Finding and analysing social hotspots in a global food value chain as a basis for livelihood improvement

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Abstract: *Globalisation of food trade leads to various impacts on the economy, the environment, and society. Countries like Brazil that have expanded their agricultural trade and have become net agricultural exporters are particularly affected. Social impacts of agri-economic growth are often less obvious and difficult to generalize as both positive and negative impacts on social inclusion, such as income distribution, access to resources and markets, or food security have been shown. Therefore, we complement global food value chain analysis between Brazil and Switzerland by further knowledge on how it affects the livelihoods of different chain actors' households. By a global value chain analysis, social hotspots including their affected actors in the food value chain are detected. The Sustainable Livelihoods Framework helps to find out how global food value chains impact those actors' livelihoods. In order to develop measurements to improve the investigated livelihoods, the insights from the global value chain analysis and the Sustainable Livelihoods Framework analysis are taken to develop cause-effect hypotheses or so-called result chains. Thus, the article focuses on the following questions:*

- *How can social impacts of global food value chains on households' livelihoods be analysed?*
- *How can a global food value chain approach and the Sustainable Livelihoods Framework be combined?*
- *Which indicators can be used to analyse social impact of a global food value chain on household's livelihood?*
- *How can result chains be developed in order to propose measurements for livelihood improvements?*

The article presents an attempt to combine the three approaches, global value chain analysis, the Sustainable Livelihoods Framework and result chains into a new "Value Chains for Livelihoods" (FC4L) –Framework. This Framework is applied to the example of frozen concentrated orange juice (FCOJ), which is produced in Brazil and consumed in Switzerland. By an initial global value chain analysis the pickers are identified as actors that are especially exposed to social risks as they suffer from severe employment conditions. In order to investigate their livelihoods a set of indicators from the "Oxfam Poverty Footprint" is brought in. Based on the insights from the global value chain and livelihood analysis, a tentative measurement to improve the pickers' livelihoods is developed. These measurements' possible impact is made plausible by result chains. The combination of the frameworks in the case study suggests a comprehensive research design to analyse social impact on chain actors' livelihoods, to develop measurements for livelihood improvements and reveals further areas to be included in research.

Keywords: *Social impact, Sustainable Livelihoods Framework, global food value chains, result chain, Brazil, Switzerland*

1 Introduction

Global food trade has increased considerably during the last decades. Notably, food value chains in developing and emerging countries have changed substantially during globalisation. One of the major changes has been the shift from domestically oriented, often state-controlled to globally integrated, liberalised food supply chains (Swinnen & Maertens, 2006). The integration into global food value chains has been associated with various impacts on the economy, the environment, and society. In this context, studies demonstrated both positive and negative impacts.

Many developing and emerging economies have profited from the expansion of agricultural trade. Increasing exports of agricultural commodities, the expansion of large-scale farming, and foreign investment in the agri-food sector have been drivers of economic development in countries, such as Brazil (Guinn & Hamrick, 2014). However, there is growing concern that these developments have been at the cost of the environment and social equity. The environmental impact of agricultural extension and intensification has been widely discussed. Resource depletion, land use, climate change, ecotoxicity, and eutrophication are some of the major impacts associated with intensified food production (European Food SCP Roundtable, 2013).

Social impacts, however, are less obvious and difficult to generalise. Both positive and negative impacts on social inclusion, such as income distribution, access to resources and markets, or food security have been shown. Guinn & Hamrick (2014) demonstrated that the agri-economic growth in emerging economies created opportunities for some, but simultaneously increased inequalities among food system actors. More specifically, Gómez & Ricketts (2013) looked at on how transformation of value chains influences malnutrition. They concluded that the impact of modernising value chains can be in either direction, increasing or decreasing malnutrition. Moreover, there are only few studies that analyse the impact of global market integration on poverty and if the impact of global value chains on poverty is studied, poverty is measured only one-dimensionally by income (Bolwig, Ponte, du Toit, Riisgaard, & Halberg, 2010).

As an answer to that gap, Bolwig et al. (2010) suggested a comprehensive framework in order to examine changes affecting chain actors regarding different dimensions of poverty like participation, vulnerability, risk and inequality as well as gender, labour and the environment (Bolwig et al., 2010). Likewise, Neven (2014) suggested a framework how to measure the sustainability performance of global food value chains from a comprehensive perspective including social aspects. He proposed several factors to measure social sustainability of food value chains, amongst others, dimensions like number of jobs created, lower prices and better availability of food for poor consumers, social objectives of additional tax income and avoidance of socially unacceptable outcomes (Neven, 2014). In order to understand and improve the social impact of food value chains Neven (2014) advices the identification of the root causes of social unsustainability. Moreover, there are many tools to measure socio-economic impact of (agri-) businesses (WBCSD, 2013). One tool noteworthy because it offers an extensive indicator base is the “Oxfam Poverty Footprint”. It is intended to analyse the socio-economic impact of a company’s activities along a value chain (United Nations Global Compact and Oxfam, 2015).

The frameworks of Bolwig et al. (2010), of Neven (2014) and the “Oxfam Poverty Footprint” (United Nations Global Compact and Oxfam, 2015) offer the possibilities to describe the overall socio-economic impacts of a global food value chain on members of a certain community and to evaluate the impacts of e.g. a single company’s activities. In our analysis, we want to add a holistic analytical focus on chain actors’ livelihoods for selected social hotspot in a global food value chain.

