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How do different stakeholders perceive palm oil in food and its impact on the environment?

Master Thesis at the Department of Environmental Systems Science, ETH Zurich

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cover pictures

left: *palm oil plantation in Malaysia (Antweiler, 2007)*

top right: *margarine selection at a Swiss supermarket (own photo, 2016)*

bottom right: *menu at a canteen at ETH Zurich (Skurikhin, 2014)*

Abstract

Motivation. Due to its favorable properties and low price, palm oil is widely used in food. Oil palms have the lowest relative land use of all oil plants. However, the expanding cultivation of oil palms in the tropics has been linked to deforestation, destruction of peatlands and land conflicts. Several NGOs have addressed palm oil in campaigns. Yet, little is known about how stakeholders in Switzerland and other industrialized countries perceive the sustainability of palm oil in food. **Methods.** In January 2016, a systematic review of previous research yielded three previous studies about stakeholder perception. The goal of the study at hand was to assess knowledge, sustainability perception and the behavior of different stakeholders in Switzerland with regard to palm oil. I conducted qualitative interviews with three stakeholder groups: ten consumers, five caterers and five retailers/manufacturers. 17 interviews were conducted face-to-face using an interview guideline, one interview was conducted over the telephone and two companies provided written statements. The interview recordings and written materials were analyzed by disassembling them into individual statements concerning various topics and comparing the statements. **Results.** 1. Among consumers, there was considerable variation in knowledge and awareness about palm oil. Many were unable to estimate their own consumption due to a lack of knowledge about the palm oil content of food. Land use information was typically unknown and consumers were unfamiliar with palm oil labels. 2. Caterers generally had little knowledge about the amount and certification of palm oil in the foods they sell. While three caterers did not have palm oil on the radar, two followed a palm oil exit strategy. None of the caterers had received any customer feedback about palm oil in the past. 3. Retailers and manufacturers used mostly certified palm oil, but specific fractions were often not available to them in a sustainable version. Both retailers and one manufacturer worked to further improve their palm oil supply chain. All companies received a considerable amount of consumer inquiries about palm oil. Companies generally refrained from printing palm oil labels on products. **Conclusions.** Future research should survey a representative sample of consumers and investigate a bigger group of retailers and manufacturers. A focus should be laid on communicating land use information to consumers, investigating the use of palm oil labels more in depth, understanding the reasons behind caterers' exit strategies and improving the transparency of palm oil supply chains.

Zusammenfassung

Palmöl findet dank seiner vorteilhaften Eigenschaften und seinem tiefen Preis breite Verwendung in Lebensmitteln. Im Vergleich zu allen anderen Ölpflanzen haben Ölpalmen den niedrigsten relativen Landverbrauch. Allerdings ist der Anbau teilweise auch mit Abholzung, Zerstörung von Torfgebieten und Landkonflikten verbunden. Verschiedene NGOs haben Palmöl in ihren Kampagnen thematisiert. Trotzdem ist wenig darüber bekannt, wie verschiedene Anspruchsgruppen in der Schweiz und in anderen Industrieländern die Nachhaltigkeit von Palmöl in Lebensmitteln wahrnehmen und bewerten.

Im Januar 2016 lieferte eine systematische Literatursuche drei frühere Studien über die Nachhaltigkeitswahrnehmung verschiedener Anspruchsgruppen. Das Ziel der vorliegenden Studie war es, das Wissen, die Nachhaltigkeitswahrnehmung und das Verhalten verschiedener Anspruchsgruppen in Bezug auf Palmöl in der Schweiz zu untersuchen. Dazu habe ich qualitative Interviews mit drei Gruppen durchgeführt: mit zehn KonsumentInnen, fünf Betriebsgastronomiebetrieben und fünf Einzelhändlern/Lebensmittelproduzenten. Insgesamt 17 Interviews wurden persönlich durchgeführt und eines telefonisch. Zwei Firmen stellten ihre Statements schriftlich zur Verfügung. Die Interviewaufnahmen und das schriftliche Material wurden in Aussagen zu verschiedenen Themen zerlegt, verglichen und analysiert.

Unter den KonsumentInnen gab es grosse Unterschiede im Wissen und Bewusstsein über Palmöl. Viele waren nicht in der Lage, ihren eigenen Palmölkonsum einzuschätzen, weil sie nicht wussten, in welchen Nahrungsmitteln Palmöl enthalten ist. Die KonsumentInnen wussten typischerweise auch wenig über den Landverbrauch von Palmöl. Palmöl-Labels waren mehrheitlich unbekannt.

