Performance Assessment of Agroecology in Attapeu, Lao PDR

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December 2024

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INTRODUCTION

Background to the Initiative

Agroecology is a holistic approach to agriculture that integrates ecological principles into farming practices, promoting sustainable food production, biodiversity conservation, and resilient livelihoods (Jones et al. 2024). The Agroecology Initiative (AEI) is a transdisciplinary, participatory, and action-oriented approach aimed at enhancing food system resilience, equity, and sustainability. The AEI aims to develop and scale agroecological innovations with small-scale farmers and other agricultural and food system actors across different social-ecological contexts in eight low- and middle- income countries (CGIAR 2025).

The AEI is structured into 5 work packages (WPs), each addressing a different aspect of agroecology. These include: WP1) co-creating innovations in a network of Agroecological Living Landscapes (ALLs) (i.e., regions within a larger administrative boundary with established agroecological based farming techniques) (REF), WP2) conducting evidence-based assessments of agroecological performance, WP3) developing inclusive business models focusing on agroecological principles, WP4) working on policy and governance to promote coherent policies and institutional changes conducive to an agroecological transition, and WP5) working on understanding and influencing agency behaviour change. Together, these WPs provide a comprehensive overview of agroecology and its performance, addressing both immediate requirements and steps required for long-term sustainability. The WPs also help visualize and support a transition to more sustainable agricultural practices.

This report presents results from WP2. Specifically, this includes an evidence-based assessment of agroecology performance in Attapeu ALL. This utilises the Holistic Localised Performance Assessment (HOLPA) tool for household surveys, developed by Jones et al. (2024). The HOLPA tool measures the multidimensional performance of agroecological fields, farms, and landscapes to provide an evidence-based understanding of future management and sustainability requirements to support a transition to agroecology.

Context of the Agroecology Initiative in Lao PDR

The agroecology living landscape (ALL) in Lao PDR is in the southernmost province of Attapeu, bordering Vietnam to the east and Cambodia to the south. The Attapeu ALL consists of ten villages distributed across two districts, namely i) Sammakhyxai, and ii) Sanamxai (Figure 1). Eight of these villages were part of the sampling frame for this study, table1. Most farmers within the ALL belong to ethnic groups including, Oy, Jaeng, Brau and Lao loum, who practice their own cultural traditions.

Rain-fed rice production comprises the primary agricultural practice in the ALL, particularly in lowland areas along the Xekong river. Rice farming is primarily rain-fed, with the average farmer owning paddy fields ranging from 0.6 to 3.5 hectares and yielding 0.8-1.5 tons of rice per hectare. Local variety and organic rice production serves both household consumption and commercial sales to IDP Co. Ltd (Clayton et al. 2023). During the dry season, when rice production is reduced, farmers cultivate cassava on nearby private or rented lands or choose to work as day laborers on sugar cane and banana plantation. The Xekong river's floodplains events provides abundant fisheries and aquatic resources that further contributes to food security.

Despite the diversity of agricultural practices in the ALL farmers suffer from high levels of malnutrition and poverty. According to the Lao Social Indicator Survey II conducted in 2017, the malnutrition levels for children under 5 are concerning in Attapeu, with 25.9% of children underweight, 29.6% stunted, and 15% wasted (Lao Statistics Bureau 2018). A recent study conducted by IWMI and WorldFish (Rizaldo et al., 2024) in the ALL using the mean dietary diversity for women methodology in one hundred households found that only 30% of the women interviewed reached the minimum diet diversity score of 5. The score of 5 and above indicates micronutrient adequacy in diets, a key dimension of diet quality. Water source availability is also an issue, particularly in the critical dry season months of March and April.

Vision to Action Plan

The LAO PDR vision to action plan (V2A) comprised three main steps: i) interprovincial consultation to co-create the ALL, ii) baseline, and iii) village action planning, with focus on co-design and transition pathways.

The visioning process commenced in Q2 of 2022 with a consultation event involving stakeholders from eight target villages. Participants shared their current agricultural practices, provincial priorities, and vision for 2030 at the provincial level to identify priorities for agroecological systems. Subsequently, a series of small exchanges, field visits, and meetings to build social connections and explore areas for collaborations were conducted, as well as the selection of trial sites. In Q2/3 of 2023 asset baseline and village visioning were conducted to gather information on community resources and visions for future development.

A full report of the Lao PDR V2A can be found at: https://hdl.handle.net/10568/139029.

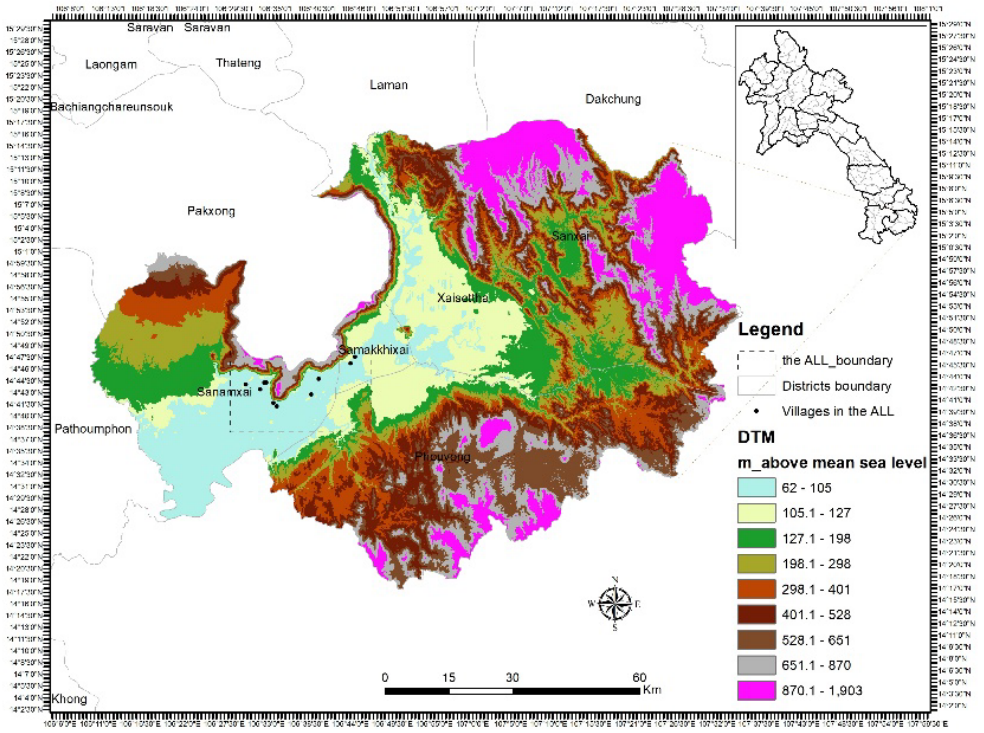

Figure 1: Location of the Lao PDR agroecological living landscape (ALL) in Attapeu province and corresponding trial villages (n=10).

Assessment of Agroecology: Measurement and Methodology

The HOLPA protocol was developed to assess agroecology performance in the Attapeu ALL. The tool is divided into three modules: i) context, ii) performance and iii) agroecology. The context module provides a comprehensive overview of the landscape, including its physical, social, and economic characteristics. The performance module evaluates the economic, social, and environmental performance of the landscape. The agroecology module assesses the ecological performance of the landscape, focusing on the interactions between the environment and agricultural practices across the 13 principles of agroecology as defined by the High-Level Panel of Experts described in the (HLPE 2019). The full list of agroecological principles and their definitions is provided in Jones et al. 2024.