In our research project, we therefore investigate the social impact of global food value chains, reaching from Brazil to Switzerland. We build upon different frameworks and combine

them into the proposed “Value Chain for Livelihood” (VC4L)-Framework in order to analyse the situation of households’ livelihoods of selected food chain actors. A livelihood perspective can deliver more information about how households choose or are forced to choose their livelihood options and about lacking possibilities to improve their livelihoods. Further, it enables to grasp the root causes of livelihood outcomes. The identification of pre-conditions for the actual livelihood situation and the deep understanding how livelihood outcomes are influenced by the integration in global food value chains, helps in a further step to develop measurements in order to improve living condition of directly or indirectly involved actors of a global food value chain. In our view, the analytical focus on households’ livelihoods is especially useful as often project initiatives and policies ultimately target livelihoods of households.

The article shows how a global value chain analysis, the Sustainable Livelihoods Framework and the establishment of result chains are combined and proposes the “Value Chain for Livelihood”-Framework as a new analytical approach. Thus, in this article we answer the following questions:

- How can social impacts of globalised food value chains on households’ livelihoods be analysed?
- How can a global food value chain approach and the Sustainable Livelihoods Framework be combined?
- Which indicators can be used to analyse social impact of global food value chain on household’s livelihood?
- How can result chains be used in order to propose measurements for livelihood improvements?

In the next, second chapter, the new VC4L-Framework is presented. In the third chapter, we use the VC4L-Framework to develop a research design. It shows a possibility how to analyse the social impact of a global food value chain on households’ livelihoods of selected actors. After that, it is presented how to develop the result chain of a possible measurement to improve livelihoods. In the last chapter, the analytical framework and its application are discussed and further research questions are raised.

2 "Value Chain For Livelihood" (VC4L) – Framework

This chapter describes the VC4L-Framework as new approach, linking together the global value chain analysis with the Sustainable Livelihoods Framework and the result chains. The Figure 1 shows the structure of the VC4L-Framework.

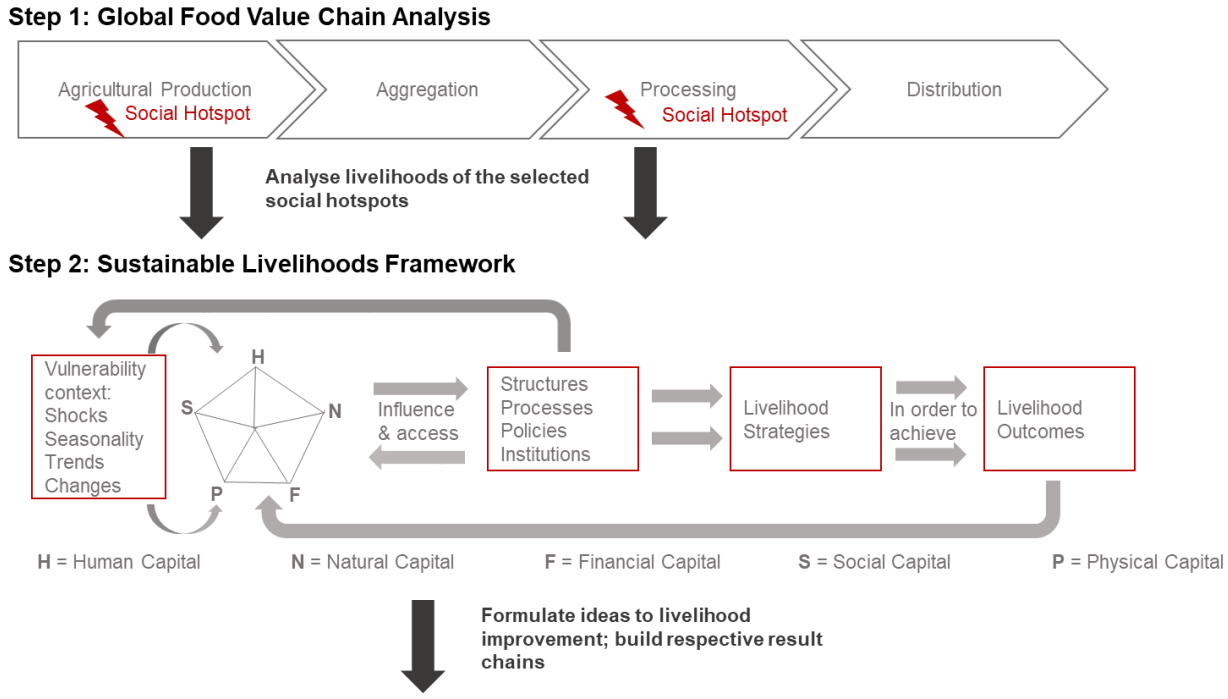

Figure 1 Overview of the "Value Chains for Livelihood - Framework (adapted from DFID Department for International Development, 2000; Gereffi & Fernandez-Stark, 2016; Nadel - Center for Development and Cooperation Zurich, n.d.; Stewart Carloni & Crowley, 2005)

2.1 Step 1) Global value chain analysis

The concept of a global value chain has been used to analyse activities that firms and workers do to bring a product, good or service from its conception to its end use and beyond (Gereffi & Fernandez-Stark, 2016). This includes activities such as design, research and development, production, marketing, distribution and support to the final consumer (Gereffi & Fernandez-Stark, 2016). Specifically, when activities in a value chain are divided among different geographies and multiple enterprises, the term global value chain is used (Stacey, 2016). A global value chain analysis involves a comprehensive study of

> the structure, actors and dynamics of value chains, including examining the typologies and locations of chain actors, the linkages between them, and the dynamics of inclusion and exclusion. It also entails understanding the structure of rewards, the functional division of labour along a chain and its changing shape, the distribution of value-added and the role of standards in facilitating or hindering participation. (Bolwig et al., 2010, p. 174)

In our study, we first apply a value chain analysis, roughly following the dimensions of a global value chain analysis by Gereffi & Fernandez-Stark (2016) including mainly the description of the central activities and segments in the global value chain. Figure 2 depicts the main steps of the global food value chain analysis.

