

# THE EFFECTS OF TOURISM ON AGRICULTURAL SUSTAINABLE LIVELIHOODS

In Bukit Lawang and Timbang Jaya Indonesia



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## Foreword

This thesis is the second I write with a focus on the Indonesian context. I learned much about the country during the writing of my first thesis. For my bachelor's thesis I travelled to several areas, while for this one I stayed in Sumatra for two months, in the same spot. Therefore, for me it was very interesting to stay in one place for a longer period. I got the feeling that I could get a better understanding of this area and the culture. Besides the greatness of the country, it was very interesting to dive into what for me is the very new subject of tourism. It was interesting to learn some of its dynamics, but especially the great impact a new sector has on an area and how this is related to agriculture; an already existing sector in the area.

I was able to get this understanding of the area because I was able to stay at Maya and Darma's house for two months. They and Iya took really good care of me. This made my stay in Indonesia much better. Their children Mala, Ulan, Deva and Satia also gave me some great moments and it was great to be a part of this family for two months.

I would like to thank Darma and Wisnu for translating some of my interviews and bringing me in contact with many great people; without their help it would have been impossible to do my research. Additionally, I would like to thank all the guides, farmers, guesthouse owners/employees, nature conservationists and all the other people I could interview for my research in Timbang Lawang, Timbang Jaya and Bukit Lawang.

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## Summary

Tourism is, on an international level, often seen as a good way to stimulate the conservation of nature and to support the local community of an area. Bukit Lawang and Timbang Jaya are two villages closely located to the Gunung Leuser National Park (GLNP). Because of a rehabilitation program for orangutans established by the government in 1973, tourists are visiting the area to see the reintroduced orangutans in the wild. Before tourists came to the area, the local community was mainly working in agriculture, specifically on rice fields and rubber plantations. This case study was used to analyse the phenomenon of the effects of tourism on local agricultural livelihoods in Bukit Lawang and Timbang Jaya by applying the Sustainable Rural Livelihood Approach.

Currently, around 1,000—1,500 members of the local community work in tourism to facilitate the stay the international tourists plus the domestic tourists. In Timbang Jaya, Bukit Lawang and Timbang Lawang there are around 1,000 families. This means that, on average, one person of every family works in tourism, which indicates the big influence and presence of tourism in the area. Most of the other members of the community work in agriculture, in the palm oil plantation or in services for the local community, such as shops and restaurants.

The tourism around Bukit Lawang is still far from sustainable as it is now. The orangutans are still inappropriately fed by guides; garbage and waste water are dumped in the national park and in the river. Additionally, the level of illegal logging has not decreased as an effect of tourism. A couple of local, national and international NGOs try to interfere by protecting the forest and training the guides, but they only have been able to take certain small steps.

Besides the environmental aspects of sustainability, the social aspect has changed as well. The communities from Bukit Lawang and Timbang Jaya seem to be more divided then before. For many people who currently work in tourism, the reason to opt for this sector is that their income would increase. Partly this happened because the daily income is much higher, even if it is a lot more unstable and can only be earned during two months a year. Furthermore, the land and food prices have increased since tourists come to the area due to its higher population and increased demand. All those aspects combined effect the agricultural livelihoods in the area, and for most of the farmers it seems that maintaining their lives has become more difficult than before, because the people working in agriculture need to pay more for their food and to obtain more land. It has also become more difficult as the product of intranational forces, as the prices of commodities, especially rice and rubber, decreased over the last year. The Indonesian government is trying to support agricultural livelihoods by granting subsidies and creating farmer groups, but for the farmers this has not been enough support to improve their livelihoods.

In sum, tourism has developed in great numbers since the rehabilitation program started in 1973. This development has affected the members of the local community who work in the tourism sector partly positive, as more income is earned in the tourism sector. Yet, for people who maintained their agricultural livelihood strategy, the effect was not positive from all aspects, since land and food prices have increased, and commodity prices have decreased. People feel the culture in the area has changed and that they are less connected to other members of the community who work in tourism.

*Key Words: Sustainable Rural Livelihoods, Tourism, Agriculture, Bukit Lawang, Timbang Jaya, Gunung Leuser National Park*





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## List of Abbreviation

3Ps: People, Planet Profit  
 CBD: Convention on Biological Diversity  
 DFID: Department for International Development  
 FAO: Food and Agriculture Organisation  
 FZS: Frankfurt Zoological Society  
 GLNP: Gunung Leuser National Park  
 HPI: Himpunan Pramuwisata Indonesia  
 ISPO: Indonesian Sustainable Palm Oil  
 IUCN: International Union for Conservation of Nature  
 MRQ: Main Research Question  
 NFC: Nature for Change  
 NGO: Non-Governmental Organisation  
 NR: Natural Resource  
 OIC: Orangutan Information Centre  
 PPLH: Pusat Pendidikan Lingkungan Hidup / Centre of Environmental Education  
 PT.: Perseroan Terbatas  
 RSPO: Roundtable on Sustainable Palm Oil  
 RSQ: Research-Sub Question  
 SOCP: Sumatran Orangutan Conservation Programme  
 SRL: Sustainable Rural Livelihoods  
 TIES: The International Ecotourism Society  
 UNEP: United Nations Environment Programme  
 UNESCO: United Nations Education, Scientific and Cultural Organization  
 UNWTO: United Nations World Tourism Organization  
 WWF: World Wildlife Fund  
 YEL: Yayasan Ekosistem Lestari / Foundation of Sustainable Ecosystems

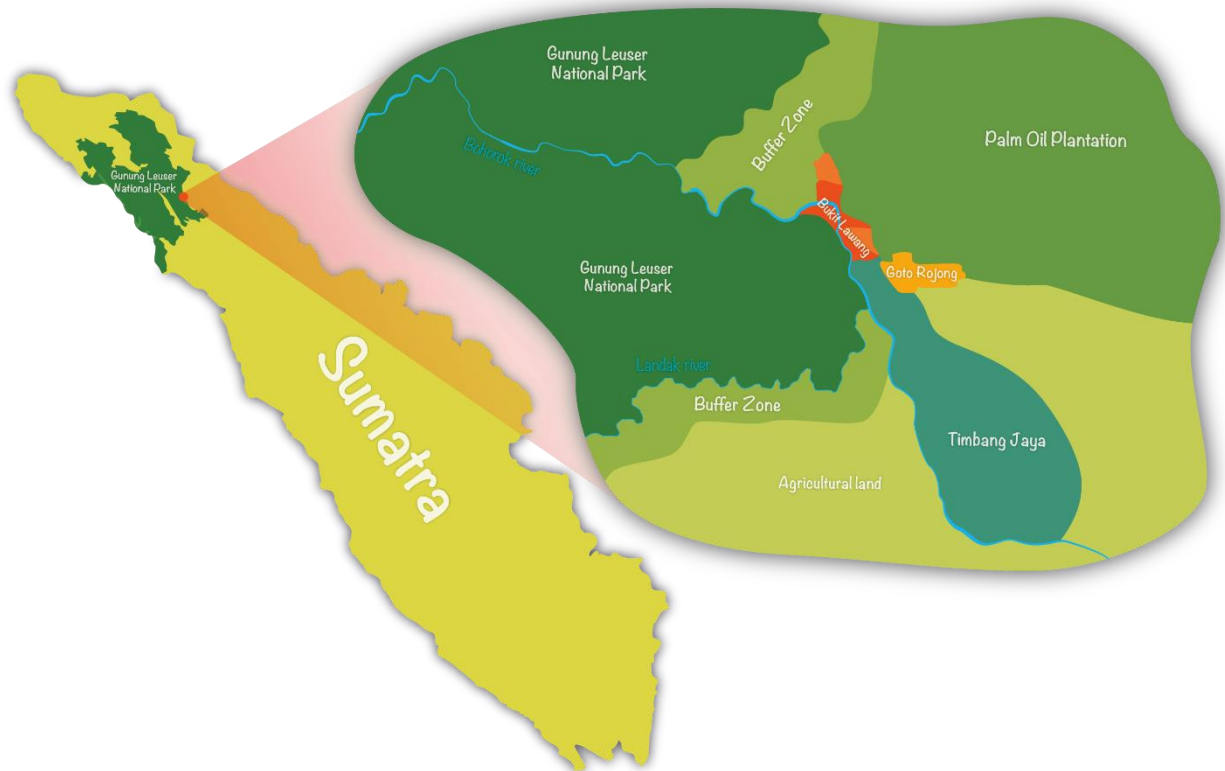
# 1 Introduction

Globally, tourism has been developing as a sustainable nature conservation strategy to protect the biodiversity of flora and fauna in protected areas. This has been done without investigating the effects on the livelihoods of the community living around national parks. Many nature conservationists assumed that tourism has a positive effect on the community, but this can vary between different regions and applications of tourism. Additionally, tourism can create tension within a specific community, either because land is taken for a new form of income, or because tourism attracts people from other areas and those people start to benefit from tourism instead of the local community (Hitchcock & Darma Putra, 2005).

This research specifically focusses on Bukit Lawang and Timbang Jaya, two villages located close to the Gunung Leuser National Park (GLNP) in Sumatra, Indonesia. Before 2002, Bukit Lawang and Timbang Jaya were still part of Timbang Lawan. In 2002, Bukit Lawang, Timbang Jaya and Timbang Lawan became three villages because of the increasing populations in the villages. For clarity purposes, in this research the areas are referred to with the names of the villages used in 2017 throughout this thesis (see **Error! Reference source not found.** for an illustration of the area). The Gunung Leuser National Park is a conservation area meant to protect its biodiversity, including the Sumatran Orangutan. Worldwide, there are only 14,613 Sumatran Orangutans left in the wild, and 90.2% of them live in Sumatra. In the GLNP, orangutans are threatened by illegal logging and, in the past, they were taken from the wild to give as presents to high ranking officials. As a result, a rehabilitation program started as part of the global nature conservation to re-establish Sumatran orangutans in the wild, specifically in the GLNP. The program started in 1973 in response to a request of the Indonesian government and it was supported by the World Wildlife Fund (WWF) and the Frankfurt Zoological Society (FZS) (Convention on Biological Diversity, United Nations Environment Programme & United Nations World Tourism Organization [CBD, UNEP & UNWTO], 2009).

While the program started as a program to protect the orangutans and their natural habitat, it became a big attraction for tourists. Currently, in the high season, 150 tourists go into the jungle daily to look at the semi-wild orangutans that previously lived in the rehabilitation program (Lonely Planet, 2017). The high number of tourists created a new livelihood strategy from which the local community of Bukit Lawang could earn an income. Guesthouses and restaurants were built in the area, and tours organised for the tourists. Now, between 1,000—1,500 people work in tourism. The question regarding how tourism affects the community beyond the increasing income remains, since tourism has a significant effect on land prices and population density. These two factors are currently threatening the longer existing livelihood strategy, namely agriculture (Van Beukering et al., 2003).

Agriculture is defined as the practice of farming through the cultivation of crops and rearing animals to produce food and other products (Oxford University Press, 2018). This means that agriculture includes the production of food, but also that of, for instance, palm oil and rubber. Agriculture has always been the main source of income around Bukit Lawang and Timbang Jaya; agricultural fields cover most of the land in the area. Within the agricultural sector, different crops are produced, such as palm oil, rubber, rice, chili, fruit trees and cacao (Nilsson et al. 2016). Oil palms covers most of the



**FIGURE 1: MAP OF THE AREA OF BUKIT LAWANG AND TIMBANG JAYA**

production land. This is mainly produced on land rented from the government by the Malaysian company PT. Langkat Nusantrara Kepong. According to R&D Director of PT. Langkat Nusantrara Kepong, the company leases 1,800 hectares of land around Bukit Lawang (Interviewee 29, Medan, Dec 21, 2017). The second biggest product manufactured from the area is rubber, yet the production levels of rubber are decreasing, because rubber is being replaced by palm oil. The third product is rice, which is more stable in terms of production. Around Bukit Lawang, vegetables are not grown widely because the climate is not suitable, while animal husbandry is relatively small-scale with a few chickens and cows roaming freely (Knoema, 2012).

Tourism and agricultural livelihood strategies are currently occurring alongside each other. Tourism is still rather new and is still developing. Thus, due to a lack of research, it is still unclear what effect tourism has on the local community. Only assumptions can be made based on other areas where agriculture was occurring alongside tourism. To fill this gap, this thesis researches the effects of the development of tourism, as an important component of global sustainable nature conservation strategies in the Gunung Leuser National Park, on the agricultural livelihoods in Bukit Lawang in Sumatra, Indonesia, since the rehabilitation program started in 1973.

This gap is researched by using the Sustainable Rural Livelihoods (SRL) approach as a theoretical framework for this thesis. SRL approach draws a picture of the livelihoods within a community and between different sectors. Thus, the SRL approach can indicate the difference between people working in tourism and people working in agriculture. The SRL approach first sketches a picture of the vulnerability context, as well as the problems and positive aspects of the area. Second, it looks at different forms of capital, which should help identify the physical, financial, natural, human and social capital people have. Third, the processes and structures influencing the livelihoods of the local

community are analysed. All those different influences and aspects of a livelihood result in the livelihood strategies, the decisions people make, which results, in the actual livelihood outcome (Carney, 1998).

To be able to gather information for this approach, several methods were used. Those included life histories, participant observations and interviews. Life histories were executed to get an idea of the development of tourism. Participant observation was done to get an impression of the area and how several people interact with each other. During participant observation, informal interviews were done with the people I came across in Bukit Lawang and Timbang Jaya. Semi-structured interviews were carried out with members of the village, people working in tourism, nature conservationist, small holder farmers, rubber producers and employees and owners of palm oil plantations. All those people were contacted via existing acquaintances and other contacts were made via snowball sampling.

This report is divided in nine chapters. Chapter 2 explains the theoretical framework used to analyse the results. Chapter 3 presents the methodology and describes how the results are gathered. Chapters 4 to 7 show the results gathered during the research. These chapters are divided based on the research questions mentioned in section 1.1.

## 1.1 Research Questions

The main research question (MRQ) for this research is:

How has the development of tourism, as an important component of sustainable nature conservation strategies, affected agricultural livelihoods in Bukit Lawang and Timbang Jaya, Sumatra, Indonesia, since the rehabilitation program started in 1973?

