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Participatory Value Chain Analysis of Organic Tea in Laos

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Participatory Value Chain Analysis of Organic Tea in Laos

Through Oxfam's Eat Greener Project – Changing Food Consumption Patterns – a Sustainable Approach towards Economic Development in Lao PDR

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Preface

In January 2015, I got the chance to apply for a thesis subject in cooperation with Oxfam Solidarity in Laos. My proposal got accepted and became the start of a challenging and rewarding internship in an international context. During the three months I spent in Laos, I met a lot of inspiring people and experienced the Laotian culture and surroundings.

I would like to thank Esther Diaz and Saymano Sanoubane for their guidance and support during the project and my colleagues at Oxfam Solidarity in general to make me feel very welcome. I would also like to thank my promotors prof. dr. ir Patrick Van Damme, dr. ir. Wouter Vanhove and ir. Kaat Verzelen for supporting me during my stay in Laos and for their constructive feedback. I am also grateful to my family for supporting me in my journey to a faraway country.

Sadly, I have to mention that the Eat Greener project was put to a stop. After one year and a half of negotiations with the Laotian government to write a memorandum of understanding (MOU), it finally did not get accepted and the project was not allowed to continue. However, Oxfam Solidarity is still active in other fields in Laos and the information gathered in this study can be shared with other NGOs working on organic agriculture in Laos.

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Acronyms

ACT = Organic Agriculture Certification Thailand

ADB = Asean Development Bank

ASDSP = Association de soutien au développement des sociétés paysannes

ASDSP is involved in sustainable production and marketing by supporting farmer groups, participation in the development of Lao Farmer Products (LFP) and producing and marketing organic products in Laos and in Europe, as well as Fair Trade. Their intervention areas are Vientiane capital, Champasak and Xiengkhouang province. In the future, they will expand to Luang Prabang, Bolikammsay and Khammouane province. They facilitate contact with stakeholders in Xiengkhouang and Champasak province.

ASEAN = Association of Southeast Asian Nations

ASEAN is a political and economic organisation of ten Southeast Asian countries. Its aims include accelerating economic growth, social progress, and socio-cultural development among its members, promote regional peace and stability and to collaborate more effectively (ASEAN, n.d.).

CADC = Clean Agriculture Development Centre

CADC is an implementing agency under the Department of Agriculture, responsible for the promotion and development of all safe and environment-friendly agricultural systems (Panyakul, 2012).

CCFD = Comité Catholique contre la Faim et pour le Développement

CUSO

CUSO is an international development organisation that works to reduce poverty and inequality (Kolandevelu, 2015).

DoA = Department of Agriculture

DAFO = District Agriculture and Forestry Office

FAO = Food and Agriculture Organisation of the United Nations

FLO = Fairtrade Labelling Organisations

FLO is an international inspection and certification body for labelled Fairtrade (FLOCERT, n.d.).

GAP = Good Agricultural Practices

Good Agricultural Practices are practices that address environmental, economic and social sustainability for on-farm processes, and result in safe and quality food and non-food agricultural products (FAO, 2008).

HELVETAS

HELVETAS is a Swiss development organisation, active in the agriculture sector in Laos since 2001 (HELVETAS, n.d.).

HACCP = Hazard Analysis and Critical Control Points

HACCP is a systematic and science based system that identifies specific hazards and measures for their control to ensure food safety (Standaert, 2015).

ICS = Internal control system

An internal control system is a quality assurance system, carried out by the organically certified farmer group. Inspectors of a certification body only need to inspect the well-functioning of the ICS (IFOAM, n.d.).

IFAD = International Fund for Agricultural Development

IFAD is a specialized agency of the United Nations, established as an international financial institution in 1977. It is an International fund for agricultural development, meant to finance agricultural development projects primarily for food production in the developing countries (IFAD, n.d.).

IFOAM = International Federation of Organic Agriculture Movements

IFOAM has developed a family of standards for organic agriculture, which are the basis for the Lao organic standard by MAF (IFOAM, n.d.).

IMO = Institute for Market ecology

IMO is a highly experienced international body for the inspection, certification and quality control of organic, eco-friendly and socially-responsible products (IMO, n.d.).

JICA = Japan International Cooperation Agency

JICA is a governmental agency that coordinates official development assistance (ODA) for the government of Japan. It assists economic and social growth in developing countries and promotes international cooperation (JICA, n.d.).

LAK = Laotian Kip

The LAK is the national currency of Laos: €1 = 8937 LAK (LAK - Lao or Laotian Kip).

LCB = Lao Certification Body

LFP = Lao Farmers' products

LFP is a packaging and processing company that processes local farmer products such as rice, tea and jams for selling on the local and international market.

MAF = Ministry of Agriculture and Forestry

MOIC = Ministry of Industry and Commerce

MOU = Memorandum of Understanding

A memorandum of understanding describes a bilateral or multilateral agreement between two or more parties. It expresses a convergence of will between the parties, indicating an intended common line of action. It is often used in cases where parties either do not imply a legal commitment or in situations where the parties cannot create a legally enforceable agreement**.** Oxfam Solidarity has to make a MOU with the Lao government to get official recognition for the Eat greener project and to arrange the handover of the project to the government and local organisations when the project by Oxfam is finished.

NAFRI = National Agriculture and Forestry Research Institute

ODOP = One District One Product

ODOP is a national project implemented by the Lao government and JICA to promote local specialized products (JICA, n.d.).

OSB = Oxfam Solidarity Belgium

PAFO = Provincial Agriculture and Forestry Office

PROFIL = Promotion of Organic Farming and Marketing in Lao PDR

In 2004, HELVETAS launched the PROFIL project in order to develop organic standards and certification in Laos and promote organic farming and marketing (HELVETAS, 2011).

PSC = Phon Soung Centre

Organisation under the government that has a strong experience with agricultural extension (organic and GAP agriculture in particular), capacity building, support to farmer groups, and some limited experience in marketing and promoting organic consumption.

SAEDA = Sustainable Agriculture and Environment Association

SAEDA is a Lao non-profit organisation that supports vulnerable communities by promoting sustainable agriculture practices, and improves their capacity and awareness to safeguard the

environment. The projects focus on three main areas of intervention: Sustainable agriculture, chemical pesticide reduction and biodiversity conservation (SAEDA, n.d. a).

SMEs = Small and Medium Enterprises

TABI = The Agro-Biodiversity Initiative

TABI is a long-term program of the Lao Ministry of Agriculture and Forestry and the Swiss Agency for Development and Cooperation. The goal of the program is to raise the status of, and integrate agro-biodiversity as a key component in the development policies and practices of Laos (TABI, n.d.).

VAT = Value Added Tax

The standard rate of VAT in Laos is 10 %. It applies to a wide range of products, including electricity, water, fuel, and all imported products, unless they receive an exemption from the Government of Laos (Kolandevelu, 2015).

WTO = World Trade Organisation

Abstract

Laos is a developing country in transition with 22 % of the population living below the poverty line. Over 80 % of the population lives in rural areas, the majority of which are small-scale farmers. Low quality of production and processing, lack of adequate services, lack of secure access and ownership over resources, and lack of an enabling environment are the main constraints of livelihood improvement for small-scale farmers.

A wide variety of measures can be implemented to improve the livelihoods of small-scale farmers. When resources are limited, it is seldom possible to address all factors simultaneously. Therefore it is useful for development agencies to select a sub-sector or even one value chain to focus on and improve its overall performance. The Eat Greener project, a project implemented by Oxfam Solidarity in Laos, has selected the organic sector as a subsector to be improved. The organic sector is chosen because the added value of organic products is based on assets which poor farmers already have, such as land free of intensive use of chemicals and knowledge of traditional production systems.

In this thesis, the organic tea sector in Laos (both tea derived from *Camellia sinensis* as the leaves of *Morus alba*) is examined, as part of the Eat Greener project. The study is set out to gain a clear understanding of the main constraints and opportunities for improvement of the organic tea sector in Laos and to identify the principal SMEs (Small and Medium Enterprises) involved. A participatory value chain analysis of organic tea is conducted in three target provinces: Vientiane province, Xiengkhouang province and Champasak province.

A participatory approach is used to provoke interest and build trust for collective action later on. Only qualitative tools are used as time and resources are limited and much information on prices and quantities can still be gathered from qualitative research and often secondary sources such as national statistics.

During field research, 45 individual stakeholders involved in the value chain of organic tea in Laos were interviewed between July and September 2016. A first identification of chain actors was done by Oxfam Solidarity's local partners *Phon Soung* Center (PSC) and *Association de soutien au développement des sociétés paysannes* (ASDSP). Individual interviews with producers, processors and traders and focus group discussions with producers were organised in every province as well as a stakeholder meeting. During these stakeholder meetings, actors involved in the organic tea sector discussed the composition of the value chain map and pointed out factors constraining the evolvement of the organic tea sector and opportunities for improvement of the value chain.

Laos offers a great opportunity for the development of the organic sector, since a lot of farmers already produce organically by default. The organic policies and framework are in place, providing access for Lao farmers and enterprises to organic certification. The organic sector is supported by national and local governments as well as NGOs. However, the support of national and local governments is limited due to budget limitations. A legal framework for cooperatives, which would be beneficial for the development of the organic sector, is lacking and access to credit for farmers and small enterprises is limited. Setting up a business and capital accumulation are difficult because of regulatory costs and underdeveloped financial markets. At present, the Lao organic label does not have international accreditation which results in a lot of extra paperwork and high costs to acquire an extra internationally recognized organic label for export which can be an obstacle for local farmer associations and entrepreneurs. Another issue is that the Lao organic standards are currently based on the IFOAM standards, which are not completely adequate for a country in a tropical climate with farmer practices that differ from the Western ones.

Only a few actors operate in the organic tea sector in the target provinces. Both in Vientiane and Xiengkhouang provinces, the organic mulberry tea sector *(Morus alba)* is monopolised by one actor performing both the producing, processing and trading (Vang Vieng organic farm and Mulberries Inc., respectively). Even though they both have a monopoly in organic mulberry tea in their province, Mulberries Inc. is able to set its price 2 to 5 times higher per kg packaged tea than Vang Vieng organic farm. This can be explained by the destination of the products: Mulberries Inc. sells 50 % of its tea products on the international market, whereas Vang Vieng organic farm sells on the national market.

In Champasak province, there is one big producer group (Paksong Farmer Organic Tea Production group) with 136 members and a family enterprise (Mrs. South) that cooperates with 10 local families for production of organic tea *(Camellia sinensis)*. Both the members of the producer group as the families cooperating with Mrs. South own on average 1 ha of tea in tea gardens.

Some actors such as Vang Vieng organic farm and Mrs. South family enterprise make use of their location in a touristic area for promotion and selling of organic tea. Mulberries Inc. and LFP, the main buyer of the Paksong farmer group, both export more than 50 % of their processed tea products. The other traders mainly sell to local retailers, wholesalers (Lao supermarket chain) and tourists. Only Mulberries Inc., the Paksong farmer group and LFP (Lao farmer's products) are organically certified. Other actors are in the process of getting organically certified or refuse to certify because of the high costs and their buyers and consumers already trusting them to produce organically.

The value chains in the three provinces differ in strengths and weaknesses, although inadequate marketing was in general experienced as the biggest constraint for further development of the tea chains. Capacity building can be given in every province by Oxfam Solidarity to enhance marketing and networking skills.

In every province, expansion of tea production is possible. In Vientiane and Xiengkhouang provinces this can be accomplished by attracting new producers. In Xiengkhouang province, Mulberries Inc. has already developed a project to teach people from Ta Thom district how to produce mulberry tea, as Mulberries Inc. currently has more demand than it is able to supply. These people are recently relocated by the government from remote mountain areas to the lowlands and do not have much experience in agriculture. Vang Vieng district in Vientiane province is a major touristic area and has a lot of market potential. The District Agriculture and Forestry Office (DAFO) is deciding on recognizing and promoting organic mulberry tea as an ODOP (One District, One Product) product, a typical product for Vang Vieng district, which will encourage local hotels and guesthouses to serve it and local shops to sell it. The obstacle here for DAFO and Oxfam Solidarity will be to convince more farmers to start cultivating organic mulberry tea, since success is uncertain. Financial and technical support by Oxfam Solidarity and its local partner organisations PSC and ASDSP can be given for building a processing unit in Vientiane and Xiengkhouang province, when production in these provinces is expanded. In Champasak province the producers are already in place and production can be increased by restarting the management of (partly) abandoned tea gardens owned by the members of the Paksong Farmer Organic Tea Production group. This will only happen if trust between the Paksong Farmer Group and its major buyer Lao Farmers' Products (LFP), which packages and sells the tea on the national and international market, is increased. Increasing production is only useful when there is a demand for it. LFP is hesitant to accept large offers, since they are not sure the Paksong Farmer Group will be able to provide it (in time) and with good quality. The Paksong farmer group is only willing to restart the maintenance of the abandoned parts if they can be ensured of a continued order. Gradually increasing orders by LFP to the Paksong farmer group can be beneficial to increase trust between the producer group and LFP. Another possibility is for the Paksong Farmer Group to search for other buyers besides LFP. At the moment, the Paksong Farmer group is already building a shop, where they will sell the products locally. Support by ASDSP and Oxfam could be offered by assisting in creating a good marketing plan and packaging system.

Each target province shows potential for further development and extension of the organic tea sector. Implementation of the suggested measures could induce major livelihood improvements for all actors involved in the organic tea value chains and boost national, Asian and European consumption of Lao organic tea.

Samenvatting

Laos is een ontwikkelingsland. Tweeëntwintig procent van de bevolking leeft onder de armoedegrens. Het grootste deel van de bevolking (meer dan 80 %) woont in landbouwgebied en doet meestal aan kleinschalige landbouw. Een lage kwaliteit van geproduceerde en verwerkte producten, een tekort aan diensten, te weinig (veilige) toegang tot en bezit van grondstoffen en een omgeving die weinig kansen biedt tot groei en ontwikkeling zijn de voornaamste factoren die kleinschalige landbouwers hinderen in het verbeteren van hun levenskwaliteit.

Een waaier aan maatregelen kan genomen worden om de levenskwaliteit van kleinschalige landbouwers te verbeteren. Wanneer middelen echter gelimiteerd zijn, is het zelden mogelijk om al deze maatregelen tegelijk toe te passen. Daarom is het voor ontwikkelingsorganisaties aan te raden om een sub-sector of slechts één waardeketen te selecteren, die over zijn geheel kan geoptimaliseerd worden. Het Eat Greener project, een project dat uitgevoerd wordt door Oxfam Solidariteit in Laos, koos voor de biologische sector als te optimaliseren sub-sector. Er werd geopteerd voor deze sector omdat de toegevoegde waarde van biologische producten voortbouwt op kwaliteiten die kleinschalige, economisch beperkte landbouwers reeds bezitten zoals landbouwgrond vrij van chemicaliën en kennis van traditionele productiesystemen.

In deze thesis wordt de biologische theesector (zowel thee afkomstig van *Camellia sinensis* als van *Morus alba*) in Laos bestudeerd, als onderdeel van het Eat Greener project. Het doel van de studie is om inzicht te verkrijgen in de beperkingen en mogelijkheden voor verbetering van de biologische theesector in Laos en om de voornaamste KMO's (kleine en middelgrote ondernemingen) te identificeren. Een participatieve waardeketenanalyse werd uitgevoerd in drie provincies: Vientiane, Xiengkhouang en Champasak.

Er werd geopteerd voor een participatieve aanpak. Dit wakkert de interesse van actoren aan en stimuleert het vertrouwen voor een verdere vlotte samenwerking. Enkel kwalitatieve methodes werden gebruikt omdat deze minder tijd en middelen vergen dan kwantitatieve methodes. Door middel van kwalitatief onderzoek en gebruik van secundaire bronnen zoals nationale gegevens kan reeds voldoende informatie over prijzen en productiehoeveelheden bekomen worden.

In de periode van juli tot september 2016 werden 45 mensen geïnterviewd die onderdeel uitmaken van de biologische theesector. *Phon Soung Center* (PSC) en *Association de soutien au développement des sociétés paysannes* (ASDSP), twee lokale partners van Oxfam Solidariteit waren verantwoordelijk voor een eerste identificatie van actoren in de biologische theesector. In elke provincie werden individuele interviews (met producenten, verwerkers en handelaars), focus

groep discussies (met producenten) alsook stakeholder bijeenkomsten gehouden. Gedurende deze stakeholder bijeenkomsten bediscussieerden betrokken actoren de structuur van de waardeketen en gaven kennis van mogelijke factoren die de verdere ontwikkeling van de theesector beperkten en opportuniteiten om te waardeketen te optimaliseren.

In Laos telen veel landbouwers reeds biologisch door een gebrek aan beschikbaarheid van pesticiden of middelen om deze te kopen. Laotiaanse landbouwers en ondernemingen kunnen zich biologisch laten certifiëren door het *Laotian Certification Body (LCB).* De biologische sector wordt ondersteund door de nationale en lokale overheden van Laos en door NGO's. Ondersteuning van eerstgenoemden is echter beperkt wegens onvoldoende budget. Er bestaat nog geen wetgeving voor het opzetten van coöperatieven en het is voor landbouwers en kleine ondernemingen onhaalbaar om geld te lenen om zichzelf te ontwikkelen. Het Laotiaanse biologische label heeft nog geen internationale erkenning verworven. Wanneer men wil exporteren zijn extra kosten en papierwerk noodzakelijk om een internationaal erkend label te verkrijgen. Dit kan een obstakel vormen voor Laotiaanse landbouwerverenigingen en ondernemingen. Een ander probleem zijn de huidige Laotiaanse standaarden voor biologische landbouw die niet volledig aangepast zijn aan landbouw in tropische klimaten met landbouwpraktijken die verschillen van deze in het Westen.

Slecht enkele actoren zijn actief in de biologische sector in de drie provincies. Zowel in de provincies Vientiane als Xiengkhouang wordt de biologische moerbeithee sector *(Morus alba)* gemonopoliseerd door 1 actor die instaat voor zowel de productie, verwerking als het verhandelen van de biologische thee (Vang Vieng organic farm en Mulberries Inc., respectievelijk). Ondanks dat beiden een monopolie hebben van biologische moerbeithee in hun provincie, ligt de verkoopprijs van Mulberries Inc. 2 tot 5 maal hoger per kg verpakte moerbeithee dan deze van Vang Vieng organic farm. Een mogelijke verklaring ligt in de bestemming van hun producten. Mulberries Inc. verkoopt 50 % van haar producten op de internationale markt, terwijl Vang Vieng organic farm voornamelijk op de nationale markt verkoopt. In de provincie Champasak is er een grote landbouwergroepering (Paksong Farmer Organic Tea Production group) met 136 leden en een familiebedrijf (Mrs. South) dat samenwerkt met 10 families, die allen biologische thee *(Camellia sinensis)* produceren. Zowel de leden van de landbouwergroepering als de families die samenwerken met Mrs. South telen thee in thee tuintjes van minder dan 1 ha groot.

Sommige actoren, zoals Vang Vieng organic farm en het familiebedrijf van Mrs. South, maken gebruik van hun locatie in een toeristische omgeving voor het verkopen en promoten van hun biologische thee. Zowel Mulberries Inc. als LFP (Lao farmer's products) exporteren meer dan 50 % van de verwerkte thee. De overige handelaars verkopen voornamelijk aan lokale

kleinhandelaars, groothandelaars (Laotiaanse winkel keten) en toeristen. Enkel Mulberries Inc., de landbouwergroepering in Paksong en LFP zijn biologisch gecertifieerd. De overige actoren bevinden zich in het proces tot het verkrijgen van het biologische label en anderen vinden het onnodig om te investeren in biologische certificering aangezien hun kopers en consumenten hen reeds vertrouwen om biologisch te telen.

De waardeketens uit de drie provincies hebben verschillende sterktes en zwaktes, maar ontoereikende marketing wordt in het algemeen beschouwd als de grootste beperking voor verdere ontwikkeling van de theeketen. Marketing en netwerkingsvaardigheden kunnen verbeterd worden door training van Oxfam Solidariteit aan landbouwergroeperingen en ondernemingen in elke provincie.

Uitbreiding van de theesector is mogelijk in elke provincie. In de provincies Vientiane en Xiengkhouang is uitbreiding mogelijk door nieuwe producenten aan te trekken. In de provincie Xiengkhouang heeft Mulberries Inc. een project opgestart om productie van biologische moerbeithee aan te leren aan families in Ta Thom district, aangezien er meer vraag is naar moerbeithee dan Mulberries Inc. kan leveren. Deze families werden recent overgeplaatst door de Laotiaanse overheid van de afgelegen berggebieden naar laagland en hebben weinig ervaring met landbouw.

Vang Vieng district in de provincie Vientiane is een zeer toeristisch gebied en heeft een grote potentiele afzetmarkt. DAFO *(District Agriculture and Forestry Office)* overweegt om biologische moerbeithee te erkennen en promoten als een ODOP *(One District, One Product)* product, een typisch product voor Vang Vieng district. Dit zal lokale hotels en gastenverblijven aanzetten om deze thee te serveren en voor lokale winkels om deze te verkopen. Het grootste obstakel in Vang Vieng district voor DAFO en Oxfam Solidariteit zal zijn om meer landbouwers te overtuigen om moerbei te telen, aangezien het succes van biologische moerbeithee onzeker is.

Zowel financiële als technische ondersteuning van Oxfam Solidariteit en haar lokale partner

organisaties PSC en ADSP kan voorzien worden in de provincies Vientiane en Xiengkhouang, wanneer theeproductie in deze provincies uitgebreid wordt. In de provincie Champasak zijn reeds voldoende producenten aanwezig en kan productie toenemen door (gedeeltelijk) verlaten thee tuintjes van de leden van de landbouwergroepering in Paksong opnieuw te cultiveren. Dit kan enkel gebeuren wanneer er meer vertrouwen is tussen de landbouwergroepering in Paksong en hun voornaamste koper LFP, die de thee verpakt en verkoopt op de nationale en internationale markt. Een toename in theeproductie heeft immers enkel nut wanneer er voldoende vraag naar is. LFP staat twijfelachtig tegenover grotere aanbiedingen van internationale kopers aangezien ze

niet zeker zijn dat de landbouwergroepering in Paksong in staat is om de gevraagd kwantiteit en kwaliteit te leveren binnen de gevraagde tijd. De landbouwergroepering in Paksong zelf is enkel bereid om de (gedeeltelijk) verlaten theetuintjes opnieuw te onderhouden wanneer ze zeker zijn van een continue verhoogde vraag. Een oplossing kan zijn voor LFP om de bestellingen geleidelijk aan te vergroten, zodat het vertrouwen tussen beide partijen toeneemt. Een andere optie voor de landbouwergroepering in Paksong is om zelf nog andere afzetmogelijkheden te zoeken. Op dit ogenblik is deze landbouwgroepering een winkeltje aan het bouwen in Paksong waar ze de thee lokaal kunnen verkopen. Ondersteuning in het maken van een goed marketing plan en verpakkingssysteem kan aangeboden worden door Oxfam en ASDSP.

Elke provincie biedt mogelijkheden voor verdere ontwikkeling en uitbreiding van de biologische theesector. Het toepassen van de gesuggereerde maatregelen kunnen een positieve invloed hebben op de levenskwaliteit van actoren uit de biologische theesector en tegelijkertijd zorgen voor een boost in de consumptie van Laotiaanse biothee in Laos en over de hele wereld

1. Introduction

1.1 Background

Laos is a developing country in transition. Twenty-two percent of the population lives below the poverty line (CIA, 2013). The Lao government has set a goal to be removed from the Least Developed Countries list by 2020. Over 80 % of the population lives in rural areas, the majority of which are small-scale farmers. Low quality of production and processing, lack of adequate services, lack of secure access and ownership over resources, and lack of an enabling environment are the main constraints of livelihood improvement for small-scale farmers. These constraints are particularly present in the uplands, where the majority of the poor live, and where farming is largely for subsistence (HELVETAS, n.d.).

