



Enhanced livelihoods and increased resilience of poor ethnic minority women and men rural areas to the effects of climate change and variability

Information for Adaptation in Vietnam (InfoAct)



Donor: Federal Ministry for Economic, Cooperation and Development - BMZ

Project Site: Lai Chau and Dien Bien Provinces

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Project's Final Evaluation

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TABLE OF CONTENTS

TABLE OF CONTENTS	2
ABBREVIATIONS	3
EXECUTIVE SUMMARY	4
CHAPTER 1. INTRODUCTION	8
1.1. Project	8
1.2. Final Evaluation	9
1.2.1. Objectives	9
1.2.2. Methods and sample	9
CHAPTER 2: FINDINGS	11
2.1 Project Outreach	11
2.2 Project's Relevance	12
2.3 Project's Effectiveness	13
Specific Objective/Outcome: Ethnic minority households in rural areas have increased their climate resilience based on improved access to and use of climate information, and resources	14
Result/Output 1 Strengthened capacity of stakeholders to interpret and apply climate information	16
Result/Output 2 Increased access to relevant and actionable climate information among ethnic minority women and men	18
Result/Output 3 Improved social protection for ethnic minority households	23
Result/Output 4 Institutionalization of climate information solution and climate risk micro-insurance system	24
Result/Output 5 Increased capacity of local partners to develop understandable downscaled climate information and advisories and supporting local farmers in articulating their climate information demand towards local authorities beyond project duration	26
2.4 Project's Efficiency	28
2.5 Project's Impact and Sustainability	30
CHAPTER 3: CONCLUSIONS AND RECOMMENDATIONS	33
3.1 Conclusions	33
3.2 Recommendations	35
ANNEX 1: RESULT FRAME	37
ANNEX 2: HYPOTHESIS TEST	43
1. Lai Chau Province	43

1.1. Hypothesis test 1: Applying the recommendations/advisories will increase the yield of the crop	43
1.2 Test Hypothesis 2: Applying the recommendation will reduce input costs	48
2. Dien Bien Province	52
2.1. Test Hypothesis 1: Applying the recommendations/advisories will increase the yield of the crop	52
2.2 Test Hypothesis 2: application of recommendations will reduce input costs	55

ABBREVIATIONS

ACIS	CARE's Agro-Climate Information Systems
CCD	Center for Community Development
CVN	CARE Vietnam
DARD	Department of Agriculture and Rural Development
IDI	In-deep Interview
IMHEN	Vietnam Institute of Meteorology, Hydrology and Climate Change
FGD	Focus Group Discussion
MEL	Monitoring, Evaluation and Learning
MET	Meteorological station
MONRE	Ministry of Natural Resources and Environment
VSLA	Village Savings and Loan Association
VWU	Vietnam Women's Union

LIST OF TABLES

Table 1: Quantitative and qualitative sample	12
Table 2: Project's beneficiaries	13
Table 3: Details of Indicator (1) measuring the project's specific objective/outcome	16
Table 4: Percentage of households that applied climate-resilience actions recommended in the advisories provided by InfoAct	17
Table 5: Total number of produced downscaled forecast and actionable advisories	18
Table 6: Percentage of targeted ethnic minority women and men who received the information and advisories understand and apply in their agricultural work	20
Table 7: Productivity increase	21
Table 8: Rice productivity 2019-2021	22
Table 9: Reduction in expenditure on inputs for the main crops as a result of the use of advisories	23
Table 10: Percentage of EM farmers reporting the changes in volume of agricultural materials/inputs used as a result of the use of advisories	23
Table 11: Achievement of Result 3	24
Table 12: Capacity self-assessment	27
Table 13: Capacity building methods assessments	28
Table 14: EM women's ability to use Vietnamese	30
Table 15: EM women's preference in channels of receiving advisories	31

EXECUTIVE SUMMARY

The “Information for Adaptation in Vietnam” Project (InfoAct) is funded by the Federal Ministry of Economic Cooperation and Development, abbreviated BMZ, and jointly implemented by CARE Vietnam (CVN) and three local partners, named Center for Community Development (CCD), Lai Chau Department of Agriculture and Rural Development (DARD) and Lai Chau provincial Vietnam Women’s Union (VWU). The project sites include four communes of Dien Bien province and four communes of Lai Chau province, namely: Muong Phang and Pa Khoang communes (Dien Bien district); Ang Cang, Ang Nua communes (Muong Ang District); Than Thuoc, Trung Dong, Ho Mit and Nam So Communes of Tan Uyen district, Lai Chau province. The overall objective of the InfoAct Project is to enhance livelihoods and increase the resilience of poor ethnic minority women and men in rural areas to the effects of climate change and variability. This is to be accomplished through a specific objective (outcome) to ensure ethnic minority households in rural areas have improved access to and use of climate information, and resources to help increase their climate resilience. The InfoAct Project is focusing mainly on two target groups: (1) 5,000 ethnic minority households, especially women, in Dien Bien and Lai Chau provinces and (2) government authorities and service providers, namely Department of Hydro-Meteorology, Department of Agriculture and Rural Development (DARD) and the provincial VWU and CCD. As InfoAct was going to phase out after three years’ implementation and close all its activities by November 2021, an independent final evaluation was conducted to understand the project’s impacts/outcomes and key lessons learned.

The Final Evaluation applied a mixed-method approach by using qualitative and quantitative data from primary and secondary sources. The primary data was collected from the key informants and household survey. The household survey was implemented with 363 and 266 people in Dien Bien and Lai Chau provinces, respectively. A total of 49 In-deep Interview (IDI) was conducted with stakeholders. In addition, 34 women and 39 men in two provinces participated in Focus Group Discussion (FGD).

Key Findings:

- *Project’s outreach:* The project targets 10,450 direct beneficiaries (equivalent to 5,000 households). The project’s intensive climate resilience interventions appear to be limited to VSLA members who are considered as the project’s primary beneficiaries. By the end of the project’s life, the project’s MEL system records only 2,099 households who have directly participated and benefited in project activities. It can be concluded that the project’s outreach to its direct beneficiaries is much lower than planned. However, more than 9,370 households (equivalent to nearly 46,000 villagers) in eight project-communes have indirectly benefited from the project activities to some extent.
- *Project’s Relevance:* The project is highly relevant to the Vietnamese government’s approach to building resilience to climate change, particularly for the agricultural sector. This project is also in line with CARE International’s approach on Increasing Resilience as stated in the CARE Guidance Note. The relevance was also confirmed from interviews with relevant stakeholders, such as representatives of MET stations, agricultural departments and farmers, in Dien Bien and Lai Chau provinces.
- *Project’s Effectiveness:* Overall, project’s effectiveness is moderate. Neither of the two targets for measuring the project’s Specific Objective/Outcome were achieved in both scale and absolute numbers. The project aimed at enabling 3,500 households (70 percent of 5,000 targeted households) to have increased their climate resilience based on improved access to and use of climate information, and

resources and only 63.9 percent of the 2099 households (equivalent to 1341 households) is the actual achievement. Out of the five outputs/results of the Project, only Output 1 related to fully enhanced capacity of service provider and users to produce and to interpret and apply climate information was achieved, i.e. all indicators met the targets. Output 2 that aims for the increased access to relevant and actionable climate information among ethnic minority women and men was not achieved. Only one of the three indicators measuring this output is partly delivered compared to the plan. Similarly, Output 3 aiming for the improved social protection and climate risk insurance coverage for ethnic minority households through VSLA was not achieved because the project failed to deliver two targets. Even so, VSLA is considered a good social protection mechanism to its members and highly appreciated by the EM women. The output 4 related to Institutionalization of climate information solution and climate risk micro-insurance system was partly achieved. One of three targets planned to measure the level of achievement of this result was fully delivered. The second target related to the institutionalization of Agro-climate information services and actionable advisories at provincial level has been done. The third target to integrate the project's policy recommendations in the National Framework on Climate Information Services has solid basic to be achieved in the near future. Finally, the Output 5 targeting increased capacity of local partners to develop understanding downscaled climate information and advisories and supporting local farmers in articulating their climate information demand towards local beyond project duration has been partially achieved. One target measuring Output 5 has been outperformed while the other was not delivered.

- *Project's efficiency:* Overall, moderate achievement of the project's targets implies that the project has not applied a value-for-money approach. Remarkably, project's management has taken the Mid-term Report's recommendations and actions have been implemented to increase the men's participation in the project, deliver advanced training in farming techniques for the targeted groups; and to improve the project's monitoring and work closely with IMHEN in the policy advocacy at national and provincial levels. Project's management is marked with flexibility. The decision to invest 15 mini weather monitoring stations and provide 25 million for each VSLA group as COVID-impact recovery fund are two good examples.
- *Project impacts* are observed at different levels (individual, community, organizational, and institutional level). In general, impacts at the individual and community levels are proven more than those at the institutional and institutional levels. At the individual level, two significant impacts generated by the Project have been the development of the leadership for VSLAs group (deputy) leaders and capacity building for officials of local state agencies and mass organizations. At the community level, the significant impact is forming people's habit of "using weather forecast information to adjust agricultural activities, thereby increasing their climate resilience. The EM women's confidence in agricultural cultivation activities has gradually changed the prevailing stereotypes about gender roles among community members, also. At organizational, and institutional levels, some key challenges were discovered that prevented the Project's impact from being generated. Particularly, it will be difficult to maintain the working group, a key mechanism in providing agricultural information services established by the Project; The use of weather data provided by the 15 gauges installed by the Project will be used by the working group members but according to the state regulation for weather forecasts information data from the national MET system need to be used for the generation of advisories and weather

forecasts. Working group members can use the information to compare it with data from the national MET system.

- *To ensure the project's sustainability*, CARE has already prepared for project sustainability as recommended in the MTR. However, there are both opportunities and obstacles for the project sustainability. The opportunities can be seen that all related stakeholders highly appreciate the results of the projects and they confirmed that the agri-weather bulletins are a needed and suitable product for local farmers. The obstacle is that MET stations are not under the management of provincial governments and by law they are service providers under management of MONRE. Therefore, the provincial governments have to arrange an annual budget for this service when they need MET data as input for agri-weather bulletins as the project is doing. By the conclusion of this project, the provincial governments have shown no such commitments.

Recommendations

(1) on project design: Design similar projects in the future to consider:

- An examination of causal relationships between the provision of climate information services and changes in crop yield should be carried out comprehensively. Many controlling factors need to be included in the theory of change, including: plant varieties, soil quality, farmers' technical capacity, and irrigation conditions in the project area. These factors all have a strong causality relationship with increased productivity. Without controlling them, the provision of climate information services will not be the means to produce the effects of changing productivity. The tests presented in Annex 2 indicate that correlation between climate information services and productivity gains or reductions in input costs cannot be concluded.
- The project should not select two potentially conflicting indicators to measure the outputs, namely (1) reduction in input costs and (2) increase in crop yield. These two indicators are not relevant when spending on agricultural inputs is falling below the minimum required for maximum crop yields.

(2) on risk management: The project needs to perform more efficiently and more often the assessment of risks, and the re-examination of the theory of change. Important risks such as price fluctuations with cash-crop (coffee and tea) directly affect farmers' decisions about spending on agricultural inputs, which in turn, directly affect cash-crop yields. The project witnessed a large price volatility with coffee in the early years of the project, and the practices of coffee farmers were affected directly and immediately. Many farmers have stopped caring for coffee farms, which means they did not have any interest in accessing climate information services.

(3) on knowledge product development: As discussed in Section 2.4, the Project should have had an investment budget for building knowledge products to be delivered to local state agencies. This helps to ensure that individual competencies are transformed into organizational competencies. The project has spent considerable amounts on capacity building of working group members and community facilitators and these training activities should be systematically documented for future users. In addition, the Project could have developed products such as the Seasonal Handbook which summarizes all the three-month agricultural newsletters that have been produced by the Project. This handbook is printed in A4 or A5 size for future reference by VSLA groups and villagers.

(4) on microfinance mechanism: The selection of food crops and livestock on a small scale (less than 10 cattle/household) for testing the micro-finance mechanism may not be appropriate. Farmers will be less concerned about damage to their food crops and small numbers of livestock and poultry. They will be more interested in ensuring crops that provide a significant source of income for their families or large herds. Raising people's awareness about the micro-finance mechanism needs to be done with more intensity. The assessment of farmers' readiness also needs to be re-evaluated before implementing the micro-finance mechanism in a new location or in a future project.

(5) on Project's adaptation in its approach: During the implementation of the Project, there was a change in the organizational structure in the agricultural sector management, specifically, the agricultural service centers came into operation through the merger of the agricultural extension centers and veterinary or plant protection centers. The project should also undertake an impact assessment of this organizational change project to include appropriate actions in its exit strategy. More specifically, the role of the Agricultural Service Center after the end of the Project also needs to be determined timelier because this affects the project's sustainability. Similarly, the transfer of gauze to local authorities is also recommended to ensure the future optimal exploitation and maintenance.

CHAPTER 1. INTRODUCTION

1.1. Project

The “Information for Adaptation in Vietnam” Project is part of CARE’s long-term program on Remote Ethnic Minority Women. It builds on CARE’s Agro-Climate Information Systems (ACIS) project implemented in Vietnam (Dien Bien province), Laos and Cambodia from 2015 to 2018.

The InfoAct Project is funded by the Federal Ministry of Economic Cooperation and Development, abbreviated BMZ, and jointly implemented by CARE Vietnam (CVN) and three local partners, named Center for Community Development (CCD), Lai Chau Department of Agriculture and Rural Development (DARD) and Lai Chau provincial Vietnam Women’s Union (VWU). In addition to the roles of coordination and implementation of the project, CARE Vietnam within this project is also responsible for the support and provision of capacity building for the local implementing partners.

The project sites include four communes of Dien Bien province and four communes of Lai Chau province, namely: Muong Phang and Pa Khoang communes (Dien Bien district); Ang Cang, Ang Nua communes (Muong Ang District); Than Thuoc, Trung Dong, Ho Mit and Nam So Communes of Tan Uyen district, Lai Chau province.

The overall objective of the InfoAct Project is to enhance livelihoods and increase the resilience of poor ethnic minority women and men in rural areas to the effects of climate change and variability. This is to be accomplished through a specific objective (outcome) to ensure ethnic minority households in rural areas have improved access to and use of climate information, and resources to help increase their climate resilience.

Specific results (outputs) that support the project outcome include: (1) Strengthened capacity of stakeholders to interpret and apply climate information; (2) Increased access to relevant and actionable climate information among ethnic minority women and men; (3) Improved social protection for ethnic minority households (4) Institutionalization of a climate information solution and climate risk micro-insurance system, and (5) Increased capacity of local partners to develop understandable downscaled climate information and advisories and support local farmers in articulating their climate information needs to local authorities beyond the project duration.

Targeted groups: The InfoAct Project is focusing mainly on two target groups. On the one hand, the project targets 5,000 ethnic minority households, especially women, in Dien Bien and Lai Chau provinces, to increase the access to relevant and actionable climate information to build resilience to the effects of climate change and variability. The project’s primary targeted group consists of members of Village Savings and Loan Association (VSLA) that CVN and the local partners have helped to establish and operate in project communes. On the other hand, this project also targets and includes government authorities and service providers, in particular the Department of Hydro-Meteorology, Department of Agriculture and Rural Development (DARD) and the provincial VWU and CCD to improve the capacity of staff within the provision of adequate climate information and to institutionalize these processes.

