



FINAL TECHNICAL REPORT

For the project

**Using indigenous knowledge to enhance community resilience to
climate change in the mountainous region of Vietnam**

Reference number: CBA2017-01MY-Ho

Project Leader:	Ho Ngoc Son
Project Collaborator:	Ha Thi Hoa
	Luu Thi Thu Giang
Project Assistant:	Dong Thi Linh Chi

Reporting Date

31/08/2019

Table of Contents

Table of Figures	4
Executive summary	5
I. INTRODUCTION	6
II. PROJECT PROGRESS	8
III. RESULTS ACHIEVED	9
1. Result 1	9
1.1. Activity A. Developing research tool	11
1.2. Activity B. Training Workshop on Research and Use of Indigenous Knowledge in Climate Change Adaptation	11
1.3. Activity C. Testing and finalizing research tool	12
1.4. Activity D. Conducting co-research fieldwork	12
1.5. Activity E. Conducting 02 research grants	14
1.6. Activity F. Data analysis and reporting	15
1.7. Activity K. Personal cost- Project assistant salary	16
1.8. Activity O. Developing a guideline on identification and use of Indigenous knowledge in climate change resilience practices	17
1.9. Activity P. Training Workshop on Indigenous Knowledge guideline	17
1.10. Activity Q. Writing policy brief, leaflets, posters	18
1.11. Activity R. Workshop on Indigenous Knowledge and Agroecology in the context of Climate Change	20
1.12. Activity S. Conducting an Independent review	21
1.13. Activity T. Personal cost- Project assistant salary	23
2. Result 2	23
2.1 Activity D. Conducting co-research fieldwork	25
2.2. Activity E. Conducting 02 research grants	25
2.3. Activity G. Organizing a local workshop to identify resilience practices for piloting	25
2.4. Activity H. Surveying, selecting pilot site/households/area	26
2.5. Activity I. Designing 3 IK based climate change resilience practices	27
2.6. Activity M. Conducting 03 technical trainings for households	28
2.7. Activity N. Monitoring, evaluation and reporting	30
2.8. Activity L. Conducting a mid-term review	31
2.9. Activity S. Conducting an Independent review	32

3. Result 3	32
3.1. Activity O. Developing a guideline on Identification and Use of IK in climate change resilience practices (IK guideline)	33
3.2. Activity P. Conducting training workshop on IK guideline	33
3.3. Activity Q. Writing policy brief, leaflets, posters	33
3.4. Activity R. Workshop on Indigenous Knowledge and Agroecology in the context of Climate Change	33
IV. LEARNING AND SHARING	33
1. Ethical values and Environmental benefits	33
2. Capacity building	34
3. Knowledge sharing and dissemination	34

Table of Figures

Figure 1. Training workshop on Research and Use of Indigenous Knowledge in Climate Change Adaptation	12
Figure 2. Focus group discussion and observation during the co-research fieldwork	13
Figure 3. Grantees conduct interview	15
Figure 4. Covers of the book	17
Figure 5. Training workshop on the use of IK guideline	18
Figure 6. Leaflet	19
Figure 7. Five posters on successful models of using IKs	Error! Bookmark not defined.
Figure 8. Policy brief cover	20
Figure 9. Workshop on Indigenous Knowledge and Agroecology in the context of climate change	21
Figure 10. A local meeting to identifying IK-based models	Error! Bookmark not defined.
Figure 11. Local green mung bean model on arid and dry land	27
Figure 12. Delivering chicken and veterinary medicine for households	28
Figure 13. Khoi Tia intercropping with local banana model	28
Figure 14. Technical training on bi-o safe chicken raising	29
Figure 15. Technical training on integrated pest and disease management for chickens	29
Figure 16. Technical training on banana care and composting microorganism fertilizer	30
Figure 17. Drought-tolerant green bean model	30
Figure 18. Model of Medicinal plants (<i>Ardisia silvestris</i>) intercropped with native bananas	31
Figure 19. Black-boned chicken raising model	31
Figure 20. Local meeting and interview with local people	32
Figure 21. Visiting piloting models	32

Executive summary

The project "**Using indigenous knowledge to enhance community resilience to climate change in the mountainous region of Vietnam**" increases comprehensively the capacity of using Indigenous Knowledge (IK) to enhance community resilience to climate change in the mountainous region of Vietnam. This project contributes to strengthening interactions among development practitioners, scientists and policy makers. This project also recognizes the importance of building resilience to climate change through improved capacity of researchers, development workers and local communities to feed information into policy and decision-making process at both local and central level. The methods used in this action focus mainly on bottom up, grassroots democratic participation and empowerment to increase capacity for different actors. Project was launched in August 2017 and ended on 31 July 2019. All activities were implemented as planned. An independent review and financial audit were carried out to assess the efficiency of the project.

A research tool using for co-research fieldwork was developed and tested. A training workshop on IK research and using IK for climate change adaptation was conducted for 36 participants (early career researchers, members of local NGOs/CSOs, targeted government officials of Bac Kan province, and key local members). A co-research was conducted and its results were used to develop an IK guideline to use as training materials for local government officials and communities, learning materials for university students, and writing manuscripts for publication. Two small research grants were awarded to young researchers to further support their capacity building and to sustain project outcomes. Three IK based resilient practices were piloted and tested to prove its resilience to climate change. Three technical training courses were provided for local participants who take part in model building and implementation. A book "Using indigenous knowledge in agroecological and climate change resilience practices" was developed by ADC and was published by the Agriculture Publishing House. One paper has been accepted for publication while two other papers are under the review. One training workshop on "Using indigenous knowledge in agroecological and climate change resilience practices" was organized for 31 participants. A policy brief, a leaflet and five posters were developed and designed for disseminating the project results. A workshop on "Indigenous knowledge and Agroecology in the context of climate change" was organized with the participation of over 50 people. All project results were shared among participants and facilitated discussions for further learning and application. Expectedly, the project will lead to more dissemination of good indigenous knowledge practices in the field of climate change adaptation.

I. INTRODUCTION

Resilience in the face of change is embedded in indigenous knowledge and know-how, diversified resources and livelihoods, social institutions and networks. Policy responses to climate change should, therefore, support and enhance indigenous and local knowledge strategies. However, local and indigenous knowledge needs to be integrated with science before it can be used in policies, education, and actions related to disaster risk reduction and climate change. Vietnam is one of the most vulnerable countries to climate change in the world. In the northern region of Vietnam, ethnic minorities or indigenous people are identified as the most vulnerable groups. Nonetheless, the capacity of scientists, development workers, and local communities to generate the evidence to convince policy-makers is limited. Therefore, this project supports capacity development of indigenous knowledge research and use in climate change adaptation for early career researchers of the Agriculture and Forestry Research & Development Centre (ADC), Thai Nguyen University of Agriculture and Forestry (TUAF), civil social organizations, and local government officials and local communities. Also, this project contributes to strengthening interactions among scientists and policy makers, and to providing scientific input to policy decision-making and scientific knowledge to civil society and the public.

Objectives of the Proposed Project

Researchers, CSOs, government officials and policy makers increase their capacity to promote indigenous knowledge use in climate change resilience practices. This overall objective is realized through three following and related specific objectives:

Specific objective 1: Early career researchers and NorthNet member organizations increase their capacity of indigenous knowledge research and use in climate change resilience

Agriculture and Forestry Research & Development Centre for Mountainous Region (ADC) is a leading local NGO working under the auspice of the Thai Nguyen University of Agriculture and Forestry (TUAF). TUAF is an education and training center for northern mountainous region of Vietnam. However, early career researchers of TUAF and ADC lack opportunities for training and thus knowledge of IK research and use in climate change adaptation. This project is designed to support key junior researchers of TUAF and ADC to become more knowledgeable and experienced in IK research and use in climate change adaptation. They are trained and participated in a co-research team to improve their knowledge and research skills. They become potential IK researchers who can provide science-based evidence and information for policy making process and discussion about climate change adaptation in Vietnam in the future.