Global food value chain analysis		Method to collect data
Step 1	Define the global value chain to be studied: specify commodity, geographical range, time frame	Desk research
Step 2	Identify the main activities/segments in the global value chain: e.g. inputs, production, packaging and storage, transportation, processing, distribution, marketing	Desk research, expert interviews, interviews with chain actors
Step 3	Identify the dynamic and structure of each segment of the value chain: Inputs used, type of companies/farms, business/production practices, degree of vertical and horizontal chain integration	Desk research, expert interviews, interviews with chain actors
Step 4	Delimitate analysis regarding activities/segments (e.g. inputs, production, transportation) and sub-segments (e.g. suppliers to the respective segments), especially include those where social risks are assumed	Desk research, expert interviews, interviews with chain actors
Step 5	Identify chain actors for each activity/segment included in the value chain analysis and look for social hotspots in the value chain. In relation to the social hotspots found, describe chain actors' situation as detailed as the so far data available allows	Desk research, expert interviews, interviews with chain actors

Figure 2 Steps of a global food value chain analysis (adapted from Gereffi & Fernandez-Stark, 2016)

The global value chain analysis serves as a basis to define social hotspots in a global food value chain. For each segment, we identify the important chain actors. Regarding these chain actors, we find out where the severest social issues occur. Social issues are situations, where international standards like labour standards, human rights and UN charter and covenants or also the UN Sustainable Development Goals are not complied. To find these social issues, we consult existing literature, databases and conduct interviews with experts and chain actors.

The further analysis will focus on these social hotspots in the global food value chain. Thus, we define which households' livelihood should be investigated in-depth.

The households' livelihoods involved in a food value chain can be affected directly by salaries or profits or indirectly by tax revenues, as consumers or by positive or negative externalities of a value chain on a society (Neven, 2014). Furthermore, how values created by a food value chain are distributed among different actors depends also on the economic, infrastructural, institutional, organizational, environmental and sociocultural elements of the value chain context. Similarly Bolwig et al. (2010) suggest that understanding of social changes in global food value chains implies looking beyond the value chain itself since the power of directly or indirectly involved actors depends on a full range of livelihood activities, social relations, as well as institutional context, policies and vulnerability context.

In order to better grasp these contextual aspects, which influence the social impact of a global food value chain on different chain actors' livelihoods, we combine the global value chain analysis with the Sustainable Livelihoods Framework in a second step.

2.2 Step 2) Sustainable Livelihoods Framework

As the Sustainable Livelihoods Framework shows, households' livelihood outcomes emerge from the interplay of households' assets and from their environmental, economic, political and institutional contexts (Stewart Carloni & Crowley, 2005). Thus,

> a livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base. (Scoones, 2000, p. 5)

The Sustainable Livelihoods Framework is a tool to capture the interactions between a household with its various assets and the natural, but also with the economic, political and institutional environment (Scoones, 2000). The framework shows, on the one hand, how the various assets of a household interact with an unstable environment and, on the other hand, how the political and institutional context affects the households' endowment with different type of assets (Stewart Carloni & Crowley, 2005). From the interplay between the different capitals of a household and its institutional and political context, different strategies for earning a living are possible (see Figure 1). The livelihood outcomes are influenced by these households' strategies and external extreme events.

In the previously outlined first step, we have described the global food value chain, found social hotspots and depicted the chain actors' situation of these social hotspots. In a second step, we use the Sustainable Livelihoods Framework to understand the chain actors' livelihoods in more detail.

Indicator database for livelihood analysis

In order to examine the livelihoods, we apply indicators from the "Oxfam Poverty Footprint" (United Nations Global Compact and Oxfam, 2015). It offers a large database of indicators. We reordered the indicators from a rather company-driven to a household perspective. As a result, indicators can be chosen from the database 1) according to the different aspects included in the Sustainable Livelihood Framework[1] and 2) according to the actors' group in the food value chain that should be evaluated; e.g. farm workers, farmers or other workers.

Applying the Sustainable Livelihoods Framework in combination with the indicators from the "Oxfam Poverty Footprint" enables a multidimensional analysis of chain actors' livelihoods. In order to link the Sustainable Livelihoods Framework with the global value chain analysis we try to find the indicators for these livelihood aspects, which are directly affected by the respective food value chain. Directly means that a link between a chain actor's activity and a certain livelihood aspect is obvious without much theoretical explanations (Neven, 2014). E.g., a household's financial capital can be directly influenced by a company's wage policies.

Using insights to improve livelihoods

According to the guidance sheet of the DFID Department for International Development (2000) we adopt a participative research approach to record the chain actors' livelihood. That means we plan to gather data directly from the actors. Moreover, we follow the principle, that the Sustainability Livelihoods Framework should be used to develop measurements to improve the livelihood situation, especially of the poorest (DFID Department for International Development, 2000). Thus, we use the insights gained from the global value chain analysis and the livelihood analysis to develop together with chain actors in question possible measurements to improve their livelihood situation.

2.3 Step 3) Developing result chains for livelihood improvement

Step 1) and 2) of the new "Value Chains for Livelihoods" (FC4L) – Framework helps us first to find social hotspots in a global food value chain and second to find out how selected actors' livelihoods are affected by the social impact of a global food value chain.