Den Betriebsgastronomen waren die Gesamtmenge und Zertifizierung des verkauften Palmöls generell nicht bekannt. Während sich drei der Betriebe bisher kaum mit Palmöl beschäftigt hatten, verfolgten die anderen zwei eine Ausstiegsstrategie. Kein Gastronomiebetrieb hatte in der Vergangenheit Kundenanfragen zu Palmöl erhalten.

Einzelhändler und Lebensmittelproduzenten verwendeten hauptsächlich zertifiziertes Palmöl. Spezifische Palmöl-Fraktionen waren jedoch typischerweise schwierig zertifiziert zu beschaffen. Beide Einzelhändler, sowie ein Lebensmittelproduzent arbeiteten daran, ihre

Beschaffungskette für Palmöl weiter zu verbessern. Alle Betriebe hatten eine beträchtliche Menge von Kundenanfragen über Palmöl zu verzeichnen. Im Allgemeinen verzichteten die Betriebe darauf, Palmöllabels auf einzelne Produkte zu drucken.

Künftige Forschung sollte eine repräsentative Stichprobe von KonsumentInnen befragen. Ausserdem sollte auch eine grössere Gruppe von Einzelhändlern und Lebensmittelproduzenten untersucht werden. Einen Schwerpunkt sollte darauf gelegt werden, Information über den Landverbrauch an die KonsumentInnen zu kommunizieren, die Nutzung von Palmöllabels genauer zu untersuchen, die Gründe hinter den Ausstiegsstrategien der Betriebsgastronomiebetrieben zu verstehen und die Beschaffungsketten für Palmöl transparenter zu gestalten.

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Content

List of Abbreviations

CSPO	Certified Sustainable Palm Oil
ETH	Eidgenössische Technische Hochschule / Swiss Federal Institute of Technology
NGO	Nongovernmental Organization
OPAL	Oil Palm Adaptive Landscapes
POIG	Palm Oil Innovation Group
RPOG	Retailers Palm Oil Group
RSPO	Roundtable on Sustainable Palm Oil
TFT	The Forest Trust
UZH	Universität Zürich / University of Zurich
WTP	Willingness to pay
WWF	World Wide Fund for Nature

1 Introduction

Palm oil is widely used in foods and other applications worldwide. Despite the many beneficial properties of the oil, there are some detrimental consequences to sustainability. Due to the increasing prevalence of the oil, cultivation in the tropical countries has contributed to deforestation of tropical rainforests, yet the extent remains unclear. Many different stakeholders in various countries are involved in the planning, financing, cultivating, processing, transporting, trading and consuming stages of the palm oil's lifecycle. While a substantial part of global palm oil production is consumed as a staple in countries of the South, a considerable share is also processed in the North, far from the places of cultivation. This study focuses on consumption of palm oil in foods in Switzerland. It identifies and investigates stakeholders at the very end of the supply chain: retailers selling products with palm oil, companies using palm oil in their manufacturing, caterers and consumers. The aim is to throw a light on stakeholder perception of the sustainability of palm oil by conducting qualitative interviews with these different stakeholder groups.

1.1 The use of palm oil

Oil palms, or *Elaeis*, are a genus of the palm tree family *Arecaceae*. There are two species commonly referred to as "oil palm": *Elaeis guineensis* (Figure 1), originating from West and Southwest Africa and *Elaeis oleifera*, originating from Tropical and Central America (Rival & Levang, 2014). Both species are exploited for their oils, but their growing pattern differs and the resulting oils have different properties (Rival & Levang, 2014). Hybrids have been created to change the chemical composition of the oil, the growing patterns, or the resistance to pathogens (Rival & Levang, 2014).

Figure 1: Oil palm plantation on the slopes of Mt. Cameroon (Schmidt, 2007).

The reddish fruits of the oil palm (Figure 2) are about the size of a plum and grow in big bunches. Palm oil is manufactured from the fruit pulp and it consists of almost 50% saturated fatty acids. Palm kernel oil is manufactured from the kernels and accounts for up to 10% of the oil palm's yield (Rival & Levang, 2014). It consists of more than 80% saturated fatty acids (Rival & Levang, 2014).