The HOLPA includes a set of standardized questionnaires, combined with locally adapted indicators, to collect data on the multifunctional performance of agroecological activities at the farm scale. The tool captures a wide range of performance aspects (Jones et al. 2024) to generate scores that indicate the status of agroecological performance in the region's ALL. The findings aim to generate an evidence base for the performance of agroecological activities both within Lao PDR and other AEI countries.

The Lao PDR ALL research hypothesis proposes that social and ecological resilience can be achieved through a transition to integrated agroecological food systems. The report aims to gather evidence and generate baseline information on the agroecological status of eight villages in Attapeu province. Thematic research questions reflecting the three HOLPA modules (i.e., context, performance, and agroecology) were developed and applied to help achieve this aim. The HOLPA modules and their corresponding research questions are as follows:

Context

- What are the key characteristics of the local landscape, including physical, social, and economic characteristics?

Agroecology

- What is the current status of agroecology in the Attapeu ALL?
- What are the main challenges in building agroecology practices in Attapeu?

Performance

- What is the current performance of agroecology in the Attapeu ALL?
- Are there differences in agroecological performance across the ALL area? If so, what factors are driving performance?
- Do land tenure, ethnicity, specific crop cultivation, and the availability of water resources affect the performance of agroecology?
- What are the variations in farmer agency in terms of power, freedom, and decision-making across different ethnic groups (e.g., Oy, Laolum, Jeng, etc) in Attapeu?
- What is the variation in diet quality based on 24-hour food consumption, categorized by ethnic group and village?
- How does the satisfaction with healthy living and well-being vary in the area? What are the highest and lowest satisfaction levels?
- Categorized by village, what are the main sources of water for household use and vegetable irrigation and which months present challenges to access water?

METHODOLOGY

Localization of the HOLPA tool

Locally adapted indicators were identified to apply within the HOLPA through a participatory Local Indicator Selection Process (LIPS). This involved co-design meetings with team members to generate indicators for each HOLPA module. These indicators were compiled and cross-checked against the original HOLPA survey to check for duplication. Original HOLPA indicators were then reviewed and revised to align with the local context. Adjustments included modifying units of currency, land areas, and food groups to correspond with local diets.

Following the localisation process, the survey was translated into Lao and uploaded to the Kobo Toolbox web page. The system was tested to ensure compatibility with Lao language requirements, and functionality across survey modules.

Implementation of the HOLPA tool

The HOLPA survey was administered to gather farm-scale data on the agroecological status of Attapeu province. In February 2024 training session on the HOLPA survey and its application were conducted. Trainees included enumerators from the National Agriculture and Forestry Research Institute (NAFRI), the Provincial Agriculture and Forestry Office (PAFO), and the respective District Agriculture and Forestry Office (DAFO). The training aimed to ensure that enumerators understood the survey, questions, and associated tools, and had pre-tested the HOLPA prior to its application.

The HOLPA was implemented in March 2024 by trained enumerators, with Kobo Toolbox utilised to collect data from households. The survey was conducted in local language across 10 villages in Sanamxai and Samakhixai districts of Attapeu province. A minimum sample size of 10% was achieved, resulting in a total of sample size of 219 households. Data was collected using a combination of digital and paper-based surveys, with responses recorded on tablets and paper forms. Upon completion, the interview forms were submitted to a centralised data location for review and quality control.

HOLPA Data Analysis

The HOLPA data were cleaned, normalised, and aggregated to generate scores for each survey question. The data were then analysed using R statistical software to generate descriptive statistics, inferential statistics, and visualisations for each indicator and corresponding module.

Specific analysis methods for each HOLPA module were as follows:

1. **Context module**: Descriptive statistics were calculated to reflect categorical or text data on respondent demographics, landscape features, production systems, and climate change impacts.
2. **Agroecology module**: Likert-scale data were converted to a standardised 1-5 scale for each indicator. The median scores across indicators within each agroecology principle were then calculated, and normalised, before summarising to an overall agroecology adherence score.
3. **Performance module:** Individual indicator scores were calculated and standardised to a 0-100 scale to facilitate comparison. Domain specific scores were calculated as the means of thematically similar indicators scores (i.e., agricultural, environmental, economic, and social). An overall performance score was then calculated by combining domain specific scores.

RESULTS

The results of the HOLPA survey for the Lao PDR ALL are presented below. These answer the key research questions developed by the research team associated to the i) local context, ii) agroecology, and iii) performance of the area.

Module 1: Context

Question 1: *What are the key characteristics of the local landscape, including physical, social, and economic characteristics?*

An overview of survey respondents' sociodemographic characteristics can be found in Table 1.

Across respondents there was a near even divide by sex with 51.1% male and 48.4% female. The Oy ethnic group was the most prevalent, accounting for 75.2% of participants. However, the ethnicity of participants varied by village, for example, Donephay participants were all from the Cheng ethnic group. The age distribution of participants was evenly divided, with 25.6% of respondents under 35 and 26,1% over 55. In terms of education, most participants completed school (46.3%), while 13.2% had no formal education and only about 2% had attained university-level education.

Table 1: Socio-demographic characteristics of survey respondents (%) across Lao PDR ALL villages (n=8).

Indicator	Variable	Donephay	Donesoung	Dongbakmai	Home	Inthy	Tammaleuy	Donemouang	Thaun
Sample Size		***28***	***6***	***39***	***44***	***24***	***25***	***29***	***25***
Sex of HH head (%)	Male	64.3	50.0	56.4	25.0	54.2	52.0	58.3	48.0
	Female	35.7	50.0	43.6	75.0	45.8	48.0	41.4	48.0
Ethnicity (%)	Cheng	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Brao/Lave	0.0	0.0	0.0	0.0	0.0	4.0	0.0	4.0
	Laoloum	0.0	0.0	2.6	63.6	0.0	0.0	0.0	0.0
	Oy	0.0	100.0	97.4	36.4	100.0	96.0	100.0	96.0
Age of HH head (in years) (%)	>=35	25.0	16.7	51.3	22.7	25.0	12.0	24.1	28.0
	36-54	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	<=55	39.3	33.3	20.5	13.6	20.8	40.0	17.2	24.0
Highest level of school attended (%)	None	35.7	16.7	5.1	9.1	8.3	20.0	10.3	0.0
	Primary	35.7	33.3	59.0	31.8	50.0	56.0	44.8	60.0
	Secondary	3.6	33.3	28.2	27.3	25.0	16.0	34.5	28.0
	High	21.4	16.7	7.7	27.3	16.7	4.0	6.9	12.0
	University	3.6	0.0	0.0	4.5	0.0	4.0	3.5	0.0

Module 2: Agroecology

This section evaluates the extent to which farmers adhere with the 13 agroecological principles as defined by the High-Level Panel of Experts described in the (Jones et al. 2024) (HLPE 2019).

Question 1: *What is the current status of agroecology in Attapeu ALL?*

Agroecology was evaluated on a 1 to 5 scale, with 1 representing low performance and 5 indicating high performance. Across the Attapeu ALL an average agroecology performance score of 2.6 was achieved across the 13 principles (Figure 2). The agroecological principles achieving the highest performance score included: i) recycling (5), reflecting the preferential use of local renewable resources and cycles of nutrients and biomass, ii) connectivity (5), reflecting promotion of fair and short distribution networks and the re-embedding of food systems into local economies (5), and iii) input reduction (4.5) reflecting attempts to reduce or eliminate dependency on purchased inputs and an increase in self-sufficiency.

