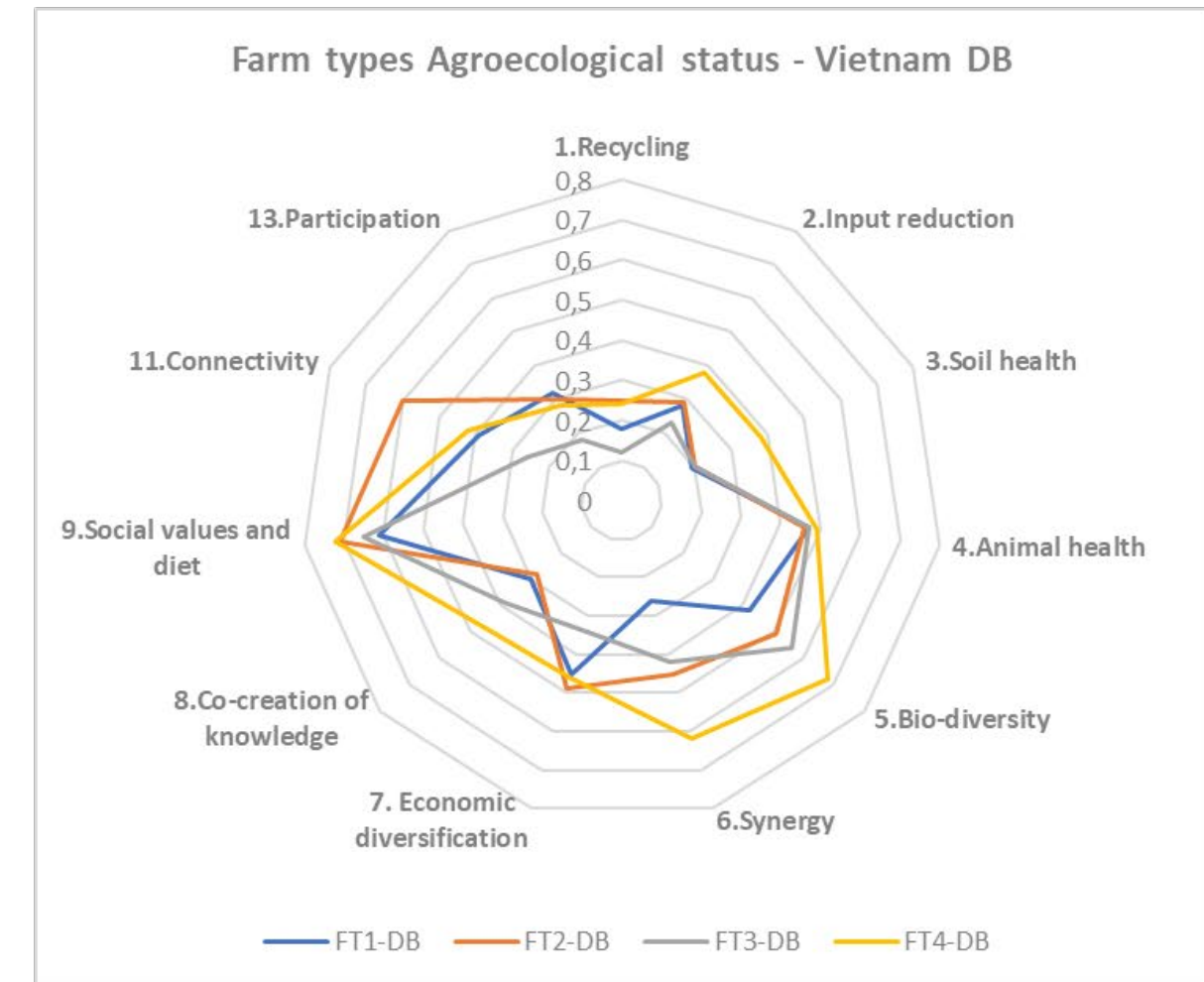