Compared to other plants cultivated for oil, the oil palm's crop productivity is significantly higher. One source states an average yield of 3.8 tons per ha for oil palm (Teoh, 2010). This is six to ten times higher than yields from oil seeds such as sunflower, rapeseed or soybean (Teoh, 2010). It is thus not surprising that while oil palm is cultivated on 7% of the world agricultural land devoted to oil production, it provides almost 40% of the world vegetable oil production (Rival & Levang, 2014). The comparatively low land use per amount of oil produced – among other factors - also results in low production costs (Rival & Levang, 2014).

Figure 2: Fruits of Elaeis guineensis, market of Orodara, Burkina Faso (Schmidt, 2006).

Originally, oil palms were used as a traditionally gathered subsistence product in palm groves bordering the Gulf of Guinea in Africa (Rival & Levang, 2014). The intensity of the exploitation of the oil palms varies from a species harvested in the natural forest to a species planted alongside other crops up to a species grown in a monoculture (Rival & Levang, 2014). Today, the predominant part of oil palm cultivation is taking place in Indonesia and Malaysia, where almost 90% of the global palm oil is produced (Rival & Levang, 2014). In the countries where oil palms are grown, as well as in many other countries of the South, palm oil is a staple in the local diet (Teoh, 2010). The European countries account for only 12% of the world palm oil consumption (Rival & Levang, 2014). About 80% of the global palm oil production is consumed as food (Rival & Levang, 2014; Teoh, 2010). In countries of the North, palm oil is ingested first and foremost in the form of processed foods such as margarine, pastry, cookies, sweets and convenience food. It has been stated that approximately half of the products in a typical supermarket contain palm oil (Seegräf, May, Breuer, & Schukat, 2010), it thus seems to be almost ubiquitous. In addition to food uses, palm oil and palm kernel oil are also used as oleochemicals in detergents, cosmetics, candles and many other products. Finally, a small percentage of palm

oil is used as biofuels (Rival & Levang, 2014). In 2010, the top 10 plantation companies accounted for roughly 20% of the global palm oil production (Teoh, 2010). Especially in Asia, the contribution of smallholders to the palm oil sector is far from negligible (D'Antone & Spencer, 2014; Teoh, 2010). Half of the palm oil produced worldwide originates from small farms (Rival & Levang, 2014).

Several beneficial properties of palm oil explain its wide global use and success. Teoh (2010) describes how world population growth and increased consumption per capita have contributed to the expansion of the market for edible oils and fats in general. According to him, the cost competitiveness of palm oil, its versatility as well as the desire to replace animal fats in the human diet have added to the expansion of palm oil in particular in industrialized countries. The high proportion of saturated fats makes palm oil solid at room temperature, rendering it a low priced substitute for butter in food processing industries (Rival & Levang, 2014). Other plant oils have to be artificially hydrogenated for use in the same applications and thus might contain harmful trans fats (Rival & Levang, 2014). In addition, palm oil's stability against oxidation and its capacity of being heated to high temperatures allow for various applications in processed foods (Rival & Levang, 2014).

1.2 Sustainability

The numerous advantages of palm oil do not come without a darker side. Several sustainability issues arising from the cultivation and usage of oil palm are known today and their interrelations and connections as well as their extent are still being investigated.

One major impact on palm oil's sustainability is related to the fact that oil palms can only be grown in tropical regions (Rival & Levang, 2014), where the natural vegetation consists of moist tropical forests. These forest ecosystems are among the most biologically diverse worldwide (Fitzherbert et al., 2008). In many cases, rainforest land has been cleared for oil palm plantations (Figure 3). It is not trivial to determine the amount of deforestation directly attributable to oil palm cultivation due to insufficient land-cover data on the one hand and limited understanding of the multifaceted causes for deforestation on the other hand (Fitzherbert et al., 2008; Rival & Levang, 2014). Undoubtedly, the expansion of oil palm is linked to deforestation at least to some extent, but not all of the deforested land is converted into oil palm plantations (Rival & Levang, 2014). Since the biodiversity in the palm

plantations is much lower than that of natural forests (Fitzherbert et al., 2008), oil palm cultivation poses a serious threat to biodiversity. Efforts to increase the ecological quality and thus the biodiversity of the plantations are presumably outweighed by the increased land use for production (Fitzherbert et al., 2008). However, replacing palm oil by other vegetable oils is not necessarily a simple and rational remedy, because the significantly lower yields of all other common oil crops would imply even higher land use for production (Rival & Levang, 2014).