NorthNet was formed in 2011 with 10 key members who were local NGOs working for the right and resource protection of ethnic minority people in northern mountainous region of Vietnam.

ADC is a founding and the current chair of NorthNet. NorthNet has actively contributed to advocating different policies related to ethnic minority people such as Law on Information Access, or Forestry Law. NorthNet members are working with different ethnic groups in different provinces. This makes them become a central role in supporting local communities including using indigenous knowledge for climate change adaptation. However, although development workers have very good skills to work with communities, they lack research skills to provide a more scientific evidence for policy advocacy. As a consequence, they often fail to use their rich field experience convince policy makers during advocacy process. This project creates opportunities for development workers of NorthNet members to participate in training and an action co-research to improve their research knowledge and skills. This project targets NorthNet organizations as key players and beneficiaries, and the NorthNet as a platform for learning and sharing about IK research and use in climate change adaptation.

Specific objective 2: Local communities increase their capacity of indigenous knowledge research and use in climate change resilience agricultural practices

Based on research findings, three IK based climate change resilient livelihood practices are selected through consultation with local communities and government officials to develop for proving its resilience capacity to climate change. ADC works with relevant government agencies and local communities to develop these models and tested in the field. ADC provides technical support for testing these models. The purpose is to pilot and test indigenous knowledge (IK) based climate change resilient agricultural practices for advocacy and scale up.

Specific objective 3: Policy makers and government officials are supportive for indigenous knowledge use in climate change adaptation programs and plans

Although IK play a very important role in climate change adaptation in real life especially in rural communities, the policy makers and government officials lack information and evidence of IK based adaptation practices. As consequence, they tend to see IK as “backward” and thus not recognize IK as one of practical solutions to climate change impacts at local level. This project uses co-research results of IK based adaptation practices of ethnic minority groups as evidence to advocate for using IK in climate change adaptation. The research results are used to share with policy makers, government officials and relevant stakeholders through workshops, meetings and policy briefs.

II. PROJECT PROGRESS

Activities have been implemented throughout two years of project as follows:

No	Activity	Implementing time	Status
A	Activity A. Developing research tool (interview guide and questionnaires)	October 1~3,2017	Completed
B	Training Workshop on Research and Use of Indigenous Knowledge in Climate Change Adaptation	October 12~13,2017	Completed
C	Activity C. Testing and finalizing research tool	October 18~21,2017	Completed
D	Activity D. Conducting co-research fieldwork	November 17~21, 2017 January 06~09,2018 January 13~16,2018	Completed
E	Activity E. Conducting 02 research grants	February ~ August 2018	Completed
F	Activity F. Data analysis and reporting	February 01~09,2018	Completed
G	Activity G. Organizing a local workshop to identify resilience practices for piloting	March 14~16,2018	Completed
H	Activity H. Surveying, selecting pilot site/households/area	March 19~21,2018	Completed
I	Activity I. Designing 3 IK based climate change resilience practices	May 22~ June 1, 2018	Completed
K	Activity K. Personal cost- Project assistant salary	August 1, 2017~ July 31, 2018	Completed
M	Activity M. Conducting 03 technical trainings for households	June 9~11,2018 August 18~20,2018 January 17~19,2019	Completed
L	Activity L. Conducting a mid-term review (local meeting)	August 11~ 16,2018	Completed
N	Activity N. Monitoring, evaluation and reporting	October 2018 ~ January 2019	Completed
O	Activity O. Developing a guideline on identification and use of Indigenous knowledge in climate change resilience practices	April ~ May 2019	Completed
P	Activity P. Training Workshop on Indigenous Knowledge guideline	July 11~14,2019	Completed
Q	Activity Q. Writing policy brief, leaflets, posters	June~July, 2019	Completed

R	Activity R. Workshop on Indigenous Knowledge and Agroecology in the context of Climate Change	July 16~18,2019	Completed
S	Activity S. Conducting an Independent review	July~August, 2019	Completed
T	Activity T. Personal costs (year 2)	August 2018 ~July 2019	Completed

III. RESULTS ACHIEVED

1. Result 1

Increased capacity for early career researchers of ADC, TAAF and CSOs members in IK research and use in climate change resilient agricultural practices

After two years, nearly 120 early career researchers coming from TAAF, ADC and CSOs have increased their IK research and use capacity in climate change resilient agriculture practices as well as academic skills. In order to achieve the result 1, the following activities have been implemented with achieved indicators:

Activity	Achieved Indicator(s)
Activity A: Developing research tools (interview guide and questionnaires)	One (01) research tool including interview guide and questionnaires was developed and tested
Activity B: Organizing training workshop on Indigenous Knowledge and climate change research;	One (01) training workshop on IK research and use in climate change was organized. 36 participants including 18 early career researchers of TAAF, ADC and 18 development workers of CSOs were enhanced their IK and CC research capacity
Activity C: Testing and finalizing research tools;	One (1) research tool finalized.
Activity D: Conducting co-research fieldwork;	One (01) co-research fieldwork carried out.
Activity E: Conducting 2 research grants;	Two (02) research grants awarded to 2 targeted groups.

	<p>One (01) paper was published in the Proceedings of National Scientific Conference: “Psychology and sustainable development” in November 2018 (in Vietnamese)</p> <p>One (01) manuscript with title "The role of indigenous knowledge in climate change adaptation of ethnic minorities in mountainous region of Vietnam: Case study of the Tay people in Bac Kan Province" is under review of the India Journal of Traditional Knowledge (Scopus)</p>
Activity F: Data analysis and reporting.	<p>One (01) research report developed</p> <p>One (01) paper has been accepted for publication in the Journal “Agricultural systems” (Scopus)</p> <p>One paper submitted to Journal of Agriculture and Rural Development in the Tropics and Subtropics (JARTS) and under the review (Scopus)</p> <p>One paper submitted to Journal of Asian Geographer and under the review after 1st revision (Scopus)</p>
Activity K. Project assistant	<p>One (01) project assistant has increased capacity on research and use of IK and CC as well as management skills.</p>
Activity O. Developing a guideline on identification and use of Indigenous knowledge in climate change resilience practices	<p>One (01) book on “Using Indigenous Knowledge in Agroecological and Climate Change Resilience Practices” was developed and published with the support of 3 facilitators of TUAF and ADC.</p>
Activity P. Training Workshop on Indigenous Knowledge guideline	<p>One (01) training workshop on indigenous knowledge guideline was organized.</p> <p>31 participants discussed about how to use the guideline, with the introduction of the book “Using Indigenous Knowledge in Agroecological and Climate Change Resilience Practices” and enhanced IK and</p>

	CC research capacity as well as developing and applying IK-based models.
Activity Q. Writing policy brief, leaflets, posters	One (1) policy brief, one (01) leaflet and five (5) posters were developed with the support of two facilitators from TUAf and ADC.
Activity R. Workshop on Indigenous Knowledge and Agroecology in the context of Climate Change	One (01) workshop on Indigenous knowledge and Agroecology in the context of Climate Change was organized. 55 participants including academics, government officials, and development workers of CSOs have enhanced IK and CC research capacity.
Activity S. Conducting an Independent review	One (01) project evaluation report was generated. 14 early career researchers of TUAf, and development workers of CSOs; 20 local women in Bac Kan were interviewed for assessing the efficiency of the project. One (01) financial audit report was provided by independent auditors.
Activity T. Project assistant	One (01) project assistant has increased her capacity on research and use of IK and CC as well as management skills.

Details of activities are described as follows:

1.1. Activity A. Developing research tool

The main goal of activity A was to prepare the research tool for the co-research fieldwork in Ba Be and Cho Moi district, Bac Kan province.