Based on the results gained so far, we can define the most severe problems of the chain actors and their root causes. Against this background, we develop ideas how an improved livelihood of selected chain actors would look like. Then, we ask the question what behaviours would have to change in order to reach these improvements and what are the

[1] Human capital, social capital, physical capital, financial capital, nature capital, structures and processes, vulnerability context, livelihood strategy, livelihood outcome

external conditions that must hold true in order to make these happen (Nadel - Center for Development and Cooperation Zurich, n.d.). In other words, we use the findings from our previous analysis to develop a result chain (van Rijn, Burger, & den Belder, 2012).

The result chain is based on the formulation of cause-effect hypotheses of proposed activities and their outcomes to improve actors' livelihoods (Nadel - Center for Development and Cooperation Zurich, n.d.): First, a desirable livelihood improvement is stated. Second, the things that have to change in order to realise this improvement are formulated. These things can be brought in hierarchic order; inputs, activities, outputs and outcomes have to be defined. Outcomes are direct and indirect effects of a planned measure to improve livelihood; outputs are products and services that are created in order to reach this livelihood improvement; activities are tasks for delivering a planned measurement; inputs are financial human and material resources being at hand to realise certain activities. External factors are included in the result chain as assumptions that persist (see Figure 1, Nadel - Center for Development and Cooperation Zurich, n.d.)

The result chain can be used in the further project planning to build a LogFrame matrix (Nadel - Center for Development and Cooperation Zurich, n.d.) or alternatively to formulate a theory of change (INSP, 2005; Stein & Valters, 2012).

The result chain, with its hierarchies of results – inputs, activities, outputs, outcomes, impacts – can be linked to the Sustainable Livelihoods Framework as van Rijn et al. (2012) showed in the case of coffee production. Van Rijn et al., (2012) assigned outcomes and impacts to different aspects of the Sustainable Livelihoods Framework. E.g. the enhancement of knowledge about coffee production was assigned to human capital. Hereby, the effects of measurements can be linked to the Sustainable Livelihoods Framework.

3 Example of Application: Frozen Concentrated Orange Juice (FCOJ) from Brazil to Switzerland

In order to apply the VC4L-Framework we choose the example of frozen concentrated orange juice (FCOJ), produced in Brazil and consumed in Switzerland. In terms of the total value, FCOJ is the major traded good between the two countries[2]. In our analysis, we include only not-labelled FCOJ[3].

3.1 Step 1) Global Food Value Chain Analysis

Brazil accounts for 21% of the global orange production (FAOSTAT)[4]. Out of this, around 70% are used to produce FCOJ (Neves, Vinicius, Lopes, Kalaki, & Milan, 2011). More than 90% of this juice concentrate is exported (Neves, Trombin, & Kalaki, 2013). Around 76% of total world exports of FCOJ comes from Brazil (FAOSTAT)[5]. In Brazil, the state of São Paulo comprises around 80% of Brazil's area with orange orchards and corresponds approximately to the so-called citrus belt (Neves, Trombin, & Kalaki, 2014; Neves et al., 2011).

[2] Value of FCOJ imported from Brazil to Switzerland in 2016: US $ 78'428'000 (FAOSTAT, retrieved on 2018-01-04)

[3] According to estimations of the fair trade organization Max Havelaar, 36% of overall orange juice products imported to Switzerland originate from fair trade (https://www.maxhavelaar.ch/produkte/produktkategorien/fruchtsaft.html, retrieved on 2018-04-26)

[4] Global orange production 2016: 81'738'436 tonnes; Brazil orange production 2016: 17'251'291 tonnes (FAOSTAT, retrieved on 2018-01-04)

[5] World exports of FCOJ: 2'181'600 tonnes; Brazil exports of FCOJ: 1'673'600 tonnes (FAOSTAT, retrieved on 2018-01-04)

After a frost reduced the orange harvest in Florida severely, Brazilian's orange industry began to develop rapidly and a competitive industry led Brazil to become the world's largest producer of oranges since the 1980s, surpassing the United States not only in production but also in technology (Neves et al., 2011). The FCOJ from Brazil is not only grown, but also processed, extracted, concentrated and frozen in Brazil (ten Kate, 2017).

The value chain of FCOJ involves four major groups of actors: orange producers including their pickers, primary processors turning the oranges into frozen concentrate, secondary processors (bottlers) turning the concentrate into juice, and retailers or food service companies distributing the juice to consumers (Grunert et al., 2005). A fifth group has to be added: transportation that is obliged to sustain a constant cooling chain along the value chain (Rotondaro, 2012). Figure 3 illustrates a simplified FCOJ value chain between Brazil and Switzerland.