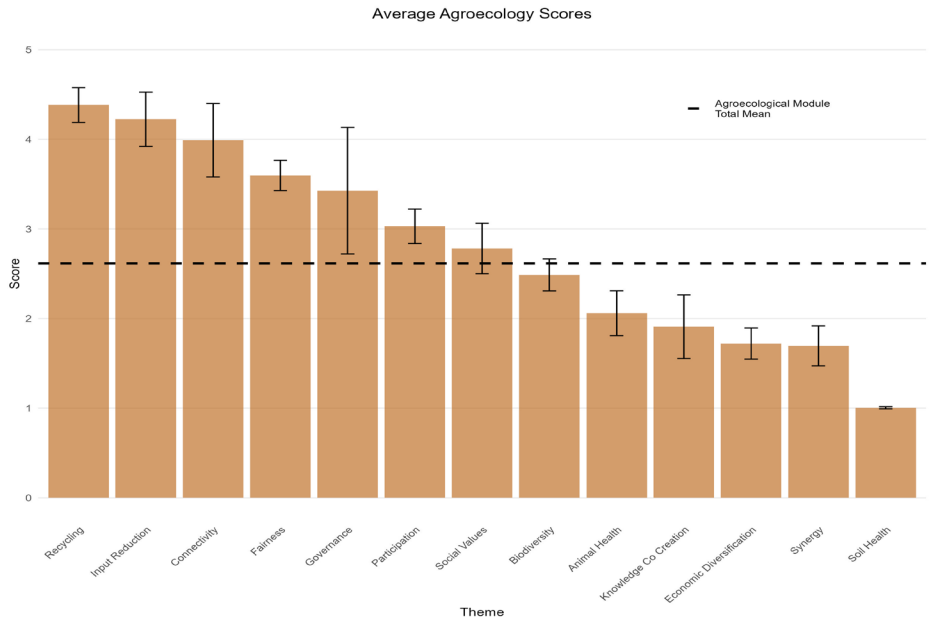

Figure 2: Average agroecology adherence scores the Lao PDR ALL categorised by the 13 principles of agroecology.

Question 2: *What are the main challenges in building agroecology practices in Attapeu?*

Across the Attapeu ALL, soil health, synergies, economic diversification and knowledge co-creation achieved the lowest performance score of 1 (Figure 2). This reflected low adherence, or minimal attempts to secure and enhance soil health and functioning for improved plant growth (i.e., soil health); enhance positive ecological interaction among agroecosystem elements (i.e., synergies); enhance livelihood portfolios ad market systems (i.e., economic diversification); and enhance co-creation and sharing of knowledge including local and scientific innovation (i.e., knowledge co-creation).

Across villages within the Attapeu ALL there was minimal variation in the total agroecology score, however, Tammaleuy exhibited the lowest score of 2.5, and Inthy the highest score of 2.8 (Table 2). The agroecological principle of connectivity had the biggest range in performance across the Lao PDR ALL (2.6), with the lowest score recorded in Donesoung (2.0), and the highest in Donehphay (4.6). This was followed by the principle of fairness (representing dignified and robust support for livelihoods) which varied by 1.7 points across villages, and knowledge co-creation, which varied by 1.2 points.

Table 2: Average agroecology principle scores (n=13) and the total agroecology score for each village (n=8) in the Attapeu ALL on a 1 to 5 scale where 1 represents low performance and 5 represents high performance.

Village	*Recycling*	*Input Reduction*	*Soil Health*	*Animal Health*	*Biodiversity*	*Synergies*	*Economic Drivers*	*Knowledge Co-Creation*	*Governance*	*Social Values and Diets*	*Fairness*	*Connectivity*	*Participation*	*Agroecology Total*
Donephay	4.4	4.8	1.0	1.7	2.6	1.9	1.4	1.8	2.3	3.3	4.0	4.6	3.1	2.6
Donesoung	4.3	3.6	1.0	2.1	2.0	1.5	1.5	2.3	3.3	4.0	5.0	2.0	3.4	2.7
Dongbakmai	4.2	4.5	1.0	1.8	2.7	2.1	1.6	2.1	2.8	3.5	3.7	4.3	3.0	2.7
Home	4.3	4.1	1.0	2.3	2.5	1.3	2.0	1.5	2.7	3.7	3.9	3.3	2.7	2.6
Inthy	4.1	4.2	1.0	2.0	2.6	1.8	1.9	2.7	3.2	3.6	3.4	4.0	3.0	2.8
Tammaleuy	4.4	4.4	1.0	1.7	2.6	1.5	1.7	1.4	2.5	3.5	4.3	2.8	3.2	2.5
Donemouang	4.4	4.3	1.0	2.4	2.4	1.8	1.8	1.8	2.6	3.6	3.6	3.2	3.1	2.7
Thaun	4.9	3.9	1.0	2.4	2.5	1.5	1.9	1.8	2.8	3.7	4.1	3.3	2.7	2.7

Question 3: *Do land tenure, ethnicity, specific crop cultivation, and the availability of water resources affect agroecological scores?*

Figure 3 presents the distribution of agroecological scores based on variations in: a) land ownership, b) ethnicity, c) crop cultivation, and d) water resources.

Households with less than 10% land ownership showed significantly higher distributions in agroecological scores (Kruskal Wallis, $p = 0.02$). This suggests that households with minimal land ownership face greater variability in agroecological outcomes. There were no significant differences in agroecological scores across ethnic groups (Kruskal Wallis, $p = 0.20$), crop species cultivation (Kruskal-Walli, $p = 0.88$), and water source (Kruskal Wallis, $p = 0.97$), suggesting these variables did not influence the performance of agroecology across the Attapeu ALL.

Across ethnic groups, Lao Loum respondents had a slightly higher agroecological score, however, the results did not suggest a notable difference across ethnicities. In terms of crop cultivation, certain crops (like rice, vegetables, and green beans) showed a broader distribution across agroecological scores, which may suggest versatility in cultivation conditions. Finally, water sources, such as rainwater and groundwater, exhibited a slightly higher agroecological score than other sources. This suggests that access to these sources may contribute to greater agroecological outcomes.

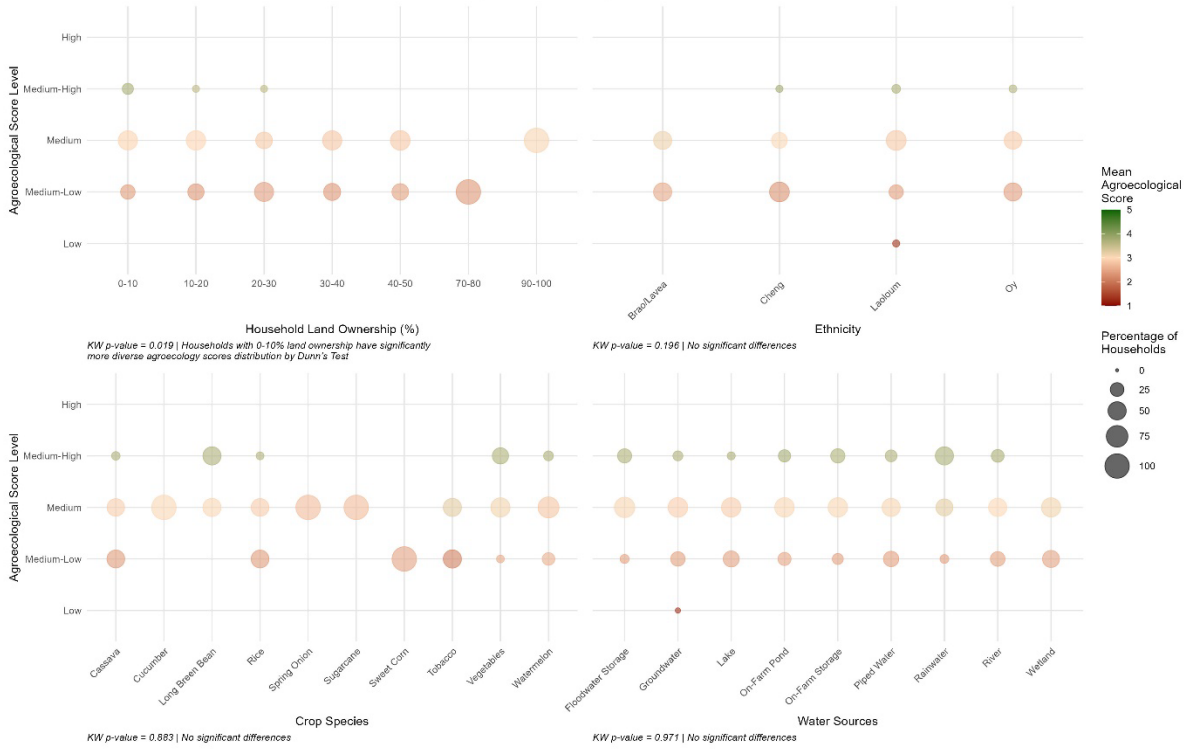

Figure 3: Distributions of agroecological scores based on: a) land ownership, b) ethnicity, c) crop cultivation, and d) water resources.

