UNIVERSITY OF COPENHAGEN

KASETSART UNIVERSITY

"United we stand"

A case of collective action in a community-based tourism project in Ban Thai Samakkhi, Thailand

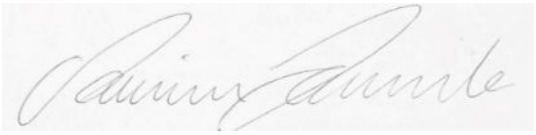
April 5th, 2019

Interdisciplinary Land Use and Resource Management (SLUSE)
Supervisors: Thorsten Treue & Frauke Tom H Mennes
Authors: Amina Samale, Chiara Chiavaroli, Jeffrey Kwok, Pernille Neve, and Peter Andreas Munk-Nielsen

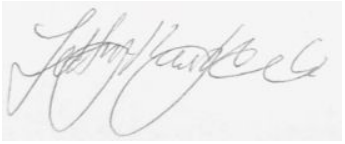
Word count: 10,955

Title: "*United we stand":* A case of collective action in a community-based tourism project in Ban Thai Samakkhi, Thailand

Signatures:

Amina Samale (fdm804): 

Chiara Chiavaroli (xls705): 

Jeffrey Kwok (wjq123): 

Pernille Neve (zhf903): 

Peter Andreas Munk-Nielsen (lbf813): 

Front page photo: Members of Thai Samakkhi's village committee (1st from the left, 2nd and 3rd from the right) and students from the University of Copenhagen and Kasertsart University taken at the community assembly hall (picture taken by authors)

Abstract

Collective action arises when people pursue a common goal (Ostrom, 2010). In the village of Ban Thai Samakkhi, Thailand, the villagers have undertaken collective action to establish and run a community-based tourism project (CBTP) to generate income.

The objective of this research is to understand the dynamics and processes in the collective action governance strategy behind the community-based tourism project, through asking the research question: *how has collective action in CBTP shaped the interactions between people and institutions?* The study is built on data collected during a field trip to the village in primo March 2019. Analyses of the data use Oakerson's framework (1992) "Analysing a Common" and theoretical contributions from Bourdieu (1986) on capitals and Peluso and Lund (2011) on power and land.

The study finds that informal power over land access and use resides with the village headman, although formally, the sub-district office is the sole institution that can assume this power. Personal ties and social capital have become important mediating factors due to the informality surrounding land access and use decisions. Villagers engage in a number of activities to gain social capital, hereunder donations and attendance at community meetings. A level of differentiated citizenship exists, where people with higher social standing and economic capital seem not to be dependent on personal ties and social capital due to their economic status within the community.

In conclusion, collective action in the community-based tourism project shows that perception of power over land gives rise to obligations that inform power relationships.

Word count: 250

Acknowledgements

In the process of writing this report as part of the SLUSE 2019 Joint Field Course in Thailand, we would like to thank all the partners who made it possible: University of Copenhagen and our supervisors, Dr. T. Treue and phd-student F. T. H. Mennes; Kasetsart University and the professors, Dr. Poonsak and Dr. Sopana; Roskilde University; our student-counterparts from Kasetsart University, Ms. K. C., Ms. Optian and Ms. Loungmuang; our driver and the staff at the Research Centre for facilitating our research; the village headman in Ban Thai Samakkhi. We would also like to extend a warm appreciation for our wonderful translators, Ms. Chananchita Rueng-O-Cha and Ms. Nattakorn Kitkaona, whose help, support, and friendship were invaluable during the field course.

We would also like to thank the people of Ban Thai Samakkhi for their hospitality and helpfulness – particularly, *Mushroom Lady, Coffee Factory Staff,* and the operators of the two case farms.

Table of work distribution

Chapter/section	Main author(s)	Contributing author(s)
Abstract	Amina, Jeffrey, Pernille	
1. Introduction		
1.1 Preface	Jeffrey	
1.2 Presenting the field site	Chiara	
1.3 Collective action approach to resource governance	Jeffrey	
1.4 Frameworks	Jeffrey	
1.5 Key concepts: Institutions, Power, and Community	Chiara	
1.6 Objective and research questions	All	
2. Methods	Pernille	Peter
3. Analysis		
3.1 A tale of two organic farms in Thai Samakkhi village *Case study diagrams*	Jeffrey Jeffrey	Pernille Pernile
3.2 Economic robustness and market access within the collective action framework *Nutrient flow analysis* *Economic analysis* *Soil sample analysis*	Pernille Pernille, Jeffrey Pernille, Jeffrey Peter	Jeffrey
3.3 Social and economic obligations of land access and participation	Chiara, Jeffrey	
3.4 Decision-making units and forms of institutions	Chiara, Jeffrey	
3.5 The Broker	Chiara	
3.6 Differentiated citizenship and social capital	Chiara, Jeffrey	Amina
3.7 Big entrepreneurs; the exception to the rule	Amina	
4. Reflections *Social sciences* *Natural sciences*	 Pernille Peter	

5. Conclusive remarks	Amina	
Data analysis - statistical analysis of questionnaire data and diagrams	Pernille	

List of abbreviations

CBTP: community-based tourism project
FGI: focus-group interview
PRA: participatory rural appraisal
SDO: Thai Samakkhi sub-district office
SPG4-01: Sor Por Gor 4-01 (land title)
SSI: semi-structured interview
TS: the village of Ban Thai Samakkhi
TSSD: Thai Samakkhi sub-district
VHM: village headman of Thai Samakkhi

Table of content

Chapter 1: Introduction

1.1 Preface

From city to village, across *different societies and ecological systems* (Ostrom, 2010, p. 155), people have always organised themselves in order to harvest the advantages of collaboration (ibid.). Be it the coming-together of different sets of knowledge and skills, the sheer power of numbers that comes with being a group, or human beings' inherent nature to seek out companionship among members of their species (Ingold, 1986), there is no doubt that achievements of collective efforts exceed what human beings can do individually (Ostrom 2007). There are interesting dynamics to be understood in the way people organise themselves when they act collectively and in the social norms that are developed therefrom (Ostrom, 2000). Every case is unique in its own right; nonetheless, there are recurring themes that can be observed (Ostrom, 2007), and each case reveals a unique facet of what people can achieve when they stand together.

This study investigates a case of collective action in Ban Thai Samakkhi village, where a significant number of residents have pulled together their efforts to secure their livelihoods through developing and supporting a community-based tourism project (CBTP). The roles of key actors, the dynamics among participants, and the socioeconomic impacts of this project will be the foci of the study.

1.2 Presenting the field site

1.2.1 History of the land

The village of Ban Thai Samakkhi (TS) is situated in the Thai Samakkhi sub-district (TSSD) of the Wang Nam Khiao district in Nakhon Ratchasima province, 395 km north-west of Bangkok. It has an altitude of around 500 meters above sea level and a temperate climate with temperatures ranging between 25-33°C. The village counts 445 households (Thai Samakkhi Administrative Organization, n.d.) and is connected to Bangkok through a well paved road. The easy access to the city allows the establishment of commercial relationships with Bangkok-based companies and retailers, while at the same time attracting tourists from urban areas to the village (Cohen, 2014).

The village lays in the overlapping area between Thap Lan National Park and TSSD (Figure 1). Thap Lan National Park is the second largest national park in the country. Although the park was under the protection of the Royal Department of Forestry as far back as the 1950s, logging concessions were still given to local settlers and their presence and activities were tolerated. In 1973 the area was formally declared a "forest reserve" and the encroachers' presence was declared illegal (Cohen, 2014). The presence of old settlers, that organised themselves to protest against their potential displacement, made the enforcement of this law virtually impossible. Moreover, the opening of road no. 304 which cut through the reserve area and

cleared the way for the establishment of new illegal settlements (ibid.). In 1981, the reserve was declared a “National Park” and the use of land was formally restricted for conservation purposes only (ibid.). Presently, a number of activities conducted by the settlers: homestay businesses, eco-tourism, and organic farming, seems to be tolerated by the local authorities, while logging and the establishment of private resorts, seem to be targeted by police (ibid.).

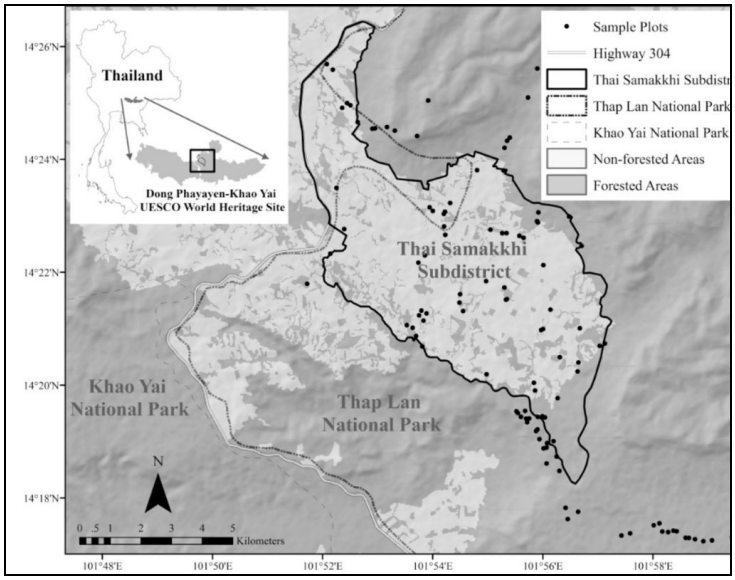


Figure 1: Map of TSSD – land overlapping with Thap Lan National Park (Pongpattananurak, 2018)

In the early 1990s, about 226.000 rai of degraded forest area in Thap Lan National Park (Cohen, 2014), was put under the administration of the Agricultural Land Reform Office, to be redistributed among landless farmers under the land title of Sor Por Gor 4-01 (SPG4-01). This land title emerged as a response to the requests put forward by landless farmers in 1973 and 1974 in a number of public demonstrations in Central and Northern Thailand (Jaratphong, 2015). The administration of SPG4-01 land is regulated by the 1975 Agricultural Law that established the creation of an Agricultural Land Reform Office that can allocate up to 50 rai of land to landless peasants (ibid.). SPG4-01 land is allocated for agricultural purposes and even though possession of the land is given to the occupants, they are not allowed to *transfer their ownership rights to any outsiders* (Wipatayotin, 2011). SPG4-01 land can therefore be inherited, but cannot be sold, as it ultimately remains “public land” (ibid.).

1.2.2 History of the village

Figure 2: Welcome sign at the community assembly hall in TS (own picture)

In a focus-group interview (FGI) conducted with 16 villagers,including the CBTP-coordinator of TS, the history of the village has been reconstructed as follows (Figure 3).

Despite the constraints to the expansion of agricultural activities represented by the presence of the National Park, TS has traditionally been a farming village. In the 1990s, traditional farming systems were based on monoculture of corn and cassava. In the years between 2010 and 2018, farming was not a sufficient income source and many villagers had to sell goods, work in private resorts or factories situated in the province and in Bangkok. Many villagers practising monoculture had to borrow money to invest in fertilisers, seeds and machinery, but the low market price of corn and cassava did not allow them to repay their debts. The limitation of monoculture farming pushed them towards income diversification. This dynamic seems to be consistent with a process of diversification throughout rural Thailand according to Ozturk (2009), and in the 2000s, rural livelihoods started to be de-linked from farming and agricultural resources (ibid.). The majority of the jobs villagers found outside the farming sector did not guarantee them a stable, year-round income, as they were mostly paid daily and worked under conditions that heavily favoured the factory or resort.

In May 2018 TS received from the Thai Samakkhi sub-district office (SDO) a fund of THB 1,000,000 to be invested in a CBTP; the establishment of the CBTP was proposed by the village headman (VHM) who encouraged the villagers to participate in collective action and the CBTP. Since then, eleven homestays have opened (Figure 4). In order to administer this fund, the village-committee (composed of 4 villagers who are elected by hand-raising in a public assembly) led by the VMH, established the CBTP-committee. The CBTP-committee has the responsibility to administer the budget received by the SDO. Moreover, 10% of the earnings from hosting the tourists, is kept and administered by the CBTP-committee.

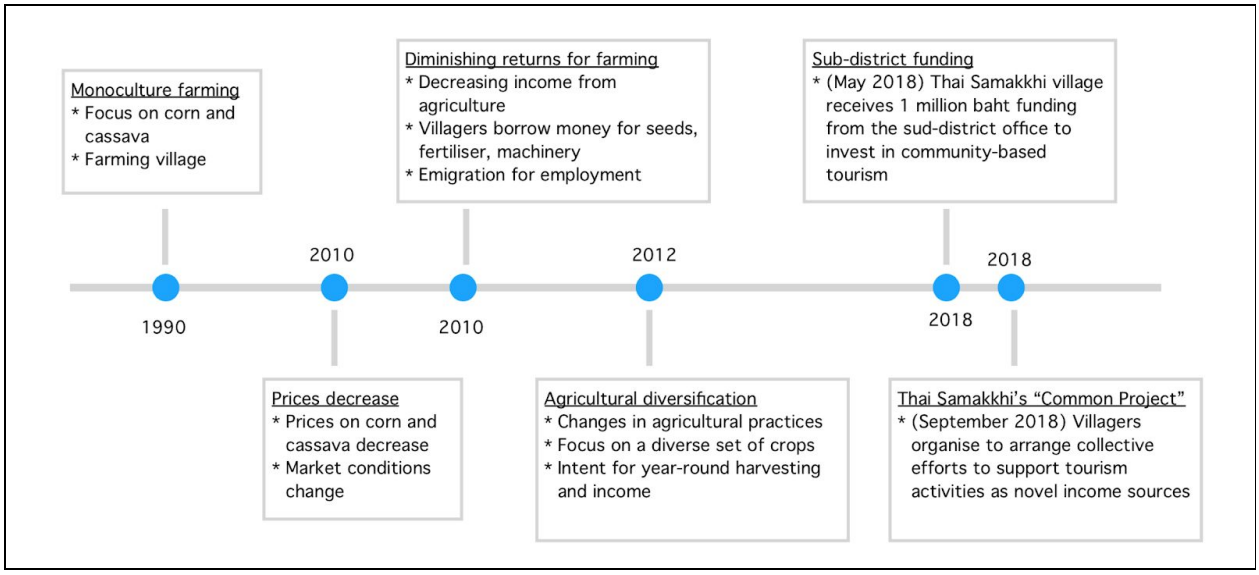


Figure 3: Timeline representing major events or trends in the recent past of TS (1990-March 2019 (time of data collection)) which have shaped the presence of TS (based on own data)

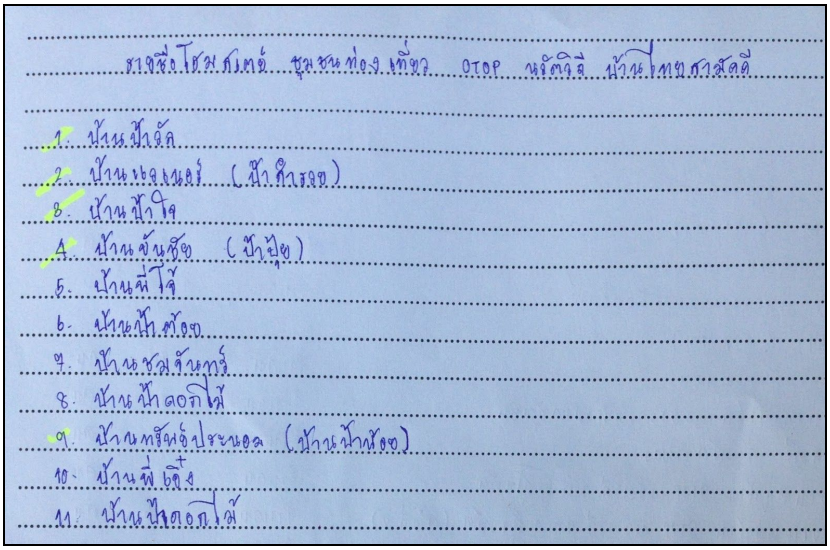


Figure 4: List of 11 homestays in TS (adapted from CBTP register)

In the words of the CBTP-coordinator, 90% of the farmers in TS are now practising organic agriculture – which is one of the OTOPs[1] of TS. The analysis of livelihood strategies conducted in the field through questionnaires, show that farming represents a significant source of income for the villagers. 40% of the respondents relate that farming is their most important income-generating activity, followed by 36% of the respondents who replied that the business

[1] OTOP ('One tambon one product'-strategy) is a governmental stimulus project that aims to increase village incomes through local entrepreneurship by supporting locally produced and crafted products from every tambon (sub-district) in Thailand (Tourism Authority of Thailand, n.d.). The most attractive product from each tambon is selected to be branded as a 'starred OTOP product' and then promoted nationally as well as internationally. The TSSD specialises in the cultivation of chrysanthemums, mushrooms, and organic vegetables (interview with VHM). Farmers that engage with the production of these OTOP products have access to funding possibilities to finance their businesses (ibid.).

they owned was their most significant source of income. Only 3% engaged with the service industry as a first source of income, this includes working in other tourist-related services or in shops (Figure 5).

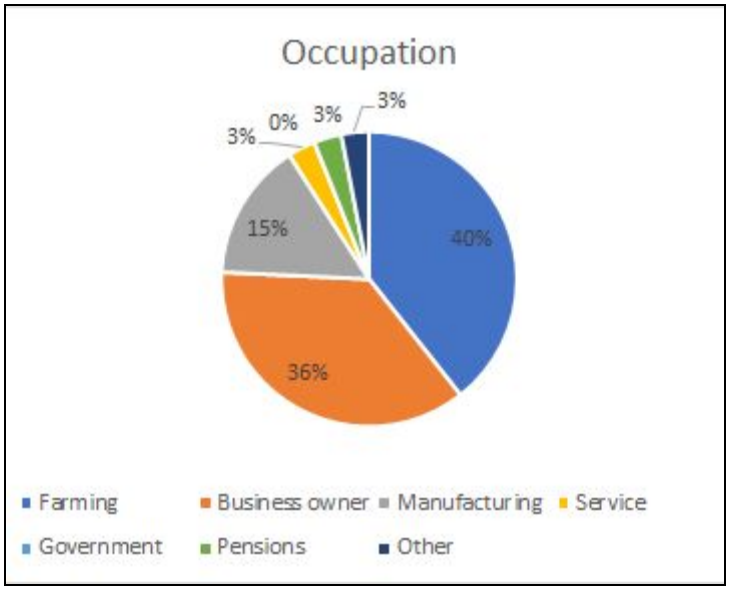


Figure 5: Distribution of main livelihood strategies in TS (graph based on questionnaire results – see Appendix F)

1.3 Collective action approach to resource governance

The governance of natural resources is a complex matter that, depending on the specific context and governance strategy in which the resource is used and controlled, exhibits particular dynamics among resource users. For example, Hardin's (1968) theory on "The Tragedy of the Commons" discusses that a resource base degrades in "open-access" circumstances due to resource users' choice to pursue their self-interest which undermines the common good, contrasting Kumar's (2005) discussion on community-based natural resource management models where engagement of resource users in governing the resource occurs and in which overexploitation costs are internalised.

The discourse around natural resource governance and the frameworks that are developed therefrom, although meant for the discussion of a subtractable and physical resource (Ostrom et al., 1994), pertain relevance for "man-made" resources too. Man-made resources such as *lobbying* (Requier-Desjardins, 2004) and a commonly shared *idea* of obtaining higher income or a particular socioeconomic outcome likewise follow the core dynamics in natural resource governance frameworks, where unmanaged or ineffective behaviour (both in relationship to resource use and actions that undermine a common project) serve as the common trait.

Collective action describes the organisation of people into groups based on a logical perception of how to pursue their common interest. This logic is based on the rational formation of collaborations when individuals' interests coincide (Olson, 1974). Oakerson (1992)

notes that *what is ordinarily called collective action can be understood as n-person reciprocity* (p. 50); here, reciprocity denotes *norms (...) that induce individuals to undertake pro-social actions whenever they expect others to do the same* (Sethi, n.d.). Hence, the success of collective action depends on several factors. Firstly, individual costs need not to exceed individual benefits for rational humans to participate in collective action (Olson, 1974). Next, reciprocity among resource users needs to be maintained such that people who benefit from collective action strategies contribute as determined by the operational rules. Lastly, a level of social control within institutions of the collective action framework needs to exist to upkeep reciprocity (Ostrom, 1986).

By extension, this section argues that natural resource governance frameworks such as Oakerson's (1992) "Analysing a Commons" model (Figure 6) can be adapted for analysing collective action organisations and institutions of a non-physical, man-made resource. CBTP in TS represents a case of man-made resource governance through collective action, where the resource is a shared goal to secure a higher, stable income. This shared goal can be seen as a "common" because it collapses if everyone acts out of self-interest alone.

1.4 Frameworks

Oakerson's Framework on Analysing a Common

Oakerson's (1992) framework on "Analysing a Commons" (Figure 6) focuses on a system's understanding of outcomes, based on individual choices and formal and informal institutions. Four attributes of resource governance structures are identified by Oakerson (1992); these attributes and the causal interactions and interconnectedness among them will be referred to throughout the analysis chapter.

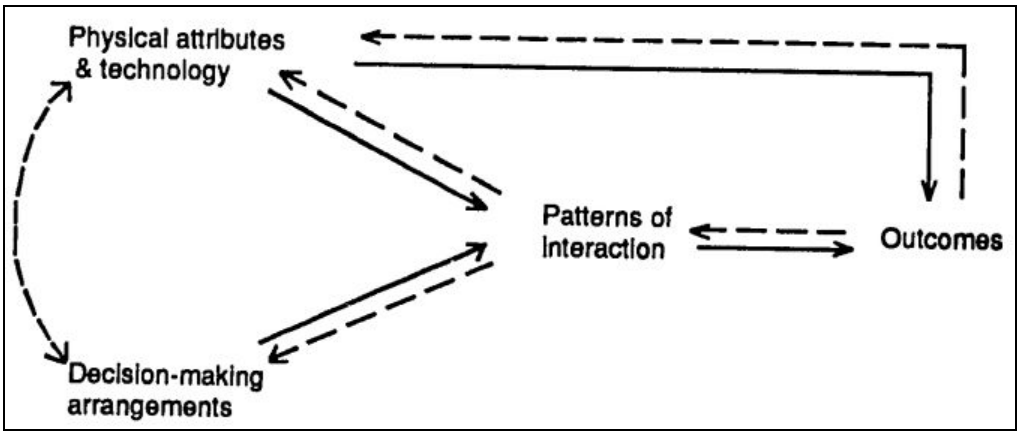


Figure 6: "Analysing a Commons" by Oakerson (1992, p. 56)

Here, the *physical attributes and technology* are the biophysical and technological restrictions in managing a "commons", i.e., the inherent natural limitations and the availability or the lack thereof in e.g., infrastructure and machinery. The *decision making arrangements* consists of the organisations and relevant institutions, both formal and informal, that form the structure of

governance system and determine its operational rules. Within these arrangements are relationships and hierarchies in decision-making processes which specify *who decides what in relation to whom* (Oakerson, 1992, p. 46). The *outcomes* are the biophysical, social, and economic effects of the operational rules on participants of the system. The *patterns of interactions* are individual decisions and patterns of behaviour. They represent the "bottleneck" that dictates whether decisions in *decision-making arrangements* are translated to desired *outcomes*. Individual choices are understood by the perceived obstacles and inducements to follow operational rules (Oakerson, 1992).

Arnstein's Ladder of Participation

Arnstein's (1969) scheme (Figure 7) describes the hierarchical structure to participation as a set of "ladder", where degrees of inclusion are analysed. It argues that interactions among collective action participants results in the creation of differentiated space for participation. Three levels of participation are identified: (1) non-participation, (2) tokenism, and (3) citizen power. More effective participation is realised when ascending the ladder (ibid.).

Non participation is characterised by the lack of power distribution with the intent of manipulating participants' opinions (manipulation) or to impose a specific narrative over them (therapy). *Tokenism* includes information sharing (informing) and the illusion of involving people and their perspectives in constructing a narrative (consultation, placation), however without implying that effective action can be taken on the basis of their perspectives. *Citizen power* implies power redistribution and coincides with spaces of participation that are taken by rather than given to the citizens (Arnstein, 1969).