In order to conduct co-research fieldwork to collect and identify indigenous knowledge of ethnic minority people in the mountainous region, a research tool including an interview guideline and questionnaires were developed with the support of 02 facilitators (Mrs. Kieu Thi Thu Huong, Mr. Nguyen Van Tam). They are senior lecturers and researchers of Thai Nguyen University. They

have extensive experience in climate change adaptation, rural development research, and gender issue.

1.2. Activity B. Training Workshop on Research and Use of Indigenous Knowledge in Climate Change Adaptation

A training workshop on “Research and Use of Indigenous Knowledge in Adaptation to Climate Change” was organized on 12~13 October 2017 in Thai Nguyen city.

36 participants in the training workshop including representatives of civil society organizations from the NorthNet network, research institutes, researchers and staff from Thai Nguyen University of Agriculture and Forestry. Most of the participants have working experience in the field of community development and climate change.

ADC organized the workshop with purposes to research, document, and promote the maintenance and conservation of indigenous knowledge of ethnic minority communities in climate change adaptation, simultaneously, supporting participants to systemize their works relating to climate change issues.

In the training workshop, based on the agro-ecological development projects using the indigenous knowledge that ADC was implementing in the project areas, ADC has outlined the importance and role of the IK as a valuable resource for addressing climate change. At the same time, the participants also shared their experience, knowledge about IK and measures to adapt to climate change of communities and organizations. Throughout the training workshop, they not only learned about knowledge in IK on climate change resilience but also practiced designing and use research tools. Moreover, they went to field to test their designed research tool. After that they finalized the research tool with the support of the two facilitators. The training workshop helped raising awareness and facilitated the research and use of IK in the development of ecological agriculture adaptation model.



Figure 1. Training workshop on Research and Use of Indigenous Knowledge in Climate Change Adaptation

1.3. Activity C. Testing and finalizing research tool

To make sure the research tool is appropriate and useful, a testing of the research tool with the local people was conducted from 18~21 October 2017 in Thanh Van commune, Cho Moi district, Bac Kan province. After the testing, the questionnaire was revised to develop a comprehensive research tool.

1.4. Activity D. Conducting co-research fieldwork

A co-research on indigenous knowledge and climate change adaptation of ethnic minority people of Bac Kan province was conducted. The goal of this activity was to identify, collect, and document indigenous knowledge and local experience of ethnic minority people in the research area towards climate change and extreme weather events as well as their adaptation practices.

In November 17~21, 2017, a co-research fieldwork was conducted in Phuc Loc commune, Ba Be district. 80 local people of 4 villages (Phieng Chi, Na Ma, Khuoi Tra and Nhat Ven) were participated in the research, in which 68 people participated in the household survey, 2 focus group discussions with 5 discussants each were conducted in each village, 7 in-depth interviews, of which two staff members of the Department of Agricultural Extension of Phuc Loc commune and Ba Be district.



Figure 2. Focus group discussion and observation during the co-research fieldwork

In January 06~09, 2018, we conducted a co-research fieldwork in Thanh Van commune, Cho Moi district. 60 local people of 4 villages (Quan Lang 1, Quan Lang 2, Na Kham, and Ban Pjoo) were participated in the research, in which, 32 people participating in the survey, 2 focus group discussions with 5 discussants each were conducted in each village, 5 knowledgeable farmers choosing from group discussions in each village were in-depth interviewed. Additionally, two staff members of the Department of Agricultural Extension of Thanh Van commune and Cho Moi district were interviewed.

In January 13~16, 2018, we conducted fieldwork in Mai Lap commune of Cho Moi district. 60 local people of 4 villages (Khuoi Dac, Tong Vu, Ban Ra, and Ban Ruoc) were participated in the research, in which, 33 people participating in the survey, 2 focus group discussions with 5 discussants each were conducted in each village, 5 knowledgeable farmers choosing from group discussions in each village were interviewed deeply. Additionally, two staff members of the Department of Agricultural Extension of Thanh Van commune and Cho Moi district were interviewed.

As planned, the research results were used to develop a guideline for indigenous knowledge identification and use in climate change adaptation practices in the second year of the project.

The research results are also the documentation of the effective use of IK in agricultural livelihood and used as evidence to advocate for the scale-up in other areas.

1.5. Activity E. Conducting 02 research grants

In terms of enhancing the research capacity of early researchers and development workers, 02 research grants (2000USD each) were granted to 02 applicants. Expectedly, we are seeking proposals for research projects that focus on the link between climate change and indigenous knowledge as climate change is an urgent issue with far-reaching impacts. And, indigenous knowledge related to climate variability and change of peoples these days are vanishing and being lost. While public awareness about climate change and the loss of IK has increased, there is a need to do more to highlight IK as a valuable resource in terms of coping with climate change.

Strong research results can help keep this issue at the forefront of the public conversation as critical decisions are being made by policymakers, government, and communities about how to best protect against and mitigate climate change and its impacts as well as preserving valuable indigenous knowledge that is fading and is at risk of being lost.

For granting purpose, a call for proposal on Climate Change and Indigenous Knowledge Research was announced in September 2017 on ADC website. 08 research proposals were received and evaluated by the panel. Grant decisions were made in December 2017.

One grant was awarded for a group of young lecturers in Thai Nguyen University. The representative of the group is Mrs. Nguyen Do Huong Giang. Their proposal on “**Gender role and utilization of indigenous knowledge in adaptation to climate change of ethnic minorities in Bac Kan province**” was approved by ADC for its merits. The overall objective of this research is to (1) Assess the impacts of climate change on the production of ethnic communities in the study area; (2) Identify the roles and roles of the sexes in using indigenous knowledge to cope with climate change of ethnic minority people in Bac Kan province; (3) provide a scientific basis for proposing solutions to improve the position and capacity of vulnerable populations to adapt to climate change. 160 local people in Lang Ngam commune, Ngan Son district were participated in the research and increased their capacity in knowledge and use of IK. A deliverable of this grant is two (02) drafts of the scientific article were submitted to ADC.

One (01) paper on “Gender roles and the use of indigenous knowledge to adapt to climate change of ethnic minorities in Lang Ngam commune, Ngan Son district, Bac Kan province” was published in the Proceedings of National Scientific Conference: “Psychology and sustainable development” in Hanoi, in November 2018.

Another grantee is a project officer of VietBac CSC, a member of NorthNet, Mr. Duong Viet Phan. He proposed to research on **“The role of indigenous knowledge in adaptation to climate change of ethnic minorities in the northern mountainous area: A case study of Tay people in Bac Kan province”**. The overall objective of this study was to assess the role of indigenous knowledge of ethnic minorities in mountainous northern Vietnam in climate change adaptation, specialized in the case of Tay ethnic group. 150 local people in Na Ri and Cho Moi districts were participated in the research and increased their capacity in knowledge and use of IK A draft of the scientific article and financial documents were submitted.

One manuscript on “The role of indigenous knowledge in climate change adaption of ethnic minorities in mountainous region of Vietnam: Case study of the Tay people in Bac Kan Province” was submitted and is under review of the India Journal of Traditional Knowledge.

To support these two grantees, Dr. Ha Thi Hoa and Dr. Ho Ngoc Son participated in their research as mentors.



Figure 3. Grantees conduct interview

1.6. Activity F. Data analysis and reporting

Research data has been analyzed for reporting. Some key findings of the fieldwork in 3 communes are summarized as below:

- 66.17% of the respondents are female and 33.83% are male.
- 41.11% of respondents are Dao ethnic people, following by Tay people and H’Mong with 36.84% and 18.80%, respectively, while only 2.26% of respondents are other ethnic groups.
- As reported, the majority (60.90%) of the respondents are in the range of 31 to 45 years old.
- The proportion of respondents with no formal education is quite high, accounting for 18.0%, and 0% of respondents had university education. Based on the results collected, the

proportion of female respondents having no formal education is 23.86% compared to 6.67% of male respondents.