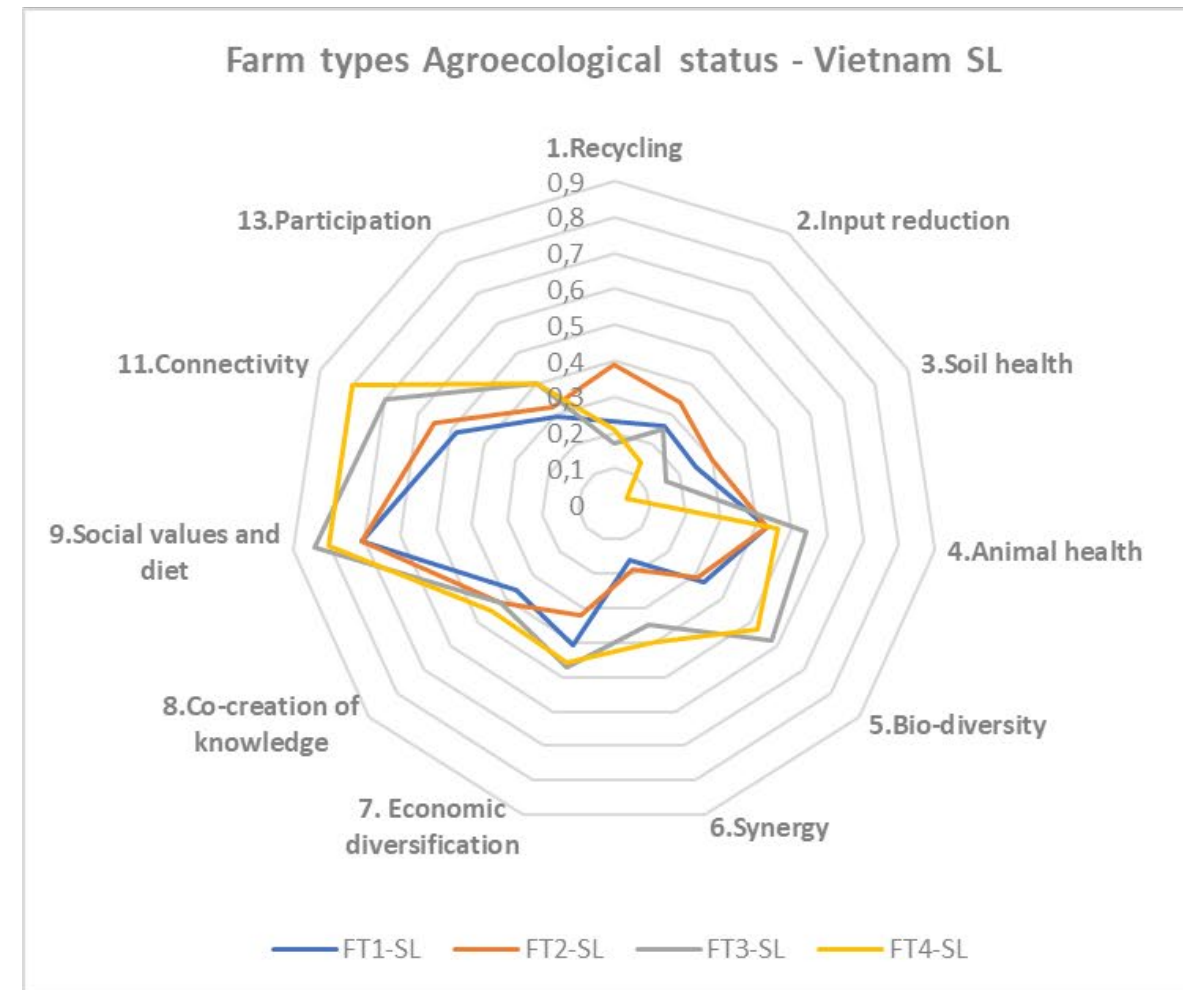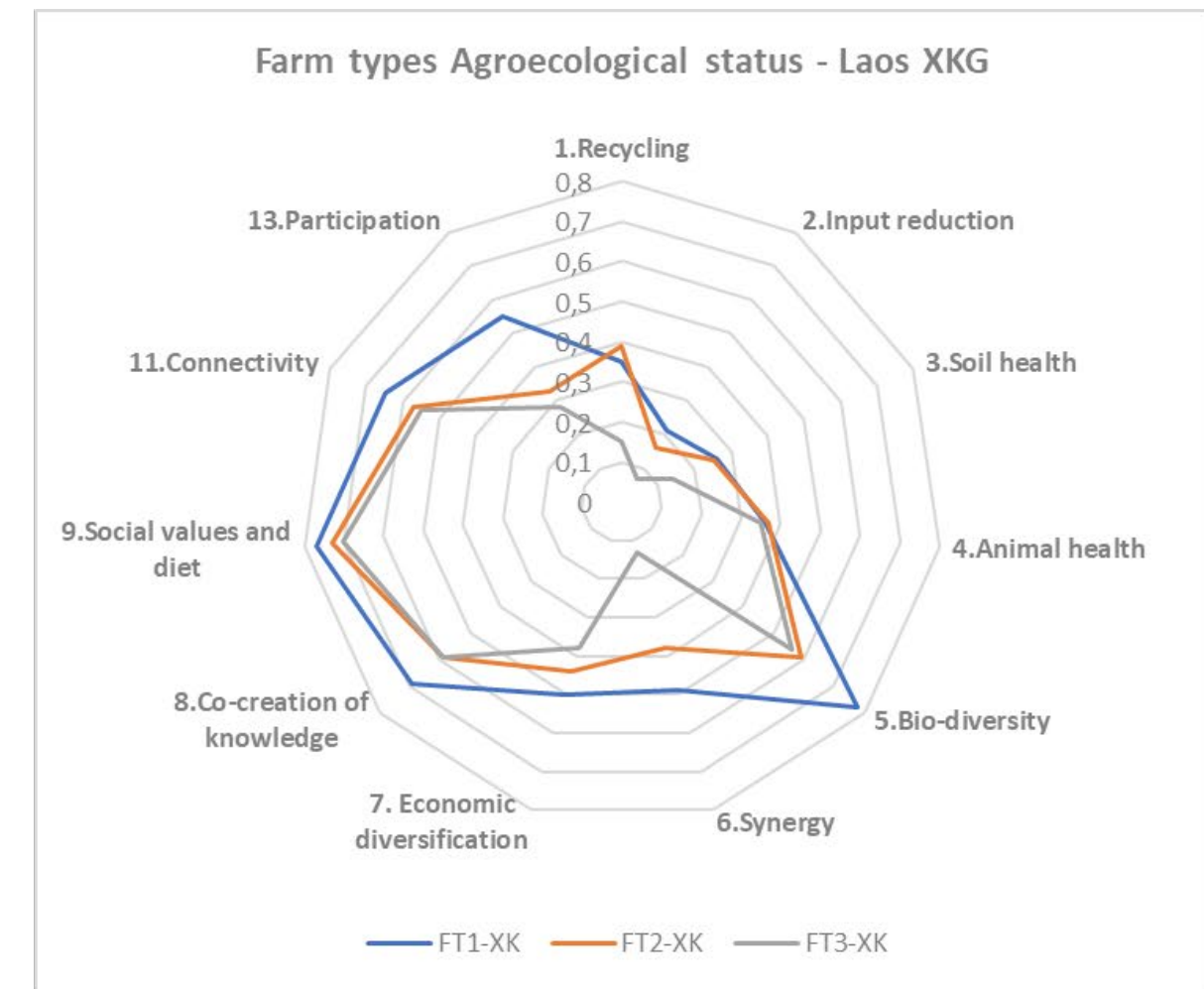