

SOCIAL POLICY ECOLOGY RESEARCH INSTITUTE - SPERI



**A case study: status and changes of local rice varieties
from 04 villages in Po E commune, Kon Plong district
Kon Tum province, Central Highlands of Vietnam**

Prepared by: Dang To Kien

Acknowledgements

In order to make this case study possible, we and entire SPERI team would very much like to deeply acknowledge the following supports please. First and foremost, at the villages and communities level, we would deeply like to thank the entire Po E communal authorities (Mr. A Chon, Mr. Tho, Mr. A Sap, Mr. A Bui, Mr. Dinh Thai, Ms. Y Nga, Ms. Y Nam and Ms. Y Pha for their wonderful supports) for their communal institutional support. At each village we visited, we wanted to thank for people, elders and key persons, women and young people of Violak village such as especially (Mr. A Pan, Mr. A Diem, Mr. Dinh Cong Muoi, Mr. Dinh Chat, Mrs. Y Biet, Mrs. Y Lieu, Mrs. Y Than, Ms. Y Nga, Ms. Y Gieng). For people, elders and key persons, women and young people from Vi K Oa village especially (Mr. A Doi, Mr. Dinh Thai, Mr. Dinh Theo, Mrs. Y Trang, Ms. Y Nga, Ms. Y Huyen, and Ms. Y Gieng). For people and villagers from Vi Po E 2 village especially (Mr. A Thap, Mrs. Y Bom, Mrs. Y Plen, Mr. A Phong and many youths engaged). For those came from Vi Klang 2 village, we would like to thank especially Mr. A Chon, Ms. Y Que, Mrs. Y Voa and all the elders and young people there.

Secondly, we would especially like to thank Mr. Douglas Nakashima from UNESCO and the entire Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Indigenous Local Knowledge (ILK) technical support unit (TSU) grant to kindly provide financial and other professional advice for this case study to happen please. Thanks very much for your ongoing supports for inputs and comments to make the case study better.

Finally, we would also like to thank especially Mr. Dam Trong Tuan (SPERI Director and their team) for also providing institutional supports and administration supports and timing for conducting this case study at the field possible. We thank Mr. Tran Ngoc Thanh for all the photos and video documentation and we thank as well deeply Mr. Hoang Van Duoc (also SPERI's indigenous Tay ethnic young farmer) whom took part during the fieldwork.

Table of Contents

Introduction	5
Why do we conduct this case study?.....	6
Why do we choose local rice varieties as the topic to conduct?	7
Study sites and timing	8
Case study methodology	9
Field based methodology	9
Limitations of our works	11
Case study’s findings	11
Current landscape changes in the Po E commune.....	11
Changes over the three types of land uses in Po E commune	13
Land areas for rice-growing and cassava-growing in the four villages in 2016	14
Cassava growing areas with herbicides which affect rice-growing areas in the lower zones.....	15
Some concluding remarks	17
Current status of rice varieties in the Po E commune	17
Status of local traditional rice varieties in Po E commune and specifically the four villages	17
Status of new rice varieties in Po E commune and specifically the four villages.....	18
Examination of other information relevant to status of rice varieties	19
The most favorite rice varieties from the four villages	21
Some concluding remarks	21
Discussion	22

Figures and Tables

Figure 1: Location of the four villages, indicated by blue circles, of the Case Study Site (2016).....	8
Figure 2: Photo-examples of field based methodology during this Case Study (2016).....	10
Figure 3: Left photo indicates mountainous areas of clearing forests for upcoming plantings of acacia and cassava crops. Right photo indicates areas of forest and land already planted with cassava crops (2016). 12	
Figure 4: Left photo indicates a small plot of local rice varieties, but the upper part is currently cleared for soon cassava planting. Right photo indicates an area already with cassava plantation (2016).....	12
Figure 5: Left photo indicates an one-village entire area covered now with cassava plantations. Villagers planted cassava in the upper-hill while rice fields are in the lowest zone (2016).	13
Figure 6: Left photo indicates another village-area with local rice varieties but on the upper landscape planting with cassava plantations. Right photo is of the same message but different area (2016).	13
Figure 7: Herbicides found in the Violak village (March, 2016).....	16
Figure 8: Herbicides found in the Vi Klang 2 village (March, 2016).....	16
Figure 9: Herbicides found in the Vi Po E 2 village (August, 2016).....	17
Table 1: Changes over the three types of land uses in Po E commune from 2014-2016 (2016).	14
Table 2: Land areas for traditional and new rice and also traditional and hybrid cassavas at the four villages in Po E commune (2016).	15
Table 3: The total number of local rice varieties still remain, save and using at each village (2016).	18
Table 4: The total number of new rice varieties recently using at each village (2016).	19
Table 5: Examination of other related information relevant to status of rice varieties	20
Table 6: The most favorite rice varieties and their uses at four villages (2016).	21
Table 7. Schedule for meetings with the H're indigenous minority community, Po E commune, Kon Plong district, Kon Tum province, Central Highlands region of Vietnam through the IPBES ILK technical support unit (TSU) grant	23