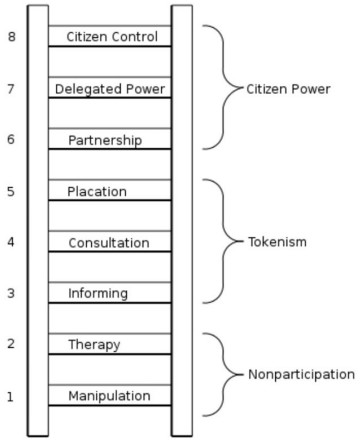


Figure 7: The ladder of participation by Arnstein (1969, p. 217)

1.5 Key concepts: Institutions, Power, and Community

In the analysis of the collective action project in TS, a specific relevance will be given to the role of **institutions***.* Firstly, institutions will be considered as mediating structures that influence access to different forms of capital, in particular land, and therefore shape local livelihood

strategies. Secondly, institutions will be considered as actors that play a significant role in the mechanism of collective action in TS. Lastly, institutions will be considered as *the means through which … three dimensions of power (regulative, normative and cognitive) work through individuals, resulting in a particular set of power relationships* (Jakimow, 2013, p. 497). This definition includes formal and informal institutions, organisations, rules and codes of behaviour organised around (1) a *regulative pillar* which consists in a body of sanctions and rules elaborated to constrain the individual to act in order to not threaten and to benefit the collective good (Scott, 1995), (2) a *normative pillar* which *brings in the prescriptive, evaluative and obligatory dimensions of social life; institutions construct what is desirable, appropriate and necessary* (Jakimow, 2013, p. 498), and (3) a *cognitive pillar* that consist of embodied cognitive schemes through which the world is seen and perceived and that represent the basis of the subject's process of thought.

Following this perspective, the webs of power relationships among subjects and institutions observed during fieldwork will be analysed considering **power** as: (1) the power residing in the decision-making process: (1a) power to make rules and (1b) to take decision over conflicts (Jakimow, 2013), as well as (2) the power of defining moral values and cognitive schemes that inform people's action (Lukes, 2004).

Community will be seen as the discursive construction that turns an heterogeneous social group into a *unified, organic whole* (Agrawal and Gibson, 1999 p. 631) with coinciding intentions and aspirations. Performing as a *community* is needed by different social actors in order to acquire power and a certain degree of control over the process of natural resource management (Agrawal and Gibson, 1999).

1.6 Objective and research questions

Based on the background information on TS and the frameworks that have been identified, the *objective* of the study is to understand the dynamics and processes in the collective action governance strategy of CBTP in TS. To investigate this objective, the following research questions and themes have been formulated:

Research question:

- How has collective action in CBTP shaped the interactions between people and institutions?

Research themes and sub-questions:

1. Characteristics of decision-making arrangements: *How does collective action work?*
    - 1.1. Which formal and informal institutions regulate collective action in Thai Samakkhi?
    - 1.2. To what extent is people's interaction with institutions based on different ladders of participation?
2. Drivers of participation: *Why do people participate in collective action?*
    - 2.1. To what extent is access to land a driver to participate in collective action?

2.2. What are the socio-economic costs and gains related to participation in collective action?

3. Dynamics of power: *How are power relationships among different actors affected by the CBTP?*
   3.1. Which power relationships emerge among the different actors involved in CBTP?
   3.2. Which institutions lose and gain power in the context of CBTP?

Chapter 2: Methods

To get introduced to the village, a community meeting with village representatives including the CBTP-coordinator was set up during the first day in the field. Through this meeting, contact was established with initial informants for the research. For data collection to investigate the research objective, the following methods have been used in the field (detailed descriptions of the applications of the methods are in Appendix B):

Focus-group interview (FGI):
A FGI with CBTP-committee members was held in combination with a timeline workshop (see Participatory Rural Appraisal (PRA)) to get information about the CBTP and the history around it and TS. The possibility of obtaining both explicit information through the interview, as well as implicit information through the observation of its participants (Brockington and Sullivan, 2005) has been the reason for choosing FGI to collect data. Through this FGI, additional contact was established with informants.

Semi-structured interview (SSI):
Several SSIs with various informants (villagers, key-informants, and 'gatekeepers') were conducted to collect data about the governance structure, collective action, the CBTP, and farm systems. Prior to each SSI, an interview guideline with topics and initial questions was constructed (see Appendix H). Conducting SSIs provides an opportunity to collect data about villagers' understanding, experiences and feelings, specific information from 'experts', in a semi-controlled setting for the conversation (Kvale and Brinkmann, 1997). Informants for the SSIs include the SDO-chief, VHM, CBTP-coordinator, two organic farmers used for case studies, and homestay owners.

Questionnaire:
Questionnaires provide a structured survey for collecting quantitative data to use in statistical analyses and for comparisons (Casley and Kumar, 1989). Quantitative demographic data about the respondent and their household, e.g., age, education-length, occupation, income, and participation in collective action was collected through the questionnaires to be analysed through correlation analysis, percentages and comparisons. Selection of participants was conducted through a convenience and snowball sampling strategy (Marshall, 1996). Refer to Appendix G for the questionnaire scheme.

Participatory Rural Appraisal (PRA):
PRA is a set of research tools that enables the local people (central to the research) to share their own knowledge with the researcher, and to analyse and discuss this knowledge collectively among each other (Emmel, 2008). The PRA-methods of timeline and calendar were used in the field. In the timeline workshop, the researcher investigates history through the perspective of local people's memory (Mahesh, 2017), which in this research was about the village history, collective action and the CBTP, including visions and goals for the future. In

addition, two agricultural activities calendars were elaborated in the two organic farms chosen for the case studies, showing patterns throughout the year (Cavestro, 2003).

Farm system analysis:
A farm system analysis with a focus on economic balance of running the farm (input: e.g., fertiliser, seeds, labour costs, and outputs: e.g., crop yield, sales price, household consumption) (Keating and McCown, 2001), and nutrient flow for agricultural produce (inputs: e.g., fertiliser, manure, and outputs: e.g., harvested crops, plant uptake, and recycles e.g., residues) (Rufino et al., 2005) was conducted for two organic farms in the village using data collected through SSIs and reference values. The analysis of economic balance and nutrient flow lay the bases of assessing the efficiency of the farm system. Contact with the two case study farmers was established at the local market and the FGI. The criteria for the choice were: the practice of organic agriculture, the location of the farm, and the dependence on collective action.

Soil sampling:
To triangulate the results from the case studies, soil analyses have been conducted. Soil samples were collected from one lettuce field in each case study farm. As the fields were organised in rows of lettuce in different production stages, four replicates of the topsoil (depth 25 cm) located in a zig-zag pattern (to represent the field) were taken using a hand-auger. The replicates were mixed into one combined sample for each field from which samples for measurements could be picked.

Nitrate-concentration:
Nitrogen (N) is one of the major plant growing nutrients (Defoer et al., 2000), and lack thereof is a growth limiting factor of organic agriculture (Øvsthus et al., 2017). Measurements of nitrate-concentration in soil can tell how much N is bound in nitrate in the soil. Nitrate is a common, plant-available form of N (Bernhard, 2010; Øvsthus et al., 2017) and can be used to compare to the efficiency of nutrient use as estimated through SSIs and reference values.
Nitrate-concentration of the soil samples from the case studies was measured with nitrate test strips dipped in the supernatant of soil water (10 ml fresh, moist soil and 30 ml water, shaken and left to settle) and then inserted into a reflectometer. To use the correct correction factor, soil texture was determined through the soil rolling method (SLUSE, 2019). Two measurements were made from four replicates from each field to determine N bound in nitrate.

Chapter 3: Analysis

3.1 A tale of two organic farms in Thai Samakkhi village

The analyses of collective action governance systems in TS takes its departure from case studies of two agricultural systems; A's organic vegetable farm (case study 1 – Figure 8) and B's organic lettuce farm (case study 2 – Figure 9). A and B, landless farmers, whose access to income generating land is due to land allocation schemes mediated by the VHM. For this reason, they have been chosen as representatives of the farming system in TS. Obtaining land through land allocation implies the absence of formal and direct land costs, e.g., from purchasing land and paying taxes on owned land. However, this also ties the two farmers to the collective action project and the formal and informal institutions for governance participation that follow. These formal and informal institutions and the associated obligations will be discussed further in section 3.3.

Figure 8: Pictures of A's organic vegetable farm (case study 1). Top right: Lettuce field. Top left: Vegetable field. Bottom right: Fertiliser product. Bottom left: Lettuce row covered with mulch (own pictures)

Figure 9: Pictures of B's organic lettuce farm (case study 2). Top right Sign with information about herself for customers to read. Top left: Employees working at the farm harvesting lettuce. Bottom right: Fertiliser product. Bottom left: Harvested lettuce being washed (own pictures)

The purpose of the case studies is to understand the economic state of agricultural operations in the village that are tied to collective action, and whether organic farms that are regulated by collective action institutions are economically viable for their operators. The assumption is that people in the collective action project comply with the operational rules and the informal and formal institutions set by decision-making units because in return, they can earn an income through the mediated access to land. To see whether the foundation of this assumption is true, the economic viability of collective action dependent operations needs to be understood.

The two diagrams in Figure 10 depicts the economic inputs and outputs of the two case study sites in terms of what the farm operators pay to run the operation and the harvest they obtain. The input and output analyses are to understand the operations' economic viability, which is indicated by a greater output than input (see Appendix C and D for full calculations on the economic analyses).

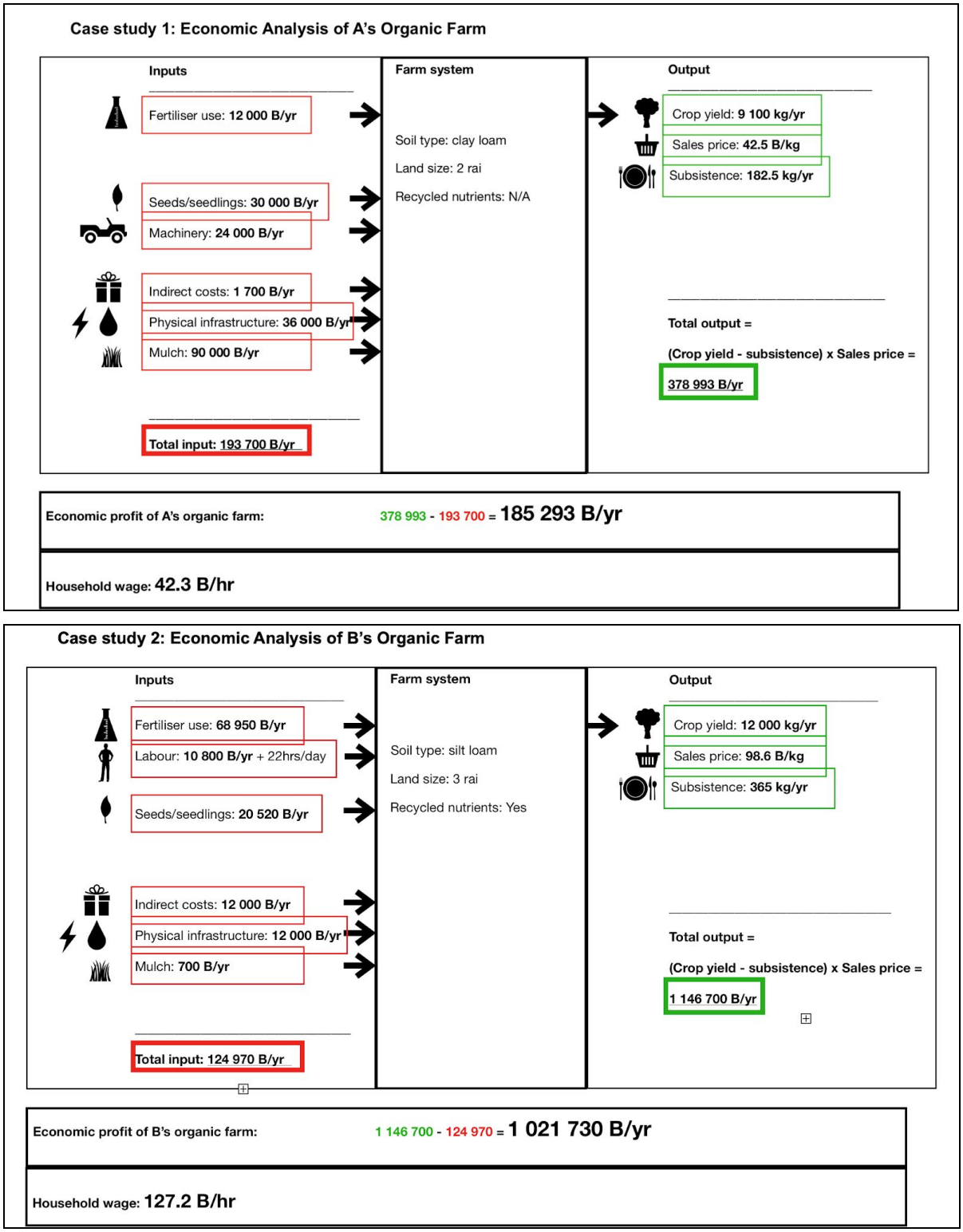


Figure 10: Economic analyses of A's organic farm (case study 1) and B's organic farm (case study 2) – For full calculations of inputs and outputs, see Appendix C and D.

The case study analysis show positive economic profit of 185,293 THB/year and 1,021,730 THB/year, respectively, and indicate economic viability for both operations. When factoring in the number of hours the two farm operating household apply as labour inputs, the *household wage* in terms of monetary value that a person generates per hour of labour is found. Both case studies show a household wage higher than Thailand's minimum wage of 300-330 THB/day (Thai Lawyers Ltd., 2018), when assuming that a working day equals 8 working hours (ibid.). The difference between the two operations' profits is largely due to the differences in sales prices, because A and B are underlaid different circumstances for market access. In the next section (3.2), the role of market access is elaborated on.

3.2 Economic robustness and market access within the collective action framework

Figure 11: Local farmers selling their agricultural produce at the local market (own pictures)

As indicated in the previous section (3.1), both farm systems are economic viable, however, the household wages in the case studies differ significantly, from 42.3 THB/hr to 127.2 THB/hr, respectively for A and B (Figure 10). Sales prices are the biggest determinant for the large discrepancy between the two farm profits; A's sales price of 42.5 THB/kg is less than half of B's sales price of 98.6 THB/kg. Due to the lack of fixed or agreed upon sales prices for the agricultural products among the farmers in TS, sales prices depend heavily on each farmer's market access. So how economically robust is the farm systems actually, i.e. what is the ability of the farm system to maintain a profitable economic output despite perturbations (Urruty et al., 2016)?

Disregarding the minor economic impact of local markets (estimated to 30% of sales (interview with A)), A's access to external markets relies on visitors to TS. Rather than direct and systematic contact to buyers, A's connections to external markets are dependent on word of mouth and on A's relationship to visitors where one later became her sole middleman for commercial sales. Even though sales to the middleman for now occur regularly, there exists no formal or fixed contract. For now the market access seems rather stable, but the lack of a fixed contract makes the market access vulnerable to perturbations (Urruty et al., 2016), such as withdrawal of the middleman or their willingness to pay. Therefore, A's operation does not benefit from the security of having diverse market accesses, as a single perturbation negatively

influencing the market access can make it impossible for the farm to maintain an economic profit (ibid.).

B's market access on the other hand is less fragile. First of all, the location of her field offers B a strategic advantage, being close to the main road and a main tourist attraction – a permanent stop on the tourist route through the village. Often B's farm itself becomes a tourist attraction as it represents a prime example of organic agriculture in TS. This location grants her a steady flow of tourists stopping by to purchase her produce. In the external market, B's main buyer is a hotel in Pattaya run by a family member. Although the external market access relies on only one buyer, which in principle compromises the economic robustness of the operation (Urruty et al., 2016), the close personal ties with the buyer can buffer against the likelihood of buyer-influenced perturbations but do not protect against changes in market conditions.

Several scholars have found that market access for agricultural products is a precondition for economic development, e.g., raising household income in rural areas of developing countries (Gyau et al., 2013; Markelova et al., 2009), and this position is supported by development-focused organisations (World Bank, 2007). A considerable share of farmers in TS (67% – Figure 12) has access to external markets, which seems to create a foundation for economic development. Scholars have previously argued that a collective action approach towards securing market access could decrease the economic vulnerability of rural farmers (Gyau et al., 2013; Markelova et al., 2009), and hence increasing the robustness of the farm systems (Urruty et al., 2016). These benefits are not incurred for TS farmers as the mechanism for entering and maintaining external market access is individualised rather than undertaken by the collective action structure – which can be a fragility in the farm systems, decreasing the economic robustness. Access to external markets, however, is not completely isolated from activities in the collective action structure of the CBTP. In some cases, the individual farmer's market access has benefitted from the influx of visitors brought on by CBTP (e.g., in the case of A), and hence constructing an indirect link between market access and collective action.

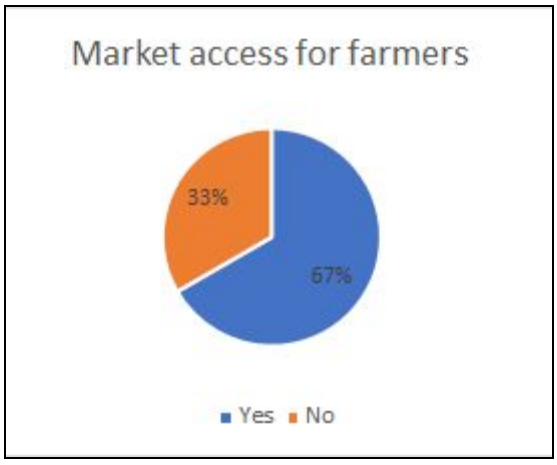


Figure 12: External market access of farmers based in TS (graph based on questionnaire results – see Appendix F)

Another point of fragility in the farm system is the nutrient use. Estimations of nutrient flow in the system for the three key nutrients for crop growth (N, P and K) are summed up in Figure 13. Refer to Appendix C and D for full calculations on the nutrient flow analyses.

	Case study 1 – A			Case study 2 – B		
	Input (kg/yr)	Output (kg/yr)	Use efficiency (%)	Input (kg/yr)	Output (kg/yr)	Use efficiency (%)
Nitrogen (N)	120.0	13.67	11.39	206.45	18.21	8.82
Phosphorus (P)	19.64	2.69	13.70	72.25	3.59	4.97
Potassium (K)	12.45	18.01	144.66	92.44	23.99	25.95

Figure 13: Table overview of input and output of nutrients (N, P and K) based on reference values (for full calculations, see Appendix C and D)

N-use efficiency can be as high as 65% for lettuce production (Øvsthus et al., 2017), which is significantly higher than the N-use efficiencies calculated (8.82% and 11.39%) from the nutrient flow analysis of the case studies (Figure 13). This suggests a less than efficient N-use in which a large portion of N-input is not harvested as N-output.

It can be postulated that the excess N-input that is not converted to harvestable biomass is retained in the soil and thus not lost from the system. Thus, it serves as a N-reservoir that can be used later on. This however is not the case; the measured nitrate levels of 23 and 19 ppm for A and B, respectively (see Appendix E) are lower than the literature's value of 25 ppm for typical vegetable production plot (Leigh, n.d.), which does not indicate N-storage in soil.

There are several possible explanations of the low nitrate level. Either N has not yet been converted from ammonium (which is a common form of N in soil) to nitrate or the nitrate has been lost to the environment through leaching or denitrification (Bernhard, 2010). The excess amount of N-input for both case study sites are neither harvested nor retained in the soil, and is likely lost from the system due to nitrate's low soil retainability and high leachability (Irshad et al., 2014). Fertiliser use therefore represents a weak point in the economic sustainability of the organic farm system because a higher amount of nitrate inputs than necessary is used. Excess expenses are incurred, which compromise economic robustness in times of perturbations (Urruty et al., 2016).

Villagers' livelihood strategies and the structure they support and rely on, e.g., the collective action structure in TS, can only exist as long as monetary or subsistence returns are granted. In Ostrom's (2007) words, the introduction of new rules and, on an individual level, the decision to participate in collective action, will necessarily involve an analysis of the benefits of the system (ibid.) and an assessment of its *profitability.* In this regard, Ostrom (2007) highlights economic

returns as a key and necessary benefit of collective action participation, alongside the reduction of conflicts and the sustainability of a resource management scheme.

Despite the weaknesses pointed out in the above paragraphs, the two case studies (although limited in scope and statistical significance) support the notion that people who participate in agricultural operations within the collective action framework can earn a decent income as both case studies exhibit netto incomes higher than village average (Figure 14). The absence of land costs and thereby land taxes alleviates some of the more significant economic challenges of running an agricultural operation, and it represents an important economic manifestation of having an agricultural operation within the collective action framework. The economic viability of the two case study farms is first and foremost, and most concretely, due to a greater economic output than input, though this is not only linked to the collective action. However, behind these numbers and in the context of these agricultural operations lie the story of power in land control, formation and recognition of institutions, and mechanisms for participation.

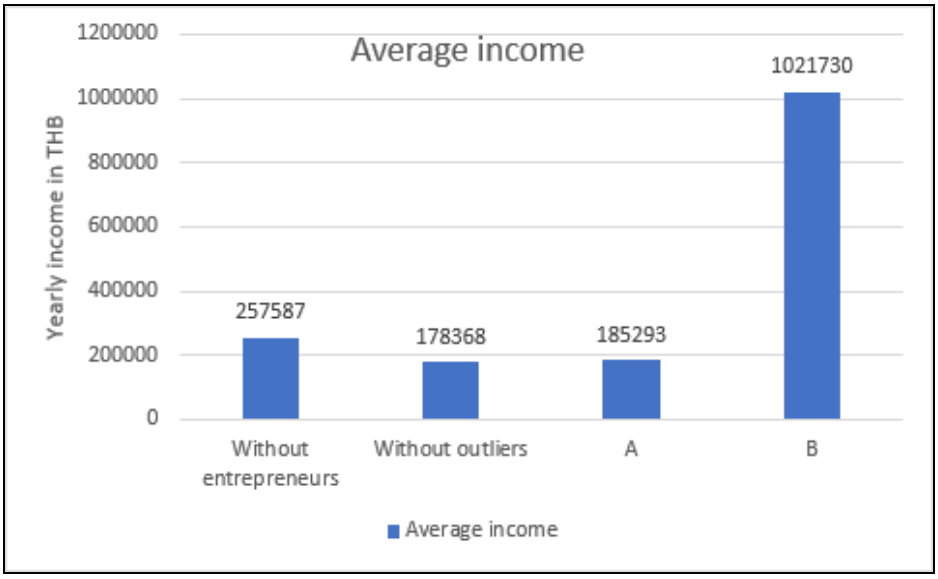


Figure 14: Average income of villagers excl. Entrepreneurs, excl. entrepreneurs and outliers, A and B (graph based on questionnaire results - see Appendix F)

3.3 Social and economic obligations of land access and participation

From the case studies emerges a discussion on what partaking in the collective action project in TS entails. Besides the economic benefits shown in the above case studies, what other sorts of benefits are derived, and what are the associated economic or social costs incurred through gaining said benefits? In other words, what do farmers like A and B have to “pay” or deliver to gain access to these positive benefits?

A common theme in both the case studies and in interviews with collective action participants is the idea of “contributions” to the collective action project. In the case studies, these are considered as “indirect costs” under inputs due to their significance in maintaining the operation (Figure 10). Contributions can take form as donation of money or of goods (e.g., produce) and services (e.g., village tours and transportation of items), all of which are used for running various activities in CBTP (Figure 16). Because land access for the farmers in the two case studies is mediated by people in the collective action decision-making arrangements, i.e., VHM and SDO, a strong social standing to these decision-makers is needed in order to secure continuous access to land. This also applies to many farmers in TS with SPG4-01 land titles that effectively means that their land is “public land”, which grants the decision-making units in the village control over by who and under what criteria land can be accessed (Cohen, 2014). Therefore, the reason behind villagers’ willingness to contribute has less to do with the direct economic benefits they derive and more to do with a social investment strategy built and maintained in order to gain social capital (Wilken, 2011). This means that villagers “pay” monetary contributions to accrue social capital, which is used to strengthen their access to land (Bourdieu, 1986).