The research sub-questions (RSQs) are:

1. How have agricultural and tourism livelihoods developed since the rehabilitation program started in 1973?
2. How have global, national and local policies, structures and processes influenced the development of nature conservation, tourism and agriculture?
3. How does a diversified livelihood strategy of tourism and agriculture affect livelihood outcomes?
4. How has the development of tourism in Bukit Lawang affected the (environmental and social) sustainability of people's livelihoods?



## 2 Theoretical Framework

To answer the research questions mentioned in the previous chapter, the Sustainable Rural Livelihoods (SRL) approach is used. As Scoones (2015) states, the approach can help to structure one's thoughts but will not give a description of reality. Nevertheless, the SRL approach is very holistic and dynamic and acknowledges the complex interactions in rural livelihoods (Carney, 1998).

The most important concept of the SRL approach is sustainable livelihoods. To create a better understanding of sustainable livelihoods, sustainability and livelihoods are discussed separately. Later they are combined to see what this directs for the research. Sustainability is defined in many different forms, and how it should be defined depends on the situation (Brown et al. 1987).

To define sustainability in this case, the 3Ps are used: People, Planet and Profit. People include the employees and other people involved in a certain supply chain, or sector, such as tourism. The sector should not negatively affect people's social relations or wellbeing. Planet stands for the earth, the environment, which should be supported, and natural resources should only be used in a way that they are able to recover and not be depleted before they are used again. Profit stands for the money that can be made with a certain product. Most of people's decisions are based on the reasoning that they want to survive. To do so, they must earn an income. Thus, a sector can only be sustainable when an income is created. Money, but also social relations and a stable environment, can help people in general to better recover and be protected for shocks. The 3Ps are sometimes hard to combine and balance because they can have a negative force on each other, but they are well fitting for the conceptualities of ecotourism (Hall, 2011).

The International Ecotourism Society (TIES) (2015) defines ecotourism as "responsible travel to natural areas that conserves the environment, sustains the well-being of local people, and involves interpretation and education [for staff and guests]". In the case of Bukit Lawang, many members of the local community call the tourism in the area ecotourism, even though there are many environmental and social unsustainable practices. Therefore, what occurs in Bukit Lawang should be referred to as tourism instead of ecotourism, but the 3Ps are still a good example of the needs to develop towards ecotourism, which ought to consider a combination of the 3 aspects.

A livelihood consists of the competence, assets —social and material — and activities required to make a living for a person. This means that a livelihood contains all the parts of life people come across. It includes the decisions people make, also called their strategies, which are based on previous decisions, due to the current social and material status (or assists), including their own skills and the influences of their surrounding (Chambers & Conway, 1992; Scoones, 2015). For instance, in Bukit Lawang, due to the growth of the tourism sector more jobs were created, but not everybody started working in tourism. This could maybe be attributed to a lack of English language skills or to the fact that people are not willing to give up their land for a new, possibly unstable sector.

When sustainability and livelihoods are combined, a sustainable livelihood can be defined as "the competences, assets and activities needed to make a living including that it should sustain environmentally and socially" (Chambers & Conway, 1992). This means that natural resources are sustainably reserved, and livelihoods are more resilient to stresses and shocks. Seen from the social side, sustainable livelihoods focus on the working days, level of poverty, the wellbeing and capabilities of people (Scoones, 2015; Carney, 1998). The understanding of sustainable livelihood is important to begin understanding the importance of the SRL approach.

The SRL approach consists of several parts: the vulnerability context, the capital assets, the transforming structures and processes, and the livelihood strategies which results in the livelihood outcomes. A visualization of the sustainable rural livelihoods approach can be seen in Figure 2 (Carney, 1998).

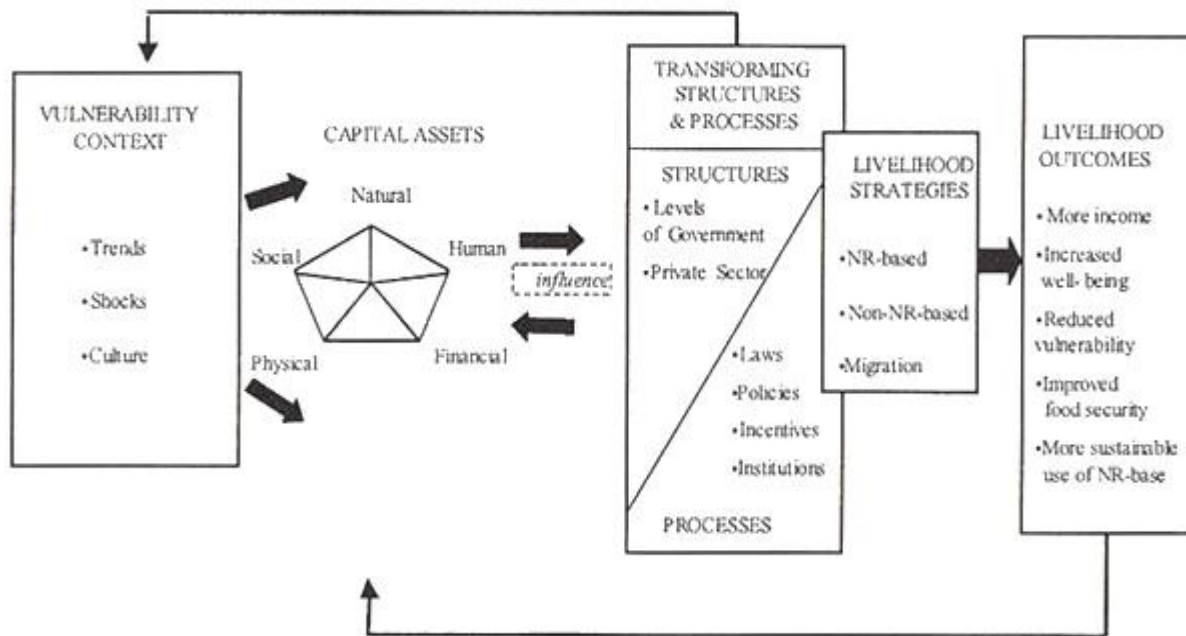


FIGURE 2: SUSTAINABLE RURAL LIVELIHOODS APPROACH (CARNEY, 1998)

The first part of the SRL approach is the vulnerability context. The vulnerability context gives an impression of the surroundings of a specific livelihood. It tries to draw a picture of the trends, shocks and culture of a livelihood. This is important to get a first understanding of the general external influences on people’s personal livelihoods. These trends relate to population density, resource stock, technology, politics and economics. Politics are included, but not the structures and processes around it as those are discussed in the third part of the SRL approach. Since all the elements of the approach are interacting with each other, the processes and structures are still important to keep in mind while looking at the vulnerability context. Those aspects are further discussed in the third part of the SRL approach. The culture looks at the effect a culture has on how people manage their livelihoods. Shocks focus on climate and conflicts that are civil or resource based. In the case of Bukit Lawang, the most important shock are the flush floods in 2003. This destroyed the whole tourism sector and the irrigation system for farming for several years. Experts say that those flush floods were a result of illegal logging in the forest (Nilsson, et al., 2016). This first part of the model gives structure to chapter 4, answering RSQ 1, because this chapter presents an overview of the surrounding environment and of how this has developed since 1973.

The second part is the capital assets. The capital assets consist of five aspects: human-, social-, natural-, physical- and financial capital. First, human capital focusses on how far somebody can go due to their health status, knowledge, skills and ability to work. People’s human capital influences their persuasive power that people need to steer towards a livelihood strategy they are aiming for. In the case of a livelihood focussing on agriculture, an important aspect of human capital can be knowledge about pest control. Second, social capital investigates the networks people have within a community, the social groups — such as religious communities— but also the access to wider



institutions. In the case of tourism, social relations seem to be less important than in farming, because in tourism people seem to act more individualistically (Carney, 1998). Other dynamics related to social capital are further discussed in the part of structures and processes of the SRL approach as the structures and processes focus at the different organisms and their influences on the area (Scoones, 2005). Third, natural capital is about the natural resource availability and pollution, such as water (Carney, 1998). In the case of Bukit Lawang, especially the availability of water seems to be a problem. In Bukit Lawang and Timbang Jaya, the need of water increased due to the developments in agriculture and tourism, and especially with the increasing number of oil palms. This resulted in an increased demand for water, which brings problems because the availability did not increase over the years: rainfall seemed to have stayed quite stable in Indonesia since 1991 (World Bank, 2017). Therefore, the natural capital of Bukit Lawang may have decreased since the tourists came to the area, but not mainly due to tourism as the agricultural sector also had some influences on it (Hamada et al., 2002). Fourth, physical capital focusses on the infrastructure of an area, its production equipment and means. In the case of Bukit Lawang these are, for example, improved roads due to a government program (The Jakarta Post, 2018). Fifth, financial capital includes the assets related to money, such as personal savings, supply of credit, pension or remittances. For farmers this can be savings with which they might need to buy seeds for the next season. Those assets combined help to create power and the capability to act, and do not only create a living for people (Bebbington, 1999). Therefore, the capitals are defined in a holistic way instead of sectorial, because all those capitals together form the access people gain, for example, for resources via their social network, and cannot only be defined in money or as a number. The capitals are used throughout the report, as they influence all the different parts of the SRL approach.

The third part of the SRL approach are the transforming structures and processes. The transforming structures focus on the “players”, meaning the levels of government, the private sector and organisations (North, 1990; Carney, 1998). Here, according to the governance triangle, the structure of the community and third party should be included. They stay separate from the state and private sector and can influence the two parties greatly, as well as, the livelihood strategies and outcomes. The governance triangle looks at the specific “players” in the government, community, third sector and the market, and investigates the interactions between them: “the rules of the game” (North, 1990). The government is seen as the different governmental organisations on a local and national level. The community consists of the individual people living in a certain region. The third party consist of non-profit organisations which support the community or natural habitats, such as the nature conservation organisation active in Bukit Lawang. The market is for profit organisations which are not connected to the government. The governance triangle defines farmers as members of the market and of the community. An illustration of the governance triangle is presented in Figure 3 (Avelino & Wittmayer, 2015).

The SRL approach and the governance triangle are combined, as the processes are the “rules of the game”. The law, policies, incentives and institutions, within the SRL approach refer to the formal and informal rules— both the informal and formal “rules” are important to consider when livelihoods are observed (North, 1990). As can already be seen with the arrows in Figure 2, the structures and processes have much influence on the vulnerability context, and the capitals and processes influence each other. The structures and processes and the governance triangle will structure chapter 5 and answer RSQ 2, as this question deals with the influences of different organisms on the tourism and agricultural sector.

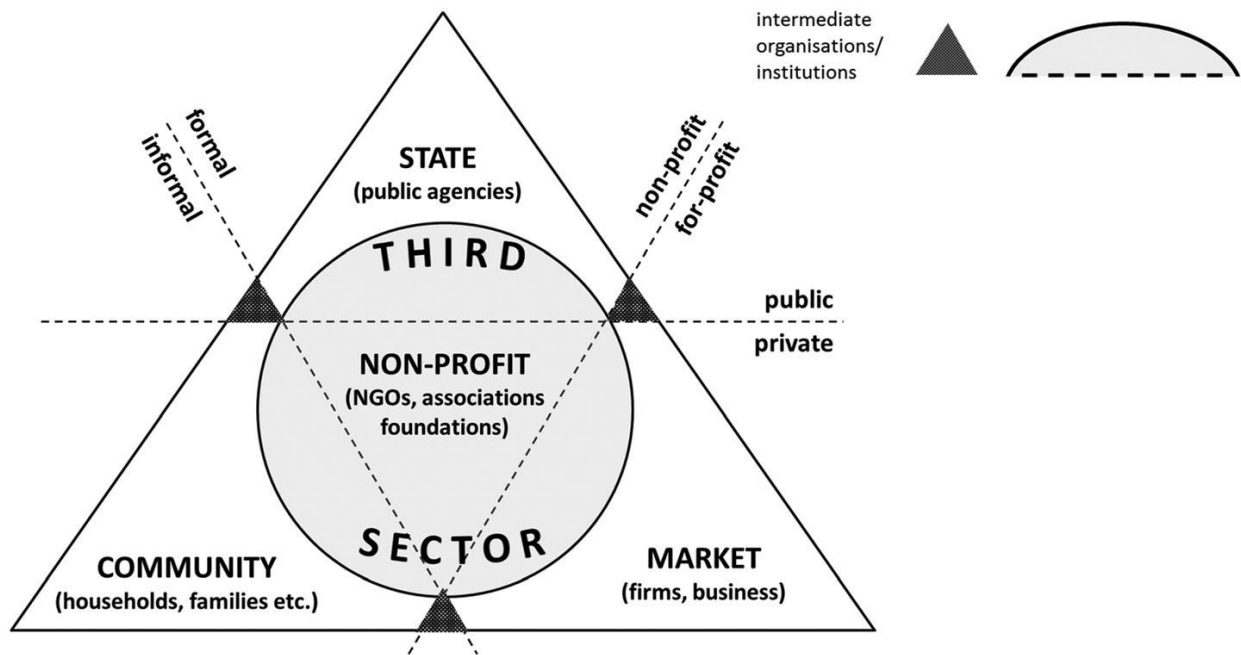


FIGURE 3: GOVERNANCE TRIANGLE (AVELINO & WITTMAYER, 2015)

The fourth part of the SRL approach are the livelihood strategies. Those livelihood strategies result from all the previous parts combined. The livelihood strategies are the different options for a strategy people have and what they eventually decide to do. The livelihood strategies can be Natural Resource (NR) based, Non-NR based and migration. In the case of Bukit Lawang, due to the increase in tourism, more members of the local community were able to shift towards a tourism-based livelihood strategy, and with this they could change their livelihood strategy, which is still NR-based, or it sifted towards a non-NR based livelihood strategy, depending on the job executed in tourism.