A wide variety of measures can be implemented to improve the livelihoods of small-scale farmers, including trade liberalisation, increasing agricultural production, improving support service and resource effectiveness, better local governance, fair terms of trade, better infrastructure etc. These can all have an important part to play in making market systems work for small-scale farmers. When resources are limited, it is seldom possible to address all factors simultaneously. Therefore it is useful for development agencies or policy makers to select a sub-sector or even one value chain to focus on and improve its overall performance. Improved performance of a value chain could mean a greater efficiency, lower transaction costs throughout the chain, an improved capacity to anticipate and respond to changes in demand and better income and power distribution throughout the value chain (Albu & Griffith, 2005).

The sub-sector or value chain chosen for intervention needs to play an important role in the livelihoods of the small-scale farmers and have realistic prospects for sustainable economic growth. This sub-sector or value chain should be analysed and market-related issues, including access to information, institutions, linkages and trade environment, should be taken into consideration (Albu & Griffith, 2005).

1.2 Eat Greener project

Laos is surrounded by highly competitive agricultural countries such as Vietnam and Thailand, which are both very well positioned in international agricultural commodity markets. Competing with these countries on similar markets is unlikely to bring tangible results. However, Laos has a considerable amount of land and potential to produce high added value products for niche markets, such as Mekong algae, balsamic wood resin, wild tea varieties and high altitude coffee.

Organic agricultural products could be another niche market with potential to be exploited (Ministry of agriculture and forestry, 2010).

An important share of farmers is still using chemical free production systems and could thus easily be integrated into the organic sector, when assisted properly (Ministry of agriculture and forestry, 2010). Oxfam Solidarity Belgium, a developing agency operating in Laos, aims at facilitating small-scale farmer integration into the organic agricultural sector by implementing a project called "Eat Greener - Changing Food Consumption Patterns – a Sustainable Approach towards Economic Development in Laos", hereafter referred to as the Eat Greener project. Through this project, Oxfam aims further to boost national, Asian and European consumption of Lao organic food products. It is useful for a NGO to select one sub-sector and improve its overall performance. A problem tree leading to the selection of the organic sector as sub-sector to be improved, is presented in Figure 1. As communicated in a conversation with Joelle Plumerel, responsible for the Eat Greener project in Belgium, the Eat Greener project has put forward four objectives, which need to be achieved:

1. raise consumers' awareness about Lao organic food products;
2. increase the number of Small and Medium Enterprises (SMEs) involved in organic value chains;
3. improve the Lao Certification Body so that it operates autonomously and meets international certification standards;
4. adopt government policies that encourage the development and the demand of organic products.

Participatory value chain analyses of organic commodities are an important part of the second objective.

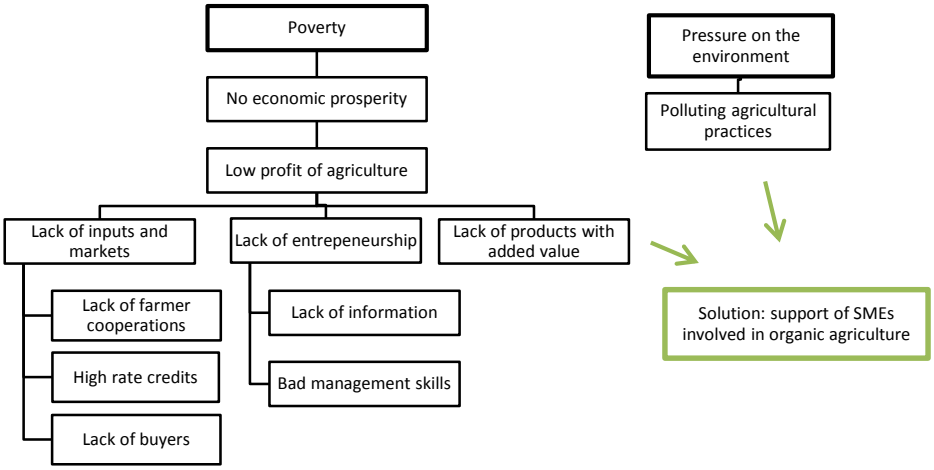

Figure 1 Problem tree leading to the selection of the organic sector as sub-sector to be improved

1.3 COMMODITY SELECTION

In order to improve the organic sector in Laos, a number of relevant organic commodities is selected by the Eat Greener project.

Rice was chosen as a first commodity to be analysed by the Eat Greener project, because it is a staple crop in Laos and was already produced organically on a small scale in several areas in Laos. The study on rice was conducted by Sunnti Duangtavanh (2015).

Organic tea was chosen as a second commodity. Its value chains will be analysed in the present study. It is the second most produced organic crop in the areas targeted by the Eat Greener project. Two types of tea are examined in this study: classic organic tea (*Camellia sinensis*) and organic mulberry tea, derived from the leaves of *Morus alba*. Both organic teas offer the advantage of being able to compete on the international market with low quality tea from China and Vietnam because of its higher quality and higher value due to the organic label. The already available contacts with the District Agriculture and Forestry Offices in the target areas were another reason for the project to choose tea.

1.4 STUDY OBJECTIVES

The overall objectives of this study are to characterise the organic tea sector in Laos, to understand the functioning of the organic tea chains and to describe actors, links between them and service providers involved. Factors constraining the production and marketing of organic tea and opportunities for future improvements and market expansion need to be identified, as well as SMEs that can potentially be supported. Value chain analyses on organic tea are conducted in three target provinces: Vientiane province, Xiengkhouang province and Champasak province. These provinces are chosen because of the presence of organic tea production and already available contacts with local stakeholders.

Research questions:

- Who is involved in the organic tea value chains in the target provinces, what are their respective roles and linkages?
- What are the main factors constraining the organic tea sector and what are opportunities for optimisation of the organic tea value chains in the target provinces?
- Which recommendations could be given to optimize the tea value chain in every province?

1.5 MASTER THESIS OUTLINE

Chapter 1 introduces the problem statement, the purpose and objectives of this thesis and its connection to the Eat greener project. Chapter 2 explains why organic agriculture can be used as a method for poverty alleviation in developing countries and continues by explaining participatory value chain analysis and how to perform it. The second part of the chapter handles a botanic review of *Camellia sinensis* and *Morus alba* and introduces the organic cultivation and processing of both teas in Laos. Chapter 3 starts with a brief overview of the study area and continues by describing the data collection and analysis methods used in the study. In chapter 4, the organic food sector in Laos is characterised, taking into account the influences from its political, economic, social and technological environment. In the second part of this chapter, the tea value chains in the target provinces are described. In chapter 5, the results in chapter 4 are discussed and compared with findings of other authors. For every target province recommendations for improvement of the value chains are suggested. In chapter 6, the conclusions of the thesis are presented and recommendations for further research are provided in chapter 7.

2. Literature review

This chapter starts with an explanation of why organic agriculture can be used as a method for poverty alleviation in developing countries and continues by explaining participatory value chain analysis and how to perform it. The second part of the chapter handles a botanic review of *Camellia sinensis* and *Morus alba* and introduces the organic cultivation and processing of both teas in Laos.

2.1 Organic agriculture as a method of poverty alleviation in developing countries

"Organic agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic Agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved." (World Board IFOAM, 2008)

Organic farming has recently gained attention as a method of poverty alleviation and a way to manage natural resources more sustainably in developing countries. The organic movement in developing countries started through cooperation between small-scale farmers and NGOs, but has recently gained interest by governments and donors as a development strategy (Setboonsarng, 2006). In Laos, organic agriculture has been incorporated in the Strategy for Agricultural Development 2011 to 2020 and the Lao National Socio-economic Development Plans for 2006-2010 and 2011-2015 (Ministry of agriculture and forestry, 2010; Ministry of planning and investment 2006 & 2011).

Organic certification adds value to agricultural products and provides access to attractive local and international markets. In organic farming, the added value is created by building on assets which poor farmers already have, such as land free of intensive use of chemicals and knowledge of traditional production systems (Setboonsarng, 2006).

There is substantial evidence showing yield and income improvements for poor farmers conversing to organic agriculture in developing countries. IFAD (International Fund for Agricultural Development) has carried out two extensive and detailed evaluations of the conversion to organic agriculture in Latin America and in Asia.

The evaluation of Latin America and the Caribbean revealed that in all case studies, farmers were able to receive higher prices for certified organic products compared to when they would have

sold them as regular products in conventional markets. Low-input farmers experienced a yield increase when shifting to organic methods. Farmers who applied chemical inputs before conversion obtained lower yields in the first year, compared to yields obtained before conversion. In some cases there was no yield difference after the switch to organic production. In all case studies, small-scale farmers that converted to organic agriculture obtained higher net revenues than before switching. In five out of the six countries covered by the study, small-scale farmers dominated organic production for export as well as domestic markets (IFAD, 2002).

The results of the evaluation in Asia showed that the immediate impact of conversion to organic production differed between farmers, depending on organisational support and cultivation method before conversion. The switch to organic production by low-input farmers tended to result in higher yields. When more intensive production methods were used before the switch, first-year losses in yield prevailed. After three years, yields had stabilised but remained somewhat below conventional yields. Here it was also the case that both types of farmers improved their income after conversion to organic production, due to higher premiums paid for organic products (Giovannucci, 2007).

The United Nations conducted a study on organic agriculture in relation to food security in Africa. It was revealed that yields stay stable when converting from farm systems that use low amounts of synthetic inputs to organic production. Over time, yield increased and became comparable to yields of more conventional, input-intensive systems. Food availability increased in all cases examined in this study (Hine, 2008).

The IFAD study in Latin America showed that organic production was associated with positive effects on health of producers and the environment. The study collected anecdotal evidence of past health problems associated with chemical inputs. Organic producers stated that concern for the potential health effects of chemical inputs had been an important factor for conversion to organic production (IFAD, 2002).

All of the case studies evaluated in the study of organic agriculture in Africa, contained some element of education that increased the knowledge of organic farming methods and the skills of farmers. In many cases, a direct health improvement of individuals and communities was observed as a result of increased knowledge, increased yields and improved access to food. In organic agricultural systems, farmer groups and cooperatives are often formed, which lower the costs (e.g. certification costs, processing costs) through economies of scale and increases knowledge sharing. Government or NGO partners can support farmers with organic certification, access to export and domestic markets and knowledge of cultivation and marketing techniques.

The majority of the case studies reported improvements of natural capital, including benefits to soil fertility, water supply, flood control and biodiversity (Hine, 2008).

2.2 PARTICIPATORY VALUE CHAIN ANALYSIS

*"A value chain analysis reveals the system of interactions and relations between different firms and organisations influencing the operation of the market system in the value chain. The relationships shed light on how the product is traded and between whom. It shows the process of creating value, which in many cases is not just production but the value-added activities that increase incomes. This information is crucial for identifying solutions for improving markets" (*SEEP Network, 2006).

In this study, a participatory approach is used for the conduction of value chain analyses in order to generate more accurate results and have a wider range of knowledge on the nature of interactions between actors, their business environment, problems they are confronted with and opportunities that arise. Participation provokes interest, builds trust and can facilitate collaboration for the improvement of linkages and value chain efficiency and for coordinating collective action later on (Albu & Griffith, 2005).

2.2.1 Market characterisation

At present, production systems tend to be "market-pulled", as opposed to "supplier-pushed", with the former having higher competition in the value chain. Examining the characteristics of the final product market is necessary for understanding the qualities the actors lower in the chain will need to possess in order to fulfil the expected requirements. In low income final markets, price will be a relatively important factor. In higher income final markets, non-price characteristics such as quality, differentiation and branding are more important (Kaplinsky & Morris, 2001).

Markets are segmented and each market segment has distinctive characteristics that need to be documented. For example, in the food sector, market segments include low income processed foods, convenience foods, organic foods, ethnic products, etc. (Kaplinsky & Morris, 2001).

2.2.1.1 PEST analysis

The PEST analysis is a common approach to categorize external influences of a business environment, namely political, economic, social and technological forces. The analysis examines the impact of each of those factors and their interplay with each other on the sector. In this study, the PEST analysis is used to situate the organic sector in Laos: how the organic sector was established and how the market is influenced by its political, economic, social and technological environment (Makos, 2013; Rivani & Ward, 2005).

(a) Political environment

Government regulations and legislation can have a great influence on a business sector. The main elements that should be assessed include political instability, tax guidelines, (international) trade regulations and restrictions, (food) safety regulations and employment laws. The occurrence of organic agriculture will strongly depend on the political climate and regulation systems available in a country (Makos, 2013; Rivani & Ward, 2005).

(b) Economic environment

Economic issues, such as inflation, interest rates, economic growth, unemployment rate, government spending, etc. can have an impact on a business sector (Makos, 2013; Rivani & Ward, 2005).

(c) Social environment

Social factors influence people's choices. Consumer needs are based on culture, lifestyle, education, income distribution, population growth and the amount of concern about health, the environment and sustainable development (Makos, 2013; Rivani & Ward, 2005).

(d) Technological environment

Technology can have a positive or negative impact on the introduction of a product on the market. Access to technology, technological advancements, the role of internet and mobile phones, energy use and costs, rate of technology transfer and the amount of government fund available for research can play a role (Makos, 2013; Rivani & Ward, 2005).

2.2.2 Value chain mapping

A value chain map provides an overview of the roles and connections between participating actors in a value chain and traces product and information flows. It helps identifying key actors and sources of innovation and improvement (Kaplinsky & Morris, 2001).

A value chain map is a conceptual framework for thinking about the commercial and institutional environment in which small-scale producers and SMEs operate. When the value chain map is conducted in a participatory way, it can directly improve linkages and relationships between market-chain actors and be a starting point for introducing innovation in products, processes and market access later on (Albu & Griffith, 2005).

For conduction of the value chain map, the methodical framework presented by Albu & Griffith (2005) is pursued.

According to Albu & Griffith (2005), a value chain map is made up out of three inter-linked components (see Figure 2).

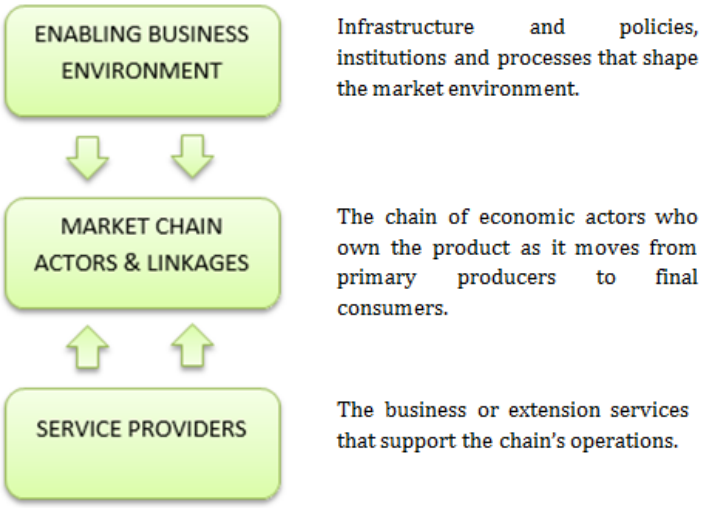

Figure 2 Components of a value chain map (Albu & Griffith, 2005)

(a) Value chain actors

The central component of a value chain map consists of the economic actors who own and transact a product that moves through the value chain from primary producer to final consumer. These economic actors include family farms and large-scale producers, traders, processors, transporters, wholesalers[1], retailers[2], etc.

Information about product volumes, values and number of livelihoods supported in the chain should be documented, as far as possible. An analysis should be made of how value accumulates along the value chain. By understanding the contribution of each actor to the product, inefficiencies and inequities can be identified.

Attention should be paid to governance in the chain, since this influences how profit margins are distributed along the value chain. To determine which actors or other institutions have power in a chain, answers to the following questions should be found:

- Which actors/institutions define the conditions for participation in the chain?
- Which actors/institutions ensure compliance with these rules?
- Which actors/institutions provide assistance with meeting these rules?

[1] A wholesaler is a person or firm that buys large quantity of goods from various producers or vendors, warehouses them, and resells them to retailers.
[2] A retailer is a business or person that sells goods to the consumer.

(b) The enabling business environment

The enabling business environment represents the critical factors and trends that shape the value chain environment and conditions in which actors operate. These factors are generated by institutions (policies, regulations and practices) and structures (national and local authorities, research agencies, etc.) that are not under direct control of value chain actors.

Factors influencing the business environment can be distinguished into

- factors relating to *market demand*, such as price, quantities, quality, taxes and tariffs.
- factors relating to *transformation activities*, such as costs of production, processing, storage and transportation.
- factors relating to *transaction activities*, such as business costs, business licensing and regulation, certification costs, systems for agricultural finance and registration of land and property.

Policy initiatives on rural poverty often focus on improving transformation activities. An increase of agricultural productivity is attempted by improving technological development in seeds, farming inputs, storage and processing techniques and by infrastructre investment. However, in value chains based on small-scale farming, transaction cost can be a big obstacle for entering the market. Transaction costs in rural economies can be high due to dispersed production, inaccesable legal systems, unclear property titling and low level of trust. When this is the case, improving agricultural productivity alone might be irrelevant for improvement of the value chain. Therefore it can be more useful to aim for improvents in trade liberalisation, support services, resource availability, local governance, infrastructure and for providing fairer terms of trade.

(c) Service providers

The value chain actors are supported by inputs and technical or market services from other enterprises and support organisations. The services that add value to the value chain or could potentially add value in the future, should be mapped out, since they could offer an opportunity to improve market-chain efficiency.

Services potentially adding value to the chain include input supplies (seeds, fertilizers, etc.), market information (prices, trends, buyers, suppliers), financial services (loans, insurance), transport services, quality assurance (monitoring and accreditation), technical expertise, business advice, support for product development and diversification, etc.

When identifying existing services, it is important to realise that services are not only provided by conventional government extension services and private fee-based services. Often, services are

embedded in a commercial transaction, e.g. pest control advice offered by a trader to a contract farmer. Services can also be informally provided, when information or advice is exchanged through social networks.

2.2.3 Value chain recommendations

In order to recommend improvements for a value chain, main factors constraining the evolvement of a commodity sector and opportunities for improvement of the value chains need to be identified. A SWOT analysis can be conducted, providing an overview of the main strengths, weaknesses, opportunities and threats of the commodity sector. Based on these SWOT analyses, possible scenarios can be suggested on how to overcome the constraints, make use of the opportunities, and how to better organise the market chain (Kaplinsky & Morris, 2001).

2.2.3.1 SWOT analysis

A SWOT analysis is a simple but structured approach to evaluate a company's strategic position in the market, by identifying its strengths and weaknesses and comparing these to opportunities and threats in the market. The conceptual structure of the SWOT-framework is presented in Figure 3 (Piercy, 2002).

	Internal factors	External factors
Favourable factors	STRENGTHS	OPPORTUNITIES
Unfavourable factors	WEAKNESSES	THREATS

Figure 3 Conceptual structure of the SWOT-framework (Piercy, 2002)

According to Piercy (2002) a SWOT analysis needs to follow certain rules in order to produce useful results:

(a) SWOT analysis needs to be focused

The more carefully an area is defined, the more productive a SWOT analysis is likely to be. SWOT analysis needs to represent a shared vision. Multiple people cooperating on a SWOT analysis is useful for obtaining richer results and reaching consensus about important issues.

(b) Customer orientation for strengths and weaknesses

Only the strengths and weaknesses that are seen and valued by the customer should be mentioned in a SWOT analysis.

(c) Environmental analysis: threats and opportunities

When identifying opportunities and threats, it is important to realise that these are elements of the environment. They are independent of the actions and strategies of actors in the market chain.

(d) Structured strategy generation

The items listed in every category of the SWOT, should be ranked by importance. The SWOT-matrix can then be used to generate strategies and recommendations for the commodity sector.

When considering recommendations, 4 types of improvements need to be contemplated (Kaplinsky & Morris, 2001):

- Improvements in *process*, either within a firm or as a result of linked actions between firms.
- Improvements in *products*, either within a firm or as a result of linked actions between firms.
- A change in *functional positions*, either by adjusting activities within a particular link, or moving to activities taking place in other links.
- Moving out of the value chain and into a new value chain.

2.3 BOTANIC REVIEW

2.3.1 *Camellia sinensis*

Tea (*Camellia sinensis*) is one of the oldest beverages in the world. It was supposedly discovered by Chinese Emperor Shen Nung around 2700 BC. From China, tea was brought to Japan by Buddhist monks at the beginning of the 8th century. It was introduced in Western Europe in the 17th century, primarily as a medicine. At the beginning of the 19th century, consumption of tea increased rapidly, particularly in the countries of the British Commonwealth. This increase was due to rust infections of coffee gardens in India and Sri Lanka, which had to be replaced by tea plants (Chang, 2015; Van Damme, n.d.; van Dierendonck, 1959).

2.3.1.1 Production

In 2013, the worldwide tea production was estimated at 5 million tonnes. Around 78 % of this world tea production was produced in the Far East, with China (1.9 million tonnes) and India (1.2 million tonnes) as main producers, followed by Sri Lanka (0.3 million tonnes) and Vietnam (0.2 million tonnes). Thirteen percent was produced in Africa, mainly in Kenya (0.4 million tonnes) whereas 5 % was produced in the Near East, with Turkey as main producer (0.2 million tonnes), 2 % in Latin-America with Argentina as main producer (79 thousand tonnes) and 2% in Japan (85 thousand tonnes) (Chang, 2015). In 2013, Laos produced 900 tonnes of tea or 0.0002 % of the amount of tea produced in the Far East (FAOSTAT, 2015). In 2014, Laos produced 111.6 tonnes of certified organic tea. No indication is given weather this amount also includes tea production quantities from other plant species than *Camellia sinensis,* such as *Morus alba* (Duangtavanh, 2015).

The average yield in the world for tea (*Camellia sinensis)* is around 1,110 kg/ha (Chen et al., 2012).

2.3.1.2 Classification

Classification of *Camellia sinensis*, according to the flowering plants handbook (Byng, 2014) is as follows:

Order	*Ericales*
Family	*Theaceae*
Tribe	*Theeae*
Genus	*Camellia* L. – tea
Species	*Camellia sinensis* (L.) Kuntze – tea

Figure 4 Taxonomy of *Camellia sinensis* (L.) Kuntze – tea (Byng, 2014)

Botanically, three sub-species of *Camellia sinensis* can be recognized: *assamica, cambodia* and *sinensis.* They all hybridize freely. Because of numerous (sub)varieties, classification is complex and might be confusing. For practical purposes, the cultivated varieties can be divided in three groups: the Assam variety (*Camellia sinensis* var. *assamica* (Masters)), the China variety (*Camellia sinensis* var. *sinensis)* and the hybrid tea group, which incorporates all hybrids of the latter two groups (Carr & Stephens, 1992; van Dierendonck, 1959).

The Assam variety, with relatively large, horizontally displayed leaves is thought to have evolved as an understorey tree in a forest environment. Unpruned, it can reach heights from 10 to 20 m, while China tea seldom reaches 10 m. The China variety, with small semi-erect leaves is thought to have been a shrub which originally grew in the open. It grows better in humid and hot climates.

Because of extensive inter-breeding, most commercial tea displays vegetative characteristics intermediate between these two main types. Populations can be found which range in mean phenotype (and possibly genotype) from almost pure China tea to almost pure Assam tea (Carr & Stephens, 1992; van Dierendonck, 1959).