1.2. Final Evaluation

1.2.1. Objectives

As InfoAct was going to phase out after 3 years' implementation and close all its activities by November 2021. CVN and its partners commissioned an independent evaluation to understand the project's impacts/outcomes and key lessons learned. The lessons learnt from the project will inform other interventions under the *Climate Services Menu for Southeast Asia* (CLISM 2019-21) project and relevant interventions of local project partners in the project sites. Furthermore, the progress against baseline indicators will be measured.

Therefore, the final project evaluation is to:

- Assess the project relevance in terms of project approaches, project direction and project adaptiveness to the findings from the Midterm review.
- Assess the project effectiveness at the project end towards baseline and target values, including analyzing the factors that contribute to or limit the result achievement.
- Assess the project efficiency to identify at which level the value for money approach is applied to ensure the project targets.
- Evaluate the sustainability of which project results, components and impact given the actual capacity and motivations of project stakeholders at different levels.
- Assess the impacts that the project has created and contributed to at this stage.
- Draw out lessons and recommendations to inform the CLISM on development of framework for designing and assessing climate services (CS) value chains (VC), and a guide for developing CS-VC business models local partners and broader project learning in terms of operating models and ways of working/approaches.

The primary audience are CARE (CVN, CARE affiliates), project implementing partners (CCD; Lai Chau VWU and Lai Chau DARD) and the project targeted beneficiaries.

1.2.2. Methods and sample

The Final Evaluation applied a mixed-method approach by using qualitative and quantitative data from primary and secondary sources.

The secondary data included but not limited to:

- Project reports,
- Project Monitoring, Evaluation and Learning (MEL) data,
- Local authorities' reports,
- Relevant policies and
- Statistical data from the baseline study and mid-term review

The primary data was collected from the key informants and household survey. The household survey was implemented with 363 and 266 people in Dien Bien and Lai Chau provinces, respectively. A total of 49 In-

deep Interview (IDI) was conducted with stakeholders. In addition, 34 women and 39 men in two provinces participated in Focus Group Discussion (FGD). (See Table 1)

Table 1: Quantitative and qualitative sample

Description		Dien Bien		Lai Chau		Total
		Number	Percentage (%)	Number	Percentage (%)	
Quantitative method						
Household survey		363	57.7	266	42.3	629
Main crop	Rice	272	74.9	266	100	538
	Coffee	91	25.1			91
	Tea			144	54.1	144
Economic situation	Above average	146	40.2	81	30.5	227
	Average	164	45.2	172	64.7	336
	Near poor	19	5.2	10	3.8	29
	Poor	34	9.4	3	1.1	37
Ethnicity	Thai	253	69.7	232	87.2	485
	Hmong	32	8.8	0	0	32
	Kho Mu	75	20.7	31	11.7	106
	Tay	0	0	1	0.4	1
	Dao	0	0	1	0.4	1
	Ta ren	0	0	1	0.4	1
	Kinh	3	0.8	0	0	3
Gender	Male	4	1.1	26	9.8	30
	Female	359	98.9	240	90.2	599
Age	<=25	28	7.7	18	6.8	46
	26 - 35	167	46	99	37.2	266
	36 - 50	146	40.2	120	45.1	266
	>50	22	6.1	29	10.9	51
Quanlitative method						
In-deep interview (IDI)		26	53.1	23	46.9	49
Representative of Provincial VWU		0	0	1	100	1
Representative of District VWU		1	50	1	50	2
Representatives of DARD		1	100	0	0	1
Representative of Agricultural Extension Center		1	100	0	0	1
Representative of Commune People's Committee		7	53.8	6	46.2	13
Representative of Commune Women's Union		5	55.6	4	44.4	9
Commune agricultural cadastral officer		7	53.8	6	46.2	13
Team Leader VSLA		4	44.4	5	55.6	9
Focus Group Discussion (FGD)		40	54.8	33	45.2	73
Women		20	58.8	14	41.2	34
Men		20	51.3	19	48.7	39

Source: Final Evaluation Team

Limitations: The final evaluation was carried out as the authorities continued to apply COVID-19 prevention measures, therefore, several interviews with representatives of local agencies in Dien Bien province and focus group discussions with the farmers were conducted virtually. Though the quality of the in-depth interviews was not affected much, the group exercises using visual aids were not used, therefore reducing group dynamics somehow. Another limitation comes from the indistinguishability of two groups of direct and indirect beneficiaries in the project. To ensure feasibility, the survey sample was determined from a group of households that are members of VSLA, who can be considered direct beneficiaries. While some metrics at the specific objective/outcome level refer to non-VSLA beneficiaries as well. Using survey data from the VSLA sample to infer the value of the entire population (who are residents of all eight communes participating in the project) is not highly reliable. Chapter two includes specific notes when data from a survey sample is used to infer population data.

CHAPTER 2: FINDINGS

2.1 Project Outreach

Table 2 below presents the number of beneficiaries at the conclusion of the project. As planned, the project targets 10,450 beneficiaries (equivalent to 5,000 households). The target for specific objective/outcome was stated to capture the increase of 5000 targeted household's climate resilience based on improved access to and use of climate information, and resources. Similarly some targets set for output 2 imply that 5,000 hh are the project's direct beneficiaries. Nevertheless the project's intensive climate resilience interventions appear to be limited to VSLA members who are considered as the project's primary beneficiaries. By the end of the project's life, the project's MEL system records only 2,099 households who have directly participated and benefited in project activities. It can be concluded that the project's outreach to its direct beneficiaries is much lower than planned.

Table 2: Project's beneficiaries

	Unit	Planned	Actual (endline)
Project			
Total beneficiaries (farmers)	Number	N/A	45,837 (9,376 hh)
<i>Direct beneficiaries</i>	Number	10,500 (5,000 hh)	2,099
<i>Women</i>	%		93.28
<i>Men</i>	%		6.72
<i>VSLA members</i>	%		100
<i>Non VSLA members</i>	%		0
Dien Bien Province			
Total beneficiaries	Number		22,858 (4,761 hh)
<i>Direct beneficiaries</i>			1,305
<i>Women</i>	%		97.7
<i>Men</i>	%		2.3
<i>VSLA members</i>	%		100
<i>Non VSLA members</i>			
Lai Chau Province			
Total beneficiaries	Number		22,979 (4,615 hh)

	Unit	Planned	Actual (endline)
<i>Direct beneficiaries</i>			794
<i>Women</i>	%		86
<i>Men</i>	%		14
<i>VSLA members</i>	%		100
<i>Non VSLA members</i>	%		0

Source: MEL System

It is worth noting that all villagers living in eight project-communes have benefited from the project activities to some extent. The project has invested in 66 sets of loudspeakers that were used to extend the weather forecasts and agricultural advisories to the villagers. The project also disseminated weather information through village meetings facilitated by village heads, or posting three-monthly bulletins (as known as seasonal calendars) in public places where villagers regularly visit, such as the village cultural house or the Commune People's Committee Offices. These activities have helped increase the number of indirect beneficiaries of the project. Therefore, more than 9,370 households (equivalent to nearly 46,000 villagers) had directly or indirectly benefited from the project.

2.2 Project's Relevance

The project is highly relevant to the Vietnamese government's approach to building resilience to climate change, particularly for the agricultural sector. The objectives of this project are in line with objectives of the National Action Plan to Respond to Climate Change in the Agricultural and Rural Development Sector for the period 2016-2020, with a vision to 2030 as stated in the Decision No.819 dated March 3, 2016 by the Minister of MARD¹. And they also contribute to three out of four key climate change adaptation objectives through 2030 of the National Adaptation Plan for 2020-2030².

This project is also in line with CARE International's approach on Increasing Resilience as stated in the CARE Guidance Note³. Its objectives are consistent with CARE's approach to increasing resilience that is "*If the capacities and assets to deal with various shocks, stresses and uncertainty are built and supported and if drivers of risk are reduced and if these actions are supported by an enabling environment, then resilience is increased*". They also reflect the integration of gender and governance in increasing resilience by increasing the voice and capacity of both women and men in the project sites.

The relevance was also confirmed from interviews with relevant stakeholders, such as representatives of MET stations, agricultural departments and farmers, in Dien Bien and Lai Chau provinces. These stakeholders at the provincial and district levels, as such Meteorological (MET) station that provide weather forecast as input for agri-weather bulletins and agri-services centers or CCD that work closely with MET stations and local farmers to prepare the bulletins, all agreed that the project results were aligned with the expectation of the local areas as well as the weather advisories. All interviewees also agreed that local farmers had an

¹ <http://fipi.vn/news/docsdetails/phe-duyet-ke-hoach-hanh-dong-ung-pho-bien-doi-khi-hau-nganh-nong-nghiep-va-ptnt-giai-doan-2016-2020-tam-nhin-den-nam-2050-108>

² The three objectives are (i) Increase its resilience to climate change, reduce vulnerability and inequality; (ii) Respond proactively to disasters and improve climate monitoring to minimize the loss of life and property and ensure social security; and (iii) Improve weather forecasting, early warning systems and communications to local communities

³ Increasing Resilience Theoretical Guidance Document for CARE International, December 2016

opportunity to access detailed and frequent agri-weather bulletins, which they had never gotten due to support from the project. *“These bulletins are needed and suitable for local farmers. They help not only to increase farmers’ knowledge about weather but also to apply that knowledge in their production for cost reduction and yield enhancement”*, was a sentiment present across most of the interviewees.

2.3 Project’s Effectiveness

This section on effectiveness assesses the extent to which this project achieved its intended results. Overall, Project's Effectiveness is moderate. Neither of the two targets for measuring the project's Specific Objective/Outcome were achieved in both scale and absolute numbers. Below is the summary of the actual delivery of all project’s targets at output level.

Output 1. Strengthened capacity of service provider and users to produce and to interpret and apply climate information	This result is considered achieved as the two targets are delivered in full. (See Annex 1)
Output 2. Increased access to relevant and actionable climate information among ethnic minority women and men	This result is considered not achieved. Indicator (1) was not achieved; Indicator (2) was partly achieved and Indicator (3) was far below the target
Output 3. Improved social protection and climate risk insurance coverage for ethnic minority households through VSLA	This result is partly achieved. Two targets have not delivered as expected. Still, VSLA is considered a good social protection mechanism to its members and highly appreciated by the EM women.
Output 4. Institutionalization of climate information solution and climate risk micro-insurance system	This result is partly achieved. The first (*) of three targets planned to measure the level of achievement of this result was fully delivered. The second target related to the institutionalization of Agro-climate information services and actionable advisories at provincial level has been done. The third target to integrate the project’s policy recommendations in the National Framework on Climate Information Services has solid basics to be achieved in the near future. <i>(*) The task force members are producing improved advisories and are better coordinated with DARD and DONRE</i>
Output 5. Increased capacity of local partners to develop understandable downscaled climate information and advisories and supporting local farmers in articulating their climate information demand towards local authorities beyond project duration	This result is partly achieved. One target related to capacity development of the three key local partners (Lai Chau DARD, Lai Chau VWU and Dien Bien CCD) has been outperformed while the other was not delivered.

The achievement of the expected outcomes and outputs are discussed in more details below.

Specific Objective/Outcome: Ethnic minority households in rural areas have increased their climate resilience based on improved access to and use of climate information, and resources

Generally, resilience is defined as the capacity of social, economic and [ecological] systems to cope with a hazardous event, trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure while also maintaining the capacity for adaptation, learning and transformation⁴. For CARE, resilience is about managing risk and dealing with shocks and stresses that negatively influence people's lives.

The InfoAct Project aims to increase the climate resilience of ethnic minority households in rural areas by improving their access to and use of climate information and resources. Specifically, the project aims to provide a full range of advice regarding climate, the impacts on crops, livestock, fisheries, and the management practices that should be followed to prevent, reduce and manage climate related risks. This information assists farmers in making management decisions to reduce risks and benefit from the opportunities from the variable and changing climate.

The project specific objective/outcome can be achieved when all five results/outputs are fully delivered. The two targets to measure the achievement of the project outcome are: 3,500 households (70 percent of 5,000 targeted households) have increased their climate resilience based on improved access to and use of climate information, and resources, and eight cases of evidence that climate data has been collected, analyzed and applied to decision-making for improved climate resilience.

One of the great successes of the project was that VSLA members use the community score card methodology to provide feedback to the authorities regarding the accuracy and relevance of the provided weather forecast/advisory to improve the quality of information.

Baseline value (quantitative & qualitative)	Target value (quantitative & qualitative)	Endline (quantitative & qualitative)
Indicator (1): The number of poor people (10,450) and households being able to improve their climate resilience based on the use of climate information and resources is low.	3,500 households (70 percent of 5,000 targeted households) have increased their climate resilience based on improved access to and use of climate information, and resources.	63.9 percent of the 2099 households (equivalent to 1341 households) showed an increase in their climate resilience based on improved access to and use of climate information, and resources. <i>(The target has not been achieved)</i>
Indicator (1): The availability of targeted climate information, and capacity to make use of it effectively is low, resulting in insufficient inclusion of it in effective decision-making when it comes to taking steps to build climate resilience.	8 cases of evidence that climate data has been collected, analyzed and applied to decision-making for improved climate resilience ⁵	Evidence from 6 cases that climate data has been collected, analyzed and applied to decision-making for improved climate resilience <i>(source: MEL framework)</i>

⁴ CVCA Handbook, version 2.0, July 2019

⁵ Adapted from the Green Climate Fund's initial results measurement framework

Indicator (1) is calculated by counting the total households in the survey sample applying at least three measures recommended in the seasonal bulletin and then multiplying it by the number of beneficiaries directly participating in the project. At the end of the period, the ratio and number of households was 63.9 percent (1,341 direct beneficiary households), lower than the targets. As the survey sample was selected amongst the VSLA members who participated directly in project's interventions, it can be estimated that the percentage of the indirect beneficiaries would be lower.

Table 3: Details of Indicator (1) measuring the project's specific objective/outcome

	Lai Chau (n=266)	Dien Bien (n=363)	Total (two provinces) (n=629)
Number of respondents reporting they have applied advisories (percent of the survey sample)	187 (70.3%)	285 (78.5%)	472 (75%)
No of respondents reporting they have applied at least three measures to increase the household climate resilience	121	281	402
<i>Percent out of those who have applied advisories</i>	64.71	98.6	85.2
<i>Percent out of total surveyed households</i>	45	77.4	63.9
Estimated direct beneficiaries (N=2099 hh)			1,341

Source: Endline household survey

In detail, the percentage of households applying each adaptation measure in the two localities is as follows:

Table 4: Percentage of households that applied climate-resilience actions recommended in the advisories provided by InfoAct

Application of the advisories for climate resilience	Dien Bien (n=285)		Lai Chau (n=213)	
	Frequency	Percent	Frequency	Percent
Visit the farm regularly	282	99.0	163	87.2
Check the farm regularly to prevent pests and diseases	266	93.3	180	96.3
Modify/change the cultivation techniques (watering, fertilizing, sowing, weeding, pruning branches/buds)	220	77.2	98	52.4
Clear ditches and drainage ditches to avoid flooding	172	60.4	92	49.2
Cultivate new crops	90	31.6	57	30.5
Harvest early to avoid natural disasters/irregular weather	144	50.5	56	30.0
Apply proper harvesting techniques according to standards/guidelines	107	37.5	47	25.1
Change of farming schedule	64	22.5	41	21.9
Use fertilizers and pesticides more economically	199	69.8	69	36.9
Improve/upgrade irrigation water system for farming	95	33.3	37	19.8
Average	163.9	57.5	84.0	39.4

Source: Endline household survey

One can observe from the above table that the percentage of households implementing the recommended measures to increase the household's climate resilience in Dien Bien is more than 18 percentage points higher than in Lai Chau. Recommendations from the Project bulletins such as promoting such as "using fertilizers and pesticides in a more economical way" was applied by nearly 70 percent of rural households in Dien Bien, while this rate in Lai Chau was only 37 percent. Another measure, "harvesting early to avoid natural disasters/irregular weather", was also applied by more than 50 percent of households in Dien Bien,

while only 30 percent of Lai Chau farmers applied the measure. Almost 100 percent of Dien Bien farmers reported the regularity of farm-monitoring, while in Lai Chau, only 87 percent farmers did this.