Introduction

The Central Highlands of Vietnam, in specific Po E commune, Kon Plong district, Kon Tum province has gone through many changes since the historical period. Notably, there was a time when colonial French dominated this region. There have been quite rich and high-valued anthropological studies, ethnological studies documented for this region. These studies were in strong relation and focus on themes of ethnic indigenous minorities of the region, particularly conducted by French social scientists. In those studies, in the past, the terms of ‘ethnic minority’ were largely referred or used as the Montagnards, sometimes referred to as ‘forest people’; but most often these descriptions have not meant to connote ‘backward’ looking/or viewing of indigenous ethnic minority communities there. Some publications were taken in the form of photos-documentation, simply photographed in black and white the very daily lives of ethnic indigenous minority groups there. Moving forwards into the contemporary development context of Vietnam, in the current Vietnamese literature and social science studies, there is a lack of interests and attention and also studies that continue gathering and reflecting what have been going through during the daily lives of the indigenous ethnic communities (in particularly from the raw-lenses of indigenous voices and field-based cultural anthropological approach). There is also lacking of studies that looking at the changes that have happened and try to examine why changes have taken places, how changes that would affect their lives in the current and (possible) future time periods.

Given the current focus of SPERI’s work that is also located in this Region, and so to draw connections with the last meeting in Chiang Mai and IPBES current works on assessing the status of local indigenous knowledge, and hence, we were proposing the plan activities in this Region engaged directly with local indigenous H’re community in the Central Highland of Vietnam. In addition to the published works on Ethno-botany for Hmong indigenous community in Lao PDR (as referred to work of Cory Whitney et al (2014) which were proposed for the previous meeting in Chiang Mai, and also continuous on-going supports that have already helped for the ethnic indigenous Hmong people in Lao Cai province (such as the Region where Mr. Vang Sin Min comes from); and we thought we would like to dedicate this chance i.e. Small Grant Case Study, to this Region and focusing on the H’re indigenous minority that would be meaningful. Besides, very too little attention that has been undertaken for this indigenous group in order to continue our learning journey towards gaining the proper insights of the H’re indigenous group there specific for this Region. The H’re indigenous minority group itself has also been found to have very limited and isolated access to not only infrastructure access but also to information and opportunities

towards enhancing their local knowledge and capacity as well as empowerment of self-ethnic-identity determination.

We thus proposed for follow up meetings with the H're indigenous minority community, Po E commune, Kon Plong district, Kon Tum province, Central Highlands region of Vietnam through the IPBES ILK Technical Support Unit (TSU) grant.

The aims of the proposed meetings will be:

1. To inform local communities about the work of IPBES and the purpose and results of the dialogue workshop in Chiang Mai;
2. To consult with local ILK holders and practitioners so as to document additional relevant ILK related information suitable to publish a case study suitable for the Asia-Pacific assessment taking into account the priority themes discussed with the Authors;
3. To support the rapid write-up of full case study reports that were shared by participants in the Chiang Mai workshop; and
4. To seek prior informed consent as appropriate for the inclusion of collectively-held knowledge in the Proceedings.

Why do we conduct this case study?

From the recent Chiang Mai meeting during June 2016, we have learnt that the IPBES program (2016-2020) in the world is currently reviewing and assessing the current status and how trends of the local indigenous knowledge system for many sites across the world. UNESCO as well as IPBES for Asia-Pacific region continues to gather more evidence and information with regards to gain better understanding of status and trends of ILK in this Region: what are the currency, losses and or changes, for the better or for worse? Causes of these changes? What would be the future? UNESCO as well as IPBES for Asia-Pacific region wants to hear from direct on-the-ground villagers and representatives' voices and inputs what they want to see the current and future of their local indigenous knowledge and how? During the follow-up meetings, we also mentioned and re-sharing the information to all villagers in the 04 villages in Po E commune of the current works from IPBES, UNESCO and the Regional Assessment.

So, in connection with the past and current on-going efforts from SPERI in terms securing and defending for Indigenous People's Rights towards managing Land and Forests for upper watershed regions and also recent recognition from IPBES/UNESCO of our case studies, we proposed this additional case study for Po E commune at 04 villages (conducted in 10 days, co-incident with the Rice ritual ceremonies of the

H're minority, and so we can ask for information and witness the practices of the community with regards to rice varieties. During SPERI's on-going works at H're commune, we have observed the certain changes in ways H're people practice with their rice varieties especially adopting new rice varieties. The ways in which H're people practicing their rice have often interlinked with entire resources including land, water and forests from their upper watershed through to downstream areas. Given the changes in adopting new rice varieties, other changes such as how they relate and interact with their land and water and forests have also been changed. Hence, in order to continued promoting the need to strengthen protection and long-term management of the land and forests in the upper watershed, we looked into rice varieties and the changes in order to understand how changes happen and what would the the future strategies needed to be adopting for continue securing local people's resources and knowledge and wisdom. The H're community as well as the communal area also experiences the every-day challenges and complex issues happening with resources management in the commune. For instance: the continued changes between forest land to now upland barren field with only cassava crops, and the changes over the rice fields (between areas planting local rice varieties and new ones).