Module 3: Performance

This section explores the relationship between adherence to agroecological principles (Module 2) and the KPI performance indicators (Jones et al. 2024). The performance module aims to provide a baseline understanding of how adherence to agroecological principles can influence the performance of four key domains including: agricultural, environmental, economic, and social. This section first assesses key KPI's across the Attapeu ALL and case study villages, before exploring specific research questions associated with agroecology performance.

Question 1: *What is the current performance of agroecology in Attapeu ALL?*

Table 3 shows the average performance scores of agroecology KPI indicators across the Attapeu ALL. The scores are based on non-normalised data and comparisons across KPI indicator scores cannot be conducted. However, several key observations were observed within the KPI thematic groups (i.e., agriculture, environment, economics, and social).

Agricultural: Agricultural performance KPI's included: i) crop health, ii) animal health, iii) soil health, iv) nutrient use, and v) biodiversity.

Across the Attapeu ALL crop health was high (84.3/100) indicating that the majority of crops had healthy foliage with no signs of deficiency. Animal health and soil health both scored moderate to high at 2.9/5 and 2.4/3 respectively. This suggests that across the Attapeu ALL there is a medium extent of injury, illness or death of livestock and or fish due to disease, and that soil exhibits moderate to high fertility with some erosion. This is somewhat incongruous with results from the agroecology module and results of TOC Soils analysis, reported separately. Nutrient use was low (21.7%), suggesting a limited amount of chemical or organic fertilised was used on cropland. Finally,

biodiversity was moderate (2.6/5) suggesting that there was an average variety of trees, plants, and animals within the ALL area.

Environmental: Environmental performance KPI's included: i) agrobiodiversity, ii) landscape complexity, iii) climate mitigation, iv) water, and v) energy use.

Agrobiodiversity exhibited a high score across the Attapeu ALL at 4.9/5, suggesting high richness in the types of crops, livestock, and fish species present. Climate mitigation was moderate (3.2/5), suggesting the majority of farms are transitioning towards low emissions and high sequestration practices. Water access difficulty also scored moderate to high, scoring 3.9/5, suggesting participants experience a significant period of time with difficulty accessing water. Finally, energy use was moderate at 2.5/5, this signifies a transition towards renewable and self-produced energy types.

Economic: Economic performance KPI's included: i) income, ii) agricultural productivity, iii) labour productivity, and iv) climate resilience. The income indicator had a low average score of 10.7, followed by a score of 2.1 for agricultural and 16.1 for labour, indicating low productivity and incomes. Finally, climate resilience exhibited an average score of 21.8.

Social: Social performance KPI's included: i) diet quality, ii) farmer agency, iii) human well-being, and iv) land tenure.

Diet quality was low to moderate (40.2/100), suggesting that villages across the Attapeu ALL have limited access to diverse and nutritious food. Farmer agency and human well-being both scored moderate to high at 3.7 and 3.7 out of 5 respectively. This suggests that farmers perceive they have a good level of power and freedom to make major decisions regarding food production, trade, consumption and other matters. While farmers also perceived good levels of life satisfaction in relation to numerous standard of living, health, relationship, economic, and social factors.

Question 2: *Are there differences in agroecological performance across the Attapeu ALL area? If so, what factors are driving performance?*

Table 3 reveals differences in KPI performance indicator scores across the eight study villages of the Attapeu ALL. These differences are discussed in accordance with key themes including the agricultural, environmental, economic, and social performance of each village.

Overall, Donesoung and Inthy village outperformed other villages, this was driven by indicators including crop health, nutrient use, climate mitigation, landscape complexity, diet quality, and land tenure. Conversely, Tammaleuy and Thaun exhibited the lowest performance, particularly in terms of climate mitigation, nutrient use, and land tenure security, highlighting several key areas for improvement.

Key indicators influencing agroecological performance within each village are described below.

Agricultural: Differences in agricultural performance were driven by crop health and nutrient use. Across these indicators Donesoung exhibited the highest crop health (91.7) score, while Tammaleuy (74.6) scored the lowest This suggests that Donesoung farms had healthy foliage with no signs of deficiency. Tammaleuy also scored lowest in terms of nutrient use (12.6), contrasting to Home, which excelled with a score of 35.2.

Environmental: Differences in environmental performance were driven by climate mitigation and landscape complexity. Inthy achieved the highest score for climate mitigation (6.2) reflecting the presence of farms with low emissions and high sequestration practices; while Tammaleuy and Thaun

scored the lowest (1.0). Donesoung scored the highest for landscape complexity (3.4) reflecting a high amount of natural or semi-natural habitat, while Home scored the lowest (2.8).

Economic: Differences in economic performance were driven by income, agricultural productivity, and labour productivity. Thaun exhibited the highest income score (12.09), while Dongbakami led in terms of agricultural productivity (4.8). Finally, Donesoung had the highest score for labour productivity (26.5), while Home scored the lowest (10.7).

Social: Differences in social performance were driven by diet quality and land tenure. Inthy performed strongly in both indicators, achieving the highest score across the ALL area of 50.0 for diet quality and 24.3 for land tenure. This suggests farmers had access to a variety of nutritional food types, and a high proportion of land that was owned by a household. In contrast, Home scored lowest for diet diversity (32.1), and Thaun had the lowest land tenure score (16.4).

Question 3: *What are the variations in farmer agency in terms of power, freedom, and decision-making across different villages and ethnic groups (e.g., Oy, Laolum, Jeng, ect) in Attapeu?*

Variations in perceived freedom, agency and decision-making was observed across the eight villages; however, most respondents perceived these variables to be 'medium-high' (Figure 4). Donesoung and Dongbakmai exhibited the highest perception of freedom and agency, with 100% and 98.5% of responses respectively scoring 'medium-high'. Home had the highest perception of freedom and agency overall, with 77.3% scoring 'medium-high' and 9.1% 'high'. Contrastingly, Donephay had the lowest perception, with 7.1% scoring 'low-medium' and 21.4% 'medium'.