Choosing a livelihood strategy will give a certain livelihood outcome. The SRL approach defines five different aspects of a livelihood outcome: More income, Reduced vulnerability, Increased food security, Increased wellbeing and More sustainable use of natural resource base. More income focuses on an increased income based on the choices people make or decide not to make. Increased food security is related to the food security in the area. During the world food summit (1996) it was defined that “Food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life”. This definition is further developed by the Food and Agriculture Organisation (FAO), which considers this definition in four dimensions: availability, access, utilization and stability (Napoli, 2011). Reduced vulnerability is related to the vulnerability context and to how well people are protected and can react to shocks and trends. Increased wellbeing is related to the wellbeing of people living in the area that choose a specific livelihood strategy. Wellbeing is defined in many ways. Gregor (2008) argues that “Wellbeing is a state of being with others, which arises where human needs are met, where one can act meaningfully to pursue one's goals, and where one can enjoy a satisfactory quality of life”. From this perspective Armitage et al. (2012) defined wellbeing as a combination of material, relational and subjective components, and how those aspects together improve people’s wellbeing. More sustainable use of NR-based outcome in the SRL approach is only related to the environment, but as the social aspect of sustainability has a great influence on the sustainability of the framework— it should also be considered. Income as another aspect of

sustainability. This is discussed in the livelihood outcome more income. In the case of Bukit Lawang, tourism is thought to imply a more sustainable use of natural resources than agricultural practices; it is also assumed that it could help to increase income, but whether this is the case will be explained by answering RSQ 3 and 4, with the help of this part of the framework. RSQ 3, discussed in chapter 6, will be structured according to the different livelihood outcomes. RSQ 4, discussed in chapter 7, will be analysed based on more sustainable uses of NR-based resources and social sustainability. These aspects of sustainability are discussed in a separate chapter because of its great importance in defining whether tourism in the area can be called ecotourism and whether tourism is helping GLNP to be conserved.



### 3 Methodology

Different methods were used during fieldwork to answer the MRQ and the RSQs. The field work was carried out between October 24, 2017 and December 22, 2017 in the form of an ethnographic case study. An ethnographic case study focusses on one small area to create a better understanding of the interactions and differences between several groups of the community, but also to see how the changes occurring in the area are received by the community — in this case the community of Bukit Lawang and Timbang Jaya (Bernard, 2011; Vaus; 2001). For my research, an ethnographic approach was helpful, because I wanted to know how people reacted to tourism or whether they preferred agriculture and how those sectors relate to one another.

To execute this ethnographic case study, I used different methods during my fieldwork. I held life histories, semi-structured interviews, participant observations and informal interviews with male and females of working age living in Bukit Lawang and Timbang Jaya. Table 1 shows the people who were interviewed during the research.

Interviewees		Male	Female
<b>Elders</b>		4	0
<b>Governmental bodies</b>		2	0
<b>Nature conservationists</b>		3	6
<b>Rangers</b>		4	0
<b>Traditional jobs</b>	Farmer or mixed job and farming as main job	7	3
	Palm oil plantation	5	1
	Non-agricultural job or mixed with farming as side job	3	2
<b>Tourism</b>	(Assistant) Guide	8	0
	Guest house/travel agent	5	1
	Other jobs in tourism	6	1
	Mixed jobs combined with farming	4	0
	Tourists	3	1
<b>Total</b>		54	15

TABLE 1: PEOPLE FORMALLY INTERVIEWED IN BUKIT LAWANG AND TIMBANG JAYA

Life histories are applied to talk to people to hear what happened during their life. This can be related to a specific topic and how this developed in an area. For this research the focus period was the years between 1968 and 2017. This was so to have a panorama of the area five years before the rehabilitation program started, and to see how the area has changed due to the program (CBD, UNEP & UNWTO, 2009). Firstly, a specific landmark per 5-year period was asked during the interviews. A landmark is an important life changing event or something that defines that period for the interviewee. A 5-year period was chosen because the process of tourism is rather slow and due to the time constraints of the research. These life histories focussed on elders living in Bukit Lawang and Timbang Jaya, since they can explain how their lives were influenced by the establishment of GLNP and the growing tourism sector. Thus, the elders helped to answer RSQ 1 by telling what happened in the area based on their life experience (Bernard, 2012; Bernard, 2011).

The second method used was semi-structured interviews. These are interviews in which the line of questioning is set, but the questions and their order can vary between the different interviews. During the research period questions were added or changed based on the information gathered.

Semi-structured interviews were held with people with different backgrounds and people working in different sectors. These included people working as nature conservationists, people in the tourism- and the agriculture sectors, people from the government and rangers. The questions were adapted to the jobs of the interviewees. The questions were developed to be open, non-leading and as unbiased as possible. These interviews helped to answer RSQ 1 until 4, because the semi-structured interviews were the main source of information of this research.

The third method used for this research was participant observation in combination with informal unstructured interviews. Participant observation focusses on analysing an area by going there and looking at what happens and what people do. Ideally, the researcher also participates in the activities. During this field work, observations were done in Bukit Lawang, Timbang Jaya and in GLNP. At the beginning of the research, participant observation helped me to construct a better picture of the area and, at the end, to compare the answers given during the semi-structured interviews with what I saw happening in the area. All the information gathered with participant observation and the informal unstructured interviews was kept in a diary. This helped to get a complete overview of the area and to connect certain loose ends (Bernard, 2012). The combination of those two methods helped to answer RSQ 3 and 4, and supplemented the data gathered during the semi-structured interviews. Those two additional methods were needed besides the semi-structured interviews to triangulate with the purpose of verifying whether the aspects described were also observed in the field.

Different persons in different fields were interviewed to hear their story (as shown in Table 1), but more importantly to compare the different views depending on people's backgrounds. Additionally, in the same field, more people were interviewed to create a broad picture, but also to triangulate information. This was also done through different methods, such as participant observation and semi-structured interviews. This was particularly important, for example, to witness the practices of the guides. Most of the guides said that there was no feeding involved, or only with specific orangutans, although I saw it happening several times, with multiple orangutans, when I was in the jungle.

All the data combined is analysed with the SRL approach, which is explained in the previous theoretical framework chapter. As stated before, the research questions are based on the SRL approach and, therefore, also the data gathered is based on this approach. The different elements of the framework help to analyse the data related to the RSQs of the research.

### 3.1 Limitations

The methods applied during the research period have some limitations. First, the life histories require people to focus on their history, but these people often forget details and no longer know the specific timeframe. To overcome these setbacks, four elders were interviewed to compare and align the information obtained. In case this did not solve the problem of conflicting information, the information was compared with data found via a desk study or with other interviews, such as the semi-structured interviews (Bernard, 2012). Second, participant observation can lead to the researcher's interpreting the observed behaviour in terms of their own cultural background — in my case, a Dutch background. This could bring problems about, because I am used to different habits and ways of action which can affect my view of an area by misinterpreting actions. Thus, during the research, I tried to stay open minded, talk to people to understand their view on things occurring in

the village, and I held interviews to get more clarity and attune my own parameters of interpretation. Third, during the life histories, semi-structured interviews and unstructured interviews, it could have happened that people wanted to give the “right” answer, which can result in a biased answer. This is always a difficulty when doing research, so it is considered during the analysis (Bernard, 2012). I was especially afraid that biased answers would influence my interviews with palm oil employees, due to their job obligations. During the field work, this did not seem to be the case, because the employees seemed to be very open regarding the positive and negative sides of the palm oil plantations and their work. Fourth, bias could also have arisen because I was living with a ranger during my fieldwork. This ranger has his own Non-Governmental Organisation (NGO) and has his own views on the research area. Another limitation I faced during my research was the language gap. I do not speak Bahasa Indonesia. Thus, I needed a translator during part of my interviews, which increases the chance on misinterpretation due to the translation filter in between. I learned some Bahasa Indonesia. Therefore, I sometimes asked some questions in different forms to check the answers given to previous questions and see if they were translated correctly and if I understood them correctly. In addition, I explained to the translator what the research was about and how these specific questions were important for the research. It helped that only two translators were involved with the research and therefore they got a better idea of the research done. Since a translator was used during field research, some of the quotes used in this report are translated and modified with first-person pronouns. Lastly, my being a woman might have influenced some answers. This is because I noticed that Indonesian women were treated differently and sometimes with less regard than Indonesian men. A helpful aspect was that my translators were men, which might have made the people interviewed to listen with a different attitude to what I was asking. Another gender issue was related to my being a white female. In the area there are many cross-cultural marriages with white women in Bukit Lawang. I had the feeling this was the reason why some of the interviewees tried to impress me during the interviews, which could have influenced their answer. Overall, all the different limitations were considered during the research to minimize them as much as possible.





## 4 The Agricultural Livelihood Setting Before and After the Rehabilitation Program Started in 1973

This chapter focuses on the development of the area before the orangutan rehabilitation program started in 1973, and on how it developed until now — specifically focusing on tourism and agriculture. First, the state of the area before the rehabilitation program started is described followed by the general area development, tourism development and agricultural development in Bukit Lawang and Timbang Jaya. This chapter focusses on the shocks, trends and culture within the area, because this should give a description on the context of the area that influenced the livelihoods of the local community.

### 4.1 Aspects of the Area Before the Rehabilitation Program Started

Before the rehabilitation program started there were many plantations in and around Bukit Lawang. Those plantations were developed by the Dutch during the colonization and taken over by the government afterwards. During the colonization, Indonesian inhabitants from Java were brought to the area to start working on the plantations. This is important to know because, according to a member of Sumatran Orangutan Conservation Programme (SOCP), people are less connected to the land because they are not native to the area. Around 1965, the government was turning secondary forests into plantations to produce rubber and cacao. Additionally, the local community started to clear the land outside the border of the national park, also called the buffer zone, for agriculture. In the first instance, the land was owned by the government, but Suharto, a military leader and the second president of Indonesia, decided to give certificates to the local community with the intention of giving it back to whomever it belonged.

### 4.2 Environmental Surrounding Influencing Developments in the Area

The environmental surroundings have changed in many ways after the rehabilitation program started in 1973. The first important component of the area is the national park, which has a big influence on the local community's livelihoods. As said before, GLNP was a protected area established by the Dutch, but it officially became a national park around 1980 (IUCN, 2010). This means that it is no longer allowed to clear forest land and poach animals, which for members of the local community was a major source of income. Due to the forces of the government, the logging factory was closed, and the level of logging decreased, but according to one of the local NGO owners in the area, this was mainly as result of international pressure. For many farmers in the area the border of GNLP was not very visible. Between 1980 and 1986 the borders were cleared from their original vegetation for the first time, and at the end of 2017 this was done for the second time. It seems that the government wants to demonstrate how important the national park is for them and that it should be protected.

The second important development in the region is the rehabilitation program for orangutans that started in 1973. The rehabilitation program was located here because the government wanted a rehabilitation program on both sides of the national park and one that was close to Medan. This is the case for Bukit Lawang. Additionally, during the period of the project, the Ministry of Forestry and Environment of the Indonesian government helped WWF and FSZ to recuperate the orangutans from the houses where they were kept by high officials. In total 223 orangutans were reintroduced to the wild. In 1980 the rehabilitation program was taken over by the Indonesian government: WWF

and FSZ needed to leave the area. According to an employee of Orangutan Information Centre (OIC), the program was completely shut down because the semi-wild orangutans were too close to the wild orangutans in 1996. One of the rangers said: “We started with the feeding of the orangutans without any support of the government, but we were supported by the community with donations” (Interviewee 14, Timbang Lawang, Dec. 12, 2017).

The rangers stopped feeding the orangutans in 2015 due to the pressure exerted by organisations such as OIC. Dellatore (2007) did a research on how many times guides called the orangutans to attract them for the tourists. He did this research between the end of May and the end of July 2007, which is partly in the high season of tourism. His research showed that there were on average 72-79 lure calls a day by guides, even though most of the guides and rangers who were interviewed said that the orangutans were fed by rangers and not by guides between 1996 and 2015. Those same interviewees said that from 2015 onwards the guides changed their strategy and started with feeding the orangutans to attract tourists. Nevertheless, the research of Dellatore shows that the feeding was already happening before 2015. This feeding done by the guides can create dangerous situation for humans, but it can also infect orangutans with human diseases and increase the mortality rate of the orangutans around Bukit Lawang (Dhumieres, 2014). Overall, the local community was not involved in the rehabilitation program and therefore could not benefit from it or adapt their livelihood strategies either in the first instance. Members of the local community, starting with the rangers, who wanted to get involved started to change their livelihood strategy when they saw white people who wanted to spend money to see the orangutans coming to the area.

The third important shock in the region was the economic crisis of 1998 (World Bank, 2018a). The crisis started because international investors lost their faith in Suharto. The roepiah dropped and the inflation of food products started (Leuz & Oberhilder-Gee, 2006). Products became more expensive and less money was earned when products were sold. This affected the livelihoods of local people greatly — both people working the agricultural- and tourism sectors.

The fourth important shock of the area was the flash floods that occurred on November 2, 2003. This shock had a big effect on the area and it showed its low resilience to natural shock. Bukit Lawang village is located very close to the river, as well as the irrigation system bringing water to the rest of the area. The flash floods only took 25 minutes and killed over 380 people, members of the community and tourists; they destroyed the tourism sector and the only irrigation system of the area. Several people in the area, including rangers and people from NGOs, stated that the flash floods were due to illegal logging. After the flood, the Indonesian government supported the area with emergency supplies. Later, the government rebuilt houses which were destroyed during the flood in a safe place where the water could not reach. After the flash floods, the area was closed for tourists by the government for eight months to give the people time to recover from this great shock. The collapse of the tourism and the problems in the agricultural sector after the flash floods demonstrated that the area is very sensitive to shocks which are created by the river. The area was not able to recover fast from this shock. Some people left the area, while others changed their type of food production and others started to work with the wood which came with the flood. The local community started to adapt their livelihood strategies to the new context in the area, but also many members of the community did not have a house or access to food. For many of them it was a hard time to survive.

The fifth trend arose after the flash floods: the area started to develop in relation to technology; phones became available, the amount of internet cafés started to increase, and phone reception is improving. Those developments are not initiated by tourism or agriculture, but these have an influence on how people work in those sectors. Thus, the development of technology influences their livelihood strategy at the end.

### 4.3 The Growth and Decrease of the Tourism Sector

The tourism in the area started two years after the rehabilitation program began. In the beginning, only a group of 20 people came once a week. From 1980 onwards, the government allowed tourists to come, even though they already came to see the orangutans. Additionally, the government themselves built their campsite in 1979 — one year before their own rules were implemented. Guesthouses have been constructed since the mid-1980s, and from 1990 onwards, more guesthouses were built.

Some of the guesthouses were built on land of the government without a permit. This indicates that the rules of the government are not always obeyed by the local community. Other pieces of land were mainly owned by people who moved to Bukit Lawang to work on the plantation. When the land was bought from them, they bought cheaper land in Timbang Jaya or Timbang Lawang. According to a member of SOCP, people were easily bought out because they were not very connected to their land. Old inhabitants were moving away from Bukit Lawang because the land became too expensive, while other people from other areas in North Sumatra moved to Bukit Lawang because they saw a new livelihood opportunity. This trend is still occurring in the area, where some inhabitants move away for Bukit Lawang while others from further away move into the area to find a better job. Farmers started to work in tourism as a side job around 1996. This indicates that those farmers still wanted to have a back-up in case something went wrong within the tourism sector. Therefore, they were more resilient than the people who currently work in tourism are without a back-up plan.