The comments below indicate that EM women and men have applied climate-resilience actions thanks to Project activities.

“It could be said that up to 80 percent of the villagers have had a positive change. Some people don't apply for advisories maybe because they are lazy, not because of the advisories' difficulties. In the past, the villagers did not know how to take care of rice plants. We just sowed the seed and the rice field was not monitored. Villagers also fertilized improperly, for example, we fertilized without cleaning the grass, so the grass grew faster than the rice plants. Pests also have many types, but the villagers did not know how to deal with each type of pest. When they saw the appearance of pests, the villagers uprooted the whole rice, as a measure to deal with the pests. Now villagers know the technique of taking care of rice fields. We apply to fertilize the rice fields three times per production cycle. We visit the fields every three days, when we see the grass growing, we pull it out. Visiting the field many times helps to detect pests and diseases early. Moreover, when villagers observe pests, they read the Project Recommendation Bulletin to identify the type of pest and purchase the correct medicine for that pest.”

(FGD, female, Nam So commune, Tan Uyen district, Lai Chau province)

Notably, having participated in the Project, the women's proactiveness in households' farming and animal husbandry enhanced, contributing to the increase in the households' climate-resilience. See the comments below in the women's group discussions:

“Previously, I was not able to make decisions regarding rice cultivation or household's livelihood development models. These decisions were usually made by my husband. Whatever I wanted to do, I had to ask my husband. For example, I had to ask my husband if the next day would be rainy or sunny so that I would use the pesticide. Now I have the weather forecast information by myself, so I also take the initiative to do it, without having to ask my husband anymore.

(FGD, female, Muong Phang commune, Dien Bien province)

“In the past, only men could access information and go to training or meetings. Females rarely participated in these social events. Now, women have phones to access the internet and are provided with project bulletins, so they gain more new knowledge. We can find weather information any time and know what to do with crops in each weather condition. And we are no longer reliant on men's technical guidance to do farming. We also confidently know which technique is right, confident when making decisions regarding agricultural production.”

(FGD, female, Trung Dong commune, Tan Uyen district, Lai Chau province)

Result/Output 1 Strengthened capacity of stakeholders to interpret and apply climate information

This result is considered achieved when the two targets are delivered in full. The two targets are: (1) 16 downscaled forecasts and actionable advisories are produced by Hydro-Meteorology Station and DARD and (2) 75 percent of the targeted staff of the service providers (Hydro-Meteorology Station and DARD) are able to interpret forecasts to produce actionable advisories.

According to the table below, the first indicator has outperformed the target by a significant number.

Table 5: Total number of produced downscaled forecast and actionable advisories

Type of advisory	Target	Midline	Endline
Short-term (weekly or 10-day) downscaled forecasts and actionable advisories	-	71	280
Seasonal downscaled forecasts and actionable advisories (3-month and Cultivation calendar)	16	14	39
Total	16	85	319

Source: MEL data

Weather patterns during the three years of project implementation were fully reflected in the 39 seasonal advisories. The advisories, especially the seasonal advisories with cultivation calendars, are highly appreciated by farmers, who find them useful. Many of the respondents, including the farmers themselves, found the presentation of the three-month advisories with specific guidance and visual illustrations very suitable for their purposes. Similarly, the cultivation calendars with pictures were extremely suitable for women with limited education in particular. See the below comment:

“Three-month advisories are very helpful. When pests appear in rice fields, I can observe the infected rice plants and pests with pictures demonstrated on three-month advisories and I know what pesticides to buy which are mentioned on the three-month advisories also. Previously, I had to bring both infected rice plants and pests to a plant protection drug store to ask the seller what kind of pesticide I should buy. At that time, I had no way to validate if they sold me the right pesticides. Now I can check for myself if the medication we are selling is the right one by looking at the recommended medication information on the three-monthly newsletter. This is very helpful because I don't buy the wrong pesticides and don't have to use many pesticides to treat the same pests on rice anymore.”

Source: IDI, a VSLA leader, Lai Chau Province

However, the accuracy of the weather forecast is a point of concern. The forecasts are able to accurately predict the weather around 70-80 percent of the time. All the respondents understood that the forecast cannot be 100 percent accurate and that was acceptable. There are other technical reasons for the lack of forecast accuracy at the local project sites. The first and foremost reason is that there are no MET stations in the project area. Moreover, due to geographic diversity such as mountains, it is hard to have accurate weather forecasts in administrative areas such as communes or districts. There may also be different micro climates and weather patterns within a district, and even a commune. In order to improve the accuracy of forecasting, the Project has installed 5 digital weather gauges or mini weather stations at communal level. The project is planning to install a total of 15 mini-stations by its end. These gauges can provide accurate observational data for one to two days into the future (with information such as rain probability, temperature, etc.). This information is highly appreciated by the local farmers. However, these gauges cannot provide observational data in the long-term, for example, and the accuracy of the data will reduce if the timespan is longer than three days. In addition, the data provided by these gauges was not used either by the task-forces as the basis for the development of advisories/bulletins or by the provincial MET station as one of their input data sources. [Although taskforce members do compare the forecast information provided by the MET and the data from these mini-stations to assess the accuracy of the MET's forecasts.]

Some farmers shared their assessment that some of the advisories are difficult to apply. Since the advisories are meant to be tailored, it is important that they are actionable. Although not many advisories were named

by the farmers, maybe it is good for the members of the task-forces to keep track of these kinds of responses in the future and find out how often farmers thought the advisories were actionable or not.

“Some recommendations of agricultural advisories cannot be implemented because they are not suitable. For example, digging a compost hole at the base for coffee is not applicable because people grow coffee on the hill. This technique is only applicable when coffee is grown in flat land. The recommendation of fertilizing 2-3 times/crop is also not applicable because coffee is grown on high hills where there is no access road. In such hilly farming areas, farmers can only fertilize once a year.”

FGD, male, Trung Đông Commune, Lai Châu

With regard to the second indicator, the midterm report recorded that 100 percent (10/10) of the taskforce members in Dien Bien province were able to interpret forecasts to produce actionable advisories. Similarly, the taskforce members in Lai Chau reported they were able to interpret forecasts to produce actionable advisories. The members are officials of the provincial/district Women's Union (Lai Chau), officials of the agriculture and agricultural extension sectors, members of CCD (Dien Bien), officers of the Provincial Hydro-meteorological Station. The interpretation of the weather forecasts to actionable advisories is done primarily by the taskforce members who have professional background as the DARD's staff and agri-extensional staffs. And their capacity increase is demonstrated strongly. See the below remarks:

“According to my observations, the capacity of local cadres has changed a lot. We also find ourselves becoming more competent in our professional fields. We have the opportunity to learn more about weather knowledge, know how to make recommendations on agricultural practices suitable for different weather conditions. By participating in the project, we also have the opportunity to work with many experts, thanks to which we acquire a lot of new knowledge. We (members of the taskforce who are district agricultural extension staff) are well versed in developing short-term downscaled forecasts and actionable advisories. Now, what has become routine is that every Monday, the Hydro-meteorological Station sends us weekly weather forecasts. Based on information about temperature, humidity, and expected rainfall, we develop recommendations for agricultural practices. For example, it is recommended not to collect coffee on a rainy day so as not to affect the selling price. Coffee harvested on a rainy day has lower quality than when they are harvested on a sunny day, then the selling price will be 1000-2000 VND/kg coffee cherry lower.”

IDI, a district agricultural extension staff in Dien Bien Province

Result/Output 2 Increased access to relevant and actionable climate information among ethnic minority women and men

This output is operationalized by three indicators. The achievement of the target for each indicator is as follows:

Indicator (1) Percentage of targeted ethnic minority women and men who received the information and advisories understand and apply them in their agricultural work. The target was set at “at least 70 percent of 10,450 targeted EMW and EMM”. If considering the percentage, this indicator, at the mid-term, was significantly higher than the target and the achievement of the target by the end of the project is again reported. But considering the absolute value, one can see that the project has only extended its services to 2,099 EM women and men (see Table 2_Project Outreach), as of its conclusion. This means the expectation

that 7,315 EM women and men (who received the information and advisories) understanding and applying the advisories **was not achieved**.

Table 6: Percentage of targeted ethnic minority women and men who received the information and advisories understand and apply in their agricultural work

Indicator (1)	Dien Bien		Lai Chau		Total		Target (project-end)
	Midline	Endline	Midline	Endline	Midline	Endline (n=2099)	
Receiving weekly weather forecast and agricultural advisories/10-day weather forecast and agricultural advisories	91.6	93.11	79.2	61.28	84.5	79.65 (n=1672)	At least 70% of 10,450 targeted EMW and EMM (n=7315)
Understanding weekly/10-day weather forecast and agricultural advisories (out of those who received)	93.1	97.93	83.9	97.05	88.2	97.4 (n=2044)	
Applying weekly/10-day agricultural advisories in agricultural work (out of those who received)	93.1	99.11	89.8	95.09	91.3	97.8 (n=2053)	
Receiving the three-monthly (agricultural) advisories	90.1	79.89	84.5	80.08	87.2	79.97 (n=1679)	
Understanding the three-monthly (agricultural) advisories (out of those who received)	98.9	95.85	80.9	96.78	89.9	96.31 (n=2022)	
Applying the three-monthly (agricultural) advisories (out of those who received)	100	98.28	89	87.79	94.5	93.84 (n=1970)	

Source: Midterm and endline surveys

Indicator (2) Increased productivity and/or reduced main crops loss in targeted communities.

Increase in productivity: The table below presents data collected by the baseline and endline surveys. The yields of all three crops recorded a significant increase in both locations. However, the data at the baseline in Lai Chau is unreliable because it differs greatly from the official DARD's statistical data for Tan Uyen district in 2018. According to that data, in Tan Uyen district, the district's average rice yield was 46.9 quintals/ha, tea yield was 84.8 quintals/ha which are much higher than those data collected and reported by the baseline study.

Table 7: Productivity increase

Crop	Unit	Lai Châu				Dien Bien			
		Baseline	Endline	Difference		Baseline	Endline	Difference	
				In quantity	Percentage			In quantity	Percentage
Rice	quintals/ha	37.4	54.9795	17.5795	47%	55	78.275	23.275	42%
Coffee	quintals/ha	n/a	n/a	n/a	n/a	58.5	64	5.5	9%
Tea	quintals/ha	44.2	103	58.8	133%	n/a	n/a	n/a	n/a

Source: Baseline and endline surveys

Having a close look at rice yield provided by the Project's monitoring system, there are some important observations as follows: (1) An increase in rice yield was observed across all farming seasons from 2019 until 2021 in VSLA member group; (2) In the same project area, the non-VSLA group has a lower yield growth than that of VSLA members in two cultivation season in 2020 while in 2021 the yield of VLSA and non-VSLA members are not significantly different; (3) VSLA members achieved significantly higher rice production than the non-project villagers in the Spring cultivation seasons in 2019, 2020 in both Lai Chau and Dien Bien Province, in Summer Autumn 2020 in Dien Bien and Spring 2021 in Lai Chau. Although these differences are statistically significant (see the table's note), there is no consistent patterns found to confirm that project's intervention has resulted in greater rice yield for the project's primary target group (aka VSLA members) in compared with the non-VSLA members or with those living in non-project locations.

Table 8: Rice productivity 2019-2021

Rice Cultivation Season	Year/number	Dien Bien					Lai Chau				
		VSLA	non VSLA	non project location	VSLA vs non-VSLA	VSLA vs. non-project location	VSLA	non VSLA	non project location	VSLA vs non-VSLA	VSLA vs. non-project location
		(1)	(2)	(3)	$=((1)-(2))/(2)$	$=((1)-(3))/(3)$	(1)	(2)	(3)	$=((1)-(2))/(2)$	$=((1)-(3))/(3)$
Spring 2020	2020	71.69	64.55	58.55	11.1%	22.4%	45.28	39.04	34.1	16.0%	32.8%
	<i>n</i>	953	641	119			133	49	140		
	2019	64.05	71.85	49.48	-10.9%	29.4%	43.53	39.32	34.34	10.7%	26.8%
	<i>n</i>	953	641	119			133	49	140		
	2020 vs. 2019	11.9%	-10.2%	18.3%			4.0%	-0.7%	-0.7%		
Summer Autumn 2020	2020	56.58	52.11	57	8.6%	-0.7%	43.24	38.79	40.3	11.5%	7.3%
	<i>n</i>	947	621	124			163	427	297		
	2019	48.81	45.86	53.26	6.4%	-8.4%	41.45	38.35	40.91	8.1%	1.3%
	<i>n</i>	946	621	124			163	427	297		
	2020 vs. 2019	15.9%	13.6%	7.0%			4.3%	1.1%	-1.5%		
Spring 2021	2021	74.27	74.96	58.81	-0.9%	26.3%	42.53	42.04	41.1	1.2%	3.5%
	<i>n</i>	925	629	170			127	195	124		
	2020	72.2	68.15	58.62	5.9%	23.2%	41.15	40.95	41.33	0.5%	-0.4%
	<i>n</i>	923	627	169			127	195	124		
	2021 vs. 2020	2.9%	10.0%	0.3%			3.4%	2.7%	-0.6%		
	2021	N/a	N/a	N/a			41.47	40.18	39.06	3.2%	6.2%

Rice Cultivation Season	Year/number	Dien Bien					Lai Chau				
		VSLA	non VSLA	non project location	VSLA vs non-VSLA	VSLA vs. non-project location	VSLA	non VSLA	non project location	VSLA vs non-VSLA	VSLA vs. non-project location
		(1)	(2)	(3)	$=((1)-(2))/(2)$	$=((1)-(3))/(3)$	(1)	(2)	(3)	$=((1)-(2))/(2)$	$=((1)-(3))/(3)$
Summer Autumn 2021	<i>n</i>						167	277	257		
	2020	N/a	N/a	N/a			40.27	39.84	38.62	1.1%	4.3%
	<i>n</i>						167	277	257		
	2021 vs. 2020						3.0%	0.9%	1.1%		

Source: Project's MEL statistics

(*) The figures in red are statistically significant

Indicator (3) Percentage of targeted ethnic minority women and men from 5,000 households that reported a reduction in expenditure on inputs for the main crops in targeted communities as a result of the use of the advisories. The Project planned that at least 80 percent of the targeted EM women and men from 5,000 households reported a reduction in expenditure on inputs for the main crops. This target was not met as indicated by the endline survey. Only 23 percent of households reported a reduction in their expenditure on inputs used for rice cultivation, nearly 51 percent reduced costs for coffee and just over 24 percent reported a reduction in input costs in tea production.