- 71.43% of the respondents belong to poor households, 21.80% are average households, only 6.77% from high-income households.
- The majority (57.89 %) of the respondents do not understand about climate change. While 39.85% of the respondents reported knowing climate change and only 2.26% of the respondents have an in-depth understanding of climate change.
- It was reported by the respondents that over last 30 years many changes in local climate were noticed, including decreased rainfall, shorter rainy seasons, later onset of rains in a year, increasing numbers of hail, strong wind events, and unusually rapid increases or decreases of temperature.
- The study found that local people used varieties of climate change adaptation strategies, of which local knowledge and experience played an important role. For example, changing planting dates and times to suit the changing climate, using local crops and animal breeds, using local experience in weather forecasting, applying traditional cultivation practices to protect soil and save water. These knowledge and practices have helped local people adapt to the changing climate and become a good source of knowledge for scientists to explore.

1.7. Activity K. Personal cost- Project assistant salary

For supporting the implementation of project, a working contract with a project assistant, Ms Dong Thi Linh Chi, was signed. The duration of the contract is 12 months from 1 August 2017 to 31 July 2018. With the experience gained from working in this project, Ms. Chi has more opportunity in improving her research skills as well as management skills that will help her to pursue further study in the future.

1.8. Activity O. Developing a guideline on identification and use of Indigenous knowledge in climate change resilience practices

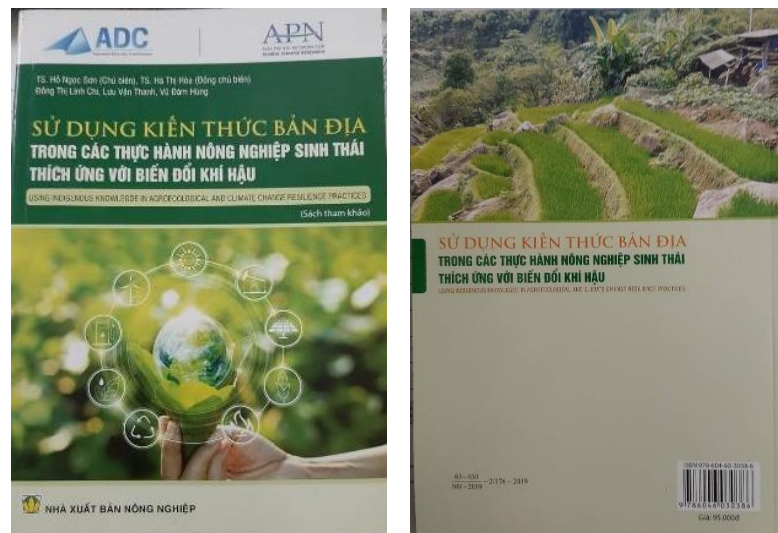


Figure 4. Covers of the book

As planned, the main goal of activity O was to develop a guideline on identification and use of Indigenous knowledge in climate change resilience practices in English version. However, considering the application aspect, the book was written bilingual, Vietnamese and English, so that local NGOs as well as local government officials can conveniently and effectively use it. Therefore, project team with the support of 03 facilitators (Mr. Vu Dam Hung, Mr. Nguyen Van Tam, and Mr. Luu Van Thanh), developed and designed a book “Using indigenous knowledge in agroecological and climate change resilience practices” in Vietnamese and English. This book was published by Agriculture Publishing House with publishing license no 60/QĐ-NXBNN dated 08/07/2019, ISBN 978-604-60-3038-6.

1.9. Activity P. Training Workshop on Indigenous Knowledge guideline

ADC organized a Training Workshop on Using Indigenous Knowledge in Agroecological and Climate Change Resilience Practices took place from 12 to 13 July, 2019 in Thai Nguyen City, Vietnam. The workshop attracted more than 30 delegates from many organizations, agencies, academia to attend compared with the initial plan of 17 participants, 2 days of training workshop on using this document has been successfully organized.



Figure 5. Training workshop on the use of IK guideline

This training workshop aimed to present the book “Using Indigenous Knowledge in Agroecological and Climate Change Resilience Practices” to the participants. ADC developed and compiled this book based on successful models and agroecological practices of using IKS implemented by ADC and non-governmental organizations in different provinces of Vietnam. This document was developed with the desire to become a teaching material and reference material for students, especially ethnic minority students at Thai Nguyen University of Agriculture and Forestry. In addition, the document was shared with local NGOs, scholars and government officials at the local and national levels.

The training workshop focused on exploiting the use of indigenous knowledge collection tools as well as analyzing and assessing the effectiveness of application of such knowledge in practice. Thereby building ecological agricultural models using indigenous knowledge to adapt to climate change and sustainable development.

1.10. Activity Q. Writing policy brief, leaflets, posters

To develop evidence and documents for knowledge and information sharing and dissemination, a policy brief, a leaflet, and five (05) posters were developed and shared with participants from government agencies, civil society organizations, academia, and the private sector in the Workshop on Indigenous Knowledge and Agroecology in the context of Climate Change (activity R). The involvement of two facilitators (Mr. Vu Dam Hung and Mr. Luu Van Thanh) helped the process of completing these documents quickly. Additionally, participating in developing and designing these documents, project team and facilitators had improved documentation skills.

A leaflet introducing the project objectives and the expected results of the project was designed.

SỬ DỤNG KIẾN THỨC BẢN ĐỊA ĐỂ TĂNG CƯỜNG KHẢ NĂNG PHỤC HỒI CỦA CỘNG ĐỒNG ĐỐI VỚI BIẾN ĐỔI KHÍ HẬU Ở MIỀN NÚI VIỆT NAM (2017-2019)

Mục tiêu

- Các nhà nghiên cứu và các tổ chức thành viên của NorthNet nâng cao năng lực nghiên cứu và sử dụng kiến thức bản địa trong việc thích ứng với biến đổi khí hậu.
- Các cộng đồng địa phương nâng cao năng lực nghiên cứu và sử dụng kiến thức bản địa trong các thực tiễn nông nghiệp có khả năng thích ứng biến đổi khí hậu.
- Các nhà hoạch định chính sách và các quan chức chính phủ cấp huyện sử dụng kiến thức bản địa trong các chương trình và kế hoạch thích ứng với biến đổi khí hậu.

Kết quả mong đợi

- Tăng cường năng lực của các nhà nghiên cứu của Đại học Huế và ADC, của bộ phận trước của NorthNet trong nghiên cứu và sử dụng KTBĐ trong thực hành nông nghiệp thích ứng biến đổi khí hậu.
- Tăng cường khả năng nghiên cứu và sử dụng KTBĐ trong thực hành nông nghiệp thích ứng biến đổi khí hậu của cộng đồng địa phương.
- Sử dụng KTBĐ trong thực hành nông nghiệp thích ứng biến đổi khí hậu của các nhà hoạch định chính sách và cộng đồng chính phủ cấp huyện và sử dụng trong các kế hoạch thích ứng biến đổi khí hậu.

Figure 6. Leaflet

Five posters were designed to introduce successful models using indigenous knowledge that ADC has been implementing.

MÔ HÌNH CHUỐI TÂY XEN ĐƯỢC LIÊU TRÊN ĐẤT ĐÓC

Đảm bảo thực hiện: Trung tâm Nghiên cứu Phát triển Nông nghiệp miền núi (ADC)
Nhóm dân tộc Tày, Dao
Đầu mục địa điểm: Thành Phố và Mù Cang Láng, huyện Chi Minh, tỉnh Bắc Kạn
Quy mô: 50.000m²

HIỆU QUẢ TRONG THÍCH ỨNG VÀ PHỤC HỒI ĐỒNG

- Mô hình xen canh chuối tây và được liêu trên đất dốc đã giúp giảm thiểu rủi ro mất mùa do biến đổi khí hậu, đồng thời tăng năng suất thu hoạch của cả hai loại cây trồng.
- Các nhà nghiên cứu địa phương đã áp dụng kiến thức bản địa để chọn giống chuối tây và được liêu phù hợp với điều kiện đất đai và khí hậu địa phương.
- Quy trình kỹ thuật canh tác được chia sẻ và áp dụng rộng rãi trong cộng đồng.