Figure 15: Locally made melon ice cream from the melon farm in TS offered to visitors at the village assembly hall – an example of a “donation” to CBTP (own picture)

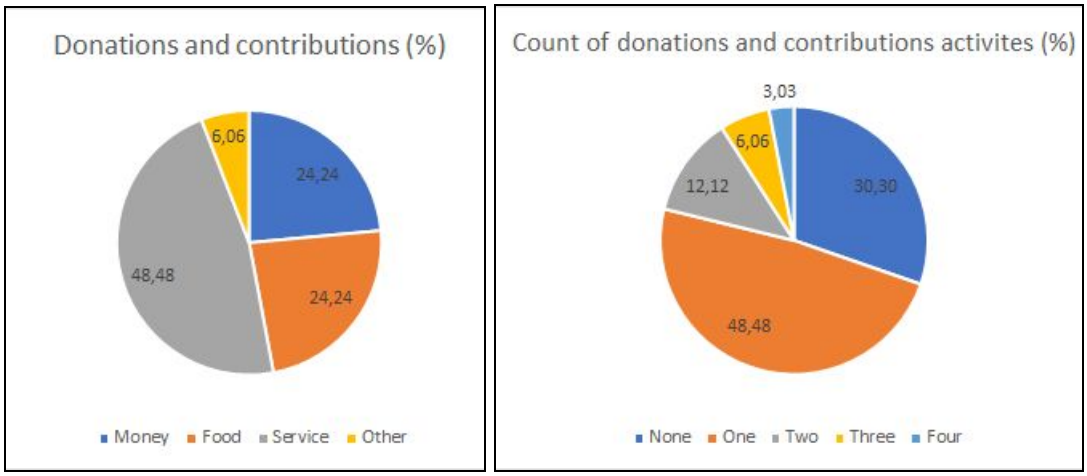


Figure 16: Left: Share of villagers contributing with donations. Right: Share of villagers contributing with several activities (graphs based on questionnaire results - see Appendix F)

Likewise, attendance in community meetings where issues pertaining to CBTP are discussed also represents a "time" cost for partaking in the collective action project. One could postulate that villagers attend these meetings in order to have a say in decisions that affect CBTP. However, evidence in the data suggests that this is not the case. The questionnaire results reveal that ~86% are informed about meeting occurrences such as the decisions made and information shared (Figure 17BL), and ~48% are consulted at such meetings (Figure 17TR), and are thus in the *tokenisms* steps (Arnstein, 1969). In contrast, only ~41% feel that they have influence over decisions and have *citizen power* (ibid.) (Figure 17BR). Most villagers are not effectively participating as according to Arnstein's (1969) ladder of participation, and the importance of effective participation with *citizen power* is not observed among them (Appendix F). Therefore, effective participation appears to not be the primary incentive for community meeting attendance. Rather it seems that these meetings provide "public open spaces" that offer opportunity for *sustaining bonding ties and making bridges* (Cattell et al., 2007, p. 544), where one's attendance conveys support for the project and thus provides social capital. So, another strategy to accrue social capital is to "pay" with one's time (Bourdieu, 1986).

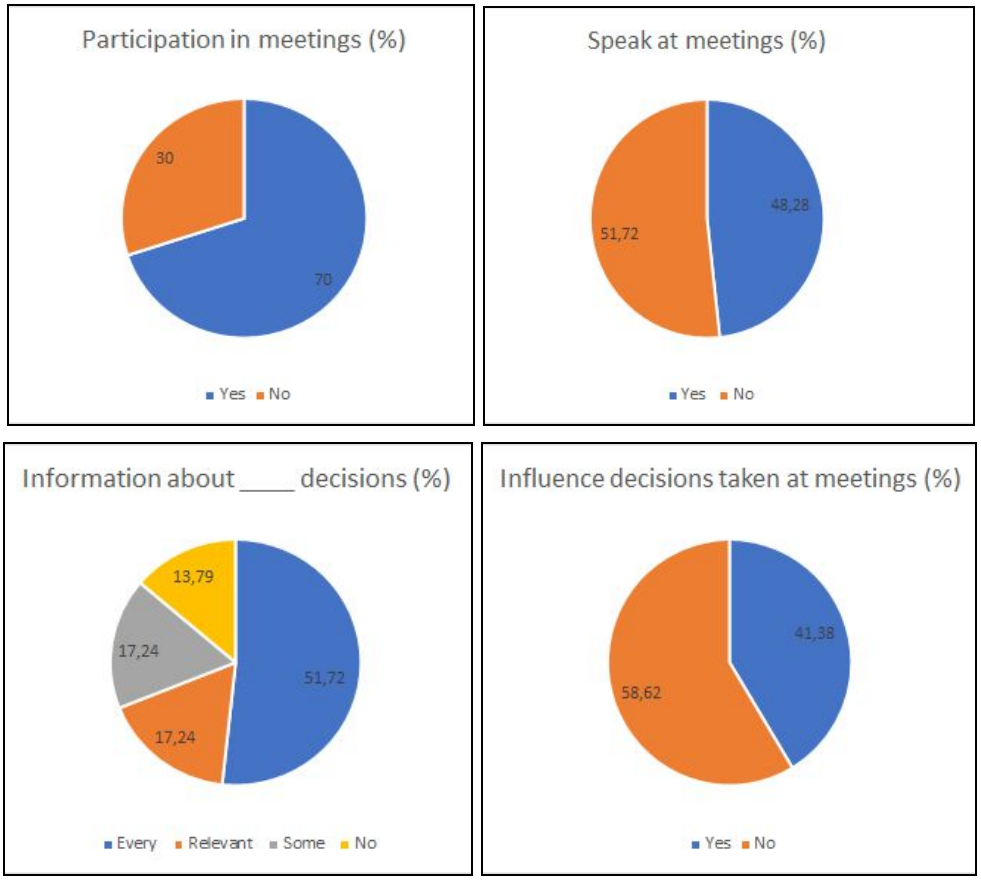


Figure 17: Top left (TL): Share of villagers participating in meetings. Top right (TR): Share of villagers speaking at meetings. Bottom left (BL): Share of villagers who get information about __ decisions. Bottom right (BR): Share of villagers who feel they can influence decisions made at meetings (graphs based on questionnaire results - see Appendix F)

Thereby, donations and attendance in village meetings seem to represent indirect costs for land access which take on both social dimensions through the creation and maintenance of personal ties and economic dimensions through contributing money, goods of monetary value, or services associated with loss of time to pursue own activities. These types of obligations, though informal and unwritten, seem to arise from the type of land control that is exhibited in TS, and exert an important control factor in how people engage with other members of the community in order to gain influence over the *decision-making arrangements* in land use and access. As an example, a homestay owner conveys that he volunteers as a driver for CBTP-activities because he is building bungalows on his land and wants to be *on good terms with the headman.* He also adds that his neighbour who is active in community projects has been granted exceptions to building regulations on allocated land due to his "good relationship" with the VHM.

In this perspective, the decision to assume the cost of donations, to volunteer, and in general to participate in community activities, can be better understood. As in Kristiansen and Ramli's (2006) case studies, to participate means to *buy an income* in the sense of having a possibility to be allocated land and to prevent land revocation. The villagers that volunteer in the community project, as in the Jakimow's (2018) Indonesian case study, are affirming, through their presence, their need to be recognised as citizens (or villagers) and are constructing a social capital that is necessary for them in order to be guaranteed their rights.

3.4 Decision-making units and forms of institutions

As discussed in the above chapters, one of the key benefits derived from participating in the collective action project is land access, which grants villagers the opportunity to partake in land-based livelihoods strategies such as organic farming. At the same time, this type of land access creates obligations for the villagers, and in particular, the obligation to establish a specific relation with the VHM. In the creation of these obligations which take on social and economic dimensions as discussed in chapter 3.3, the importance of villagers' perception of who has power over land matters, because it determines the institutions that are constructed therefrom.

Below is an excerpt between interviewer (I) and "B" from case study 2, which reveals how villagers perceive the role of VHM:
I: How did you get this land?
B: The headman gave me land.
I: What was the decision process like?
B: The headman is a good leader and he decided to give me land. He knows that I am going to work on this land and to keep it well.
I: What restrictions do you have in using this land?
B: I can only do organic farming and I can only sell my crops. I cannot do anything else. (…)
I: What can happen if you break these rules?

B: The headman can take back the land. This land can be taken away from me at any time.

In B's words, the process of land allocation seems to be based on a decision taken solely by the VHM. B does not refer to any formal application process, but only to an informal conversation with the VHM in which her necessities were heard by him. The process was described in similar terms by several other villagers and by the VHM assistant who, when asked about land access, mentioned the headman as the one figure who takes decisions over these applications. In contrast to the villagers' statements, the SDO-chief relates that there is a formal process of land allocation which is of exclusive competence of the SDO. In this formal process, the VHM is seen as a collaborator of the SDO and a channel of communication with the village about decisions taken by the SDO.

The SDO-chief describes the land allocation processes in TS in the following interview excerpt:
I: Who is responsible for land allocation in the village of TS?
SDO-C: It is the responsibility of the sub-district office, but the land administration in the village of TS is very problematic, because the village lays in the National Park Area. At the beginning of 2000, villagers in TS were still given SPG4-01 land but they all sold it illegally. What people can claim now is only empty community land.
I: What are the conditions for land allocation?
SDO-C: It depends on each village. There must be a group of villagers claiming. The claim cannot be done individually. What really happens is that villagers are already using this land and the sub-district office, helped by the headman, is only trying to organise what has already been done by the village.

The VHM however describes the process of land allocation very differently, referring to a greater power than the one that is formally assigned to him:
VHM: A villager comes with a proposal for a piece of land and can take it to the headman, the village-committee or the sub-district. The proposal must include information about their plans for the piece of land, and information about how much land they already have. The subdistrict and a government representative will measure the size of the land that is already owned by the villager. Then the proposal for land is either accepted or not. An objection about the land distribution can happen within 30 days. It is also possible for the villager to get a deed on the land.
I: Who exactly takes the decision on the land?
H: The headman, the village village-committee and the sub-district office can all allocate land

These interviews reveal the duality of a formal and informal decision-making unit in the process of land allocation; respectively the SDO and VHM. The control that the VHM seems to have over the process of land allocation in TS relies on different basis than those of legal regulations, and what emerges from the villagers accounts is the existence of a space for the *informal* management of land allocation processes. Even though the control over and the power to allocate land reside with the SDO, which come with formal institutions to guide these

processes, informal practices such as having a conversation with the VHM or *having his trust* (interview with VHM assistant) are much more important on a village level.

Thereby, it matters whom the villagers perceive is in power because the perception of power relationships shapes how institutions are formed. The need to maintain good ties with the VHM and the practises of donations and attending community meeting that stem therefrom (chapter 3.3) have become *de facto* informal institutions for land access on a village level because villagers perceive the VHM as the sole figure in land allocation and revocation processes. In Berenschot and Van Klinken's (2018) words, *informality* is defined as *a particular mode of state-citizen interaction, marked by the use of personal connections as a means to influence the implementation of state regulations* (p. 99). There are, nonetheless, interesting exceptions in CBTP which is discussed in chapter 3.7.

3.5 The Broker

The VHM contributes to make the village's social life intelligible to the SDO by reporting to the SDO about the dynamics of land use in the village and by giving his endorsement to some villagers' applications for communal land. The VHM thus creates a mutually beneficial link between state (represented by the SDO) and society, offering villagers a channel of interaction with SDO-institutions and vice versa. According to Berenschot and Van Klinken (2018) the need for such mediation on the side of the institution *constitutes a response to the limited response of state based institutions to implement their regulations in an impersonal manner* (p. 100) and represents an attempt to fill the gap left by *the weakly institutionalised nature of its institutions* (p. 100). A certain fragility of state institutions in this context is demonstrated by the massive occurrence of illegal selling of SPG4-01 land; a phenomenon that shatters the mechanism of state land tenure. As the SDO-chief relates; land allocation happened outside of the control of the institution and what the authority can do is only to try and regulate and *organise* a process that has already *been done by the villagers* (interview with SDO-chief).

On the other hand, the VHM's mediation is needed by the villagers in several ways. At first instance, the land that is allocated by the SDO has to be claimed collectively. A wide literature exists on the recent *widespread preoccupation with community* (Agrawal and Gibson, 1999, p. 6) in the discourse of institutions and development agencies. Agrawal and Gibson (1999) argue that a specific discursive operation is needed in order to transform *people* that threaten conservation into *communities* that can be seen, by local institutions, as potential actors of conservation. In TS such a discursive operation seems to have been based on the VHM's capacity to organise the villagers around a unified goal: CBTP, enabling them to perform and therefore be recognised by the Royal Department of Forestry[2] as *communities*.

Moreover, the proposed plan for land administration has to fit with the state plans for the development of the territory and, in particular, with the compromises for land use that emerge

[2] Royal Department of Forestry is the regulating institution for National Park areas

from the frame of the contestation over National Park land. Even though the National Park Law prohibits any land use except for conservation (Cohen, 2014), the state authorities seem to be aware of the impossibility to enforce this rule and some practices employed by the villagers, seem to be more accepted than others.

The SDO-chief in that regard conveyed the following:
The National Park Law is very strict but the message is not conveyed properly so many people are not sure of what they should do. The community is just inside the National Park, so the National Park Law cannot do much about them. The Government is now trying to adjust the law to solve this conflict, but people that live there have to live there. The community and the sub-district office may have fought in the past, but now they need to collaborate and are collaborating helping each other. The sub-district office wants to fix the law also to avoid that land in the villages can be bought by some middlemen. (…) The National Park Law was not helpful to establish community tourism as the law does not allow any activity except strict conservation, but still a lot of households are actually in the park. The resorts that are in the park cannot be there, but there are other things that you can do: agrotourism, ecotourism, homestay.

The VHM's proposal to start a CBTP in TS emerges from a deep understanding of this institutional dialogue started by state authorities to find a compromise with the local communities. The VHM's presence was crucial for the village to get access to funding for community-based tourism given to TS in 2018 by the SDO. The SDO-chief relates that among the reasons for which TS was chosen for this funding is *a strong leadership exercised by the headman, who collaborates well with the sub-district* (Interview with SDO-chief). Also, the VHM's decision to promote organic farming comes from an understanding that traditional farming is more problematically accepted within the National Park's boundaries. The VHM offers to the villagers an understanding of a complex set of institutional frameworks, allowing them to be tolerated on the National Park land, while at the same time giving to the state a level of control of those local practices that otherwise will not be under its grasp. The distance between state and local communities creates a space for the VHM to act as a *broker*, what Berenschot and Van Klinken (2018) defines as a mediator *that operate[s] at the intersection intersection of citizens with state institutions* (p. 104). As Auyero (2000) notes in his accounts from Argentina, in a context of weakness of formal institutions, *personal ties are increasingly important for gaining access to resources* (p. 60) e.g., land, to which access is mediated by brokers that act as intermediaries between authorities and other levels in the society. The broker is an individual that *use its savoir-faire and connections with politicians and bureaucrats to help particularly poorer citizens get access to state benefits, ranging from school admissions, subsidised health care to electricity connection and access to welfare* (paraphrased from Berenschot and Van Klinken, 2018) or, in this context, land. By claiming the function of allocating land, the VHM exercises a certain form of "land control" (Peluso and Lund, 2011), a function that other institutions proved not to be able to exercise. In particular, by being able to choose which projects to endorse, the VHM can, to a certain extent, prescribe a specific land use that, in this case, seems to be organic farming or homestay establishments. Peluso and

Lund (2011) define this type of control over land use as *enclosure: the exclusion of certain bodies and inclusion of others from rights of use and control* (p. 674).

The VHM derives a significant degree of power from his position in the process of land allocation: *when people accept land allocation (…) they must recognize – at least by implication – the authority of the institution allocating land to them, which shifts the terms of hegemony and sovereignty* (Peluso and Lund, 2011: p. 677). Even though his participation in the process may not be formally recognised, to local villagers the VHM is the institution that practises land allocation and his power is significant to them.

3.6 Differentiated citizenship and social capital

According to conventional theories of citizenship, being a citizen is the condition of having an unmediated access to certain rights which are evenly distributed within a certain community (Tilly, 1997). This idea of citizenship excludes that access to the enjoyment of citizen's rights can be informed by personal connections. By definition, citizenship should be exactly the condition that makes such personal connection irrelevant.

However, as Berenschot and Van Klinken (2018) noted, *the reality and experience of citizenship depend not just on the content of laws and regulations, but also on the strength of their personal social network* (p. 95). A situation of differentiated citizenship is observed in TS. Villagers with greater economic capital and higher social standing in the community perceive institutions differently than their counterparts, as the former group tends to follow formal institutions on the sub-district level while the latter group uses personal ties with the VHM and village-committee and thus comply with informal social and economic obligations for land access and use as described in section 3.3. Hence, the relevance of social capital is also dictated by one's class which determines the recognition of formal institutions; this is expanded upon in chapter 3.7. A growing body of research conducted particularly in South East Asia demonstrates that *differentiated citizenships* (Berenschot and Van Klinken, 2018) are experienced by different social subjects in contexts in which formal rights are not necessarily evenly guaranteed to all the citizens and a number of actors mediate access to the enjoyment of citizenship rights (Berenschot and Van Klinken, 2018; Kristiansen and Ramli, 2006; Jakimow, 2018). This creates competition among villagers for the formal right to claim communal land. In TS context, the ways in which communal land is claimed among social groups differ due to that rights to land claims can be achieved through multiple pathways for which the importance of social capital differs.

Villager's perceptions of their access to land as fragile and dependent on their interactions with the VHM and the CBTP affect the *pattern of interactions* among members of the community. As described in Oakerson's framework (1992), it creates incentives for people to act in ways that are viewed favourably by those who have power over land. In the competition for communal land, the VHM and the CBTP committee are perceived by the villagers as arbitrators of the process for their ability to: (1) grant land access to landless villagers for them to generate

an income, and (2) decide how landholder's land can be used. In this context, social capital becomes a key mediating factor in order to access land. Social capital is defined as the set of benefits that an individual can expect to get through the social networks that (s)he is part of and the social connections that (s)he has (Bourdieu, 1986). Put another way, *who you know* and *what you know* make a difference in life and society (Lin, 2001). As described by Wilken (2011), Bourdieu generalises social capital to refer to the profit potentially gained from the networks and connections that you build and maintain through various social investment strategies (exchange strategies, marriage strategies, educational strategies, etc.). Bourdieu (1986) argues that people have different amounts and combinations of capital, and they have different opportunities to accumulate and convert a form of capital into another.

This study hypothesizes that social capital in TS can be exchanged for economic capital in the sense that the former can potentially yield access to land, which can be used for various income generating activities, e.g., agriculture and accommodation services. ~70% of villagers participate in village meetings related with CBTP (Figure 17TL), even when the respondents are not directly involved with any tourist-related activity. When asked how important these meetings are, ~86% of villagers conveyed that these meetings are "very important" or "important" (Figure 18). Given that the VHM and CBTP-committee operate as *decision-making units* and have the power to allocate land to people for establishing organic farms and decide who can open a homestay, respectively, the importance given to these meetings could be based on a perception that social relationships with the CBTP-committee members, the VHM, and in general within the community need to be cared for and maintained. According to Bourdieu (1986), in the same way you accumulate economic capital and cultural capital through different investment strategies, you also accumulate social capital by investing in social relations.

However, the link between social capital and economic capital might exist solely in people's perceptions rather than in the actual structure and mechanisms of the CBTP-system. Due to short duration of the collectively driven CBTP in TS (i.e., 6 months when the data for this study were gathered), it has yet to be revealed whether measures to gain social capital translate to economic capital. As ~70% of villagers participate in village meetings related to the collective action (Figure 17TL), one could imagine that income level correlates to participation in community meetings – however no significant correlation is found. Hence, it can be postulated that villagers engage in e.g., giving donations and attending community meetings not because of concrete economic gains, but rather because they understand who has power over land in the community and recognise the importance of cultivating positive relationships with decision-makers over land.

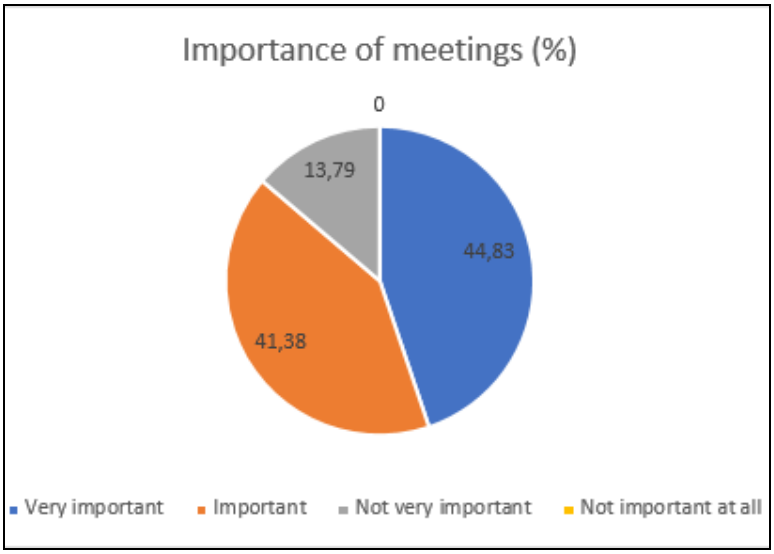


Figure 18: Importance of community-meetings according to villagers' perceptions
(graph based on questionnaire results – see Appendix F)

3.7 Big entrepreneurs; the exception to the rule

As argued throughout the analysis, the average villager sees a financial advantage in participating in the collective action project. Thereby it confirms the important role of maintaining good social relations to accrue social capital in enhancing the value of economic capital (Wilkens, 2011). However, this state of affairs does not seem to apply to the biggest entrepreneurs in TS. These are actors who come from other areas of the country, mainly from Bangkok, bringing with them sizable economic capital to invest in their businesses. For instance, during conversations with the owner of the largest coffee shop in the village and the owner of the melon farm, the following is revealed about their start-up capital:

I was awarded a severance pay of THB 1.5M after my company closed down, which I then invested in this business (Interview with the owner of the 'Coffee Factory').

I stopped running my restaurant four years ago, and invested the money from that in the melon farm (Interview with the owner of "Sweet Melon Farm").

The above-mentioned quotes illustrate how the group of big entrepreneurs in the village start out financially stronger than the average villager, highlighting the fact that building and maintaining social networks and connections with villagers in general and CBTP-members specifically to potentially gain a profit is not something they are necessarily in need of. In fact, the barriers that constrain the average villager when it comes to accessing land and exercising autonomy over land use do not hamper the entrepreneurs who are liberated from the informal institutions of land access and use in TS due to their economic strength and familiarity to formal processes.

For example, it can be gleaned from the following quote, that the owner of "Sweet Melon Farm" was able to circumvent the "strict" land ownership transfer of SPG4-01 policies due to her considerable resources:

When I started my business (in 2010), I rented this land from a local. But I wanted the land to be in my name because I invested a lot of money on it and in my business, so I applied to the sub-district office to get my name on the deed. It took quite a long time, maybe 2 years, and it was a difficult process (...), I had to go through a lot to get it done.

The VHM also points to *knowledge* and *experience* as crucial factors to the big entrepreneurs success: *(...) we cannot compete with [the big entrepreneurs, ed.] because they have the knowledge and the experience (...).* This confirms what will be illuminated further below, which is that economic and social capital are not the only forms of capital that account for why some social groups do better. When one is accounting for how the world is structured and functions, one must also reckon with a third capital dimension, namely cultural capital (Bourdieu, 1986).