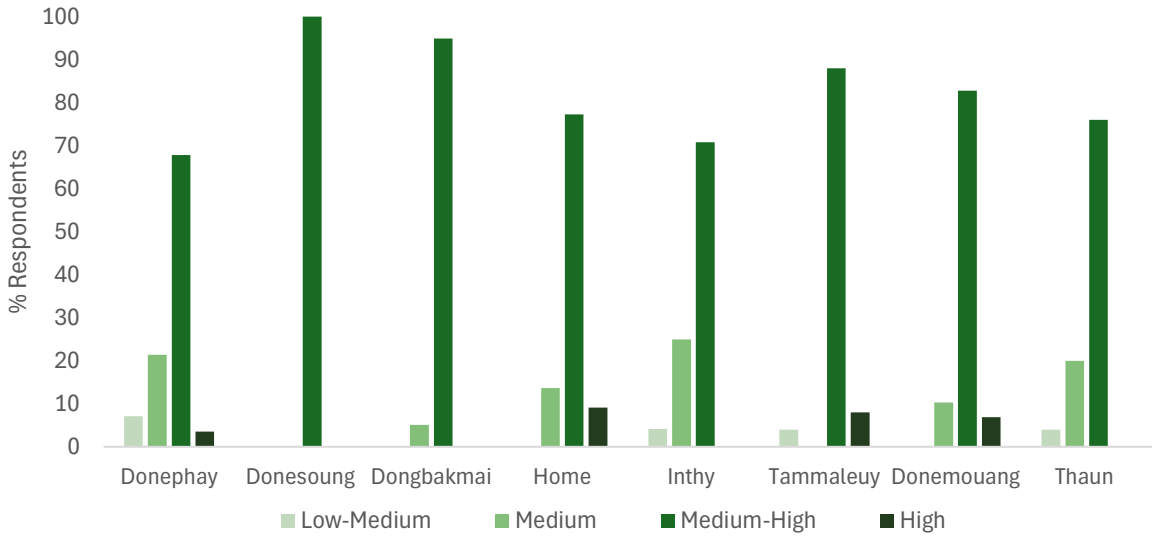

Figure 4: The percentage of respondents within Attapeu ALL villages that agreed that they had freedom and agency in regard to decision making, ranked on a 4-point Likert scale from low to high.

Among ethnic groups, Laoloum had the highest perceptions of agency and freedom, with 72.1% scoring 'medium-high' and 13.8% in 'high' (Figure 5). However, Oy had the highest overall score for 'medium-high' at 85.1%. Across ethnic groups, Cheng had the lowest overall perception, with 7.1% of respondents scoring 'low-medium', and 21.4% scoring 'medium'.

Table 3: The average scores for the agroecology KPI performance indicators across the Attapeu ALL and its corresponding study villages, along with the minimum and maximum values scored for each indicator. Detailed information on each indicator can be found in Jones et al. (2024).

Theme	Agriculture					Environment					Economic				Social			
Indicator	**Crop Health**	**Animal Health**	**Soil Health**	**Nutrient Use**	**Biodiversity**	**Agrobio-diversity**	**Landscape Complexity**	**Climate Mitigation**	**Water**	**Energy Use**	**Income**	**Agricultural Product**	**Labour Product**	**Climate Resilience**	**Diet Quality**	**Farmer Agency**	**Human Well-Being**	**Land Tenure**
Min	*20.0*	*1.0*	*1.0*	*0.0*	*1.0*	*0.0*	*1.0*	*0.0*	*2.0*	*2.0*	*0.7*	*0.0*	*0.0*	*1.0*	*0.0*	*2.2*	*2.8*	*0.0*
Max	*100.0*	*4.0*	*3.0*	*100.0*	*3.5*	*22.6*	*4.7*	*50.0*	*6.5*	*3.7*	*29.9*	*100.0*	*100.0*	*52.5*	*100.0*	*5.0*	*4.9*	*100.0*
Attapeu ALL	**84.8**	**2.9**	**2.4**	**21.7**	**2.6**	**4.9**	**2.9**	**3.2**	**3.9**	**2.5**	**10.7**	**2.1**	**16.1**	**21.8**	**40.2**	**3.7**	**3.7**	**20.4**
Donephay	89.9	2.8	2.4	16.6	2.7	4.4	2.9	4.5	4.4	2.3	8.6	1.9	17.4	20.8	33.9	3.5	3.6	24.1
Donesoung	91.7	3.3	2.6	32.8	2.7	5.3	3.4	4.2	3.9	2.5	10.6	2.1	26.5	18.1	46.7	3.5	3.8	23.5
Dongbakmai	85.6	3.2	2.4	26.1	2.6	5.2	2.8	3.0	3.6	2.4	11.7	4.8	21.3	23.5	43.8	3.8	3.8	21.7
Home	84.4	2.5	2.5	35.2	2.6	4.7	2.8	3.4	3.8	2.5	9.9	1.5	10.7	20.8	32.1	3.7	3.7	18.8
Inthy	87.5	2.5	2.4	17.3	2.9	6.0	3.1	6.2	4.2	2.5	10.4	1.7	16.7	21.1	50.0	3.5	3.8	24.3
Tammaleuy	74.6	2.8	2.4	12.6	2.6	3.2	2.9	1.0	4.0	2.5	11.8	1.1	25.8	20.4	44.0	3.7	3.7	20.0
Donemouang	88.3	3.1	2.4	19.6	2.6	4.5	3.3	3.0	4.0	2.5	11.0	1.5	10.2	20.9	40.7	3.8	3.7	18.1
Thaun	80.6	2.7	2.4	19.9	2.6	6.8	3.1	1.0	3.9	2.5	12.0	1.3	10.8	26.3	40.4	3.8	3.8	16.4

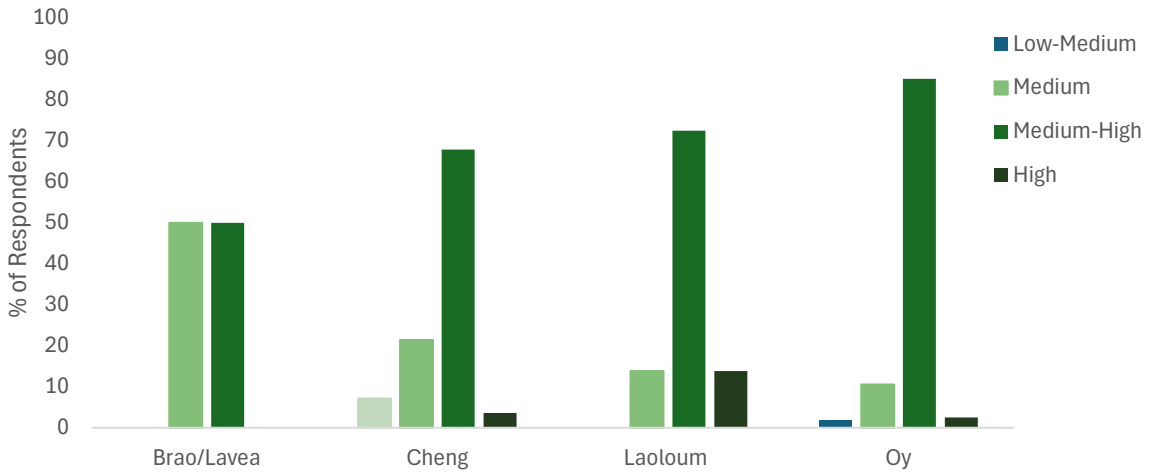

Figure 5: The percentage of respondents within Attapeu ALL ethnic groups that agreed that they had freedom and agency in regard to decision making, ranked on a 4-point Likert scale from low to high.

Question 4: *What is the variation in diet quality based on 24-hour food consumption, categorized by ethnic group and village?*

Diet quality, as assessed through food group consumption scores, exhibited moderate variation across villages and ethnic groups. Across villages, grains dominated local diets, consistently forming the largest proportion of food intake (Figure 6). Villages including Donephay, Donesoung, and Dongbakmai exhibited limited variation in their diet, with grains and vegetables the most consumed items, with relatively low consumption of nutrient-dense foods like seafood, poultry, or fruits. Home, Inthy, and Tammaleuy exhibited greater diversity in their diets, including a larger percentage of respondents consuming green vegetables, eggs, and poultry. Across all villages, processed foods, sweets, and soft drinks comprised a negligible proportion of diets, indicating limited consumption of highly processed foods.