Table 9: Reduction in expenditure on inputs for the main crops as a result of the use of advisories

			Dien Bien		Lai Chau		Total		Target (project-end)
			Midline	Endline	Midline	Endline	Midline	Endline	
Rice	Lower expenditure on main agricultural inputs (*)		28.2	28.31	26.7	18.39	27.5	23	At least 80% targeted EMW and EMM from 5,000 HHs
Coffee	Lower expenditure on main agricultural inputs		40	50.57	N/A	N/A	40	50.57	
Tea	Lower expenditure on main agricultural inputs		N/A	N/A	26.7	24.06	26.7	24.06	

Source: Endline survey

(*) Any of the six categories (manure, fertilizer, microbiological fertilizer, pesticides, herbicide and growth-stimulants)

It is worth discussing that the Project's set two targets (increasing productivity and reducing input costs) that seem quite ambitious and somehow conflicting to each other. The Project expects farmers to reduce the cost of fertilizer use if they apply at the right time (appropriate to weather conditions). However, a fact that farmers in eight communes participating in the Project are using the amount of fertilizer at the volume lower than recommended by the experts, due to their poor economic condition. Therefore, to increase productivity, farmers must at least use enough in terms of type and quantity of fertilizers. Quite a few farmers said that they do not have enough money to buy the recommended amount of fertilizer, so it is difficult for

them to reduce the cost of fertilizer. If they have enough money or if the prices of coffee and tea go up, they want to spend more to buy fertilizer, not to reduce this cost.

Table 7 below shows the more detailed data collected by the Endline survey. We will see that the percentage of farmers who said they have reduced the volume of agricultural materials/inputs used is quite low. For example, 11.3 percent of rice-farmers in Lai Chau who said they used less pesticides in the most recent rice crop, nearly 69 percent reported that they did not change the volume and 20 percent said they used more pesticides. The same pattern is also found with the volume of chemical fertilizers used for rice cultivation or herbicide and seed.

Table 10: Percentage of EM farmers reporting the changes in volume of agricultural materials/inputs used as a result of the use of advisories

Change in the volume of agricultural materials/inputs used	Lai Chau					Dien Bien				
	No. of obs.	Higher (%)	No change (%)	Lower (%)	Not know (%)	No. of obs.	Higher (%)	No change (%)	Lower (%)	Not know (%)
Food crop (Rice)										
Manure (kg)	265	1.89	80.38	11.3	16.6	271	9.6	64.2	5.5	20.7
Chemical fertilizers (nitrogen, phosphorus, potassium, NPK fertilizers etc.)	265	12.1	80.0	7.6	0.4	271	13.3	76.8	8.9	1.1
Microbial fertilizer (kg)	265	0.4	81.9	0.0	17.7	271	7.0	57.6	2.6	32.8
Pesticides (packs/bottles)	265	20.0	68.7	11.3	0.0	271	18.5	72.7	8.5	0.4
Herbicide (pack/bottle)	265	4.2	81.1	1.5	13.2	271	7.8	82.7	8.9	0.7
Plant Growth Regulators (packs/bottles)	265	0.4	81.5	1.1	17.0	271	6.3	56.5	4.4	32.8
Seed (kg)	265	5.3	92.8	1.5	0.4	271	8.1	87.5	4.4	0
Cash Crops										
		Tea					Coffee			
Manure (kg)	144	2.1	81.3	2.1	14.6	91	2.2	92.3	1.1	4.4
Chemical fertilizers (nitrogen, phosphorus, potassium, NPK fertilizers...) (kg)	144	22.9	65.3	9.7	2.1	91	6.6	75.8	17.6	0
Microbial fertilizer (kg)	144	2.1	81.9	0.7	15.3	91	0.0	90.1	2.2	7.7
Pesticides (packs/bottles)	144	13.9	75.0	8.3	2.8	91	6.6	69.2	24.2	0
Herbicide (pack/bottle)	144	11.1	73.6	11.8	3.5	91	4.4	53.9	39.6	2.2
Plant Growth Regulators (packs/bottles)	144	4.9	86.8	4.2	4.2	91	0	89.0	2.2	8.8
Seed (kg)	144	0.7	84.0	1.4	13.9	91	0	84.6	1.1	14.3

Source: Endline survey

Result/Output 3 Improved social protection for ethnic minority households

The result is measured by two indicators: (1) Number of VSLA members participating in any micro-insurance scheme and (2) Number of VSLA members aware of micro-insurance and the benefits of micro credits. The activities to implement this result were only carried out in Dien Bien province, so the project monitoring data relates to this province only. The table below shows the mid-term progress on delivering Result 3.

Table 11: Achievement of Result 3

Target	Midline	Endline
At least 17% of VSLA members (total of 1,875 members) are participating in a micro-insurance scheme	<ul style="list-style-type: none"> 550 VSLA members participated in a risk sharing fund for rice. 95 members participated in a risk sharing fund for cattle (buffaloes/cows) 	<ul style="list-style-type: none"> Risk sharing fund for rice stopped in the end of 2020 Risk sharing fund for cattle (buffaloes/cows) stopped in the end of 2020
80% of VSLA members participating in micro-insurance report recognizing value in the micro-insurance scheme	<ul style="list-style-type: none"> 98.2 percent of VSLA members who participated in a risk sharing fund reported they recognize value in a risk sharing fund 	<ul style="list-style-type: none"> 89.8 percent of VSLA members who participated in a risk sharing fund reported they recognize value in a risk sharing fund.

Source: Mid-term, endline household survey and MEL data

The project recruited consultants to develop a micro-insurance scheme which later was changed to risk-sharing funds. This fund has only been piloted in Dien Bien province since the Winter-Spring crop in the second project year. Each household agreeing to participate in risk-sharing funds, will contribute a certain amount, for example, 30,000 VND(1,20 €)/rice crop. This amount will be used to pay the participants in case of having damages. At the end of each production cycle, fund usage has been reported and completed before a new cycle begins. This fund was discontinued at the end of 2020. Several operational limitations were observed by local implementation partners as follows:

- The level of farmers' willingness to benefit from the micro-insurance scheme is still low. The rice-farmers are less concerned with output loss because rice is not cash-crops to them. While few communication activities have been carried out by the Project to raise awareness among farmers. The Project's consultants did provide training on the micro-insurance scheme, but it was not enough to convince farmers to pay into the funds. Farmers who receive compensation for crop-losses will make simple comparisons that they receive less compensation even though the level of contribution to the fund is equal among households. And farmers will not want to continue participating in risk-sharing funds any longer.
- Although the micro-insurance scheme is a very challenging activity, personnel with the experience and expertise to carry out the activities involved is not enough. The local partner agencies in Dien Bien province do not have the capacity to lead the piloting. The effectiveness of this model is very high and meaningful. However, due to the unclear communication and program design at the beginning and the consultant has not done it methodically causing some shortages.

The Project has also been flexible in adding COVID-impact recovery fund to VSLA groups. Each VSLA group has received VND 25 million (1,000 €) in 2021 and this amount is borrowed by members to restore household livelihoods. EM women joining VSLA reported that they have experienced higher levels of protection. Group discussion with VSLA members shows several benefits from VSLA's memberships:

“Joining VSLA group, women have many changes. VSLA members know how to practice thrift. We have a common fund to support our members when they face production difficulties or major life events such as illness. Many VSLA members have borrowed from the group's fund to buy fertilizer, or start a new livelihood such as raising fish, raising cattle, or poultry. Many members borrowed up to VND 20 million (800€) to invest in expanding livestock farms. For example, the household of the head of the women's union branch has borrowed money to both raise fish and buy cows. Previously, she raised cattle and buffaloes freely. Now she has built the stables to raise cows, she buys straw and grass to feed the cows. Thanks to participating in VSLA, many women have had significant changes in husbandry scale and technique. VSLA is also a social protection mechanism because many members also contribute capital to each member to develop the household economy. Another example is a member who borrowed VND 20 million (800 €) to cover hospital fees. Without VSLA's fund, she would not have been able to overcome this challenge.”

(IDI, WWU in Muong Phang Commune, Dien Bien Province)

“Each VSLA group has received VND 25 million from the Project's COVID Fund. The Covid epidemic has greatly affected the economic life of farmers. I can cite a few examples as women who work as hired workers in restaurants, workers in industrial zones in Hai Phong and Hai Duong have been unemployed and have no income. The COVID Fund is really a helpful because it has helped many women get capital for agricultural production.”

(IDI, WWU in Muong Phang Commune, Dien Bien Province)

Result/Output 4 Institutionalization of climate information solution and climate risk micro-insurance system

Three targets planned to measure the level of achievement of this Result are: (1) The task force members are producing improved advisories and are better coordinated with DARD and DONRE and (2) Agro-climate information services and actionable advisories are included by DARD in provincial sector planning level and

(3)“(At least) three recommendations from InfoAct will be included in National Framework on Climate Information Services”.

It can be seen that the first target has already fully delivered by mid-term. However, the task force is a temporary working mechanism and most likely to stop its operation when the InfoAct project concludes, hence the expected result that the climate information solution will be institutionalized beyond the project lifespan may encounter serious challenges.

Moreover, the collaboration between DARD and DONRE (via the participation of Hydro-Meteorology Station) has been improved by this project. But the provincial Hydro-Meteorology Station’s activities of data provision for the task force is contract-based, meaning these Stations are being paid to provide data. This contract relationship may not be maintained in the future when the InfoAct Project funding has ended. Thus the collaboration between DARD and DONRE in providing climate information solutions is unlikely to be institutionalized.

Discussions have taken place at CARE to advance target (2) that states “agro climate information services and actionable advisories are included in DARD at provincial sector plan level”. Interviews with representatives from DARD Dien Bien showed that the province is preparing a proposal to get the state fund to run a similar so-called taskforce mechanism in the coming year. Though it is not feasible in 2022, it is expected that the year 2023 will witness advancement. In Lai Chau, there is no evidence of such mechanisms under development.

Regarding the target (3): The Project has submitted a “Policy brief” (May, 2020) with five key recommendations. Vietnam Institute of Meteorology, Hydrology and Climate Change (IMHEN) is a partner that has collaborated with CARE in the InfoAct Project and other projects for advocacy. IMHEN is also the unit tasked by the Ministry of Natural Resources and Environment (MONRE) to develop the National Framework on Climate Information Services. According to the IMHEN’s representative, the five

MAIN RECOMMENDATIONS

01

The National Framework for Climate Services should be developed and officially implemented in Vietnam. The National Framework for Climate Services has been included in the Hydrometeorological Sector Development Strategy, but an inter-sectoral coordination mechanism is needed to develop obviously the National Framework for Climate Services.

02

Agricultural officials and agricultural extension workers at the local and regional levels usually have limited access to the Meteorological and Hydrological Services which makes Using local meteorological information very difficult. It is necessary to improve the capacity of locality officials to develop detailed forecasts and transmit them with easy-to-understand and suitable language and content for users. It is necessary to improve the capacity of agricultural officials and agricultural extension workers to read, understand and analyze climate information and forecast weather applications in agriculture.

03

Farmers who directly cultivate at the local level often lack Agro-meteorological information and languages used for climate services are often not the primary languages of the users. Forecast information needs to be more timely, accurate and detailed zoning, and recommendations for farmers to act in the management and care of crops and livestock are necessary. Climate services need to be derived from user needs, information needs to be easily understood in accordance with the local context on crop structure, local farming conditions and practices, and developing monitoring and evaluation systems is done by the people. Especially, climate service solutions need to pay attention to the needs and conditions of accessing information of the poor, ethnic minorities and women.

04

It is necessary to maximize available communication channels (speakers, village meetings) in addition to promoting information channels including messages and social networks such as Zalo or Facebook, encouraging ideas to enhance interaction between people as well as between people and service providers.

05

It is necessary to apply lessons learned from the climate service models that the NGOs implemented focusing on improving capacity and developing applications providing climate service. In the CARE project, 75% of staff trained in climate information services were able to provide forecasting information and advice to farmers in Lai Chau and Dien Bien provinces.

recommendations are well received and reflected in the Draft of the National Framework on Climate Information Services. The IMHEN's representative also said that the climate information service deployed in Dien Bien and Lai Chau province is considered an important input for the Institute in the process of developing relevant policy documents. IMHEN has also tabled trials of climate information service delivery in the two provinces into seminars and discussions at MONRE.

Currently, IMHEN and CARE are coordinating with the Center for Hydrometeorological Forecasting in Lai Chau Province to build a website that continues to provide 10-day and 6-monthly forecast information. Their task is to build a mechanism to maintain the 10-day and 6-month newsletters in the following years in Lai Chau province. This system is built with a level of automation in making agricultural recommendations from weather forecast data. It is expected that about 20 percent of the information will be provided by meteorologists and agricultural experts, and 80 percent of the information of the newsletter will be produced automatically by this system. These are solid backgrounds to forecast the likeliness of the institutionalization of climate information solutions.

Result/Output 5 Increased capacity of local partners to develop understandable downscaled climate information and advisories and supporting local farmers in articulating their climate information demand towards local authorities beyond project duration

The project's MEL framework states the three key local partners with whom the project plans to build capacity, including: Lai Chau DARD, Lai Chau VWU and CCD (Dien Bien). Their changes in different areas of capacity that have been developed by the Project are presented in the table infra:

Table 12: Capacity self-assessment

Aspects of capacity that InfoAct Project aims to build for partners	Capacity self-assessment (Using a 5-point scale)					
	Lai Chau province			Dien Bien province		
	Baseline (2018)	Endline (present)	Change	Baseline (2018)	Endline (present)	Change
Developing weather forecasts and agricultural advisories	0.7	3.3	2.7	3	4.5	1.5
Developing seasonal calendars	1	3	2	3	4.5	1.5
Motivating EM women to participate in the process of providing and feedback on climate information/advisories applied to agricultural activities	1	3.3	2.3	3	4.5	1.5
Advocacy skills (propaganda and dissemination of weather information on agriculture in general and agricultural activities in particular)	1	3.7	2.7	3	5	2
Deploying the VSLA model	0.5	4	3.5	-	5	-
Deploying gender discussions	1.5	4.5	3	-	4	-
Monitoring and evaluating the application of weather information of VSLA members	1	3	2	-	4	-
Gender integration in information dissemination on agriculture	0.5	4	3.5	-	3	-

Deploying the agricultural risk sharing/insurance fund model in the community	0.5	2.5	2	2	2.5	0.5
Average	0.9	3.5	2.6	2.8	4.1	1.3

In-depth interviews with staff of partner agencies are consistent with the above self-assessment results.

"Normally, the Women's Union usually does its work such as disseminating policies to its members or conducting movement activities related to women. When participating in this project, the staff of the Women's Union have changed their capacity and working skills a lot. My personal knowledge has also improved remarkably. Especially I understand more about new agricultural knowledge through the process of participating in the development of short-term weather bulletins and seasonal calendars. Since I am a member of the working group, I also participated in the training sessions or when developing the weather bulletin along with the staff of the provincial Department of Meteorology and Hydrology, and I learned a lot from you. My management and monitoring skills have also improved since being the commune's WU leader. I am responsible for supervising the project's activities at grassroot level. As I keep a close eye on the VLSA groups, I also have to build my own capacity to guide and support the groups' operation."