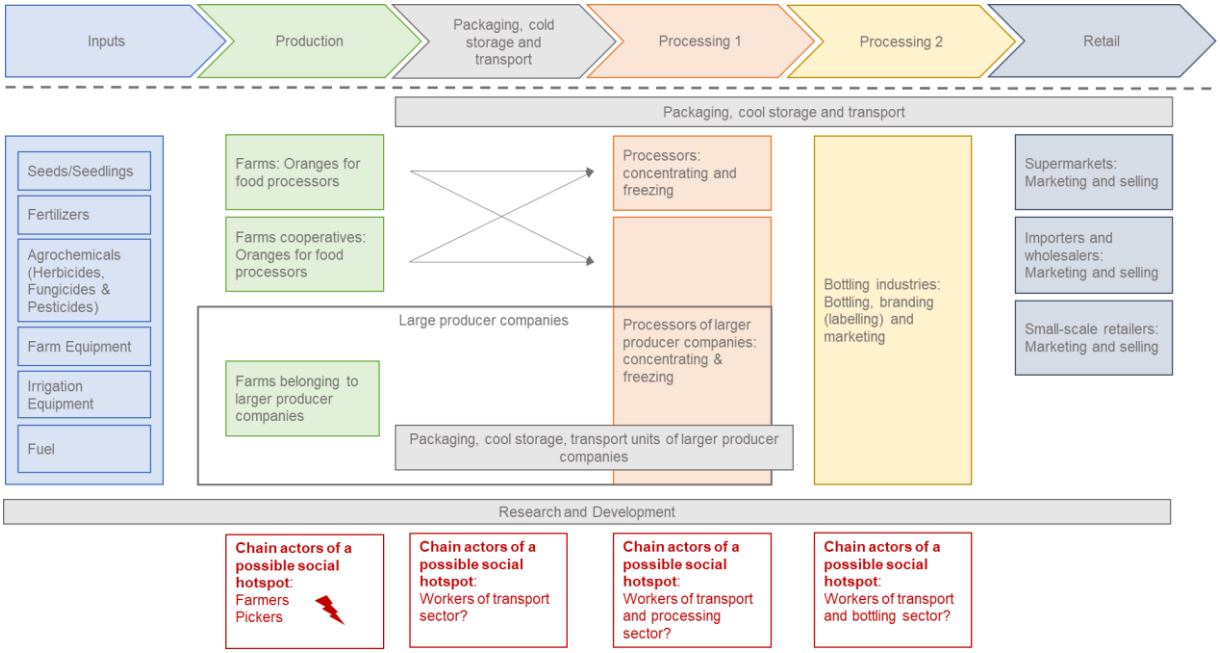

Figure 3 Simplified Value Chain of Frozen Concentrated Orange Juice (FCOJ) from Brazil to Switzerland (adapted from Gereffi & Fernandez-Stark, 2016; Neven, 2014; Rotondaro, 2012)

Producers and pickers with low power in the value chain

Generally, oranges in Brazil are grown in very extensive plantations as monoculture. In these plantations, machines undertake plant care and soil maintenance (Wildenberg & Dusch Silva, 2015). However, pickers primarily harvest oranges by hand, as the oranges do not all ripen at the same time (Wildenberg & Dusch Silva, 2015). The pickers belong to the vast majority of people in the Brazil orange juice industry, which are employed seasonally.

A total of 420,000 people work in the Brazilian orange juice industry (ten Kate, 2017). Nearly 80% of these are seasonal workers (ten Kate, 2017) and are employed mainly as pickers. Labour conditions of the pickers are extremely poor and cases of modern slavery (Social Hotspot Database, 2017b; ten Kate, 2017) and child labour (Social Hotspot Database, 2017a) have been identified. The risk that their salaries are under the national minimum wage is high (Social Hotspot Database, 2017c). Additionally, seasonal workers suffer from poor housing, health and security conditions (Wildenberg & Dusch Silva, 2015). And ten Kate (2017) reports that workdays are 14 hours long, and farm workers who join a labour union, risk losing their jobs, so they don't dare to speak publically about their situation.

After harvesting, orange growers sell the oranges to a processor. The sale of the oranges occurs under time pressure. Immediately after harvesting, growers have to dispose of their oranges in order to preserve the fruits' quality. This time pressure enables fruit buyers to enforce lower prices (Rotondaro, 2012). Further, as the processing industry is highly

concentrated they have the ability to set prices and delivery time limits on their own (ten Kate, 2017). The orange juice processors possess also orange plantations by their own. First, they buy oranges from their own plantations and then they will try to buy more fresh oranges at the farm gate (Rotondaro, 2012). At a last option, when the others are no longer attractive, they will buy oranges form other organisations, like smallholder cooperatives (Rotondaro, 2012).

On these grounds, the relationship between growers and the processor industry is often conflictive. Collaboration is most often governed by contracts, which are setup individually between producers and processing industry (Grunert et al., 2005).

Another problem of orange farmers is the dependency of their harvest on weather conditions especially if there are no irrigation systems available (Grunert et al., 2005). Additionally, pests and diseases cause harvest losses and higher costs for the use of pesticides and fertilizers – accounting for 12% of the total production costs (Neves et al., 2011).

Orange producers sell their fruits in large quantities with low margins (Wildenberg & Dusch Silva, 2015). Hence, there is a big pressure to increase productivity, namely in such way to reduce production costs per box of orange. In order to enhance cost efficiency and be able to deliver oranges to industrial processors, production of scale and compliance with labour and environmental legislation is needed (Neves et al., 2013). These requirements are in general easier to be met by large farmers. They can save costs using technology, by ideally dimensioning the size of equipment and by having a better bargaining position towards suppliers (Neves et al., 2013). However, still 78% of the growers in Brazil's citrus belt, Brazils main orange producing regions, are small-scale growers (Neves et al., 2014) supplying oranges to the processing industry.

As a consequence of the low prices paid for oranges at the farm gate, Neves et al. (2013) showed that 44% of the overall area in Brazil's citrus belt exhibited productivity below what is necessary to gain a profit. Due to the problem to cover costs by the prices paid for oranges, many small farmers have given up and sold their land (Dusch Silva, Wesenick, & Braunger, 2013) or switched crop, extended their production to sugarcane (Wildenberg & Dusch Silva, 2015) or rented the land to plant sugarcane for ethanol and sugar industries (Schiesari, Grüninger, Portela, & Matias, 2014).

Hence, growers are under economic pressure. This negatively affects wages and labour conditions of pickers in turn (ten Kate, 2017).

Highly concentrated processing sector in Brazil

Three industrial groups dominate the orange processing industry in Brazil (Gomes, 2015) and generally supply over 50% of orange juice products to major bottling companies worldwide (Dusch Silva et al., 2013). As reasons for this consolidation in Brazil's orange processing industry, were seen economies of scale and better possibilities to invest in new technologies in order to enhance efficiency (Dusch Silva et al., 2013). The three big Brazilian processors expanded their activities along the value chain. They also possess their own orange orchards and transport the FCOJ to their own terminals in important ports in Europe, USA and Asia (Dusch Silva et al., 2013; Grunert et al., 2005).