Concurrent with village data, grains were a staple food source across ethnic groups (Figure 7). The Brao/Lavea group exhibited a relatively high dietary diversity, with a high percentage of respondents consuming green vegetables, poultry, eggs, and seafood. This variety suggests the Brea/Lavea group have the highest level of diet quality compared to other ethnicities. The Cheng group had a more restricted diet, relying heavily on grains, with limited intake of protein rich foods like poultry and seafood, or nutritious foods like green vegetables. The Laoloum group had moderate diversity in their diet, with high intake of vegetables, poultry, and eggs. However, their consumption of key proteins, like seafood, was limited. Finally, the Oy group showed high diversity, with substantial contributions from vegetables, poultry, and seafood, suggesting high diet quality.

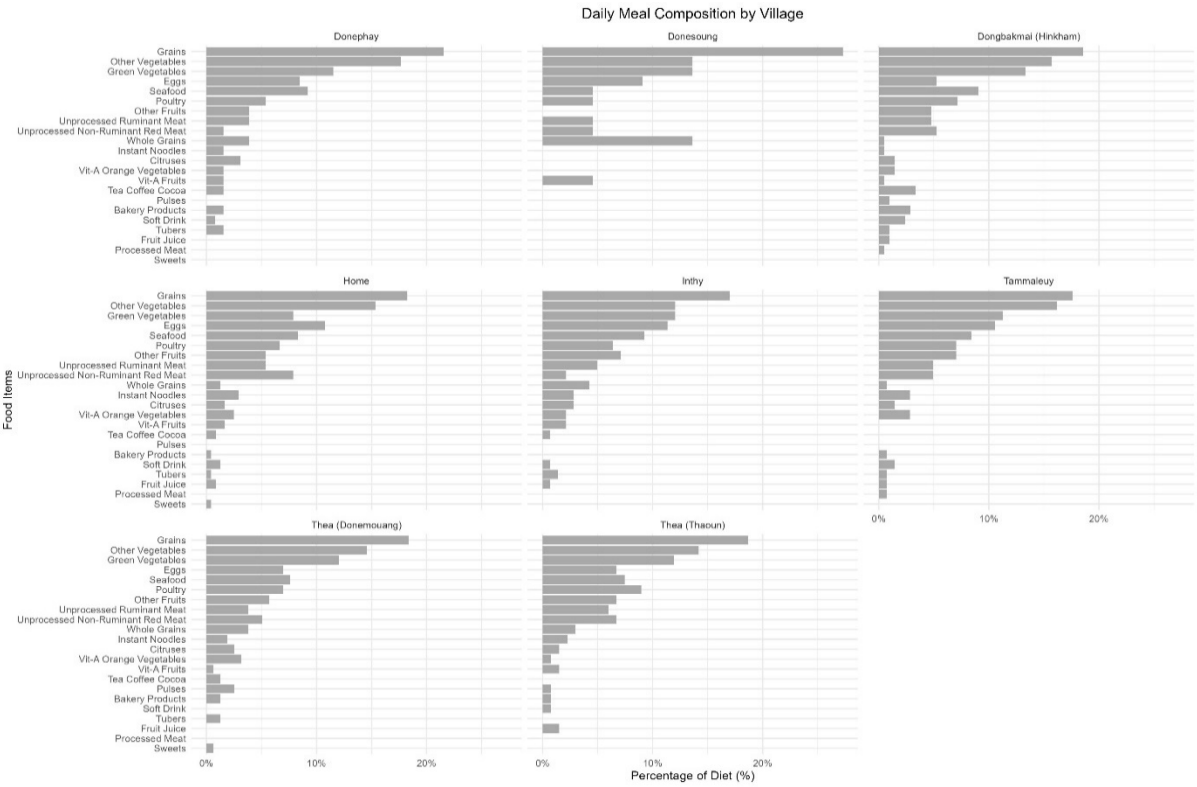

Figure 6: The percentage of respondents consuming different food types in a 24 period within the eight study villages located in the Attapeu ALL.

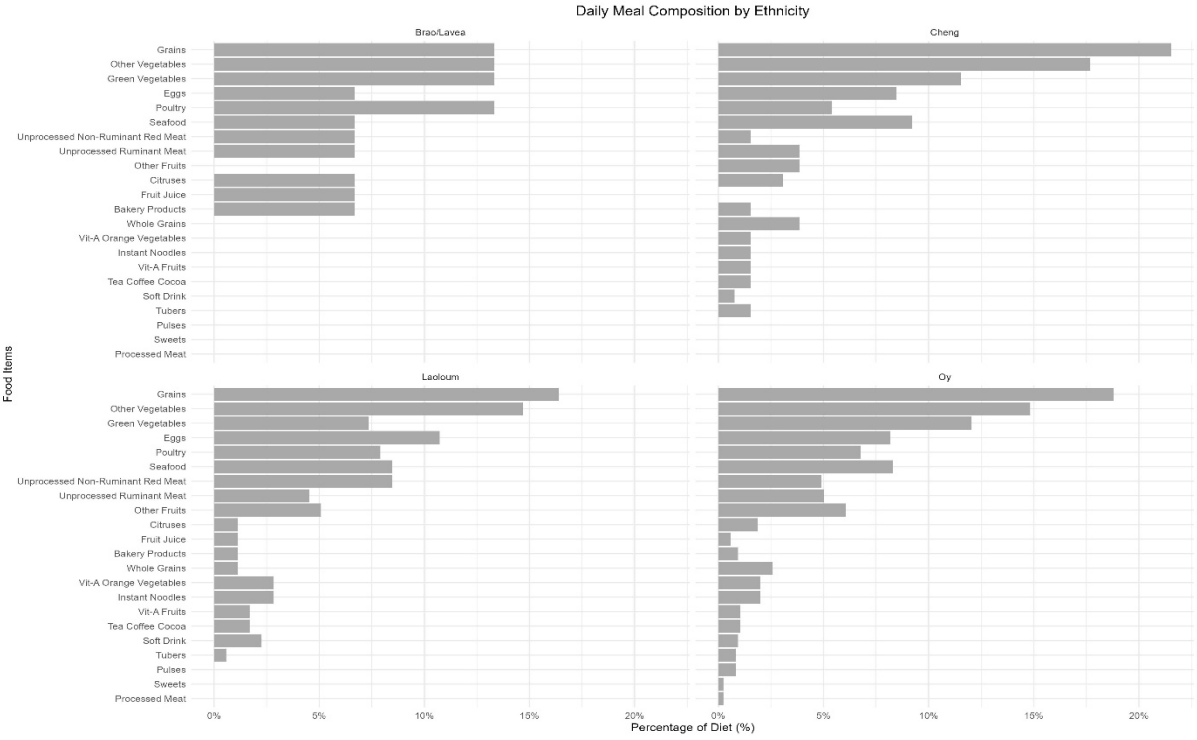

Figure 7: The percentage of respondents consuming different food types in a 24 period within the different ethnic groups located in the Attapeu ALL.

Question 5: *How does the satisfaction with healthy living and well-being vary in the area? What are the highest and lowest satisfaction levels?*

Satisfaction with healthy living and well-being varied across villages and factors (Figure 8). The lowest satisfaction levels were consistently observed in relation to 'economic conditions' and 'agency and freedom'. Across villages, participants were most unsatisfied with these factors in Home and Inthy, reflecting potential challenges in financial security. 'Health' satisfaction was moderate across villages, however, Donephay and Inthy had a lower score, suggesting gaps in healthcare or quality at these locations. In contrast, 'food availability' satisfaction was lowest in Donemoung and Dongbakami, suggesting potential food security issues. Across most villages, factors associated with 'living comfort' (i.e., 'housing condition') consistently received lower satisfaction scores. Across the sample, the strongest satisfaction levels were observed in Dongbakamai, particularly in terms of 'relationships', which was a key contributor to the overall well-being of this village.