Clearing tropical forests for oil palm cultivation not only affects biodiversity but further aspects of sustainability, such as global climate. The carbon density of oil palm plantations is considerably lower than that of rich tropical rainforests. This leads to a net loss in carbon storage and increases the carbon content of the atmosphere when the forest is cleared, thereby contributing to climate change. When peatlands are drained for oil palm plantations, release of the previously stored carbon into the atmosphere also contributes to global climate change (Teoh, 2010). The magnitude of the contribution of oil palm cultivation to global warming remains unknown.

Figure 3: Peat forest in Sumatra, Indonesia that has been cleared for oil palm plantation (Aidenvironment, 2006).

Due to the labor-intensive production process, the palm oil sector is a major employer in the countries of cultivation (Teoh, 2010). Much like other industry branches heavily relying on workforce in developing countries, this circumstance raises questions on the treatment and compensation of workers in general, i.e. the social sustainability of palm oil production. Teoh (2010) identifies a need for further study on the working conditions in oil palm plantations.

The big potential for ecological and social harm caused by the global palm oil trade has not gone unnoticed by the general public. Several NGOs have campaigned against palm oil (Greenpeace, 2011; Say no to palm oil, 2016; Zero Palmöl, 2014) and these campaigns have drawn the interest of some consumers' and citizens. One campaign video published by Greenpeace showed a KitKat consumer biting into the finger of an orangutan (Figure 4), suggesting that palm oil use leads to tropical deforestation and is thereby threatening the survival of orangutans. The campaign pressured Nestlé to stop sourcing unsustainable palm oil (Greenpeace, 2011). While campaigns like these raise important questions about the sustainability of today's global use of palm oil and the treatment of natural resources in general, the full complexity of the issues at hand is often not taken into account.

Figure 4: Snapshot from a 2010 Greenpeace campaign graphically illustrating how palm oil in foodstuffs can be linked to tropical deforestation and endangering the survival of orangutans (Watts, 2010).

The industry took matters into its hands when founding the Roundtable on Sustainable Palm Oil (RSPO) in 2004. In its statutes, the RSPO (2015b, p. 1) states that its "objectives are to promote the growth and use of sustainable palm oil through co-operation within the supply chain and open dialogue with its stakeholders." The RSPO (2016) "has developed a set of environmental and social criteria which companies must comply with in order to produce Certified Sustainable Palm Oil (CSPO)."

Plantations and mills fulfilling the criteria set by the RSPO Principle and Criteria for Sustainable Palm Oil Production (RSPO, 2013) can become RSPO certified. Palm oil buyers can then choose between four supply chain models. In the "Identity Preserved Supply Chain Model" the certified oil has to be kept separately from ordinary palm oil and can be traced back to a single identifiable certified source (RSPO, 2015a). Similarly, in the "Segregated Supply Chain Model", the oil is kept separate from non-certified oil (RSPO, 2015a). However, palm oil from different certified sources can be mixed and hence, its origin is not preserved. A third model is called "Mass Balance Supply Chain Model". In this model, certified sustainable palm oil can be mixed with conventional palm oil (RSPO, 2015a). Due to this mixing procedure, the palm oil bought by the buyer physically contains sustainable palm oil, but not exclusively. Finally, the "Book & Claim Supply Chain Model" allows retailers and manufacturers to buy Green Palm certificates from RSPO-certified growers (RSPO, 2015a). Such a certificate guarantees that the corresponding amount of certified palm oil has been produced and put on the market. However, the buyer of the Green Palm certificate does not buy oil from the owner of the certificate, instead, the oil can be sourced anywhere on the market. The certificate only guarantees that sustainable palm oil has been produced. This procedure is similar to buying certificates for renewable energy.

The efforts of the RSPO are not without critical review. In 2011, more than 250 organizations worldwide signed a statement declaring the RSPO activities as greenwashing (Rettet den Regenwald e.V., 2011).

1.3 Stakeholder Involvement, the OPAL Project and the situation in Switzerland

Palm oil is a cost-efficient vegetable oil with several favorable properties. It provides a livelihood to many in the countries of origin. Yet, the downsides of oil palm cultivation are not negligible. The preceding paragraph gave an overview about the environmental and

social costs within and beyond the landscapes where oil palm is cultivated. Whoever wants to benefit from the advantages of palm oil should also address these sustainability issues.