HIỆU QUẢ ĐẾN VÙNG VỚI MẶT NHIỆT TẾ

- Cây chuối tây và được liêu có khả năng chịu nhiệt tốt, giúp giảm thiểu rủi ro mất mùa do biến đổi khí hậu.
- Mô hình này đã được áp dụng thành công ở các vùng có khí hậu nóng ẩm.
- Thu nhập của người dân được cải thiện nhờ vào năng suất cao của mô hình.

HIỆU QUẢ ĐẾN VÙNG VỚI MẶT THÈM CHẾ - XÀ HỘ

- Mô hình này đã được áp dụng thành công ở các vùng có khí hậu lạnh.
- Cây chuối tây và được liêu có khả năng chịu lạnh tốt, giúp giảm thiểu rủi ro mất mùa do biến đổi khí hậu.
- Thu nhập của người dân được cải thiện nhờ vào năng suất cao của mô hình.

HIỆU QUẢ ĐẾN VÙNG VỚI MẶT MÔI TRƯỜNG

- Mô hình này đã được áp dụng thành công ở các vùng có khí hậu khô hạn.
- Cây chuối tây và được liêu có khả năng chịu hạn tốt, giúp giảm thiểu rủi ro mất mùa do biến đổi khí hậu.
- Thu nhập của người dân được cải thiện nhờ vào năng suất cao của mô hình.

MÔ HÌNH NGÔ XEN CÚ ĐẬU VÀ KHOAI SỌ

Đảm bảo thực hiện: Trung tâm Nghiên cứu Phát triển Nông nghiệp miền núi (ADC)
Nhóm dân tộc Tày, Dao
Đầu mục địa điểm: Thành Phố và Mù Cang Láng, huyện Chi Minh, tỉnh Bắc Kạn
Quy mô: 10000m² và 30 ha Banlung
Tháng gieo hạt: 02/11/2015

- HIỆU QUẢ TRONG THÍCH ỨNG VÀ PHỤC HỒI ĐỒNG**
 - Đảm bảo thực hiện: Trung tâm Nghiên cứu Phát triển Nông nghiệp miền núi (ADC)
 - Mô hình này đã được áp dụng thành công ở các vùng có khí hậu khô hạn.
 - Cây ngô, củ đậu và khoai sọ có khả năng chịu hạn tốt, giúp giảm thiểu rủi ro mất mùa do biến đổi khí hậu.
 - Thu nhập của người dân được cải thiện nhờ vào năng suất cao của mô hình.
- HIỆU QUẢ ĐẾN VÙNG VỚI MẶT NHIỆT TẾ**
 - Cây ngô, củ đậu và khoai sọ có khả năng chịu nhiệt tốt, giúp giảm thiểu rủi ro mất mùa do biến đổi khí hậu.
 - Mô hình này đã được áp dụng thành công ở các vùng có khí hậu nóng ẩm.
 - Thu nhập của người dân được cải thiện nhờ vào năng suất cao của mô hình.
- HIỆU QUẢ ĐẾN VÙNG VỚI MẶT THÈM CHẾ - XÀ HỘ**
 - Cây ngô, củ đậu và khoai sọ có khả năng chịu lạnh tốt, giúp giảm thiểu rủi ro mất mùa do biến đổi khí hậu.
 - Mô hình này đã được áp dụng thành công ở các vùng có khí hậu lạnh.
 - Thu nhập của người dân được cải thiện nhờ vào năng suất cao của mô hình.
- HIỆU QUẢ ĐẾN VÙNG VỚI MẶT MÔI TRƯỜNG**
 - Cây ngô, củ đậu và khoai sọ có khả năng chịu hạn tốt, giúp giảm thiểu rủi ro mất mùa do biến đổi khí hậu.
 - Mô hình này đã được áp dụng thành công ở các vùng có khí hậu khô hạn.
 - Thu nhập của người dân được cải thiện nhờ vào năng suất cao của mô hình.
- KHẢ NĂNG NHẬN ĐỒNG**
 - Mô hình này đã được áp dụng thành công ở các vùng có khí hậu khô hạn.
 - Cây ngô, củ đậu và khoai sọ có khả năng chịu hạn tốt, giúp giảm thiểu rủi ro mất mùa do biến đổi khí hậu.
 - Thu nhập của người dân được cải thiện nhờ vào năng suất cao của mô hình.

MÔ HÌNH NGÔ XEN CÚ ĐẬU VÀ KHOAI SỌ

Đảm bảo thực hiện: Trung tâm Nghiên cứu Phát triển Nông nghiệp miền núi (ADC) Hà Giang, Chi Minh
Nhóm dân tộc Mông
Đầu mục địa điểm: Thành Phố và Mù Cang Láng, huyện Chi Minh, tỉnh Bắc Kạn
Quy mô: 10000m²
Tháng gieo hạt: Tháng 02/2015 - Tháng 11/2015

- HIỆU QUẢ TRONG THÍCH ỨNG VÀ PHỤC HỒI ĐỒNG**
 - Mô hình này đã được áp dụng thành công ở các vùng có khí hậu khô hạn.
 - Cây ngô, củ đậu và khoai sọ có khả năng chịu hạn tốt, giúp giảm thiểu rủi ro mất mùa do biến đổi khí hậu.
 - Thu nhập của người dân được cải thiện nhờ vào năng suất cao của mô hình.
- HIỆU QUẢ ĐẾN VÙNG VỚI MẶT NHIỆT TẾ**
 - Cây ngô, củ đậu và khoai sọ có khả năng chịu nhiệt tốt, giúp giảm thiểu rủi ro mất mùa do biến đổi khí hậu.
 - Mô hình này đã được áp dụng thành công ở các vùng có khí hậu nóng ẩm.
 - Thu nhập của người dân được cải thiện nhờ vào năng suất cao của mô hình.
- HIỆU QUẢ ĐẾN VÙNG VỚI MẶT THÈM CHẾ - XÀ HỘ**
 - Cây ngô, củ đậu và khoai sọ có khả năng chịu lạnh tốt, giúp giảm thiểu rủi ro mất mùa do biến đổi khí hậu.
 - Mô hình này đã được áp dụng thành công ở các vùng có khí hậu lạnh.
 - Thu nhập của người dân được cải thiện nhờ vào năng suất cao của mô hình.
- HIỆU QUẢ ĐẾN VÙNG VỚI MẶT MÔI TRƯỜNG**
 - Cây ngô, củ đậu và khoai sọ có khả năng chịu hạn tốt, giúp giảm thiểu rủi ro mất mùa do biến đổi khí hậu.
 - Mô hình này đã được áp dụng thành công ở các vùng có khí hậu khô hạn.
 - Thu nhập của người dân được cải thiện nhờ vào năng suất cao của mô hình.
- KHẢ NĂNG NHẬN ĐỒNG**
 - Mô hình này đã được áp dụng thành công ở các vùng có khí hậu khô hạn.
 - Cây ngô, củ đậu và khoai sọ có khả năng chịu hạn tốt, giúp giảm thiểu rủi ro mất mùa do biến đổi khí hậu.
 - Thu nhập của người dân được cải thiện nhờ vào năng suất cao của mô hình.