Why do we choose local rice varieties as the topic to conduct?

Despite our current and on-going SPERI's work for this Region (which focuses more on securing land and community forest titles for communities/villages), observations that we have encountered is that why the local rice tastes so good but people there seem to reduce in using them. As far as our observation concerned, why there used to be numerous hill-rice varieties but now no-longer at use? Why H're indigenous people now cultivate in wet-rice cultivation, not hill-rice cultivation? There used to be a story from one of the local villagers said that, they used to only need to work on the land with hill rice varieties for one crop per year; but the production can feed the entire family for a year long or even two years. However, the other issue is recently when they were introduced by wet-rice cultivation (largely by policy/agricultural extension officers), they become less using hill-rice cultivation; instead, engaging more in the wet-rice cultivation. Additional factor is that for quite an area of uphill land, people are now shifted towards planting cassava crop, even clearing trees (big trees) for planting cassava to feed the nearby Cassava Processing Factory. Associated with cassava crops, there is an increasing uses of Herbicides. This is such an alarming concern faced by the Region including policy makers, villagers, factory processors, buyers/traders of cassava crops. The promotion of cassava crop as a million-dollar crop has arrived at these villages and that a number of villagers' population has already engaged in clearing uphill land for planting cassava, which continues to worry the further loss of local rice varieties.

The local rice varieties, from our current understanding, are not only embedded with very rich local indigenous knowledge but part of their lives, wisdom and cultural practice such as the Ritual ceremony.

Study sites and timing

Target names: H're indigenous minority community, Po E commune, Kon Plong district, Kon Tum province, Central Highlands region of Vietnam.

Target villages: Violak village, Vi K Oa village, Vi Klang 2 village, and Vi Po E 2 village.

Timing of meeting: the many meetings took place from August 10-20, 2016, same time with Rice Ritual Ceremonies of the H're community.

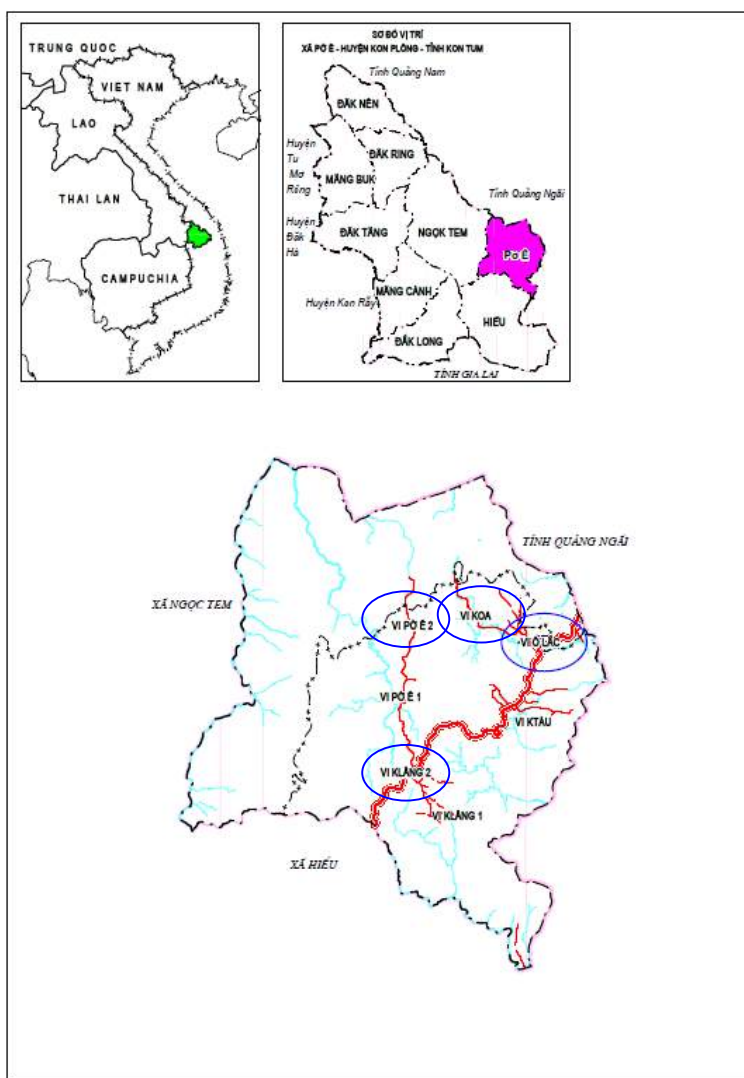


Figure 1: Location of the four villages, indicated by blue circles, of the Case Study Site (2016)