That it was sometimes good that the farmers did not only focus on tourism was shown over time. This transpired, firstly, due to the seasonal dependency. Most of the tourists come to the area only 2-3 months a year, which makes it hard for people who work in tourism to find an income for the rest of the year if they only focus on tourism (Champion Traveller, 2018). Secondly, jobs change and disappear depending on developments in the fast-changing tourism sector. For instance, a current cook in the jungle told me he had been a kayak driver for people to cross the river around 1979, but when bridges were built he needed to find a new job. Third, the number of tourists who visit the area is influenced by the country's stability. In 1998, an Asian economic crisis started which caused social unrest and political instability in Indonesia (Wirajuda, 2010). Therefore, the Ministries of Foreign Affairs of several countries, including the Netherlands, advised tourists not to visit Bukit Lawang. Still, local tourists came to the area, but their numbers were lower, and they only stayed for one day or with 10 people in one room; thus, they spent less money than international tourists and, therefore, many jobs disappeared (Dellatore, 2007).

In October 2003 there were around 42-45 guesthouses. With the flash floods, almost all the guesthouses were destroyed, and the tourism sector did not exist anymore because the government closed the area until 2005. It took five years before everything was rebuilt in the area. Therefore, many livelihood opportunities were lost because of this shock. Currently, the number of tourists is

almost the same as before the flash floods in 2003. The number of tourists is still increasing. Domestic tourists mainly come on Sundays. This can be up to 1,000 domestic tourists a week. Most of the domestic tourists do not go into the jungle and do not stay for the night. US\$1 million is earned with tourism yearly. The biggest part of the income originates from international tourists. In the high season, 100-150 people, mainly international, go into the jungle a day, even though only 50 tourists a day are allowed according to the rules set by the government in 1980. The high number of tourists entering the park affects the natural habitat and health of the orangutans. Probably due to this and the feeding, there is a very high mortality rate of orangutans in the area, which will in the end affect the tourism sector greatly (Dhumieres, 2014).

Currently there are different jobs in tourism, especially local people who work as waitresses, guides, in guesthouses, in restaurants and as drivers. Restaurants, guesthouses and travel agencies are often combined. There are 40 guesthouses, with 350-450 rooms. All jobs combined, around 1,000-1,500 people work in tourism. Bearing in mind that there are around 1,000 families in the region of Timbang Lawang area, which includes Bukit Lawang, Timbang Jaya and Timbang Lawang village these figures would imply that on average one person per family works in tourism. In turn, especially guides often do not have a family yet, as they are still young or prefer a free lifestyle as a guide. The guesthouses are owned by local people or cross-cultural couples. Around 50% to 60% of the guesthouses are owned by cross-cultural marriages. Cross-cultural marriages are marriages between an international person, often a woman, who moves to Bukit Lawang and marries a local person, often a man. Most of the international owners do not work in the guesthouses anymore. They live in other areas or moved back home, and their local partners work still in the guesthouses. The big increase in cross-cultural marriages indicates the increase in international infiltration, which can affect the culture within the area and diminish the positive effects of tourism for the local community.

Tourism in the area is still developing. A canopy trail is developed by the government and was about to open by the end 2017. This canopy trail should make it easier for tourists to see the nature and the orangutans. Some rangers are against it because it can create dangerous situations with the orangutans. As seen with the dropping number of tourists after the economic crisis of 1998, the tourists' perception towards the area is very important, especially considering the resilience and development of the tourism sector. Therefore, this new canopy trail could influence the tourism sector greatly and effect the sustainability of the livelihoods for people working in tourism.

#### 4.4 Agricultural Developments and Changes

Lastly, the agricultural sector has been through several developments since the rehabilitation program started. The first shock affecting the agricultural sector was the flash floods destroying the irrigation system in 1975. These floods were not as disastrous as the floods in 2003, because there were no houses in the river banks and only some fruit, bamboo and wood trees, which can also keep the water from flooding.

Around 1973, rice, fish, vegetables and corn were produced. In the first instance, rice was only produced once a year, but technologies improved. After some time, rice could be produced twice a year and currently even three times a year. In the time the farmers were producing rice two times a year, they had a period of legumes and vegetables between their crops to give the soil time to recover. In 2003, after the flash floods destroyed the irrigation system, some farmers changed their

production from rice to rubber, because they lacked access to water and some said it took the government two years to rebuild the irrigation system; others said it took 10 years, and still some pieces are not rebuilt.

Additionally to rice, other products are produced around Bukit Lawang and Timbang Jaya including cacao, rubber and palm oil. Cacao and rubber were mainly produced in the past, but the production decreased after the commodity prices dropped (World Bank, 2018b). The rubber prices dropped from Rp15.000 to Rp7.000 per kg in 2009. According to one of the elders, this was because the United States of America switching to synthetic rubber and the Chinese started to buy the product. After the switch from cacao to rubber, many plantations started producing palm oil after 2009. Currently, farmers earn the same income with palm oil as with rubber per hectare, but they spend fewer labour hours. Therefore, the extra time can be used to execute another job. For instance, a palm oil producer started to sell herbal teas, which increased his income per month rapidly. As a result, his income is more diverse and should make him more resistant to shocks.

Apart from the privately-owned plantations there are the plantations of the government. When the government managed the plantations they were supplying food, housing and salary to the employees. Over time, the extras, such as food, became less and less. At one point the government did not have enough capital anymore to manage the land, and they started to rent the plantation to PT. Langkat Nusantrara Kepong, a Malaysian company, in 2012. The plantations were totally turned around; new employees were hired and the yield per hectare increased and continues to increase. The basic salary remained the same, but the employees get paid extra based on their performance. Therefore, now the employees earn more because the production increased. The houses built by the government are decreasing in quality, and the company will not rebuild those houses, the company does not give food to their employees and the employees are less certain of their contract, which is reviewed yearly as the health status of the employees is important to execute their job. This would in the first instance sound as a non-sustainable livelihood strategy, but many people want to work on the plantation. One of the palm oil plantation employees said: "I work on the plantation, so I have a stable income to support my family, which I did not have when I was I guide" (Interviewee 31, Bukit Lawang, Nov 6, 2017). Therefore, for the palm oil employees the physical capital and human capital seems to be decreasing while their financial capital has improved. Thus, for many people this is a safe choice with a good income. The employees have the feeling they are more income secure if they choose for palm oil and this choice affects their livelihood outcome.

Currently there is rice, palm oil, rubber, cacao and fruit production, and cat fish, cow, goat and buffalo rearing. The products are sold to the middlemen, on the market of Bukit Lawang, or directly to tourists. Cacao and rubber are becoming more of a side job due to the decrease of the commodity price. Fruit trees are mainly planted next to the house, or on bigger plots of land, in the case of durians. Fruit trees, especially durians, are attractive for production due to their great economic value. Currently, the animals from the forest, who are more used to human presence, are threatening the fruit production, which in turn threatens the stability of the farmers' financial capital.



## 5 The Influences of Global and National Policies, Structures and Processes on the Development of Nature Conservation, Tourism and Agriculture

This chapter focusses on the influences of national and international organizations, institutions and the community on the livelihood assets and livelihood strategies of the citizens of Bukit Lawang and Timbang Jaya. Specifically, it deals with what effect these organisms have on nature conservation, tourism and agriculture.

### 5.1 Involvement and Influences of the State on the Area

The first part of the governance triangle is the government (Avelino & Wittmayer, 2015). The Indonesian government has a strong role which influences the strategies that the members of the local community choose to take. The government is active in different layers of the nation. In Bukit Lawang, the national government had a certain degree of influence, but could have had more had they have a stronger presence in the area, according to employees of the Sumatran Orangutan Conservation Programme (SOCP). In 1980 rules related to tourism were set by the government; those rules are not followed. In 2009 United Nations Education, Scientific and Cultural Organization (UNESCO) set more rules to build ecotourism, but these rules are also not enforced in the national park either (United Nations Education, Scientific and Cultural Organization [UNESCO], 2009). As a result, in GLNP there is much animal feeding, and too many tourists and guides go into GLNP, which results in orangutans that are aggressive towards humans. This aggressiveness can besmirch the good name of Bukit Lawang among tourists. When this happens, less tourists will come. Therefore, in the case of Bukit Lawang, it seems that the processes are in place to develop ecotourism, but the structurers are not in place to enforce those processes. If the low enforcement of the law continues, the resilience and sustainability of tourism as a livelihood strategy can decrease.

To enforce the law around Bukit Lawang, there are 40 rangers who patrol inside GLNP and control the borders of GLNP. The rangers are from two different agencies, both of which have a different role in relation to the park. One of the ranger groups works inside the park while the other ranger group works outside of it. These two groups of rangers do not work together, which affects their ability to enforce the national park's rules. According to an employee of Orangutan Information Centre (OIC), it would be of great help if the agencies started to work together instead of counteracting each other's efforts. Many guides enter the park via side roads to avoid the park entrance and, with that, the rangers, to avoid buying a permit. When the rangers see a guide inside the park without a permit, the guides get the opportunity to buy the permit without a fee. The rangers are not supported by law to impose a fee when they find guides who do not follow the law, because only the Indonesian Ministry of Tourism has this power. Another problem the rangers face when enforcing the law on guides is that most people in the area are known to each other and they are each other's friends. This makes it difficult for the rangers to impose a fee or a higher punishment on the guides, even if the rangers are supported by law. Therefore, for the ranger the informal and formal processes are not in place to manage the tourism sector. People of several NGOs said that not enough rangers are present in the area, but when I was in the village I regularly saw the rangers of GLNP drinking coffee, waiting for a job, or early at home, because there was no work for them to execute. Moreover, both times I went into the national park I did not see any rangers at the border or inside the national park. According to SOCP and OIC, the rangers should

focus on reacting to conflicts with orangutans, enforcing the rules on people going into the park and supervising the guides and other actors in the tourism entering GLNP. The rangers mainly enforce the first two parts of this job description and are not able to ensure ecotourism, which would support the orangutans, the park and its surrounding. Therefore, in Bukit Lawang the processes and structures are actually not well placed to enforce ecotourism and develop a more sustainable livelihood outcome.

Several people working in tourism were complaining that the money that is earned by selling the permits to enter GLNP is sent back to Jakarta and is not returned to Bukit Lawang or GLNP. Some of those respondents said this money should be spent differently, such as on the promotion of tourism in Bukit Lawang. According to an employee of OIC, the permits paid for in Bukit Lawang create an income of around €160,000 yearly; including the income from other areas, the total income from GLNP is around €250,000. The government has expenses of more than €2 million to maintain and protect GLNP. Therefore, the government is investing quite heavily into GLNP even though members of the local community feel money is taken away from the area and not reinvested. It seems that members of the local community do not trust the government and its work, and that they feel they are not supported enough.

A third influence the government has on the tourism sector is at the entrance of Bukit Lawang. When tourists enter by bus they must pay a small fee of Rp3,000 (€0.20) per person to enter the village. According to the rules set this money should go to the Ministry of Tourism. This is not controlled, and the money often ends up in the pockets of the people standing at the gate according to an employee of OIC. Tourists do not have knowledge of this, but if they did it could also besmirch the name of Bukit Lawang, because it can be seen as corruption. The same employee said that “The ministry of tourism decides who comes into Bukit Lawang, and they only care about the money and not the forest” (Interviewee 7, Medan, Dec. 22, 2017). With this he also added that the Ministry of Forestry and Environment should play a bigger role to control the flow of tourists, thus increasing the influence of the government on the area and decreasing the number of tourists who enter GLNP.

Currently, the guides receive a license of the Ministry of Tourism when they have followed training, are from the area and meet some other pre-requirements. Many guides were asked what they needed to do to receive their license; one of the guides responded: “Usually, we don’t do training because we follow a guide to go to the jungle.... If I can speak English, I can become a guide.... learning by doing” (Interviewee 45, GLNP, Nov. 20, 2017). People aspiring to become guides need to follow a guide and then pay for the permit to become one —even if the guiding association says: “The guides have to follow a training of the government to get a certificate” (Interviewee 59, Bukit Lawang, Nov. 17, 2017). Another problem with the licenses given to the guides is that they are given by the Ministry of Tourism and not the ministry of forestry and environment. Therefore, the rangers cannot rescind the licences from the guides if they wanted to, as when guides do not buy permits for the tourists to enter the park or when they feed the orangutans. OIC has been trying to put pressure on the government to change this, but until now there has been no effective change. All these points indicate that NGOs are trying to influence the government in a certain direction, but until now this has not had a big effect on the sustainability of tourism in the area and a change in the processes of the government influencing the area.

Focussing on the agricultural sector, the government influences the community and the private sector in several ways. First, the government intervenes with the plantations. The government subsidises fertilizers and pesticides for palm oil and rubber farmers. According to some farmers,



those are of low quality and, therefore, they still buy the unsubsidized product. Additionally, Jokowi, the current president of Indonesia, promised in 2015 to crack down the deforestation due to palm oil production and he launched the Indonesian Sustainable Palm Oil (ISPO) certification to make the palm oil production more sustainable. Some changes have been made at the plantation PT. Langkat Nusantrara Kepong, but overall this has not been fruitful. The power of the private sector companies has been too strong and only small changes are made (Johnson, 2015). This example indicates that the government is trying to support and intervene with the production of palm oil and rubber, but has for now not been able to do so, as it was the government's intention. This can be due to a lack of rules developed or the ability to implement those rules.

The second point related to agriculture are the farmer groups formed by the government for rice farmers to use as incentives to motivate farmers to work and decide together when the crops are planted and harvested. Farmer who own wet land are pressured by the Indonesian government to produce rice. If those farmers want to sell rice, they should produce it three times a year during a period set by the government. This division of periods of plantation should help the farmers to increase their income. One of the farmers said about this rice production that should occur three times a year: "Now I produce less rice in a year than when I was producing rice two times a year.... [This is because] the quality of the soil decreases because I cannot plant legumes in between the cycles" (Interviewee 28, Timbang Lawan, Nov. 24, 2017). Therefore, the government is influencing his financial capital. If people obey the rules of the government, they get to use a tractor (a small tractor) when available. It seems that the farming community does not appreciate the different actions taken by the government and still feels that there is not enough support because they still do not earn enough money with their rice production as the commodity prices are dropping, even though they see the prices of rice they buy increase.