The OPAL project (The OPAL Project, 2016) is a consortium coordinated by ETH, working together with various international institutions, universities and consulting firms as well as a few grower associations. On its website it is stated that the project "uses natural and social sciences to build role playing games that reflect existing oil palm landscape realities." The aim of these games is "to explore alternative oil palm trajectories with stakeholders and decision makers in Indonesia, Cameroon, and Colombia, to help chart a path towards more sustainable and inclusive futures." In order to foster a more sustainable use of palm oil, it is important to involve stakeholders along the whole process path from cultivation of the oil palms to milling, further processing and finally to consumption by the consumer. Both supply and demand sides need to be looked at carefully, as they are necessary pieces of the sustainable palm oil puzzle.

The research undertaken in this study aims to investigate stakeholder perception in Switzerland and thereby to contribute to the knowledge base available for the OPAL project. With this goal in mind, three groups of stakeholders will be discussed more in depth in the following. Firstly, suppliers ensure that sustainable palm oil is produced and offered on the market. From this point of view, retail companies are important to investigate because they decide what products and ingredients are available on the shelves, and what kind of palm oil they include. Secondly, in addition to retailers, catering companies determine what foods are sold in canteens, restaurants and cafeterias and what ingredients are included in these foods. As many people in Switzerland regularly consume meals outside of home, caterers are a major place of food consumption in addition to food stores. Analyzing their motives might prove fruitful with regard to sustainability efforts. However, suppliers cannot offer products and foodstuffs that are not demanded on the market. From that point of view, consumers are important to study because they make purchase decisions and consequently create demand. They thus compose the third group investigated in this study. All three groups are stakeholders at the end of the palm oil supply chain.

While it has been stated that the predominant part of the global palm oil production is used in the countries of the south, about 15% of the world total is consumed in Europe and the USA (Rival & Levang, 2014). Due to their spending power and their commitment to

sustainability, these countries could constitute an important driving force towards a more sustainable way of producing palm oil. Several initiatives and campaigns of the recent past (Greenpeace, 2011; Say no to palm oil, 2016; Zero Palmöl, 2014) have shown that the topic is important to consumers and citizens in countries like Switzerland, Australia and Germany. A report published on behalf of the Swiss Federal Office for the Environment (Anwander, Gautschi, Challandes, & Hernandez, 2015) analyzed the ecological, social and economic relevance of palm oil and several other edible commodities processed in Switzerland. The report estimates the per capita consumption of palm oil in foodstuffs to lie between 3.8 and 5.9 kg and assumes that between one fourth and half of the palm oil consumed in Switzerland is imported in the form of already processed products. The market share of RSPO certified palm oil in Switzerland is estimated to account for about 56% in 2013 (Anwander et al., 2015).

During the carrying out of the study at hand, the council of Zurich passed a postulate stating that the canteens of municipal institutions such as hospitals, nurseries and nursing homes are to examine options to reduce, or discontinue, the use of palm oil and products containing palm oil (Gemeinderat der Stadt Zürich, 2016). This constitutes but one example to illustrate the potential societal relevance of palm oil use in Switzerland.

1.4 Systematic review of previous research

Using the databases ISI Web of Science and Scopus, I searched for publications containing the term “palm oil” and a term from each of two groups of keywords. The first group contained keywords concerning the stakeholders: stakeholder, consumer, retailer, manager, and society. The second group included synonyms for perception; namely view, perception, opinion, knowledge, concern, understanding. Wildcards were used to allow for different spelling or grammatical versions of the aforementioned keywords. Within the keyword groups, the OR operator was used to differentiate between keywords. The search process was conducted analogous to the one described in (Locatelli, Pavageau, Pramova, & Di Gregorio, 2015).

After removing duplicates, the search conducted in January 2016 yielded 329 results. The results were evaluated on the base of their titles and abstracts for their relevance to the topic investigated in this thesis. Several publications were excluded due to their focus on

stakeholders in the countries of cultivation or because they were older than twenty years. Out of more than 300 total publications, only seven were considered potentially relevant to stakeholder perception of palm oil sustainability in countries that do not cultivate oil palms or use palm oil as a typical household staple. The latter setting is likely to differ considerably from the situation in Switzerland and studies investigating it were therefore excluded. Overall, the systematic review identified three recent studies directly investigating stakeholder perception of the sustainability of palm oil meeting the aforementioned criteria. Their results will be described in the following.

Giam, Mani, Koh, and Tan (2015, p. 1) surveyed 251 consumers in front of a Singapore supermarket on their "attitude and willingness-to-pay (WTP) for deforestation-free sustainable palm oil". They found "little consumer bias against palm oil per se" but "strong negative opinions towards products that cause deforestation". Furthermore, they found that only half of the surveyed consumers were able to correctly indicate that certain brands of chocolate bars contain palm oil. Based on their data, they estimated a "WTP of 8.2–9.9% more for common palm oil-containing products that are deforestation-free" (Giam et al., 2015, p. 1). However, the considerable cultural and political differences between Singapore and European countries such as Switzerland limit the transfer of these results.