According to Bourdieu (1986), cultural capital exists in three forms: *embodied*, *objectified* and *institutionalised*. Embodied cultural capital is acquired through socialisation and embedded as tendencies in *habitus*[3]. Here, cultural capital is a matter of having a sense and understanding of particular values and goods and an ability to express this understanding bodily, mentally, and socially (ibid.). This understanding is especially shaped in the family and is linked to manners, to language, and to your taste in everything from entertainment to travel and political attitudes. Embodied cultural capital is observed amongst several of the big entrepreneurs in TS. For instance, the melon farm located close to TS with its Japanese letters and decor is deliberately promoting a foreignness that its owner believes is economically advantageous (Figure 19L). By imbuing its products with a Japanese aesthetic, the owner is tapping into the high value associated and ascribed to Japanese goods, thereby revealing a sophisticated understanding of the cultural cache Japan holds in Thailand and many other places in Asia (Otmazgin, 2008).

[3] The core of the concept of habitus is an assumption that people's understanding of reality, and hence their choices and actions, are, in many ways, generated by internalised tendencies to feel, think and act in certain ways. These tendencies are acquired (mostly unconsciously) through a lifetime under certain social conditions (Wilken, 2011).

Figure 19: Left (L): Japanese aesthetics used for marketing in TS “Sweet Melon Farm”. Middle (M): Non-production rice field in the “Coffee Factory” paints a romanticised picture of rural life. Right (R): Modern and urban atmosphere in the “Coffee Factory” buys into the urban lifestyle (own pictures)

Cultural capital is also found in an objective form, which translates into objects such as paintings, musical instruments, books and buildings. This kind of objective cultural capital can be accessed both through economic capital as well as by having an embedded, habitual sense of decoding cultural forms, meaning ownership or appreciation of cultural objects (Bourdieu, 1986). This sense of decoding culture forms was evident among the non-native entrepreneurs. The various shops owned by these entrepreneurs are all imbued with a sensibility that is distinct to anything else one comes across in TS (Figure 19L, 19R). Their sensibilities are aligned with what Bourdieu (ibid.) describes as the dominant cultural capital (Wilken, 2011), which translated in to a larger share of the visitors, which then translates into economic capital. Finally, there is cultural capital in institutionalised form, such as diplomas, academic titles, honours and awards. The institutionalisation helps to give the cultural capital legitimacy and to make it the basis of power (Bourdieu, 1986). The power derives from being in possession of a diploma is evident in the observed group of entrepreneurs. A correlation between higher education levels and the ability to generate higher income is observed. The average income without the big entrepreneurs is THB 178,386 (Figure 14), and on average, the length of education for everyone questioned was 7.6 years, which fell to 5.67 years when excluding the big entrepreneurs, who all had 16 years of education (Appendix F). Having up to 16 years of education provides the big entrepreneurs with a certain authority. They make training and know-how available to the villagers, thereby presenting themselves as a benevolent presence, which is corroborated in the following quote:

“[The big entrepreneurs, ed.] contribute by employing local villagers and by letting villagers use their resort if there is not enough place in homestays (…) [the big entrepreneurs, ed.] will share tourists and share the income and they will let villagers take tourists in their properties (…) Villagers depend on [the big entrepreneurs, ed.] because the main tourist attractions are in their land” (Interview with the VHM).

As can be perceived from the quote above, there is a sense among the VHM, CBTP-members and villagers at large that these entrepreneurs are integral to the village's – and thereby villagers' – future success. This, in turn, adds another dimension to the complex power dynamics in TS, where villagers depend on the VHM to access land and on big entrepreneurs, to some extent, to maintain the allure of the village that is vital for CBTP to flourish.

Chapter 4: Discussion of methodology

4.1 Social science reflections

A number of biases can be related to the data collection with effects on the results presented in the report.

First, the representation of the reality through the data collected can be questioned, as the snowball and convenience sampling strategy can be a measure of critique as it is based on cooperation with the villagers, and not on a systematic or random sampling. The data is collected in arguably the most convenient way, taking into account the limited availability in terms of time and respondents, and the questionability of representation of even systematic random samples (Sincero, 2012). In addition, time limitations also affects the sampling size of the questionnaire which only represent ~7.5% of the households in TS, though a larger share is needed to secure statistical significance (SurveyMonkey, n.d.). Furthermore, the majority of the questionnaire respondents are females (~81%) which can result in gender biases, as the interviewed sample is not representative of the gender distribution in TS, which is roughly 50/50 (Thai Samakkhi Administrative Organization, n.d). However, among community-based income strategies in Thailand such as OTOPs and CBTPs, females are often more engaged (Natsuda et al., 2012), which can be an explanation for the preponderance of female respondents.

As argued in the previous chapter, it is experienced that social capital is important to maintain for the local villagers through various activities in order for them to benefit economically from the CBTP. During interview settings an unspoken respect (Bourdieu, 1986) for 'higher ranking' actors in the community is experienced, e.g., in the implicit information through observation of behaviour, e.g., the villagers offering their seat to the VHM and seeming reluctant to express their opinion whenever he, or other members of the CBTP-committee were present during interviews. As well as in the explicit information given by villagers such as *The headman is a good leader and he decided to give me land* (Interview with case-study B), and the villagers' general support for the CBTP lead by the VHM and CBTP-coordinator. The possibility of maintaining the social capital this way may influence the freedom of the respondents to convey their opinions openly.

FGI, SSI, questionnaires, and PRA all rely on the researchers' ability to understand the subjects who are being interviewed, and it can be challenging to avoid personal biases or interpretation on the culture, people, and customs in the research setting. Researchers often "fill in the gaps" which can lead to subjective interpretation rather than "objective" understanding. However, emphasis was put on these methods because of their suitability to analyse patterns of interactions and power dynamics through multiple angles and in different fora.

4.2 Natural science reflections

Nutrient flow calculations and soil sample measurements were done as part of the case studies and therefore having recognizable impact on the farm system analysis.

For the nitrate-concentration measurements multiple sources of error might have influenced the data. First, the fourth sample from case study B showed “HIGH”, indicating too high nitrate-concentrations for the reflectometer to measure (see Appendix B). Diluting the sample did not result in reasonable data. It was also difficult to mix soil properly before the random soil sampling in the bags for the analyses. Furthermore the nitrate strips were not kept at 2-8°C all the time, as recommended on the packaging.

It is arguable that for soil fertility to have been an objective of the project, it would have required more soil data from the TS farms. This would have allowed for a more rich, and statistically more representative and valid analysis and comparison of farms in the village. The soil data show more ammonium, nitrate and phosphorus and SOM in A than in B, which could indicate that A is a more fertile soil than B due to greater nutrient availability to plant crops (Øvsthus et al., 2017). Possibilities for using the data more to conduct further analysis include investigating correlations between soil texture and nitrate-retention, and between nutrient catchment and SOM (see Appendix B and E). This would have been relevant to investigate how soil fertility could be improved.

A major drawback for the validity of the nutrient flow analysis is the use of reference values for the fertiliser products as the precise amount of nutrients in the fertiliser products was not indicated on the fertiliser bags. This information was not known by the farmers and the lack of precise volumes of fertiliser used for each crop-type and the amount of each crop harvested could very well result in non-precise volume data of nutrient use.
A key issue regarding the connection of nutrient efficiency to the economy of the farms might be that fertiliser application, that involves losing N to the environment can still be economically viable since plants would not be able to take up all of the applied N anyway (Kirk, 2001). Some farmers could be preferring a greater N application and thereby amount of N taken up by plants (with the N loss that it implies) rather than optimizing the proportion of N taken up by plants (Monaghan, 2015).

Chapter 5: Conclusive remarks

The purpose of this report was to answer the following research question:

"How has collective action in CBTP shaped the interactions between people and institutions?"

In continuation hereof, sub-questions were formulated to examine *how collective action in TS works*, *why people participate in collective action*, as well as analyse *how power relations amongst different actors were affected by the CBTP*.

The entry point to answering the research question was two case studies. To better understand the economic viability of collective action dependent agricultural systems, the decision is made to study two farms where land has been accessed through land allocation schemes mediated by the VHM. The case study findings show positive economic profit, which indicates that the systems are economically viable despite nutrient use efficiencies being low. Furthermore, gross income for both case studies are shown to be higher than the village average, and household wages in both studies are shown to be higher than the country's minimum wage. Thereby, this indicates that there is a connection between participating in CBTP and economic gains; that by engaging in the community project, villagers are able to earn a decent income.

Furthermore, the findings showed that access to land – who receives it, under what conditions and what it can be used for – is brokered by the VHM, granting him a significant degree of power vis á vis the participants of CBTP, who *perceive* him as the final arbiter in all matters pertaining to land access. Given this perception, the findings also show that accumulating social capital is therefore of significant importance to the CBTP participants, manifesting itself through regular attendance of community meetings about the CBTP, via donations (goods, services, money), or by generally striving to have good personal ties with the VHM and, to some extent, the village committee; all in the hopes of somewhat being able to influence the direction of decisions that are made by the VHM and the village committee on who can partake in income generating activities such as agriculture and homestay services, and thereby potentially yielding more financial gains for the participants in the long run.

In order to answer the research question, it can therefore be said that collective action in CBTP has helped to somewhat strengthen the position of the already influential village decision-making units, as well as enhance the importance of *who you know* and *what you know* (Lin, 2001), highlighting that the institutions and associated operational rules by which people follow are moldable and shaped by shifting power dynamics that exist in society. More broadly, this uncovers that perception of power plays an outsized role on a community level, because people's perceived realities legitimise institutions that they interact with and in some cases, formalises informality.

Chapter 6: References

Agrawal, A. and Gibson, C., 1999. Enchantment and Disenchantment. The Role of Community in Natural Resource Conservation*. World Development*, vol. 27:4, pp. 629-649.

Arnstein, S. R., 1969. A Ladder of Citizen Participation. *JAIP*, vol. 35:4, pp. 216-224.

Auyero, J., 2000. The Logic of Clientelism in Argentina: An Ethnographic Account. *Latin American Research Review,* vol. 35:3, pp. 55-81.

Bernhard, A., 2010. The Nitrogen Cycle, Processes, Players, and Human Impact. *Nature Education Knowledge*, vol. 3:10, p. 25.

Berenschot, W. and Van Klinken, G., 2018. Informality and citizenship: the everyday state in Indonesia. *Citizenship Studies*, vol. 22:2, pp. 95-111.

Bourdieu, P., 1986. The Forms of Capital. In: J. G. Richardson, ed., *Handbook of Theory and Research for the Sociology of Education*. New York: Greenwood Press, pp. 241-258

Brockington, D. and Sullivan, S., 2003. Qualitative Research. In: R. Scheyvens and D. Storey, ed., *Development Fieldwork. A Practical Guide*. SAGE Publications, pp. 57-74

Casley, D. J. and Kumar, K., 1989. *The collection, analysis and use of monitoring and evaluation data (English)*, Baltimore, MD: The John Hopkins University Press. [Online] Available at: http://documents.worldbank.org/curated/en/534751468763750439/ [Accessed 26 March 2019]

Cattell, V., Dines, N., Gesler, W. and Curtis, S., 2008. Mingling, observing, and lingering: Everyday public spaces and their implications for well-being and social relations. *Health & Place*, vol. 14:3, pp. 544-561. doi: 10.1016/j.healthplace.2007.10.007

Cavestro, L., 2003. *P.R.A. - Participatory Rural Appraisal. Concepts, Methodologies, and Techniques.* Universita' Degli Studi Di Padova Facolta' Di Agraria. [Online] Available at: http://www.yemenwater.org/wp-content/uploads/2015/04/PARTICIPATORY-RURAL-APPRAISAL.pdf [Accessed 26 March 2019]

Cohen, E., 2014. Tourism Encroachment on Reserved Forest Areas: A Case Study from Thailand. *Tourism Recreation Research*, vol. 39:2, pp. 185-2012.

Defoer, T., Budelmann, A., Toulmin, C. and Carter, S. E., 2000. Sources and flows of nutrients in farming. In: T. Defoer, A. Budelmann, C. Toulmin and S. E. Carter, ed., *Managing soil fertility in the tropics, a resource guide for participatory learning and action research -*

Building common knowledge, participatory learning and action research. Amsterdam: Royal Tropical Institute, pp. 3.1-3.35.

DeWalt, K. M. and DeWalt, B. R., 2002. *Participant Observation: A Guide for Fieldworkers.* Rowman Altamira

Emmel, N., 2008. *Participatory mapping: An Innovative Sociological Method, ESRC* [Online] Available at: http://eprints.ncrm.ac.uk/540/2/2008-07-toolkit-participatory-map.pdf [Accessed 20 February 2019]

Government of Manitoba, 2015. *Properties of Manure*. [Online] Government of Manitoba Database. Available at: https://www.gov.mb.ca/agriculture/environment/nutrient-management/pubs/properties-of-manure.pdf?fbclid=IwAR1_ta0R7CS4kO22rCgU6Br_oBHSx0pd2lXaaylr2qPsY3DIgdWeZ-qMMfk [Accessed 8 March 2019]

Gyau, A., Franzel, D., Chiatoh, M., Nimino, G. and Owusu, K., 2013. Collective action to improve market access for smallholder producers of agroforestry products: key lessons learned with insights from Cameroon's experience. *Current Opinion in Environmental Sustainability*, vol. 6, pp. 68-72. DOI: https://doi.org/10.1016/j.cosust.2013.10.017

Hardin, G., 1968. The Tragedy of the Commons. *Science*, vol. 162:3859, pp. 1243-1248. DOI: 10.1126/science.162.3859.1243

Jakimow, T., 2013. Unlocking the black box of institutions in livelihoods analysis: Case study from Andhra Pradesh, India*. Oxford Development Studies*, vol. 41:4, pp. 493-516. DOI: 10.1080/13600818.2013.847078

Jakimow, T., 2018, Volunteering and Citizenship in Indonesia: Practices of Care as a Model for State-Citizen Relations. *Citizenship Studies*, vol. 22:2, pp. 145-159.

Jaratphong, S., 2015. *Land Reform and Thailand's Socio-Economic Development.* The American University of Paris (France)

Keating, B. A. and McCown, R. L., 2001. Advances in farming systems analysis and intervention. *Agricultural Systems*, vol. 70:2-3, pp. 555-579. doi: https://doi.org/10.1016/S0308-521X(01)00059-2

Kirk, G. J. D., 2001. Plant-mediated processes to acquire nutrients: nitrogen uptake by rice plants. *Kluwer Academic Publishers, Plant and Soil*, vol. 232, pp. 129–134.

Kristiansen, S. and Ramli, M., 2006. Buying an Income: The Market for Civil Service Position in Indonesia. *Contemporary Southeast Asia*, vol. 2:2, pp. 207–233.

Kvale, S. & Brinkmann, S., 1997. *Interview, introduktion til et håndværk.* Hans Reitzels Forlag.

Kumar, C., 2005. Revisiting 'community' in community-based natural resource management. *Community Development Journal*, vol. 40:3, pp. 275–285. doi: https://doi.org/10.1093/cdj/bsi036

Ingold, T., 1986. *Evolution and Social Life*. Cambridge University Press.

Irshad, M., Waseem, A., Umar, M. and Sabir, M. A., 2014. Leachability of Nitrate from Sandy Soil using Waste Amendments. *Communications in Soil Science and Plant Analysis*, vol. 45:5, pp. 680-687. DOI: 10.1080/00103624.2013.867046

Leigh, T., n.d. *Normal Soil Nitrate Levels.* [Online] Home Guides | SF Gate. Available at: http://homeguides.sfgate.com/normal-soil-nitrate-levels-80102.html [Accessed 01 April 2019]

Lin, N., 2001. *Social Capital: A Theory of Social Structure and Action*. Cambridge University Press

Lukes, S., 2004. *Power: A Radical View*. 2nd ed. Houndmills: Palgrave Macmillan.

Mahesh, V., Swathilekshmi, Daliyamol, P. S., Prakash, P., Ananda, P. D. and Kumar, A., 2017. PRA Techniques in Agriculture: Common Diagraming and Mapping Tools. *Indian Journal of Social Research,* vol. 58:4, pp. 411-422. [Online] Available at: http://eprints.cmfri.org.in/12906/1/Swathilekshmi%20P%20S_2017_Indian%20Journal%20of%20Social%20Research_PRA%20TECHNIQUES%20IN%20AGRICULTURE.pdf [Accessed 26 March 2019]

Markelova, H., Meinzen-Dick, R., Hellin, J. and Dohrn, S., 2009. Collective action for smallholder market access. *Food Policy*, vol. 34:1, pp. 1-7. [Online] Available at: https://www.researchgate.net/publication/223485510_Collective_action_for_smallholder_market_access [Accessed 24 March 2019]

Marshall, M. N., 1996. Sampling for qualitative research. *Family Practice*, vol. 13, pp. 522-525. [Online] Available at: https://pdfs.semanticscholar.org/063d/8f0ba824da42f1a55136bdd7aac0f37cc8df.pdf [Accessed 26 March 2019]

Monaghan, R. M., Paton, R. J., Smith, L. C., Drewry, J. J. and Littlejohn, R. P., 2005. The impacts of nitrogen fertilisation and increased stocking rate on pasture yield, soil physical condition and nutrient losses in drainage from a cattle-grazed pasture. *New Zealand Journal of Agricultural Research*, vol. 48, pp. 227-240.

Natsuda, K., Igusa, K., Wiboonpongse, A., and Thoburn, J., 2012. One Village One Product – rural development strategy in Asia: the case of OTOP in Thailand. *Canadian Journal of Development Studies/Revue canadienne d'études du développement*, vol. 33:3, pp. 369-385. DOI: 10.1080/02255189.2012.715082

Oakerson, R., 1992. Analyzing the Commons: A Framework. In: E. Ostrom, ed., *Making the Commons Work, Theory, Practice, and Policy*. San Francisco, California, ICS Press, pp. 41-63.

Olson, M., 1974. *The logic of collective action, public goods and the theory of groups*. Cambridge, Mass.: Harvard University Press

Ostrom, E., 1986. An Agenda for the Study of Institutions. *Public Choice*, vol. 48, pp. 3-25.

Ostrom, E., Gardner, R. and Walker, J., 1994. *Rules, Games and Common-Pool Resources*. The University of Michigan Press

Ostrom, E., 2000. Collective Action and the Evolution of Social Norms. *The Journal of Economic Perspectives*, vol. 14:3, pp. 137-158. [Online] Available at: https://www.jstor.org/stable/2646923?seq=13#metadata_info_tab_contents [Accessed 02 April 2019]

Ostrom, E., 2007. *Governing the Commons, The Evolution of Institutions for Collective Action*, 20th printing (first published 1990), New York: Cambridge University Press.

Ostrom, E., 2010. Analysing collective action*. Agricultural Economics*, vol. 42, p. 155-166.

Otmazgin, N. K., 2008. Contesting soft power: Japanese popular culture in East and Southeast Asia. *International Relations of the Asia-Pacific*, vol. 8, pp. 73-101.

Peluso, N. L. and Lund, C., 2011. New frontiers of land control: Introduction. *Journal of Peasant Studies,* vol. 38:4, pp.667-681.

Pongpattananurak, N., 2018. Impacts from tourism development and agriculture on forest degradation in Thap Lan National Park*. Agriculture and Natural Resources,* vol. 52:3, pp. 290-297.

Requier-Desjardin, D., 2004. *Produced Common Pool Resources, Collective Action and Sustainable Local Developement: The Case of Food-Processing Clusters.* [Online] Available at: https://www.researchgate.net/publication/42761904_Produced_Common_Pool_Resources_Co

llective Action and Sustainable Local Developement The Case of Food-Processing Clusters [Accessed 21 February 2019]

Rufino, M. A., Rowe, E. C., Delve, R. J. and Giller, K. E., 2006. Nitrogen cycling efficiencies through resource-poor African crop–livestock systems. A*griculture, Ecosystems and Environment*, vol. 112, pp. 261–282. Doi: doi:10.1016/j.agee.2005.08.02.

Scott, W. R., 1995, *Institutions and Organizations*. London: Sage.

Sethi, R., n.d.. *Reciprocity and Collective Action*. [Online] Available at: http://www.columbia.edu/~rs328/palgrave.pdf [Assessed 20 February 2019]

Sincero, S. M., 2012. *Methods of Survey Sampling*. [Online] Explorable.com. https://explorable.com/methods-of-survey-sampling [Accessed 27 March 2019]

SLUSE, 2019. *SLUSE Soil Analyses* (Document retrieved from KU Absalon)

SurveyMonkey, n.d. *Survey Sample Size*. [Online] Available at: https://www.surveymonkey.com/mp/sample-size/ [Accessed 31 March 2019]

Thai Lawyers Ltd., 2018. *Thai Labor Law*. [Online] Available at: http://thailawyers.com/thai-laws/thai-labor-law/ [Accessed 02 April 2019]

Thai Samakkhi Administrative Organization, n.d. *Basic data*. [Online] Available at: http://www.thaisamakee.com/%E0%B8%82%E0%B9%89%E0%B8%AD%E0%B8%A1%E0%B8%B9%E0%B8%A5%E0%B8%9E%E0%B8%B7%E0%B9%89%E0%B8%99%E0%B8%90%E0%B8%B2%E0%B8%99.html [Accessed 28 March 2019]

Tourism Authority of Thailand, n.d. *What is OTOP?* [Online] Royal Thai Embassy. Available at: https://www.thaiembassy.sg/friends-of-thailand/p/what-is-otop [Accessed 01 April 2019]

Tilly, C., 1997. A Primer on Citizenship. *Theory and Society*, vol. 26:4, pp. 599–603.

Urruty, N., Tailliez-Lefebvre, D. and Huyghe, C., 2016. Stability, robustness, vulnerability and resilience of agricultural systems. A review. *Agronomy for Sustainable Development*, vol. 36:15 [Online] Available at: https://link.springer.com/article/10.1007/s13593-015-0347-5#Sec5 [Accessed 23 March 2019]

UC Davis, n.d. Lettuce Nitrogen Uptake and Partitioning. [Online] UC Davis Extension Services. Available at: https://apps1.cdfa.ca.gov/FertilizerResearch/docs/N_Lettuce.html?fbclid=IwAR2qt9RYACHVaAWT9bVf40CJDxljps64CnKK1faRRCcq3DrW-IIw7WFHX4g [Accessed 8 March 2019]

USDA, 2018. *Basic Report: 11253, Lettuce, green leaf, raw.* [Online] United States Department of Agriculture – Agricultural Research Service. Available at: https://ndb.nal.usda.gov/ndb/foods/show/301896?manu=&fgcd=&ds=SR&q=Lettuce,%20green%20leaf,%20raw [Accessed 8 March 2019]

Wilken, L., 2011. *Bourdieu for begyndere*. Samfundslitteratur

Wipatayotin, A., 2011. Tourism in Wang Nam Khiao. *Bangkok Post* (5 August), p. 3.

World Bank, 2007. *World Development Report 2008: Agriculture for Development*. Washington, DC. © World Bank [Online] Available at: https://openknowledge.worldbank.org/handle/10986/5990 License: CC BY 3.0 IGO. [Accessed 24 March 2019]

Zeng, F., Ali, S., Zhang H., Ouyang, Y., Qiu, B., Wu, F. and Zhang, G., 2011. The influence of pH and organic matter content in paddy soil on heavy metal availability and their uptake by rice plants. *Environm Pollut.,* vol. 159:1, pp. 84-91. doi:10.1016/j.envpol.2010.09.019

Øvsthus, I., Seljåsen, R., Stockdale, E., Uhlig, C., Torp, T, Breland, T. A., 2017. Yield, nitrogen recovery efficiency and quality of vegetables grown with organic waste-derived fertilisers. *Springer Science + Business Media, Nutrient Cycling Agroecosystem*, vol. 109, pp. 233–248. DOI: 10.1007/s10705-017-9881-7

Appendices

Appendix A: Synopsis

Synopsis
Thai Samakkhi Group

Name	Pernille	Amina	Jeffrey	Chiara	Peter
KU number	zhf903	fdm804	wjq123	xls705	lbf813

Governance and collective action: Investigating the community level collective action governance system in Thai Samakkhi

1. Introduction:

1.a Governance and commons:

The publication of Hardins' book "The Tragedy of the Commons" in 1968 sat the theoretical frame for a consistent body of literature that discuss degradation of natural resources in terms of a failing system of management of the *commons* (Ostrom et al., 1994). In this literature, the term 'commons' has been used in an ambiguous way both as: 'open-access resource' and 'commonly owned resource' (Bromley, 1992). Moving beyond different property regimes, Ostrom et al. (1994) propose to intend commons as 'common-pool resource': "*a resource from which it is difficult to exclude or limit users*" (ibid.). An important characteristic for these sets of resources is *subtractability,* i.e., one person's use of the resource subtracts from the amount available to others (ibid.).