During the past years, the three companies were accused by different non-governmental and activists organizations of unfair competition like price-agreements at costs of the orange producers, setting prices and deadlines unilaterally, unfair business practices and labour rights violations (Dusch Silva et al., 2013; Gomes, 2015; ten Kate, 2017).

Bottling industry under consolidation processes and pressure from retailers

Bottlers are companies that buy FCOJ from the Brazilian processors. They use FCOJ as a base for their beverages, like juices or other juice-based beverages (Grunert et al., 2005). Then, they often put their trademarks on their beverages (Neves et al., 2013).

Brazilian processors sell almost all FCOJ abroad, since the Brazilian market absorbs only small quantities of orange juice products. Thus, Brazilian orange growers and processors are highly dependent on these bottlers abroad, as 95% of oranges produced are consumed out of the country (Neves et al., 2013).

Selling prices to the bottling industry were negatively influenced by the increased power of retailers demanding less and cheaper orange juice as well as an oversupply of orange juice (Neves et al., 2013). As Neves et al. (2013) shows, also the bottling industry is highly concentrated. The world ten largest orange juice bottlers buy 52% of FCOJ. Also in Switzerland, there are only few bottlers[6] producing orange juice, which provide their orange juice products to the retailers in Switzerland. Some bottlers use fair trade certified FCOJ which seems at least to improve the producers' sales prices for their products (Schiesari et al., 2014).

Generally bottlers are the element in the value chain, where product development takes place, but there are also few FCOJ processors that offer differently blended products to the bottlers in order to strengthen the relationship between bottler and processor (Grunert et al., 2005).

Swiss retail market: in the hand of a few

Orange juice is mainly consumed in North America and Europe: 80% of total world orange juice consumption (Neves et al., 2013). However, orange juice consumption in both regions of the world has declined. In Europe by 8.1% between 2011 and 2015 (Morris, 2017).

In countries that are major orange juice consumers orange juice sales are highly concentrated in few retailers (Neves et al., 2013). 93,5% of Brazilian orange juices (concentrated and fresh) was sold to five main retailers in Switzerland in 2016 (Markestrat based on CITRUSBR, 2016).

These retailers procure their orange juices mainly from the Swiss bottling industry but they offer also orange juice products bottled in other European countries. Some of these retailers include in their holding group their own bottlers. Those bottlers mainly produce home brand orange juice. When bottlers supply products for retailers' own labels, there is cooperation in terms of providing product specifications and joint product development (Grunert et al., 2005).

According to a study commissioned by the labour organisation Unia, a choice of some main retailers in Switzerland fulfil the minimal standards regarding labour rights, minimal wage and gender, yet, there is still potential to improvement (Reutimann & Iten, 2014).

Governance Structure and social risk hotspots of the global FCOJ value chain between Brazil and Switzerland

The global value chain for FCOJ between Brazil and Switzerland is concentrated in several places: the three Brazil conglomerate producing and processing as well as shipping orange juice concentrate, the bottlers and retailers in Switzerland.

The consolidation of processing industry in Brazil gives an enormous power in price and delivery terms negotiations to these companies, especially towards the producers. They can push prices for oranges regularly below the costs of production (Dusch Silva et al., 2013).

As in Switzerland, the selling of orange juice lies in the hand of only a few retailers, they can also exert price pressure on the bottlers supplying juice (Neves et al., 2013). They pass this price pressure further to the processors and they in turn to their producers and pickers (ten Kate, 2017).

[6] E.g. Henniez, Bischofszell Nahrungsmittel, Ramseier AG, Rivella AG

So far, the global value chain analysis showed that one of the main social risk hotspots in the FCOJ value chain from Brazil to Switzerland concerns smallholder producers and pickers in Brazil. They both have minimal bargaining power and poor livelihood outcomes in the face of a highly concentrated processing industry.

Additional analysis is necessary to find out more about the livelihood conditions e.g. of workers employed by processors, transportation companies or bottlers. We did not find any literature addressing the situation of these chain actors. Thus, with the information at hand, it is not sure if other social hotspots are hidden in other value chain segments of the FCOJ value chain Brazil – Switzerland. Moreover, it is not clear how fair trade initiatives consider labour conditions and livelihoods of workers along the value chain, besides pickers and producers (Max Havelaar-Stiftung (Schweiz), n.d.).

For the further steps of the FC4L-Framework, we focus our analysis on orange pickers in Brazil as one of the major social hotspots in the value chain. As shown in the above sections, as price pressure is high in the juice industry, pickers are often employed at conditions which do not conform to international labour right and human rights standards (Gomes, 2015). Consequently, pickers seem to have limited and flawed livelihood options.

3.2 Step 2) Analysing households' livelihoods of orange pickers in Brazil

Households' livelihoods of orange pickers in Brazil

According to the Sustainable Livelihoods Framework, we try to grasp the Brazilian orange pickers' livelihood assets, their livelihood strategies and find out how the institutional, political, socio-cultural, economic and vulnerability context affects their livelihood outcomes. In order to do that, we plan to gather data by means of the indicators from the "Oxfam Poverty Footprint" (United Nations Global Compact and Oxfam, 2015). In our planned field research, we include the indicators that cover all the aspects of the Sustainable Livelihoods Framework and that are relevant for farm workers.