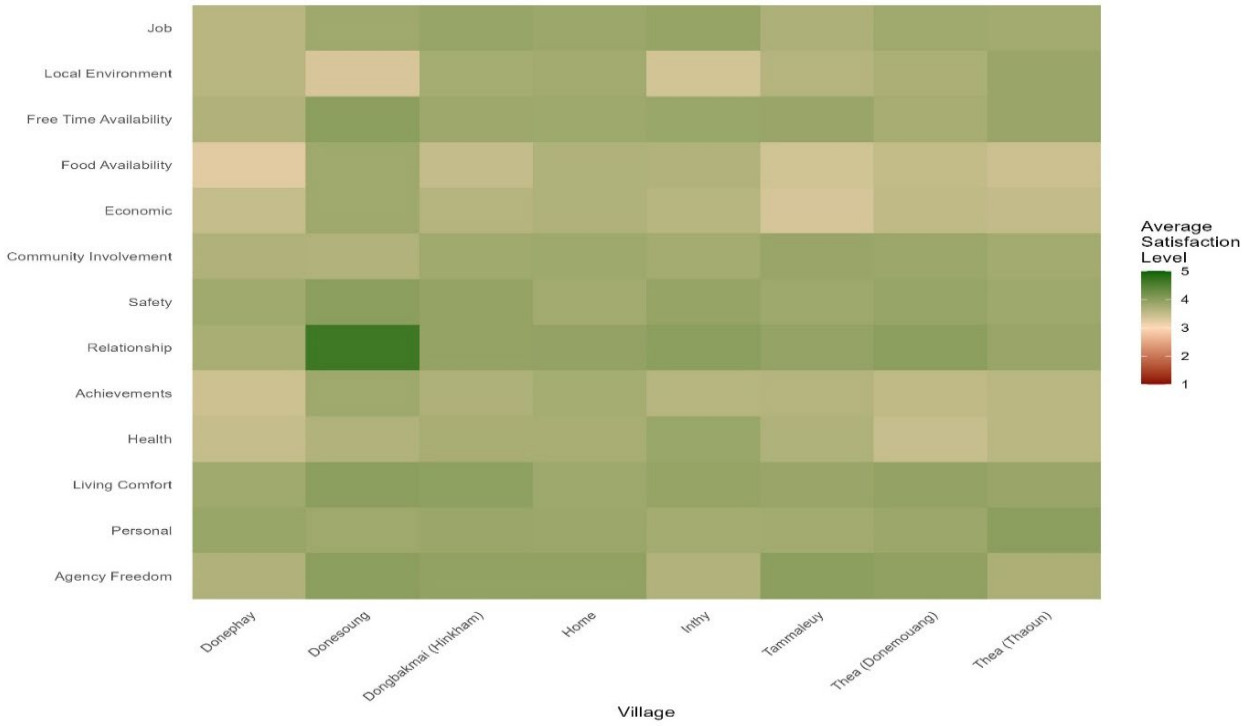

Figure 8: The average satisfaction level of survey respondents based on different factors ranging from 1 (very low) to 5 (very high) across the different study villages (n=8) in the Attapeu ALL.

Question 6: *Categorized by village, what are the main sources of water for household use and vegetable irrigation and which months present challenges to access water?*

Across the Attapeu ALL, groundwater comprises the most popular water source in all villages. In Dongbakmai village, on-farm storage comprises the main water source (Figure 9). The least common water source is rainwater, which is only utilised in 5 of the villages. In Home, Donemouang and Donesoung, the river comprises the second most common water source. While in Dongbakmai and Tammalauy on-farm storage comprises the second most common water source. In Tammaleuy and Donephay on-farm ponds are the second most common source.

Variations between villages highlights the localised nature of water access issues (Figure 10). However, across villages, March comprises the peak month for water access issues, particularly in Dongbakmai, where the highest percentage of respondents had difficulties. Other villages, including Donesoung and Thaun, also show increases in water access challenges during the dry season, particularly between April and May. Water access difficulties markedly decrease from October to December in most villages, with some areas reporting minimal or no challenges during these months. However, villages including Home and Tammaleuy show more consistent, moderate levels of difficulty throughout the year.

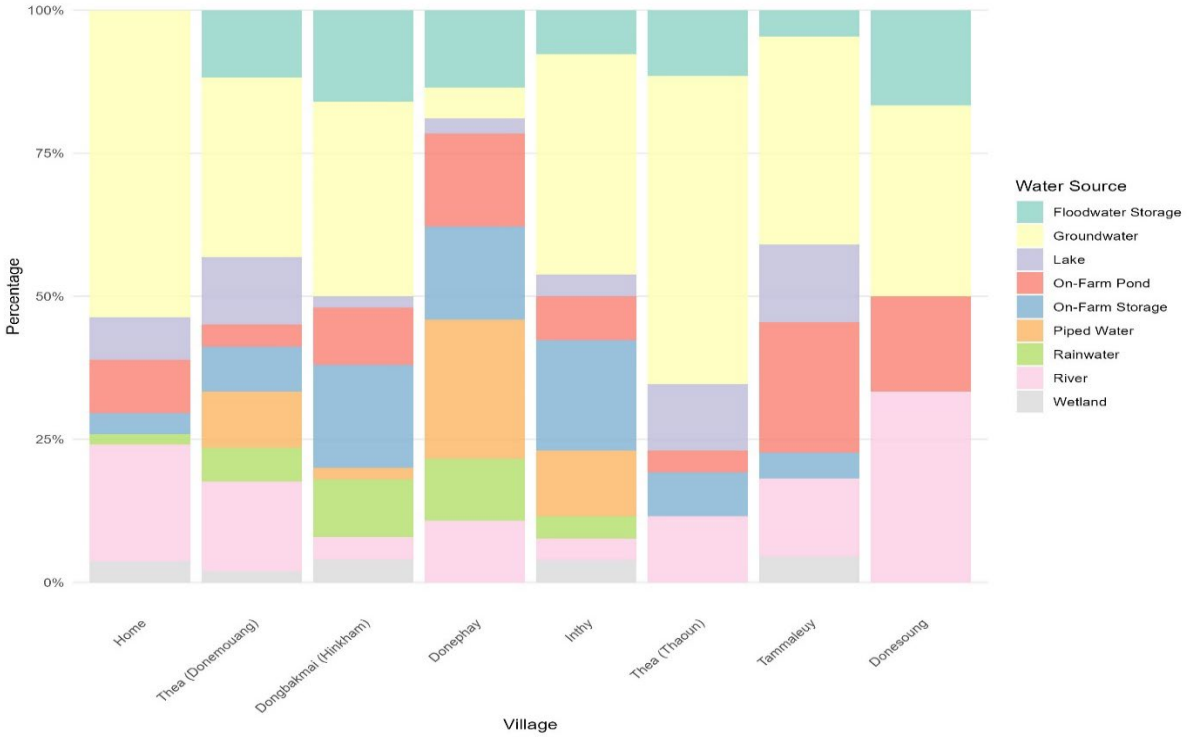

Figure 9: The main types of water sources used (based on % of respondents) by villages in the Attapeu ALL.