However, whilst the discourse about commons and the dynamics in management of commons are rooted in the efficient utilisation of a subtractable, commonly owned resource, it still pertains a high degree of relevance in adjacent contexts. Management and the institutions that are developed thereof can emerge as a self-organised governance of a particular common-pool *resource* which unmanaged utilisation causes loss of collective benefits, thus remaining specific to the uses and limitations of said resource. Similarly, it can also be translated to the discourse about and the management of a 'man- made' resource, such as an idea to obtain higher income, or a socioeconomic outcome. For example, Requier-Desjardins (2004) argues that the common can likewise be a human-action created resource such as lobbying. Thereby, institutions do not necessary stem not from the need for managing a physical resource, but rather, it emerges from a *common problem and interest* shared among a group of people, following which institutions and organisations on managing behaviours and individual decisions are constructed.

Different management systems emerge from the inevitable interconnection and dependence of the users of the common among each other (Ostrom et al., 1994). The conservation of the commons is to a certain extent a state prerogative, and a management process can be conducted through a top-down establishment of formal rules, although this generally results in more complex processes. To take into account this complexity, the concept of *governance* has been used to refer to: "*the norms, institutions and processes that determine how power and responsibilities over natural resources are exercised, how decisions are taken, and how citizens – women, men, indigenous peoples and local communities – participate in and benefit from the management of natural resources*" (IUCN, 2016, p. 1). The

idea of governance includes processes of *citizen participation* (Ostrom, 1993) and community involvement. In particular, in the 1980s and '90s, critiques to top-down management systems encouraged the start of decentralisation processes and the consistent rise of CBNRM (Community- Based Natural Resource Management) models (Kumar, 2005). According to Wells and Brandon (1992), the failure of state management left CBNRM as the most feasible option. The term "community" refers to a complex and heterogeneous set of actors (Agrawal, 1999), although its use in the literature about CBNRM has been ambiguous and inconsistent. However, what CBNRM systems have in common is their reliance on the "collective action" as basic mechanism for their functioning.

1.b Collective action:

When a common interest is shared by individuals, they often organise in groups based on the logical perception of them *collectively acting* to pursue their interest. This logic is built on the rational behaviour of individuals who want to pursue their self-interest, which when coincide with other people's interests forms the basis of collaborations. A lot of literature and research exist on collective action, but the work by the two scholars Mancur Olson and Elinor Ostrom seems to be the mostly recognised. While Olson (1974) and Ostrom (2000) sometimes are at odds, they seem to agree upon the need for some *social control* and the willingness to reciprocate for the collective action in large groups to be efficient. Here, reciprocity denotes "*norms (...) that induce individuals to undertake pro- social actions whenever they expect others to do the same*" (Sethi, n.d.). The social control should limit 'free-riders' that are not reciprocating. Both Olson (1974) and Ostrom (2000) argue that there needs to some actors who are willing to exercise coercion or personal incentives, and Ostrom (2000) further argues a need for actors to initiate cooperative action for reciprocating. As Oakerson (1992) writes, "(...) *what is ordinarily called collective action can be understood as n-person reciprocity*" (p. 50).

The social control is shaped by the existing institutions within the society where collective action takes place. In the context of this research, institutions are understood as the generally agreed upon, though they can be informal, 'rules of the game' that shape and delimit how people act, but without determining it (Jakimow, 2013; Ostrom, 1986). Scott (1995) argues, that institutions have three pillars consisting of regulative, normative and cognitive nature, that to various extents shape the society. In this research work, the three pillars are going to be considered and investigated, within the context of the theoretical framework described below.

2. Theoretical Frameworks

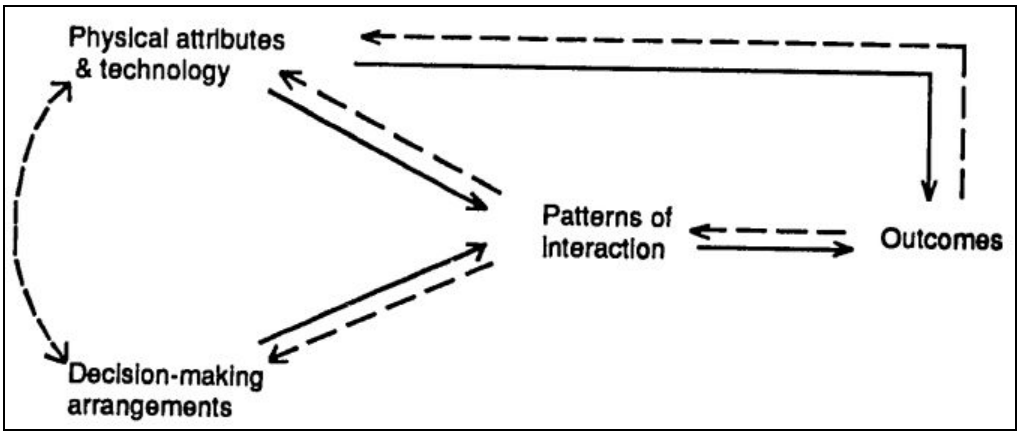
2.a Oakerson's Framework on Analysing a Common

A number of relevant frameworks about collective action and governance exists in the literature, with different foci ranging from a strong institutional approach (Feiock, 2013) to a system's understanding of outcomes, basis for individual choices, and formal and informal organisations (Oakerson, 1992). The theoretical framework around which this study builds is Oakerson's (1992) *Dynamic Framework for Analysing the Commons* (Figure 1). In this framework, the causal interactions and interconnectedness of four attributes are mapped out.

Here, the *physical attributes and technology* unit is the constraints established by inherent limitations in nature and availability of technologies or the lack thereof in e.g., infrastructure and machinery. These limitations determine the biophysical and technological restrictions in managing a "common".

Next, the *decision-making arrangement* consists of the institutions and organisations that characterise the governance system, e.g., a collective action governance system, which in turn form the basis for the operational rules. It also takes into account the relationships and hierarchies in the decision- making processes to specify "*who decides what in relation to whom*" (Oakerson, 1992, p. 46). In the right side of the diagram is *outcomes*, which are the impacts that the operational rules as determined by the decision-making organisations have on the participants of the system. These can be in the form of biophysical, social, and economic outcomes. In the middle of the diagram is the *patterns of interactions*, which connects *outcomes* and *decision-making arrangements*. Individual decisions and patterns of behaviour among individuals represent an important bottleneck in the process that translates operational rules to desired outcomes. Individual choices can be understood by the perceived *obstacles and inducements* to follow operational rules as well as the incentives to break reciprocity (ibid.), Olson's (1974) 'free-rider'.

Figure 1 (Oakerson, 1992, p. 56)



2.b Ostrom's adaptation of Rational Choice Theory to collective action contexts

The patterns of interactions in Oakerson's framework (1992) follow complex and interdependent pathways, which trace people's incentives as an individual and in collective settings. Incentives for people to reciprocate in order to reap benefits perceived as being greater than their costs are similarly complex.

Ostrom's theory on core relationships in collective action contexts (1998) (Figure 2) presents three key elements for determining whether people comply or reject operational rules set by decision- making organisations. The theory argues that in order for collective action participants to reciprocate and comply to relevant institutions, the decision-making organisation(s) and the people that represent said organisations must have a certain level of *reputations* among collective action participants through their social identities, often reinforced by information of their past actions (ibid.). A higher level of *reputation* leads to a higher level of *trust*, which in turn increases people's incentive to reciprocate (ibid.). The triangle of these three elements represents a feedback loop which can act both positively and negatively in response to *outcomes* and *decision-making processes* (Oakerson, 1992).

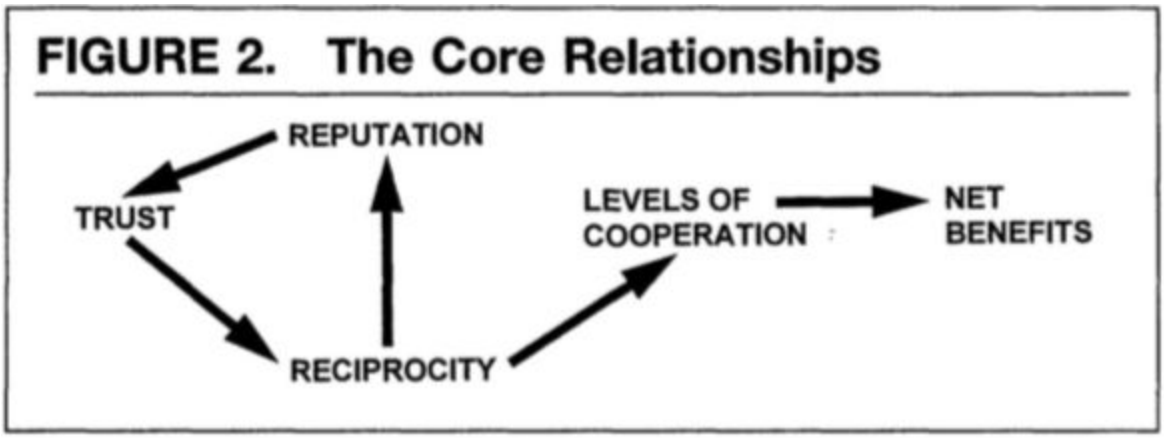


Figure 2 (Ostrom, 1998, p. 13)

2.c Ladders of participation

The framework above describes the pattern of interactions among participants of collective action but fails to capture the way in which these interactions result in the creation of differentiated spaces for people's participation. Arnstein (1969) provides a hierarchy of different *ladders of participation* (Figure 3), according to which the degree of inclusion of the participants of collective action can be analysed (ibid.). The ladder is organised across three different levels from highest to lowest: (i) non participation, characterised by the lack of power distribution and the intent to manipulate the participants' opinion (*manipulation*) or to impose a specific narrative over them (*therapy*), (ii) tokenism, which includes the sharing of information (*informing*) and the involvement of people in the exercise of constructing a narrative (*consultation*), to give them the feeling that their perspectives are taken into account (*placation*), but does not imply that effective action can be taken on the basis of this information, and (iii) citizen power, which implies power redistribution and it coincides with spaces of participation that citizens take through an exercise of collective action, rather than given to them from above (ibid.).

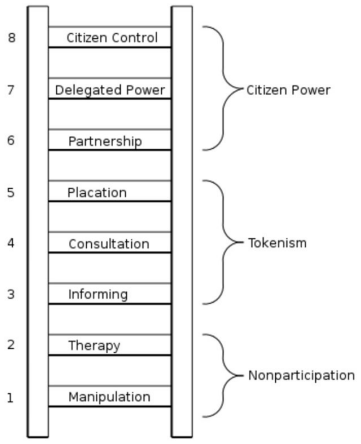


Figure 3 (Arnstein, 1969, p. 2)

3. Context:

The village of Thai Samakkhi is situated in the Nakhon Ratchasima province in Northeastern Thailand. After the Green revolution of the 1980s in Thailand farming has become one of the main livelihood strategies and a pillar of the national economy (Conway and Barbier, 2013). However, from the 2000s, a process of de-linking livelihoods from farming and agricultural resources started in rural Thailand. Even in the district of Wang Nam Khiao, where Thai Samakkhi is located, agriculture seems to be failing to provide a sustainable livelihood strategy and a process of livelihood diversification is occuring in the region (Ozturk, 2009). The village of Thai Samakkhi seems to have undergone a similar process of diversification from agricultural activities (Treue, 2019). In the village, a limit to agricultural expansion is posed by the presence of the Thap Pan Lan National Park, that restricts the use of a significant portion of land to conservation. Moreover, in the mid-2000s, the village seemed to have been affected by a number of challenges to agricultural productivity. These would include declining soil fertility, pesticides, fertiliser, and infrastructure but also non-physical attributes like changes in market dynamics (ibid.), creating the foundation for economic and biophysical outcome of the governance system. The land tenure system forbids the villagers to sell their land and pushes them in debt. The common necessity to address a decrease in agricultural productivity and the need to renegotiate the financial agreements that left the villagers indebted, constituted a common problem and interest on the basis of which common pool of resources was initiated by the villagers (ibid.). In this sense we understand the idea of collective action towards increased income as a non-physical, human-created common-pool resource (Requier-Desjardins, 2004).

It appears that Thai Samakkhi undertook collective action to design and implement a new process of natural resource management to face some of these challenges. This collective action was based on and with little financial capital to invest in new economic activities. The land system that emerges from this action relies on agricultural intensification and diversification as well as community-based ecotourism activities; an alternative, multifunctional land use system, that seeks to utilize agricultural diversification to get a presumably more attractive natural landscape in terms of tourism activities (ibid.). Conclusively, a transition from mono-cropping systems to more diversified, but also more intensified crop production along with the rise of ecotourism activities seems to be generating new sources of income for Thai Samakkhi. This transition appears to have alleviated the villagers' economic stress from indebtedness of previous, unsuccessful monoculture practices (ibid.).

4. Problems The governance structure defined by collective action in Thai Samakkhi reflects a combination of Ostrom et al.'s (1994) discourse about managing a common in terms of e.g., mechanisms of excluding unentitled individuals and the trait of *subtractability*, and Requier-Desjardins' (2004) reflection on how a man-made resource that stems from a shared idea (rather than a physical resource) has similar characteristics in collective governance strategies. The case of Thai Samakkhi therefore represents an interesting and unusual case of collective action due to the lack of a single physical resource around which governance is built. It provides an opportunity to investigate the construction of *decision- making arrangements* and the dynamics of *pattern of interactions* (Oakerson, 1992) in the absence of a tangible and diminishable resource.

4.a Knowledge Gaps The knowledge gaps in the case of Thai Samakkhi through the lens of collective action governance construction and continuous management are thus the following:

- The construction and structure of a collective action approach when it is based on a shared goal of increasing income level for participating in lieu of a physical resource
- Interplay and interconnectedness among collective actions' institutions, organisations, and individual incentives for behaviours pertaining to the collective action strategies, in terms of e.g., operational rules
- Exclusion is a necessary dimension in collective action strategies to maintain viability by ensuring that unentitled parties do not benefit from collective action. Participation and exclusion exist in opposite ends of a spectrum and are both relative rather than absolute; the ways in which a balance between exclusion and participation is reached in the

arrangements of collective action are not fully understood

5. Statement of objective and research questions

5.a Objective: The objective of this study is to understand the dynamics and processes in the emergence of collective action as a governance strategy and the economical profitability and the environmental viability of this system of governance in Thai Samakkhi.

5.b Research question: How have the processes of natural resource management and their economic and biophysical outcomes in Thai Samakkhi been shaped by collective action to natural resource governance?

5.c Research themes and sub-questions: 1. History and characteristics of decision-making arrangements:

1.1. What is the history collective action in the governance structure of Thai Samakkhi?

- In relation to agriculture, tourism, and the combination of both

1.2. Which formal and informal institutions regulate collective action in Thai Samakkhi?

- Hereunder, adaptive management

1.3. To what extent is this system of governance based on different ladders of participation?

2. Economics outcomes

2.1. What are the direct and indirect economic outcomes, in terms of economical contributions to

household income?

2.2. What are the direct and indirect economic outcomes, in terms of economical contributions to

collective income of collective action participants?

3. Biophysical outcomes

3.1. How has collective action land management strategies determined present agricultural

practices?

3.2. What are the traits of soil fertility in agricultural plots of households participating in collective action governance and how do they differ from agricultural plots of non-participating households?

4. Patterns of interactions

4.1. What are the inducements and obstacles of being part of a collective action management on

a household level? - Inducements and obstacles in terms of for example: Economy, gender etc.

4.2. How does the perception of soil fertility create obstacles and inducements for land management?

4.3. To what extent does collective action create conflicts in the community, and how are these

conflicts, if applicable, dealt with?

6. Methodology and time schedule:

To collect data during field work in Thai Samakkhi several methods from both social and natural sciences are planned on being used. The necessary data and the methods proposedly used to collect the data, an explanation of how and why the methods will be used, as well as the proposed time schedule for the field work are explained in Appendix A, B, and C.

References:

Anderson and Ingram, 1993. *Tropical Soil Biology and Fertility – A handbook of Methods*, CAB International.

Bernard, H. R., 2006. Research Methods in Anthropology: Qualitative And Quantitative Approaches. 4th ed.

Brockington, D. and Sullivan, S., 2003. Qualitative Research. In: R. Scheyvens and D. Storey, ed., *Development Fieldwork. A Practical Guide*. SAGE Publications, pp. 57-74

Casley, D. J. and Kumar, K., 1989. *The collection, analysis and use of monitoring and evaluation data (English)*, Baltimore, MD: The John Hopkins University Press. [Online] Available at: http://documents.worldbank.org/curated/en/534751468763750439/The-collection-analysis-and-use-of-monitoring-and-evaluation-data [Accessed 21 February 2019]

Conway, G. R. and Barbier, E. B., 2013. *After the green revolution: sustainable agriculture for development*. Routledge

DeWalt, K. M. and DeWalt, B. R., 2002. *Participant Observation: A Guide for Fieldworkers*. Rowman Altamira

Emmel, N., 2008. *Participatory mapping: An Innovative Sociological Method*, ESRC [Online] Available at: http://eprints.ncrm.ac.uk/540/2/2008-07-toolkit-participatory-map.pdf [Accessed 20 February 2019] Feiock, R., 2013. The Institutional Collective Action Framework. *Policy Studies Journal*, 41:3, pp. 397-425. doi: 10.1111/psj.12023

IUCN, International Union for Conservation and Of Nature and Natural resources, [Online] Available at: https://www.iucn.org/sites/dev/files/content/documents/nrgf_initial_Design_pdf_edited_2.pdf [Accessed 20 February 2019]

Jakimow, T., 2013. Unlocking the Black Box of Institutions in Livelihoods Analysis: Case Study from Andhra Pradesh, India. *Oxford Development Studies*, 41:4, p. 493-516. DOI: 10.1080/13600818.2013.847078

Kumar, C., 2005. Revisiting 'community' in community-based natural resource management. *Community Development Journal*, 40,3, pp. 275–285, doi: 10.1093/cdj/bsi036

Kvale, S. & Brinkmann, S., 1997. *Interview, introduktion til et håndværk*. Hans Reitzels Forlag.

Mahesh, V., Swathilekshmi, Daliyamol, P. S., Prakash, P., Ananda, P. D. and

Kumar, A., 2017. PRA Techniques in Agriculture: Common Diagraming and Mapping Tools. *Indian Journal of Social Research*, 58:4, pp. 411-422.

Oakerson, R. (1992). Analyzing the Commons: A Framework. In: E. Ostrom, ed., *Making the Commons Work, Theory, Practice, and Policy.* San Francisco, California, ICS Press, pp. 41-63

Olson, M., 1974. *The logic of collective action, public goods and the theory of groups.* Cambridge, Mass.: Harvard University Press

Ostrom, E., 1986. Ostrom, E., 1996. An Agenda for the Study of Institutions, *Public Choice,* 48, pp. 3-25. Ostrom, E., 1998. A Behavioral Approach to the Rational Choice Theory of Collective Action. *The American Political Science Review,* 92:1, pp. 1-22

Ostrom, E., 2000. Collective Action and the Evolution of Social Norms. *The Journal of Economic Perspectives*, 14:3, pp. 137-158. [Online] Available at: https://www.jstor.org/stable/2646923?seq=13#metadata_info_tab_contents [Accessed 20 February 2019]

Ostrom, E., Gardner, R. and Walker, J., 1994. *Rules, Games and Common-Pool Resources.* The University of Michigan Press

Ozturk, I., 2009. A Case Study on Changing Livelihood Strategies of the Community of Ban Non Sao-e Village, Nakhon Ratchasima Province, Thailand. *European Journal of Development Research*, 21:2, pp. 250-263. DOI: 10.1057/ejdr.2008.21

Rea, L. M. and Parker, R. A., 2005. *Designing and conducting survey research. A Comprehensive guide.* 3rd ed. John Wiley & Sons.

Requier-Desjardin, D., 2004. *Produced Common Pool Resources, Collective Action and Sustainable Local Developement: The Case of Food-Processing Clusters*. [Online] Available at: https://www.researchgate.net/publication/42761904_Produced_Common_Pool_Resources_Collective_Action_and_Sustainable_Local_Developement_The_Case_of_Food- Processing_Clusters [Accessed 21 February 2019]

Scott, W., 1995. Sethi, R., n.d.. *Reciprocity and Collective Action*. [Online] Available at: http://www.columbia.edu/~rs328/palgrave.pdf [Assessed 20 February 2019]

SLUSE Soil Analyses (Document retrieved from KU Absalon)

Spradley, J. P., 1980. Participant Observation. Cengage Learning Inc.

Treue, T., 2019. *THAILAND - DESCRIPTION OF FIELD SITE AND RESEARCH THEMES 2019* (Document retrieved from KU Absalon)

Wells, M. and Brandon, 1992. *People and Parks: Linking Protected Area Management with Local Communities.* Washington, DC.: The World Bank.

APPENDIX A: METHODOLOGY

In order to answer the above-mentioned research questions, we plan on applying a range of methods as follows: (i) qualitative methods, (ii) Participatory Rural Appraisal (iii) quantitative methods (iv) soil sampling.

The selection of participants in the research activities will be based on the observations in focus groups and talks with key informants in order to identify participants that are representative for the sample. The following factors are going to be considered while drawing the sampling strategy: income level, level of participation in collective action as identified through observations or conservation with key informants, gender

1. Qualitative methods

Semi-structured interview We plan on collecting qualitative data by conducting in depth-interviews during the course of our fieldwork. This will be done through semi-structured interviews with 'gatekeepers', key informants as well as villagers in general. The semi-structured interview is a method that illustrates people's understanding, experiences and feelings, and what this means for the individual in different situations (Kvale & Brinkmann, 1997, p. 45-46). This type of interview differs from a regular everyday conversation in that it allows the interviewer more control over the conversation and the opportunity to steer it in a desirable direction.

In our research we will use semi-structured interviews to investigate (i) the history of collective action in the governance structure of Thai Samakkhi in relation to agriculture, tourism, and the combination of both, (ii) the formal and informal institutions regulate collective action in Thai Samakkhi, (iii) the extent to which is this system of governance based on different ladders of participation and (iv) economical outcomes will also be discussed.

Focus group interview and observation A focus group interview is discussing (a) certain issue(s) with a group of people, and at the same time have the possibility to observe how the people discuss in a group-setting (Brockington and Sullivan, 2005). By using a focus group

interview to discuss the emergence and villagers' experience and perception of such system while having at the same time having the possibility to observe group dynamics and power structure among the villagers (the group included in the interviews – who talks and when etc.).

In our research we will use focus group to investigate the history of collective action in the governance structure of Thai Samakkhi in relation to agriculture, tourism, and the combination of both. We will ideally have several focus group interviews combined with different PRA (Participatory Rural Appraisal) workshops.

Participant observation: Participant observation is a practice that lays at the core of the ethnographic field practice (Spradley, 1980). It is the process that "*enabling researchers to observe the activities in the natural setting through observing and participating in those activities*" (DeWalt and DeWalt, 2002, p. 20). Bernard (2006) considers it as a "strategic method" that permits the simultaneous collection of data related to different questions and different categories. Moreover, it is a useful method to gain a general understanding of the dynamics that shape everyday life within a specific context on the basis of which in depth interviews can be planned and structured (DeWalt and DeWalt 2002). Over other qualitative methods, participant observation has the advantage of allowing the collection of both "explicit" and "implicit" data, as the observer has a direct access to the understanding of specific social situation, access that is not mediated by the words of an informant (as in the case of interviews) (DeWalt and DeWalt, 2002).