Pearson, Lowry, Dorrian, and Litchfield (2014) investigated public awareness among 403 visitors of Melbourne Zoo before, during and after an education campaign about the impacts of oil palm cultivation on orangutan conservation. Their focus was on support for mandatory labeling of palm oil, as well as previous and future conservation behavior of the visitors. Before the campaign had started, roughly 70% of the zoo visitors stated that they would prefer mandatory palm oil labeling (Pearson et al., 2014). At the same point in time, the percentage of visitors stating that mandatory labeling would influence their buying decisions was slightly lower, at 66.3%. 18.7% of participants reported avoiding palm oil or unsustainably sourced palm oil products at baseline, but up to 60% of interviewees declared their willingness to change their future conservation behavior, implicitly referring to palm oil buying behavior (Pearson et al., 2014). The focus of the conservation campaign was on the discontinuation of palm oil use. It is possible that the zoo setting, in addition to the self-reported behavior led to certain degree of social desirability which would result in overstating the consumers' concern.

In a lab experiment, Disdier, Marette, and Millet (2013) investigated French consumers' concerns about palm oil. To estimate a willingness to pay (WTP) for milk rolls made with and without palm oil, they provided information about the characteristics of both product versions. They found that "environmental and health messages negatively affect the WTP expressed for the palm oil product, while land use information negatively influences the WTP expressed for the palm oil-free product" (Disdier et al., 2013, p. 184). In addition, they identified a significant proportion of consumers with a strongly negative attitude towards palm oil. Depending on the order of information provided during the experiment, between 18.9 and 27.1% of participants stated that they were boycotting the palm oil product. On the other hand, a significant share of participants also decided to boycott the palm oil substitutes when provided with land use information (between 6.3 and 9.4%). However, the predominant part of participants (more than 30%) appeared to be somewhat indifferent to the palm oil messages. While these results are not lacking validity, their generalizability might still be limited. First of all, it seems as though the unhealthiness of palm oil might be of considerable concern to French consumers. It is unknown to what extent this is the case in other European countries. The study did provide sustainability information, but it might be difficult to completely disentangle health and sustainability aspects in the consumers' perceptions. An additional caveat of the study lies in the fact that sustainable cultivation of palm oil was not considered as an alternative. Furthermore, one might hypothesize that the experimental setting differs considerably from the natural setting, where supermarket customers are not provided with a comparable amount of information. Nonetheless, the results could prove helpful when planning to provide information to consumers about the sustainability of palm oil, its alternatives and the implications for shopping behavior.

A number of other publications provided additional insights into stakeholder perception of palm oil, albeit not directly investigating the characteristics of these perceptions in depth. Unsurprisingly, several authors highlighted the importance of engaging and consulting stakeholders on their concerns in general (Aikanathan, Sasekumar, Chenayah, Basiron, & Sundram, 2014; D'Antone & Spencer, 2014; Teoh, Ng, & Abraham, 2001). Teoh (2010) gave a good overview on the global palm oil debate and identified key stakeholders. At the 2001 International Palm Oil Congress, Teoh et al. (2001) had already characterized the stances of various NGOs on palm oil and analyzed the implications for the palm oil industry.

D'Antone and Spencer (2014) precisely carved out how diverging views of palm oil production led to the formation of four ideal type market versions, each catering to different groups of consumers. According to them, the formation of market types constitutes a simplification of concerns because ideally, the preoccupations should "include all forests and all types of oils that are employed in industrial production, but the movement cannot encompass the complexity of this full set of concerns" (D'Antone & Spencer, 2014, p. 95). Table 1 shows an overview of the palm oil market versions they identified.

Table 1: Palm oil market versions as identified by D'Antone et al.