## 5.2 Activities of the Private Sector in the Area

The second part of the governance triangle is the private sector (Avelino & Wittmayer, 2015). In the tourism sector, 70% of the guest houses are owned by cross marriages and only 30% by the local community. When most guest houses were built it was not allowed, according to the Indonesian government, for businesses to be owned only by international people; therefore, the guest houses in Bukit Lawang are always partly or totally owned by Indonesian people and often members of the local community (Saraswati et al., 2017). The guest houses are the main restaurants in Bukit Lawang and they organize and provide tours. 30% of the money spent on tours ends up at the guest house, and the other 70% goes to the guides. Before, all the money went to the guides when they arranged the tours by themselves. In the beginning the tourists even still slept in the guides' houses. Therefore, the guesthouses are starting to play a more prominent role in the tourism sector than before.

In the agriculture sector, the private sector is even more prominently present. The Malaysian company PT. Langkat Nusantrara Kepong is renting from the government all the palm oil plantations with a size of 1,800 ha since 2009 and until 2039. In 2016 PT. Langkat Nusantrara Kepong received the Roundtable on Sustainable Palm Oil (RSPO) certificate. PT. Langkat Nusantrara Kepong wanted to become a member of RSPO due to the pressure of NGOs, but mainly due to the wishes of their own customers, such as Cargill and Nestlé. According to the Manager of the Medan area, including Bukit Lawang, the rules of RSPO are too strict for the company. Not enough producing companies are members of RSPO and, therefore, they do not have enough influence on the decisions made. Thus,

the actions taken by the PT. Langkat Nusantrara Kepong is influenced by international organisations who are members of RSPO. Therefore, the international structures are influencing PT. Langkat Nusantrara Kepong while the processes do not force them to change towards a more sustainable production.

### 5.3 Influences of the Community in the Area

The third part of the governance triangle is the community (Avelino & Wittmayer, 2015). The community is influenced by the government but can also put pressure on the government.

For instance, most of the guesthouses are currently built on the riverbanks, even though this is illegal. After the flash floods all the guesthouses were destroyed and there was a great opportunity for the government to intervene, but they did not. Again, after the flood, the guesthouses are built in an unsafe place and they will be destroyed if another flood enters the area. According to an employee of SOCP, the structures of the community groups were too strong for the government to enforce the policies in place. One of the other respondents of an NGO believes that the leading Langkat Pupati party was very corrupt and did not have the right people at the right place.

According to several members of the community, the government is not supporting them enough, even though the government has quite a few support programs, such as the rebuilding of 350 houses for people who lost their houses due to the flash floods and the infrastructure project of the Indonesian government focussing constructing and renovating roads. Still, many community members feel that the government should scale up this project, because the tourists still complain about the bad roads.

Currently, the government is still supporting the community, especially people who are really in need. Those people receive money to send their children to school. A hired employee of a privately-owned plantation would receive money until their children were almost in junior high; some children are supported until high school. Really poor people can also receive some extra money — Rp500.000 (€30, -) a month. The money they receive is based on their housing situation and the jobs they have. This indicates that the government is supporting people based on their income and trying to improve their livelihoods by providing money for them.

### 5.4 Activities of the Third Sector in the Area

The fourth part of the governance triangle is the third sector (Avelino & Wittmayer, 2015). In the case of Bukit Lawang, the tourism sector was initiated by the third-sector. Therefore, those actors are very important to consider in the area.

Tourism started after the rehabilitation program was set up by the World Wildlife Fund (WWF) and the Frankfurt Zoological Society (FZS). After the government closed the rehabilitation program, the rangers started to feed the orangutans. NGOs, such as OIC, were against this because the orangutans should become wild again instead of depending on humans. Due to those forces, the rangers stopped feeding the orangutans, but the guides continued to do it. This new form of feeding creates very dangerous situations because the guides do not know how they should do it safely. Therefore, SOCP, an NGO, did not want the rangers to stop feeding because they were already afraid the feeding by the guides would happen. This feeding is not allowed according to the rules set by the government, but the as said the structures are not in place to manage the feeding. Yet, the NGOs in the area are still pushing for this to change.

Another big influence on the tourism sector is Himpunan Pramuwisata Indonesia (HPI), the guiding association of Bukit Lawang which was formed in 1988. This organization has its headquarters in Jakarta and it was set up by the ministry of tourism, but is non-political and non-profit (Himpunan Pramuwisata Indonesia [HPI], N.D.). HPI in Bukit Lawang started with five members; in 1997 there were 20 guides and now there are 215 guides of which three are female. Even though the number of tourists was about the same in 1997 and 2017, the number of guides has increased drastically. According to the person who issues the permits to new guides, no new guides will join the organisation because the number is already too high. The head of the guiding association said that still more guides can become members of HPI, which means that the growth of guides will probably continue in the future and more guides will have difficulty to earn an income in the low season and mainly earn their money in the high season. If HPI starts to control the processes, the guides could be better supervised and maybe trained to execute better practices in GLNP.

For HPI it could become easier to train the guides if they start to work with the rangers. Currently, the guiding association and rangers do not work together at all. For a long time, they have disagreed and not talking about and discussing solutions to protect the national park. For the rangers it is almost impossible to impose the law or become partners of HPI, because HPI is not a private institution, such as a corporation or cooperation. HPI refuses to become such an organization and, therefore, it is impossible for HPI and the rangers to start a partnership. This process improvement will stay stuck if HPI does not change their legal status.

In the area other organizations are active which work with the national park or are trying to improve the tourism sector. These are the national organizations Foundation of Sustainable Ecosystems (YEL), PanEco & SOCP (both part of YEL), OIC and Nature for Change (NFC), and the international organizations are GreenLife Project, Darwin Animal Doctors and Bukit Lawang Trust. Those organizations all take different approaches to protect the national park and teach the local community and tourists how they should act around the orangutans and in the national park.

The last organisation in the area is Centre of Environmental Education (PPLH) Bohorok, also part of YEL. One of the employees of PPLH said: “We are in the area to create awareness among the people to learn to respect nature; we start with the students and the farmers” (Interviewee 10, Timbang Jaya, Dec. 8, 2017). PPLH is educating local farmers on how they can produce organic food products and how this can benefit them. According to the current members of PPLH, all the farmers should start producing organic to keep the ground, water, air and land clean. The idea is that in the end the farmers will supply Ecolodge — which is owned by PanEco, YEL, PPLH and SOCP — with organic food products to support the lodge in becoming more sustainable than it currently is. Now, Ecolodge is already producing its own energy with solar panels, recycling its waste by composting it and cleaning their waste water. Ecolodge is trying to be an example for other guesthouses and lodges in Bukit Lawang to become also greener. For instance, the manager said: “We asked our neighbours to give us their organic garbage, but they were not interested” (Interviewee 41, Bukit Lawang, Nov. 3, 2017). Therefore, there seems to be still a long way before the other guesthouses become sustainable. Ecolodge is seen by NGOs as a good example for other guesthouses to become more suitable for ecotourism.

Last year SOCP, PPLH, OIC, and the organisation of GLNP trained 60 guides in cooperation with HPI and the government. The people present at this training were selected by the head of the guiding association. When one of the guides was asked how he learned to become a guide, he said, “it is all

learning by doing” (Interviewee 49, Bukit Lawang Nov 4, 2017). Later, a photograph of the training became available, and with it became clear that this guide had been present at this training, but the training does not seem to have made a big impression on him. The changes seem to be low that it influences his behaviour towards the tourists and in GLNP. Another training was also given in 2008-2009, but the effects went away over time. According to OIC, the evaluation should be done by rangers, but the performance is low. This again evinces a lack of agreements between the organisations.

Bukit Lawang Trust has been active in the area for already eleven years, and OIC for nine years. Both of those organizations have been trying to change laws and to enforce good tourism practices, but neither has seen big changes. Yearly, there is a round table meeting with several stakeholders of the area. This year, rangers, guides and members of PPLH were present. The accomplishment of the round table meeting was that the head of the rangers and the head of the guiding association started to talk and debate. The organizations were planning to have another meeting to discuss things further. According to the Bukit Lawang Trust, this was a big accomplishment because those two organizations had not been willing to talk for a long time. Several topics were discussed, but no decisions were made. This example illustrates how slow the process is to develop new agreements between different organisations before the structures can be changed is.

Overall the third sector is trying to influence the area to make it more sustainable, but it seems that the community and the government is not yet ready to change. Therefore, the area will probably change slowly. The area could change faster if the third sector would get more power in the area.

## 6 The Effect of a Diversified Livelihood Strategy on Livelihood Outcomes

This chapter is divided in the four different elements of the livelihood strategies: more income, increased food security, decreased vulnerability and increased wellbeing. The last livelihood outcome, more sustainable use of NR-based resources, is discussed in another chapter due to its great importance to define tourism. This is also done because, for this research, when sustainability is addressed, it focusses on natural sustainability, social sustainability and profit. Profit is discussed in section 6.1 as more income.

### 6.1 More Income in the Tourism Sector

When the livelihood outcome of more income is analysed, not only income, but also financial stability and buying power are important components.

The first aspect of more income is income itself. In general, people opt for tourism because they see that people earn much money with a day of work. Tourists pay around €45.- for a day tour (Ecolodge, 2018). Of this, 30% is paid to the guesthouses, meaning the guides can earn as much as €31.50 a day, whereas people working in agriculture sometimes earn less than this in a month. A female farmer with 6 rante, which is 0.24 ha, earns Rp1.425.000 per half a year, excluding the rice she consumes by herself. This results in earnings of €14.02 per month, which is less than half of what guides can earn in a day. Her income would be €15,88 if she did not consume her own rice herself but bought it, which would be more expansive in the end. For palm oil employees, the income per month is also higher than for a rice farmer. The income is around Rp3.5 million (€206.50) depending on their performance. Due to the higher income, many members of the community want to work in tourism. The incomes of the rice farmers and palm oil employees are not directly influenced by tourism, as the prices of rice are mainly based on the commodity price and the income of palm oil employees is set by the company (Molitor et al., 2016). Some meat and vegetable producers sell their products to the guesthouses, but vegetables are not produced in big quantities in the area. In turn, the income of the construction workers is influenced by tourism. One of the construction workers said that his income was Rp80.000 a day in the village, and Rp100.000-120.000 in Bukit Lawang. According to this construction worker, this is thanks to tourism.

Besides income, the stability of income is important. In agriculture the income people receive is based on their harvest quantity and quality and the commodity prices; if the harvest fails there is no income. The least resilient crop produced in the area, out of the most common produced crops, is rubber. This is followed by rice and then oil palm. The production of rubber is not very robust because farmers are not able to harvest their crop when it rains too heavily, and the commodity prices are dropping rapidly (World Bank, 2018b). According to a couple of farmers in the region, the commodity price of rubber dropped from Rp19.000 in 2003 to Rp7.000 per kg in 2009. A couple of respondents said that the local economy would be greatly stimulated if the prices increased to Rp15.000. This would increase the financial capital of rubber farmers substantially. The rice sales price decreased from Rp4.1000 to Rp3.8000 per kg in one year, while for palm oil the prices and production are more stable. If the focus is on income stability of tourism, this has other factors. With tourism the money is mainly earned in the high season, which is two months per year. The rest of the year income should be earned from other sources, especially for the older guides and guesthouse employees, but the combination of two sources of income was something that was only

done by three out of nineteen respondents who worked in tourism. Many of the guides and shop owners keep working in the tourism sector in the low season, which means that they earn almost enough money in two months of high season, since they do not earn as much in the low season. The people working in palm oil have the most stable income as they get the same income every month and it can only be higher if their performance is better. Again, focussing on income stability, the income stability is mainly influenced by crop prices and not by tourism; this is only the case for the people working in tourism or that have a relation with tourism. For those people, the financial capital has improved due to tourism. For others who do not work with tourism and are not related to it, the financial capital has decreased as the land prices are increasing, which makes it harder to buy land, due to an increased population that comes to the area because they see an opportunity to earn income from the tourists.

To conclude, for people working in tourism the income has increased greatly, while for people not working in tourism it depends heavily on the job whether their income was influenced. For people indirectly related with tourism, such as producers of meat and vegetables, could have some more income due to tourism, because they can sell their product for a higher price, while for other farmers, the land prices increased, and it became harder to obtain more land. Therefore, the financial capital has improved for people working in the tourism sector and for people in the agricultural sector the financial capital has decreased due to international developments and influences of tourism.

## 6.2 Food Security Developments

The second aspect of improved livelihoods is improved food security. As defined previously, food security is built up by availability, accessibility, utilisation and stability (Napoli, 2011).

First is the availability of the product. In Indonesia, 2,776 calories were available per capita in 2013 (FAOSTAT, 2017b). This means that there is more food available in the country than people need to consume. Over time the food availability has increased. Looking at the current trends, it seems that this will continue (FAOSTAT, 2017a). This development is on a national level and, therefore, not specifically related to the tourism in Bukit Lawang; yet it can be related to the farming programs of the government and the national economic development, which has shown its effects on the agricultural sector in the area.

Along with the food availability, also the access to food has improved on a national level (FAOSTAT, 2017a). Specifically focussing on Bukit Lawang, on the one hand, food access has increased due to the improvement of the physical capital of the area. This is partly due to the infrastructure project of the Indonesian government focussing on small scale infrastructure, but also due to governmental construction work on province level. Still, many tourists complain about the bad roads from Medan to Bukit Lawang. In other areas such as in Lombok, the specific roads which are used for tourism are reconstructed while others are not. Therefore, the tourism sector could help to improve the access to food if the roads improved, since the government sees the importance of road construction to support tourism in the area and, with this, the physical access to food. On the other hand, the economic access in the area has decreased. The commodity prices of rice have decreased and therefore people in farming earn less money, while the food prices have increased, which makes it even harder to buy food. This increase in food prices is related to tourism; farmers said that rice and other products are more expensive in Bukit Lawang than in Bohorok, which is 15km from Bukit

Lawang. The last aspect of the access to food is social access. Based on this research it is not possible to give information on food access on a household level, but it is possible on a community level. In the area, a large difference can be seen within the community between people who have their own land for producing food crops and those who work in tourism and who do not have their own land. People with their own land and who produce rice can provide themselves with food. People working in tourism, who often have more income, can buy the food as well. Especially for people without land or those producing rubber, it is harder to obtain enough food, as the income is lower, and the food prices are increasing. Therefore, there is a difference in food access within the community. If the land prices keep increasing and rubber pricing dropping — meaning a decrease in the financial capital of rubber farmers — food access will decrease even more.