2.3.1.3 Description

The tea plant is a perennial evergreen. It is grown as a tree, semi-tree or shrub depending on the external environment. *Camellia sinensis* var. *sinensis* or China tea usually grows into a shrub about 1 – 5 m high, with long, slender and more or less straight stems. Leaves are 1.5 – 8 cm long (see Figure 5), hard and have a dark-green colour with a dull surface. *Camellia sinensis* var. *assamica* or Assam tea is described as an erect tree with many branches and can become 8 – 12 m high. Leaves are 15 – 20 cm long (see Figure 5) and have a light-green colour with a glossy surface (Chen et al., 2012).

Tea flowers are bisexual with a slight fragrance and are usually white. The morphology of the flower is one of the important parameters in the classification of the tea plant. The fruit of the tea plant is light green (see **Fout! Verwijzingsbron niet gevonden.**), usually three-celled, thick-walled and shiny at first, but then duller and slightly rough later. Tea seed has a brown colour, is thin-shelled, about 1 – 2 cm in diameter, and is (semi-)round in shape (Chen et al., 2012).

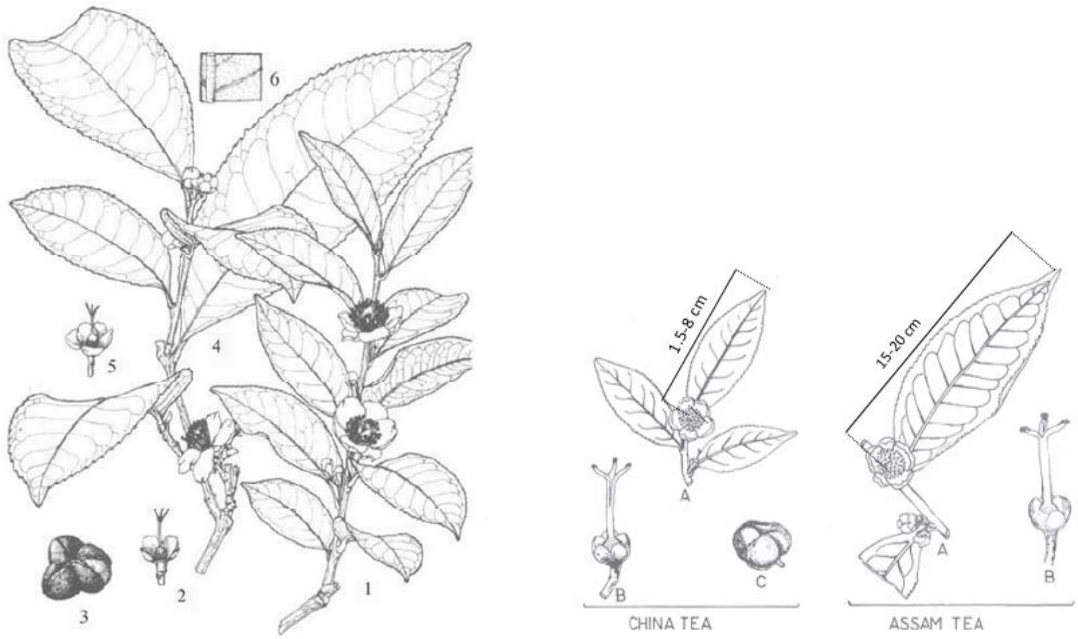

Figure 5
Left: *Camellia sinensis* var. *sinensis* (1-3) and *Camellia sinensis* var. *assamica* (4-6). 1 flower and branch; 2 gynoecium; 3 fruit; 4 flower and branch; 5 gynoecium; 6 undersurface of leaf (Chen et al., 2012)
Right: Leaf length of China and Assam tea (Carr & Stephens, 1992)

Fresh shoots represent the economic harvest of the tea plant. Leaves have an alternate phyllotaxy. Leaves are leathery in texture, with silvery pubescences (fine, short hairs) on the undersurface of tender leaves. Lateral veins curve upward and connect with the upper veins, forming a dense transporting network, which is a typical characteristic of the leaves of the tea plant (Chen et al., 2012).

The tea beverage is made using tender shoots consisting of a few leaves with an apical bud. Commonly, a shoot with 2-3 leaves is harvested. These shoots can be actively growing (i.e. with an active apical bud) or dormant (i.e. with a dormant apical bud). During plucking, the apical dominance is removed. One or two axillary buds below the plucking point will start swelling and regenerate new shoots. Generally, the axillary bud immediately below the plucking point is the first to produce a new shoot. The first leaf appendages to unfurl are the two outer covers of the bud as 'scale leaves' (see **Fout! Verwijzingsbron niet gevonden.**). These two scale leaves have a short lifetime and they fall off a few days after opening. The next leaf appendage to open is the fish-leaf or *janum* which is an oval-shaped, blunt leaf without apparent serration and veins. Tea manufactured from the fish-leaf is of low quality. After producing the fish-leaf, the terminal bud produces normal 'flush leaves' (De Costa et al., 2007).

The growth rate of the axillary bud is slow until the production of normal leaves begin. The terminal bud of a growing shoot on a frequently harvested tea bush produces several leaves before it ceases leaf production and becomes dormant. The dormant bud or *banji* is a few millimetres long bud, usually covered by leaf hairs. It can be easily differentiated from an active apical bud, which is much larger (see Figure 6). The dormant apical bud re-activates its leaf production after a dormancy period, ranging from several weeks to months depending on various ecological and genetic factors. This characteristic of alternative active and dormant phases of growth of a free-growing shoot is known as periodic growth or growth periodicity of tea. A tea bush in plucking has both actively growing and dormant shoots (De Costa et al., 2007).

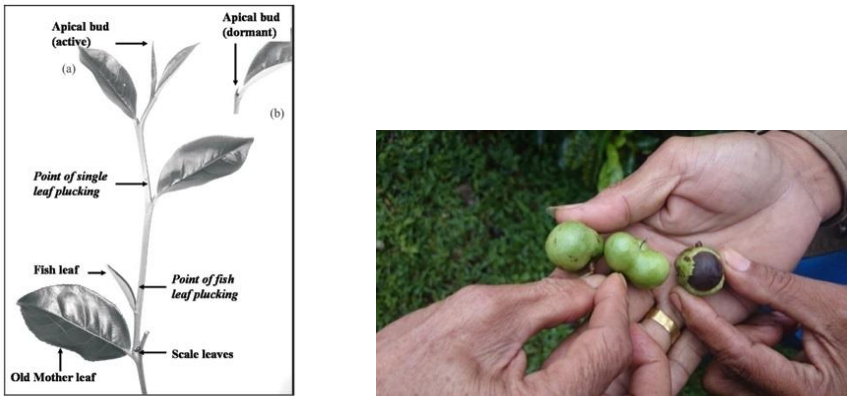

Figure 6 Left: Typical active (a) and dormant (b) shoots of tea (De Costa et al., 2007)
Right: Fruit and seed of a tea plant, taken at Paksong Farmer Organic Tea Production group

2.3.1.4 Agro-climatic requirements

The origin of tea lies within a fan-shaped area extending from the Assam/Myanmar border in the west to China in the east, and south from the line through Myanmar and Thailand to Vietnam (see Figure 7). This is an area of monsoon climates with a warm, wet summer and a cool, dry (or less wet) winter. Tea has been introduced into many other areas of the world and is grown in conditions which range from Mediterranean-type climates to the hot, humid tropics (Carr & Stephens, 1992).

Figure 7 Map with a fan-shaped area representing the origin of tea (University of Texas, 2004)

The minimum air temperature required to support shoot growth is 13-14 °C, with optimum growth from 18 to 30 °C. The tea plant seems unable to maintain a favourable water balance in its leaves if the saturation deficit of the air exceeds about 2.0 kPa. A high relative humidity is thus necessary to maintain a favourable water balance in tea leaves, even when the soil profile is at field capacity. In most tea areas 150 mm of rain each month will ensure continuous crop production, i.e. an annual total of 1800 mm. Tea should not be grown in areas where the rainfall is below 1150 mm, unless irrigation is available. Areas subject to frequent hail storms should be avoided, and high winds are harmful to growth, at least when the soil is wet (Carr & Stephens, 1992).

Tea is originally mountain vegetation. In tropical areas it grows well from sea level up to 2500 m above sea level. Height has a positive influence on flavour but results in lower yields. At a higher level above sea there is also more risk of hail storms (Van Damme, n.d.).

2.3.1.5 Pests and diseases

Insect pests can cause a decrease in tea production by weakening the tea plant or directly damaging tea shoots. The most serious pests occurring on tea *(Camellia sinensis)* in Asia are as follows (Chen et al., 2012; Muraleedharan,1992):

- **sucking pests** which suck the sap from buds, young leaves and tender stems and cause deformation and bad growth of leaves due to intensive feeding: including tea leafhopper *(Empoasca vitis),* tea black spiny whitefly *(Aleurocanthus spiniferus),* tea mirid *(Helopeltis schoutedeni)* and tea aphid *(Toxoptera aurantii)*
- **defoliating chewing pests** which can cause serious damage to the shoots and leaves: including tea looper *(Ectropis oblique),* tea tussock *(Euproctis pseudoconspersa)*, tea small leafroller *(Adoxophyes honmai),* tea leafroller *(Homona magnanima)* and tea tortrix *(Homona coffearia)*
- **tea mites** which cause damage to the green tissues of foliage and thereby reduce the area of photosynthetic surface, resulting in lower yields: including tea pink mite *(Acaphylla theae),* tea scarlet mite *(Brevipalpus obovatus),* tea kanzawai mite *(Tetranychus kanzawai),* tea red spider mite *(Oligonychus coffea)* and scarlet mite *(Brevipalpus phoenicis)*
- **stem-boring pests**: including tea shot-hole borer *(Xyleborus fornicatus)*

The occurrence of tea diseases is serious in hot and humid environments. Blister blight *(Exobasidium vexans)* is a major tea disease affecting leaves of young branches in China, India, Sri Lanka and Indonesia. Other common diseases on tea in Asia are tea anthracnose disease *(Gloeosporium theae-sinensis)* and brown blight *(Guignardia camelliae)*. A major disease affecting the roots of tea plants is root knot *(Meloidogyne incognita*, *Meloidogyne javanica)*. Other root diseases are red root rot *(Poria hypolaterita*, *Ganoderma sp.)* and brown root rot *(Phellinus lamaensis)* (Chen et al., 2012).

The damage in yield caused by these pests and diseases ranges from 5% – 55%, and generally from 10% – 20% (Chen et al., 2012). Early intervention and prevention of pest and diseases is important in tea production because pesticide residue on tea leaves can result in lower quality tea or tea that is not suited for consumption (Van Damme, n.d.).

2.3.2 *Morus alba*

The most important use of mulberry *(Morus spp.)* globally is for silk manufacturing. The foliage of mulberry is used to feed silkworms *(Bombyx mori)*, which feed exclusively on mulberry leaves. Silk production was important in Europe during the 19th and early 20th centuries. In Japan and Korea it was important up to the middle of the 20th Century. Silk production nowadays is dominated by China and India (Sánchez, 2002).

The foliage is also used for herbal teas, animal fodder and medicinal uses. In most European countries, including Turkey and Greece, mulberries are grown for fruit production rather than foliage (Singhal et al., 2010). Other uses of mulberry are for landscaping, gardening and handicraft (Sánchez, 2002).

Due to the importance of silk trade in the past and the additional uses of mulberry, *Morus spp.* know a wide distribution throughout the world. The origin of most cultivated mulberry varieties is believed to be in the area of China-Japan and at the base of the Himalayas (Sánchez, 2002).

The most popular species in the world are *M. alba* and *M. indica*. These have been subject to breeding in several countries, resulting in over a thousand varieties including many polyploids (Sánchez, 2002). In the area under study *M. alba* is cultivated for herbal tea production.

2.3.2.1 Production

The only countries for which data concerning production area of *Morus spp.* are available and substantial are Brazil (38,000 ha), China (626,000 ha) and India (280,000 ha). Mulberry production in Cuba, the Dominican Republic, El Salvador, Honduras, Mexico, Panama and Saint Vincent is limited to amounts less than 1000 ha per country (Sánchez, 2002). Note that these production areas are for mulberry in general. As can be observed in Table 1, mulberry leaf production for the purpose of herbal tea is only a minor use in Asia and Europe.

Table 1 Major and minor uses of mulberry in the world (Sánchez, 2002)

Continent	Major uses	Minor uses
Asia ***China, India, Japan etc.***	Sericulture Fruit Animal feed	Medicinal Herbal tea Handicraft
Africa ***Egypt, Ethiopia, Kenya etc.***	Sericulture	Animal feed Fruit
Latin America ***Brazil, Cuba, El Salvador etc.***	Animal feed	Sericulture Landscaping & gardening
Europe ***France, Greece, Turkey, Spain***	Landscaping & gardening	Herbal tea Fruit

2.3.2.2 Classification

Classification of *Morus alba*, according to the flowering plants handbook (Byng, 2014) is as follows:

Order	*Rosales*
Family	*Moraceae*
Tribe	*Moreae*
Genus	*Morus* L.
Species	*Morus alba* L.

Figure 8 Taxonomy of *Morus alba* L.– tea (Byng, 2014)

2.3.2.3 Description

M. alba is a perennial shrub (see Figure 9) or tree growing up to 10 m tall. The leaves are bright green, hairless and have an ovate or broadly ovate form with a rounded or heart-shaped base. The leaf margin is coarsely serrated to crenated. The leaf length varies between 5-30 cm, the width between 5-12 cm. For preparation of green mulberry tea, the fourth leaf of every branch is picked (not considering the shoot with the sprouting leaves). For preparation of red mulberry tea, the freshly sprouted young leaves are used. *M. alba* can be monoecious or dioecious, carrying male and/or female catkins (see Figure 9). The berry is a syncarp and consist of many individual fruits or drupes derived from separate ovaries within a common receptacle. The syncarp is blackish purple, purple or greenish white when mature (Zhengyi et al., 2003).

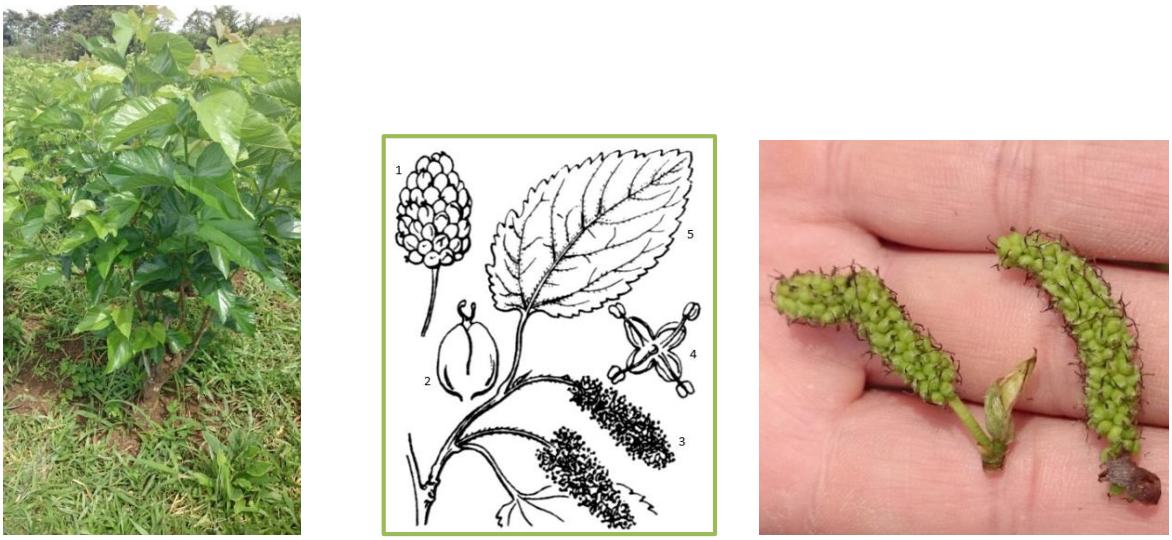

Figure 9 *Morus alba*
Left: Picture of *Morus alba* shrub, taken at Mulberries Inc., Xiengkhouang
Middle: 1 female catkin; 2 female flower; 3 male catkin; 4 male flower; 5 leaf (Dickenson, 2016)
Right: picture of a female catkin, taken at Mulberries Inc., Xiengkhouang

2.3.2.4 Agro-climatic requirements

M. alba grows in areas with a subtropical or mild temperate climate. It is shade-tolerant and highly susceptible to drought (Orwa et al., 2009).

Table 2 Minimal climatic requirements allowing production of *Morus alba* (Orwa et al., 2009)

Minimal climatic requirements	
Temperature	0-40 °C
Mean annual precipitation	1500-2500 mm
Soil type	pH 6.0-7.5 variety of soils ranging from sandy loam to clayey loam
Elevation	0-3000 m

2.3.2.5 Pests and diseases

Major pests on mulberry *(Morus alba)* in Asia are mulberry whitefly *(Pealius mori.)* which infests leaves, red-spotted longhorn *(Batocera rufomaculata)* of which the larvae are trunk borers and jackfruit longhorn *(Apriona germari)* of which the larvae bore branches. Minor pests causing damage to mulberry leaves include gold-dust weevil *(Hypomeces squamosus),* silk worm *(Bombyx mori)* and fluted scale *(Icerya aegyptica)* (Hill, 2008).

Diseases occurring on mulberry *(Morus alba)* include bacterial blight (*Pseudomonas syringae pv. mori)* and fungal leaf spot *(Cercospora moricola, C. missouriensis, and Cercosporella spp.)* (Texas A&M University, n.d.).

2.4 CULTIVATION AND PROCESSING OF ORGANIC TEA IN IN LAOS

2.4.1 *Camellia sinensis*

Cultivation and processing of tea *(Camellia sinensis)* varies amongst tea growing countries. In historic tea countries such as China and Japan, tea has been grown by small-scale farmers for many centuries. Therefore, methods for cultivation and processing can be old-fashioned and specific for a certain area (Harler, 1956). In India, Sri Lanka and Kenya tea production is mostly organized in large-scale corporate plantations, whereas small-scale tea production still dominates in China and Vietnam (Intergovernmental group on tea, 2012).

In Laos, tea cultivation by small-scale farmers is usually done by following the traditions of former generations (Yuzhe, 2010).

The tea producers and processors under study are working organically and mostly use traditional methods. Therefore, it is considered more interesting to describe the cultivation and processing methods as observed at the farms and plantations visited, than to describe methods presented in

literature. For an overview of the cultivation and processing methods of organic tea (*Camellia sinensis)* at the areas under study, see Annex 1.

2.4.2 *Morus alba*

M. alba is grown in many places around the world and comprises many varieties. Therefore, cultivation methods vary from region to region (Sánchez, 2002). For this reason and because cultivation and processing in the areas under study are being done organically, a description of the observed cultivation and processing methods of organic mulberry tea (*Morus alba)* is presented in Annex 2.

3. Methodology

This chapter starts with a brief overview of the study area and continues by describing the data collection and analysis methods used in the study.

3.1 STUDY AREA

Laos is a landlocked country located in Southeast Asia, situated Northeast of Thailand and West of Vietnam (see Figure 10). The economy depends heavily on the export of capital-intensive natural resources. Other significant contributions to the GDP are foreign investments in hydropower dams along the Mekong river, copper and gold mining, logging, and construction. Agriculture accounts for about 25% of the GDP and 73 % of total employment, with paddy rice in the lowlands as the most dominant crop (CIA, 2013.). In the rural areas, 80 % of the population are subsistence farmers. The estimated percentage of the population living in rural areas decreased from 72.9 % to 66.8 % between 2005 and 2010, indicating the beginning of a rural-to-urban shift (WHO, n.d.).

Figure 10 Location of Laos in Southeast Asia (University of Texas, 2013)

Value chain analyses are conducted in three target provinces in Laos: Vientiane province, Xiengkhouang Province and Champasak province (see Figure 11). These provinces are chosen because of the presence of organic tea production and already available contacts with local stakeholders.

Figure 11 Map of Laos showing the location of the target provinces: Xiengkhouang, Vientiane and Champasak province (United Nations geospatial information centre, 2004)

3.1.1 Vientiane Province

Vientiane province is a province in the Northwest of Laos. The research in this study focuses on one district, Vang Vieng district (see Figure 11). The district covers an area of 212.5 km^2 and has a population of around 65,000 people, living in 75 villages (Saliankham et al., 2013).

Tourism plays a key part in the economy of Vang Vieng district. It provides income for local people involved in accommodation, transport, food and entertainment (Saliankham et al., 2013). Farmers living near Vang Vieng town rely on its markets for selling their products, which are highly demanded by local restaurants (Thongyoun, n.d.). Vang Vieng district is not ideally situated

for growing classic tea (*Camellia sinensis).* However, *Morus alba* is grown in that area for the production of organic mulberry tea.

3.1.2 Xiengkhouang province

Xiengkhouang is a province in the Northeast of Laos (see Figure 11). It is a mountainous area and is one of the main maize producing regions of Laos. Xiengkhouang consists of 8 districts, namely Paek, Kham, Nong Hed, Khoune, Mok May, Phu Kud, Pha Xay, and Tha Tom. The last one has been recently transferred to a new province. The majority of its population lives in rural areas and is engaged in subsistence farming and livestock (Duangtavanh, 2015). The study focuses on the area surrounding Phonsavan, the capital city of Xiengkhouang Province, where *Morus alba* is grown for tea production and silk worm rearing.

3.1.3 Champasak province

Champasak is a province in the Southwest of Laos. The research in this study focuses on Paksong district, located on the Boloven Plateau, near the province capital Pakse (see Figure 11). Paksong is a self-sufficient district with a good economic growth. The main crop produced on the Boloven Plateau is coffee, which takes up 80-90% of the agricultural area. The second crop is tea. The coffee production expanded in the 1990s because of trade liberation and high prices on the world market. Tea production, which used to be a major production in this area, decreased at the same rate as the coffee increased. The local climate and fertile soil are ideal for the production of several vegetables, like cabbages and pumpkins, next to coffee and tea. Paksong has a daily production of 250 ton vegetables a day, which are mostly exported to Thailand but also to other Lao provinces (Duangtavanh, 2015).

3.2 MATERIAL AND METHODS

In order to understand the organic tea sector in Laos and to be able to suggest recommendations for support of the organic tea chains in Xiengkhouang, Vientiane and Champasak provinces, participatory value chain analyses are conducted.

Preliminary research is carried out by studying guidebooks for value chain analysis and value chain studies concerning food products in developing countries: Kaplinsky & Morris (2001), Ruben (2006), De Caluwé (2011), Vanhove (2008) and Lusby & Panlibuton (2002). Consultation meetings are held with people involved in the Eat Greener project, the organic sector in Laos and with people who are acquainted with the target provinces, in order to gain understanding of specific issues which might be of interest for value chain analysis of the organic tea sector in Laos. An overview of these consultation meetings is given in Table 3.

Table 3 Persons/actors included in consultation meetings

Name	Function
Joelle Plumerel	Person responsible for the Eat Greener project in Belgium
Helga Duhou	Representative of Oxfam shops, responsible for contact and capacity building with tea producers and processors in Paksong, Laos for export to Europe
Esther Diaz and Saymano Sanoubane	Administrators of the Eat Greener project
Sunnti Duangtavanh	Performed a participatory value chain analysis on organic rice in Laos (Duangtavanh, 2015)
Chansamon P., Phouva M., Bounlouay V., Khamphet K.	Director and project officers of ASDSP and PSC, partner organisations of Oxfam Solidarity and active in the target provinces
Thavisith	Deputy director of standard and certification division of the department of agriculture
Soukaseum	Director of Lao Farmer Products, a factory processing and packaging organic tea in Vientiane
Ian Dierden	Manager of Agro Asie, a social enterprise in Vientiane aiming at creating employment through organic agriculture

Individual actors may link to a variety of chains, making value chains very complex. Therefore, it is important to define a point of entry for the analysis. Since the Eat Greener project wants to focus on Small and Medium enterprises (SMEs) in order to provide support in the future, these were chosen as a point of entry (Kaplinsky & Morris, 2001).