MÔ HÌNH ĐÀO XANH CHỊU HẠN

Được thực hiện: Trung tâm Nghiên cứu Phát triển Nông Lâm nghiệp miền núi (ADC)
 Miền Bắc: Yên Bái
 Khu vực cấp: Xã Thanh Văn và Mai Lạp, huyện Chợ Mới, tỉnh Bắc Kạn
 Quy mô: 1.000ha
 Thời gian thực hiện: từ cuối 2015 - 2019




- HIỆU QUẢ TRONG THÍCH ƯNG VÀ PHỤC HỒI BỆNH**
 - Mô hình được áp dụng tại các vùng canh tác chè truyền thống đã gặp phải các vấn đề về bệnh hại do biến đổi khí hậu, đặc biệt là bệnh đốm nâu và bệnh thối rễ. Việc áp dụng mô hình này giúp giảm thiểu các vấn đề về bệnh hại, đồng thời cải thiện năng suất và chất lượng sản phẩm chè.
- HIỆU QUẢ VÀ BỀN VỮNG VỀ MẶT KINH TẾ**
 - Việc áp dụng mô hình này giúp giảm chi phí đầu tư cho thuốc trừ sâu và phân bón hóa học, đồng thời tăng năng suất và chất lượng sản phẩm chè, từ đó tăng thu nhập cho người dân.
- HIỆU QUẢ VÀ BỀN VỮNG VỀ MẶT MÔI TRƯỜNG**
 - Mô hình này giúp bảo vệ môi trường đất và nước, đồng thời giảm thiểu lượng thuốc trừ sâu và phân bón hóa học được sử dụng, góp phần cải thiện chất lượng môi trường sống.
- HIỆU QUẢ VÀ BỀN VỮNG VỀ MẶT MÔI TRƯỜNG**
 - Mô hình này giúp bảo vệ môi trường đất và nước, đồng thời giảm thiểu lượng thuốc trừ sâu và phân bón hóa học được sử dụng, góp phần cải thiện chất lượng môi trường sống.
- KHẢ NĂNG NHÂN BỘNG**
 - Mô hình này đã được nhân rộng tại các vùng canh tác chè truyền thống khác, đồng thời được áp dụng tại các vùng canh tác chè mới, góp phần mở rộng diện tích canh tác chè bền vững.





MÔ HÌNH CHĂN NUÔI GÀ ĐEN

Được thực hiện: Trung tâm Nghiên cứu Phát triển Nông Lâm nghiệp miền núi (ADC)
 Địa điểm thực hiện: Xã Mai Lạp, huyện Chợ Mới, tỉnh Bắc Kạn
 Quy mô: 800 con gà đen bản địa của người H'Mông
 Thời gian thực hiện: 2018-2019
 Mục tiêu: Sử dụng giống bản địa có khả năng chống chịu tốt với điều kiện thời tiết cực đoan tại địa phương, ít bị nhiễm dịch bệnh, chất lượng thịt ngon, phù hợp với điều kiện kinh tế hộ gia đình tại địa phương.




- HIỆU QUẢ TRONG THÍCH ƯNG VÀ PHỤC HỒI BỆNH**
 - Giống gà đen H'mông có khả năng thích ứng cao với điều kiện thời tiết cực đoan ở khu vực miền núi phía Bắc, đồng thời có thể chịu nóng và chịu rét tốt, ít bị dịch bệnh và không phụ thuộc vào các loại thuốc phòng bệnh với điều kiện chăm sóc của người dân.
 - Mô hình chăn nuôi theo hướng an toàn sinh học giúp nâng cao chất lượng sản phẩm và giảm phát thải trong chăn nuôi.
- HIỆU QUẢ VÀ BỀN VỮNG VỀ MẶT KINH TẾ**
 - Mô hình chăn nuôi theo hướng an toàn sinh học giúp nâng cao chất lượng sản phẩm và giảm phát thải trong chăn nuôi.
- HIỆU QUẢ VÀ BỀN VỮNG VỀ MẶT MÔI TRƯỜNG**
 - Mô hình chăn nuôi theo hướng an toàn sinh học giúp nâng cao chất lượng sản phẩm và giảm phát thải trong chăn nuôi.
- HIỆU QUẢ VÀ BỀN VỮNG VỀ MẶT MÔI TRƯỜNG**
 - Mô hình chăn nuôi theo hướng an toàn sinh học giúp nâng cao chất lượng sản phẩm và giảm phát thải trong chăn nuôi.
- KHẢ NĂNG NHÂN BỘNG**
 - Mô hình này đã được nhân rộng tại các vùng canh tác gà đen truyền thống khác, đồng thời được áp dụng tại các vùng canh tác gà mới, góp phần mở rộng diện tích chăn nuôi bền vững.

KHUYẾN NGHỊ CHÍNH SÁCH

SỬ DỤNG KIẾN THỨC BẢN ĐỊA TRONG CÁC THỰC HÀNH NÔNG NGHIỆP SINH THÁI THÍCH ỨNG VỚI BIẾN ĐỔI KHÍ HẬU



THAI NGUYEN, 2019

Figure 8. Policy brief cover

A policy brief on using IK in agroecological and climate change adaptation was compiled and designed. This policy brief is designed to provide evidence of agro-ecology practices based on indigenous knowledge that responds to climate change for communities, local government officials and policy makers. Simultaneously, it also affirms the role of indigenous knowledge in biodiversity conservation, maintaining plant genetic resources, protecting ecological diversity in sustainable development in response to climate change as well as improving incomes and livelihoods for ethnic minority people, ensuring food security.

1.11. Activity R. Workshop on Indigenous Knowledge and Agroecology in the context of Climate Change

Workshop on Indigenous knowledge and Agroecology in the context of climate change was successfully organized on 17 July 2019 in Thai Nguyen city, Vietnam.

The event brought together over 50 participants from more than 8 provinces in northern Vietnam, representing government agencies, civil society organizations, academia, and the private sector.

Besides being a place to share valuable experiences and lessons about indigenous knowledge and agroecological practices adapting to climate change, the workshop also provided a valuable networking opportunity and set the stage for further cooperation among organizations, institutions, universities, and government agencies.

The workshop began with an opening remark by Dr. Ho Ngoc Son, project leader, and continued with 07 interactive presentations, discussions and briefings on topics of interest to the future agroecology and indigenous knowledge in the context of climate change. It concluded with a set of noteworthy recommendations to promote the use of indigenous knowledge. As focusing on a very wide topic of indigenous knowledge, the workshop had a colorful picture of indigenous knowledge, helped participants gained more knowledge, understandings, added to what we already know, and it opened up opportunities for future cooperation.



Figure 9. Workshop on Indigenous Knowledge and Agroecology in the context of climate change

1.12. Activity S. Conducting an Independent review

In terms of evaluating the efficiency of the project, an independent review and financial audit were conducted. An evaluator had interviewed some project beneficiaries in Bac Kan, Yen Bai and Thai Nguyen and reviewed project documents for assessing whether the outputs of the project are meeting the indicators as planned or not. Simultaneously, a team of financial auditors had reviewed the financial documents and reports of the project.

One (01) project evaluation was generated. According to the report, the project has achieved the main objectives set out and most outputs meet the indicators.

As stated in the report, there are some accomplishments and limitations of the project:

(1) The project has supported to build the capacity in IK research and use in climate change resilient agricultural practices for early career researchers of Thai Nguyen University, development workers of NorthNet members, policy makers, government officials, local community. The success of capacity building activities is to train a team of researchers with experience in the field of indigenous knowledge.

(2) The project has also successfully built models using indigenous knowledge in eco-agricultural practices that respond to climate change, contributing to income generation for ethnic minority households based on the results of research. However, the scale of models is still small, and the number of beneficiaries is still low.

(3) The networking of non-governmental organizations also creates certain effects on maintaining and preserving indigenous knowledge.

(4) Another important success is that the project has positively influenced policy makers, which can effectively promote the policy advocacy process.

Additionally, some recommendations were made:

(1) ADC needs to continue to coordinate with local authorities and relevant agencies to continue to support households to maintain, expand and reinforce models of using indigenous knowledge in adaptive ecological agricultural practices.

(2) Continue to maintain a network of researchers and NGOs and policy makers to share information about IK.