The food utilisation in the area has changed since tourists started coming. Tourists are asking for a more diverse diet than the traditional diet of the area. Tourists ask for a wider spectrum of meat and vegetables. Therefore, the local community could buy those products. Nonetheless, the price of those new products is often higher than for traditionally produced products. Thus, as not everybody is benefiting from more income, the access to a more diverse diet has not increased for the people who did not increase their income. However, a poultry seller said that in general people are consuming more poultry than before. For some of the people the income has increased, and poultry is more commonly available, which makes it more affordable. Poultry is still a special product, mainly consumed on special occasions. Overall, the dimension of food utilisation has improved in the area, as the local community now has a wider spectrum of foods available than before tourism came to the area.

The stability of food security on a national level is rather good because during the economic crisis of 2008, Indonesia still had economic growth and a stable food security (Food Security Portal, 2012). Focussing on Bukit Lawang and Timbang Jaya, the income of people is greatly influenced by the commodity prices, which are currently decreasing (World Bank, 2013). Therefore, for people in agriculture, the food security is not stable. As neither is it for people who work in tourism and who mainly get an income for two months a year. Considering income retrieved from tourism is heavily influenced by political stability because when political instability would arise the tourism sector would decrease rapidly and, with that the income of people on tourism. Lastly, the flash floods of 2003 have shown that the area is greatly influenced by natural shocks and thus the food stability would drop drastically if another flood would occur. Therefore, the stability of food security in the area has been good for the last 10 years but could drop fast if commodity prices drop, if political instability arises or if there is another flash flood.

Thus, the food security in the area is, on the one hand, positively influenced by tourism, while on the other hand, it negatively influences the food security for the local community, especially for those who do not work in tourism. However, for the whole community the stability of food security seems to be decreased since tourists started to come to the area, due to tourism, national stability and international forces.

### 6.3 Increased Vulnerability of the Area

The third aspect of the livelihood outcomes is reduced vulnerability. The first aspect affecting vulnerability is related to the shocks and trends in the area. The main threat in the area comes from the river. Since tourism started, people are less protected from the river, as all the guest houses and

restaurants are built on the riverbanks, which would be destroyed if there is a flood. Additionally, in the past, fruit and other trees were grown on the river banks, which lowered the chances of the river reaching the local community. Lastly, resource stocks are decreasing due to illegal logging, which is still a considerable problem in the area and is not decreasing on a national level (FAO, 2015). Illegal logging in the area can still increase the chance on floods in Bukit Lawang. Therefore, there is a bigger chance that the river will flood in the future. All those points combined indicate that the local community's vulnerability has increased with time, because there is not taken care of the natural capital.

Bukit Lawang is located on the Aceh side of the river. This area was part of Aceh in the past. In Aceh there is still political unrest, because the local community of Aceh wants to become independent from the Indonesian government. According to one of the rangers, Bukit Lawang will be part of Aceh when Aceh becomes independent. This can affect the tourism sector greatly, as social unrest could arise, and tourists do not easily go to another country which is not well known. Therefore, this increases the vulnerability of the community of Bukit Lawang in the area, since a big part of the community now depends on tourism as a source of income.

Another trend in the area is the increasing population density. This is a problem for both tourism and agriculture. As more Indonesians immigrate to Bukit Lawang and Timbang Jaya, more people aspire to the same job and land. In agriculture this is noticeable as the land prices are increasing. This trend is probably due to tourism, because people see the high earnings in the area and move or stay in Bukit Lawang while in other areas people are leaving rural areas to move towards urban areas.

Overall, the tourism sector has influenced the vulnerability in the area, as the vulnerability in the area has now increased. The natural capital in the areas has decreased and the social capital could decrease if Aceh would become independent. Yet, the financial capital in the area has improved for people working in tourism. Thus, those people may have built up their savings to be more resilient for shocks. It seems not to be likely that people have increased their savings, since, based on observation, people who work in tourism have a more expensive lifestyle than people who do not work in tourism.

## 6.4 Increased Wellbeing

The fourth aspect of livelihood outcomes is increased wellbeing, which is a combination of the material, relational and subjective dimensions. The first element to consider is the physical aspect of the material human needs, which is part of the physical capital. When people were asked about housing, several reactions were that this had not improved, and for some even decreased in quality. For instance, palm oil employees live in houses built by the government, but those houses have not been renovated since the 70's. Therefore, the quality of their houses has decreased. People whose houses were destroyed due to the floods were given a new house built by the government. Those houses seem to be of better quality than the average house in the area. Therefore, the wellbeing related to the local community's physical capital has decreased in some cases, but it could be said that for the people who got a new house, the wellbeing improved a bit. This is partly due to the tourism sector, which takes space from the river and partly caused the damage of the flash floods. The financial aspect of the material status is already discussed, and this has improved for the people in tourism while for people in agriculture it only has become more difficult to be financially



sustainable. Third, the natural environment, or also called the natural capital, is not well taken care of. The tourism sector affects this as all the waste water is directly deposited in the river. This pollutes the land as the water is used for agriculture. Two other aspects of tourism influencing the natural capital are the camps in the forest and the interference of humans with the animal habitat. This both affects the natural capital and can destroy the tourism sector in the future, but this will be discussed further in section 7.1. Overall, tourism has a mainly positive influence on the material dimension, not considering the natural capital of the area.

The second dimension is the relational dimension built up by social relations and political relations. The social relations, related to social capital, in the area were probably influenced by tourism. This is for two reasons. First, people living in Bukit Lawang and in Timbang Jaya are not really having social gatherings as they mainly stay connected within their own sector. Second, some guides said that they are not married, because wives do not see people working in tourism as good husbands. Some people of the older generation stopped to work in tourism because they wanted to settle down. This aspect influences the social capital of guides, as it is harder to get a wife and start a family if they continue to work in tourism. Third, people from Timbang Jaya say they do not feel related to people working in tourism because the people from Timbang Jaya feel that their behaviour and habits are different than from people working in tourism. However, that the members of the communities of Timbang Jaya and Bukit Lawang do not relate can also be related to the geographical distance.

The political relation in the areas seemed low in the first instance, but the government has different influences, such as the farmer groups and the rangers who try to manage the tourists and protect the park. The interference of the Indonesian government seems to be lacking from how the NGOs in the area wish it would be as the NGOs are hoping to develop ecotourism in the area, but the government has not been able to enforce their rules. Overall, the relation between the government and community is good, since the local community accepts the interference and there is no political conflict in the area. Nevertheless, the social capital in the area has decreased, as there seems to be a bigger division within the community between members of the community who work in the agricultural and tourism sector. Those two sectors seem not to be connecting to each other and mainly develop a social network with people within the sector they work in.

The third dimension of wellbeing is the subjective dimension. The first aspect are the norms, values and culture. Many members of the local community in Timbang Jaya and Bukit Lawang say that the people in Bukit Lawang working with tourists have changed their norms and values due to these tourists. People in Bukit Lawang are much more open about their drinking, drugs and sexual behaviour (Bukit Lawang, 2015). Nevertheless, people who were in Timbang Jaya or working less with tourist were more open to me in sharing their lives, and they were more willing to help me. In addition, people who work with tourists seem to be more detached from their religion. This can also be because in Bukit Lawang different tribes live alongside each other and therefore are exposed to different religions and cultural traditions than people who live in Timbang Jaya. Additionally, the cultural changes in the area can also be due to globalisation, which is occurring in many areas and not per se due to tourism (Macleod, 2004). The last aspect of the subjective dimension is the notion of self — including shared and individual fears, hopes and aspirations; trust; confidence; and levels of satisfaction (Armitage et al., 2012). In the area it seems that local people are working on their aspirations and especially those of their children. People in the area are trying to give their children a better life and especially a better education than the one they obtained. People are trying to

improve the human capital of their children. People hope for a better future with education, but also related to their own work; they hope for an increase in the rubber and rice prices, for more tourists coming to the area, a better division of the tourists over the area, including Timbang Jaya, and better tourist management. Overall, it seems that, because of tourism but also with support of the government, the community is developing in its subjective dimension, as people are trying to improve the human capital of their children and they still see opportunities for an improvement in their own financial capital.

The three dimensions of wellbeing combined have different influences on the community's livelihood outcomes. Mainly the material and subjective dimension are positively influenced by tourism, while tourism influences the relational dimension in the area mainly by creating a division in the community for people working and not working in tourism. To sum up, the increased wellbeing as part of the livelihood outcome is positively and negatively influenced by tourism.

## 7 The Effect of the Development of Tourism on the Environmental and Social Sustainability of People's Livelihoods

This chapter demonstrates the actual effect of tourism on the environmental and social sustainability of the community's livelihoods in Bukit Lawang and Timbang Jaya, and how local stakeholders expect tourism to develop in the future. The focus is on the agricultural and tourism livelihoods, as well as on a mixed livelihood strategy, in which people combine the other two. The development of tourism can affect the different strategies by becoming more sustainable or unsustainable. When I was in Bukit Lawang, most of the guides called the tourism in the area ecotourism. Meanwhile, members of OIC and SOCP, two NGOs working in the area, as well as the research of Nilsson et al. (2016) could not agree with this definition of ecotourism for the area, they even called the tourism in Bukit Lawang mass tourism. The two most important aspects of ecotourism are that the tourists coming to the area are not harming the environment, and that the whole community benefits from the tourists coming to the area (The International Ecotourism Society [TIES], 2017), while mass tourism is mainly tourism on a bigger scale, which is very seasonal and perceived as unpleasant (Cohen, 2017). Therefore, it is important to see how sustainable tourism is in Bukit Lawang, and whether it improves the livelihoods of people in the Bukit Lawang and Timbang Jaya.

### 7.1 Environmental Sustainability

The environmental sustainability in this case is defined by the compliance to the rules stated by the government and UNESCO, which are related to poaching, feeding and the distance between the orangutans and humans (UNESCO, 2009). Additionally, environmental sustainability is related to water and land management (Hall, 2011). All those aspects combined are part of the natural capital.

Firstly, UNESCO, in cooperation with OIC and the Indonesia Ministry, developed several guidelines for the area to develop in a more environmentally sustainable way. UNESCO set rules related to poaching (UNESCO, 2009). Poaching in the area has changed in the area. Currently according some plantation owners, the orangutans venture outside the park more often to enter the plantations because the orangutans are less afraid of humans, and due to the higher population density in this area, more orangutans need to find their food from the same food sources in GLNP. Some of the farmers kill the orangutans because they eat their harvest. Additionally, the farmers can earn money if they sell the orangutans on the black market. Another negative effect of tourism on the orangutans, according to NGOs such as SOCP and OIC, is that tourists often come too close to the orangutans and the orangutans are fed, which influences their natural behaviour and makes them more dependent on humans than wild orangutans.

Secondly, water management is very important for the area, but is lacking now. Waste water is not treated and dumped in the river, which ends up on the land of the farmers via the irrigation system, harming the natural capital of the area. This is probably the case because people lack the knowledge and thus the human capital to know the effects of pollution. In addition, more water is used in the area due to tourism, but the levels of groundwater are mainly decreasing due to the production of palm oil. Therefore, the water management in the area needs more attention to assure that the water is not polluted more and that the groundwater levels do not continue dropping. The palm oil production was started by the government and is still supported by the Indonesian government.

Therefore, it is here mainly the Indonesian government who should change its processes to decrease the palm oil production to improve the water level in the area.

Thirdly, land management needs more attention in the area. Illegal logging of the national park is occurring, which helps farmers to obtain more agricultural land, but also makes them less resistant to shocks. People often opt for the illegal logging of land if they have limited livelihood strategies available (Tacconi, 2012). Moreover, not only illegal logging threatens the land, but also soil erosion due to the decreasing water levels and the soil pollution because of bad garbage management. Those two points greatly affect the agriculture sector and could even result in the impossibility of agriculture in certain areas if this continues. Thus, better control of resources should be assured in the area. In this case, it seems that the financial capital of the farmers needs to be improved before the natural capital can be protected. This can also be related to the human capital, as some of the members of the community could lack the knowledge on increased changes of floods due to illegal logging.

Overall, tourism has affected the natural capital in the area by not handling the orangutans according to the guidelines of the government and not treating waste water, which can affect agricultural livelihoods since a negative impact on the natural capital of the area makes the practice of farming harder. Additionally, illegal logging still occurs in the area. To minimize illegal logging in the area, the financial capital and human capital of people with an agricultural livelihood strategy should improve, as people often feel less the need for illegal logging when their financial capital is better and if their knowledge is improved they may understand the influences of their actions (Tacconi, 2012).

## 7.2 Social Sustainability

The social sustainability consists of the trainings, social acceptance and differences between different working groups, age exclusion, seasonality and division of income (Hall, 2011).

First, it is important to consider the trainings in the area, which are lagging. In the region there is a great lack of skills related to tourism. In the past, rangers were trained in Medan, but this is not the case anymore. Rangers are only trained in the field. This minimum training makes it harder for rangers to know how they should handle certain situations with the guides or to share knowledge on changing their behaviour with the guides. It does not help that the rangers are not supported by law to enforce rules on the guides. Additionally, the guides themselves are not trained well enough on the guidance of tourists. The guides do not see the importance of protecting the natural capital of the area. They should learn more about this, as it can affect their own livelihood strategy if they cannot work in tourism anymore, because the name of the area is besmirched. Moreover, they do not knowhow, and thus lack the human capital, to control the tourist and protect the environment from their actions. Both of those aspects can create social unrest and therefore a decrease in tourists coming to the area. Therefore, the human capital in the area should improve to diminish this problem. Due to those practices, tourism is still socially unsustainable in the area. Due to this unsustainability of tourism, according to PPLH, it is important that guides learn other skills, such as farming, to have a backup plan whenever tourism is not present anymore. This would make their livelihood strategy more resilient, as the members of the community would be sharing the risks among different sectors. Additionally, this could also help to decrease the differences between the different sectors, since the guides and other people in tourism combine their work more.

The second aspect to consider is social acceptance. As said before, people working in Timbang Jaya and Bukit Lawang have, generally speaking, different cultural habits. This is related to the relations people have among and the way people act towards their religion and each other. Yet, a clear difference between people working in the tourism and agriculture sectors could be noticed during field work. Thus, this division in the different working groups is probably partly the reason why the social capital in the region has decreased. At this moment the differences between working groups do not create conflict, but this could happen if people do not tolerate the differences in culture anymore. Thus, this could negatively affect social sustainability in the future.