Value chains can be analysed using qualitative and/or quantitative tools. There are no rules stating which approach is better, but usually a qualitative analysis is recommended to be used first, followed by a quantitative analysis. When time and resources are short, it may be better to focus on qualitative analysis alone, knowing that much information on prices and quantities can still be gathered from qualitative research and often secondary sources such as national statistics (Hellin & Meijer, 2006).

The following tools are used for qualitative value chain analysis (Hellin & Meijer, 2006)

- Participant observation: fundamental to qualitative research and leads to a better understanding of the characteristics of the situation under study;
- Semi-structured interviews & focus group discussions: guided conversations in which topics are predetermined and during which new questions and insights arise as a result of discussion;
- Stakeholder meetings: meetings with several stakeholders involved in the chain, to exchange knowledge, initiate contact and discuss issues of the sector as a whole;

Individual interviews as well as focus group discussions are conducted because a stakeholder does not make a decision in isolation, but is influenced by social pressure and beliefs. Interviews with groups may provide better insight than those with individuals, because group members have

an overlapping spread of knowledge, which may cover a wider field than any single person (Hellin & Meijer, 2006).

Based on the preliminary research and consultation meetings, three semi-structured surveys are designed to be used during semi-structured interviews and focus group discussions: one for producers, one for processors and one for traders and hotels (see Annex 3, Annex 4 and Annex 5). Table 4 gives an overview of the topics covered by the semi-structured surveys. The surveys are revised by two colleagues who translated during the interviews, in order to see if the questions are easily understandable.

Table 4 Overview of the topics covered by the semi-structured surveys designed for each chain actor involved in the organic tea sector in Laos

Topics	Producer	Processor	Trader & hotels
Location	✓	✓	✓
Socio-economic data	✓	✓	✓
Production	✓	-	-
Quantities and prices	✓	✓	✓
Processing	-	-	✓
Buying and selling	✓	✓	✓
Transportation	✓	✓	✓
Financing	✓	-	-
Organic	✓	✓	✓
Problems encountered	✓	✓	✓

✓ : covered by survey; - : not covered by survey

No survey is designed to gain information about the final actor of the value chain, the consumer, because secondary data on consumer perceptions of organic food in Laos are already extensively researched in a study by Vagneron et al. (2015) for Oxfam Solidarity Belgium.

3.2.1 Data collection

During field research, 45 individual stakeholders involved in the value chain of organic tea in Laos are interviewed between July and September 2016. An overview of the interviews and focus group discussions that took place in the different provinces, is provided in Table 5, 6 and 7. For each interview, the role of the stakeholder in the value chain is given, the sex as well as some details concerning the type of interview and when relevant, the function of the interviewee.

Interviews were done either in Laotian and were then directly translated to English, or were conducted in English or French in which case translation was not necessary. All stakeholder meetings were in Laotian and were directly translated to English.

Table 5 Overview of interviews and focus group discussions in Vientiane province

Stakeholder	Role in the value chain	No. of people ♂	No. of people ♀	Details
DAFO	Chain supporter	1		Interview with the head of DAFO
District Commerce Office	Chain supporter	2		Interview with technical staff, head of Commerce was not present
District Finance Office	Chain supporter	1		Interview with the head of Finance
Vang Vieng Organic farm	Producer/Processor/Trader: retailer & wholesaler	1	1	Two individual interviews with the owner (♂),who also participated in the focus group discussion. Additionally, an individual interview and demonstration by a labourer (♀)
Mrs. Kamphy	Producer/Processor/Trader		1	Focus group discussion
Family farms	Future producers	1	1	Focus group discussion
Kampaseuth hotel	Trader: Hotel	1		Interview
Vang Vieng Chalern shop	Trader: Retailer	1		Interview

Table 6 Overview of interviews and focus group discussions in Xiengkhouang province

Stakeholder	Role in the value chain	No. of people ♂	No. of people ♀	Details
SAEDA	Chain supporter		1	Interview with the program Officer
DAFO	Chain supporter	1		Interview with the deputy head of DAFO
District Commerce Office	Chain supporter	4	2	Conversation with the director of Commerce and his team, with functions in product promotion, domestic trade unit and SME registration
District Finance Office	Chain supporter	2		Interview with the head of Finance and the person responsible for the Tax Unit
Organic market	Chain supporter		1	Interview with the head of the organic market
Mulberries Inc.	Producer/Processor/Trader: Retailer & wholesaler		3	Two interviews with the founder of Mulberries and the manager of the farm. Also, an individual interview and demonstration by a labourer
T-sun shop	Trader: Retailer		1	Interview
Hotel	Trader: Hotel		1	Interview
Mulberries Inc. shop Vientiane	Trader: Retailer & Wholesaler		1	Interview with the manager of the store

Table 7 Overview of interviews and focus group discussions in Champasak province

Stakeholder	Role in the value chain	No. of people ♂	No. of people ♀	Details
DAFO	Chain supporter	1		Interview with the head of DAFO
District Commerce Office	Chain supporter	2		Interview with the deputy head of Commerce and someone from the SME registration unit
District Finance Office	Chain supporter	1		Interview with the deputy head of Finance
Paksong Farmer Organic Tea Production Group	Producer	8	2	Two focus group discussions: Focus group 1: Manager, Head of the 10 villages, 4 producers Focus group 2: 4 producers
Mrs. South family enterprise	Producer/Processor/Trader: Retailer & wholesaler		1	Two individual interviews with the owner
LFP	Trader: Retailer & Wholesaler	2		Two individual interviews, one with the manager and one with the person responsible for finances

In every province, a stakeholder meeting was organised to discuss the organic tea sector. Actors involved were able to provide their opinion on the composition of the value chain map and point out factors constraining the evolvement of the organic tea sector and opportunities for improvement of the value chain. An overview of the participants of stakeholder meetings is given in Table 8.

Table 8 Participants stakeholder meetings, excluding Oxfam representatives and partners

Date	Province	Commodity	Participants	No. of people ♂	No. of people ♀
23th of July 2015	**Vientiane province**	Organic mulberry tea	• Representatives DAFO, District Finance Office, District Commerce Office • Lao Women's Union • Hotel/Restaurant association • Current and future producers • Hotel and shop owners	11	7
13th of August 2015	**Xiengkhouang province**	Organic mulberry tea	• Representatives DAFO, District Finance Office, District Commerce Office • Producers (Manager mulberries and mulberry leaf producers for silk) • Hotel and shop owners	8	4
27th of August 2015	**Champasak province**	Classic organic tea	• Representatives DAFO, District Finance Office, District Commerce Office • Producers • Managers from Paksong farmer organic tea production group and Mrs. South family enterprise • Shop owner	15	2

Some pictures of the conduction of interviews, focus group discussions and stakeholder meetings are provided in Annex 6.

A first identification of chain actors is done by Oxfam Solidarity's local partners *Phon Soung* Center (PSC) and *Association de soutien au développement des sociétés paysannes* (ASDSP). PSC is a government organisation with a strong experience in agricultural extension (organic and good agricultural practices (GAP) in particular), capacity building, support of farmer groups and a more limited experience in marketing and the promotion of organic consumption. Their intervention area is situated in Vientiane Province. ASDSP supports farmer groups with a focus on sustainable production. Its intervention areas are Vientiane capital and Champasak and Xiengkhouang provinces. In future, they will expand their activities to Luang Prabang, Bolikammsay and Kammouane provinces.

PSC and ASDSP made contact with the Districts Agriculture and Forestry Offices (DAFOs) of the target areas, who provide knowledge of the location and importance of actors involved in the organic tea chain in their district. By talking to actors known by DAFO, additional actors are

revealed. During the period of field study, PSC and ASDSP were responsible for organising and guiding the stakeholder meetings.

In order to characterize the organic sector in Laos, a PEST-analysis is performed. Information for the analysis was gathered through research and conversations with people involved in the organic sector (see Table 3).

In order to recommend improvements for the organic tea value chains, the main factors constraining the evolvement of the organic tea sector and opportunities for improvement of the value chains need to be identified. For every target area, a SWOT analysis is conducted, providing an overview of the main strengths, weaknesses, opportunities and threats of the organic tea sector. Based on these SWOT analyses, possible scenarios can be suggested on how to overcome the constraints, make use of the opportunities, and how to better organise the market chain (Kaplinsky & Morris, 2001). The information used for these SWOT analyses was gathered during stakeholder meetings, providing a shared vision, and during individual interviews.

As mentioned in literature, a SWOT analysis needs to be focused. In this study, the subject of every SWOT analysis is narrowed down to the tea sector of one target area. Examining every enterprise of a target province separately might have resulted in more accurate results, but in this study the examination of the tea sector as a whole was chosen. This option was chosen, because the tea sector is small and to have a better insight of the opportunities and threats of the sector as a whole.

4. Results

In this chapter, the organic food sector in Laos is characterised, taking into account the influences from its political, economic, social and technological environment. A description of tea value chains in Vientiane, Xiengkhouang and Champasak provinces is given, with at the end an overview for easier comparison.

4.1 Market characterisation of the organic food sector in Laos

In Laos, many farmers produce organically by default. In comparison with neighbouring countries (China, Thailand and Vietnam), the use of chemical inputs by Lao farmers is low. HELVETAS, a Swiss development organisation, involved in Lao agriculture since 2001, saw an opportunity in the absence of chemicals to develop an organic framework and thereby improve the livelihood of local farmers. In 2004, HELVETAS launched a project for the Promotion of Organic Farming and Marketing in Lao PDR (PROFIL) in cooperation with the Laotian Department of Agriculture (DoA) (HELVETAS, 2011).

The PROFIL-project approached the Earth Net Foundation, a non-profit organisation for the promotion and support of organic agriculture in Thailand, to assist in developing a framework for organic agriculture in Laos. A series of capacity building activities were organized which included the design of internal control systems and the transfer of knowledge, primarily regarding organic rice production. In 2008, the Lao Certification Body (LCB), established by the PROFIL-project, was approved by the DoA. LCB started offering organic inspection and certification services in 2009 (Green net cooperative n.d.). The official Lao organic label is presented in Figure 12.

Figure 12 Official Lao organic certification label (Green net cooperative, n.d.)

In the 2008, the first year that LCB was officially operating, 795 farmers were organically certified, corresponding to an area of 1803 ha. After three years, this amount has increased with 70 % and the organically certified area has more than tripled (see Table 9). The main organically certified products are coffee, rice, vegetables and herbs.

Table 9 Overview of the amount of organically certified farmers and corresponding production area (Green net cooperative, n.d.)

Year	Area under organic production (ha)	Number of farmers
2008	1803.53	795
2009	5243.85	1832
2010	6005.78	1333
2011	5989.59	1342

In order to characterise the organic food sector in Laos, a PEST analysis is conducted. This PEST analysis represents the political, economic, social and technological environment in which the organic sector resides.

4.1.1 Political environment

The political situation in a country can have a significant influence on the kind and amount of economic activity. It determines how businesses are regulated and it influences the spending power of businesses and consumers. Elements such as government stability, awareness of the need to have a healthy population and policies on agricultural activities can have a significant effect on economic activities in the food industry (Oraman, 2014).

In this section the political situation in Laos, taxes, policies concerning organic agriculture and organic certification are described.

4.1.1.1 Political situation

Laos was subjected to many years of colonisation, foreign occupation, civil war and political instability. In 1975 the Lao communists took the power after the US withdrew from Vietnam. This resulted in the end of the monarchy and the establishment of the Laos People's Democratic Republic.

Laos is in name a Marxist-Leninist state, ruled by the Lao People's Revolutionary Party. The head of State is the president, elected for a five year term by the parliament. The head of government is the prime minister, appointed by the president with parliamentary approval. The Political Bureau (Politburo), which has 9 members, is the key decision making body. Its main functions are to formulate the Party's important policies in general and to control the operation of both the Party itself and the government. A national assembly meets twice per year and is responsible for evaluating the proposed legislation. The national assembly is elected by the Lao people from a list of candidates, approved by the Party (New Zealand Foreign affairs and trade, 2008; Runckel & Associates, 2007).

In 1991, the National Assembly formalised the establishment of a market oriented economy and guaranteed the right to own property for Lao citizens, by changing the constitution.

The military has always been present in political life. The military's activities are diverse, including participation in reconstruction work and private business.

Laos suffers from widespread corruption among government officials. This causes public discontent, problems in tax collection and degraded public services. In 2013, more than 50 officials of provincial governments were investigated for fraud. Senior civilians and military officials are often involved in logging, mining, and other extractive enterprises. The judicial system is inefficient, and protection of property rights is weak (The Heritage Foundation, 2015).

The Lao Constitution guarantees freedom of assembly, religion and speech. In reality, political or other forms of opposition are not tolerated and dealt with harshly. Freedom of speech is severely contained. Although the human rights situation has slightly improved, the government maintains tight control over the population to minimise potential provocation of the ruling party (The Heritage Foundation, 2015).

4.1.1.2 Tax regulation

Tax regulations are made to lower the barrier for the export of agricultural products. '*Article 59: General Export Customs Duty Exemption: export of agricultural products derived from production, plantation and breeding, and industrial products that have been manufactured or processed, and handicraft products, are exempted from export customs duties, except for some items of goods that require an export duty*.' (Ministry of Finance, 2011). This has as a result that enterprises do not have to pay taxes when they export. When they sell the same products locally in Laos, they do have to pay a Value Added Tax (VAT) of 10 %. However, tax exemption is possible when producing organically, depending on the agreement with local governments (district or provincial) and the scale of producing.

4.1.1.3 Organic policies

The Lao government has acknowledged the possible economic, environmental and social advantages of promoting and supporting organic agriculture. Organic agriculture is frequently mentioned in the Strategy for Agricultural Development 2011 to 2020 and the Lao National Socio-economic Development Plans for 2006-2010 and 2011-2015. The first states that an important share of farmers can easily be integrated into organic production, when assisted properly, because they are still using chemical free production systems. The second promotes clean and sustainable agriculture in general, such as GAP (Good Agricultural Practices) and organic agriculture. More specific goals include encouragement of organic production and markets and establishment of a research centre and laboratories for the universities in Vientiane, with focus on research in key sectors, such as organic fertilizer (Ministry of agriculture and forestry, 2010; Ministry of Planning

and Investment, 2006). The main targets for 2015, reported in the Socio-economic Development plan of 2011-2015 include development of new technologies and improvement of existing technologies that are environment- and user friendly, such as organic fertilisers, hydro-energy, biogas and others (Ministry of Planning and Investment, 2011). The production of certified organic export products in the Mekong lowlands and organic vegetables in the Boloven plateaux is to be promoted (Ministry of agriculture and forestry, 2010).

4.1.1.4 Standards and certification

The information for this section was gathered through an interview with Mr. Bounyasouk, the deputy head of the Standard and Accreditation Division.

The organic standards were developed by the PROFIL-project in 2004. They are based on the basic standards of IFOAM (International Federation of Organic Agriculture Movements) and ACT (Organic Agriculture Certification Thailand). In 2005 the Ministry of Agriculture and Forestry approved the proposed standards as the Lao organic standards. The Lao Certification Body (LCB) got official approval as an organic certification body by the Department of Agriculture in 2008. The LCB was placed under the Clean Agriculture Development Centre (CADC), an implementing agency of the DoA, responsible for the promotion and development of all safe and environment-friendly agricultural systems. The LCB was meant to be an autonomous organisation without any conflict of interest, but because the inspectors and researchers trained in organic agriculture by the PROFIL-project were all DoA staff and the private sector in Laos did not have the capacity to make the necessary investments costs, the LCB remained under the DoA.

In the beginning, LCB had two functions: support and control. It assisted producer groups with setting up an internal control system and provided organic inspection and certification services. In 2011, the LCB was transferred from the CADC to the Standard and Accreditation division. The supporting function remained under the CADC and the focus of LCB was reduced to inspection and certification only.

LCB has no international recognition as a certification body. However, within Laos the certification body does get widely accepted by consumers of organic products. In 2012, most of the organic operators in Laos (72.6 %) had double certifications from LCB as well as foreign bodies. A quarter (26.9 %) had only local certification from LCB and no foreign certification while very few (0.5 %) had foreign certification alone. Lao certification from LCB is relatively cheap compared to certification costs from an internationally approved certification body. However, when exporting organic products, recognition from an internationally approved certification body is required (Panyakul, 2012).

Inspection of organically producing farmer groups is performed randomly. When the Internal Control System (ICS) is considered strong by former reports, the square root of the amount of members of the farmer group is inspected. An internal control system is a quality assurance system, carried out by the farmer group (IFOAM, 2008). Inspectors of LCB only need to inspect the well-functioning of the ICS. When the ICS is believed weak, 1.2 or 1.3 or 1.4 times the square root is inspected, depending on the weakness of the ICS. All the inspectors are staff of the DoA. At present there are 11 inspectors. New trainings have started for staff of the CADC.

4.1.1.5 Support and promotion of the organic sector

Several NGOs work in collaboration with national or local government agencies to promote organic and sustainable agriculture and provide training to farmers and extension staff of District Agriculture and Forestry Offices (DAFOs). Among the NGOs active in the organic sector are HELVETAS, Oxfam Solidarity Belgium and SAEDA. All trainings, whether provided by NGOs or the CADC, are linked to projects on organic agriculture in a specific target area (Panyakul, 2012).

4.1.2 Economic environment

Laos has one of the fastest growing economies of the Asia-Pacific region, with a GDP of $ 20.8 billion, showing a 8.2 % growth from the year before. In comparison, the GDP of Thailand is $ 985.5 billion.

Laos has an average tariff rate of 13.2 % (in comparison: EU-countries have a 1.0 % average tariff rate and Thailand 6.2 %). On the one hand judicial and regulatory systems can discourage foreign investment because of excessive registration requirements, a gap between legislation and implementation and unclear or conflicting regulations. On the other hand, corruption amongst government officials is widespread and the interests of the local population are not always a priority, creating a climate where investments disruptive for the local population are possible, e.g. foreign investments into hydropower dams along the Mekong river leading to the relocation of entire villages (Sarnsamak, 2010). The financial system is underdeveloped and the banking sector is dominated by three state-owned banks. In 2013, following a 15-year negotiation process, Laos became a member of the World Trade Organisation (The Heritage Foundation, 2015).

Index of Economic freedom

Every year, The Wall Street Journal and The Heritage Foundation publish an Index of Economic freedom, in which they present an analysis of the economic freedom of 186 countries, including Laos. The overall economic freedom score is a result of the performance in 10 categories: property rights, freedom from corruption, government spending, fiscal freedom, business freedom, labour freedom, monetary freedom, trade freedom, investment freedom and fiscal freedom.

Laos' economic freedom score is 51.4, making its economy the 150th freest in the 2015 Index, and the 33rd out of the 42 countries in the Asia-Pacific region (see Figure 13). Its overall score on economic freedom is below the world and regional averages. Compared to last year, the score improved with 0.2, which is a consequence of improvements in freedom from corruption and labour freedom, that outweighed the declines in investment freedom, business freedom, and monetary freedom. The analysis states that the economic freedom in Laos has scarcely improved over the past five years, which shows a lack of commitment to reform the economy. Five-year improvements have been observed in half of the economic freedom parameters but the improvements are counterbalanced by a decline in property rights, government spending, monetary freedom, and trade freedom.

Laos is mostly absent from the Asian trading network, and its trade freedom with a score of 58.6 remains much lower than the global average of 75.4 and the average of 72.8 for Asia and the Pacific (see Figure 13). Business formation and capital accumulation are difficult because of regulatory costs and underdeveloped financial markets. The government influences many prices through subsidies and state-owned enterprises (The Heritage Foundation, 2015).

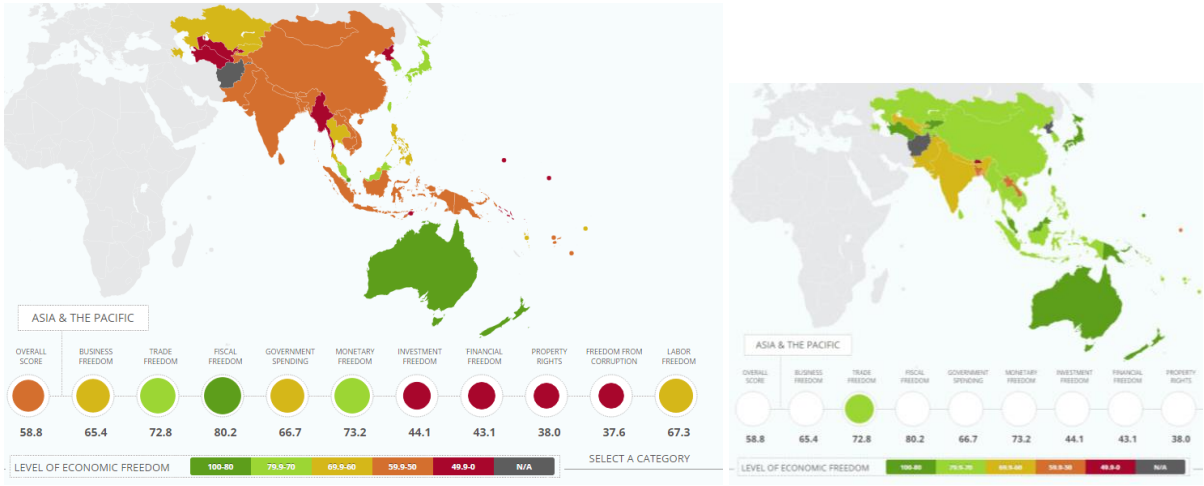

Figure 13 Overall score on economic freedom (left) and aspect of trade freedom (right) (The Heritage Foundation, 2015)

4.1.3 Social environment

Laos has a very young population, the medium age is 22.3 years old and life expectancy at birth is 64 years. In comparison, the median age in its neighbouring country Thailand is 36.7 years old with a life expectancy at birth of 74 years. About 80 % of the population is literate, but the share of men that is literate is 15 % higher than the share of women, indicating issues with gender equality. School life expectancy, which indicates the total number of years of schooling (primary to tertiary) a child is expected to receive, is 11 years for men and 10 years for women. (CIA, 2013)

In Laos, 22 % of the population lives below the poverty line (CIA, 2013). Poverty is more common in mountainous regions, where the majority of the country's ethnic minorities live (Khmou, Hmong and others). Women generally work longer hours than men, often taking on about 70 % of farming and household tasks, as well as the care of young children. Women of ethnic minorities are the most vulnerable members of rural communities, since they represent 70 % of the illiterate population and few of them speak the national language (IFAD, 2014).

However, the share of the middle class (expenditures of $2–$20 per person per day) has increased with 29 % over the period of 1990-2008 and is expected to increase further in Laos. In 2002, 24 % of the population belonged to the middle class (ADB, 2010).

Consumer perceptions of organic food in Laos

A study was carried out by the Eat greener-project on the consumer perceptions of organic food in seven provinces in Laos (Vagneron et al., 2015). The general objective of the study was to understand the current perceptions and attitudes of end-users (e.g. consumers, traders, restaurants) towards organic food in Laos.

The study showed that consumers of organic products were wealthier and more educated than those who did not. The main motives for consumers to buy (and for traders to sell) organic products were that they expected them to be safer and healthier. The results of the study highlighted the importance of health in the perception of organic agriculture and showed how one-sided knowledge was: not many people mentioned the environment and only a handful established a link between farming methods, the environment and health.