In our research, we will use participant observation in order to (i) gain a general understanding of power dynamics and patterns of social interactions in the village of Thai Samakkhi, (ii) to investigate the mechanism according to which different formal and informal institutions regulate collective action and (iii) to understand the potential of rise of social conflict in relation to collective action and (iv), if applicable, the mechanism through which they are dealt with.

Participatory Rural Appraisal (PRA)

PRA is a term used to describe a heterogeneous set of research approaches that are used to enable local people to share their own knowledge with the researcher and among each other, to analyse it collectively and to learn from this discussion. (Emmel, 2008). The most used PRA tools are: social maps, timeline analysis, ven diagrams and resource maps (Emmel, 2008). In our research we will mainly use the tool of timeline analysis as described below.

Timeline analysis: Timeline is a tool developed within the PRA methodology, which is used to collect data on the participants' memory of past events in order to investigate history from the perspective of community members (Manesh et al., 2017). During timeline-workshops events are described according to people's recall of certain historical dynamics, to their prioritisation and the significance that they attribute to them. Relations of causality among events are also established directly by participants of the workshop (Emmel, 2008).

In our research, we will use timelines in order to get a general understanding of the history of collective action in the governance structure of Thai Samakkhi in relation to agriculture, tourism, and the combination of both. Particular attention will be given to the emergence of conflicting narratives or perspectives among the group members.

2. Quantitative methods

Questionnaire:

The use of questionnaires is usually based on the purpose of collecting more quantitative data than what interviews can gather. At the same time, the data collection through questionnaires becomes a more structured survey (Casley and Kumar, 1989).

In our research, we will use questionnaires (i) to conduct a basic income analysis in order to understand the economic outcomes of the collective action at the household level and (ii) to investigate the direct and indirect economic outcomes, in terms of economic contributions to collective income of collective action participants. Moreover, it will be used (iii) to investigate the different ladders of participation on which the system of governance is based. A number of proxies will be established to analyse people's participation in collective action. The formulation of the questionnaires will take into account the sensitivity of the income topic (Rea and Parker, 2005).

Soil sampling

Nitrate Measurement of nitrate concentration in the soil can be important for figuring out the nutritional level. Nitrate is very often found to be a limiting factor for crop plants and is therefore considered a good indicator for soil fertility.

We plan to compare plots which reflect different agricultural practices to get insight on how livelihood strategies have contributed to maintaining soil fertility. The analysis will be carried out using falcon tubes with 30 mL water. The sampled soil is added until the solution level reaches 40 mL and after shaking the nitrate concentration in the supernatant is measured with the reflectometer (Anderson and Ingram, 1993; SLUSE Soil Analyses).

For better statistical value we are planning to sample 2 replicates for each plot and to subtract NO3- N from the water used as solution for the samples to avoid bias due to natural amount NO3- in drinking water.

Bulk density Bulk density serves as another important measure of agricultural practice in relation to tillage effects, but also as an inherent feature of the soil that determines the level of root penetration. We plan to collect, dry and weigh 100 cm3 soil from each relevant and compare these (Anderson and Ingram, 1993).

APPENDIX B: TIMELINE

The proposed time schedule is presented below, which maps out the tentative lengths of time required to conduct the proposed methods as listed in the above section. In short, gathering information on community opinions and dynamics is done stepwise, where interviews with key informants is following by a focus group and PRA workshop, and these are aimed to provide information on which households or individuals are relevant for targeting the questionnaire. Parallelly, measurements on soil fertility commence after a general overview of the community and the land has been gained and are carried out for a duration of 7 days.

February-March 2019	28	1	2	3	4	5	6	7	8	9	10
Arrival											
Interview with key- informants											
Focus group interview + Timeline workshop											
SSI – history and characteristics											
SSI – obstacles and inducements analysis											
SSI – perception of soil											
Soil sampling (+ GPS)											
Questionnaire + Interview (income)											
Questionnaire (participation)											
Presentation to villagers											
Departure											

APPENDIX C: DATA MATRIX

Overall objective	To understand the dynamics and processes in the emergence of collective action as a governance strategy and the economical profitability and the environmental viability of this system of governance in Thai Samakkhi.			
Overall research question	How have the processes of natural resource management and their economic and biophysical outcomes in Thai Samakkhi been shaped by collective action to natural resource governance?			
Research themes	Sub questions	Data required	Data collection method	Data analysis method
1. History and characteristics of **decision-making arrangements**	1.1 What is the history of collective action in the governance structure of Thai Samakkhi? - In relation to agriculture, tourism, and the combination of both	Timeline of collective action governance Knowledge about governance Knowledge about the collective action approach in relation to agriculture and tourism Identification of key informants	PRA - focus group interviews and workshop with timeline Interview w. gate-keepers and key-informants Semi-structured interviews	
	1.2 Which formal and informal institutions regulate collective action in Thai Samakkhi? - Hereunder, adaptive management	Knowledge about formal institutions Knowledge about informal institutions	Semi-structured interviews Participant Observation	
	1.3 To what extent is this system of governance based on different ladders of participation?	Knowledge about villagers' participation in collective action governance	Questionnaire Participant Observation Semi-structured interviews	Proxies to be compared applying the Ladder of Participation Theory
2. Economic **outcomes**	2.1 What are the direct and indirect economic outcomes, in terms of economic contributions to household income?	Info collective contribution to household incomes	Questionnaire and follow up interview	
	2.2 What are the direct and indirect economic outcomes, in terms of economic contributions to collective income of collective action participants?	Info about the overall impact of collective action contributions across households' incomes	Questionnaire and Semi-structured interview	
3. Biophysical **outcomes**	3.1 How has collective action land management strategies determined present agricultural practices?	Knowledge about the range of agricultural practices in the village	Semi-structured interviews	
	3.2 What are the traits of soil fertility in agricultural plots of households participating in collective action governance and how do they differ from agricultural plots of non-	Nitrate information (tells about the fertilizer use) Bulk density (tells about compaction, machinery, possible root depth)	Nitrate measurements Weight of soil samples with rings	Statistics to compare plots and see if they are significantly different from each other

	participating households?			
4. **Patterns of interaction**	4.1 What are the inducement and obstacles of being part of a collective action management on a household level? - Inducement and obstacles in terms of for example: Economic, gender, etc.	Knowledge about the type of inducements and obstacles that occur in the participation process of households	Semi-structured Interviews with key informants (both households engaged in collective action processes and not)	
	4.2 How does the perception of soil fertility create obstacles and inducements for land management?	Knowledge of perception of soil fertility	Semi-structured Interviews with key informants (both households engaged in collective action processes and not)	Correlation analysis?
	4.3 To what extent does collective action create conflicts in the community, and how are these conflicts, if applicable, dealt with?	Knowledge about conflicts that occur Knowledge about how the conflicts are dealt with	Semi-structured interviews with households involved and key-informants Participant observation	

Appendix B: Methods description

Overview of methods applied in the field:

Method	How many
FGI	1
SSI	6
Questionnaire	33
PRA	4 (2 timelines, 2 calendars)
Soil samples	2 (4 replicates each)
Nitrate-concentration	16 (4*2 replicates each)
NPK	16 (2 replicates each)
SOM	6 (3 replicates each)

FGI:

Methodological relevance: A FGI is discussing (a) certain issue(s) with a group of people, and at the same time have the possibility to observe how the people discuss in a group-setting (Brockington and Sullivan, 2005). By using a focus group interview to discuss the emergence and villagers' experience and perception of such system while having at the same time having the possibility to observe group dynamics and power structure among the villagers (the group included in the interviews – who talks and when etc.).

In practice: In the field, a FGI was held at the first day with various CBTP-committee members from the village, though mainly females were present. With the CBTP-committee members, the history of CBTP was discussed and the events that lead to its emergence. The implementation of a timeline workshop (see PRA) was used to also encourage other than 'high ranking' villagers to share their knowledge and express their opinions. However, in practice it became very chaotic, and still only a few contributed verbally with knowledge.

SSI:

Methodological relevance: The SSI is a method that illustrates people's understanding, experiences and feelings, and what this means for the individual in different situations through in-depth conversations. This type of interview differs from a regular everyday conversation in that it allows the interviewer more control over the conversation and the opportunity to steer it in a desirable direction (Kvale & Brinkmann, 1997, p. 45-46).

In practice: In the field 6 SSIs were conducted; two with the organic farmers in the case-studies about the farm system operations and relationship to collective action, one with

the CBTP-coordinator/wife of VHM about the CBTP-committee roles and the governance structure of TS, one with the VHM about his role in TS, one with the SDO about CBTP and land tenure in TS, and one with a homestay owner about the homestay business since implementation of CBTP. The SSIs were conducted with different topics to be covered, and interview guides (see appendix H) were created before each SSI to be sure to cover all planned topics (in combination with the students from Kasetsart University), but with the possibility of investigating a subject that was not planned on but was brought up during the interview.

Questionnaire:

Methodological relevance: The use of questionnaires is usually based on the purpose of collecting more quantitative data than what interviews can gather. At the same time, the data collection through questionnaires becomes a more structured survey (Casley and Kumar, 1989). With the quantitative data from the questionnaire surveys, several possibilities of statistical analyses arise, e.g., correlation analysis. The questionnaire surveys were distributed through a snowball and convenience sampling strategy which is based on availability in both time and respondents (Marshall, 1996).

In practice: A questionnaire was developed incorporating topics of interest of this study and the study of the Kasetsart University counterparts. The questionnaire covered topics such as personal information (name, age, education length, number of people in the household, occupation, income etc.), their perception of changes due to the CBTP (number of tourists, agricultural practices, everyday practices, cultural practices, income etc.), participation in community meetings (speak, information, influence etc.), and agricultural practices (conventional or organic farming, land size and access, income etc.). The questionnaire scheme and data can be seen in Appendix G. Due to sensitivity of some topics, e.g., income (Rea and Parker, 2005), rapport was tried to be established, formulation of questions were considered (ibid.), as well as the respondents were allowed to skip a question if they were not comfortable answering. In addition, questions were skipped if they were not applicable for the respondent. In total 33 questionnaires were conducted covering ~7.5% of the households in TS. The respondents were selected based on the most convenient way to get access to most using less time. For this reason a snowball and convenience sampling became the strategy, even though it can be criticised for not systematic and then securing greater chance of representing the reality of TS (Sincero, 2012). The initial goal was to cover 10% of the households in TS as the Kasetsart counterparts had planned this. However, the questionnaires proved to be a more time consuming task than initially thought of.

PRA:

Methodological relevance: PRA-methods are a range of research approaches used to engage local people in the research collection by either applying their local knowledge in field, or sharing their knowledge with the researcher by discussing with other local counterparts (Emmel, 2008). In this study, the use of PRA-approaches were restricted to the methods of timeline analysis and calendar.

Timeline analysis: Timeline is a tool developed within the PRA methodology, which is used to collect data on the participants' memory of past events in order to investigate history from the perspective of community members (Mahesh et al., 2017). During timeline-workshops, events are described according to people's recall of certain historical dynamics, to their prioritisation and the significance that they attribute to them. Relations of causality among events are also established directly by participants of the workshop (Emmel, 2008).
Calendar: The calendar can be used to collect information about trends and patterns throughout the different seasons during the year. Through this tool emerges an understanding of the different events and trends that might influence life of local people, and causality of calendars based on different topics can be discussed with the participants (Cavestro, 2003).

In practice:
Timeline analysis: A PRA-workshop with the purpose of creating a timeline for the implementation of the CBTP, the events leading up to this implementation as well as an element of wishes for CBTP to bring to the future were conducted during a FGI. In practice the respondents (all from the CBTP-committee) were randomly divided in two groups of 10-15 people each with the same tasks of writing some keywords to describe each of the three elements: before, now, and in the future, in three sections. After each section the keywords assigned to the element were compared, and the participants were encouraged to discuss the keywords and to elaborate some more. In general, many of the keywords were repetitives between the two groups. The general experience of the timeline workshop were, however, that the groups might have been too big, as only a few were raising their voice and really participating in the workshop.
Calendar: The calendar tool was focused on creating crop calendars with the two case-study participants in order to estimate their patterns of agricultural practices throughout the year. The crop calendars were used in the farm system analysis to determine the yearly amount of tilling, ploughing, sowing, and harvesting periods, labour hours and costs etc.

Farm system analysis – economic and nutrient flow analysis:
Methodological relevance: A farm system analysis of the flow of inputs and outputs in terms of economy (Keating and McCown, 2001) and nutrients (Rufino et al., 2005). The data to conduct the farm system analysis will be collected through SSIs, and the remaining information will be compared to reference values in literature.

In practice: Two organic farms were chosen to be subject of the two farm system analyses. Certain criteria were set up to select the farms as the subject of the case studies: organic farms, based in TS, and to some extent dependent on the collective action in TS. Contact with these farmers were established at the local market and the FGI. Two SSIs were conducted with each farmer; the first with the purpose of collecting all data needed (following a interview guide constructed before the SSI (see Appendix H), but after revision of data in the farm system analysis and discovering data discrepancies, a follow-up SSI were conducted to collect the remaining data to do a full farm system analysis. For full calculation of the farm system analyses, see Appendix C and D.

Economic analysis of the farm system:
Methodological relevance: The economic analysis is conducted by determining the monetary value of all inputs and outputs that are executed to run the farm system. Examples on inputs are fertiliser, seeds, labour costs, and outputs are crop yield, sales price, household consumption (Keating and McCown, 2001). The economic analysis is determining the economic balance, and this knowledge can be used in determining the economic robustness of the farm system.

In practice: During two SSIs with A and B, monetary values were assigned to the costs of running the farm in terms of cost of fertiliser, seeds, labour, machinery, infrastructure, land access etc., and the income generated from the agricultural produce being harvested through data on crop yield, sales price, household consumption etc. With data derived from the SSIs on these inputs and outputs a calculation of economic balance of the farm systems were possible. If some data were unknown to the farmers, reference values from literature were used, hence an uncertainty of the farm system analyses is present. See Appendix C and D for results.

Nutrient flow analysis of the farm system:
Methodological relevance: Certain levels of the major plant nutrients (i.e., nitrogen (N), phosphorus (P) and potassium (K)) are required for optimum plant growth (Defoer et al., 2000). Therefore an analysis of the nutrient flow in a farm system is a relevant mechanism to measure in terms of understanding the efficiency of the farm system in terms of agricultural practices and produce, but also the economic efficiency (Rufino et al., 2005). Each step in during the agricultural practices affecting nutrients have the possibility of losing nutrients due to various reasons, and hence the system can become inefficient in many steps along the way (ibid.). Due to large uncertainties of the nutrient flow analysis, soil analyses were conducted as well (see soil analysis, nitrate-concentration, additional nutrients, and SOM).

In practice: The nutrient flow analysis were based on determining the volume of nutrient inputs into the farm system through fertiliser and manure – the latter of which they did not use directly but only through the fertiliser they used, the outputs of plant uptake of nutrients and the amount of harvested crops, as well as the recycled nutrients in the shape of residues left on field. See Appendix C and D for results.

Soil analysis:
To triangulate the data from the SSIs, soil analyses have been conducted. Soil samples at one lettuce field at each farm were collected. As the fields were organised in rows of lettuce in different production stages, four replicates of the topsoil (depth 25 cm) located in a zig-zag pattern (to represent the field) were taken using a hand-auger. The replicates were mixed into one combined sample for each field from which samples for measurements could be picked.

Nitrate-concentration:

Methodological relevance: N is one of the major plant growing nutrients, and according to Rufino et al. (2005) it is often the growth determining nutrient, as a lack of N will limit the growth of the plant, especially in organic grown cash crops (Øvsthus et al., 2019). In the soil, N is converted into nitrate (Bernhard, 2010), and a measure of nitrate-concentration can therefore be used as an indicator of plant-available N in the soil (SFgate 2018).

In practice: Following the instructions of SLUSE (2019), fresh, moist soil from the two soil samples were used to determine nitrate-concentration. From each soil sample four replicates were conducted to decrease uncertainties by calculating an average of the results for each field. The analysis is carried out using falcon tubes with 30 ml water. The sampled soil is added until the solution level reaches 40 ml. The mixture was shaken for five minutes and left to settle for at least an hour before the nitrate-concentration was measured by dipping nitrate test strips in the supernatant and then read with a reflectometer (ibid.). To secure more precise measurements, the nitrate-concentration of the water used for the soil-mixture was measured before to set up the correct nitrate-level in the reflectometer. To determine the amount of N bound in nitrate, the result of the reflectometer measurement were divided by 2 according to the soil texture (ibid.). See Appendix E for results.

Soil texture:

Methodological relevance: The soil texture was used to determine the correct correction factor to use for estimating the amount of N bound in nitrate in the soil (SLUSE, 2019).

In practice: 'Feel measure' was used to determine the soil texture. The soil texture was determined by rolling moist soil as thin as possible in a roll while preserving the ability to make the ends reach each other without breaking the roll. Two replicates were made for each field, and the average were calculated. The table with "key for soil textural classes" and the figure with "texture pyramid" (both from SLUSE, 2019) were used to determine the soil texture for the fields. See Appendix E for results.

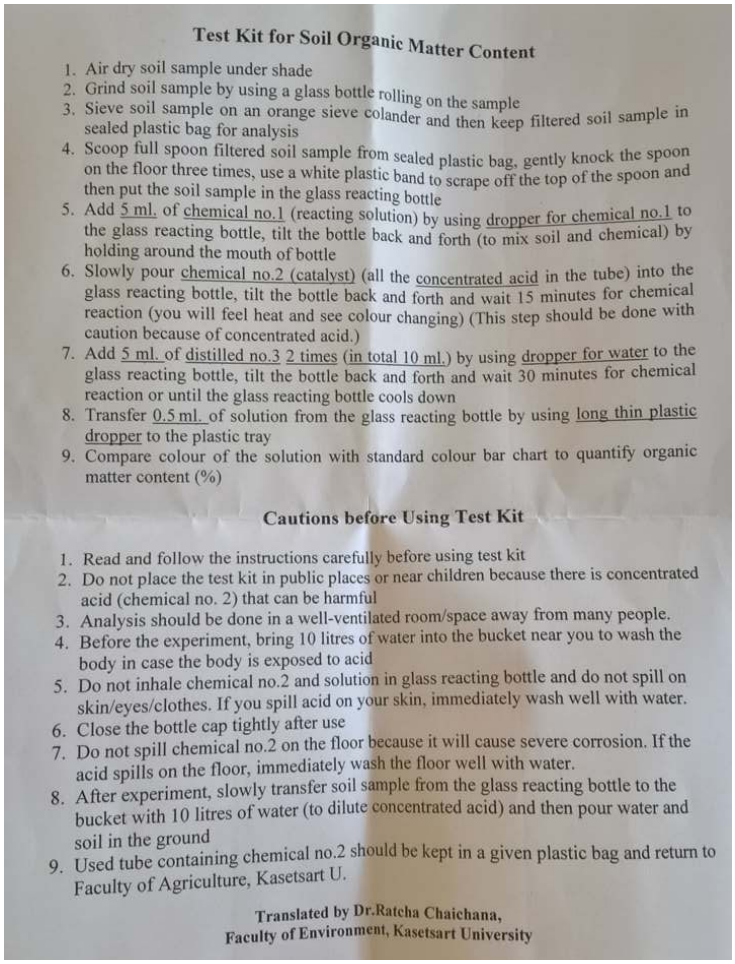
Soil organic matter (SOM):

Methodological relevance:

To assess soil fertility and nutrient flow in a farm system SOM is a relevant indicator to consider, due to SOM being able to increase the availability of nutrients to the plants by increasing cation exchange capacity in soils (Zeng, 2011).

In practice: Following the instruction of the SOM manual developed by Kasetsart University (see Figure B1), soil samples were dried before being mixed with a mixture developed for the purpose. The results come in relative values ranging from 0-3% based on a colour scheme. Three replicates were made for each of the soils and the average of the measurements were calculated.

A source of error for the SOM was the drying process which were not completely done by air-drying as stated in the manual, as the soil was placed in the sun for some time during the drying process.



Test Kit for Soil Organic Matter Content

1. Air dry soil sample under shade
2. Grind soil sample by using a glass bottle rolling on the sample
3. Sieve soil sample on an orange sieve colander and then keep filtered soil sample in sealed plastic bag for analysis
4. Scoop full spoon filtered soil sample from sealed plastic bag, gently knock the spoon on the floor three times, use a white plastic band to scrape off the top of the spoon and then put the soil sample in the glass reacting bottle
5. Add 5 ml. of chemical no.1 (reacting solution) by using dropper for chemical no.1 to the glass reacting bottle, tilt the bottle back and forth (to mix soil and chemical) by holding around the mouth of bottle
6. Slowly pour chemical no.2 (catalyst) (all the concentrated acid in the tube) into the glass reacting bottle, tilt the bottle back and forth and wait 15 minutes for chemical reaction (you will feel heat and see colour changing) (This step should be done with caution because of concentrated acid.)
7. Add 5 ml. of distilled no.3 2 times (in total 10 ml.) by using dropper for water to the glass reacting bottle, tilt the bottle back and forth and wait 30 minutes for chemical reaction or until the glass reacting bottle cools down
8. Transfer 0.5 ml. of solution from the glass reacting bottle by using long thin plastic dropper to the plastic tray
9. Compare colour of the solution with standard colour bar chart to quantify organic matter content (%)

Cautions before Using Test Kit

1. Read and follow the instructions carefully before using test kit
2. Do not place the test kit in public places or near children because there is concentrated acid (chemical no. 2) that can be harmful
3. Analysis should be done in a well-ventilated room/space away from many people.
4. Before the experiment, bring 10 litres of water into the bucket near you to wash the body in case the body is exposed to acid
5. Do not inhale chemical no.2 and solution in glass reacting bottle and do not spill on skin/eyes/clothes. If you spill acid on your skin, immediately wash well with water.
6. Close the bottle cap tightly after use
7. Do not spill chemical no.2 on the floor because it will cause severe corrosion. If the acid spills on the floor, immediately wash the floor well with water.
8. After experiment, slowly transfer soil sample from the glass reacting bottle to the bucket with 10 litres of water (to dilute concentrated acid) and then pour water and soil in the ground
9. Used tube containing chemical no.2 should be kept in a given plastic bag and return to Faculty of Agriculture, Kasetsart U.

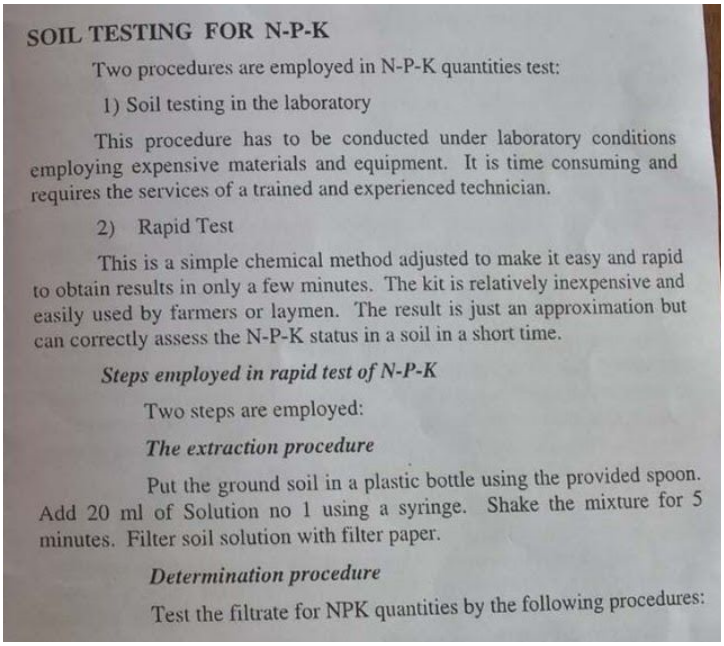
Translated by Dr.Ratcha Chaichana,
Faculty of Environment, Kasetsart University

Figure B1: Manual for SOM-kit from Kasetsart University

Additional nutrients:

Methodological relevance: N is not the only nutrient important for plant growth, as certain levels (though varying) of P and K are also crucial for plant growth (Defoer et al., 2000). Measurements of P and K in soil are therefore also relevant in order to investigate the nutrient flow in the farm system. A NPK-kit developed by Kasetsart University (Figure B2 and B3) were used for the measurements.