Case study methodology

There were three people involved in the collecting information of this case study. One focused on the camera (documenting photo and video), one focused on learning local indigenous knowledge on rice seeds/species, varieties and practices during the ceremony, and myself will focus on the entire ceremony with people from the village/who is doing what and how and the interactions during the ceremony and also ask about questions of how and why. Three of us also engaged in the ceremony to talk to village elders and other villagers' members groups. We asked for inputs from key persons, women's group, youth's group, elderly group in the villages to talk in-depth in the evenings. We also strictly followed the local customs there to respect their tradition and custom.

As the Ritual ceremonies were happening rather widely over 04 villages which each of them is quite distant from one another. We dedicated two days for each village to have proper times to observe, asking simple questions when we can intervene, we asked for permission to take photos and takes notes of what is and will be happening during the ceremony. We also kindly gave UNESCO/IPBES contributions to each village and the Po E commune as the financial planned budget; and acknowledged the current works from UNESCO/IPBES of how the Program wanted to support and contribute towards Recognition of Indigenous People and their Knowledge system. We also asked whether we can acknowledge all the names and knowledge from villagers contributed into this Case Study and we got approval and supports from all villagers and local village's authorities.

Given the timing of the study, we looked and interviewed and observing changes that have taken place since 2010. Most often we will refer to current sources of information for matters of access to the currency of the issues in this region. This case study and write-up serves as the reflection of realities that have been encountered by this indigenous community over the last recent years.

Field based methodology

- Initially, we talked to all communal authorities of our planning and the Program. We also asked from them about how we should go about conducting these activities for the purpose of the Program and Case study.
- Field based direct observations at villages (entire landscape system, around the rice paddies, at each households visited and also their rice storage area)

- Ask for opinions and ask for permission to document their knowledge from knowledgeable persons in the communities in terms of their local rice varieties. Deep listening and documentation of their exchanges and knowledge sharing.
- Direct interviews at the rice fields (area where they harvest, where and when they dry rice, or when villagers help each other (on rotational labor exchange to harvest, rice separation)).
- Consults as well as ask for data from communal authorities.



Figure 2: Photo-examples of field based methodology during this Case Study (2016).

Limitations of our works

We simply aim to raw-document of the situation(s) there, what and how local rice varieties have changed, in the form of visual video and write-up, through listening to local grassroots indigenous villagers and key persons. This means that we also lack of the scientific-aspect part from examining these traditional rice varieties themselves for quality assessment and nutritional factors.

Our examination of the situation of why local rice varieties have changed and the factors involved also largely focus on cultural factor and derived from cultural anthropological approach. Our examination respects the voices of indigenous leaders and key persons from all villages. And so we realize we lack local market analysis over the last 5 years of why people's use of local rice have changes and also due to the remoteness of the area and we lack available data to support this part further.

We prepared very simple questions and follow directly what happened on-the-ground following the narrative of the H're informant(s). We simply took notes and asked questions and documented. This also means that the complexity and dynamics are difficult to analyze and framing them within this draft.

Given most of us cannot speak the H're ethnic minority language, and joining with us were other local H're people and so we could not obtain the entire 100% of the all meanings and interpretations from the direct informants.

There may be a lot more insights, which we have not yet been able to study to the full. But to link up to the original thinking of using hill-rice for food and ensure food security in the past during their lives, and the numerous current changes that have happened also around their new lives, we thought we could target the changes of local rice varieties as the starting point but we realize this is also part of the limitations.

Case study's findings

Current landscape changes in the Po E commune

During the pre-2010, Po E commune was an area with much big trees' coverage and in certain parts, there have been only parts of acacia trees plantations but not to a big scale. During interviews and field works, we found that there were not any photos or images from the past to be available for documentation and publication for the area.