The selected indicators are ascribed to different themes suggested by the "Oxfam Poverty Footprint" (United Nations Global Compact and Oxfam, 2015) presented in Table 1. The themes are then again assigned to the different aspects of the Sustainable Livelihoods Framework. The detailed table with the indicators is available in Appendix 1.

The themes presented in Table 1**Σφάλμα! Το αρχείο προέλευσης της αναφοράς δεν βρέθηκε.**, which can be directly influenced by another chain actor, like suppliers, producers, processors or transporters of the FCOJ value chain are marked with bold letters. The other themes are defining livelihoods of pickers but are not directly influenced by other main chain actors. Bearing in mind that all elements of the Sustainable Livelihoods Framework are interrelated and that value chains interact with their context as well, it becomes clear that the FCOJ value chain can influence indirectly all the element of pickers' livelihoods.

Table 1 Livelihood Aspects and **t**hemes for the livelihood analysis of pickers' households (adapted from Stewart Carloni & Crowley, 2005; United Nations Global Compact and OXFAM, 2015; van Rijn et al., 2012)

Livelihood Aspect	**Theme**
Financial Capital	**Wage, benefits and access to financial resources**
	Security of income
Social Capital	Networks and groups
	Socio-political influence
Physical Capital	Housing situation
	Physical property
Human Capital	Access to education
	Health status
	Informal knowledge
Natural Capital	Natural resources
	Recreation space
Structures and Processes in the global FCOJ value chain	**Labour rights and working conditions**
	Economic development of the community
	Corruption
	Empowerment
	Health regulations and programs
Vulnerability Context	**Risks**
Livelihood strategies	Short- and mid-term strategies
	Long-term strategies
Livelihood outcomes	**Households' activities to ensure a living**

3.3 Step 3) Result chains of measurements to improve pickers' livelihoods

As we have not yet conducted the field research drafted in the above section, we test the VC4L-Framework by building a hypothetical result chain. On grounds of the global value chain analysis and the Sustainable Livelihoods Framework analysis, the root causes and conditions of the pickers' livelihood situation can be worked out. Based on these insights, measurements for possible pickers' livelihood improvement can be developed.

The possible outcomes of a proposed measurement to improve livelihoods should be made plausible. This is done by creating a result chain. It is based on cause-effect hypotheses as the following illustrative, hypothetical example for one selected livelihood aspect shows (see Figure 4). The aimed livelihood improvement is a higher income for pickers. One possible activity to ensure higher income is to establish a credit organisation that ensures access to fair credit for pickers (output). Consequently, pickers would be able to repay their debts and would not have to pay high interest rates to their employer (outcome 1). At the end, more of the pickers' income would be left for other uses (outcome 2).This outcomes only hold true, if people are allowed to repay their debts by their contractor (and creditor at the same time) and if their wages stay the same (see assumptions in Figure 4**Σφάλμα! Το αρχείο προέλευσης της αναφοράς δεν βρέθηκε.**).

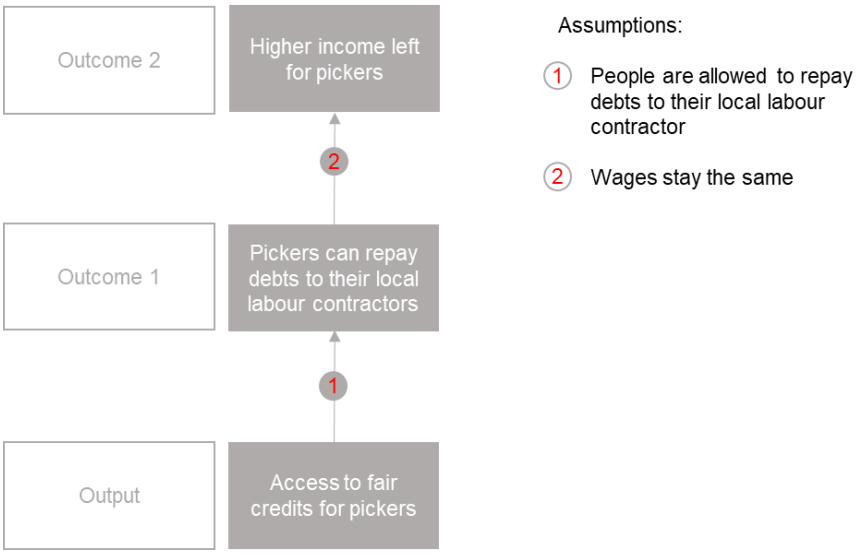

Figure 4 Illustrative, tentative example of result chain for a measurement to improve Brazilian pickers' livelihood (adapted from Nadel - Center for Development and Cooperation Zurich, n.d.)

The result chains formulated are useful for the actual project planning for livelihood improvement.

The outcomes of the proposed measurements to improve pickers' livelihoods can be located in the Sustainable Livelihoods Framework (van Rijn et al., 2012). Thus, it can be estimated how a measurement affects certain aspects of livelihoods. In this case, the proposed activity influences directly financial assets of a households' livelihood. Moreover, financial assets in their turn can have an impact on other livelihood assets, as they can be transformed into other types of capital and can be used to enhance livelihoods resilience (DFID Department for International Development, 2000).

4 Discussion and Conclusion

The VC4L-Framework – including a global value chain analysis, the Sustainable Livelihoods Framework and the development of a result chain – worked out for the planning of a research aimed at analysing the social hotspots of the FCOJ value chain from Brazil to Switzerland. The example showed that the combination of the frameworks offers an approach to examine, how a global value chain impacts selected actors' livelihoods and to develop ideas, what measurements could be proposed to improve their livelihood situation.

The combination of the three frameworks serves as a guideline from a global perspective to a local, household perspective. The global value chain analysis facilitates to find social hotspots along the global value chain and the Sustainable Livelihoods Framework enables to analyse chain actors' livelihoods holistically.