(3) Continue to coordinate with researchers who have been trained to continuously develop and gather evidence on IK of other ethnic groups on a larger scale to develop evidence for policy advocacy at higher levels.

(4) ADC needs to continue improving the organization's policies, plans and strategies to incorporate research results into practical production to maintain and preserve indigenous knowledge. In addition, ADC should provide supports more to ethnic minority communities to develop livelihoods based on the use of indigenous knowledge in agricultural practices.

(5) ADC should continue to disseminate the results of the project (publications, books, etc) to researchers, teachers, and students of universities.

The independent auditors' team provided a Statement of Income, Expenditure and Fund balance and Auditors' Report. According to the results of the audit, there was a change in the budget of

some activities of the project without written approval from the Donor for actual disbursements incurred over the budget.

1.13. Activity T. Personal cost- Project assistant salary

For supporting the implementation of project, an extension-working contract with project assistant, Ms Dong Thi Linh Chi, was signed. The duration of the contract is 12 months from 1 August 2018 to 31 July 2019. With the experience working in this project, Ms. Chi has been selected for an Australian Award Scholarship offered by the Department of Foreign Affairs and Trade (DFAT) and she will commence her Master course in January 2020 in Australia.

2. Result 2

Increased capacity for local communities of IK research and use for climate change resilience agricultural practices

Over the 2 years of project, at least 680 local people including Tay, Dao, and H'mong people have increased their capacity IK research and use for climate change resilience agricultural practices, the following activities have implemented to attain the result 2 with achieved indicators:

Activity	Achieved indicator(s)
Activity D. Conducting co-research fieldwork	200 local people in Ba Be and Cho Moi districts were improved their knowledge and capacity on research and use of IK through their participations in this co-research fieldwork.
Activity E. Conducting 02 research grants	310 local people in Ngan Son, Na Ri, Cho Moi district were enhanced their knowledge and capacity on research and use of IK through their participations in these 2 researches.
Activity G: Organizing a local workshop to identify resilience practices for piloting	One (01) local workshop conducted to identify piloting models with the involvement of: 30 participants from two communes of Thanh Van and Mai Lap were increased their decision-making abilities by discussing to identify 03 resilience practices for piloting.

	Three (03) IK resilience practice models for piloting were identified: H'mông black-boned chicken raising model, local green mung bean model, and local banana intercropping with Khoi Tia (a type of medicinal plants – Scientific name: <i>Ardisia Silvestris</i>) model.
Activity H: Selecting pilot site/households/area	Twelve (12) households are directly benefited from developing the models.
Activity I: Designing three IK based climate change resilience practices	<p>Three (03) of IK practices were piloted.</p> <p>800 black-boned chickens used for piloting in 8 households.</p> <p>01 ha of piloting local green mung bean model.</p> <p>02 ha local banana intercropping with Khoi Tia (a type of medicinal plants – Scientific name: <i>Ardisia Silvestris</i>).</p>
Activity M: Conducting 03 technical trainings for households	<ul style="list-style-type: none"> - One (01) technical training on bio-safe chicken raising was provided for community. <p>Thirty (30) households are well-trained on bio-safe chicken raising.</p> <ul style="list-style-type: none"> - One (01) technical training on Integrated disease management for chickens was organized for community. <p>Thirty (30) households are well-trained on disease management for chickens.</p> <ul style="list-style-type: none"> - One (01) technical training on banana care and microbiological composting techniques

	Twenty-five (25) households are well-trained on banana care and microbiological composting techniques.
Activity L: Conducting a mid-term review	One (01) local meeting to review project activities was organized. 40 people participated in the meeting and increased their knowledge on climate change and IK through project review.
Activity N. Monitoring, evaluation and reporting	12 households participating in the implementation of the model are monitored and supported regularly by ADC, ensuring the application of technology as well as timely handling of possible risks like pests and disease.
Activity S: Conducting an Independent review	20 local people in Thanh Van, Mai Lap communes were participated in review process with evaluator to assess their capacity and the efficiency of the project.

[2.1 Activity D. Conducting co-research fieldwork](#)

This activity was described in details in part 1.4.

[2.2. Activity E. Conducting 02 research grants](#)

This activity was described in details in part 1.5.

[2.3. Activity G. Organizing a local workshop to identify resilience practices for piloting](#)

A local workshop with the participation of 30 participants from Thanh Van and Mai Lap communes, including local government representatives and local people was organized on 15 March 2018.

This activity aimed to identify what climate change resilience livelihood practices for piloting. They were increased their decision-making abilities by discussing to identify 03 resilience practices for piloting



Through discussion and consultation with participants, 03 models were proposed for piloting:

Model 1: Green mung bean planting model that is drought-resistant plants and easy to take care of. It is often used in traditional dishes.

Model 2: H'mong black-boned chicken raising models. Black-boned chicken less suffers from disease, is cold resistant, and produces a high quality of meat.

Model 3: Intercropping local banana with *Khoi Tia* (a medicinal plant, scientific name: *Ardisia Silvetris* Pitard). The local banana variety is easy to take care, can be planted in sloping land, saving land for other purposes. The leaf of *Khoi Tia* is used to extract Tannin and Glycoside in pharmacology. Besides, it is used as a traditional remedy curing abdominal diseases of indigenous people. As proposed, with this model, people can sell both banana and *Khoi tia* to improve their income of people living in the area.

2.4. Activity H. Surveying, selecting pilot site/households/area

After the local workshop to identify 03 models to adopt, we conducted a survey to select suitable households that meet the requirements to build these 03 models from 19 to 21 March 2018. We visited the households and their land areas of 30 participants who were willing and committed to participate in developing models.

Due to the limited budget, there were only eight (08) selected households to develop black chicken model, two (02) households chosen to develop local banana and *Khoi tia* intercropping model with 1 ha each household, and two (02) households selected to develop local green mung bean model with 0.5 ha each household. However other people who were interested with above models was also invited to participate in the training.

Twelve (12) households are selected to participate in building the climate change resilient models.

2.5. Activity I. Designing 3 IK based climate change resilience practices

In order to design and build 03 models identified in the Activity G, this activity was implemented from 22 May to 1 June 2018.

The objective of this activity is to pilot and test identified climate change resilience practices. Through this, the effectiveness of building models in the local community will be the evidence used to achieve outcome 3. In addition, local green mung bean and Khoi Tia varieties, and black-boned chicken breeds will be preserved, maintained and developed as a new type of livelihoods to increase income for local people.

For the success of the models, we prepared materials to support local people to build 03 models.

For the model 1, the local green mung bean variety seeds were prepared by local people, we supported them with organic fertilizer, inorganic fertilizers, and lime. Organic fertilizer that is eco-friendly with environment is recommended to apply. A small amount of inorganic fertilizers is used for nutrient addition. Lime helps plants flourish by correcting the pH in the soil.



Figure 11. Local green mung bean model on arid and dry land

For the model 2, 800 one day old black-boned chicks were bought and delivered to selected households. The chicks have been vaccinated and have a quarantine certificate issued by a competent authority. Each household takes care of 100 chickens and was supported with brans and vaccines and veterinary medicine for the first 12 days.



Figure 12. Delivering chicken and veterinary medicine for households

For the model 3, as 02 selected households have their own area of banana, we supported them with 200 Khoi tia cuttings, 100 for each household, so that they can plant them intercropped with banana. The total area of banana and Khoi tia plantation is 01 ha each household.



Figure 13. Khoi Tia intercropping with local banana model

2.6. Activity M. Conducting 03 technical trainings for households

One (01) technical training on bio-safe chicken raising was organized for households in Mai Lap commune. With the participation of 8 households participating in the piloting model and 22 local people who are interested in chicken raising.

Throughout the training, participants were instructed chicken-care techniques in accordance with biosafety standards. Three principles on taking care of chickens regarding different growth period of chicken were given. The participants were also instructed with information on types of foods that can feed their chicken flocks, how to mix these foods to provide adequate nutrients for chickens.