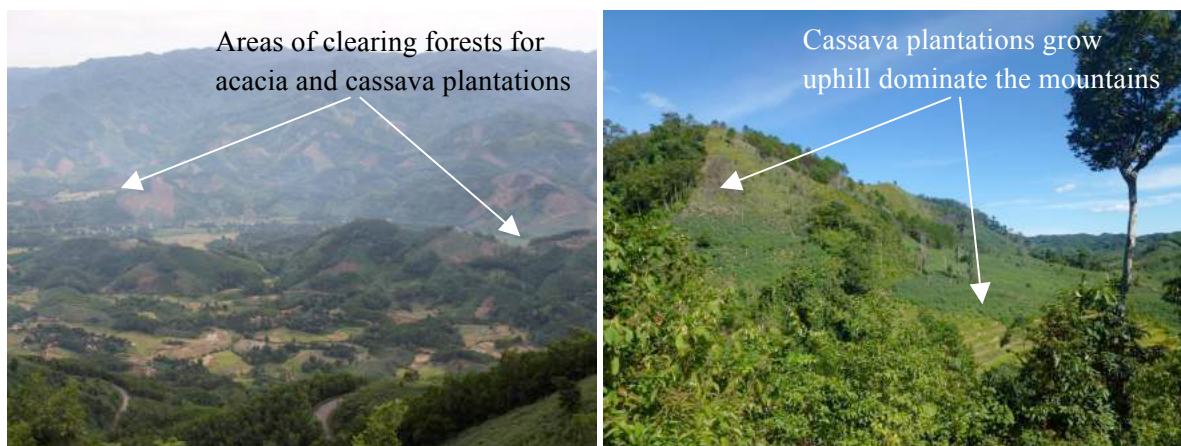


Figure 3: Left photo indicates mountainous areas of clearing forests for upcoming plantings of acacia and cassava crops. Right photo indicates areas of forest and land already planted with cassava crops (2016).

Po E commune locates on the beginning area from Violak Pass from Quang Ngai area going on the Highway No. 14 leading to the Mang Den ecological tourism area. It has a total land area of 11,736 hectares. From viewing the area from Violak Pass through to the inner Road along the two road-sides of the Highway No.14 passing through the main center of Po E commune, we can see already practices such as clearing of forest and land to make ways for new plantations crops such as acacia and cassava that have already taken place on various mountains i.e. on a landscapes' levels. Such a practice has become popular since 2013. In certain parts within the communal zone, we can see more land areas are now spent for cassava plantations while the rice fields are decreased.

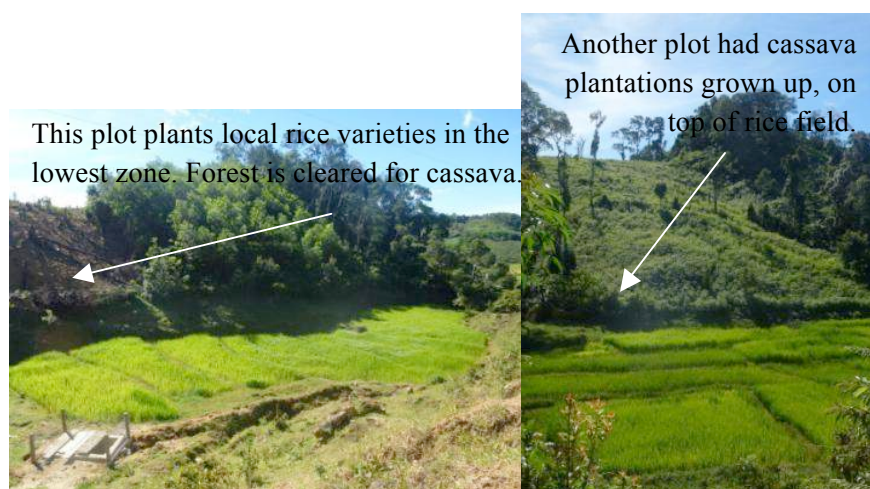


Figure 4: Left photo indicates a small plot of local rice varieties, but the upper part is currently cleared for soon cassava planting. Right photo indicates an area already with cassava plantation (2016).



Figure 5: Left photo indicates an one-village entire area covered now with cassava plantations. Villagers planted cassava in the upper-hill while rice fields are in the lowest zone (2016).

As we go into the inner road, often inter-villages road, massive changes over the landscapes level of the extension of clearing forest and trees and land to make ways for cassava crops plantations. Cassava plantations have taken spaces until top of the hills, i.e. implying the big trees had already been cleared. From the landscape and ecosystem viewing, all of the rice fields are located in the lowest zone of the landscapes.



Figure 6: Left photo indicates another village-area with local rice varieties but on the upper landscape planting with cassava plantations. Right photo is of the same message but different area (2016).

Changes over the three types of land uses in Po E commune

We were able accessing to data over the last three years 2014 to 2016. In the 2016, the information collected by local officials have been specifically observed between the early first 6 months compared with the planning for entire year.

Table 1: Changes over the three types of land uses in Po E commune from 2014-2016 (2016).