(IDI, Trung Dong Commune WU, Lai Chau)

"The Women's Union participated in the project from the very beginning, especially the workshop on developing the implementation plan. I myself have accumulated more knowledge about climate change. I gradually became interested in the importance of weather issues and the value of agricultural recommendations in different weather conditions. Due to being constantly exposed to weather information, I am now able to perceive weather patterns. When participating in planning activities and training courses, I perfected my presentation and planning skills. From there, I helped improve these skills for my colleagues at the Women's Union so that they perform WU's activities more efficiently."

((IDI, Mường Agn WU leader, Dien Bien)

Various capacity building methods used by the project were appreciated by the interviewees. See the table below:

Table 13: Capacity building methods assessments

Methods of capacity building that InfoAct project has implemented <i>(rated on a 5-point scale, with 5 being the highest level of conformity with their needs)</i>	Assess the appropriateness of the capacity building methods	
	Lai Chau province	Dien Bien province
Training/workshop on methods of developing weather forecasts and agricultural advisories	4	4.5
Training/workshop on methods of developing seasonal calendars	4	4.5
Capacity building through participation in the Working Group	3.7	4.5
Capacity building through practical activities in the community	4.3	4.5
Average	4	4.5

One target was set particularly for Lai Chau Women's Union that the WU would integrate climate service in their own agenda as well as in supporting women raising their voice to local authority to demand for user

driven climate services. Interview with the Chairwoman of Provincial WU confirmed that PWU integrates the plan to support local agencies in the implementation of the provincial plan on natural disaster as one of their usual duties. By project's end, Lai Chau VWU has not integrated climate service in their own agenda. To conclude, the target has not been achieved.

In addition, one of the great successes of the project was that VSLA members use the community score card methodology to provide feedback to the authorities regarding the accuracy and relevance of the provided weather forecast/advisory to improve the quality of information. Before this project, ethnic minority farmers usually did not get in direct communication with authorities.

2.4 Project's Efficiency

This section does not discuss in detail the disbursement rate and expenditure structure of the Project which is presented fully in the project's financial report. Instead, important observations are worth being noted.

Overall, moderate achievement of the project's targets as discussed in Section 2.3 implies that the project has not applied a value-for-money approach.

Project's management has taken the Mid-term Report's recommendations seriously, including: (1) increasing the men's participation in the project; (2) including the delivery of advanced training in farming techniques for the targeted groups, in association with applying agricultural advisories; (3) improving the project's monitoring and working closely with IMHEN in the policy advocacy at national and provincial level. However, the collaboration with the provincial People Committee was not intentionally enhanced.

Project's management is marked with flexibility. The decision to invest 15 mini weather monitoring stations and provide 25 million for each VSLA group as COVID-impact recovery fund are two good examples.

The various methods of providing weather information used by the project are considered very appropriate for the beneficiaries. The EM women's ability to use Vietnamese language was considered when designing the channel of agricultural advisories dissemination.

Table 14: EM women's ability to use Vietnamese

Ability to use Vietnamese	Dien Bien		Lai Chau	
	Freq.	Percent	Freq.	Percent
Not at all	9	2.48	7	2.63
Can hear and understand a little	48	13.22	50	18.8
Can speak a little	95	26.17	81	30.45
Can speak, read and write in Vietnamese	211	58.13	128	48.12
Total	363	100	266	100

Source: Endline survey

The percentage of people who can't speak Vietnamese is quite small (about 2.5 percent) of respondents. The proportion of respondents who said that they could only understand very little Vietnamese was quite significant, with over 13 percent in Dien Bien and nearly 19 percent in Lai Chau. The proportion of respondents who said that they could speak only a little Vietnamese was also relatively large, over 26 percent in Dien Bien and over 30 percent in Lai Chau. The group able to communicate with all three skills of speaking,

reading and writing accounted for over 58 percent in Dien Bien, the percentage in Lai Chau was less than 50 percent. Thus, it can be seen that the ability to use Vietnamese in general in the project area is quite limited.

Taking into account this limited ability to use Vietnamese, in addition to building the capacity of VSLA team leaders so that they can disseminate advisories in the group's monthly meetings, the project has applied a variety of channels. The most popular advisories are listed in the Table below. Broadcasting of bulletins in loudspeakers was rated as the most popular channel for receiving advisories by respondents in both localities. Texting by phone was done in Dien Bien and was appreciated by nearly 52 percent of respondents. In Lai Chau, because sending information via phone messages is not done (only weather information generated by mini hydro-meteorological monitoring stations is sent to people's phones), the percentage of respondents sharing SMS as their preferred channel for receiving advisories is significantly lower than Dien Bien. Dissemination of the newsletter by village heads was highly appreciated in Dien Bien. Meanwhile, the dissemination of advisories done by representatives of the Women's Union and the local Farmers' Union are more appreciated by the people of Lai Chau. Despite the limited Vietnamese language usage, a small percentage of people in Lai Chau (6.4 percent) said they would like to receive a printed newsletter in their mother tongue, that of Dien Bien is higher, approximately 24 percent.

When establishing a community facilitator group in Dien Bien Province, the Project also selected representatives of VSLA team leaders and village heads who could speak the three common languages Kinh, Thai and H'mong. This six-member facilitator group has played an active role in communicating climate service information more effectively to the villagers.

In short, the diversification of information channels is an appropriate approach of the Project, especially the mobilization of mass organizations such as the Women's Union, or agricultural extension officers and village heads in information spreading and educating farmers, has proven to be very suitable as perceived by the beneficiaries.

Table 15: EM women's preference in channels of receiving advisories

Preference in channels of receiving advisories	Dien Bien			Lai Chau		
	Frequency	Percent of responses	Percent of cases	Frequency	Percent of responses	Percent of cases
Print on paper – Vietnamese	242	17.8	69.0	159	19.6	59.8
Print on paper – my ethnic language	84	6.2	23.9	17	2.1	6.4
The village/commune bulletin board	27	2.0	7.7	12	1.5	4.5
Large-sized paintings that are hang in public places	55	4.0	15.7	128	15.8	48.1
Public announcement (speakers)	272	20.0	77.5	165	20.4	62.0
Agricultural extension officers directly disseminate the advisories	156	11.5	44.4	99	12.2	37.2
The village heads directly disseminate the news	194	14.3	55.3	90	11.1	33.8
Representatives of farmers' unions/commune/village women's unions directly disseminated	148	10.9	42.2	122	15.0	45.9

Phone messages	182	13.4	51.9	19	2.3	7.1
Others	1	0.1	0.3	0	0.0	0.0
Total response	1,361	100		811	100	

Source: Endline survey

2.5 Project's Impact and Sustainability

Project impacts are observed at different levels: individual, community, organizational, and institutional level. In general, impacts at the individual and community levels are proven more than those at the institutional and institutional levels.

At the individual level, two significant impacts generated by the Project have been the development of the leadership for VSLAs group (deputy) leaders and capacity building for officials of local state agencies and mass organizations. Although not all VSLA team leaders and deputy leaders have become competent community leaders, and not all local officials after building their capacity will continue to work in their current positions, what is undeniable is that the Project has dramatically enhanced the leadership and expertise of many of them. The higher capacity of VSLA team leaders is expected to contribute to the change in gender equality in the locality in the long-run. While the change in the capacity of the officers of local organizations/agencies will help improve agricultural services in general and the weather information services in particular in the long term.

"Before, standing in front of a crowd was shaking. Since joining the Project, I have attended meetings and training quite often. After that, I did the training again for my VSLA team so I also became more and more confident. My presentation skills are also much better. I highly appreciated the training courses delivered by the Project because I not only absorbed new knowledge introduced by the DARD's officer but also shared my experiences with other VSLA team leaders. This learning has changed me a lot, helping me become a more active actor in my community."

(IDI, a VSLA leader, Trung Dong Commune, Lai Chau Province)

"Since becoming the VSLA team leader, I feel much more confident. After attending many training courses organized by the Project, I became more and more proactive in community activities. When I have gained new knowledge, I guide/train the group members again. I also joined the community facilitator group established by CCD in the project communes, so I was regularly involved in technical discussions with the working group to develop weather bulletins and agricultural recommendations. These experiences give me confidence when instructing EM women on how to compost manure, how often to visit rice fields, and how to stop using growth stimulants. I found myself trusted by VSLA team members and they followed my technical instructions. This is a great encouragement for me to continue leading VSLA in the future."

(IDI, a VSLA Team Leader, Muong Phang Commune, Dien Bien)

At community level, the significant impact is forming people's habit of "using weather forecast information to adjust agricultural activities, thereby increasing their climate resilience. At the same time, the EM women's confidence in agricultural cultivation activities has gradually changed the prevailing stereotypes about gender roles among community members. These impacts are shared by many interviewees, and below are some examples:

“Farmers used to not have the habit of recording agricultural production materials nor monitoring their farms closely. However, after participating in the InfoAct Project, it can be observed that up to 40 percent of farmers paid attention to regular monitoring of their household's farming activities, and up to 20 percent of farmers took careful notes. Some people who are literate and more interested in farming activities have taken notes, while the rest of the people are verbally communicating with each other to learn farming techniques according to each weather condition. Of course, these rates are my subjective estimates of my interactions with people. The remaining 60 percent of farmers are already in the habit of updating themselves with weather forecasts. Sending weather advisories which provide customized instructions for early or late sowing rice fields helps people get the right care for their household's rice fields. I can observe that farmers have got into the habit that whenever they receive advisories, they check the status of their rice fields and apply the recommendations.”

(IDI, agricultural extension officer, Dien Bien district, Dien Bien province)

“As a member of the local implementing partner located in Dien Bien Province, I am proud that the project has created a change in the attitudes of community members who have become more interested in using weather information in their agricultural production. When visiting households, I heard people say, “Thanks to the weather bulletins, I didn't harvest rice yesterday. Otherwise, my rice will be spoiled.” Farmers now know how to use weather information to make decisions about their crops, they know the right time to spray pesticides. In the past, the villagers relied only on their own experience to decide on agricultural practices, but now they are starting to know how to observe the phenomena that appear on crops in each weather condition, and then talk with the village chief, village, agricultural staff to know how to apply measures to protect crops appropriately. They also became much more confident when discussing topics related to agricultural production in village meetings and VSLA group meetings. People highly appreciate learning and exchanging production experiences with agricultural experts that the Project sent to them. In particular, EM women have become much more confident when they master farming techniques and know how to cope with different weather conditions. This contributes to changing stereotypes about gender roles in the family and communities. In the past, the common norm was that women were only good at housework and not good at farming techniques. These stereotypes are gradually changing as an impact of the Project.”

(IDI, a CCD representative, Dien Bien province)

At organizational, and institutional levels, some key challenges were discovered that prevented the Project's impact from being generated. Particularly:

It will be difficult to maintain the Working Group, a key mechanism in providing agricultural information services established by the Project, to continue to provide weekly or ten-day weather forecasts and agricultural advice as it is now. Although many members said they would continue to use the knowledge acquired by the Project in developing the seasonal newsletters which are produced every six-month, the related provincial state agencies (DARD and Hydrometeorology Centers) have not yet made a decision on the mechanism to maintain the working group. It is almost certain that the working group will cease to function after the Project ends. While some members of the working group will retire shortly or change their jobs, the Project has not developed knowledge products as a knowledge transferring mechanism to maintain its capacity building impacts.

“The actual implementation of the project was too short for people to really be able to interpret weather data from different sources into appropriate agricultural behaviors. This means that it is

still necessary to maintain the operation of the working group and the community facilitator group for a few more years. At present, even the community facilitators are not fully competent to operate independently, that is, they cannot guide the villagers without the coaching/mentoring of the working group. When the Project ends, the Commune People's Committee will not have the budget to print the three-month weather bulletins, nor the budget to support the facilitator group in their information dissemination. I would say the impacts of the Project are still in their infancy and need to be consolidated. But unfortunately the project has ended.”

(IDI, a representative from Commune VWU, Ang Cang Commune, Muong Ang District, Dien Bien Province)

The use of weather data provided by the 15 gauges installed by the Project will not be integrated with the routine operation of the Provincial Hydrometeorological Centres. This data will not be exploited by agricultural/extensive staff to develop agricultural advisories. This means data-provided by gauge mining will totally depend on the ability of villagers who are not yet fully proficient to interpret the data.

The Project's mechanism of paying for Provincial MET stations to provide data for taskforce to build agri-bulletins is also a challenge that makes taskforce's operation impossible to maintain when the Project's funding stops, while the Provincial People's Committee has not committed. provide funding to replace the Project's budget.

To ensure the **project's sustainability**, CARE has already prepared for project sustainability as recommended in the MTR report for “*discussion for maintaining the Working Group model*” and “*mobilization of budget for MET services*”. The report on *Capacity, financial and legal challenges and solutions for documenting and scaling up the Climate Information Access Model* prepared for CARE by an independent consultant in April 2020 shows the intention for the project sustainability preparation. The report has identified and analyzed related challenges then also come up with relevant solutions to prepare for a manual on climate information access model that is expected to be institutionalized at various administrative levels and also be mainstreamed into socio-economic development plans of those levels.

However, there are both opportunities and obstacles for the project sustainability. The opportunities can be seen that all related stakeholders highly appreciate the results of the projects and they confirmed that the agri-weather bulletins are a needed and suitable product for local farmers. The agri-weather bulletins should be maintained and also expanded to other villages/communes. It is recommended that a key actor should be assigned to be in charge of this activity in districts/provinces. The Agricultural Services Center (ASCs) is recommended as the right actor with suitable mandate and capacity for continuation of the agri-weather bulletins. It may be useful to consider if ag extension services can be bundled together with agri-advisories, so that farmers are not only getting advisories but also other associated support for changing practices. This can be achieved if the provincial governments have officially assigned decisions to DARDs and the ASCs. The obstacle is that MET stations are not under the management of provincial governments and by law they are service providers under management of MONRE. Therefore, the provincial governments have to arrange an annual budget for this service when they need MET data as input for agri-weather bulletins as the project is doing. By the conclusion of this project, the provincial governments have shown no such commitments. It is shared from the conversations with MET representatives in both provinces of Lai Chau and Dien Bien that they strongly believe the cost for MET data service is manageable and they are willing to support if the provincial governments would like to do so.

CHAPTER 3: CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusions

The final evaluation, conducted by an independent team of evaluators, has reached the following conclusions:

Project's outreach: The project targets 10,450 direct beneficiaries (equivalent to 5,000 households). The project's intensive climate resilience interventions appear to be limited to VSLA members who are considered as the project's primary beneficiaries. By the end of the project's life, the project's MEL system records only 2,099 households who have directly participated and benefited in project activities. It can be concluded that the project's outreach to its direct beneficiaries is much lower than planned. However, more than 9,370 households (equivalent to nearly 46,000 villagers) in eight project-communes have indirectly benefited from the project activities to some extent.

Project's Relevance: The project is highly relevant to the Vietnamese government's approach to building resilience to climate change, particularly for the agricultural sector. This project is also in line with CARE International's approach on Increasing Resilience as stated in the CARE Guidance Note. The relevance was also confirmed from interviews with relevant stakeholders, such as representatives of MET stations, agricultural departments and farmers, in Dien Bien and Lai Chau provinces.