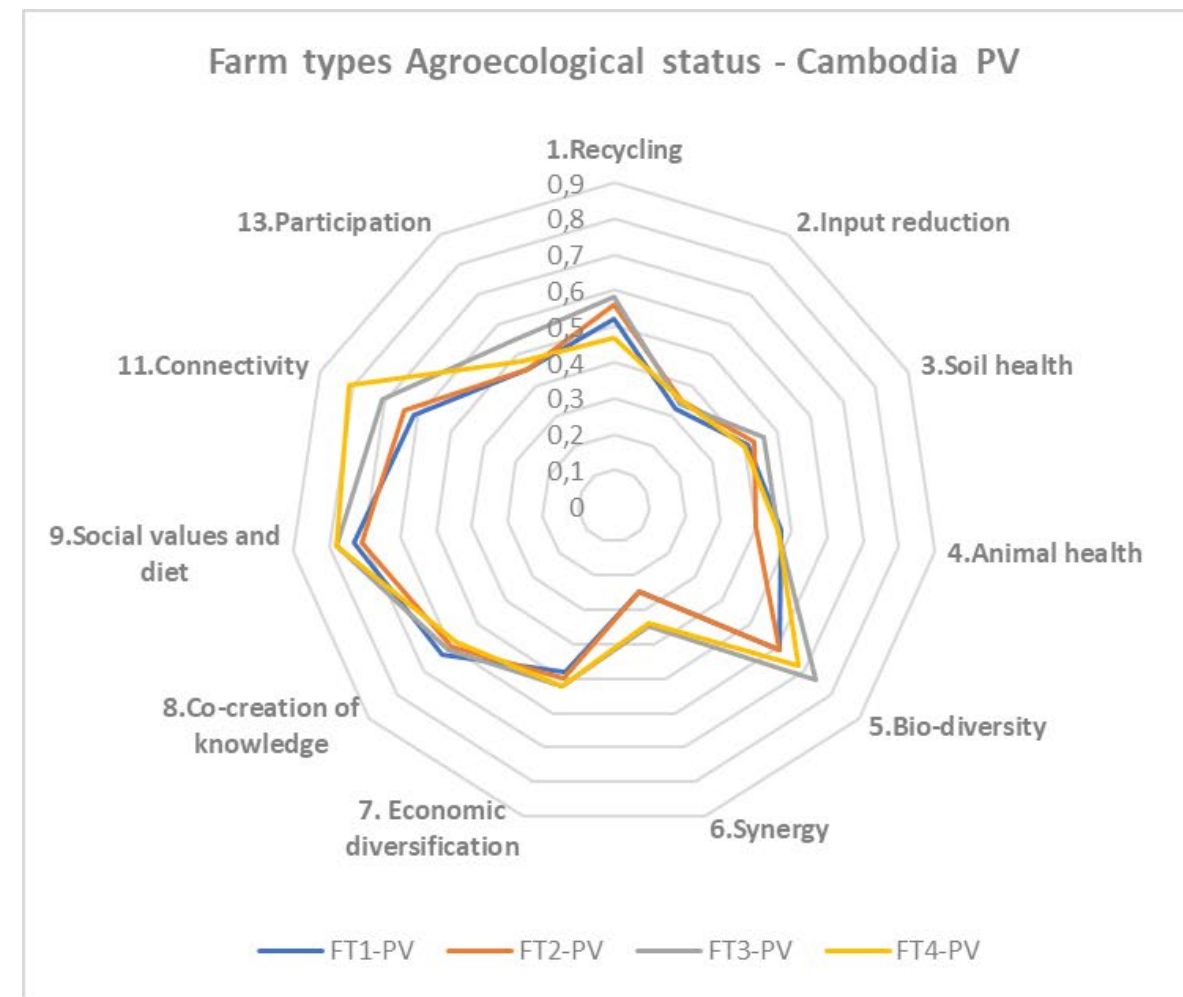# Main results