Land types and areas	2014	2015	2016 (early first 6 months)	2016 (planning for entire year)
Hilly areas (largely corns and cassavas)	384 ha	442 ha	<u>419 ha</u>	405 ha
Rice growing areas (to a certain area already affected by herbicides spraying)	320 ha	364 ha	246 ha	364 ha
Forestland areas (largely production forests such as acacia, cinnamon, bamboo)	644.6 ha	655.6 ha	655.6 ha	698 ha

The table above indicates that more hilly areas are now used for corns and cassavas and compared to the last two years (2014 and 2015), more cassavas have been planting. Even in the early first six months of the year 2016, we already see the total land area for corns and cassava have already gone above the limit (i.e. the yearly permitted planning). Specifically, 419 ha is now covered by cassavas despite the earlier planned of only 405 ha. The other notice is that the table also indicates the planning from Po E communal authority is to increase of production forestland such as acacia, cinnamon, and bamboo types of forests. Rice growing areas have already reached 246 ha out of 364 ha planned, in which villagers in Po E commune have, to a certain extent, planting both local traditional varieties and also new varieties.

Land areas for rice-growing and cassava-growing in the four villages in 2016

Through a series of discussions and combined between key villagers/leaders' knowledge of each village and the communal official data, we have developed a table comparing local rice growing area versus new rice growing area and also similar approach for cassava crops.

Amongst the four villages, Violak village is the only village that now all villagers are planting new rice varieties. Villagers in Vi Klang 2 village have been mixed planting between local rice and new rice varieties so that they can test which one give better yield for their lives. Vi Po E 2 is the village whom keeps the most land area for traditional varieties, followed by Vi K Oa village.

It is important to also aware that areas of planting cassava crops also increase over the recent years. Almost all villages have now adopted the hybrid cassava species and the areas for planting them are quite big.

Table 2: Land areas for traditional and new rice and also traditional and hybrid cassavas at the four villages in Po E commune (2016).

Land types and areas		Vi Pờ Ê 2 village	Vi Klâng 2 village	Vi K Oa village	Vi Ô Lắc village
Rice growing area	Entire rice area	43.5/40.1 ha	50/53.6 ha	45.5/53.1 ha	58 ha
	Local rice area	39.15 ha	25 ha	31.85 ha	
	New rice area	4.35 ha	25 ha	13.65 ha	
Cassava growing area	Entire cassava area	32 ha	39 ha	36 ha/41 ha	63 ha
	Local cassava area	4 ha	4 ha	4 ha	5 ha
	Hybrid cassava area	28 ha	35 ha	32 ha	58 ha
Community forestland area that SPERI has attempted since 2014	Watershed forests, sacred forests must be protected collectively under titles	76.24 ha	215.3 ha	152.16 ha	231 ha

Cassava growing areas with herbicides which affect rice-growing areas in the lower zones

Our observations and field trips have indicated that land areas where cleared and planting cassava plantations, villages have used herbicides such as these below.

Given over the large landscapes changes as we can see, planting cassavas associated with use of herbicides such as these which would be affecting the entire ecosystem from the upper land to the lower zones, including the rice fields.



Figure 7: Herbicides found in the Violak village (March, 2016)



Figure 8: Herbicides found in the Vi Klang 2 village (March, 2016)



Figure 9: Herbicides found in the Vi Po E 2 village (August, 2016)

Some concluding remarks

Over the times observations of the landscapes and ecosystem practices from the villages, the case study have found that:

- Rapid transition from forestland to now cassava plantations, combined with use of herbicides widespread will be extremely dangerous threatening the Food Security zone (largely rice paddies in the lowest areas)
- If continued shifting towards cassava plantations and more use of herbicides, these will be affecting entire landscapes including local native species, quality of the rice paddies, soil quality and water sources, as well as health impacts to community.
- The land resources are not going to produce more; and so, without proper practice and management of the current entire land resources of the commune, there would be huge consequences we have to bear in the next 3-5-7 years.

Current status of rice varieties in the Po E commune

Status of local traditional rice varieties in Po E commune and specifically the four villages

Across the entire Po E commune, we had found that not only the 04 villages but all 07 villages here still maintain, save and using the local traditional rice varieties. Given our time limit, we could only ask and documenting the 23 traditional rice varieties. These varieties have been stored in the traditional rice-stored house, which is made of a certain timber wood and has a specific design structure in order to avoid rats to destroy and eat all the harvest.

Table 3: The total number of local rice varieties still remain, save and using at each village (2016).

Names of villages examined of local rice varieties	The total number of local rice varieties still maintained, saved and using (till 2015-16)	
Vi Pờ Ê 2 village	21 varieties documented	<i>07 varieties without images</i>
Vi Klâng 2 village	14 varieties documented	
Vi K Oa village	11 varieties documented	<i>05 varieties without images</i>
Vi Ô Lắk village	07 varieties documented	
Vi K Tau village	20 varieties documented	
Vi Pờ Ê 1 village		
Vi Klâng 1 village	14 varieties documented	

The total number of local rice varieties examined and documented was 23 varieties. Yet, this figure does not represent the entire of villages. In addition, given each local rice varieties is ripen at the different times, sometime early whilst the other time late. During the last Rice ritual we could only witness and had access to the 23 varieties with certain images of them. We still lack images and examination of the few.