The main reasons for not buying organic products by non-consumers of organic products were
i) a lack of information about organic agriculture (definition, benefits, etc.)
ii) limited availability of organic products
iii) lack of demand by guests or costumers for traders, hotel and restaurant owners to be convinced to purchase organic products

Surprisingly, the price seemed not to be a reason not to purchase organic products by individual non-consumers. Traders and hotel/restaurant owners on the other hand, were discouraged by the higher price of organic products, as they claimed not to be convinced of a high demand and the willingness of consumers to pay more.

Although only a small share of respondents were aware of Lao organic standards, organic label and the Lao certification body, they seemed to trust the existing institutions. Overall, a majority of the respondents were willing to let the government play an important role in guaranteeing the organic standard (Vagneron et al., 2015).

4.1.4 Technological environment

Technology can either positively or negatively impact the development of organic agriculture. Technological factors include technological advancements, the role of the Internet, and the spending on technology research by the government (Makos, 2013; Rivani & Ward, 2005).

Research and development in organic agriculture

The Faculty of Crop Sciences of the National University of Laos organises a course on organic agriculture, consisting of lectures and practical exercises in the field. General agricultural research is carried out by university researchers and NAFRI-staff (National Agriculture and Forestry Research Institute). In 2012, there was no specific research on organic agriculture in Laos. However, there were a couple of undergraduate students who conducted research on organic farming for their final year projects. Also, the CADC (Clean Agriculture Development Centre), an implementing agency under the Department of Agriculture, has done some research on how to cultivate organically. The latter research mainly consists of testing foreign organic cultivation techniques and adapting them to Laotian circumstances when necessary (Panyakul, 2012).

Internet as a source of information

The internet plays an important role in providing access to information. General information about organic agriculture is easily accessible and specific farmer platforms have been established on organic agriculture and agriculture in general to facilitate the exchange of knowledge between Lao farmers.

The internet provides a way for entrepreneurs to connect directly to the market. At a very low cost a website can provide a link with buyers from around the globe (da Silva et al., 2009). For example Mulberries Inc., a social enterprise that sells organic mulberry tea, has an online contact form on their website where new and existing wholesale buyers can log in and place orders.

Agrochemicals

In Laos, lots of farmers have never used agrochemicals because of low accessibility or high costs. This is in favour of the development of organic production. However, agrochemicals are getting more and more accessible as former marginal areas are now more accessible (Ministry of agriculture and forestry, 2010).

4.2 ORGANIC MULBERRY TEA VALUE CHAIN ANALYSIS VIENTIANE PROVINCE

4.2.1 Value chain actors

4.2.1.1 Producers

Vang Vieng Organic Farm: plantation

The organic farm in Vang Vieng, managed by Mr. Thanongsi Solangkoun is a diverse enterprise. They produce various organic products, such as mulberry tea, wine and juice and fresh goat cheese and combine this with a restaurant and the possibility of home stay in bungalows or African clay huts. They have 4 ha of mulberry in a plantation (see Figure 14) and employ men for maintaining the plantation and women for harvesting leaves and fruit. Mr. Thanongsi estimates the production cost, including labour, to be around 90,000 LAK (€10) per kg of dried mulberry tea.

Mulberry production in this area was introduced by Mr. Thanongsi in 1996, with support of the Participatory Development Training Centre (PADETC). PADETC is a Lao non-profit organisation, supporting Laos in becoming more sustainable through an integrated development process with the participation of all civic sectors (PADETC).

The initial purpose of the mulberry plantation was the use of leaves as silk worm feed for silk production. This idea was inspired by the Queen of Thailand, who promoted the production of mulberry as a multipurpose tree at that time. In the beginning, the production of leaves for mulberry tea turned out to be more profitable than silk. 1 kg of mulberry tea sold for the same price as the silk produced out of 40 kg of leaves. At present, the silk price has strongly increased and the situation has reversed.

Figure 14 Mulberry plantation at Vang Vieng organic farm (Organic farm Vang Vieng, 2016)

Small family farm

At present, there is only one woman, Mrs. Kamphy, producing mulberry tea on her own farm with 0.3 ha of mulberry tea. Another family was at the stage of planting mulberry trees with cuttings from Vang Vieng Organic farm, to produce mulberry for tea production in the future. Mrs. Kamphy harvests her own leaves in October and November. She does not have many costs, since cow dung is used from her own cows as fertilizer and rice chaff, which can be obtained from the miller for free. Every once and a while, labour is hired for weeding.

Both producers are not organically certified because of the high certification costs. However, Vang Vieng organic farm promotes and labels all its products as organic.

4.2.1.2 Processors

Vang Vieng Organic farm hires local women to harvest and process the mulberry tea. These women are paid 30,000 LAK (€3,35) per dried kg of mulberry tea. For more information on the processing of organic mulberry tea at Vang Vieng organic farm, see Annex 2. Mrs. Kamphy does her own processing and packaging of mulberry tea. Vang Vieng organic farm packages in small bags of 50 g, ready for sale, while Mrs. Kamphy puts the tea in big bags of 9 kg.

4.2.1.3 Traders

Mrs. Kamphy sells the mulberry tea in bulk to one trader and does not know what happens with it afterwards. Vang Vieng organic farm has a wholesaler as well as a retailer function. They sell 70 % of their production to retailers from Pakse, Luang Prabang and Vientiane. No contract is being made with these retailers. They buy directly from the farm. Twenty percent of production goes to relatives in Vientiane, where mulberry tea is easier accessible for interested (low quantity) buyers

from mainly Australia, Japan and Korea, who buy regularly but are not able to come to Vang Vieng. The other 10 % of production is sold directly to tourists on the organic farm.

The maximum production capacity of Vang Vieng organic farm is estimated to be around 300-400 kg a month. However, there is no demand for it. During the dry season from November to April, more is harvested than during the rainy season. Not many producers have irrigation systems, resulting in a lower supply during the dry season. Therefore, more buyers come to Vang Vieng organic farm, which is close to a river and has an irrigation system, during the dry season. More information about quantities and prices of organic mulberry tea sales in Vang Vieng district is given in Table 10. Price setting is done by Vang Vieng organic farm. In the case of Mrs. Kamphy, price is set by the trader.

Information was gathered from two retailers, one hotel and one shop owner. In Kampaseuth hotel organic mulberry tea from Vang Vieng organic farm is served. Vang Vieng Chalern shop used to sell organic mulberry tea and would like to sell it again in the future, when the renovation of his store is finished.

Table 10 Sales of organic mulberry tea in Vang Vieng: Quantity and sales prices

PRODUCER	Quantity & buyers	Retail sales price	Wholesale sales price
Vang Vieng organic farm	Dry season: 200 kg/month Rainy season: 50 kg/month 70 % retailers 20 % relatives (retailers) 10 % tourists	Bag of 50 g: 15,000 LAK (€1,70)	Bag of 50 g: 13,000 LAK (€1,50) Bag of 1 kg: 150,000 LAK (€17)
Family farm	9-18 kg/month, only from October to November 100 % to one retailer		Bag of 1 kg: 60,000 – 70,000 LAK (€6,70-7,80)
TRADER	**Quantity served/ bought**	**Buying price**	**Sales price**
Khampaseuth hotel	0.5 kg can last for a couple of months 70 % Lao tourists, 30 % international tourists	80-90,000 LAK (€9-10) for a bag of 0.5 kg from Vang Vieng organic farm	Mulberry tea is served to hotel guests
Vang Vieng Chalern shop (past)	20 - 30 packs (50 g) per month, mostly tourists	13,000 LAK (€1,50) for a bag of 50 g	15,000 LAK (€1,70) a bag

4.2.2 Value chain map of the organic mulberry tea sector in Vientiane province

The value chain map in Figure 15 shows the linkages between producers, processors and traders of organic mulberry tea in Vientiane province. The initial quantities of dried mulberry tea produced are given, as well as the share of it that is bought by different traders.

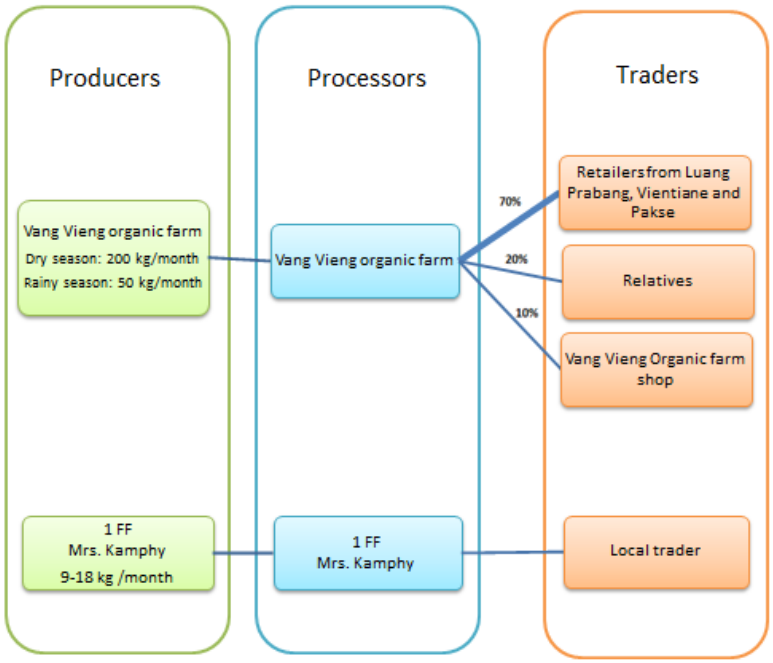

Figure 15 Value chain map of the organic mulberry tea sector in Vientiane province

4.2.3 Enabling environment of the organic sector in Vientiane province

District Agriculture and Forestry Office (DAFO)

A national project aims to promote local SMEs and improve the livelihood of local residents of a district through the ODOP project (One District, One Product), in cooperation with a Japanese agency JICA. In practice, a district can choose one or several products they want to promote and recognize as a typical product of their district (JICA, n.d.). The DAFO of Vang Vieng district in Vientiane province is considering mulberry tea as a commodity that needs to be supported. If the mulberry tea is recognized as an ODOP product, the District Commerce Office will promote it by bringing it to meetings, events, market fairs, etc. and advertise to attract tourist buyers. DAFO will provide technical assistance by connecting producers and organising meetings.

DAFO promotes organic agriculture in general. They have established a model farm where organic vegetables and fruits are produced and frogs and chickens are raised.

District Commerce and Industry Office

The District Commerce and Industry Office provides marketing information but have no fund to support producers and SMEs. Once a year, a meeting is organised for restaurant holders and hotels with the cooperation of staff from the Ministry of Industry and Commerce (MOIC). At this meeting information is being provided and restaurant and hotel staff can attend trainings and obtain certifications.

District Finance Office

The District Finance Office takes care of business registration and taxes. There is no value added tax on organic tea products at district level. The tax is only for commercialized products.

4.2.4 Service providers

In the cases under study, land is owned by the farmer or plantation owner and not rented. Family farms occasionally hire labour for weeding. At Vang Vieng organic farm, fixed labour is hired for harvesting, processing and the maintenance of the mulberry plantation. There are sometimes difficulties with finding labour, since most of the people prefer working in the tourism sector. The equipment for harvesting and maintenance is quite basic, consisting of hedge scissors and sometimes a grass mower. There is a possibility to lend capital from the bank. However, the interest rates are high (14 % for the Agricultural Development Bank) and do not encourage investment. Farmers mostly rely on their own capital.

4.2.5 Future possibilities for the organic tea sector in Vientiane province

There is some interest by local producers to start producing organic mulberry tea, as well as from the DAFO of Vang Vieng district to support the commercialisation. At the stakeholder meeting in Vang Vieng, the possibility for expanding organic mulberry tea production was discussed. It was agreed upon that if organic mulberry tea was to be promoted, a common brand for the producers in Vang Vieng district would be necessary to create a common market link and one quality level for Vang Vieng organic mulberry tea would need to be ensured.

4.2.6 SWOT analysis of the organic mulberry tea sector in Vientiane province

STRENTGHS	WEAKNESSES
• Production of good quality mulberry tea • Knowledge on mulberry tea production and processing by Vang Vieng organic farm • Mulberry tea is mentioned in touristic guidebooks and tourists often ask where they can buy it • Mulberry tea production is feasible for women, since it does not require heavy labour	• Difficult to attract big buyers because of a lack in marketing • High certification costs, especially international organic certification • No common market brand
OPPORTUNITIES	**THREATS**
• Vang Vieng has a big market potential, because of the many restaurants, shops and guesthouses for tourists • Mulberry tea might become recognized as an ODOP product for Vang Vieng • The mulberry tree is a multipurpose tree	• Farmers can have doubts to start mulberry production, because success of ODOP commercialisation is uncertain • A challenge when commercialising mulberry tea as an ODOP product and simultaneously expanding production over many farmers will be to maintain a uniform, good quality • Cuttings/seedlings are not easily accessible

4.3 ORGANIC MULBERRY TEA VALUE CHAIN ANALYSIS XIENGKHOUANG PROVINCE

4.3.1 Value chain actors

4.3.1.1 Producers

Mulberries Inc.

Mulberries Inc. is a social enterprise with the ambition to create income opportunities for Lao people in a socially and environmentally responsible manner. The organic silk producing farm was established in 1993 to serve as a model farm and research centre. Its purpose is to encourage Lao traditional silk production, by providing training and support in silk worm rearing and the art and craft practices of weaving. They own 59 ha of mulberry tea in plantations (see Figure 16), of which 17 ha can be used for mulberry tea production (some varieties are not ideal for tea production). Leaves are certified by IMO, the Institute for Marketecology and by the Lao certification body (see Figure 16). IMO is a highly experienced international body for the inspection, certification and quality control of organic, eco-friendly and socially-responsible products. This makes the mulberry tea organically certified, but not the silk, since there are other factors involved then only the worm feed. However, it is not necessary for the silk to be internationally organically certified, since it is unusual to organically certify non-food products. The certification costs amount up to 10 million LAK (€1119) per year for 59 ha, including inspection fee, accommodation, transportation inspectors,…).

Figure 16 Mulberry plantation at Mulberries Inc. (left), Lao organic certificate for Mulberries Inc. (right)

The farm has been growing mulberry trees to feed silk worms for silk production since 1993. In 2002, Mulberries Inc. had a desire to expand to mulberry tea production and started a study on mulberry tea production and processing with the cooperation of a technical team from Thailand. In 2005, the first mulberry tea was ready for the market.

Mulberries Inc. employs over 2,000 villagers who are involved in silk production, including mulberry production and silk worm rearing at home or at Mulberries Inc., silk extraction and weaving. At present, the villagers grow mulberry at home for silk worm rearing alone. Only the mulberry farm itself produces mulberry leaves both for silk worm rearing and for mulberry tea. More information about the cultivation of organic mulberry tea at Mulberries Inc. can be found in Annex 2.

4.3.1.2 Processors

Mulberries Inc. does its own processing. The first part is performed at the farm in Xiengkhouang, where the roasted mulberry tea gets bagged in big quantity and transported to Vientiane, where the mulberry tea undergoes a further drying process and is packaged in various types of packaging material. The tea is loosely packaged or bagged in tea bags in bamboo boxes or cardboard boxes (see Figure 17). More information about the processing of organic mulberry tea at Mulberries Inc. can be found in Annex 2.

Figure 17 Bamboo and cardboard boxes containing mulberry tea loose or in tea bags (Mulberries Inc, 2016)

Mulberry tea is a secondary product for Mulberries Inc. They only produce when there is a surplus for silk worm feed. Therefore, the costs for the mulberry tea production are difficult to estimate. Additional costs that need to be made for mulberry tea are the labour for tea harvesting and processing and the packaging material. Mrs. Poukham, the marketing manager of Mulberries Inc. made an estimation of the total costs to get to the finished tea product, which is provided in Table 11.

Table 11 Estimated costs and profit organic mulberry tea production for Mulberries Inc.

Packaging type	Costs	Retail price	Profit
Bamboo box with loose tea in a plastic bag (24g)	22,000 LAK (€2,4)	35,000 LAK (€3,9)	13,000 LAK (€1,5)
Cardboard box with loose tea in a plastic bag (40 g)	9000 LAK (€1)	22,000 LAK (€2,4)	13,000 LAK (€1,5)
Cardboard box with tea bags (24 bags)	19,000 LAK (€2,1)	29,000 LAK (€3,2)	10,000 LAK (€1,1)

A notable difference between the processing in Vang Vieng organic farm (Vientiane province) and Mulberries Inc. were the hygiene and health precautions. At Mulberries Inc., the women roasting the mulberry leaves wore face masks and protective coats and were prohibited to speak during the two hour roasting period in order to avoid contamination of the mulberry tea.

This can probably be explained by the fact that Mulberries Inc. is organically certified by IMO and exports to countries such as Canada and Australia, which have strict quality and food safety standards.

4.3.1.3 Traders

Mulberries Inc. has three shops, placed in Luang Prabang province, Xiengkhouang province and Vientiane Capital. They also sell to Mpoint, the only supermarket chain in Laos and export to Canada and Australia. Information from one local retailer, T-sun shop, was gathered as well. An overview of quantities and sales is given in Table 12.

Table 12 Sales of organic mulberry tea in Xiengkhouang: Quantity and sales prices

PRODUCER	Quantity & buyers	Retail sales price	Wholesale sales price
Mulberries Inc.	336 kg Tourists: 3000-4000 boxes per year Retailers: Mpoint distributors: 1000-2000 boxes per year Australia: 50 kg of green mulberry tea, 30-40 kg of red mulberry tea per year (big bags) Canada: Normally two times per year, every time 1200-1600 boxes a time	Bamboo box with loose tea in a plastic bag (24g): 35,000 LAK (€3,9) Cardboard box with loose tea in a plastic bag (40 g): 22,000 LAK (€2,4) Cardboard box with tea bags (24 bags): 29,000 LAK (€3,2)	Wholesale price for selling in Lao: 20 % discount of the retail price. Wholesale prices (export): Big bags (unpackaged) = 146,000 LAK (€16) per kg Cardboard boxes = 13,000 (€1,50) per box Bamboo boxes = 22,000 LAK (€2,4) per box
TRADER	**Quantity served/ bought**	**Buying price**	**Sales price**
T-sun shop	24 boxes of green mulberry tea and 24 boxes of red mulberry tea per month	She buys at 25 % discount. (5 % more discount than the wholesaler price, since she's a family friend)	Cardboard box with tea bags (24 bags) = 29.000 LAK (€3,2)

4.3.1 Value chain map of the organic mulberry tea sector in Xiengkhouang province

The value chain map in Figure 18 shows the linkages between producer, processor and traders of organic mulberry tea in Xiengkhouang province. The initial quantity of dried mulberry tea produced is given, as well as the percentage of it that is bought by different traders.

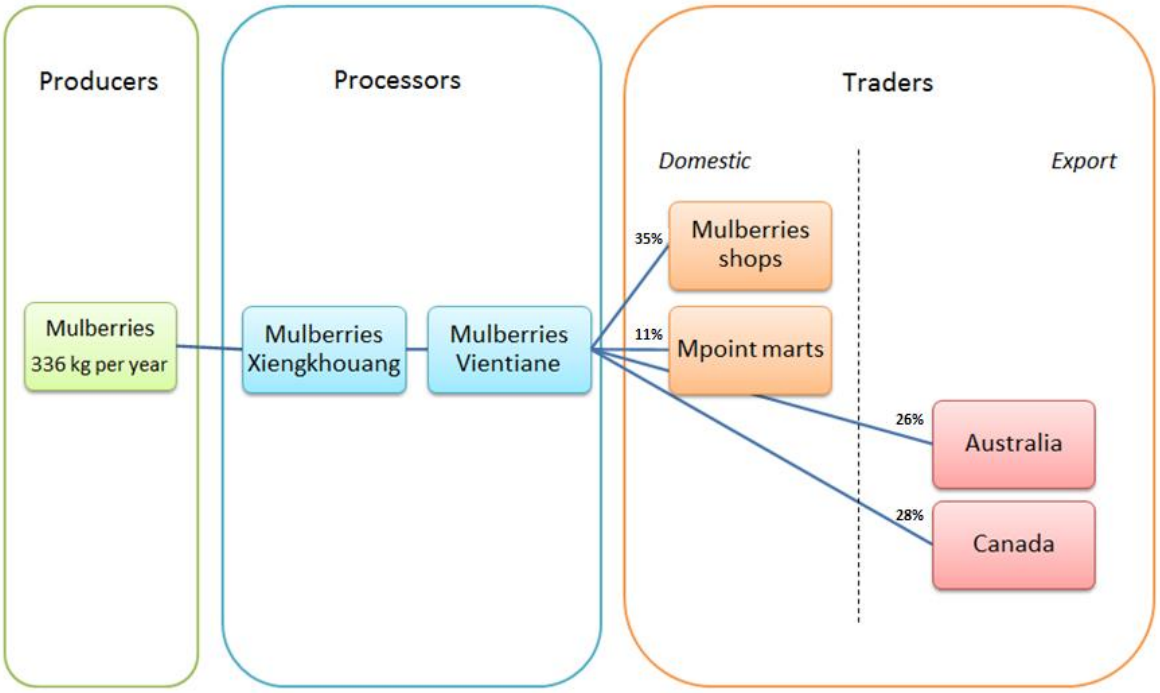

Figure 18 Value chain map of the organic mulberry tea sector in Xiengkhouang province

4.3.2 Enabling environment of the organic sector in Xiengkhouang

Sustainable Agriculture and Environment Association (SAEDA)

SAEDA is a Lao non-profit organisation, founded in March 1991 with support from CUSO, an international development organisation that works to reduce poverty and inequality. The association is currently obtaining official registration as a non-profit organisation (SAEDA, n.d.).

SAEDA works to support vulnerable communities by promoting sustainable agriculture practices, and improving their capacity and awareness to safeguard the environment with projects focusing on three main areas of intervention: sustainable agriculture, chemical pesticide reduction and biodiversity conservation (SAEDA, n.d.).

With the support of SAEDA, Xiengkhouang province has become nationally known for organic agriculture. Their project has led to the establishment of the Organic Farmers Association in Paek district and the Farmer Association for Sustainable Agriculture Production in Khoun-district. SAEDA sets up campaigns to promote organic products, provides training, tries to facilitate market access and give (financial) support to farmers for organic certification. They helped establishing the organic market which is considering selling organic mulberry tea from Mulberries Inc.

District Agriculture and Forestry Office (DAFO)

As a policy DAFO tries to promote organic agriculture to be the main type of agricultural production in Paek district, Xiengkhouang province. They try to achieve this goal by establishing organically producing farmer groups and by providing technical training about organic production, with the support of SAEDA.

DAFO has worked on organic fertilizer and technical training for farmers. They did some research on investment costs for organic agriculture in comparison to regular agriculture and found the former to be cheaper. They also did some research on farmers and consumers health. In 2011, 27 households, spread over 5 villages, produced organically. DAFO invited important authorities in the district to get involved by organizing planting and harvesting events, so people could interact with farmers and see the importance of organic agriculture.

The social and economic development plan prioritises organic production and tourism for the future of Paek district. In 2013, the Organic Farmers Association (OFA) was established in cooperation with SAEDA. In 2015, OFA had more than 780 organic farmers as member, spread over 24 villages. They all received training. Next to SAEDA, other organisations supported the extension of organic agriculture in Xiengkhouang province, such as the Department of Agricultural Extension and Cooperatives, Oxfam Solidarity and The Agro-Biodiversity Initiative (TABI), a long-term program implemented by the Ministry of Agriculture and Forestry.