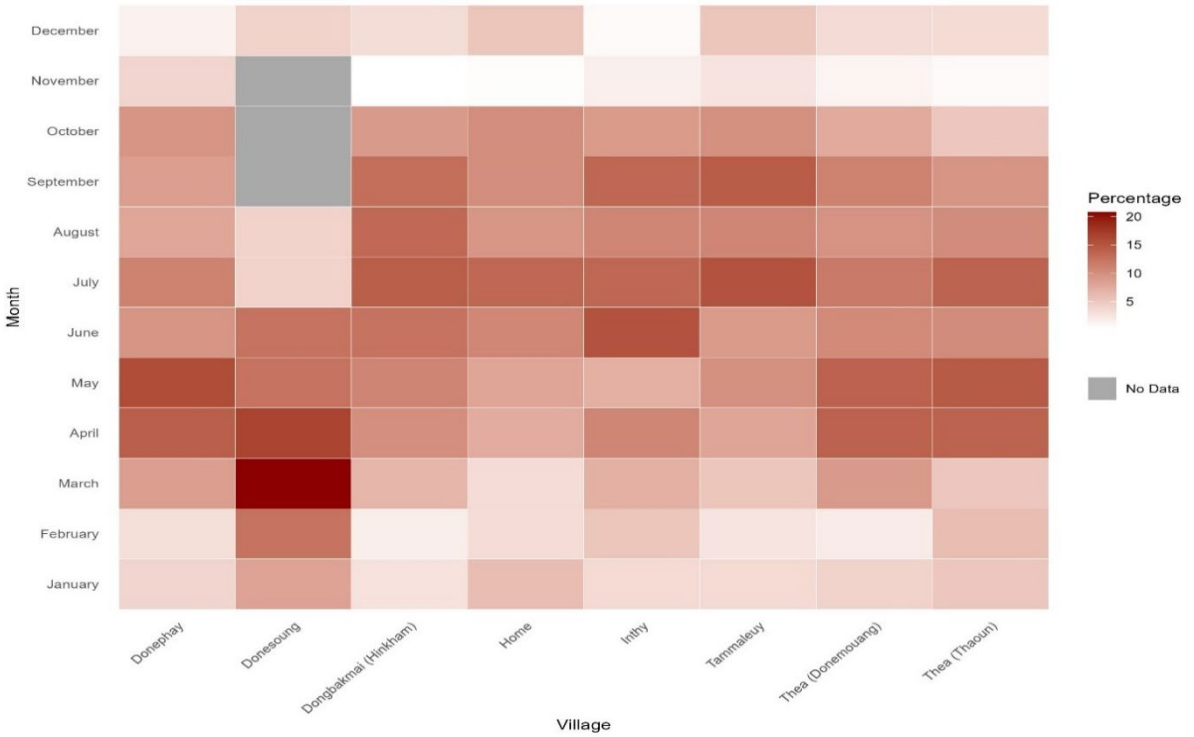

Figure 10: The percentage of respondents experiencing difficulty accessing water based on calendar months within each village of the Attapeu ALL.

USE OF ASSESSMENT RESULTS

The results of this report provide key directions for transitioning to agroecology in Laos. Key strengths, challenges, and leverage points were identified across the Attapeu ALL from HOLPA outputs, providing an actionable pathway to enhance agroecology. Several key findings are listed below.

Leveraging High Performance Agroecological Principles

The agroecological principles of recycling, connectivity, and chemical input reduction exhibited high performance across the Attapeu ALL. These strengths could be further built upon to support an agroecological transition by:

- **Recycling:** Supporting a transition to more integrated, circular economy type food production and collective action in agricultural management.
- **Connectivity:** Developing channels through which households can sell their on-farm produce directly to consumers.
- **Input Reduction:** Employing ecological practices and treatments to manage soil fertility, crop pests, livestock/fish diseases in croplands. Utilising dry feeds for livestock nutrition, and natural fish feeds.

Combating Low Performance Agroecological Principles

The lowest performing agroecological principles included soil health, synergies, and knowledge co-creation. These factors may present critical barriers to an agroecology transition that require addressing within the Attapeu ALL. Suggested steps to overcome these barriers include:

- **Soil Health:** Expanding the number of agricultural practices employed to improve soil quality and health.
- **Synergies:** Expanding the number of practices implemented to ensure positive relationships between animals, crops, trees, soil, and water.
- **Economic Diversification:** Diversifying the numbers of crops, practices and income generating opportunities through improvements in processing, value addition and market systems.
- **Knowledge Co-Creation:** Increase the number of times households exchange information with extensionists, consumers, food traders, government, NGOs, other farmers, and researchers. Newly formed knowledge hubs in the ALL will act as local aggregators.

Enhancing Performance KPIs

Results of the agroecological performance KPIs provide actionable insights for a transition to agroecology. Suggested focal points to enhance agricultural, environmental, economic and social performance are listed below.

- **Improving Animal and Soil Health:** The moderate KPI score in terms of animal and soil health highlight the need for targeted interventions to improve animal husbandry and reduce the extent of injury, illness, and death of animals, as well as to enhance soil fertility through soil improvement practices and to mitigate soil erosion.
- **Enhancing Water Access:** Water access was a major issue in terms of environmental performance, with most farmers having trouble accessing enough water for agricultural needs during dry months. Addressing this issue is critical for improving agroecological sustainability, and may require interventions such as improved irrigation, integrated water storage solutions, and improved surface and groundwater water management practices.
- **Improving Diet Quality and Diversity:** Diet quality and diversity emerged as a significant issue across villages in the Attapeu ALL, with many respondents having limited access to proteins and other nutritious and diverse food types.

LESSONS LEARNT

Implementation of the HOLPA survey in Attapeu ALL highlighted several key limitations that can inform future survey iterations. These included:

- **Survey Duration and Fatigue**: The extended duration required to complete the survey resulted in fatigue among participants, potentially impacting on the quality of responses and overall data reliability. Future survey iterations may focus on developing a more streamlined approach to sustain engagement.
- **Question Clarity**: Several survey questions were found to be confusing or unclear to participants, which may have led to inconsistent or inaccurate responses. Future testing of the survey, and iterative refinements to ensure question clarity, is required prior to survey re-implementation.

CONCLUSIONS AND NEXT STEPS

The HOLPA survey provided a critical baseline for assessing changes and supporting a transition to an agroecological food system within Laos. Key next steps include:

- **Leveraging the Baseline Data:** The HOLPA dataset provides a benchmark to evaluate the present status of agroecological practices within the Attapeu ALL, and the changes brought about by a transition to agroecology. This baseline can help identify focal areas for improvement and provide evidence to support a transition to agroecology. Steps to leverage this baseline data, include results sharing workshops with the Laos Sub-Sector Working Group on Agroecology (SSWG-AE) will be held.
- **Capacity Building for District and Provincial Staff:** Training programs will be developed and held to equip district and provincial staff with the skills to understand and utilise the HOLPA dataset, both for HOLPA purposes and broader local planning and decision-making. Training will also be held to support staff in implementing future iterations of the HOLPA survey.
- **Engaging with the National and Regional Networks e.g., the Agroecology Learning Alliance in Southeast Asia (ALiSEA):** Collaboration with ALiSEA (https://ali-sea.org/) can help amplify the impact of HOLPA findings by providing a platform to disseminate results. ALiSEA can also support cross-regional learning and allow agroecological transitions in Laos best align with regional initiatives.

Suggested citation

Douangsavanh, S.; Xaydala, V.; Chanthalath, A.; Dubois, M. 2024. *Performance assessment of agroecology in Attapeu, Lao PDR*. Colombo, Sri Lanka: International Water Management Institute (IWMI). CGIAR Initiative on Agroecology. 24p.

Acknowledgments

This work was carried out under the CGIAR Initiative on Agroecology (https://www.cgiar.org/initiative/agroecology/), which is grateful for the support of CGIAR Trust Fund contributors (www.cgiar.org/funders). The authors wish to express gratitude to the initiative team and Alliance Bioversity-CIAT for their continuous technical support during the training sessions and workshop.

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We would like to thank all funders who support this research through their contributions to the CGIAR Trust Fund: www.cgiar.org/funders.

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