Third, there is exclusion based on age; especially in tourism, people are often forced to leave the working sector early and older people are therefore excluded from the labour market. They need to start working in another sector. This affects the social sustainability of the area, because older people start to work in agriculture instead of being distributed among the different sectors. This could create a surplus of older employees on the agricultural labour market, which is also a very physically intensive job. This all means that the human capital in the area is changing and people who are older are less able to find work than before.

The fourth aspect is the seasonality of tourism and agriculture. At first it was thought that the seasonality of tourism and agriculture could have a positive effect on one another by creating jobs for people in different seasons, but in the area, it is seen that people do not combine jobs in such a way. This is probably because of the seasons set for rice planting by the government. The planting of rice takes place every three months — also in July, when it is high season for the tourists. Farmers are not allowed to skip one season a year, because otherwise the government would not allow them to sell the rice on the market for the rest of the year. Therefore, it becomes difficult for the farmers to combine their work with work in tourism, which creates a division between the two sectors and the two groups in the area. Still, some of the people in tourism combine their work with farming, but in terms of this research, this was only the case of two out of the nineteen respondents who worked in tourism.

Last, there is a very big division in income between people working in tourism and in agriculture. It could be said that this would create some conflict between the two sectors, but this does not seem to be the case. Now, the two sectors are starting to become more intertwined because more and more tours are organized to visit farms. This is an effective way of letting a bigger part of the community benefit from tourism instead of only a specific group.

Overall, the social sustainability of tourism has some effect on the agricultural sector, mainly pointing at the divisions between working groups, income division and the accessibility to food. This could negatively affect the sustainability of people's livelihood outcome, but now the two groups are living alongside each other and no conflict has occurred between or among them.



## 8 Discussion

The discussion of this thesis starts with an analysis of the theory and how this has affected the research. Lastly the discussion will analyse the outcomes of the research in relation to other tourism areas.

### 8.1 Positive and Negative aspects of the Sustainable Rural Livelihood Approach

The Sustainable Rural Livelihood (SRL) approach is a very human centric approach (Department for International Development [DFID], 2008). According to Krantz (2001), a positive side of the approach is that it acknowledges the direct and indirect effects on people's living conditions better than frameworks in which the focus is on income level. That the focus is on income level is still the case for the monitoring and evaluations of many projects which are implemented to support the poor. The sustainable livelihood approach could help in those cases to assess the actual impact for people (Krantz, 2001). Bukit Lawang is a good example in which financial capital is seen as a main indicator to opt for a certain livelihood strategy, as many people working in tourism say they chose this approach because of an increased income, while the people working in the sector acknowledge that they like the feeling of having a holiday and being in contact with nature. According to Chen and Prebensen (2017), the satisfaction of being in contact with nature improves one's emotional- and life satisfaction. Therefore, it is important that not only financial capital, but also other aspects of the approach are acknowledged.

Another positive aspect of the SRL approach is that it helps to look at the context and the relations in a specific case. This will give input to make the development process-oriented instead of only identifying problems and finding solutions (Serrat, 2017). Still, the construction of the SRL approach makes it seem that a livelihood is very straight forward, as the approach does not deal with the issue of how the people who are interviewed identify themselves. There are many informal rules, power relations and different institutions who apply rules, which are not included in the approach (Scoones, 2005; Krantz, 2001). Including the way how members of the community identify themselves can be very important to include in relation to, for instance, tourism and agriculture. In several regions in Africa and Asia, it is seen that mainly men work in tourism as guides, while women work more in shops and restaurants (Ogunjinmi et al., 2014). But what could be the reason behind this division? The intimate government model of Carr (2013) can create a better picture of this aspect. An example of what is not included when the SRL approach is used for analyses, but which was seen in the field, was related to women who are not present at farmers meetings, because only men should be there. When asked if the female farmer did not want to be present at this meeting, she said: "No, I do not need to be present, because no important things are discussed.... I will just hear after the meeting when I should plant my rice and collect fertilizers and pesticides" (Interviewee 19, Timbang Jaya, Dec. 5, 2017). Since she was not present at those meetings, she could not make use of the tractor, as small tractor, while others could. This makes her work more physically demanding than it would otherwise have been. The SRL approach does not include those differences within the working group which affect the livelihood of this specific woman greatly.

Specifically focussing on the different elements of the approach, there are also some critical strengths and weaknesses, starting with the vulnerability context. The vulnerability context gives an impression of the surroundings of a specific livelihood. This part is an important component of the model because when a specific livelihood is analysed, many approaches "forget" the wider context

and the wider structural aspects. This vulnerability context part is more specific than only the “context”, and in the case of Carney’s approach (1998) the context investigates the trends, socks and culture of the context. This is more comprehensive, but the vulnerability context of Carney does not investigate the historical developments and how this affects the current situation. This was one of the most important aspects for this research. The SRL approach was applied more dynamically to include those historical aspects, but a clear guidance is missing in the approach and should be included here (Scoones, 2015; O’ Laughlin, 2002).

The capital assets, as a second part of the SRL approach, is seen, by many sociologists, as another method to measure a community instead of trying to understand a community. However, the capitals are more incomprehensive than it would be to merely look at the trio of land, labour and capital. The capitals acknowledge the social and political resources and the endeavour. For the capitals, it is not only about the distribution of the different assets, but also how these are combined (Batterbury, 2008; Moser, 2008; Scoones, 2015). Those aspects are important to consider, but the SRL approach is not clear regarding how to measure those capitals (Morse & McNamara, 2013). The difficulty of this was also noticeable during the research, as the capitals and the effects on the outcomes are all very descriptive, and not one conclusion can be drawn based on those, as they are all interfering with each other. For other researchers such as Arce (2003) and Wilshusen (2014), the measurability of the capitals is also one of the problems with the capitals. When a researcher is trying to make the capitals measurable the complex interactions between the different parts of the approach are harder to be acknowledged, and how those influence the capitals and at the end the livelihood outcomes. The capitals should be constructed as a process instead of a as thing, as it is stated now. Constructing the capitals as a thing erases the working powers in practice, which hides the internal conditions of neoliberal capitalism.

The third part of the SRL approach is the Transforming Structures and Processes. This part of the approach tries to incorporate the informal rules and processes developed by individuals and organisations which are influencing the livelihood strategies and outcomes (Carney, 1998). This aspect of the approach assures the combination of a bottom-up approach with a recognition of the impact of macro level governance, policies and institutions to analyse the structures and processes influencing the livelihoods of the community that is researched (Small, 2007). Scoones (2015), as a developer and critic of the approach, criticises this part of the SRL approach, as it only focusses on the local level of transforming structures and processes while failing to consider national and international forces on the livelihood outcomes of people. Bukit Lawang is a very good example where the international forces are important. In Bukit Lawang there are palm oil plantations and a tourism sector due to the policies of national ministries and international companies and organisations. These different levels of structures and processes were incorporated into the research through the additional of RSQ 2, but still were difficult to analyse, as the approach does not give support to incorporate the international and national processes.

As stated in the theoretical framework, there are the livelihood strategies which are NR-based, non-NR-based and migration. Bukit Lawang is a good example of a place where those three livelihood strategies are applicable. In the area there are the livelihood strategies focussing on agriculture, shops, tourism and immigration for tourism or migration for schooling or for some a combination of the different strategies. Scoones (2015) uses other livelihood strategies. He proposes the strategies agricultural intensification, agricultural extensification, livelihood diversification and migration.



According to the research conducted, the three livelihood strategies of Carney (1998) are more fitting. In Bukit Lawang it is for agriculture not about intensification or extensification of the production. However, diversification of the livelihood strategies is occurring more than before in the region, as the local community is now working in tourism and agriculture. Only a couple of members of the community try to make their livelihood strategy mixed by combining tourism and agriculture in their livelihood strategy. Of the interviewees who were working in tourism only 3 out of 19 were combining tourism with agriculture.

The livelihood strategy and the other elements of the SRL approach combined result in the livelihood outcome, which for Carney (1998) are focussing on more income, food security, vulnerability, wellbeing and use of NR-based resources. As argued before, in those outcomes the social aspect of sustainability is missing; additionally, the importance of sustainable income is not considered. As previously defined, ecotourism is only reachable when nature is not threatened and the community benefits from it. As the social aspect is missing in the livelihood outcomes, this was a piece which needed to be added during the research to see the effects on the community. In this case no conflicts were arising, but currently the community is more fragmented than before, and therefore it is important to consider the social aspects of sustainability. During this research, the aspect of income is discussed in the livelihood outcomes as more income. This part can be related to the profit aspect of the 3P model (Hall, 2011). This aspect is not discussed as part of sustainability in the SRL approach, even though this should be the case, as profit could bring positive aspects for the community, but, as can be seen in the case of Bukit Lawang, profit is the main driver for the local community to work in tourism. Even though, the cultural habits of people who work in tourism are different compared to people from Timbang Jaya; the two areas are more divided, and the products consumed, and land are more expensive than before. Of course, the last aspect is mainly important for people who work in agriculture, but also for members of the community who would have wished to build a guest house. They are now not able to build a guesthouse, because the prices are too high. Additionally, guides who were interviewed say that other guides were feeding the orangutans because they are assuring the tourists they will see orangutans and therefore, the lure call the orangutans to assure that the tourists see orangutans and preferably from a short distance. Thus, in this example the profit aspect of sustainability interferes with the planet aspect of sustainability. Therefore, it is important to acknowledge profit when the sustainability of the livelihood strategy is considered, as it is a main driver, but as people who work in tourism choose for more income the planet and people aspect of sustainability are also influenced by the choice made for more income. Furthermore, besides the missing aspects of social and income of sustainability in the livelihood outcomes, it is not possible to measure the livelihood outcomes and how one can be more important than the other (Small, 2007). Therefore, it is still hard to determine whether tourism is a more sustainable livelihood approach than agriculture.

To conclude there are several criticisms and gaps in the SRL approach which resulted in some gaps in the research. Where possible, the gaps were filled with information gathered during the research period. The other gaps are acknowledged and need to be considered when the research is reviewed. Yet, the SRL approach also has several important aspects which made that many of the important aspect of a livelihood are considered during this research.

## 8.2 Comparison of Observed Tourism in Bukit Lawang with Other Areas in and outside Indonesia

In many areas in the world, tourism is introduced as a new livelihood strategy, especially when tourists “discover” a new area. Worldwide tourism is growing rapidly, with a 7% increase in 2017 (UNWTO, 2018). Likewise, in Bukit Lawang tourism has been growing over the last years, and it seems this growth will continue in the future, possibly affecting the local communities even more than it currently is.

When new livelihood strategies occur, some researchers, such as Dressler and Fabyinyi (2011) state that they expect that the local community stays connected to their traditionally way of working. As an example of a shift from one sector to another is Palawan Island, in the Philippines. Local people focussed on swidden agriculture, but several organisations pushed them towards other forms of agriculture because those organisations wanted to protect the area from deforestation. The local community changed their livelihoods, but held on to their old land. It seems that they want to stay connected with their old habits to assure financial stability, but still move along with the transformation (Dressler & Fabyinyi, 2011). In the case of Bukit Lawang this is not happening, as most people who start working in tourism are not trained anymore to work in agriculture and neither do they own any land. One part of the community stays totally connected to agriculture, while another part does not work in it anymore. Even though, for the older generation this was still the case and people from this generation bought extra agricultural land when they quit tourism.

Likewise, as in the case of Bukit Lawang, a new livelihood strategy arose after influences from national and international organisations interfered in the region. In Indonesia this is happening in several other regions, as the Indonesian government is trying to divide tourists who now go to Bali between different areas all over Indonesia. The government does this so more money can be earned for the community and the environment is protected in those areas (Brandon, 1996; Manuring, 2002). In Bukit Lawang it was not the idea that tourism would be developed, but when the government saw that tourists were coming they built the first campsite and a guesthouse, which meant that they supported the sector, but not specifically that they protected the environment as part of their aim.

Apart from this similarity, Bukit Lawang was not the only village where tourism took over the area and switched agricultural land to tourism area after the involvement of the government. For example, Gili Trawangan, located between Bali and Lombok, which was first an agricultural island, became attractive for tourist. Soon more investors became interested in Gili and the local people needed to sell their land due to pressure by the government and started to benefit less from tourism (Richards & Hall, 2003). In other words, the people from outside the community are now benefiting from the tourists, instead of the local community. At the same time, the local community is no longer able to use their agricultural land, because it became too expensive (Ahebwa, 2012; Richard & Hall, 2003). Therefore, in this example the local community is not benefiting from tourism and only perceiving the bad effects from it. In the case of Bukit Lawang this is partly the situation, as the local community has less access to the land and products became more expensive. The guesthouses are partly owned by internationals and therefore the money leaves the area. In turn, in Bukit Lawang, still many people of the local community work in tourism and own part of the guesthouses. Thus, money is still divided among the community of those working in tourism.

The increased income from tourism creates an income gap between people working in tourism and people who work in agriculture. For people in agriculture, products are becoming more expensive because tourists are in the area. Bukit Lawang is not the only region where this occurs, as was also the case for the Nusa Tenggara islands, close to Bali. The number of jobs is low, undernourishment is common and there is little schooling. The people living on this island are badly affected by the tourism sector because, for example, it is too expensive for them to go to the doctor in Bali, because it is all developed to support the tourists (Schonhardt, 2011). In Bukit Lawang it is still manageable, but this may change in the future as tourism continues to grow, as people working in agriculture already notice some problems with increased food and land prices.

Part of the Nusa Tenggara Island is the Komodo National Park. This is a rather new national park which is attracting tourists, whose numbers are still growing. As well as in Bukit Lawang, tourists mainly come to see one specific animal — in this case, the Komodo Dragon. Currently, the main troubles for the community in this area are the inappropriate dress code of the tourists and the inflating prices due to the increased number of tourists. Also, in this case the main benefit of tourism is more income, and with this probably also the financial capital. In this area the community understands that the tourism sector is totally depending on the existence of the park. Tourists will only persist to come if the park continues to exist, which is also the case for Bukit Lawang. As well as with the previous example of Nusa Tenggara islands, where there is also an unequal distribution among the community of the benefits which are gained with tourism, there is also this unequal distribution of income among the community of the Komodo National Park and of the community around Bukit Lawang. Therefore, there are many comparisons between those two areas, even though the Komodo National park is still a “new” tourist attraction (Walpole & Goodwin, 2001).