District Commerce and Industry Office

The District Commerce Office of Paek district has a commercial products promotion unit. They support villagers in choosing what product to commercialise, how to link with the market and they promote local products in other provinces. The District Commerce Office claims that every district gets an annual budget for product promotion, as a nationwide policy. This budget can be used for training, transport of employees, activities, etc. Beside this annual budget, they can obtain extra budget through a proposal. Every district gets a different budget, depending on the size and the focus of their projects. Paek district gets 30 million LAK (±€3350) per year for product promotion.

ODOP (One District One Product) is a national incentive to promote local specialized products. The District Commerce Office of Paek district has a list of 10 products they want to promote. The 10 products are among other things: wooden carvings, silk, organic vegetables, etc. When they write a proposal they can get fund for the packaging of indigenous products.

District Finance Office

The District Finance Office is only engaged in the domestic, local market in Laos. Export to other countries is regulated by the provincial or national level.

When someone wants to invest in or start a business, they have to submit a 3 or 5 year business proposal to the department of planning and investment. When this proposal is approved, the District Commerce Office takes care of the official registration. Then the District Finance Office will provide a tax certification and tax number. Every 3 or 6 months (depending on the agreement), the business has to hand in an official record of transactions that occurred during that period. Some SMEs do not have a good book keeping system. In these cases a monthly fee is charged, independent of the profit.

There are 4 taxes the district office charges:

1] Land tax: if a company/person rents land from another person or the government, 10 % tax needs to be paid to the government.

2] VAT: value added tax. When a product is transported out of the district to be sold, it has to be reported to the department of Commerce, who will calculate the price of the product and give the information to the District Finance Office, who will collect 10 % of this calculated amount. This is only for manufactured products and normally does not apply to agricultural products. However, when transported in big quantity, they will apply a tax (for example, when a farmer loads a big truck with harvested products, he has to report it to the District Commerce Office). The percentage of the tax is not fixed, but is negotiable. Since organic tea is one of the promoted products, no VAT is charged.

3] Annual tax for SMEs: a profit tax where SMEs are charged 24 % of the net profit (net profit=income-expenses). If the business has not made any profit, the business is charged 0.1 % of the income.

4] Labour tax: when the salary of a labourer is less than 1 million LAK (€112) per month, no tax has to be paid. When the salary exceeds 1 million LAK, the labourer has to pay 5 % of the monthly amount exceeding 1 million LAK to the District Finance Office.

4.3.3 Service providers

The plantation area of Mulberries Inc. enterprise is owned by the government. Mulberries Inc. has a concession with the government in which they pay $ 600 per year for 59 ha mulberry, of which 17 ha is used for mulberry tea.

Eighty percent of the employees working at Mulberries Inc. are women. There is work to be done the whole year round. From March-October the main occupation is silk worm feeding. In the dry season (November-April), main work shifts from worm feeding to pruning of the mulberry fields and taking care of new saplings. There are 12 people assigned to mulberry tea production and processing, of which 10 are female and 2 are male. Labourers work 6 days out of 7, and are paid by day. In the rice season, they do not work every day in order to be able to produce rice for home consumption. Mulberries Inc. uses a work plan to divide the labourers during this period, so the work still gets done.

Mulberries Inc. does not take loans because they find it too risky when being involved in agriculture. Instead, they use their profit to invest. The group members who produce mulberry for silk also do not take loans. There is no bank that offers a low enough interest for small producers to be able to lend money, even the Agricultural Promotion Bank has a rate of 14 %. In the future they want the group members to be shareholders, but this will have to wait until Mulberries Inc. is a stable company.

4.3.4 Future possibilities for the organic tea sector in Xiengkhouang province

Organic mulberry tea expansion with the aid of Mulberries Inc.

The government relocated 300 families from the mountain areas to Tha Tom district. This is part of the government's relocation strategy which aims to improve access to education, health, water, agricultural services, electricity and roads by relocating people that live in mountainous areas to the lowlands. Further reasons are the eradication of opium production, extended administrative control, integration of ethnic minorities into Lao society and resettlement of villagers with a history of armed rebellion. It is hoped that by providing services and encouraging the production of commercial crops, relocated farmers will switch from subsistence farming to market-oriented production (Bird, 2009). These people are from different ethnic groups, but the majority speak Lao as a second language. The mountain tribes are mainly foragers; most of them have no knowledge on how to cultivate crops. Last year the government's relocation strategy focused on rice paddies. This year they want to focus on the cultivation of other products. Mulberries Inc. want to start training relocated families in the Tha Tom-district to produce mulberry tea in combination with soy bean. They already started planting. Tha Tom-district is a chemical free

zone. Before there was no road, but now there is easy access. They will teach them how to make soy milk for home consumption and for selling to a Thai company who processes soy milk for breast feeding products. They will also provide weaving training. At present, Mulberries Inc. produces enough organic mulberry tea for the domestic market. However there is a demand for export of mulberry tea to Australia, Canada, Germany and the USA. There is enough capacity to expand the tea production on the producer side. With this in mind, Mulberries Inc. has made plans to construct a small tea factory. The main investors would be themselves, but they are looking for another company for joined investment. They have planned a meeting with a Thai company that would be interested and already has a market in form of a Japanese company who would use the dried mulberry tea in beauty products. The Thai company would supply the machines. They would need $ 300,000 for the factory, excluding the machines.

Another (bigger) plan for the future is the extension of mulberry production to 4 other provinces, mainly for silk manufacturing. They would provide 400,000 seedlings, to be spread over 600 households per province. The goal is to reach a total production area of 1000 ha, by 2020. This is a project in cooperation with different government authorities (DAFO, PAFO and the central government), Lao Women Union, the Department of Environment and Natural Resources, the Department of Commerce and rural development.

Phou San tea (*Camellia sinensis)*

Another possibility for expanding the organic tea sector in Xiengkhouang province would be the re-establishment of Phou San tea as organic tea. This tea is grown in the Phou San mountain area in Xiengkhouang province and is derived from large, 100 year old tea trees *(Camellia sinensis)*. This tea was originally being supported for becoming organically certified and promoted by Oxfam Solidarity, but the project had to stop due to a concession made with Chinese companies, in which was stipulated that all Phou San tea had to be sold to them. However, it seems that the Chinese concession may be finished soon, because 4 consecutive Chinese companies have had problems with selling the tea. In total Paek district has 100 ha of Phou San tea (plantations and traditional old trees together). The production is still organic, since the producers have not changed their technique. They were not yet certified before the ending of the project. If the Chinese concession is put to an end, the District Commerce Office wants to promote Phou San tea as an organic product, and wants it to have a health certificate from the food and drug department as well as an organic certificate. The Phou San tea is currently produced by 48 households, of which 2 households are the head and responsible for the processing. Some households do their own processing and find their own market.

4.3.5 SWOT analysis of the organic mulberry tea sector in Xiengkhouang province

STRENTGHS	WEAKNESSES
• High quality tea • Mulberries Inc. has a strong management and a good marketing strategy • Mulberries Inc. provides training on how to produce mulberry, knowledge for starting producers is easily accessible • Support of organic agriculture by local authorities • One tree can last for 100 years under good management	• Expensive processing of high quality mulberry tea • Local population prefers classic Phou San tea over organic mulberry tea, since Phou San tea has been traditionally grown in Xiengkhouang • Insufficient production capacity to meet international demand
OPPORTUNITIES	**THREATS**
• Growing interest of Lao people in mulberry tea • Increase of international demand • Expansion of tea production to relocated families in Tha Tom district • Increase of production possible by producers linked to Mulberries Inc. who at present only produce mulberry for silk worm rearing • Mulberries Inc. can be the market link for local farmers who want to produce mulberry for tea • Conversion to organic production of Phou San tea	• Competition with cheap Vietnamese tea for the domestic market

4.4 ORGANIC TEA *(CAMELLIA SINENSIS)* VALUE CHAIN ANALYSIS CHAMPASAK PROVINCE

4.4.1 Value chain actors

4.4.1.1 Producers

Paksong Farmer Organic Tea Production Group

Paksong Farmer Organic Tea Production group, is a producer group with 136 members, corresponding to 107 ha of tea *(Camellia sinensis)*, spread over ten villages in Paksong district (2014). Most of the members are small-scale farmers, who own less than 1 ha of tea and cultivate tea in 'tea gardens', where tea plants are grown in combination with coffee and other plants. They do not produce at full capacity but leave part of their tea plants abandoned, because there is not enough demand. The members of the producer group deliver to a small processing unit, owned by the producer group and established in 2013 with the support of ASDSP and Oxfam Solidarity Belgium.

Every village has a representative in the executive committee of the producer group, who informs about local sales prices and provides technical recommendations to producers. It is often the village representative who receives training and passes the information to the producers of his village. The advantages of being in this producer group are the certainty of sales, the fixed price for all members and the provided training. The group members want to contribute to the community and put part of the profit in a fund that goes to the development of local villages (roads, schools,…).

There had been a bigger processing unit in the same area, also established with the support of ASDSP and corresponding to a former producer group (The groups of Southern Tea producers in Paksong District), which contained generally the same members as the present one. This producer group was organically certified by a certain German certification body (name unknown) and fair trade certified by FLO and exported tea through the fair trade network. In 2009, evidence of contamination was found in one of the containers that were exported to Germany. As a result, the orders from Germany ceased and the processing unit closed down. Management and financial issues might have been an additional factor. Most of the tea producers changed to coffee as a main crop and left their tea plantations abandoned or cut the trees down to plant something else. Some of them continued to produce and process tea and sold to local traders. In 2011, the present, smaller processing unit was established by ASDSP and Oxfam Solidarity Belgium (OSB). Budget was recovered from the fund of the former producer group and some financial support of CCFD (*Comité Catholique contre la Faim et pour le Développement*). OSB provided processing equipment and supported in building facilities. Permanent staff was recruited to take care of the management

of the processing facility (director, accountant, unit supervisor, stock manager) as well as labourers to process the tea.

The organic and Fair Trade certifications were linked to the former group, so the new producer group had to apply for organic and fair trade certification again. They received organic certification from the Lao certification Body (LCB) in 2012 and obtained organic certification by the Thai certification body in 2014, which is recognised by the EU and allows export to European countries.

Mrs. South family enterprise and family farms

Mrs. South and her family have a small enterprise with coffee and tea plantations, who process and sell their own tea and that of 10 other families. Their main activity is coffee, secondly comes tea (primarily *Camellia sinensis* and small amounts of *Morus alba)* and then other products. They have 3 ha of tea in the form of a plantation and the area of tea of the 10 supplying families is about 10 ha in total. During the coffee season (November-March) the supplying families do not have time to harvest tea and the supply is little. At the family farm of Mrs. South, they do keep on harvesting at their own plantation. The family has good marketing experience, which is shown by the inclusion of some touristic elements, such as a coffee shop (see Figure 19) near a frequently visited waterfall and guided tours on the plantation.

Figure 19 Coffee shop of Mrs. South family enterprise

4.4.1.2 Processors

Processing unit Paksong Farmer Organic Tea Production group

The processing unit at km 36[3] processes the tea for the Paksong Farmer Organic Tea Production group. The fresh leaves are delivered by the producers. Twice a year Lao Farmers' Products (LFP)

[3] There is only one big road in that area. People use the distance, e.g. km 36 to indicate how far along this road they are located.

places a demand, resulting in two busy periods a year. LFP is a packaging and processing company in Vientiane, the capital of Laos, that processes local farmer products such as rice, tea and jams for selling on the local and international market. To avoid a bigger supply than the facility can process, a schedule is made during these busy periods which spreads the supply from the different villages. On average the factory processes about 50 kg of dried tea a day, during a busy period. They could process more, but since there is not that much demand, there is no reason to put more people to work. The reason that the demand is low is because LFP is afraid to take on larger orders from international buyers. They are not sure the producer group will be able to provide larger amounts in time and maintain adequate quality. There is also the issue of pre financing. LFP does not have enough budget or is not willing to pay the producer group beforehand for such high amounts and consequently the members are not willing to produce so much more without the certainty of getting paid. A lack of trust from all parties is the main obstacle for production expansion.

For more information about the processing of organic tea by the Paksong Farmer Organic Tea Production group, see Annex 1. After the tea is processed and dried, it is send to LFP in big bags. LFP checks the humidity and does an additional drying when necessary. After an order, the desired amount gets taken out of the storage room, pulverized and manually transferred to typical teabags by using a spoon. A piece of string containing the label gets manually attached to every teabag. Afterwards, the small teabags get wrapped in plastic one by one and are closed hermetically. For export to Europe, the teabags are transferred to illustrated cardboard boxes and piled up for easy transport. For selling in Laos, the tea bags are put in plastic packaging of different sizes, or the tea gets put loose in plastic bags.

Plantation at km 40: Mrs. South family enterprise

Mrs. South family enterprise also has a processing unit, where the same kind of equipment is used as at the processing unit of the Paksong farmer group (see Annex 1). The packaging happens manually. Since they sell over 2000 kg of tea per month, this means that they process about 60-70 kg of dried tea a day. Even though they produce different types of tea next to *Camellia sinensis*, such as mulberry and moringa tea, they do not have a different processing system but apply the same methods as for classic green tea.

4.4.1.3 Traders

The main buyer of organic tea from the Paksong Farmer Organic Tea Production Group is LFP, who puts in a command twice per year, mainly for export to Europe. After receiving organic certification from ACT (Organic Agriculture Certification Thailand), the purchasing prices for fresh leaves, bought from the members, went up from 3,000 LAK (€0,33) to 5,000 LAK (€0,56) for

a kg of fresh leaves. The price for processed tea bought by LFP went up from 60,000 LAK to 80,000 LAK (€6,7 to €9) per kg of dried tea.

The main buyers of organic tea (*Camellia sinensis,* mulberry, moringa and lemon grass tea) from Mrs. South family enterprise are tourists, locals and a Japanese tea shop in Vientiane. Last year *Malongo*, a French company, discovered their organic coffee and organic tea products.

More information about quantities and prices of organic tea sales in Champasak province is given in Table 13.

Table 13 Sales of organic tea in Paksong: Quantity and sales prices

PRODUCER	Quantity	Retail sales price	Wholesale sales price
Paksong Farmer Organic Tea Production group	3,049 kg per year		Farmers to processing unit: 5,000 LAK (€0,56) per kg fresh leaves (equivalent to around 20,000 LAK (€2,20) per kg dried tea) Processing unit to LFP: 80,000 LAK (€9) per kg dry tea.
Shop of Km 40	classic tea: about 2,000 kg per month (from April to October) *moringa*: several 100 kg per month *mulberry*: depending on the demand *lemon grass*: very little production 80% tourists and local buyers Retailers: 10 % to a Japanese tea shop in Vientiane 10 % to Malongo	Bag of 30 g classic tea: 10,000 LAK (€1,1) Bag of 60 g moringa tea: 20,000 LAK (€2,2)	Bag of 30 g classic tea: 8,000 LAK (€0,9)
TRADER	**Quantity served/ bought**	**Buying price**	**Sales price**
LFP	3,049 kg per year Export: 64% to Solidar'monde who distributes it further in Europe Retailers: 32.5% to Mpoint and HomeIdeal 2.5% at LFP shop Hotel: 1% to Mercure hotel	80,000 LAK (€9) per kg dried tea	

4.4.2 Value chain map of the organic tea sector in Champasak province

The value chain map in Figure 20 shows the linkages between producers, processors and traders of organic tea in Champasak province. The initial quantities of dried tea produced are given, as well as the percentage of it that is bought by different traders.

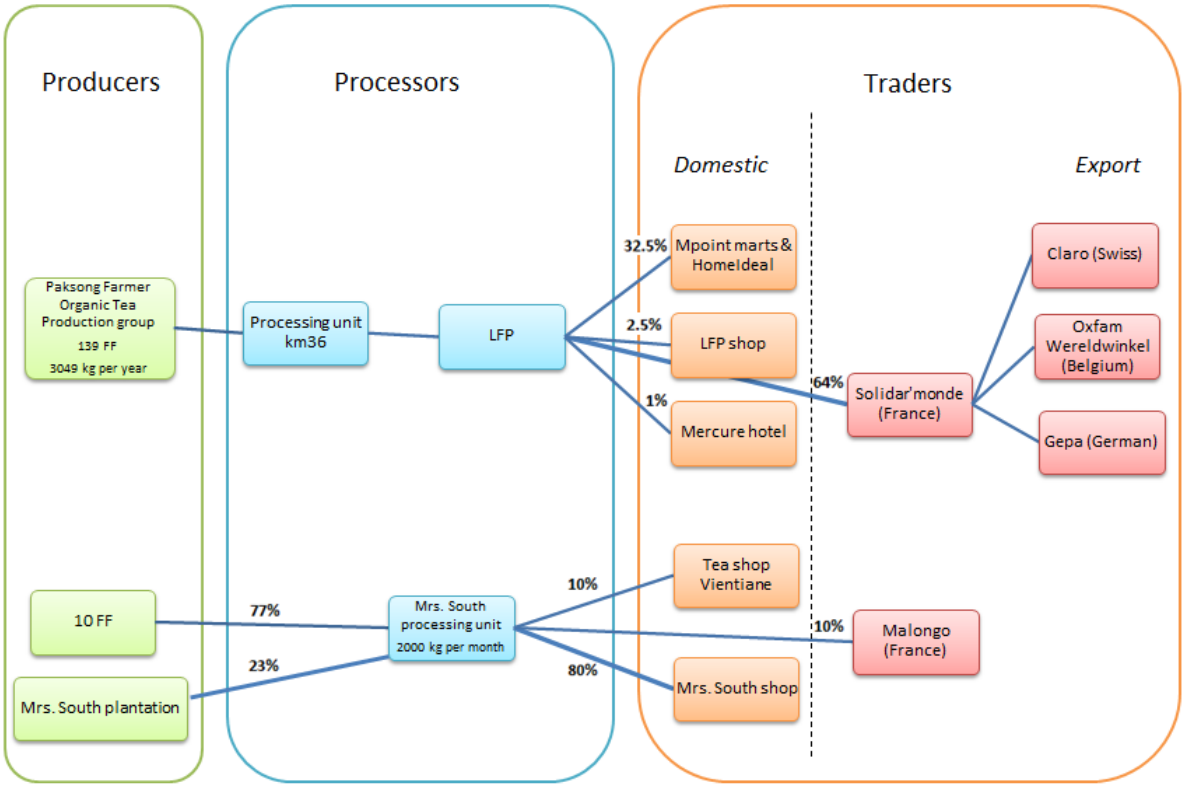

Figure 20 Value chain map of the organic tea sector in Champasak province

4.4.3 Enabling environment of the organic sector in Champasak

***Association de soutien au développement des sociétés paysannes* (ASDSP).**

ASDSP supports farmer groups with a focus on sustainable production. They have played a supportive role throughout the creation and development of the organic producer group and processing facility of the Paksong Farmer Organic Tea Production group. ASDSP organises trainings to instruct DAFO members on how to give training about organic cultivation techniques and follows up their activities. A local ASDSP member provides technical assistance for the management of the producer group. The certification costs of $ 750 per year are paid by ASDSP, until the end of the project. The intention is that the producer group will take over this cost afterwards.

District Agriculture and Forestry Office (DAFO)

DAFO promotes the organic production of coffee, tea and vegetables through technical training. In general, DAFO organises two trainings per year since they have limited fund and HR capacity. When producers demand a specific training, DAFO can provide it. Financial support for these trainings is given by the Asian Development Bank (ADB). There is no organic market.

District Commerce and Industry Office

The District Commerce Office gives consultations when SMEs have questions about how to do business and how to conduct the official processes.

District Finance Office

The District Finance Office in Paksong has no funds to support agricultural production. They do use tax exemption as a form of support, so no value added tax needs to be paid for agricultural products. The producers have to pay a land tax of 40,000 LAK (€4,5) per ha per year.

4.4.4 Service providers

At Mrs. South family enterprise, two male labourers are employed permanently for the maintenance of the plantation and tea processing. The land is property of the family and they rely on family capital for investments, since the interest rates of loans are too high.

Most of the producers of the Paksong tea producer group do not take loans for tea production, because for tea they do not do big investments. Some of them, that also produce coffee, take loans to be able to buy pesticides or fertilizer for coffee production. These loans have an interest rate of 14 %. Most of the producers own their own land. At the processing unit in Paksong, labourers are hired to do the processing as well as some of the producers who want to process as well.

At LFP, there are 15 fixed and 9 temporary labourers (see Figure 21) who process all kind of products, such as tamarind, jam, rice and tea.

Figure 21 Personnel of Lao Farmers' products in Vientiane capital

4.4.5 SWOT analysis of the organic tea sector in Champasak province

STRENTGHS	WEAKNESSES
• Knowhow on tea production by farmers • Tea is harvested all year long • Paksong, with its location on the Boloven plateau, has a good environment to produce good quality *(Camellia sinensis)* tea • Waterfalls in the area attract tourists • Tea is either ODOP or organically certified • Paksong farmer group membership guarantees a stable sales price	• Insufficient marketing & promotion • Seasonal mismatch between supply and demand • Competitiveness within the Paksong farmer group • Difficult to control the organic standards in the Paksong farmer group • Difficult to safeguard high quality in the Paksong farmer group
OPPORTUNITIES	**THREATS**
• Expansion of production: abandoned parts of plantations can be put to use again and the current tea plants can be more regularly harvested by Paksong farmer group members • The market for normal quality tea is oversaturated, but there is a niche market for high quality organic tea	• Competition on the domestic market with Vietnamese low quality tea • Trust issues concerning adequate quantity and quality of supply and uncertainty of getting paid between LFP and producer group hindering expansion of tea production • Pesticide contamination from nearby non-organic coffee plantations

4.5 Overview of the organic tea chains in Vientiane, Xiengkhouang and Champasak provinces

Characteristics	Vientiane province	Xiengkhouang province	Champasak province
Type of tea	*Morus alba*	*Morus alba*	*Camellia sinensis*
Number of producers	2	1	147
Prominent production type	Plantation	Plantation	Tea gardens* (< 1 ha)
Farmer associations	No	No	Yes
Estimated production area (ha)	4,3	17	120
Number of processors	2	1	3
Estimated total production (tonnes)	1.53	0.34	17.0
Share of total production for export (%)	_	54	20
Wholesale price per kg processed tea (LAK/€)	150,000 LAK / €17	146,000 LAK/€16	80,000 LAK/€9 (1) 266,000 LAK/€29 (2)
Retail price per kg packaged tea (LAK/€)	300,000 LAK / €31	550,000/€61 to 1,458,000 LAK/€160 depending on packaging type	333,000 LAK/€37 (2)
Touristic environment	Yes	No	Yes

* tea gardens: tea plants are grown in combination with coffee and other plants

(1) Paksong farmer organic tea production group (2) Mrs. Kamphy

5. Discussion

In this chapter, the results are discussed and compared with findings of other authors. For every target province recommendations for improvement of the value chains are suggested, based on the results of the SWOT analyses.

5.1 ORGANIC TEA SECTOR

PEST analysis revealed that Laos suffers from widespread corruption among government officials and that political or other forms of opposition are not tolerated and dealt with harshly, even though the Lao Constitution guarantees freedom of assembly, religion and speech. Setting up a business and capital accumulation are difficult because of regulatory costs and underdeveloped financial markets. The government influences many prices through subsidies and state-owned enterprises.

These factors can make it more difficult for SMEs to develop a fruitful business. This is confirmed in a study by Southiseng & Walsh (2010) on the competition and management issues of SMEs in Laos. The study concluded that entrepreneurs find it difficult to access finance and modern technology, have limited capital and skills and often receive unfair treatment by officials. As a consequence, mainly short-term objectives are considered and few SMEs are able to consider long-term plans or business sustainability (Southiseng & Walsh, 2010).