Figure 14. Technical training on bio-safe chicken raising

One (01) technical training on integrated disease management for chickens was organized for 30 households in Mai Lap commune. This training provides people with knowledge to identify the symptoms of a disease, therefore, applying appropriate treatments, to ensuring the health of their chicken flocks. During the training, some vaccines and veterinary medicines were introduced to participants with specific prescriptions.



Figure 15. Technical training on integrated pest and disease management for chickens

One (01) technical training on banana care and microorganism composting fertilizer was organized for 25 households in Mai Lap and Thanh Van communes. At the training, ADC technical staff instructed households how to take care of banana plants, control pests and diseases, harvest and store banana. In addition, ADC staff also instructed households on the process of microbiological composting using for banana trees. Through this training, the farmers will be able to intensify banana cultivation with new knowledge, gradually change the traditional practices of banana cultivation in order to improve the quality and products and increase income. At the same time, it is convenient for the locality to expand banana cultivation area in order to continue to bring into full play its advantages and potentials in areas suitable for banana trees to develop and build a sustainable chain of links in agricultural production and consumption of bananas.



Figure 16. Technical training on banana care and composting microorganism fertilizer

2.7. Activity N. Monitoring, evaluation and reporting

Regular visits to the sites of 03 models were carried out to ensure the performance of these models, to support and timely handle potential risks such as diseases and pests.

A model evaluation report was generated by technical assistant – Mr Vu Dam Hung to assess the efficiency of three models in terms of social, economic and adaptation aspects.

Accordingly, for the black-boned chicken raising model, it brings high economic value for villagers but the inputs (feed and vaccine) for the first two months are high. Only bananas in the model of native banana intercropping with Khoi Tia were harvested during the implementation period, Khoi Tia is still growing, but it is expected to bring high economic benefits when the demand for purchasing herbs in the area is high. Drought-tolerant green bean model is assessed as an efficient model with low input needs, short period of growth, suitable to poor-nutrient soil.



Figure 17. Drought-tolerant green bean model



Figure 18. Model of Medicinal plants (Ardisia silvestris) intercropped with native bananas



Figure 19. Black-boned chicken raising model

2.8. Activity L. Conducting a mid-term review

A meeting for mid-term reviewing was organized in 12 August 2018 with 40 participants (local government representatives and people participating in piloting models). In order to generate a report assessing the progress of the project, short interviews with households participating in piloting models were implemented. Through this, we have received significant comments and suggestions that we should consider for the next activities of the project. The respondents acknowledged and highly appreciated the role of IK in diversifying livelihoods in climate change context and in preserving the cultural and ethical values of local people.



Figure 20. Local meeting and interview with local people

Most of the suggestions are the need for more technical trainings in developing livelihoods, especially training courses on chicken care techniques. They stated that from July to the present, the temperature varied unpredictably with longer heavy rain, therefore, there were the incidents of the chicken-related- disease.



Figure 21. Visiting piloting models

2.9. Activity S. Conducting an Independent review

This activity was described in details in part 1.5.

3. Result 3

Indigenous knowledge use in climate change resilience practices is recognized and used by policy makers and government officials through development plans and programs

In order to achieve the result 3, the following activities implemented in year 2:

Activity	Achieved indicator(s)
Activity O. Developing a guideline on Identification and Use of IK in climate change resilience practices (IK guideline)	- One (01) guideline (book) was developed and published.
Activity P. Conducting training workshop on IK guideline	One (01) training workshop on IK guideline was organized. 31 participants were trained on the use of the IK guideline.
Activity Q. Writing policy brief, leaflets, posters	a policy brief, a leaflet, and five (05) posters developed and shared
Activity R. Workshop on Indigenous Knowledge and Agroecology in the context of Climate Change	Over 50 participants took part in the workshop.

3.1. Activity O. Developing a guideline on Identification and Use of IK in climate change resilience practices (IK guideline)

This activity was described in details in part 1.1.

3.2. Activity P. Conducting training workshop on IK guideline

This activity was described in details in part 1.2.

3.3. Activity Q. Writing policy brief, leaflets, posters

This activity was described in details in part 1.3.

3.4. Activity R. Workshop on Indigenous Knowledge and Agroecology in the context of Climate Change

This activity was described in details in part 1.4.

IV. LEARNING AND SHARING

1. Ethical values and Environmental benefits

The project has emphasized the role of indigenous knowledge and climate change adaptation among ethnic minority people in northern mountainous region of Vietnam. It also pointed to the need to combine indigenous knowledge and scientific knowledge to build community resilience.

With the implementation of the IK resilience practice models, especially the local green mung bean model that is suitable to develop on poor-nutrient soil and has resistance to drought. This type of green bean also can be intercropped with maize, improving soil quality through the use of organic fertilizer and micro-organism in green bean roots with the self-synthesize nitrogen ability. Moreover, its stems and leaves can be used as a source of on-site fertilizer. Additionally, green mung bean is used as a special ingredient in the traditional foods in holidays, festivals, Lunar New Year's days of the Tay and Nung ethnic minority people, thus the implementation of the model helps maintain the ethnic cultural values.

Additionally, Khoi Tia plant, used in model of intercropping local banana with Khoi Tia, was listed as “Vulnerable” (Level V) in the Red book Data of Vietnam (1996, 2007) with the decrease of at least 20% according to the habitat loss and level of exploitation. The leaf of *Khoi Tia* is used to extract Tannin and Glycoside in pharmacology. Besides, it is used as a traditional remedy curing abdominal diseases of indigenous people. Although the species has a large distribution area, but the number of individuals is less due to the regeneration of seeds, and is exploited as medicine in large quantities, so the source of seed for regeneration. As proposed, with this model, people can sell both banana and Khoi Tia that improve the income of people living in the area.

Consequently, with implementation of activities, we hope to conserve and share these valuable indigenous knowledge and experience of ethnic minority groups through trainings and workshops.

2. Capacity building

Through the workshop and trainings provided, young researchers have improved their abilities to conduct research in climate change and indigenous knowledge. Local people have participated in technical training and in building models that help them to improve their livelihoods as well as conserving their local varieties that can be used as a source of income.

3. Knowledge sharing and dissemination

One paper “Indigenous knowledge and climate change adaptation of ethnic minorities in Vietnam: A case study of the Yao people in Bac Kan Province” has been accepted to be published in the **journal of Agricultural systems**. Part of the funding for the paper come from APN project.

One (01) paper on “Gender roles and the use of indigenous knowledge to adapt to climate change of ethnic minorities in Lang Ngam commune, Ngan Son district, Bac Kan province” was published in the Proceedings of National Scientific Conference: “Psychology and sustainable development” in November 2018.

Three (03) manuscripts are under review of international journal, including:

- 1) One paper submitted to Journal of Asian Geographer and under the review after 1st revision (Scopus)
- 2) A manuscript on “The role of indigenous knowledge in climate change adaption of ethnic minorities in mountainous region of Vietnam: Case study of the Tay people in Bac Kan Province” is under review of the India Journal of Traditional Knowledge (IJTK).
- 3) A manuscript on “Climate change adaptation in the Northern Mountainous Region of Vietnam: A case study of the Hmong people of Bac Kan Province” is under review of the Journal of Agriculture and Rural Development in the Tropics and Subtropics (JARTS).

One (01) book on “Using indigenous knowledge in agroecological and climate change resilience practices” was published by the Agriculture Publishing House.

The book and project publications (posters, policy brief, etc) were shared through workshops. ADC has donated a number of the book “Using indigenous knowledge in agroecological and climate change resilience practices” to the Center of Information Technology and Library- Thai Nguyen University, and the Library of Thai Nguyen University of Agriculture and Forestry as a reference document for training and scientific research activities of researchers, teachers, and students.