Project's Effectiveness: Overall, project's effectiveness is moderate. Neither of the two targets for measuring the project's Specific Objective/Outcome were achieved in both scale and absolute numbers. The project aimed at enabling 3,500 households (70 percent of 5,000 targeted households) to have increased their climate resilience based on improved access to and use of climate information, and resources and only 63.9 percent of the 2099 households (equivalent to 1341 households) is the actual achievement. Out of the five outputs/results of the Project, only Output 1 related to fully enhanced capacity of service provider and users to produce and to interpret and apply climate information was achieved, i.e. all indicators met the targets. Output 2 that aims for the increased access to relevant and actionable climate information among ethnic minority women and men was not achieved. Only one of the three indicators measuring this output is partly delivered compared to the plan. Similarly, Output 3 aiming for the improved social protection and climate risk insurance coverage for ethnic minority households through VSLA was not achieved because the project failed to deliver two targets. Even so, VSLA is considered a good social protection mechanism to its members and highly appreciated by the EM women. The output 4 related to Institutionalization of climate information solution and climate risk micro-insurance system was partly achieved. One of three targets planned to measure the level of achievement of this result was fully delivered. The second target related to the institutionalization of Agro-climate information services and actionable advisories at provincial level has been done. The third target to integrate the project's policy recommendations in the National Framework on Climate Information Services has solid basics to be achieved in the near future. Finally, the Output 5 targeting increased capacity of local partners to develop understanding downscaled climate information and advisories and supporting local farmers in articulating their climate information demand towards local beyond project duration has been partially achieved. One target measuring Output 5 has been outperformed while the other was not delivered.

Project's efficiency: Overall, moderate achievement of the project's targets implies that the project has not applied a value-for-money approach. Remarkably, project's management has taken the Mid-term Report's recommendations and actions have been implemented to increase the men's participation in the project, deliver advanced training in farming techniques for the targeted groups; and to improve the project's monitoring and work closely with IMHEN in the policy advocacy at national and provincial levels. Project's management is marked with flexibility. The decision to invest 15 mini weather monitoring stations and provide 25 million for each VSLA group as COVID-impact recovery fund are two good examples.

Project impacts are observed at different levels (individual, community, organizational, and institutional level). In general, impacts at the individual and community levels are proven more than those at the institutional and institutional levels. At the individual level, two significant impacts generated by the Project have been the development of the leadership for VSLAs group (deputy) leaders and capacity building for officials of local state agencies and mass organizations. At the community level, the significant impact is forming people's habit of "using weather forecast information to adjust agricultural activities, thereby increasing their climate resilience. The EM women's confidence in agricultural cultivation activities has gradually changed the prevailing stereotypes about gender roles among community members, also. At organizational, and institutional levels, some key challenges were discovered that prevented the Project's impact from being generated. Particularly, it will be difficult to maintain the working group, a key mechanism in providing agricultural information services established by the Project; The use of weather data provided by the 15 gauges installed by the Project will not be integrated with the routine operation of the Provincial Hydrometeorological Centres nor exploited by agricultural/extension staff to develop agricultural advisories.

To ensure the project's sustainability, CARE has already prepared for project sustainability as recommended in the MTR. However, there are both opportunities and obstacles for the project sustainability. The opportunities can be seen that all related stakeholders highly appreciate the results of the projects and they confirmed that the agri-weather bulletins are a needed and suitable product for local farmers. The obstacle is that MET stations are not under the management of provincial governments and by law they are service providers under management of MONRE. Therefore, the provincial governments have to arrange an annual budget for this service when they need MET data as input for agri-weather bulletins as the project is doing. By the conclusion of this project, the provincial governments have shown no such commitments.

3.2 Recommendations

Recommendation (1) on project design: Design similar projects in the future to consider:

- An examination of causal relationships between the provision of climate information services and changes in crop yield should be carried out comprehensively. Many controlling factors need to be included in the theory of change, including: plant varieties, soil quality, farmers' technical capacity, and irrigation conditions in the project area. These factors all have a strong causality relationship with increased productivity. Without controlling them, the provision of climate information services will not be the means to produce the effects of changing productivity. The tests presented in Annex 2 indicate that correlation between climate information services and productivity gains or reductions in input costs cannot be concluded.
- The project should not select two potentially conflicting indicators to measure the outputs, namely (1) reduction in input costs and (2) increase in crop yield. These two indicators are not relevant when spending on agricultural inputs is falling below the minimum required for maximum crop yields.

Recommendation (2) on risk management: The project needs to perform more efficiently and more often the assessment of risks, and the re-examination of the theory of change. Important risks such as price fluctuations with cash-crop (coffee and tea) directly affect farmers' decisions about spending on agricultural inputs, which in turn, directly affect cash-crop yields. The project witnessed a large price volatility with coffee in the early years of the project, and the practices of coffee farmers were affected directly and immediately. Many farmers have stopped caring for coffee farms, which means they did not have any interest in accessing climate information services.

Recommendation (3) on knowledge product development: As discussed in Section 2.4, the Project should have had an investment budget for building knowledge products to be delivered to local state agencies. This helps to ensure that individual competencies are transformed into organizational competencies. The project has spent considerable amounts on capacity building of working group members and community facilitators and these training activities should be systematically documented for future users. In addition, the Project could have developed products such as the Seasonal Handbook which summarizes all the three-month agricultural newsletters that have been produced by the Project. This handbook is printed in A4 or A5 size for future reference by VSLA groups and villagers.

Recommendation (4) on microfinance mechanism: The selection of food crops and livestock on a small scale (less than 10 cattle/household) for testing the micro-finance mechanism may not be appropriate. Farmers will be less concerned about damage to their food crops and small numbers of livestock and poultry. They will be more interested in ensuring crops that provide a significant source of income for their families or large herds. Raising people's awareness about the micro-finance mechanism needs to be done with more intensity. The assessment of farmers' readiness also needs to be re-evaluated before implementing the micro-finance mechanism in a new location or in a future project.

Recommendation (5) on Project's adaptation in its approach: During the implementation of the Project, there was a change in the organizational structure in the agricultural sector management, specifically, the agricultural service centers came into operation through the merger of the agricultural extension centers and veterinary or plant protection centers. The project should also undertake an impact assessment of this organizational change project to include appropriate actions in its exit strategy. More specifically, the role of

the Agricultural Service Center after the end of the Project also needs to be determined timelier because this affects the project's sustainability. Similarly, the transfer of gauze to local authorities is also recommended to ensure the future optimal exploitation and maintenance.

ANNEX 1: RESULT FRAME

Overall objective (Impact): Enhanced livelihoods and increased resilience to the effects of climate change and variability of poor ethnic minority women and men in rural areas

Specific objective (Outcome) #Ethnic minority households in rural areas have increased their climate resilience based on improved access to and use of climate information, and resources	Indicators (evtl. zzgl. Mengengerüst)		
	Baseline value (quantitative & qualitative)	Target value (quantitative & qualitative)	Endline (quantitative & qualitative)
	The number of poor people (10,450) and households being able to improve their climate resilience based on the use of climate information and resources is low.	3,500 households (70% of 5,000 targeted households) have increased their climate resilience based on improved access to and use of climate information, and resources	63.9% of the 2099 individuals (1341 individuals) <i>(The target has not been achieved)</i>
	The availability of targeted climate information, and capacity to make use of it effectively is low, resulting in insufficient inclusion of it in effective decision-making when it comes to taking steps to build climate resilience.	8 cases of evidence that climate data has been collected, analyzed and applied to decision-making for improved climate resilience ⁶	6 cases evidence that climate data has been collected, analyzed and applied to decision-making for improved climate resilience (MEL framework)

Results (Output)	Indikatoren (evtl. zzgl. Mengengerüst)			
	Baseline value	Target value	Value achieved so far	
			Midline	Endline
1. Strengthened capacity of	The quality of the downscaled forecast and	16 downscaled forecast and actionable	Number of seasonal downscaled forecasts and actionable advisories: 14	Number of seasonal downscaled forecasts and actionable advisories: 39

⁶ Adapted from the Green Climate Fund's initial results measurement framework

service provider and users to produce and to interpret and apply climate information	actionable advisories produced by Hydro-Meteorology Station and DARD are very poor and not suitable for the target group.	advisories are produced by Hydro-Meteorology Station and DARD	Number of seasonal downscaled forecasts and actionable advisories (3-month and Cultivation calendar): 71	Number of seasonal downscaled forecasts and actionable advisories (3-month and Cultivation calendar): 280
	Most of the service providers (Hydro-Meteorology Station and DARD) are having difficulties to interpret forecasts and with that information to produce actionable advisories	75 % targeted staff of the service providers (Hydro-Meteorology Station and DARD) are able to interpret forecasts to produce actionable advisories	Dien Bien: 100% (10/10) task force (staff from Hydro-Meteorology Station, DARD, Department of Agriculture, Extension officers at district level and CCD) are able to interpret forecasts to produce actionable advisories. The Hydro-Meteorology Station provides weekly forecast and guides team members to interpret the information. Based on meteorological forecasting information, agricultural staff and extension officers giving production advisories. Following that, all members compose their forecasts based on technical information which have discussed and agreed. Drafts from each member are shared via Zalo group chat. The most concise and understandable forecast will share with the community.	Dien Bien/Lai Chau: 100% task force are able to interpret forecasts to produce actionable advisories.
2. Increased access to relevant and actionable climate information among ethnic	Currently ethnic minority women and men are receiving only few information and advisories that they can use for their agricultural	At least 70% of 10,450 targeted ethnic minority women and men who received the information and advisories understand and	40% of 10,450 targeted ethnic minority women and men who received the information and advisories understand and apply in their agricultural work	63,5% of the 2,099 households (8,396 individuals) have increased their climate resilience based on improved access to and use of climate

minority women and men	work, which improves the risk of losses	apply in their agricultural work		information, and resources.
	During weather disasters, many of the targeted communities suffer from severe crops losses (30%) due to the lack of relevant information. With the increased access to relevant and actionable information crops losses should be reduced and the productivity even increased. The average annual rice yield is 50 t/ha	10% increase in productivity and/or reduced main crops loss in targeted communities	N/A at this stage of the project	Increase in productivity Lai Chau (rice): 47% Lai Chau (tea): 133% Dien Bien (rice): 42% Dien Bien (coffee): 9%
	Expenditures on inputs for the main crops are very high and the income out of the yield are hardly covering these costs. Currently advisories are not given to the people on alternative methods.	At least 80% targeted ethnic minority women and men from 5,000 households reported reduction in expenditure on inputs for the main crops in targeted communities as a result of use of advisories	N/A at this stage of the project	Rice farmers: 23% Coffee farmers: 50.57% Tea farmers: 24.06% And the total beneficiaries: 2099 households <i>Targets have not been achieved</i>
3. Improved social protection and climate risk insurance coverage for ethnic minority households through VSLA	No VSLA member is participating in any micro-insurance scheme	At least 17% of VSLA members (total of 1,875 members) are participating in micro-insurance scheme	Lai Chau: <ul style="list-style-type: none"> By 31 December 2018, there are 30 VSLA groups established in Lai Chau province, with the total of 450 members; (2020) The micro insurance scheme has not set up in Lai Chau; 	Lai Chau: 41 VSLA groups have been operating at the end of ; <ul style="list-style-type: none"> The risk sharing fund for rice has not been set up in Lai Chau; The risk sharing fund for cattle set up in Lai Chau; All members of VSLA are benefiting from

			<p>Dien Bien (2020):</p> <ul style="list-style-type: none"> • 550 VSLA members participated in a risk sharing fund for rice. • 95 members participated in a risk sharing fund for cattle (buffaloes/cows) 	<p>the post-covid recovery fund (VND 25,000,000 per VSLA group)</p> <p>Dien Bien: 60 VLSA</p> <ul style="list-style-type: none"> • The risk sharing fund for rice ended by the end of 2020; • The risk sharing fund for cattle ended by the end of 2020;
	No VSLA member knows about micro insurance and benefits from microcredits in case of natural disasters	80% of VSLA members participated in micro-insurance report that recognizing value in micro-insurance scheme	The inductions of micro-insurance activities were preliminarily organized in all project's villages; however, the implementation of this activity has not yet started in the field, the consultant is currently developing the tools and guidelines for its operation.	<p>Lai Chau: The launch of risk sharing fund took place in November 2021 (without radical/significant modifications from what had been implemented in Dien Bien)</p> <p>Dien Bien: the risk sharing funds have been stopped by end of 2020 for different reasons, of which the main one is that the participants do not see the benefits of such funds.</p> <p>However, 98.2 percent of VSLA members who participated in a risk sharing fund reported they recognize value in a risk sharing fund.</p>
4. Improved coordination mechanism for climate information and climate risk micro-insurance system	The coordination mechanism (dissemination and feedback mechanism) between forecast Hydro-Meteorology stations of DONRE and DARD are very	The taskforce members are producing improved advisories and are better coordinated between DARD and DONRE	<p>Dien Bien and Lai Chau:</p> <ul style="list-style-type: none"> - The task force set up a coordination mechanism to produce a flexible forecast via Zalo and email. All members jointly produced a draft appropriate for the community. - Regular information exchange mechanism via 	Dien Bien and Lai Chau: Same as at baseline

local authorities beyond project duration	<p>basic capacity to understand weather forecast and how it is being translated to advisories based on the needs of men and women farmers. However, capacity to identify innovative communication solutions, supporting farmers to raise their voice to get financial and technical investment from Government and private sectors needs to be built.</p> <p>Currently Lai Chau Women's Union lacks basic knowledge about weather forecasts and advisories. Capacity also needs to be built to integrate climate service in their own agenda as well as in supporting women raising their voice to local authority to demand for user driven climate services.</p>	<p>Lai Chau Women's Union documents women's climate information needs and integrates climate information in their own agenda (meeting agenda, minutes of meetings).</p> <p>Capacity self-assessments of DARD, CCD and WU during end line evaluation</p>		<p>Lai Chau Women's Union are not integrating climate information needs and integrate climate information in their own agenda except the implementation of the plan of natural disaster as instructed by the Provincial People Committee (as business as usual)</p>
---	--	---	--	---

ANNEX 2: HYPOTHESIS TEST

1. Lai Chau Province

1.1. Hypothesis test 1: Applying the recommendations/advisories will increase the yield of the crop Rice

```
sum nslua
```

Variable	Obs	Mean	Std. Dev.	Min	Max
-----+-----					
nslua	265	54.97951	76.679	2.4	1200

```
. ttest nslua, by (apdung)
```

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
-----+-----						
Co ap du	217	55.99796	5.49621	80.96422	45.16489	66.83103
Khong ap	29	40.47028	2.802035	15.08942	34.73057	46.20999
-----+-----						
combined	246	54.16747	4.868382	76.35758	44.57824	63.75669
-----+-----						
diff		15.52768	15.09522		-14.20588	45.26125
-----+-----						
diff = mean(Co ap du) - mean(Khong ap)					t =	1.0286
Ho: diff = 0				degrees of freedom =	244	
-----+-----						
Ha: diff < 0		Ha: diff != 0			Ha: diff > 0	
Pr(T < t) = 0.8477		Pr(T > t) = 0.3047			Pr(T > t) = 0.1523	

Testing the average value of rice yield (calculated by production) did not have a statistically significant difference between the households applying and not applying the agricultural recommendations/advisories.