5.1.1 Certification

The results show that organic certification in Laos is possible. Only a small share of Lao consumers are aware of Lao organic certification. There are some restraints for farmers and enterprises to apply for organic certification, as was discussed in a conversation with Mr. Bounyasouk, deputy head of the Standard and Accreditation Division.

The main difficulties for farmer cooperatives and enterprises who want to get certified are the certification costs and the burdensome administration. However, the certification process often does improve the functioning of enterprises or farmer cooperatives because they have to keep record frequently and more thoroughly. After applying, there are often difficulties with obtaining or maintaining the organic certificate due to traceability problems, and issues with quality, safety and hygiene. Appropriate knowledge of organic standards is not always present.

The Lao Certification Body (LCB) is only accredited for the local market. When enterprises want to export, they need an internationally acknowledged label. At present, the international label of the Thai Certification Body is used, but the costs for inspection and certification are high.

At present, the Lao organic standards are based on the IFOAM standards, but these are described as not completely suitable for Laos by deputy head of the Standard and Accreditation Division, and are planned to be adapted. Some variation in standards are acceptable by IFOAM and many international traders in organic products, since conditions influencing organic agriculture are not the same in all countries and total homogeneity of standards worldwide would be economically inefficient. However, fundamental differences between local standards and those of IFOAM are not accepted by them (Wynen, 1998).

5.2 ACTORS

Only a few actors operate in the organic tea sector in the target provinces. Both in Vientiane and Xiengkhouang provinces, the organic mulberry tea sector is monopolised by one actor performing both the producing, processing and trading (Vang Vieng organic farm and Mulberries Inc., respectively).

In Champasak province, there is one big producer group (Paksong Farmer Organic Tea Production group) with 136 members and a family enterprise (Mrs. South) that cooperates with 10 local families for production of organic tea *(Camellia sinensis)*. Both the members of the producer group as the families cooperating with Mrs. South own on average 1 ha of tea in tea gardens. Some actors such as Vang Vieng organic farm and Mrs. South family enterprise make use of their location in a touristic area for promotion and selling of organic tea. Mulberries Inc. and LFP, the main buyer of the Paksong farmer group, both export more than 50 % of the processed tea products. The other traders mainly sell to local retailers, wholesalers (Lao supermarket chain) and tourists. Only Mulberries Inc., the Paksong farmer group and LFP are organically certified. Other actors are in the process of getting organically certified or refuse to certify because of the high costs and their buyers and consumers already trusting them to produce organically.

A study on the benefits and challenges of promoting organic certification for the coffee sector in Laos (Saysana, 2011) found similar results. In Laos, most coffee farmers produce organically by default and own less than 5 ha. However, only a few producer groups and enterprises are organically certified, as is also the case for organic tea. There are several coffee producing companies in the process of converting to organic production. The total area of organically certified coffee is 680 ha and about 485 additional ha is still in the process of getting organically certified. Coffee production in Laos is mostly small-scale and the output per ha is low compared to neighbouring countries such as Vietnam, which makes it difficult to compete. As is the case for tea, coffee producers and processors try to compete with cheaper Vietnamese products by delivering higher quality products. A difference with the organic tea sector is that organic coffee

is mainly produced for export, whereas an important share of organic tea is also bought by local retailers, tourists and Lao supermarkets (Saysana, 2011).

5.3 ENABLING ENVIRONMENT

The organic sector is supported by national and local governments as well as NGOs. The support of local governments does not always reach far, as budget is limited. It is mostly translated to tax exemption but can be more substantial when organic tea products are recognized as ODOP products (One district, One product). When an NGO is involved, as is the case with SAEDA in Xiengkhouang province and ASDSP in Champasak province, more support is given, for the establishment of farmer groups, capacity building, enhancing management and networking skills and organic certification. However, these are not the only needs. At present, there is no policy and official legal framework for the registration and approval of cooperatives. If the general government created a legal framework, this would be beneficial for the development of cooperatives and offer a way for small-scale farmers to increase their market power and enjoy the benefits of being a member of a cooperative, such as sharing in costs and reduce business uncertainty (Sharma, n.d.).

The organic coffee sector also enjoys support of the Lao government, even more so than organic tea, since there is a specific plan to promote high altitude organic coffee (Ministry of agriculture and forestry, 2010).

5.4 SERVICE PROVIDERS

Land is mostly owned by the organic tea producers. At Vang Vieng organic farm, Mulberries Inc. and Mrs. South family enterprise, labour is hired for harvesting, processing and the maintenance of the mulberry and classic tea plantations. The Paksong farmer group hires labour for processing. The equipment for harvesting and maintenance is basic, consisting of hedge scissors and sometimes a grass mower. Farmers mostly rely on their own capital. There is a possibility to lend capital from the bank but the interest rates are high (14 % for the Agricultural Development Bank) and do not encourage investment.

The organic coffee sector requires intense labour and only manual labour is used. A producer group of organic coffee at the Boloven plateau provides loans for members in need (Saysana, 2011).

5.5 QUANTITIES AND PRICES

There is a large difference in quantities and prices of organic tea *(Camellia sinensis)* between the Paksong Farmer Organic tea Production group and Mrs. South and family farms. The Paksong farmer group produces 3 tonnes dry tea per year with 136 members and 107 ha and Mrs. South family enterprise in combination with 10 family farms produce around 2 tonnes dry tea per month on 13 ha. Out of two focus group discussions it was made clear that for most of the members of the Paksong farmer group, tea was not the main crop or even considered a small side crop. Some members declared that they left most of their plantation abandoned and only maintained a small part which they harvested to bring to the processing unit. The Paksong farmer group only processes tea two periods per year, when LFP orders a large quantity for export. The rest of the year, only small amounts of tea are being processed for LFP for local buyers.

When comparing organic mulberry tea production in Vientiane and Xiengkhouang province, it is clear that Vang Vieng organic farm produces larger quantities (dry season: 200 kg/month, rainy season: 50 kg/month) than Mulberries Inc. (336 kg per year), even though the latter has more production area. This can be explained by the fact that Mulberries Inc. primarily uses mulberry leaves for silk production and not for organic tea.

When comparing wholesale prices, the prices of Vang Vieng organic farm and Mulberries Inc. are similar (150,000 LAK/€17 and 146,000 LAK/€16 per kg of processed tea, respectively). However, both mostly sell their mulberry tea in small packages and not in bulk, even for export of tea from Mulberries Inc. to Canada and Australia. When comparing retail prices, Mulberries Inc. asks 2 to 5 times higher prices per kg packaged tea than Vang Vieng organic farm, depending on the type of packaging (bamboo or cardboard box, tea loose or in bags). The retail price per kg packaged organic mulberry tea of Vang Vieng organic farm is comparable to the retail price per kg classic tea *(Camellia sinensis)* sold by Mrs. South family enterprise in Champasak province, which does not have a monopoly. This indicates that Vang Vieng organic farm, even though a monopoly, is not able to set a higher price, whereas Mulberries Inc. does benefits from its monopoly through higher price setting. Another explanation is that Mulberries Inc. exports 50 % of its tea production and price is set for the international market, whereas Vang Vieng organic farm sells on the national market.

5.6 RECOMMENDATIONS FOR IMPROVEMENT OF THE ORGANIC TEA VALUE CHAINS BASED ON SWOT ANALYSIS

5.6.1 Vientiane province: Vang Vieng district

If DAFO and the District Commerce Office would recognize organic mulberry tea as an ODOP product, they will provide technical assistance and organize promotion. In this scenario, more producers could be attracted by DAFO and Oxfam Solidarity to produce organic mulberry tea and especially women could be encouraged to produce. It would be advisable to organize these organic mulberry tea producers under one common label and create a producer group, which could share costs, such as organic and HACCP certification and which could appoint people for marketing and management. At present, tea processing is entirely manual. A small processing unit could be created with the support of Oxfam Solidarity, PSC and the future producer group where processing could be partly mechanically performed. There would be a need for support in marketing and campaigning, which can be provided by extension officers of DAFO, PSC or Oxfam Solidarity.

Creating a common label and a common market link will offer a better chance of finding buyers and will ensure a fixed price for all producers. However, this can only be accomplished when the quality and taste of the tea, supplied by different producers, are homogenous. There would be a need for one type of packaging that ensures quality, so the colour, taste and smell of the tea can be maintained when producing high quantities. When producing large quantities of mulberry tea under the same label, the production price can decrease, allowing organic mulberry tea to compete with cheap Vietnamese tea on the domestic market. Big sales opportunities lie in the tourism sector in Vang Vieng. Organic mulberry tea already has acquired a good reputation by tourists worldwide, who ask about the organic tea when visiting Vang Vieng. When DAFO and the District Commerce Office further develop this recognition by choosing it as an ODOP product, the tourism sector could be involved by DAFO and be encouraged to serve and sell mulberry tea.

When expanding the organic mulberry tea production in Vang Vieng, the problem of insufficient availability of cuttings could be solved by teaching the technique to some producers, who could provide cuttings to new producers. Trainings can be organised by PSC, Oxfam solidarity or DAFO.

5.6.2 Xiengkhouang province: Paek district

Technical and financial support for Mulberries Inc. is needed and can be given by Oxfam Solidarity or ASDSP to construct the small tea factory and for teaching the people of Tha Tom-district to produce organic mulberry tea. Mulberries Inc. can also look for other interested parties to invest

in this project by making use of its network. Furthermore, surveys could be made to see if any of the current mulberry producers would be interested in producing leaves for tea as well as silk. This can be done by Mulberries Inc., who already have regular contact with these producers for silk production. Producing mulberry both for silk worm feed and tea production might not be an option for most family farms, since a farmer needs at least 1 ha, containing 3,000 to 4,000 mulberry plants, to be able to have sufficient feed for the silk worms.

In 2007, ASDSP wanted to promote organic Phou San tea in Xiengkhouang. The project was stopped because of a concession given by local authorities to a Chinese company. However, there are some difficulties and it might be possible for ASDSP in the future to re-establish the project and promote Phou San tea as an organic tea again. Apparently, the producers have not changed their production methods and are still using organic techniques. A first step would be to reinstate the former producer groups, assist with marketing and promotion and with obtaining organic certification.

5.6.3 Champasak province: Paksong district

Mrs. South family enterprise is at present satisfied with the amount of products being sold. They do not want to expand and work with more family farms than they do at present, in order to maintain a high quality. However, it could be that they need marketing and networking assistance by ASDSP or Oxfam Solidarity in the future, because buyers are volatile.

The Paksong Farmer Organic Tea Production group could be supported to become a real cooperative. At a focus group discussion with 6 members (mostly village heads), the manager of the production unit and the head of the ten villages, it was remarked that they should cooperate better, be less competitive and share more information. In order to improve cooperation of the Paksong farmer group equity among members and equal access to the benefits of the farmer group, such as training, needs to be ensured. High integrity and transparency by management needs to be maintained, e.g. through democratically elected members responsible for administration and management, appropriate internal monitoring systems and external audits (Mwichabe, n.d.).

There are some difficulties with safeguarding the organic standards. The village heads, who are responsible for conveying information about organic agriculture and explaining that there are certain obligations when being organically certified, have difficulties in convincing farmers of the importance of these obligations. This is particularly the case for limitations on the use of chemical fertilizers or pesticides and the measures that need to be taken to avoid contamination with these products used on nearby non-organic crops. One member using pesticides can have great

consequences for the whole group. The same goes for quality. To maintain a good quality tea only the bud and two consecutive leaves are allowed to be harvested. There is a need for extra support on how to produce organically. Extra training and information could be provided by ASDSP and Oxfam. Another idea that was discussed at a focus group discussion with the village heads, is to create a lab which could test the batches for pesticide residues before export, but this might be very costly for the Paksong farmer group.

The Paksong Farmer Organic Tea Production group has a lot of growth potential. Most of the producer group members do not consider tea as their main crop or even a small side crop. Some members leave most of their plantation abandoned and only maintain a small part which they harvest to bring to the processing unit. If buyers are interested and the members are willing, the Paksong farmer group could supply a lot more tea.

There is a need for marketing assistance, promotion and the attraction of new buyers. LFP, who buys all tea from the processing unit and does the packaging, gets offers from foreign companies for large quantities (for example a request from a Chinese company for 1 tonne) but at the moment is hesitant to accept such offers, since they are not sure the Paksong farmer group will be able to provide it (in time) and with good quality. At the focus group discussion it was mentioned that the members would be willing to provide larger quantities, but only if they can be ensured of a continued order, and not just a one year supply, since the focus of the members often is on other crops, mostly coffee. Gradually increasing orders by LFP to the Paksong farmer group, can be beneficial to increase trust between the producer group and LFP. Another barrier could be the maximum processing capacity of the production unit in Paksong. At present, around 50 kg of dried tea a day is being produced. They could process more, but the maximum capacity of the processing unit remains unclear. The Paksong farmer group can also be encouraged to find other bulk buyers besides LFP by enhancing their marketing and networking skills through support of ASDSP and Oxfam.

At the moment, the Paksong Farmer group is building a shop, where they will sell the products locally. Support by ASDSP and Oxfam can be offered by assisting in the development of a good marketing plan and packaging system.

6. Conclusions

The study was set out to gain a clear understanding of the main constraints and opportunities for improvement of the organic tea sector in Laos and to identify the principal SMEs involved. The thesis is part of the Eat Greener project, a project implemented by Oxfam Solidarity in Laos. The Eat Greener project aims to facilitate small-scale farmer integration into the organic agricultural sector, since organic certification adds value to agricultural products, provides access to attractive local and international markets and relies on assets which poor farmers already have, such as land free of intensive use of chemicals and knowledge of traditional production systems.

Laos offers a great opportunity for the development of the organic sector, since a lot of farmers already produce organically by default. The organic policies and framework are in place, providing access for Lao farmers and enterprises to organic certification. The organic sector is supported by national and local governments as well as NGOs. However, the support of national and local governments is limited due to budget limitations. Furthermore, a legal framework for cooperatives, which would be beneficial for the development of the organic sector, is lacking and access to credit for farmers and small enterprises is limited. Setting up a business and capital accumulation are difficult because of regulatory costs and underdeveloped financial markets. At present, the Lao organic label does not have international accreditation which results in a lot of extra paperwork and high costs to acquire an extra internationally recognized organic label for export which can be an obstacle for local farmer associations and entrepreneurs. Another issue is that the Lao organic standards are currently based on the IFOAM standards, which are not completely adequate for a country in a tropical climate with farmer practices that differ from the Western ones.

A value chain analysis of the organic tea sector was conducted in three target provinces: Vientiane province, Xiengkhouang province and Champasak province. None of the value chain maps are complicated, since the organic tea sector in Laos is very small. This is to be expected since the Laotian regular tea sector is already negligible compared to the total production in Asia (900 tonnes corresponding to 0.0002 % of total tea production in the Far East).

In Vientiane and Xiengkhouang province organic mulberry tea *(Morus alba)* is produced in plantations. In Champasak province, organic tea *(Camellia sinensis)* is cultivated, mostly in tea gardens with a surface area of less than 1 ha. Both in Vientiane and Xiengkhouang province there is only one major stakeholder present, respectively Vang Vieng Organic Farm and Mulberries Inc. The latter is able to make use of its monopoly by setting a high price, whereas the retail price per kg organic mulberry tea of Vang Vieng organic farm is 2 to 5 times lower than at Mulberries Inc.

This can also be explained by the fact that Mulberries Inc. exports 50 % of its tea production and price is set for the international market, whereas Vang Vieng organic farm sells on the national market. In Champasak province there are several stakeholders of importance: The Paksong Farmer Organic Tea Production group with 136 members and Mrs. South family enterprise, connected to 10 family farms. Both have their own processing units. Another significant stakeholder is processing company LFP, who packages all tea of the Paksong Farmer Organic Tea Production group.

The value chains in the three provinces differ in strengths and weaknesses, although inadequate marketing was in general experienced as the biggest constraint for further development of the tea chains. Capacity building can be given in every province by Oxfam Solidarity to enhance marketing and networking skills. At the production level there seem to be some seasonal constraints in certain areas. In Vientiane province, the small family farm had limited production in the dry season due to a lack of irrigation water. In Champasak province the production stopped during the coffee season due to limited manpower. All producers claim to have no problems with pests.

The research in Vientiane province focused on Vang Vieng district, which is a major touristic area and has a lot of market potential. The large number of hotels, restaurants and shops in Vang Vieng could be potential buyers. At present, producers of mulberry tea in Vang Vieng are scarce (Vang Vieng organic farm and one small family farm). However, the knowhow of producing and processing is present. If the District Agriculture and Forestry Office (DAFO) and the District Commerce Office decide to recognize organic mulberry tea as an ODOP product, they will provide technical assistance and organize promotion. ODOP (One District, One Product) is a national project where each district can choose one or several products they want to promote and recognize as a typical product of their district. In this scenario, more producers could be attracted by DAFO, Oxfam Solidarity and PSC (Oxfam's local partner) to produce organic mulberry tea and especially women could be encouraged to produce, since mulberry tea production does not require heavy labour. It would be advisable to group the future producers under one label to ensure quality and facilitate organic certification. If needed, a small processing unit could be created by the future producer group and PSC or Oxfam Solidarity. Recognizing organic mulberry tea as a typical product for Vang Vieng will encourage local hotels and guesthouses to serve it and local shops to sell it. There would be a need for marketing and campaigning assistance.

In Xiengkhouang province, the only current producer and processor of organic mulberry tea is Mulberries Inc. At Mulberries Inc., the main purpose of mulberry leaves is silk worm rearing. Only a small part of the mulberry plantations is intended for organic tea production. Since the demand

is higher than current production, Mulberries Inc. plans to extend mulberry tea production to relocated families in Tha Tom district. These families will be trained in organic tea production and a small tea factory will be created for processing, possibly in cooperation with a Thai company. Technical and financial support for trainings and the factory construction in Tha Tom district can be given by Oxfam Solidarity and ASDSP (Oxfam's local partner).

Another possibility for Xiengkhouang province could be the re-establishment of the Phou San tea *(Camellia sinensis)* group in the future. A project on the promotion of organic Phou San tea, under guidance of ASDSP, was put to a stop due to concessions made between local authorities and a Chinese company. However, there seem to be some difficulties and it might be possible in the future to re-establish the project and promote Phou San tea as an organic tea again. The producers have not changed their production methods and are still using organic techniques. A first step for ASDSP would be to reinstate the former producer groups, assist with marketing and promotion and with obtaining organic certification.

In Champasak province, classic organic tea *(Camellia sinensis)* is produced by the Paksong Farmer Organic Tea Production group and Mrs. South family enterprise. At present, Mrs. South is satisfied with the amount of tea being sold and does not want to expand. However, it could be that they need marketing and networking assistance in the future, because buyers are volatile.

The Paksong Farmer Organic Tea Production group still needs some guidance from ASDSP and Oxfam in certain areas. There have been some difficulties with safeguarding the organic standards. The village heads explain that some members do not always understand the importance of the obligations that come along with organic certification, especially concerning the use of chemical fertilizer or pesticides. The same goes for quality.

However, the Paksong Farmer Organic Tea Production group has a lot of growth potential. The group has 107 ha of tea available for production, but large parts are neglected because of a lack in demand. If new buyers are found and the members are willing to restart the maintenance of (partly) abandoned tea gardens, the Paksong farmer group could supply a lot more tea. However, there are some trust issues between the Paksong Farmer group and LFP, the main buyer who packages the tea. LFP is hesitant to accept large offers, since they are not sure the Paksong Farmer Group will be able to provide it (in time) and with good quality. The Paksong farmer group is only willing to restart the maintenance of the abandoned parts if they can be ensured of a continued order. Also, the maximum processing capacity of the production unit in Paksong is not clear. Gradually increasing orders by LFP to the Paksong farmer group, can be beneficial to increase trust between the producer group and LFP. Another barrier could be the maximum processing capacity of the production unit in Paksong, which is unknown.

At the moment, the Paksong Farmer group is building a shop, where they will sell the products locally. Support by ASDSP and Oxfam could be offered by assisting in creating a good marketing plan and packaging system.

Each target province shows potential for further development and extension of the organic tea sector. Implementation of the suggested measures could induce livelihood improvements for all actors involved in the organic tea value chains and boost national, Asian and European consumption of Lao organic tea.

7. Recommendations for further research

As the study was only conducted in three provinces in Laos, it can be useful to research if organic tea is produced in other provinces in Laos and perform similar value chain analyses in these areas. Supporting organic tea production in every tea producing province in Laos can boost overall production and increase recognition of Lao organic tea on the international market.

A next step can be to perform similar studies on other organic commodities such as jams and honey, which are being produced organically in Laos.

At present, several NGOs are involved in projects promoting organic agriculture for livelihood improvement. Therefore, a study researching the actual benefits and disadvantages of producing and processing organically in Laos needs to be performed in order to evaluate the usefulness of these projects.

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Annex 1: Cultivation and processing of classic organic tea (*Camellia sinensis*)

Using the results of the surveys and focus group discussions, the production and processing of classic organic tea (*Camellia sinensis*) in Champasak province is described. Further information was gathered from a MSc thesis by Standaert, who did a HACCP analysis of the harvesting, processing and packaging of organic tea of the Paksong Farmer Organic Tea Production group (Standaert, 2015).

1. CULTIVATION AND HARVEST

Organic tea in the area under study is produced by family farms in Paksong, who are members of the Paksong Farmer Organic Tea Production group or are associated with Mrs. South family enterprise. The family farms own 1 ha of tea on average and produce tea in 'tea gardens', where tea plants are grown in combination with coffee and other plants. Mrs. South and a few members of the Paksong Farmer Organic Tea Production group own more than 1 ha and produce tea in small plantations. An agricultural calendar of tea (*Camellia sinensis*) cultivation practices is provided in Table 15.

Harvesting

Harvesting happens all year round in intervals of 15 days, which is the time a tea plant needs to produce a new shoot/sprig/branch with young leaves. However, there are some variations in the quantities harvested. The families delivering to Mrs. South supply smaller quantities or even stop harvesting at all during the coffee production period from November to March. Every six months, the members of the Paksong Farmer Organic Tea Production group harvest higher quantities for a short period to answer the demand of Lao Farmers Products, their main buyer. During the rest of the year, low quantities of tea are harvested and processed for the domestic market.

Pruning

At the plantation of Mrs. South, pruning happens regularly to maintain the ideal shape of the tea plants. Members of the Paksong Farmer Organic Tea Production group do not prune regularly. However, every three years stems are cut back at knee height to facilitate plucking of the leaves. (see Figure 22).

Figure 22 Demonstration of cutting height organic tea

Weeding

Once per month, the tea plantation of Mrs. South is weeded. In between the rows, the weeding is done with a grass mower, at the foot of the trees weeding is done by hand. At the Paksong Farmer Organic Tea Production group there is some variation in weeding frequency. Some members weed monthly from June-October with a grass mower and only once in the dry season, when an axe is used to destroy the grass and create a mulch. Other members only weed twice per year.

Irrigation

Because of the geographical location on the Boloven plateau the climate is different from the rest of Lao, resulting in lower temperatures. In the dry season the temperatures climb only to 24-28 °C. Therefore, most members of the Paksong Farmer Organic Tea Production group do not irrigate. Mrs. South does irrigate once a week in the dry season.

Fertilisation

At the plantation of Mrs. South, fertilizer is applied a bit here and there when organic fertilizer is present. As a fertilizer they use coffee grounds and tea remainder from the coffee shop, cow dung when it is available, and the peel of banana and passion fruit.