MARKET VERSION	MAIN CHARACTERISTIC
RSPO MARKET	Driven by an environmental motivation
POIG MARKET	Advanced and stricter version of the RSPO attempt
PALM OIL BOYCOTT	Total elimination of palm oil
FAIR PALM OIL MARKET	Advocates temporary setting aside of environmental issues in favor of the social issues of poorer producing countries

Manjunath, Ramachandra, and Swamy (2002) questioned Indian consumers on their attitude towards palm oil, but without focusing on sustainability. Several publications investigated the perception of genetically modified palm oil (Amin, Hassan, Ibrahim, & Ibrahim, 2014; Amin, Othman, Lip, & Jusoff, 2011; Teoh et al., 2001). Aikanathan et al. (2014) highlighted the importance of involving stakeholders but failed to mention the exact characteristics of their perceptions

1.5 Research questions

The main research question of this study was the following: How do different stakeholders perceive the use of palm oil in food and its impact on the environment? To gain a better insight into the sustainability perception of the three stakeholder groups, the main research question was divided into three areas. The first group of research questions focuses on the knowledge about palm oil and the reasons for palm oil use. The second group of research questions focuses on the sustainability perception in particular. The third group deals with effective and potential actions to improve the sustainability of palm oil.

1.5.1 Knowledge about use and origin of palm oil

What do consumers associate with palm oil?

What do consumers know about oil palm cultivation?

What do managers of catering companies, manufacturers and retailers know about the origin of palm oil in the foodstuffs they produce and sell?

Why do the catering companies, manufacturers and retailers use palm oil?

What are the perceived benefits of palm oil?

1.5.2 Sustainability perception

What do the consumers know about sustainability issues related to palm oil? What are the perceived risks for biodiversity, global climate and society caused by the use of palm oil? Are there other sustainability issues that stakeholders connect to palm oil?

Which sustainability aspects of palm oil do consumers emphasize?

Have NGO campaigns influenced the consumers' perception of the sustainability of palm oil?

How do stakeholders perceive the sustainability of palm oil compared to other vegetable oils?

What are the differences and similarities between the different stakeholders' perception of the sustainability of palm oil?

1.5.3 Actions and behavior

What steps are stakeholders taking or planning to take to improve the sustainability of palm oil?

What affected the stakeholders to take these steps?

To what extent are stakeholders willing to pay more for products with sustainable palm oil or without palm oil?

2 Methods

What methods were applied to gain knowledge on stakeholder perception of the sustainability of palm oil in Switzerland and consequently to answer the research questions described in section 1.5? Because there is very limited previous knowledge on stakeholder perception of palm oil, I decided to conduct qualitative interviews with the three groups of stakeholders.

While the interview guidelines were tailored to the respective stakeholder group, some general considerations hold true for all three interview guidelines. Questions were drafted in three areas: 1) knowledge about the origin and use of palm oil, 2) perception of sustainability and 3) behavior. They were developed to answer the research questions outlined in section 1.5. General questions aiming more at previous knowledge, facts and associations were placed at the beginning of the guideline to allow for investigation of the participants' perception without creating unwanted references to sustainability issues that might not have existed in the minds of the interviewees before. Consequently, these topics were thoroughly questioned only after some introductory questions. As much as possible, the questions were worded to avoid leading the interviewees to a particular direction.

The selection of participants, the content of the interviews as well as the analysis of the material varied considerably between and among the three groups and will be described more in detail in the following section.

2.1 Consumers

Participants of the consumer interviews were chosen among neighbors and loose acquaintances. I strived for variety regarding age, gender and education of participants. Potential participants were asked to participate in a short interview on food. They were told that the interview was for my master thesis, but the exact topic was not disclosed in advance to avoid specific preparation and reading about the topic.

The interviews lasted between 25 and 30 minutes each. Two interviews took place at the home of the participants, the remainder was conducted at my home. Participants received a short disclaimer on the confidentiality of the interview, were told that there are no right or wrong answers to the interview questions and that I am interested in their personal opinions. They were then asked for permission to record the interview. During the

interview, the guideline in Appendix A was followed as closely as possible while still allowing for a natural conversation. If a topic came up earlier than planned during an interview, the interviewee was asked the related questions and the topic was not brought up again later – unless the conversation touched the subject again. Furthermore, if a question turned out obsolete because of the answer to another question, the additional question was discarded. When participants asked me to answer their personal questions on palm oil, I tried to postpone answering these questions until after the interview whenever possible. I did answer questions about comprehension if needed to allow for proper understanding of the questionnaire. Questions were rephrased and/or elaborated when participants did not understand them.

An additional question was added to the interview guideline after two interviews had already been conducted. At this point in time, a short report on palm oil was aired on the Swiss public television program *Kassensturz*. The additional question aimed at finding out if the participants had seen this report to be able to find out if this had influenced their knowledge, perception and behavior.