In practice: Following the instructions of the NPK-kit manual, two replicates of each soil sample for each nutrient were measured. The results come out in relative results ranging from “very low to very high” based on a color scheme, hence not indicating a volume or percentage. However, due to the relative values, the P and K measurements were not used further in the analysis of the farm system. The N measurements based on nitrate and ammonium were only used superficial to triangulate with the values of N determined through the nitrate-concentration measurements.



SOIL TESTING FOR N-P-K

Two procedures are employed in N-P-K quantities test:

1) Soil testing in the laboratory

This procedure has to be conducted under laboratory conditions employing expensive materials and equipment. It is time consuming and requires the services of a trained and experienced technician.

2) Rapid Test

This is a simple chemical method adjusted to make it easy and rapid to obtain results in only a few minutes. The kit is relatively inexpensive and easily used by farmers or laymen. The result is just an approximation but can correctly assess the N-P-K status in a soil in a short time.

Steps employed in rapid test of N-P-K

Two steps are employed:

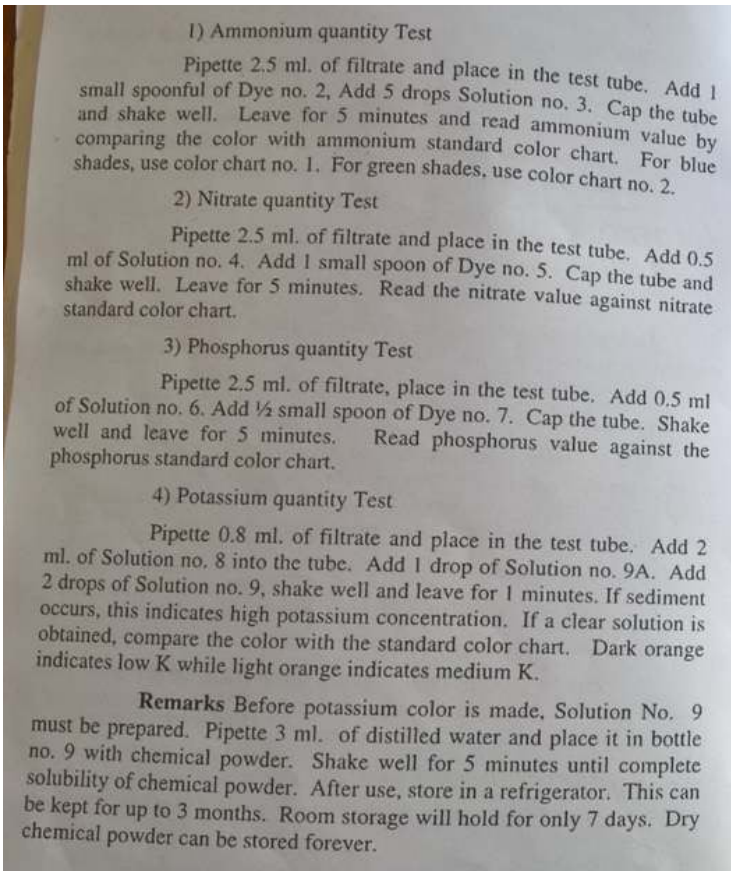
The extraction procedure

Put the ground soil in a plastic bottle using the provided spoon. Add 20 ml of Solution no 1 using a syringe. Shake the mixture for 5 minutes. Filter soil solution with filter paper.

Determination procedure

Test the filtrate for NPK quantities by the following procedures:

Figure B2: Manual (page 1/2) for NPK-kit from Kasetsart University



1) Ammonium quantity Test

Pipette 2.5 ml. of filtrate and place in the test tube. Add 1 small spoonful of Dye no. 2, Add 5 drops Solution no. 3. Cap the tube and shake well. Leave for 5 minutes and read ammonium value by comparing the color with ammonium standard color chart. For blue shades, use color chart no. 1. For green shades, use color chart no. 2.

2) Nitrate quantity Test

Pipette 2.5 ml. of filtrate and place in the test tube. Add 0.5 ml of Solution no. 4. Add 1 small spoon of Dye no. 5. Cap the tube and shake well. Leave for 5 minutes. Read the nitrate value against nitrate standard color chart.

3) Phosphorus quantity Test

Pipette 2.5 ml. of filtrate, place in the test tube. Add 0.5 ml of Solution no. 6. Add ½ small spoon of Dye no. 7. Cap the tube. Shake well and leave for 5 minutes. Read phosphorus value against the phosphorus standard color chart.

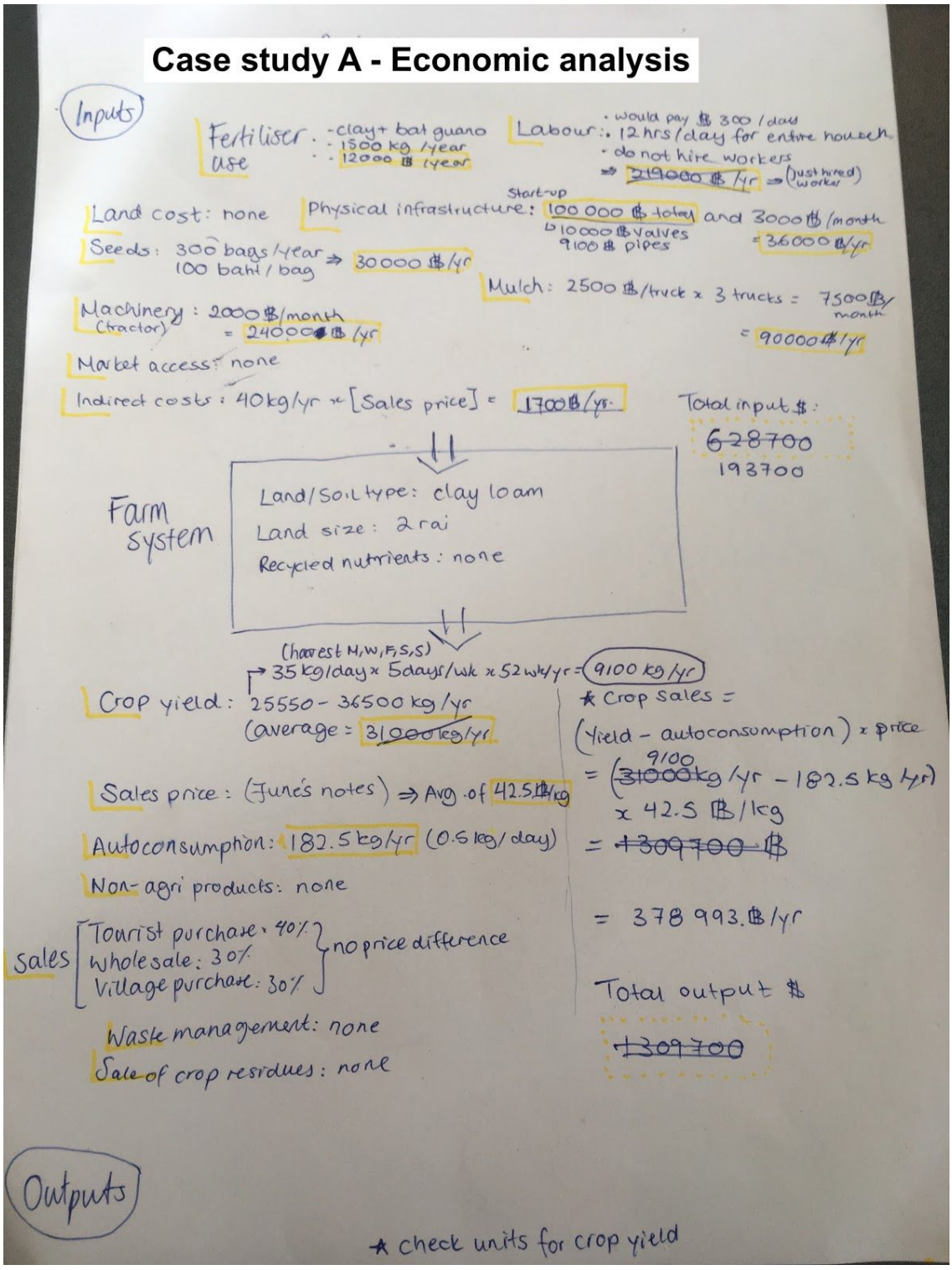
4) Potassium quantity Test

Pipette 0.8 ml. of filtrate and place in the test tube. Add 2 ml. of Solution no. 8 into the tube. Add 1 drop of Solution no. 9A. Add 2 drops of Solution no. 9, shake well and leave for 1 minutes. If sediment occurs, this indicates high potassium concentration. If a clear solution is obtained, compare the color with the standard color chart. Dark orange indicates low K while light orange indicates medium K.

Remarks Before potassium color is made, Solution No. 9 must be prepared. Pipette 3 ml. of distilled water and place it in bottle no. 9 with chemical powder. Shake well for 5 minutes until complete solubility of chemical powder. After use, store in a refrigerator. This can be kept for up to 3 months. Room storage will hold for only 7 days. Dry chemical powder can be stored forever.

Figure B3: Manual (page 2/2) for NPK-kit from Kasetsart University

Appendix C: Case study A nutrient flow and economic analyses



Case study A - nutrient flow analysis (inputs)

(Mulch: Assume no nutrient export to soil)

Fertiliser: 1500 kg/yr (8:3:4 fertiliser)

8% N ⇒ 120 kgN/yr

3% P_2O_5 ⇒ 45 kg P_2O_5 /yr ⇒ (× 0.4364) = 19.64 kgP /yr

4% K_2O ⇒ 15 kg K_2O /yr ⇒ (× 0.83) = 12.45 kgK /yr

Case study A - Nutrient flow analysis (outputs)

(→ Clay and bat guano fertiliser as inputs)

Lettuce: (all fresh weight)

(N) Nitrogen: [1.75 - 4.74] lbs of N / ton of lettuce

⇒ [1.75 - 4.74] lbs / 1000 kg

793787 - 2150028 mg / 1000kg

⇒ 793.8 mg - 2150 mg / kg (UC Davis, n.d.)

(P) Phosphorus: 29 mg / 100g

⇒ 290 mg / kg (USDA, 2018)

(K) Potassium: 194 mg / 100g

⇒ 1940 mg / kg (USDA, 2018)

Calculations of N, P, K content per kg. fresh lettuce

Output of nutrients per year (9282.5 kg / yr) (harvest)

N ⇒ 7.37 - 19.96 kg N / yr
↳ avg. of 13.67

P ⇒ 2.69 kg P / yr

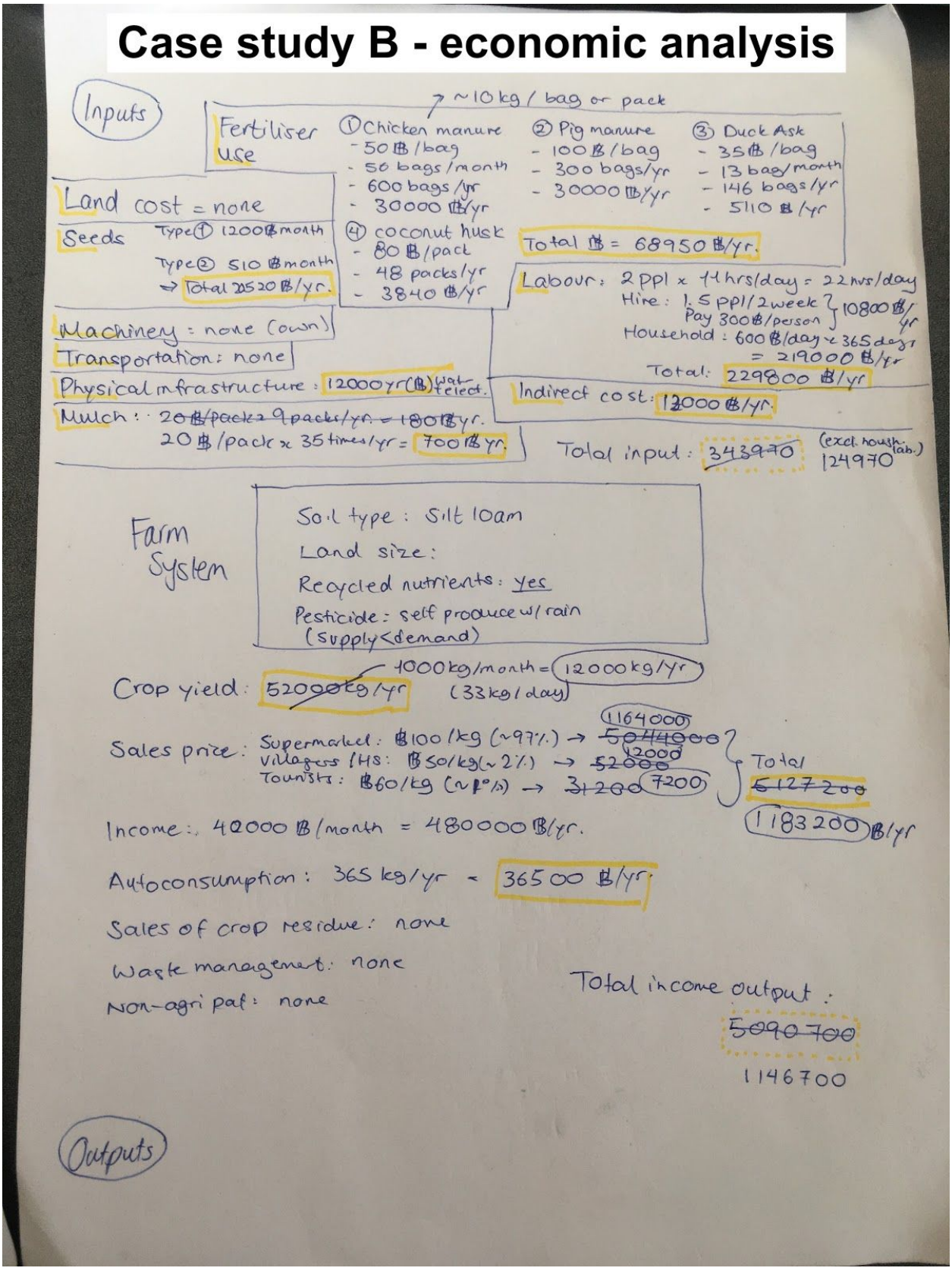
K ⇒ 18.01 kg K / yr

Calculations of amount of N, P, K harvested in fresh weight lettuce per year

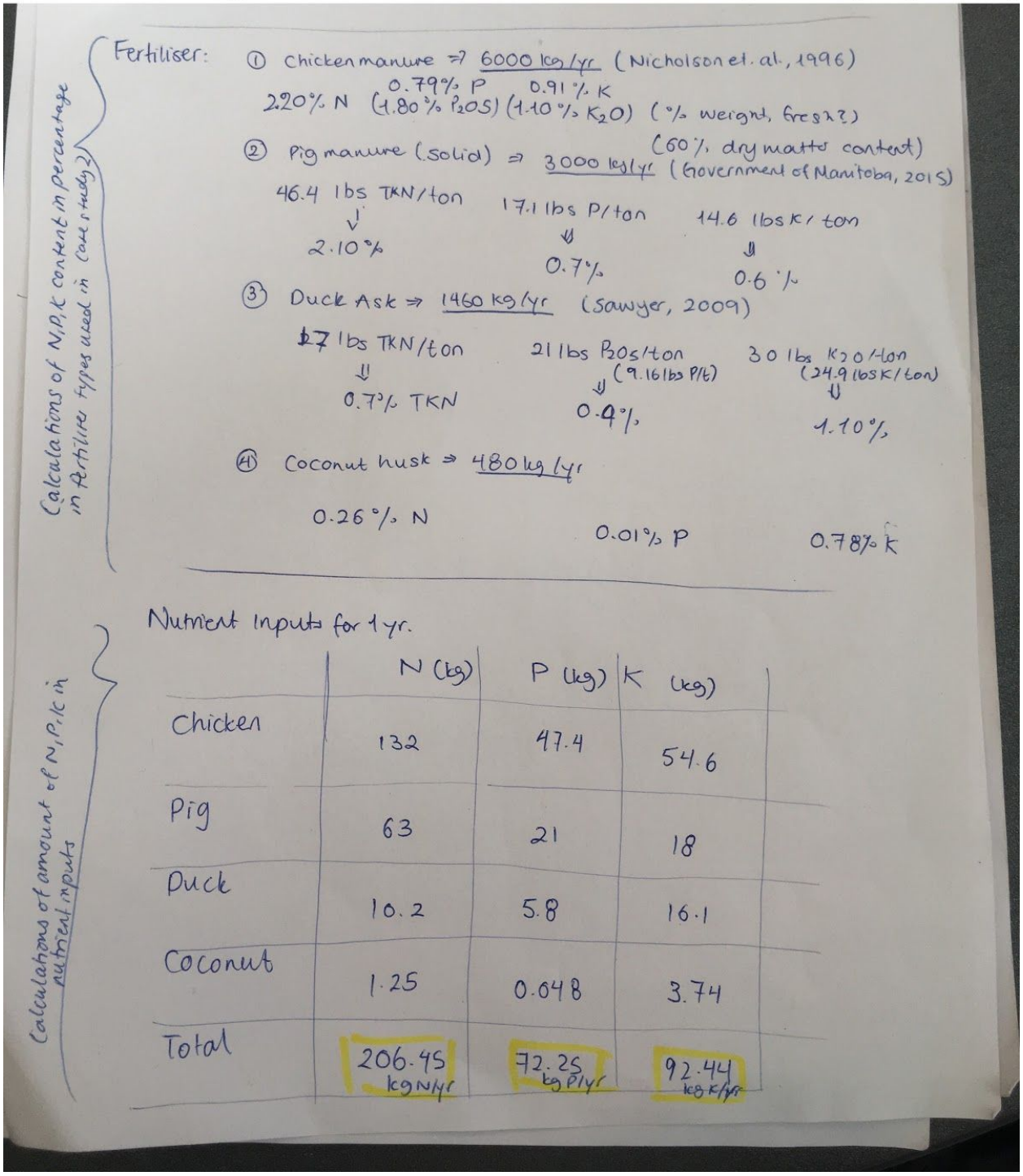
~~References in FB convo betw Jeffrey → Perrille~~

Nutrient use efficiency:
N ⇒ 6.14 - 16.6 % → avg. of 11.39%
P ⇒ 13.7 %
K ⇒ 144 %

Appendix D: Case study B nutrient flow and economic analyses



Case study B - nutrient flow analysis (inputs)



Calculations of N,P,K content in percentage in fertilizer types used in case study 2

Fertiliser:

① Chicken manure ⇒ 6000 kg/yr (Nicholson et. al., 1996)

2.20% N (1.80% P_2O_5) (1.10% K_2O) (% weight, fresh?)

0.79% P 0.91% K

② Pig manure (solid) ⇒ 3000 kg/yr (Government of Manitoba, 2015) (60% dry matter content)

46.4 lbs TKN/ton → 2.10%

17.1 lbs P/ton → 0.7%

14.6 lbs K/ton → 0.6%

③ Duck Ask ⇒ 1460 kg/yr (Sawyer, 2009)

27 lbs TKN/ton → 0.7% TKN

21 lbs P_2O_5/ton (9.16 lbs P/t) → 0.4%

30 lbs K_2O/ton (24.9 lbs K/ton) → 1.10%

④ Coconut husk ⇒ 480 kg/yr

0.26% N

0.01% P

0.78% K

Calculations of amount of N, P, K in nutrient inputs

Nutrient inputs for 1 yr.

	N (kg)	P (kg)	K (kg)
Chicken	132	47.4	54.6
Pig	63	21	18
Duck	10.2	5.8	16.1
Coconut	1.25	0.048	3.74
Total	206.45 kg N/yr	72.25 kg P/yr	92.44 kg K/yr

Case study B - nutrient flow analysis (outputs)

Lettuce:

N: 793.8 - 2150 mg/kg (UC Davis, n.d.)

P: 290 mg/kg (USDA, 2018)

K: 1940 mg/kg (UCDA, 2018)

content of N, P, K per weight of fresh lettuce (see case study A output analysis sheet for full calculations)

Output of nutrients per annum (12365 kg/yr)

N ⇒ 9.82 - 26.6 kg N/yr (UC Davis, n.d.)
↳ avg. of (18.21)

P ⇒ 3.59 kg P/yr (USDA, 2018)

K ⇒ 23.99 kg K/yr (USDA, 2018)

Amount of N, P, K per year in harvested fresh weight of lettuce

Nutrient use efficiency:

N ⇒ 4.7 - 12.9% ⟶ avg. of 8.82%

P ⇒ 4.97%

K ⇒ 25.95%

Appendix E: Results - soil sampling

Case study 1 (farmer A) is denoted CS1x, with x indicating which test replicate
Case study 2 (farmer B) is denoted CS2x, with x indicating which replicate

Determination of Nitrate-concentration in water:

Replicate	*CS1a*	*CS1b*	*CS1c*	*CS1d*	*CS2a*	*CS2b*	*CS2c*	*CS2d*
A	*82*	*56*	*13*	*66*	*14*	*72*	*39*	*-*
B	*54*	*84*	*14*	*57*	*19*	*84*	*41*	*-*

Raw data from the reflectometer. Measurements are shown in mg NO3-/L. The background (nitrate concentration in water used for the extractions) was measured as 6 mg NO3-/L and this value should be subtracted from the results. The CS2d could not be measured due to too high concentrations.