In another national park in Uganda and Rwanda, where gorillas are the attraction for tourists, the tourism sector has been developing for a longer time. The gorillas and the forest were used by the local community for agriculture, local hunting and fruit picking (Van der Duim et al., 2014). Since the tourism sector grew the livelihoods changed and, according to Ahebwa (2012), the livelihoods of the local communities even improved. In those areas, nature conservation is an important component from international forces as well as the local community. The local community participates because they see the importance of the gorillas to sustain the tourism in the area (Van der Duim et al., 2014). Especially in Rwanda, the number of gorillas has even been growing since the tourism sector came despite the conflict in the area (Maekawa et al., 2013). According to the founder of SOCP (Interviewee 9, Dec. 13, 2017), this gorilla tourism should be an example of how Bukit Lawang could develop a tourism sector which could become more sustainable and move towards ecotourism.

The processes occurring in Bukit Lawang can also be seen in other regions. The difference between Bukit Lawang and the other areas mainly seems to be a difference in the development of tourism and the number of tourists coming to an area. Therefore, the processes seem to be not specific to the area, but rather sector related or due to the general introduction of a new sector into an area.



## 9 Conclusion

This research analysed how the development of tourism, as an important component of global sustainable nature conservation strategies in the Gunung Leuser National Park, has affected the agricultural livelihoods in Bukit Lawang, in Sumatra, Indonesia, since the rehabilitation program started in 1973.

When the rehabilitation program started the aim was to protect the orangutans from humans by reintroducing them to the wild. According to members of the NGOs, after tourism started this only affected the orangutans negatively, as they are now more in contact with humans than before the tourists came. The orangutans are fed and possibly infected by diseases. Apart from the animals, the water quality is polluted by the tourists who use the water from the river in the forest and pollute it with soap and other products. Tourism is believed to decrease illegal logging, but the patrols of the ranges showed that there is still illegal logging in GLNP also close to the tourism areas. Those aspects combined indicate that tourism is not developing in the area as a sustainable nature conservation strategy, as it pollutes and influences the environment. Additionally, due to illegal logging, the area is more vulnerable to floods, but also due to tourism this vulnerability increased. All the guest houses are built on the riverbanks, which reduces the natural space of the river and thus increases the changes of the river's overflowing. This would greatly affect the tourism sector, but also the agricultural sector will be affected, as was shown after the flash floods of 2003, when the irrigation system was destroyed.

Local people in the area, especially in Timbang Jaya, say that the culture has changed because of the tourists. This is probably partly true, as it has also to do with globalisation in general, which influences people's behaviour; yet the different behaviour of people in Bukit Lawang and Timbang Jaya is still very noticeable. For the agricultural sector sustaining a livelihood has become more difficult, because the population density is increasing. People from different areas in North Sumatra see a new and, for them, a better livelihood opportunity by working in tourism. More people are trying to get the same job and land. Thus, the land prices are increasing, and jobs are becoming scarcer. The tourism sector has also influenced the agricultural sector and people with other jobs if those people become involved with tourism — for instance, with the selling of products — and people are paid better when a job is done in the tourism sector. This is only the case for a small proportion of the community who indirectly benefits from tourism and does not directly work in the tourism sector.

Overall, the Indonesian government does not seem to have a specific focus on tourism or agriculture, as they intervene in both, but it seems that their influences are having more influence on the agricultural sector. On the other hand, national and international NGOs specifically focus on tourism and on how the tourism sector can be improved. Their influence does not seem very prominent until now, but they will probably try to keep intervening in the future.

In sum, agricultural livelihoods are influenced due to the national forces of the government and globally changing commodity prices. Agricultural livelihoods are mainly influenced by the tourism sector, as land and product prices are increasing, and more harvest, especially in the form of fruits are taken from the land by the orangutans. Those influences could become more positive if tourists started to visit the farms more than they currently are. More members of the community would be

involved in the sector and could benefit from more income to support themselves as the food and land prices are now higher.

Comparing these results with those of the other examples given in the discussion, the processes taking place in Bukit Lawang can be seen in many other areas. As well as in other areas the number of tourists is growing, and a part of the community is benefiting from the tourism sector while another part of the community who stay connected to their older livelihood strategy mainly feel some negative influences especially on their livelihood outcome of a decreased income, their vulnerability and on their social sustainability. Thus, it seems that the developments around Bukit Lawang and Timbang Jaya are mainly caused by tourism or the introduction of another livelihood strategy in the area. Therefore, it seems that the outcomes of the research can be applied seen as a trend which is also occurring in other regions apart from Bukit Lawang and Timbang Jaya. Thus, this research could be used as a basis for other areas when researching tourism. Of course, it remains important to consider the local context and the stage of tourism as there are several differences between areas which also influence the livelihood outcomes of the local community, but this research is still showing an example of the effects of tourism on agricultural livelihoods in a specific area.

### 9.1 Recommendation for further research

After completing the research, there are still some aspects that should be further researched, including:

- The influences of the international organisation on the local context of Bukit Lawang and Timbang Jaya.
- The international influences on the Indonesian government should be investigated, since the first decision to support the rehabilitation program was maybe also due to international pressure on the Indonesian government, but that is still unclear.
- To get a better understanding of the interactions within the community it should be further researched how the members of the community identify themselves as this can affect their livelihood strategy and their livelihood outcomes.
- The research was now only done in the low season to get a greater understanding of people who combine tourism and agriculture and to see the actual feeding practices in the area, the research should also be executed in the high season as well.

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## 10.1 References of interviewees

#	Date	Gender	Age	Place	Language	Job	Organisation / household composition	Type interview
1	10/29/2017	Male	In his 60s	Timbang Jaya	Bahasa Indonesia	Chief of sub-district Timbang Jaya	Indonesian Government	Formal
2	03/01/2017	Male	Unknown	Via email	Bahasa Indonesia	North Sumatran Conservation Agency	Ministry of Forestry	Questionnaire
3	12/18/2017	Male	In his 70s	Bukit Lawang	English/ Bahasa Indonesia	Builder ecolodge/Business man	N.A.	Formal
4	11/16/2017	Male	In his 70s	Timbang Jaya	Bahasa Indonesia	Previous plantation Employee and afterwards rice farmer	5 children	Formal
5	12/19/2017	Male	In his 80s	Bukit Lawang	Bahasa Indonesia	Previous plantation Employee and cow farmer	3 Children	Formal
6	11/21/2017	Male	In his 60s	Goto Royong	Bahasa Indonesia	Sawyer for rubber plantations	Widower, 10 Children	Formal
7	10/27/2017 & 21/22/2017	Male	Unknown	Medan	English	Nature Conservationist	OIC	Formal
8	10/26/2017	Male	Unknown	Medan	English	Nature Conservationist	SOCP	Formal
9	12/13/2017	Female	In her 50s	Via Skype	English	Nature Conservationist	Founder SOCP	Formal
10	10/26/2017, 11/5/2017, 11/12/2017. 12/8/2017	Male	Unknown	Medan & Bukit Lawang & Timbang Jaya	English	Nature Conservationist	PPLH	Formal / Informal

	& 12/9/2017							
11	11/05/2017	2 females	Unknown	Bukit Lawang	English	Nature Conservationist	Animal Doctors	Round Table Meeting
12	11/05/2017	3 females	Unknown	Bukit Lawang	English	Nature Conservationist	Bukit Lawang Trust	Round Table Meeting
13	11/05/2017	Male	In his 40s	Bukit Lawang	English	Head of the Rangers	Ministry of Forestry	Round Table Meeting
14	Daily between 10/28/2017 & 12/20/2017	Male	In his 40s	Timbang Lawan	English	Ranger & Nature conservationist	Ministry of Forestry & NFC	Informal
15	Several occasions between 10/28/2017 & 12/20/2017	Male	In his 30s	Bukit Lawang	English	Ranger & Guide	Ministry of Forestry	Formal / Informal
16	10/30/2017 & 11/15/2017	Male	In his 50s	Bukit Lawang & Timbang Jaya	English/ Bahasa Indonesia	Ranger & Farmer	Ministry of Forestry	Informal / Formal
17	11/23/2017	Male	In his 40s	Timbang Jaya	Bahasa Indonesia	Farmer and Construction worker	Married and 2 children	Formal
18	12/05/2017	Female	In her 50s	Bukit Lawang	Bahasa Indonesia	Hired farmer and shop owner	Widow and 3 children	Formal
19	12/05/2017	Female	In her 50s	Timbang Jaya	Bahasa Indonesia	Rice farmer	Widow and 3 children	Formal

20	12/04/2017	Male	In his 50s	Bukit Lawang	Bahasa Indonesia	Palm oil producer & Herbal tea maker		Formal
21	21/04/2017	Male	In his 30s	Timbang Jaya	Bahasa Indonesia	Rubber & Durian producer & Film maker	Married and 3 Children	Formal
22	12/08/2017	Female	In her 30s	Timbang Jaya	Bahasa Indonesia	Organic Farmer	PPLH & Married 1 child	FGD
23	12/08/2017	Male	In her 30s	Timbang Jaya	Bahasa Indonesia	Organic Farmer	PPLH & Married 1 child	FGD
24	12/08/2017	Male	In his 40s	Timbang Jaya	Bahasa Indonesia	Organic Farmer	PPLH	FGD
25	12/08/2017	Male	In his 70s	Timbang Jaya	Bahasa Indonesia	Organic Farmer	PPLH	FGD
26	10/31/2017	Male	Unknown	Bukit Lawang	English	Weet farmer in GLNP	Unknown	Informal
27	12/10/107	Male	In his 60s	Timbang Jaya	English/ Bahasa Indonesia	Rubber and Poultry Farmer & Tofu maker	Married	Informal
28	11/24/2017	Male	In his 30s	Timbang Lawan	Bahasa Indonesia	Construction employee & Rice farmer	Married	Formal
29	12/21/2017	Male	Unknown	Medan	English	R&D Director Palm oil plantation company	PT. Langkat Nusantrara Kepong Married and 2 Children	Formal
30	11/08/2017	Male	In his 20s	Bukit Lawang	Bahasa Indonesia	Plantation Employee	PT. Langkat Nusantrara Kepong, Unmarried	Formal
31	11/06/2017	Male	In his 30s	Bukit Lawang	Bahasa Indonesia	Plantation Employee & Cow care taker	PT. Langkat Nusantrara Kepong Married and 2 Children (5 & 3 years old)	Formal
32	11/06/2017	Male	In his 30s	Bukit Lawang	Bahasa Indonesia	Plantation Employee & Cow care taker	PT. Langkat Nusantrara Kepong Married and 2 Children (4 & 2 years old)	Formal

33	12/08/2017	Male	In his 50s	Timbang Jaya	Bahasa Indonesia	Plantation employee & Restaurant Owner	Privately owned, Married and 2 Children	Formal
34	11/28/2017	Male	In his 30s	Bukit Lawang	Bahasa Indonesia	Restaurant for locals and rubber plantation owner	Married and 1 Child	Formal
35	11/28/2017	Female	In her 20s	Bukit Lawang	Bahasa Indonesia	Poultry seller	Married and 2 children	Formal
36	12/07/2017	Female	In her 60s	Bukit Lawang	Bahasa Indonesia	Shop owner	Married and 5 children	Formal
37	10/30/2017	Male	Unknown	Bukit Lawang	English	Guesthouse owner	Ekotravel / Cross Marriage	Formal
38	11/14/2017	Male	In his 60s	Bukit Lawang	English/ Bahasa Indonesia	Guesthouse employee	Jungle Tribe & Old plantation employee	Informal
39	11/11/2017	Female	In her 40s	Bukit Lawang	English	Guesthouse employee	Fido Dido	Informal
40	11/04/2017	Male	In his 20s	Bukit Lawang	English	Guesthouse Employee	Jungle Inn	Informal
41	11/03/2017	Male	In his 40s	Bukit Lawang	English	Guesthouse Manager	Ecolodge	Formal
42	11/25/2017	Male	In his 20s	Bukit Lawang	English	Guesthouse employee	Ecolodge	Informal
43	11/11/2017	Male	In his 50s	Bukit Lawang	English	Tour agent, Hut owner & Guide	Married and 4 children	Formal
44	11/11/2017	Male	In his 30s	Bukit Lawang	English	Guide	Married and 2 children	Informal
45	11/20/2017	Male	In his 30s	In GLNP	English	Guide	Unmarried	Formal
46	11/18/2017-11/20/2017	Male	In his 40s	In GLNP	English	Guide	Unmarried	Informal
47	11/16/2017	Male	In his 30s	Bukit Lawang	English	Guide	Unmarried	Formal
48	11/16/2017	Male	In his 40s	Bukit Lawang	English	Guide	Unmarried	Formal
49	11/04/2017	Male	In his 30s	Bukit Lawang	English	Guide	Unmarried	Formal
50	11/27/2017	Male	In his 50s	Timbang Jaya	English	Guide & Recruiter new guides	HPI, Married and 3 children	Formal



51	11/27/2017	Male	In his 30s	Bukit Lawang	English	Assistant guide & Old farmer	Married and 2 children	Formal
52	10/31/2017	Male	In his 20s	Bukit Lawang	English	Assistant guide & Farmer	Unmarried	Informal
53	11/27/2017	Male	In his 30s	Timbang Jaya	English/ Bahasa Indonesia	Guide, Cooking in Jungle & Farmer	Unmarried	Formal
54	11/08/2017	Male	In his 50s	Bukit Lawang	English	Plantation Employee & Guide in high season	Married and 4 children	Formal
55	11/16/2017	Male	Unknown	Bukit Lawang	English	Kayak Renter	Unknown	Informal
56	11/14/2017	Male	Unknown	Bukit Lawang	English	Craft Shop employee	Unknown	Informal
57	11/14/2017	Female	Unknown	Bukit Lawang	English	Clothing Shop owner	Married and 4 children	Informal
58	10/30/2017	Male	In his 40s	Bukit Lawang	English	Cook in Jungle	Ekotravel, Married and children	Informal
59	11/17/2017	Male	Unknown	Bukit Lawang	English	Head of the Guiding Association	HPI, Married and 2 Children	Formal
60	09/24/2017	Male and Female	In their 20s	Vught	Dutch	Tourists	Unmarried	Formal
61	10/31/2017	2 Males	In their 20s	Bukit Lawang	English	Tourists	Unmarried	Informal