Across the 07 villages, we see that Vi Po E 2 village keeps most of the local varieties, about 21. The Vi K Tau village, despite not on the list of the villages in the follow-up meetings but during the field-work according to the local custom, we also engaged with the village leaders and key persons from that village and we found that this village keeps the second most of the varieties, about 20. Vi K Lang 2 village keeps the 3rd most varieties with about 14. And during our final exit-meeting at the Po E communal house, we invited all villages' representatives to attend and hearing and contributed comments; we found that the Vi Klang 1 village also keeps the same amount of traditional varieties like the Vi Klang 1 village, i.e. about 14. The Vi K Oa village keeps the 5th most of the local varieties, i.e. 11 ones and Violak village keeps about 07 local varieties.

Status of new rice varieties in Po E commune and specifically the four villages

Not only looking at the traditional rice varieties, we also encounter the new rice varieties. Interviews have pointed that in all villages they have now used the new rice varieties. The changes have taken place about five years ago, about since 2010. This change came from a fact that during the 2009 over the rainy season,

villagers and villages were hitting hard by a very strong rain and given its early arrival which caused them huge losses over the harvest that caused them stayed in hunger. There has also been additional new approaching from governmental Agricultural program that promoted new rice varieties which give higher yield whilst indicated that traditional varieties gave lower yield.

Table 4: The total number of new rice varieties recently using at each village (2016).

Names of villages examined of new rice varieties	The total number of new rice varieties used for the last 5 years
Vi Pờ Ê 2 village	02 new rice varieties documented
Vi Pờ Ê 1 village	02 new rice varieties documented
Vi K Oa village	08 new rice varieties documented
Vi Ô Lắk village	08 new rice varieties documented
Vi K Tau village	04 new rice varieties documented
Vi Klâng 2 village	02 new rice varieties documented
Vi Klâng 1 village	02 new rice varieties documented

The total number of new rice varieties is 08 varieties. Across all villages, the Violak village uses the most new varieties. Vi K Oa is on the same position. Vi K Tau village uses 04 new varieties although they still remain using the traditional rice as well. Vi Po E 2 and Vi Po E 1 villages use 02 new varieties. Vi Klang 2 and Vi Klang 1 villages use also about 02 new varieties. For those families whom use the new rice varieties have also been approached using chemical fertilizers since 2012, 2013 up to now.

Examination of other information relevant to status of rice varieties

From our discussions with key persons in each village, we also documented the additional following information such as (a) percentage of families using local varieties, (b) percentage of families using new varieties for each target village, and also (c) the number of families and the number of people for each village. The number of women, number of elders as well as number of knowledgeable persons whom know and save and use local traditional rice varieties were also asked.

Table 5: Examination of other related information relevant to status of rice varieties

Examining other related information	Vi Pờ Ê 2 village	Vi Ô Lắk village	Vi Klàng 2 village	Vi K Oa village
% of families use local varieties	85%	Only keep 03 local varieties: Mao Hroa, Kdút, Co	100%	30%
% of families use new varieties	15%	100%	90%	70%
Total number of families	44	57	98	69
Total number of people	128	n/a	450	248
Total number of women	48	n/a	n/a	120
Total number of elders (> 60 old)	15	22	22	14
Total number of knowledgeable persons whom know and save and use local rice varieties	15	9	20	12

As indicated in the Table, it appears that the Vi Klang 2 village is the one with 100 percentages of all families still daily using their local rice varieties, but at the same time 90% of all families using new rice varieties. This implies that they practice rice farming on plots through cultivating both local and new rice varieties at the same time. This village has had the most knowledgeable persons whom know and save and use local traditional varieties.

Violak village is the one with highest percentage of all families whom are using new varieties. They only keep the traditional ones for special occasions such as used in sacred ritual, making special local indigenous cake named ‘Banh Tet’ as well as making wine. The three traditional rice varieties are traditional sticky rice.

Most of the families in Vi K Oa village, up to 70 percent use new rice varieties and the rest uses local traditional ones. We can still find many knowledgeable persons whom know and save and use local rice varieties. Vi Po E 2 village has a very high percentage up to 85 percent of all families whom using local varieties but we can see the other 15% of families already shift to using new varieties.

The most favorite rice varieties from the four villages

Fieldwork and interviews have found that in each village they have their own specific favorite rice varieties, even different in the collection of their favorites. Despite they come from the same ethnic indigenous H're and living on the same territory/commune, each has their own collection of seeds and favorite varieties.

Table 6: The most favorite rice varieties and their uses at four villages (2016).