* Test the correlation between rice yield and the application of recommendations/advisories

```
pwcorr nslua apdung, sig
```

	nslua	apdung
nslua	1.0000	
apdung	-0.0657	1.0000
	0.3047	

There is no statistically significant correlation between rice yield (in kind) and recommendation application

- ttest nslua_m, by (apdung)

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
-----+						
Co ap du	217	4.766744	.4738308	6.979964	3.83282	5.700668
Khong ap	29	2.934931	.2031706	1.094107	2.518755	3.351107
-----+						
combined	246	4.550799	.4202217	6.590919	3.723091	5.378507
-----+						
diff		1.831813	1.300512		-.7298495	4.393476

diff = mean(Co ap du) - mean(Khong ap)					t =	1.4085
Ho: diff = 0			degrees of freedom = 244			
Ha: diff < 0		Ha: diff != 0		Ha: diff > 0		
Pr(T < t) = 0.9199		Pr(T > t) = 0.1602		Pr(T > t) = 0.0801		

There is a statistically significant (greater) difference (greater than 10 percent) between the households applying and not applying the agricultural recommendations.

. sum nslua_m

Variable	Obs	Mean	Std. Dev.	Min	Max
nslua_m	265	4.549966	6.476348	.158	78

```
pwcorr nslua_m apdung, sig
```

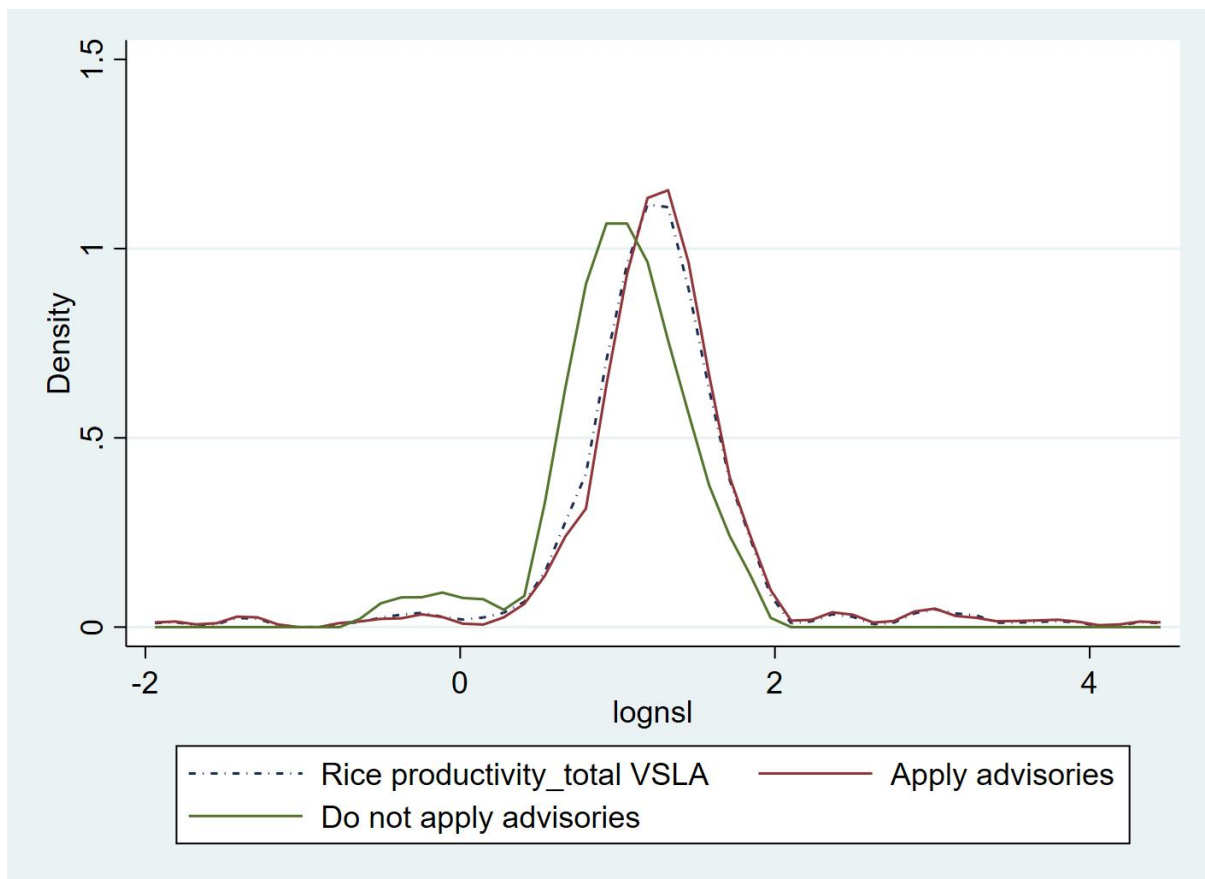
```

      |  nslua_m  apdung
-----+-----
nslua_m |  1.0000
      |
      |
apdung  | -0.0898  1.0000
      |  0.1602

```

Testing the correlation between rice yield (in monetary terms) and the application of the 10-day newsletter recommendation/season is also not statistically significant.

Kernel Density



The Kernel density shows the distributions of (log) rice productivity for the three group (1) total VSLA members in Lai Chau who grow rice respectively, (2) for group of VSLA members who applied 10 days/3-month advisories, and (3) for group of VSLA members who did not apply. The distribution of VSLA members,

who applied is shifted to the right significantly, implying that in Lai Chau provinces, VSLA members who apply 10 days/3-month advisories on average growing rice with higher productivity than those who did not apply 10 days/3-month advisories (the same with t test)

* Tea

```
* sum nsche nsche_m
```

Variable	Obs	Mean	Std. Dev.	Min	Max
-----+-----					
nsche	144	103.4817	189.7995	0	1350
nsche_m	138	5.217583	9.66675	.0045	74.25

- pwcorr nsche apdung, sig

		nsche	apdung
-----+-----			
nsche	1.0000		
apdung	0.0374	1.0000	
		0.6653	

- pwcorr nsche_m apdung, sig

		nsche_m	apdung
-----+-----			
nsche_m	1.0000		
apdung	0.0308	1.0000	
		0.7277	

The correlation test between tea yield and the application of the 10-day newsletter recommendation/season is also not statistically significant.

- ttest nsche_m, by (apdung)

Two-sample t test with equal variances

```

-----
      Group |      Obs      Mean      Std. Err.      Std. Dev.      [95% Conf. Interval]
-----+-----
Co ap du |      113      4.901599      .8621462      9.164739      3.193367      6.609831
Khong ap |       17      5.747043      2.499058      10.30388      .4492766      11.04481
-----+-----
combined |      130      5.012157      .8141722      9.282991      3.401297      6.623017
-----+-----
      diff |           -.8454446      2.423145              -5.640051      3.949162
-----

      diff = mean(Co ap du) - mean(Khong ap)              t =   -0.3489
Ho: diff = 0              degrees of freedom =           128

      Ha: diff < 0              Ha: diff != 0              Ha: diff > 0
Pr(T < t) = 0.3639      Pr(|T| > |t|) = 0.7277      Pr(T > t) = 0.6361

```

- ttest nsche, by (apdung)

Two-sample t test with equal variances

```

-----
      Group |      Obs      Mean      Std. Err.      Std. Dev.      [95% Conf. Interval]
-----+-----
Co ap du |      119      96.93653      16.43507      179.2855      64.39061      129.4824
Khong ap |       17      117.4709      49.89206      205.7102      11.70443      223.2373
-----+-----
combined |      136      99.50332      15.61423      182.0917      68.62317      130.3835
-----+-----
      diff |           -20.53434      47.35563              -114.1955      73.12685
-----

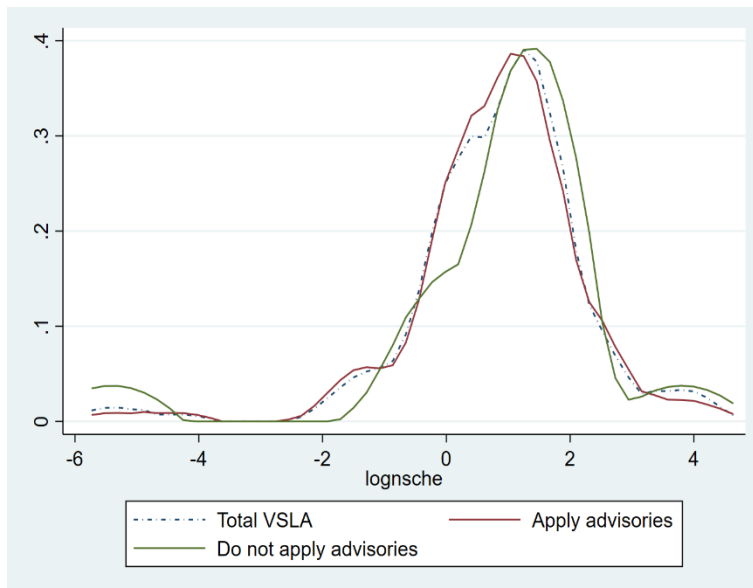
      diff = mean(Co ap du) - mean(Khong ap)              t =   -0.4336
Ho: diff = 0              degrees of freedom =           134

      Ha: diff < 0              Ha: diff != 0              Ha: diff > 0
Pr(T < t) = 0.3326      Pr(|T| > |t|) = 0.6653      Pr(T > t) = 0.6674

```

There is no statistically significant difference between the households applying and not applying the agricultural recommendations.

Kernel Density



The Kernel density demonstrates the distributions of (log) tea productivity for three groups: (1) the total VSLA members who grow tea in Lai Chau, (2) for those who applied weekly/3-month advisories, and (3) for those who did not apply. The distribution of VSLA members who applied is shifted to the left implying that they have lower productivity than those who did not apply weekly/3-month advisories.

1.2 Test Hypothesis 2: Applying the recommendation will reduce input costs

- `tab q11a apdung, col chi2 (Đầu vào tính cả giống)`

```

+-----+
| Key          |
+-----+
| frequency    |
| column percentage |
+-----+

RECODE (LUA - Luong | RECODE (Ap dung ban
      vat tu NN su dung | tin 10 ngay/mua vu)
      trong nam qua) | Co ap dun  Không ap  |      Total
-----+-----+-----+
Không giam/Không biet |      171      25 |      196

```


		78.80	86.21		79.67
-----+-----+-----					
Giam		46	4		50
		21.20	13.79		20.33
-----+-----+-----					
Total		217	29		246
		100.00	100.00		100.00

Pearson chi2(1) = 0.8662 **Pr = 0.352**

- tab q11a1 ap dung, col chi2 (đầu vào ko tính giống)

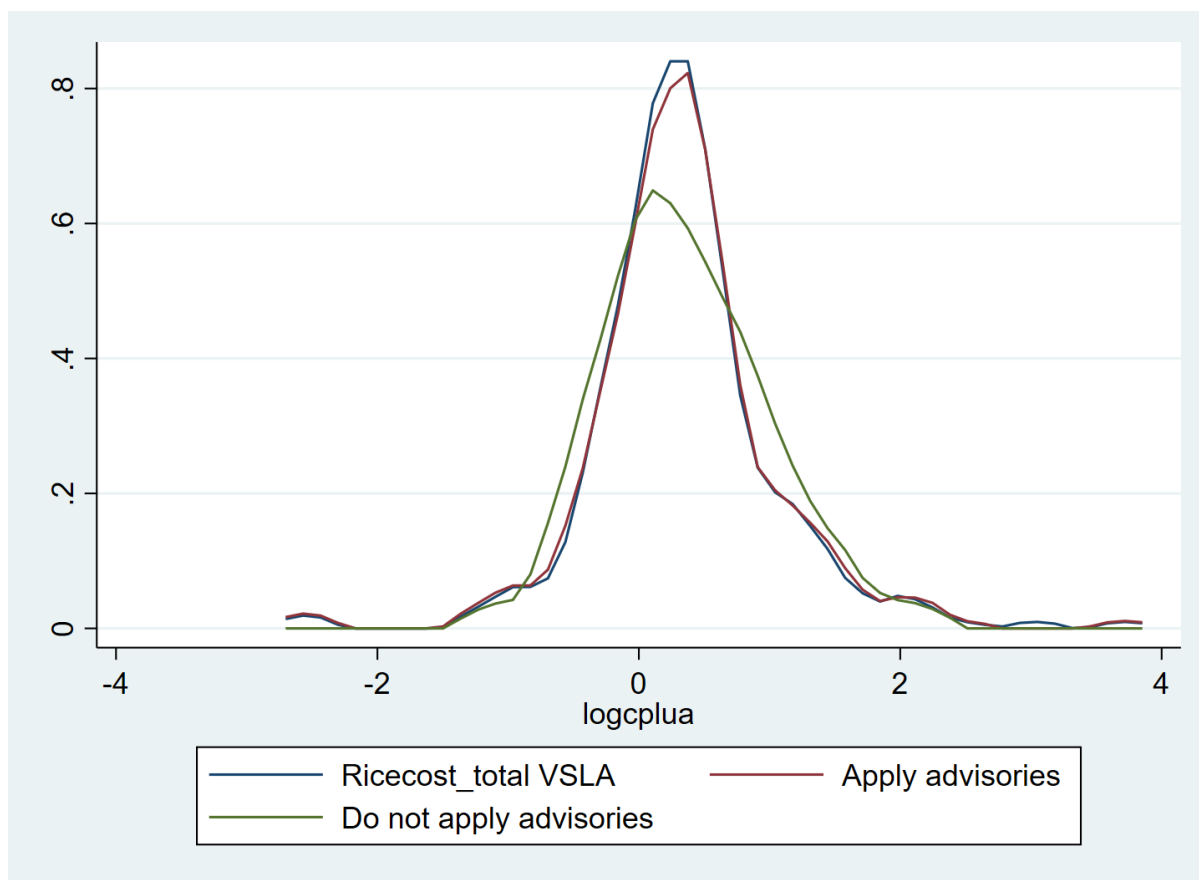
```
+-----+
| Key          |
|-----|
| frequency    |
| column percentage |
+-----+
```

RECODE (LUA - Luong					
vat tu NN su dung RECODE (Ap dung ban					
trong nam qua (Tru tin 10 ngay/mua vu)					
Giong)) Co ap dun Khong ap Total					
-----+-----+-----					
Khong giam/Khong biet		173	25		198
		79.72	86.21		80.49
-----+-----+-----					
Giam		44	4		48
		20.28	13.79		19.51
-----+-----+-----					
Total		217	29		246
		100.00	100.00		100.00

Pearson chi2(1) = 0.6847 **Pr = 0.408**

The relationship between reducing input costs and applying recommendations for Rice is not statistically significant

Kernel with average cost for rice



The Kernel density demonstrates the distributions of (log) rice expenditure/m2 for three groups: (1) the total VSLA members who grow rice in Lai Chau, (2) for those who applied weekly/3-month advisories, and (3) for those who did not apply. The distribution of VSLA members who applied is shifted to the right implying that they have higher expenditure than those who did not apply weekly/3-month advisories. (The results of the qualitative survey show that when applying the recommendation to use more input costs because of the use of seeds, the technical farming method requires the application of pesticides to have a higher yield than with the traditional farming method of the people).