- **Total AE scores were low**, with only 4 out 15 farm types getting agroecology scores higher than 5 (out of 10) and below 6 in all farm types.

- The **lowest scores** were observed for **Recycling**, **Soil health**, **& Input reduction** Principles, underlying farms' strong reliance on external inputs (pesticides, fertilizers).

- The **highest score** was observed for **Social values & diets Principle**, in line with the importance farmers allocate to local varieties/breeds and self-sufficiency.

Mean score per Principle - all provinces

Principle	Mean score
1.Recycling	0,34
2.Input reduction	0,26
3.Soil health	0,27
4.Animal health	0,44
5.Bio-diversity	0,55
6.Synergy	0,32
7. Economic diversification	0,45
8.Co-creation of knowledge	0,49
9.Social values and diet	0,73
11.Connectivity	0,58
13.Participation	0,37

Main results

AE scores were significantly **higher** in locations **where** multiple **initiatives have been promoting the use of cover crops** for soil health and biodiversity enhancement, especially **in paddy and tea-based systems**.

Farm types Agroecological status - Cambodia PV

Farm types Agroecological status - Laos XKG

Farm types Agroecological status - Vietnam SL

Farm types Agroecological status - Vietnam DB

Conclusions

- The assessment of AE principles using a scoring method highlights **priority areas for intervention**, and helps visualize the possible impacts of AE adoption

- The scoring method can **apply to multiple scales** e.g. province, farming systems, cropping and livestock systems, to tailor AE interventions at these different scales

- It may **enrich and complement existing AE evaluation methods** based on household surveys, focus group discussions and territorial diagnosis