The Paksong Farmer Organic Tea Production group does not use fertilizer. In the past they used organic fertilizer and cow dung, but they prefer not to since they do not want to increase their production. The organic fertilizer applied in the past was made of a mixture of coffee grounds, ash and banana leaves.

Plant protection products and preventive measures

Mrs. South applies lime at the tree bottoms when there is an increase in the ant population. When the ants have caused damage and by consequence infection, the infected branches are removed. Recently, they found an insect that eats the stem; by recommendation of an intern they should apply Tabaco leaf and hot pepper as organic plant protection products. Lime is available at the local markets.

The members of the Paksong Farmer Organic Tea Production group claim to have no problems with pests. They do create a mulch to prevent weeds from growing.

Yield loss

In general there is no significant yield loss. When yield loss occurs at Mrs. Souths plantation it is because of sickness caused by leaf damage by ants. The Paksong Farmer Organic Tea Production mentioned bad harvesting practices as a possible cause for yield loss. If you harvest too soon, the next time the leaves will not come out right. If you wait too long, the leaf is too big. That's why they harvest in intervals of 15 days.

Table 14 Agricultural calendar organic tea production. FFS= Family farms delivering to Mrs. South

Activity		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Weeding	Mrs. South/FFS												
	Farmer group												
Irrigation	Mrs. South/FFS												
	Farmer group												
Fertilisation	Mrs. South/FFS												
	Farmer group												
Harvesting	Mrs. South												
	FFS												
	Farmer group												

PROCESSING

Harvesting

Only the bud and two consecutive leaves are allowed to be harvested to generate a high quality tea (see Figure 23). Tea gets harvested every 15 days.

Figure 23 Tea bud and two consecutive leaves

Withering

Tea is laid out on a shelf for 12-20 hours, depending on the condition of the leaves and which type of tea is wanted, to reduce the moisture content and to allow several biochemical reactions to take place (see Figure 24). This process makes the leaves easier to handle in the further stages.

Rolling

The rolling process distorts the leaves. As a result enzymes and flavour components are released. This happens manually during roasting and with a rolling machine (see Figure 24).

Figure 24 Withering of tea leaves (left), rolling machine (right)

Fermentation

During the fermentation or oxidation step, leaves are spread in thin layers to oxidise. The enzymes released in the rolling process bind to oxygen molecules resulting in a darkening of the leaves. When black tea is required, the tea leaves are laid out until they are fully oxidised. For oolong tea, only partial fermentation takes place. Leaves for green tea are immediately roasted after withering, resulting in a deactivation of the fermentation enzymes. No fermentation takes please and the leaves maintain a more green colour.

Roasting

Leaves are roasted on hot plates for 3-4 hours to reduce the moisture content to ±5 % humidity and to inactivate fermentation enzymes (see Figure 25).

Figure 25 Roasting of leaves for green tea

Annex 2: Cultivation and processing of organic mulberry tea (*Morus alba* L.)

Using the results of our surveys and focus group discussions, the production and processing of organic mulberry tea *(Morus alba)* in Vientiane and Xiengkhouang provinces is described.

In both Vientiane and Xiengkhouang province, mulberry tea (*Morus alba* L.) is produced in plantations (4 ha and 17 ha, respectively), with the family farm of Mrs. Kamphy as an exception, who produces mulberry in a tea garden of 0.3 ha. The plantations are cultivated by labourers. Their level of education varies, but all of them finished primary school and most of them did 1 to 7 years of secondary school. At Mulberries Inc., 3 people finished a higher, technical education. At both plantations the work is done by both female and male labourers. Only the heavier work, such as the building of fences, is mainly done by male labourers.

2. CULTIVATION AND HARVEST

The original mulberry trees of Vang Vieng organic farm were obtained from cuttings of the centre of sericulture in Vientiane in 1996. Mulberries Inc. started planting in 1993, with cuttings imported from Thailand together with some authentic Lao varieties. Mrs. Kamphy obtained her starter cuttings from Vang Vieng organic farm. The propagation of mulberry trees happens mostly through cuttings and at Mulberries Inc. recently also by seed, for a new variety imported from China. An agricultural calendar of mulberry tea cultivation practices is provided in Table 15.

Harvesting

The plantations are divided in sections, that are harvested in succession. When a full rotation is completed, the mulberry plants in the first section have developed new leaves ready for harvest. Therefore, tea can be processed year round. Mrs. Kamphy only harvests in October and November, because she only has one buyer and does not produce much because she lacks an irrigation system.

Pruning

Pruning is done 2 to 3 times per year, after leaf harvesting. Normally, hedge scissors are used.

Weeding

Weeding happens all year long but inconsistently. Weeds are mostly removed when detected during other activities. Around the same time as pruning, the weeds/grass gets mowed. Mulberries Inc. does a complete clearing of weeds once per year. The grass gets ploughed into the soil with a motorized tractor plough, or sometimes with a manually pushed one.

Irrigation

Most of the year, there is sufficient water available. After the rainy season, the ground stays moist

for a while. In the hot dry season from March to April, irrigation is necessary once or twice a week. Both Mulberries Inc. and Vang Vieng organic farm are close to a river, which they use to pump water to disperse over the different sections. Mulberries Inc. makes use of a sprinkler system to ensure good growth of saplings.

Fertilisation

In general, organic fertilizer is applied twice per year, after pruning. An easy accessible organic fertilizer is a homemade mixture of cow dung and rice chaff, where the latter can be obtained from rice millers for free. A more advanced organic fertilizer is amongst others a liquid fertilizer prepared at Vang Vieng organic farm. Fruits and the leaves of banana plants from the farm are put in a mixing tank to ferment. This results in a highly concentrated compost, which needs to be lengthened with water before administration. At Mulberries Inc., an organic fertilizer is made with sugar cane waste as main component. Long bean (*Vigna unguiculata ssp. sesquipedalis* (L.) Verdc.) and soybean (*Glycine max* (L.) Merr.) are planted as green manure and also serve as soil cover.

Plant protection products and preventive measures

Organic plant protection products are used against the yellow colouring of the leaves, probably caused by a virus. When leaves are infected, infected branches are cut off. Vang Vieng organic farm prepares its own organic pesticide with lemon grass and *lee la lang kai*, very old and strong ginger (*Zingiber officinale* Roscoe). These ingredients are crushed and soaked in one night, and a little bit of soap is added in order to make it cling.

Both plantations use preventive measures against weeds, such as mulching with rice straw or by leaving the remainder after mowing.

Both Vang Vieng organic farm as Mulberries Inc. have very few pest problems with their mulberry cultivation. Sometimes, there is an increase in insect populations in May, but this lasts only for a short period and the damage is usually negligible. Vang Vieng organic farm claims to place frogs and lizards in the plantation to eat the insects. However, it is unclear if these are reared especially for this purpose or if the naturally occurring frog and lizard populations are captured.

Yield loss

There are several causes of yield loss, agricultural as well as logistic. Mrs. Kamphy who does not have an irrigation system, has almost no leaf production in the dry season. This gap in production can be an important factor to take into account when assessing the possible success of expansion to small-scale farmers in Vientiane and Xiengkhouang provinces, who do not have the means to develop an irrigation system. A lack of fertilizer availability is another cause of low yields. At Vang Vieng organic farm, there are some difficulties with finding enough labourers to produce and process tea, since Vang Vieng is a touristic area with a lot of alternative employment opportunities.

Table 15 Agricultural calendar for mulberry tea production

Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Pruning												
Weeding												
Irrigation												
Fertilisation												
Harvesting												

PROCESSING

The processing of mulberry tea at Vang Vieng organic farm and Mulberries Inc. is similar. Mulberries Inc. estimates that 4 kg of fresh leaves yields 700-800 g of dry tea after processing (1 kg wet -> 175-200 g dry tea) . Vang Vieng organic farm estimates 5 kg of fresh leaves to be necessary for 1 kg of dry tea (1 kg wet -> 200 g dry tea).

Harvesting

For preparation of green mulberry tea, the fourth leaf of every branch is picked (not considering the shoot with the sprouting leaves). Leaf numbers five or six have the same quality but result in a more yellow tea colour. When numbers five or six are also plucked, they have to be kept separated for roasting, since the optimal temperature to dry will be different because of the different water content. When folding the leaf in half and squeezing it, a good tea leaf will not tear (see Figure 26).

Figure 26 Detection of a bad tea leaf: the leaf on the left tears when squeezing, while the right one remains undamaged

For preparation of red mulberry tea, the freshly sprouted young leaves are used. These leaves are steamed instead of boiled. Harvesting of green mulberry tea is done year round on Vang Vieng organic farm, whereas it is done from March to June and from September to November on the Mulberries Inc. plantation, depending on the needs of silk worm, as the main use of mulberry at Mulberries Inc. is for silk worm feed.

Washing of leaves

Mulberries Inc. plantation uses water from a water pomp equipped with a filter. Leaves are washed manually (Figure 27).

Sorting and cutting

Leaves of approximately the same size are piled up so the petioles are placed neatly one above the other in order to facilitate the cutting process. A large cutting knife (see Figure 27) is being used to cut off the petioles of the leaves. These will be used as animal fodder or compost. Then the leaves are cut to strips in the way a chef cook would slice vegetables.

Figure 27 Washing of tea leaves (left) and cutting of tea leaves (right) (Organic farm Vang Vieng, 2016)

Vang Vieng organic farm: steaming

Quick process: 2-5 minutes. A kettle with hot water is placed upon a charcoal fire. The leaf strips are put in a tray with holes in the bottom, so the steam can go through (see Figure 28). When there is enough steam, the tray is placed on the kettle and the whole is covered with a lid. When the leaf strips have shrunk they are removed from the fire and cooled immediately so that they maintain their green colour. They are transferred to a big bowl and gently stirred to speed up the cooling process.

Figure 28 Steaming at Vang Vieng organic farm

Mulberries Inc.: boiling

Instead of steaming, leaf strips are immersed for 15 seconds in a pot of water with an estimated temperature of 70-80 °C. After immersion, leaf strips are immediately cooled in cold water and stirred to enhance the cooling process in order to guard leaf colour. Leaves that are used for red mulberry tea get steamed instead of boiled. The leaf strips are put in a bowl and squeezed and kneaded until the leaf veins have completely softened up.

Roasting

After boiling or steaming, leaf strips are transferred to a big wok pan over a gas burner. One wok pan can contain about 4 kg of leaves for effective roasting. The leaf strips are manually rolled to a small ball and then rolled back out, while squeezing the water out of the leaves (Figure 29). The temperature is adapted intuitively, depending on the season and water content. During the roasting process the water content decreases. As a result, the temperature of the gas burner needs to gradually decrease as well to obtain a uniformly roasted batch of tea. The transformation to dried leaves takes approximately 2 hours and 30 minutes.

At Mulberries Inc., the women wear hygienic protection masks, hair nets and protective coats and are not allowed to talk during roasting to prevent contamination with hair or saliva (Figure 30).

Figure 29 Roasting at Vang Vieng organic farm

Figure 30 Roasting at Mulberries Inc., while wearing hygienic protection masks, hair nets and protective coats

Drying

Roasted leaves are dried and stored in bags. To reduce water content to 7 % and make the tea crunchier, leaves are put on trays in an oven for 1-2 hours, depending on the moisture content of the leaves. In case the leaves have a higher moisture content than 7 % there are more susceptible to fungi, in case the moisture content is less than 7 %, tea gets too dry.

The roasted tea from Mulberries Inc. is not dried on the plantation, but gets send in big bags to the Mulberries Inc. processing unit in Vientiane. There the leaves are additionally dried in an oven and packaged.

Packaging

After drying, tea gets stored in big bags and then packaged in small plastic bags of 50 g, imported from Thailand. Inside the bag, a label is put in the form of a paper containing information about the beneficial properties of Mulberry tea. The labels are printed in Vientiane. The package is sealed with a sealing machine.

Annex 3: Focus group producers

Translator:

A. Location

A.1. Province:_____

A.2. District:_____

A.3. Village:_____

A.4. Name of the village head:_____

B. Socio-economic information

B.1. What type of producers are you? Do you work at plantation or do you have a family farm?

B.1.1. In case of family farms: which family members are involved with the tea production? Are the children interested to take over the farm when they're older?

B.1.2 In case of plantation:
- number of men/women working on the plantation: #M= #F=

B.2. What is the general level of education of the tea producers who produce organic tea in this area? □ None □ Primary school □ Secondary school □ Higher education

B.2.1 In case of higher education: What kind of higher education?

B.3. What is the main activity of most organic tea producing farmers in the area?

B.4. Are there organic tea producers who do any secondary activities? Which kind? (*business, commerce, teacher, household, ….)*

C. Tea production

Paksong: Information about production area and yield will be obtained through the village head/DAFO.

Production area?

Yield?

C.1. When did tea production start in this area?

C.2. How old are the tea plants/mulberry trees?

C.3. How were the tea plants/mulberry trees obtained? □ Seeds □ Cuttings □ Other:

C.3.1 Where do the seed/cuttings come from?

C.4. What kind of activities are carried out, how frequently and by whom?

Activity	Frequency (times per year) + when	
Pruning		□ Men □ Women □ Both
Weeding		□ Men □ Women □ Both
Irrigation		□ Men □ Women □ Both
Fertilisation		□ Men □ Women □ Both
Applying of plant protection products		□ Men □ Women □ Both
Soil preparation (Harrowing, ploughing, …)		□ Men □ Women □ Both
Harvesting		□ Men □ Women □ Both
Other:		□ Men □ Women □ Both

C.4.1 Do most farmers here have an irrigation system?

C.4.2 What kind of fertiliser is generally being used, which quantity and how many times?

C.4.2.1 How is this fertiliser obtained?

C.4.3 How are pests and weeds being controlled? Preventive measures? Plant protection products: which quantity, and how many times?

C.4.3.1 How are these plant protection products obtained?

C.4.4 What kind of machines/tools/equipment are generally being used for the crop management of tea/mulberry?

- To control weeds
- For pruning
- For fertilisation
- For irrigation
- For harvesting

C5. After harvest, where do the tea leaves generally get stored?

C.5.1 Which treatments happen before storage? Packaging?

C.6. What do you think of the quality of the tea leaves in general? How do you define the quality? What is a good leave? What happens with the bad quality leaves?

□ Very bad □ Bad □ Normal □ Good □ Very good

C.6.1 When not satisfied, what are the quality problems? Damage by insects

□ Diseases

□ Bad taste

□ Other:

C.7. What are the main causes for yield loss in this area? Give a number by importance (0=Not a cause of loss, 1=minor cause of loss, 2= average cause of loss, 3=major cause of loss)

Pests: _____

Diseases: _____

Climate: _____

Other: _____

C.8. What are the plans for the future of your tea production?

D. Management and financing

D.1. Who does the finances in general? Man or women?

D.2. When farm: Do most farmers own their own land or is it rented?

When plantation: Who owns the plantation?

D.3. Can you give an estimation of the yearly amount generally invested in the cultivation of tea/mulberry?

D.4. Do farmers get loans here? Yes / No

D.4.1 Is getting a loan a possibility? Yes / No

When yes: From which credit institution(s)? How does it work?

D.5. Are there other possibilities to get access to finances?

E. Market access

E.1. Are most of the organic tea producers in this area part of a farmer group? Yes / No

When yes: Name of the farmer's association(s): _____

What are the main benefits of being in an association?

- □ Better price for the products
- □ Training in farming techniques
- □ Marketing support
- □ Other: _____

E.2. Where/to whom are the tea leaves generally being sold? (%)

- □ Retailer (shop)
- □ Retailer (market)
- □ Wholesaler

  Do producers generally have a contract with the retailers/wholesalers?
- □ Processor

  Do producers generally have a contract with the enterprise? Yes / No
- □ Other:

E.3. Are producers in this area looking for other buyers? Yes / No

When yes: How do they do this?

If farmer's association, is there someone responsible for marketing and attracting new buyers?

E.4. What are the sales prices and how do they vary in time?

- □ Minimum price: _____ LAK
  Time of the year: _____
- □ Maximum price: _____ LAK
  Time of the year: _____

E.4.1 How does the price get determined?

E.5. How does the transportation generally go to the market/intermediary/enterprise?

- □ The products are picked up at the farm/plantation
- □ With own car or motorbike
- □ With the use of animals
- □ Other: _____

E.6. What are the transportation costs in general?

F. Organic production

F.1. How long has organic production been going on in this area? _____ Years
Are there any farmers/farmer groups/plantations certified in this area? Yes / No Why?
Do the organic tea producers supply to an enterprise that is certified? Yes / No
When yes: how many years?
What were/are the main obstacles whit the certification process?

F.2. What where the main aspects farmers in this area had to change to become organic producers?

F.3. Was training about producing organically provided? Yes / No
If yes: From whom/which organisation(s)?

F.4. What are the main reasons producers in this area chose to produce organic tea? *(Maybe social influence from projects or government?)* Would you rather produce something else?

Annex 4: Focus group traders & hotels

Translator :

A. Location

A.1. Province:_____

A.2. District:_____

A.3. Village:_____

B. Socio-economic information traders

B.1. Type of trader:

- □ Wholesaler
- □ Retailer (shop)
- □ Retailer (weekly market)
- □ Retailer (monthly market)
- □ Other: _____

Wholesaler: Person or firm that buys large quantity of goods from various producers or vendors, warehouses them, and resells to retailers. Wholesalers who carry only non-competing goods or lines are called distributors. Retailer: A business or person that sells goods to the consumer, as opposed to a wholesaler or supplier, who normally sell their goods to another business.

B.2. What is the general level of education of the retailers in this area?

□ None □ Primary school □ Secondary school □ Higher education

B'. Socio-economic information hotel/restaurant

B'.1. Type of hotel/restaurant that provides organic tea: (%)

- □ International tourists
- □ Lao tourists
- □ Business

B'.2. Size of the hotel/restaurant: How many guests stay/eat in the hotel/restaurant?

C. Purchase of tea products: Make a distinction between Retailer/Hotel & Restaurant /Wholesaler!

C.1. Where is the organic tea generally being bought?

- □ Directly from the producers: - farmer's association
  - individual farmers
- □ Retailer (market)
- □ Retailer (shop)
- □ Wholesaler
- □ Processor
- □ Other: _____

C.2. How much and at what frequency?

C.3. Are the amounts of organic tea available for purchase satisfactory? Yes / No

C.4. Is the quality of organic tea available for purchase satisfactory? Yes / No

C.5. What are the purchasing prices and how do they vary in time?

- □ Minimum price: _____ LAK
  Time of the year: _____
- □ Maximum price: _____ LAK
  Time of the year: _____

C.6. Have the prices been changing a lot over the years? Have they risen or fallen? Why?

C.7. How does the transportation of purchased goods happen?

D. Selling of tea products: Make a distinction between retailers and wholesalers

D.1. In what form is the tea generally being sold? □ Loose □ Bags □ Other:

D.2. To whom are the tea products generally being sold?

- □ General public: …….. %
- □ Retailers: …… %
- □ Wholesalers: ……. %
- □ Enterprises: …….. %
- □ Institutions: ……. %
- □ Hotels: …… %
- □ Restaurants: …… %
- □ Other:

D.3. Are there contracts being made with the buyers? Yes / No

When yes: What is the content of such a contract in general?

D.4. At what prices is the tea generally being sold and how do they vary in time? Difference in price according to type of packaging?

- □ Minimum price: _____ LAK
  Time of the year: _____

□ Maximum price: _____ LAK

Time of the year: _____

D.5. How much tea do retailers/wholesalers generally sell? (kg, number of bags 250 g, ….)

D.6. Does the amount of sold tea products change during the year?

D.7. Why organic tea products?

D.8. In comparison to other products, does the organic tea sell well?

Yes / No / Neutral

Why do you think this is the case?

D.9. What are the bottlenecks/challenges for trading in organic tea in general?

D.10. When exporting:

What are the bottlenecks/challenges for exporting organic tea?

D.11. How is the organic tea being promoted? Website, banners, flyers, through friends & family, …

D.12. Are there retailers/wholesalers who are organically certified?

D'. Selling of tea products: Hotels/Restaurants

D'.1. Why does the hotel/Restaurant provide organic tea?

D'.2. How much organic tea is being consumed? Does consumption vary during the year?

D'.3. Next to organic tea, does the hotel/restaurant also provide regular tea? Yes / No

When yes: Which one do the guests prefer?

D'.4. Are you looking for other suppliers for organic tea?

D'.5. Would you think about providing only organic products?

Annex 5: Survey processor

Translator :

A. Location

A.1. Province:_____

A.2. District:_____

A.3. Village:_____

B. Socio-economic information

B.1. How many people are employed here? (permanent/temporary) _____ / _____

B.2. What level of education do they have?

- None: ….. % of employees
- Primary school: ….. % of employees
- Secondary school: ….. % of employees
- Higher education: ….. % of employees

B.3. In case of higher education: What kind of higher education?

B.4. Ask a full explanation of the processing.

  - Process
  - Materials used and their origin
  - Degree of mechanisation

C. Purchase of tea products

C.1. From who do you buy the organic tea?

□ Directly from the producers: - farmer's association
- individual farmers

□ Retailer (market)

□ Retailer (shop)

□ Wholesaler

□ Processor

□ Other: _____

C.2. How much and at what frequency?

C.3. Are you satisfied with the amounts of organic tea available for purchase? Yes / No

C.4. Are you satisfied with the quality of organic tea available for purchase? Yes / No
When No: why?

C.5. What are the purchasing prices and how do they vary in time?

- □ Minimum price: _____ LAK
  Time of the year: _____
- □ Maximum price: _____ LAK
  Time of the year: _____

C.6. Have the prices been changing a lot over the years? In what way?

C.7. What happens if the quality of tea leaves/mulberries is not adequate?

C.8. Are you interested in finding new suppliers? Yes / No
When yes: Why?

C.9. How does the transportation of purchased goods happen?

C.10. In what form and in what type of packaging material do the products arrive at the processing enterprise?

D. Selling of processed tea products

D.1. To whom do you sell the tea products?

- □ General public: …….. %
- □ Retailers: …… %
- □ Wholesalers: ……. %
- □ Enterprises: …….. %
- □ Institutions: ……. %
- □ Hotels: …… %
- □ Restaurants: …… %
- □ Other:

D.2. Do you have a contract with the buyers? Yes / No
When yes: What is the content of such a contract in general?

D.3. Do you export organic tea to other countries? Yes / No

D.4. At what prices do you sell the processed products and how do they vary in time? Difference in price according to type of packaging?

- □ Minimum price: _____ LAK
  Time of the year: _____
- □ Maximum price: _____ LAK
  Time of the year: _____

D.5. How much tea do you sell? (kg, number of bags 250 g, ….)

- □ Per day: _____
- □ Per week: _____
- □ Per month: _____
- □ Per year: _____

D.6. Does the amount of sold tea products change during the year?

- □ Minimum amount: _____ kg
  Time of the year: _____
- □ Maximum amount: _____ kg
  Time of the year: _____

D.7. Why do you process organic tea products?

D.8. Are you interested to process other organic products?

D.9. What are the bottlenecks/challenges in the processing of organic tea?

D.10. Is your company organically certified?

Annex 6: Field work in Laos

In order to visualise how the value chain analyses were conducted, some pictures are provided of individual interviews (Figure 31), focus group discussions (Figure 32) and stakeholder meetings (Figure 33).

Figure 31 Individual interviews with a processor at Vang Vieng organic farm in Vientiane province (left), Mrs. South in Champasak province (middle) and the manager of Mulberries Inc. (right)

Figure 32 Focus group discussions with the village heads and manager (left) and producers (right) of the Paksong Farmer Organic Tea Production group in Champasak province.

Figure 33 Stakeholder meeting in Vientiane province