The Sustainable Livelihoods Framework offers a multidimensional perspective on livelihoods and shows how livelihoods interact with their contexts, i.e. also with a global food value chain. Thus, it meets requirements to better understand the social and economic impact of global food value chains: impacts on chain actors can be analysed comprehensively (Bolwig et al., 2010) and root causes of livelihood outcomes can be detected (Neven, 2014). The Sustainable Livelihoods Framework integrates external circumstances influencing households' livelihoods as policies, institutions, processes and vulnerabilities.

However, differences between similar chain actors' households (e.g. pickers) may need special attention, as the Sustainable Livelihoods Framework does not address those possible disparities explicitly (e.g. female- and male-headed households of pickers). Another aspect to consider are differing interests within households, as the Sustainable Livelihoods Framework does not clearly thematise intra-household inequalities.

The Sustainable Livelihoods Framework also supports the selection of indicators from the "Oxfam Poverty Footprint". It helps to organise the data around a theoretically well-founded concept – the Sustainable Livelihoods Framework.

The holistic understanding of chain actors' livelihoods serves as good basis to find ideas for measurements to improve livelihoods and to build their respective result chains. The integration of the result chain creates the link from research to action.

The outlined application of the frameworks offers a research design for an in-depth field research in Brazil. Yet, the research design has to be further elaborated, e.g. it has to be decided how the data are best gathered (e.g. by qualitative, quantitative or mixed-methods) and the best sampling strategy has to be found. Especially, the selected themes and their respective indicators have to be tested in practice.

Next, the research design could be expanded to the investigation of livelihoods of other value chain actors. Namely, the workers in the transportation, in the processing, bottling and retail industry are not discussed widely in literature. Although they may not be prone to extreme poverty as for instance pickers, they may suffer from relatively deprived livelihood outcomes in their respective socio-economic contexts. In addition, it is not clear how fair trade initiatives include labour conditions of these workers, e.g. in the processing or transportation industry (Max Havelaar-Stiftung (Schweiz), n.d.).

Additionally, the further elaboration of the global value chain analysis of FCOJ could offer interesting insights. A stricter analysis according to the dimensions proposed by Gereffi & Fernandez-Stark (2016) could deliver more insights into to functioning of the FCOJ chain from Brazil to Switzerland. Moreover, notably a detailed cost and profit analysis along the value chain elements would shed light on which value chain elements have the best profit margins.

Another important value chain element, which needs to be further analysed is the behaviour of consumers of orange juice. Hence, their choices and willingness to pay can have a great influence on the overall value chain.

Additionally, the inputs suppliers of Brazilian orange producers could be included in the global value chain analysis as well as the end of product. This may be especially important to analyse environmental aspects of the FCOJ value chain.

In a further step, we plan to expand our analysis of global food value chains between Brazil and Switzerland. The social impact of further most traded goods between the two countries should be analysed including meats like turkey, chicken, beef and veal, as well as coffee and sugar.

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Appendix 1

Livelihood aspects, themes and indicators for the livelihood analysis of pickers' households (adapted from Stewart Carloni & Crowley, 2005; United Nations Global Compact and OXFAM, 2015; van Rijn et al., 2012)

Livelihood Aspect	Theme	Subtheme
Financial Capital	**Wage, benefits and access to financial resources**	**Wages of workers**
		Social Benefits offered by companies
		Distribution of margins
		Access to credit
		Credit conditions
	Security of income	**Stability of contracts**
		Contracts' policy and monitoring by the state or by companies
		Access to (other) jobs
		Insurances
Social Capital	Networks and groups	Informal networks
		Formalized group membership
	Socio-political influence	Membership in labour unions
		Political participation
Physical Capital	Housing situation	Quality of house
		Access to drinking water
		Access to sanitation
	Physical property	Access to communication technology
		Access to mobility
		Access to energy
Human Capital	Access to education	Distance to school
		Educational level
		Extension services
	Health status	**Access to health services**
		Socio-cultural health aspects
		Health and security conditions at the workplace
	Informal knowledge	Informal agricultural knowledge and skills
		Other informal knowledge
Natural Capital	Natural resources	Availability of drinking water
		Access to land
		Access to grazing and fishing
		Wild products and biodiversity
	Recreation space	Availability of clean environment
		Availability of relatively quiet environment
Structures and Processes in the global FCOJ value chain	**Labour rights and working conditions**	**Reported labour rights abuses**
		Working times, compensation of overtime
		Labour rights policy
		Labour rights monitoring

	Economic development of the community	Employment
		Wealth distribution
		Access to market
	Corruption	Corruption and corruption fighting
	Empowerment	Freedom of association and right to collective bargaining
		Fair and equitable access to non-judicial grievance mechanisms
		Awareness of rights and contractual Conditions
		Communities' voice & power relations with processing companies
		Access to training, credit and extension services
	Health regulations and programs	**Right to a clean and healthy environment**
		Right to basic services
		Availability of health insurance
		Health programs
		Socio-cultural aspects of health
Vulnerability Context	**Risks**	Food insecurity
		Harvest losses (leading to job losses)
		Exposure to violence and conflict
		Situation of migrant workers
Livelihood strategies	Short- and mid-term strategies	Migration
		Second jobs
		Other Mechanisms of coping with shocks
		Risk management strategies
	Long-term strategies	Aspiration for children's future
		Aspiration for old age
Livelihood outcomes	**Households' activities to ensure a living**	**Household's total income**
		Household's combination of activities to earn a livelihood
		Household internal distribution of income between household members
		Use of household income
		Debts