N parts per million (ppm) bound in Nitrate:
CS1: 45,25 PPM NO3-N
CS2: 36,83 PPM NO3-N

Determination of SOM:

Replicate	CS1a	CS1a+b	CS1b	CS2a	CS2a+b	CS2b	All
Soil organic matter content	3%	1,5%	2,5%	1,5%	2%	2%	1,5%

Determination of additional nutrients: (ammonium, phosphorus, potassium)

Nutrient/replicate	CS1a	CS1b	CS2a	CS2b
NH4+	VH	M	L	L
NO3-	M	VL	O	O-VL
P	VH	H	M	L
K	M	L	M	M

Determination of soil texture:
CS1: Silt loam
CS2: Clay loam

Appendix F: Results - questionnaire

Questionnaire legend:

Name of variables	Comments
NNX	The number of questionnaire paper/notes
Age	Age of respondent
Sex	Sex of respondent 1 = female, 0 = Male
Marital_status	Marital status of respondent 1 = married, 0 = divorced
Education	Numbers of years in education
PP_in_HH	Number of people in the household
Occu_1	Type of the first occupation 6 = farming, 5 = business owner, 4 = manufacturing industry, 3 = service industry, 2 = government job, 1 = pensions, 0 = other
Occu_more	More than one occupation 1 = yes, 0 = no
Occu_location	The location for the occupation 2 = Thai Samakkhi, 1 = daily commute, 0 = permanent stay (min 5/7)
Occu_1_past	Type of the first occupation in the past 6 = farming, 5 = business owner, 4 = manufacturing industry, 3 = service industry, 2 = government job, 1 = pensions, 0 = other
Occu_more_past	More than one occupation in the past 1 = yes, 0 = no
Occu_location_past	The location for the occupation 2 = Thai Samakkhi, 1 = daily commute, 0 = permanent stay (min 5/7)
Income_inc_CBTP	Increase in income since the start of CBTP 3 = a lot, 2 =slightly, 1 = no difference, 0 = decreased
Income_annually	Income annually (gross)
Tourist_inc	Increase in tourists since the start of CBTP 3 = a lot, 2 =slightly, 1 = no difference, 0 = decreased
Infra_improvement	Improvement in the infrastructure since start of CBTP, e.g., roads, electricity, water, street lights 1 = yes, 0 = no
Skill_access	Access to any skill development training 1 = yes, 0 = no
Skill_participation	Participated in any skill development training 1 = yes, 0 = no
Part_meet	Participation in community meetings (CBTP) 1 = yes, 0 = no
Meet_import	The importance of the meetings as experienced by respondent 3 = very important, 2 = important, 1 = not very important, 0 = not important at all
Meet_speak	If respondent speak at meetings 1 = yes, 0 = no
Meet_info	The level of information the respondent gets about decisions in meetings 3 = every decision, 2 = relevant decisions, 1 = some decisions, 0 = no information
Meet_influence	Respondent's perception of influence on decision meetings 1 = yes, 0 = no

Contrib_money	Money contribution of respondent to village activities 1 = yes, 0 = no
Contrib_food	Food contribution of respondent to village activities 1 = yes, 0 = no
Contrib_service	Service contribution of respondent to village activities 1 = yes, 0 = no
Contrib_other	Other contribution of respondent to village activities 1 = yes, 0 = no
Land_size	Land size of respondent (rai)
Land_access	How the respondent has access to the land 3 = own, 2 = rent, 1 = given by village, 0 = other
Land_access_pay	The price the respondent must pay to have access to the land (B/year)
Soil_perception	The perception of the respondent about the soil 2 = good, 1 average, 0 =bad
Agri_change	Has the agricultural practices of the respondent changed since the start of CBTP 1 = yes, 0 = no
Agri_change_kind	The kind of change in agricultural practices 5 = organic, 4 = crop, 3 = vegetable, 2 = organic and crop, 1 = organic and vegetable, 0 = other
PP_HH_agri	Number of people from household involved in agriculture
Fertiliser	Type of fertiliser 2 = chemical, 1 = organic, 0 = chemical and organic
Harvest_volume	Volume of harvest (kg/year)
Harvest_income	The income from harvest (B/year)
Harvest_HH	Consuming in own household 1 = yes, 0 = no
Harvest_OHH	Selling to other households 1 = yes, 0 = no
Harvest_commercial	Selling to commercials 1 = yes, 0 = no
Harvest_tourists	Selling to tourists 1 = yes, 0 = no
Harvest_HS	Selling to homestays 1 = yes, 0 = no
Harvest_other	Selling to other 1 = yes, 0 = no
Price_satis_agri	Respondent's satisfaction with the income from agriculture 3 = very satisfied, 2 = satisfied, 1 = not satisfied, 0 = not sure
Harvest_inc	Volume of harvest increased since the start of CBTP 3 = alt, 2 = slightly, 1 = no difference, 0 = decreased

In the questionnaire data, NN23, NN25 and NN33 (coloured in pink) are data from three of the big entrepreneurs in TS. NN28 and NN32 (coloured in grey) are respondents with an income that are outliers compared with the income of the rest (without the big entrepreneurs) based on a boxplot of the income data.

Questionnaire data:

NNX	Age	Sex	Marital_status	Education	PP_in_HH	Occu_1	Occu_more	Occup_location	Occu_1_past
1	35	0	1		5	6	1	2	6
2	49	1	1	3	2	5	1	2	6
3	59	1	1	4	2	5	1	2	6
4	40	1	1	16	5	5	1	2	3
5	38	0	1	16	5	5	1	2	5
6	41	1	1	6	6	6	1	2	3
7	48	0	1	12	4	4	0	2	4
8	69	0	1	4	5	6	1	2	6
9	50	1	1	6	3	6	1	2	
10	48	1	1	9	4	5	1	2	5
11	53	1	1	10	4	5	1	2	5
12	60	1	0		3	6	0	2	6
13	37	1	0		4	5	0	2	3
14	55	1	1	2	8	6	0	2	6
15	52	1	1		2	3	0	2	3
16	53	1	1	4	5	5	0	2	3
17	40	1	1	3	3	4	0	2	4
18	77	1	1		4	6	0	2	6
19	66	1	1	4	4	6	0	2	
20	49	1	1	6	4	4	0	0	
21	72	0	1		4	1	1	2	6
22	53	1	1		1	6	1	2	6
23	45	0	1	16	3	6	1	2	6
24	60	1	1	4	11	0	0	2	
25	38	0	0	16	5	5	1	2	3
26	55	1	1	0	10	4	1	2	4
27	52	1	1	1	5	5	0	2	5
28	55	1	1	4	6	5	0	2	5
29	49	1	1	4	5	4	0	2	6
30	58	1	1		2	5	0	2	5
31	45	1	1	12	6	6	1	2	6
32	61	1	1	12	10	6	1	2	6
33	29	0	1	16	4	6	1	2	3

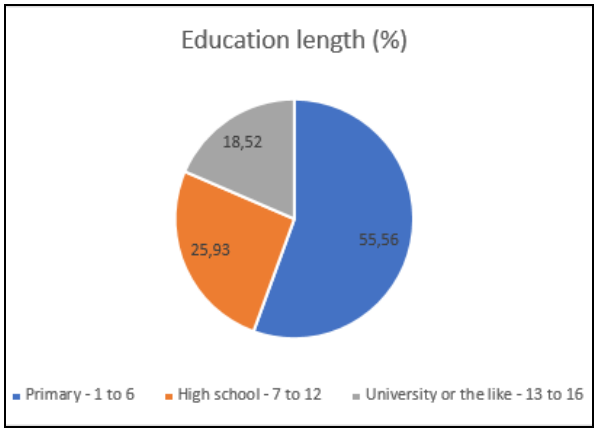
NNX	Occu_more_past	Occu_location_past	Income_inc_CBTP	Income_annually	Tourist_inc	Infra_improvement	Skill_access	Skill_participation	Part_meet
1	0	0	3	1000000					0
2	0	2	2	35000	0	1	1	1	1
3	0	2	1	50000	0	1	1	1	0
4	0	0	2	500000	3	0	1	1	0
5	1	2	2	450000		1	1	1	1
6	0	2	3	350000	3	1	1	0	1
7	0	0	0	150000					0
8	1	2	2	100000	0	0	1	1	1
9	0		2		3	0	1		1
10	1	2	2		0	1	1	0	0
11	0	2	3	180000	3	1	1		1
12	0	2	1		1	1	1		1
13	0	0	2		2	0	0		1
14	0	2	2	17500	1		1		1
15	0	1	1	36000	3	0	0		0
16	0	0	0	60000	1	0	1		1
17	0	0	1	36000	3		0		1
18	0	2	1	120000	0	1	0		0
19	0		1	12000	0	1	0		1
20	0	2	1	36000	2		0		1
21	0	2	1	360000	3	1	1		1
22	1	2	1		3	1	1	1	1
23	1	2	3	360000			1		1
24	0	2	2		3	0	1		1
25	0	2	3	10000000			0		0
26	1	2	3	60000	3	1	0		1
27	0	2	1	240000	3	1	1	0	0
28	1	2	1	2400000	0	0	1	0	1
29	0	2	1	36000	3	0	1		1
30	1	2	3	36000	3	1	0		0
31	0	2	2	60000	3	0	1		1
32	1	2	2	2000000	3	0	1	1	1
33	0	0	2	360000	2	0	0		0

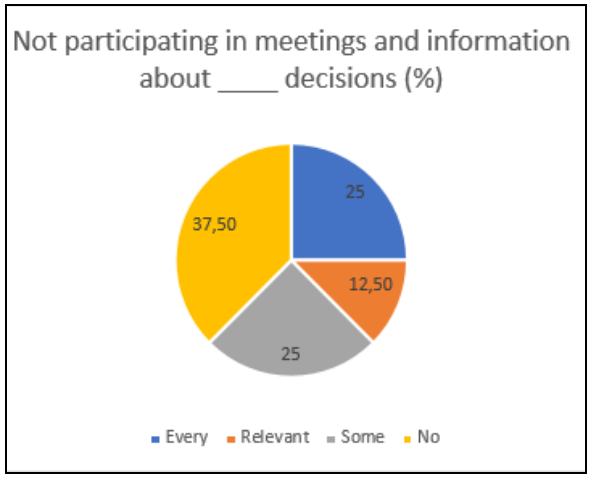
NNX	Meet_import	Meet_speak	Meet_info	Meet_influence	Contrib_money	Contrib_food	Contrib_service	Contrib_other	Land_size
1			1		1	0	0	0	9
2	3	1	3	0					5
3	2	0	0	0	0	0	1	0	23
4	2	0		1	0	0	1	0	
5	3	1	3	1			1	1	10
6	3	0	2	0					8
7	3	0			0	0	0	0	10
8	3	1	3	1	0	1	0	0	2
9	2	1	2	1	0	0	1	0	30
10	3	0	3	1	1	0	1	0	3
11	3	1	3	1	0	1	0	0	10
12	2	0	3	0	0	0	0	0	0
13	3	1	3	1	0	0	1	0	10
14	2	0	3	1	0	0	1	0	4
15	1	0	0	0	0	0	0	0	2
16	1	0	3	0	0	1	0	0	0
17	2	1	1	1	0	0	1	0	1
18	2	0	1	0	0	0	0	0	10
19	3	0	0	0	0	0	0	0	21
20	2	0	1	0	0	0	0	0	0
21	3	1	2	1	1	1	1	1	0
22	3	1	3	0	0	0	1	0	1
23	3	1	3	1	1	0	0	0	22
24	2	0	3	0	0	0	1	0	1
25	1	0	0	0	1	0	0	0	10
26	2	1	3	0	1	1	0	0	0
27	2	0	2	0	0	0	1	0	1
28	1	1	3	0	1	1	1	0	2
29	1	1	2	0	0	1	1	0	0
30	2	0	3	0	0	0	0	0	2
31	3	1	3	1	0	0	1	0	1
32	3	1	1	1	1	1	1	0	70
33	1	0	0	0	0	0	0	0	5

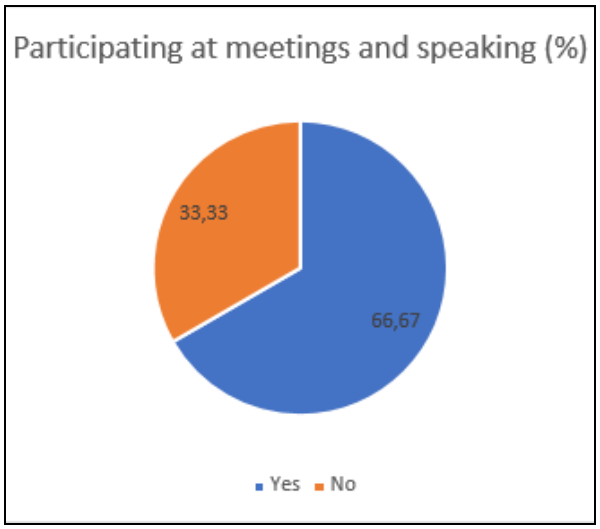
NNX	Land_access	Land_access_pay	Soil_perception	Agri_change	Agri_change_kind	PP_HH_agri	Fertiliser	Harvest_volume	Harvest_income
1	2	8.000	2	0		2	0		1.600.000
2				0			1		
3	3	0	0	0		0	0		100.000
4									
5	3		2	0		2	0	600	13.200
6				0		3	2		
7	3	0	2			2	2		
8	1	0	2	1	4	2	0	5.600	70.000
9	43.499	0	1	1	3	1	0		
10	1	0	2	1	2	4	2		350.000
11	3		2	1	3	1	1	1.000	7.470
12									
13	3								
14	3								
15	3		2	0			2		
16	3		0						
17			2						
18	2	10.000	2	0			2		120.000
19	0		0	0			2		
20	3		2						
21									
22	1	0	2	0		1	1		0
23	2	120.000	1			1	1		700.000
24			2	0					
25	3		2				1	120.000	
26									
27	3		2						
28	3		2	0			0	2.750	
29	3		1						
30	1	30	2	0		2	0		
31	3		1	1	3	6	1	2.500	375.000
32	3		2	0		2	1		1.069.000
33	3		2	0		1	1		

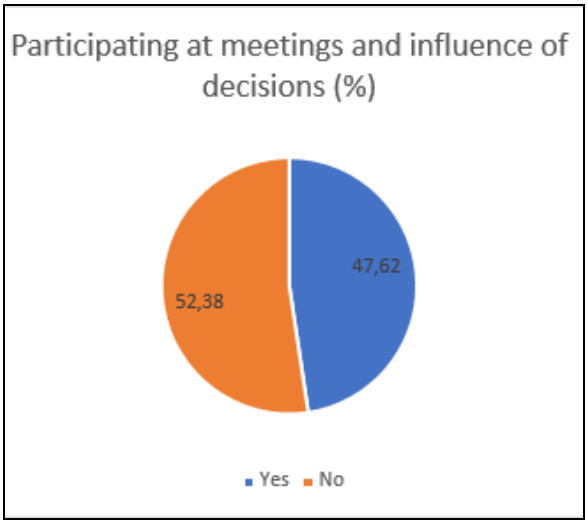
NNX	Harvest_HH	Harvest_OHH	Harvest_commercial	Harvest_tourists	Harvest_HS	Harvest_other	Price_satis_agri	Harvest_inc
1	1	0	1	1	0	0	3	
2	1	0	1	0	0	0		
3	1	1	1	1	0	0	2	1
4								
5	1	1	0	0	0	0	2	
6	1	1	1	1	0	0	3	3
7	1	0	0	0	1	0		
8	0	1	0	1	1	0	2	3
9	0	1	1	1	1	0	3	1
10							2	
11	1	0	1	1	0	1	3	1
12	0	0	0	0	0	0		
13	0	0	0	0	0	0	2	
14	0	0	0	0	0	0	1	
15	0	0	0	0	0	0	1	
16	0	0	0	0	0	0	2	
17	0	0	0	0	0	0	1	
18	1	0	1	0	0	0	1	1
19	1	0	1	0	0	0	1	1
20	0	0	0	0	0	0	1	
21	0	0	0	0	0	0		
22	1	1	0	0	0	0	3	1
23	1	0	1	1	0	0	3	
24	0	0	0	0	0	0		
25	0	0	1	1	0	0	3	
26	0	0	0	0	0	0	3	
27	0	0	0	0	0	0	2	
28	0	1	1	0	0	0	3	1
29	0	0	0	0	0	0	1	
30	0	0	0	0	0	0	2	
31	1	1	1	0	1	0	2	1
32	0	0	1	0	0	0	2	
33								

Graphs based on questionnaire data - not included in the report:









Appendix G: Questionnaire scheme

Questionnaire for Household survey in Thai Samakkhi, march 2019:

Introduction to the questionnaire:

We are a group of students from Kasetsart University and University of Copenhagen conducting a survey on the CBTP (Community Based Tourism Project). The purpose of this study is to learn more about CBTP in Thai Samakkhi. All the information that will be given to us will be treated anonymously and confidentially. If you do not feel comfortable about answering one or more questions, please feel free to skip them.

General information:

GPS-point location:	X: Y: Z:	Sub-location: *(E.g., house, field)*	
Interviewer:		Translator:	
Respondent:		Date: DD/MM/YYYY	

Demographic info:

Name:		Age:	
Sex:		Marital status:	
Main Occupation:		Educational status:	
Number of people in HH:			

Income and tourism activities:

1. Which activities do your household engage in to make an income – (annually)?

How much does each contribute to your income (in shares)?

Farming			Manufacturing industry			Government job		

Business owner			Service industry			Pensions		
Other:			Please specify:					

2. Where are the main activities situated?

Thai Samakkhi		Daily commute		Permanent stay (min 5/7)	

3. Which activities did your household engage in to make an income prior to the start of the CBTP (annually)?

How much does each contribute to your income (in shares)?

Farming			Manufacturing industry			Government job		
Business owner			Service industry			Pensions		
Other:			Please specify:					

4. Where are the main activities situated?

Thai Samakkhi		Daily commute		Permanent stay (min 5/7)	

5. Have your household income increased since the introduction of CBTP?

A lot		Slightly		No difference		Decreased	

6. How much do you earn approximately annually?

7. Has there been a change in the number of tourists coming to your village since the start of CBTP?

A lot		Slightly		No difference		Decreased	

8. Has the infrastructure improved since the start of the CBTP? Yes No

Human and social capital:

9. Have you ever had access to any skill development training related with tourist activities since the start of CBTP? Yes No

10. Has any of the following changed in relation to the start of CBTP?

Style habits		Family relationship	
Religious practices		Others, please specify:	

11. Have the following activities increased since the start of CBTP?

Stealing (both ways)		Begging	
Smoking/drinking		Violence	
Other, please specify:			

Natural capital:

12. Since the start of CBTP do you practice any of the following more?

Waste management		Water management	
Other, please specify:			

13. Since the start of CBTP, has the community employed any new strategy for the following issues?

Waste management		Water management	
Other, please specify:			

Participation:

14. Do you participate in community meetings? Yes No

Why?

15. Do you think that these meetings are important?

Very important		Important		Not very important		Not important at all	

Why?

16. Do you speak at the meetings? Yes No
Why?
17. Do you feel informed about decisions made at the meetings?

I am informed about every decision taken		I am informed about decision relevant to me (farmer, homestay…)	
I am informed about some decisions		I am not informed at all	

Why?

18. Do you feel you can influence decisions made at the meetings? Yes No
Why?

19. Do you contribute to community activities?

Money		Food		Services		Other	

Agricultural practices: *To be asked only to people that practice agriculture*

20. How big is your field (rai)?
21. How did you get this land?

Own		Rent		Given by village		Other	

22. Do you have to pay to get access to use the land?
If yes, how much?
23. How good is your soil for agriculture?

Good		Average		Bad	

24. Have you changed your traditional cropping pattern to suit CBTP? Yes No
What kind of change?

25. What are your motivations for this change?

26. Who is involved in agriculture in the household?

27. What type of fertiliser do you use in your field?

Chemicals		Organic/Bio/manure	
Which kind:			

28. How much do you harvest of your main crop (volume)?

29. How much do you consume yourself, and how much of your products do you sell to the following?

Your HH		Other HH in the village		Tourists	
Commercial chains (supermarket)		Homestays		Other, please specify	

30. How much do sell your products for (for the different buyers)?

31. Are you satisfied with what you are earning from selling your crops?

Very satisfied		Satisfied		Not satisfied		Not sure	

32. Has the amount of your agricultural production increased since the start of CBTP?

A lot		Slightly		No difference		Decreased	

Appendix H: Interview guides - examples

Focus group questions:

Present:
- How is Thai Samakkhi today?
- What do you like about the village?
    - What will you show to tourists?
- What do you not like about the village?
    - What will you not show to tourists?
- (Following from previous question): As a committee, what can you do to solve the problem?

Past:
Talking points if stuck: debt, national park, private investors who built e.g., hotels, range of crops, fertilizer
- How was TS when you were a kid?
- How was TS when the village started with tourism, when the village had debt problems? (emphasize on what problems made people shift to tourism)
- Were there any problems that you faced when you shifted to tourism?

Future:
- What do you think should change in TS?
- How do you imagine TS in 5 years?
- What are the challenges for reaching the goal?
    - (How do you deal with these challenges?)

Conflict:
- (Introduce: we were told by the headman assistant that there is an inspector that check for example if homestays follow the rules)
- Hypothetically, if the inspector found out that a homestay does not follow a rule, what would you as a committee do?

Cases study questions for farmers

Land and household:

1. How big is your land in rai?
2. How did you get this land?
3. Do you have to pay to use the land?
4. How much do you have to pay?
5. How good is your soil?
6. How many people live in your household?
    a. How many is engaged in your farming?

Farming techniques:

7. Crop calendar – monthly of a whole year for each crop:
    a. When do you plant the seeds?
    b. When do you harvest?
    c. How long is the harvest season?
    d. What happens with the plot/field in between?
8. Do you practice crop rotation?
9. Do you have any plots dedicated to fallow?
10. What do you use for irrigation and how?
    a. If yes: Do you have to pay to use the water?
11. Do you use machinery?
    a. If yes: Do you own it or do you have to pay to use it?
    b. If yes: Which kind of machinery

Crops:

12. Which crops do you have?
13. How big is each plot?
14. How much space do each crop occupy?

Soil preparation:

15. What do you do to prepare your field before planting (ploughing, tilling)?
16. How long does it take to prepare the soil?
17. Who does the soil preparation?
18. Do you employ any workers to do the soil preparation?
    a. If yes: For how many days?
    b. If yes: How much do you pay them?

Planting:

19. Do you use seeds or seedlings?
20. Where do you get them from?
21. How much do you pay for them/How much would you sell it for?
22. How long does it take to do the planting?

23. Who does the planting?
24. Do you employ any workers to do the planting?
    a. If yes: For how many days?
    b. If yes: How much do you pay them?

Management:

25. How do you take care of your field?
26. How do you control weeds?
27. How do you control pests?
28. Do you use any pesticides?
    a. If yes: How much do you pay for it?
    b. If yes: Where do you get them from?
29. How much time do you spend managing your field?
30. Who does the crop management?
31. Do you employ any workers to do the crop management?
    a. If yes: For how many days?
    b. If yes: How much do you pay them?
32. Do you do anything else to protect your crops (mulching)?
33. Do you use fertiliser?
    a. If yes: What type of fertiliser?
    b. If yes: How much do you use?
    c. If yes: How often do you use fertiliser?
    d. If yes: How much does it cost (per kg)?
    e. If yes: Where do you get it from?

Harvesting:

34. Do you use any machinery to harvest your crops?
35. How long does it take to harvest each crop?
36. Who does the harvesting?
37. Do you employ any workers to do the harvesting?
    a. If yes: For how many days?
    b. If yes: How much do you pay them?
38. How much do you harvest of each of your crops?
39. What do you do with the residuals?
40. Selling/market:
41. How much of each crop do you consume in your household?
42. Who do you sell the rest to (list)?
    a. What are the shares or quantity (kg)?
    b. For each of your buyers, what is the price for each of your crops?
        i. Commercial chains
        ii. Other households in the village
        iii. Homestays
        iv. Tourists

v. Others, specify:

43. How did you get in contact with the buyers?
    a. Did you receive any help from the community/committee to get in contact with buyers?
44. How often does each of you buyers buy from you?
45. What type of contract do you have with your buyers?
46. Who is in charge of transporting the products to the buyer?
47. How much is your transportation costs (if any)?
48. Are you in charge of selling your own products?
    a. If yes: How much time do you spend?
    b. If you had to pay others to do it: What would the costs be?

Other (income):

49. Is farming your main income?
50. Do you engage in other income activities?
    a. If yes: Which?
    b. If yes: How big is the share of each activity?
51. How much is you total (gross) income?
52. Do you contribute to community activities (money, food, services, other)?
53. Do you participate in community meetings?
    a. Why?

Semi-structured interviews:

- SOIL: For people doing agriculture
    - Knowledge about the range of agricultural practices in the village
        - § What crops do you grow?
        - § Do you use fertilizer? What kind? How much?
        - § How much do you harvest per year?
        - § How big is your farm?
        - § Do you have farm machines? What kind?
    - Knowledge about perception of soil fertility
        - § how good is your soil?
        - § Do you think it is better now than before using organic / when you did monoculture?

- HISTORY: Everyone
    - Timeline and history what have changed before and after September 2018 (last year)
        - § What did you do to earn money before ecotourism?
        - § When did you change to what you do now?
        - § What are the reasons for doing X? What are the benefits to your family?

- PARTICIPATION: Everyone
    - Knowledge about villagers' participation in collective action governance
        - § Do you go to committee meetings? If so, who in the family goes?
        - § What is your role in the committee?
        - § What does the committee do?
        - § How is the meeting structured?
        - § How is a decision made? Who decide? How is it decided? (hand raise, anonymous)
    - Knowledge about the type of inducements and obstacles that occur in the participation process of households
        - § What is good about being in the committee?
        - § What is bad about being in the committee?

- CONFLICTS: Everyone
    - Knowledge about formal institutions
        - § What are some things that you cannot do because it is forbidden by the committee?
        - § What are some things that you cannot do because of the laws?
    - Knowledge about conflicts that occur
        - § Tell me about the last time you had a conflict with someone about things that you do in your establishment?

        - § Do other people break the rules?
    - Knowledge about how the conflicts are dealt with
        - § How are the situation dealt with? (Who decides, how decisions are made etc.)