Names of villages	Names of most favorite rice varieties and continue using and saving	For what use purposes?
Vi Pờ Ê 2	+ Mao Kdút + Mao Luộc + Mao Hroa (sticky) + Mao Tdo âng gam (black sticky rice)	More seeds and higher yield; Make wines most tasty
Vi Ô Lắk	+ Mao Hroa (sticky) + Mao Kdút (sticky) + Mao Co (sticky)	Make wine For sacred ritual (traditional New Year) Make special cake (Tép)
Vi K Oa	+ Mao Nụ + Mao Hroa (sticky)	For sacred ritual Make wine Make special cake Make 'cóm' Women eat during 3 months after delivery (Mao Nụ)
Vi Klâng 2	+ Mao Tdoâng mong + Mao Tinh + Mao Nét + Mao Mong + Mao Diu	Make special cake Make wine For daily uses

Some concluding remarks

- The total of local traditional rice varieties documented is 23 species: with Vi Pờ Ê 2 village keeps the most and Vi Ô Lắk village keeps the least.
- The total of new rice varieties documented is 08 species: with Violak village uses the most (100% families) and 04 villages (Vi Pờ Ê 2, Vi Pờ Ê 1, Vi K lằng 2, and Vi K lằng 1) only use for now 02 species (many villagers still testing on their rice fields)

- Families whom use new rice varieties already used chemical fertilizers since 2010. Most obvious is families in Violak (since 2013, 2014) and about 2/3 of families in Vi K Oa. Very few households in Vi Klang 2, Vi Po E 2 start using new rice varieties in 2015-2016 with some chemical fertilizers (depending on families whom have money to buy fertilizers).

Discussion

Given the interviews both direct and indirect, formal and informal sessions, we have found that most of the local traditional rice varieties have continued been using and saved by all local indigenous villagers. For two villages such as Vi K Oa and Violak they saved less local varieties compared to other villages but they still use them and will never forget using them particularly in the sacred, special traditional ceremonies or rituals; and also specialty wine making process. Given the current effects from herbicides uses and more awareness and realization of impacts from using chemical fertilizers and herbicides making the soil structure harden and reduced in productivity, certain groups of villagers started to realize the interdependences between traditional and new rice varieties with use of agricultural inputs which are largely provided and dependent upon external/outside. There is not yet a systematic and comprehensive scientific-based collection of data and samples to testing how use of chemical fertilizers and herbicides affect the soil productivity, rice yield productivity, and indigenous villagers' health.

Certain parts of traditional rice varieties growing areas would have been affected by changes from the cassava plantations area as these upper zones have been sprayed by herbicides. The initial natural forest structure would give the natural nutrients and organic ecological matters from the upper mountains to feed the soil and keep water safe for rice production in the lower zones. The landscape and ecosystem services have changed dramatically towards the continuous cassava-landscapes (or cassava-mountains), together with promotion and use and dependence of herbicides, the effects and impacts toward future dynamics of biodiversity and ecosystem functions would likely get worse. In other parts of Vietnam, reports and media have already reflected the use of herbicides would kill the social health, well-being, livelihoods and thus the local economy.

In some villages, there are still areas of absolute organically ecological local rice growing zones. Interviews and discussions have also found out that the taste and nutrition from the local rice varieties are much higher, and quality oriented. As a farmer shared, he may just eat one bowl of local rice variety and he feels more filling for entire day – compared to use of new rice variety. In other cases, people report that use of new rice variety does not give a good taste to wine. Those local varieties to be grown in a very clean area support highly ecosystem functions and services, not only to biodiversity, but also adding aesthetic values and beauty of entire landscapes.

Pressures driving the change in the status and trends are derived largely from the process of un-realizing impacts from chemical spraying and herbicides spraying onto the soil, which often is caused from limited access to information and knowledge of what is right and what is not relevant in terms of farming practices needed to be practiced for social well-being as well as ecological well-being.

Annexes:

Table 7. Schedule for meetings with the H're indigenous minority community, Po E commune, Kon Plong district, Kon Tum province, Central Highlands region of Vietnam through the IPBES ILK technical support unit (TSU) grant

Date	Activity
10 August:	Arrival.
10 August:	Evening: introduction to the group of the key persons there. Mentioned of our aims of this small case study and also sharing about the current IPBES work at the international level; sharing as well how things had done and shared during the last ILK meeting in Chiang Mai in order to realize more the significance of Indigenous Local Knowledge. Ask for consultation on how to engage into the ceremony as well as asking questions for this case study theme.
11-12 August:	Violak village (10-20 people) participants list attached.
13-14 August:	Vi K Oa village (10-20 people) participants list attached.
15-16 August:	Vi Klang 2 village (10-20 people) participants list attached.
17-18 August:	Vi Po E 2 village (10-20 people) participants list attached.
19 August:	Summary, present findings to villagers, and evaluation (20-35 people)
19 August:	Meeting happens in the Po E communal people's committee office, inviting not only villagers, village representative leaders, as well as other functional offices to attend to hear as well.
20 August:	Departure.