- tab q11b apdung, col chi2 (bao gồm cả giống Chè)

```
+-----+
| Key      |
|-----|
| frequency |
| column percentage |
```

+-----+			
RECODE (CHE - Luong RECODE (Ap dung ban			
vat tu NN su dung tin 10 ngay/mua vu)			
trong nam qua) Co ap dun Khong ap Total			
-----+-----+-----			
Khong giam/Khong biet	86	12	98
	72.27	70.59	72.06
-----+-----+-----			
Giam	33	5	38
	27.73	29.41	27.94
-----+-----+-----			
Total	119	17	136
	100.00	100.00	100.00

Pearson chi2(1) = 0.0209 **Pr = 0.885**

- tab q11b1 apdung, col chi2 (trừ giống)

+-----+			
Key			

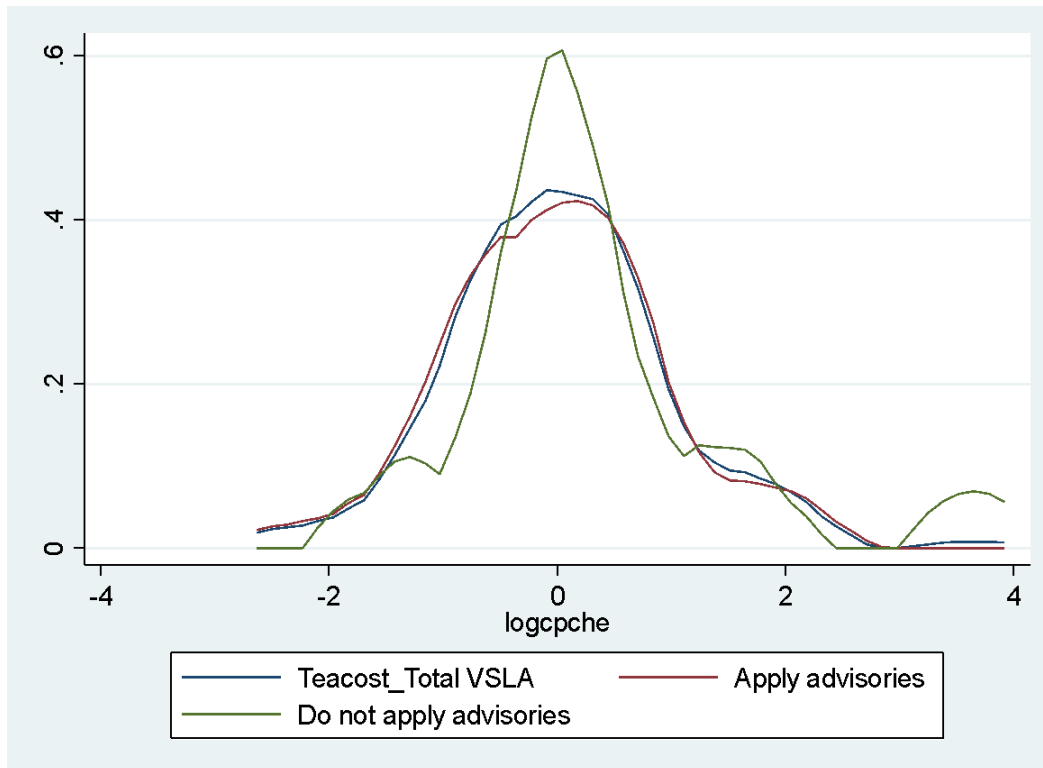
frequency			
column percentage			
+-----+			
RECODE (Chè -			
Luong vat tu NN su RECODE (Ap dung ban			
dung trong nam tin 10 ngay/mua vu)			
qua(Tru Giong)) Co ap dun Khong ap Total			
-----+-----+-----			
Khong giam/Khong biet	87	12	99
	73.11	70.59	72.79
-----+-----+-----			
Giam	32	5	37
	26.89	29.41	27.21
-----+-----+-----			

Total		119	17		136
		100.00	100.00		100.00

Pearson chi2(1) = 0.0477 Pr = 0.827

The relationship between the reduction of input costs and the application of recommendations for Tea is not statistically significant

Kernel with average cost of Tea



The Kernel density demonstrates the distributions of (log) tea expenditure/m2 for three groups: (1) the total VSLA members who grow tea in Lai Chau, (2) for those who applied weekly/3-month advisories, and (3) for those who did not apply. The distribution of VSLA members who applied shows that in average the expenditure/m2 is shifted to the right implying that they have higher than those who did not apply weekly/3-month advisories, however for group which has expenditure below the average, the expenditure of VSLA member who applied advisories seem to be lower than who not applied.

2. Dien Bien Province

2.1. Test Hypothesis 1: Applying the recommendations/advisories will increase the yield of the crop

In the case of Dien Bien, 100% of coffee growers apply the recommendations, so there is no comparison between those who apply and do not apply to coffee.

```
ttest nslua, by (apdung)
```

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
Co ap du	263	78.60136	2.82272	45.77683	73.04326	84.15947
Khong ap	2	112.5	62.5	88.38835	-681.6378	906.6378
combined	265	78.8572	2.82701	46.02038	73.29085	84.42356
diff		-33.89864	32.66004		-98.20708	30.4098

```
diff = mean(Co ap du) - mean(Khong ap)          t = -1.0379
Ho: diff = 0                                     degrees of freedom = 263
```

```
Ha: diff < 0           Ha: diff != 0           Ha: diff > 0
Pr(T < t) = 0.1501      Pr(|T| > |t|) = 0.3003      Pr(T > t) = 0.8499
```

```
. ttest nslua_m, by (apdung)
```

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
Co ap du	263	11.02911	1.000578	16.22665	9.058907	12.9993
Khong ap	2	7.3125	4.0625	5.745243	-44.30646	58.93146
combined	265	11.00106	.9934473	16.17215	9.044967	12.95714
diff		3.716605	11.49835		-18.92394	26.35715

```
diff = mean(Co ap du) - mean(Khong ap)          t = 0.3232
Ho: diff = 0                                     degrees of freedom = 263
```

```
Ha: diff < 0           Ha: diff != 0           Ha: diff > 0
```

$\Pr(T < t) = 0.6266$

$\Pr(|T| > |t|) = 0.7468$

$\Pr(T > t) = 0.3734$

Testing the average value of rice yield in Dien Bien (both in terms of money and output) did not have a statistically significant difference between the households applying and not applying the agricultural recommendations.

```
. pwcorr nslua apdung, sig
```

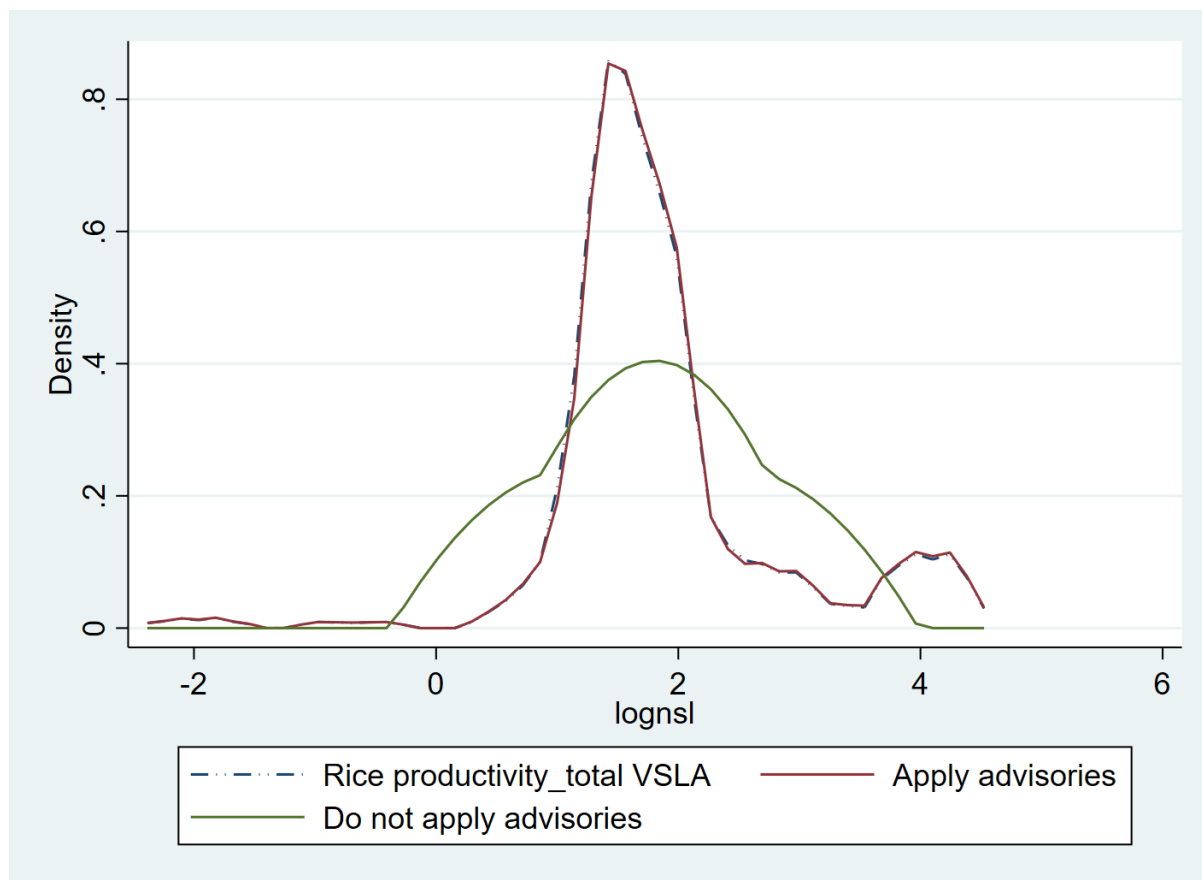
	nslua	apdung
nslua	1.0000	
apdung	0.0639	1.0000

```
. pwcorr nslua_m apdung, sig
```

	nslua_m	apdung
nslua_m	1.0000	
apdung	-0.0199	1.0000

The correlation test between the application of recommendations and rice yield (both in cash and in kind) shows no statistically significant correlation.

Kernel density of rice



The Kernel density shows the distributions of (log) rice productivity for the three group (1) total VSLA members in DienBien who grow rice respectively, (2) for group of VSLA members who applied 10 days/3-month advisories, and (3) for group of VSLA members who did not apply. The distribution of VSLA members, who applied and not apply base on this figure implying that in Dien Bien provinces, VSLA members who apply 10 days/3-month advisories on average growing rice with quite similar productivity with those who did not apply 10 days/3-month advisories, however with who did not apply, the fluctuation of the productivity is larger than who apply 10 days/3-month advisories.

2.2 Test Hypothesis 2: application of recommendations will reduce input costs

```
tab q11a apdung, col chi2
```

```
+-----+
| Key      |
|-----|
| frequency |
| column percentage |
+-----+
```

```

RECODE (LUA - Luong | RECODE (Ap dung ban
vat tu NN su dung | tin tuan/mua vu)
trong nam qua) | Co ap dun  Khong ap  |      Total
-----+-----+-----
Khong giam/Khong biet |      191      2 |      193
|      72.62     66.67 |      72.56
-----+-----+-----
Giam |      72      1 |      73
|      27.38     33.33 |      27.44
-----+-----+-----
Total |      263      3 |      266
|      100.00    100.00 |      100.00

```

Pearson chi2(1) = 0.0529 **Pr = 0.818**

```
. tab ql1a1 apdung, col chi2
```

```

+-----+
| Key          |
|-----|
| frequency    |
| column percentage |
+-----+

RECODE (LUA - Luong |
vat tu NN su dung | RECODE (Ap dung ban
trong nam qua (Tru | tin tuan/mua vu)
Giong)) | Co ap dun  Khong ap  |      Total
-----+-----+-----
Khong giam/Khong biet |      195      2 |      197
|      74.14     66.67 |      74.06
-----+-----+-----
Giam |      68      1 |      69
|      25.86     33.33 |      25.94
-----+-----+-----

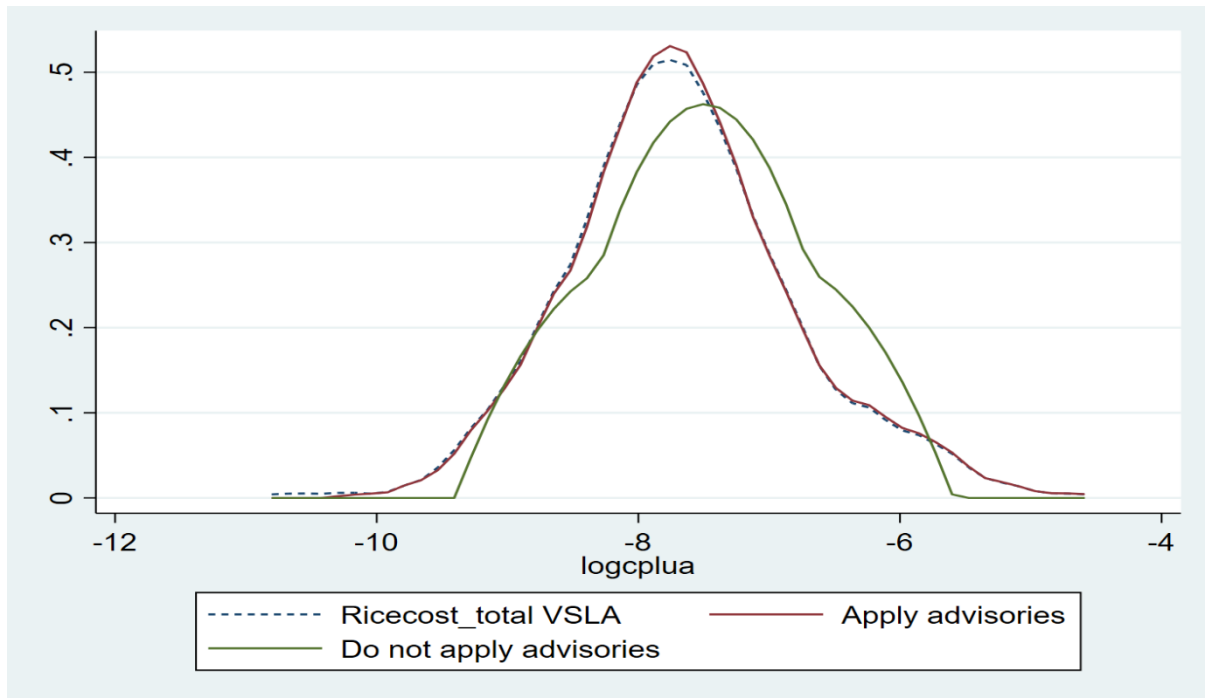
```


Total		263	3		266
		100.00	100.00		100.00

Pearson chi2(1) = 0.0863 Pr = 0.769

The relationship between reducing input costs and applying recommendations to rice is not statistically significant

Kernel with average cost for rice



The Kernel density demonstrates the distributions of (log) rice average cost for three groups: (1) the total VSLA members who grow rice in DienBien, (2) for those who applied weekly/3-month advisories, and (3) for those who did not apply. The distribution of VSLA members who applied is shifted to the left implying that they have lower cost than those who did not apply weekly/3-month advisories.