In total, I interviewed n = 10 consumers with an average age of 42.4 and a median age of 38 over a timespan of two months. A list of the participating consumers with their age and gender is given in Table 2. The average household size was 2.8 and the median household size was 3. All the interviewed consumers were responsible for household shopping, either alone or together with other members of the household. None of the participants had formal training in the area of environmental science or closely related fields. Half of the 10 participants had secondary education, such as high school or professional education. The other half had tertiary education and was thus holding a diploma from a university or a university of applied sciences. One participant stated to be vegan and another participant declared to suffer from celiac disease.

Table 2: Participating consumers with ID, age and gender. Entries in order of interviews.

ID	AGE	GENDER	ADDITIONAL REMARKS
C1	42	M	
C2	65	M	
C3	50	F	
C4	29	M	
C5	56	F	
C6	34	F	Participant is vegan
C7	34	M	
C8	52	F	
C9	29	M	
C10	33	F	Participant suffers from celiac disease

To analyze the consumer interviews, I compiled a list of topics and keywords related to the research questions. I then listened to the recordings and assigned answers and statements to these keywords. Some statements were assigned to two topics, if they contained relevant information for both of them. This procedure was repeated for every interview with the same list of topics and keywords. When I came across interesting remarks and statements, I collected them and decided afterwards, if the list of topics and keywords needed to be extended. After these steps, I had a table of short statements sorted by topic for every interviewee. This allowed me to analyze a specific topic by taking together the relevant statements of all the interviewees. To analyze a topic more in depth and answer a specific research question, I focused on the statements I had collected on this topic.

2.2 Catering companies

The participating catering companies are listed in Table 3. All the catering companies operating at ETH Zurich and/or University of Zurich (G2, G3, G4, G5) and one small company operating a restaurant at a research institute (G1) were contacted and asked to participate in an interview about the sustainability of palm oil. A little summary about the project was included in the interview request. The full advanced disclosure of the topic was necessary to allow the companies to find the right interview partner(s) inside the company. Some caterers only agreed to an anonymous interview. When an interview was arranged, the interview questions were sent to the interview partners about a week in advance. This allowed them to gather all the relevant data to answer the questions. Two of the interviews were conducted with procurement managers, two with culinary managers. One interview was conducted with three interview partners at the same time: the manager of the restaurant, the head chef, as well as a contact person from the research institution.

Table 3: Participating catering companies and function of the interview partners. Entries in order of interviews.

ID	INTERVIEW PARTNER	ADDITIONAL REMARKS
G1	Manager, head chef, contact person from research institution	Restaurant at research institution (not a chain)
G2	Procurement manager	
G3	Culinary manager	No oral interview → written statements
G4	Culinary manager	
G5	Procurement manager	

The interview guideline for catering companies can be found in Appendix B. Unlike the interview guideline for consumers, this guideline did not include knowledge questions about the cultivation of oil palms or about specific sustainability issues of palm oil. Instead, the questions focused more on the companies' knowledge of their supply chain, the perception and inquiries of their consumers and the behavior of the company with regard to palm oil. A

general interview guideline for catering companies was compiled in advance, but the questions were slightly adapted to the individual companies. When companies stated a certain behavior towards palm oil during the email contact, this knowledge was included in the adapted guideline and elaborated more in depth in the subsequent interview. The last two interviews also included a question about criteria from business clients.

The face-to-face interviews with the catering companies lasted about an hour each and took place either in a conference room at the headquarter of the company or in a restaurant managed by the catering company. One catering company (G3) cancelled the interview appointment after having reviewed the interview guideline and provided short written statements as answers to the interview questions instead. The oral interviews were recorded with the permission of the interview partners. The interviews differed considerably in their nature. Two interviews (G1 and G4) were held in a more traditional interview style with me asking the questions and the interviewee(s) answering them. Two interviews (G2 and G5) were set up more similar to a presentation prepared by the interviewee to answer the questions I had provided in advance. In these cases, I was still able to ask for clarification or elaboration on certain aspects, but the lead of the conversation was more with the interview partners of the companies. When answers to interview questions touched upon new topics, I asked additional questions during the interview to clarify these aspects and elaborate them more in depth. In addition to the oral interviews, several interview partners also provided links, written statements and official publications on the company and its sustainability efforts.

The process to analyze the interviews with caterer was very similar to the consumer interviews. Statements from the interview recordings or the written answers were divided and organized into topics. The statements relating to a particular topic were then taken together and compared to answer the respective research question.

2.3 Retailers and manufacturers

This stakeholder group is the most homogenous group investigated in the study, but actually included two subgroups. Retailers form the first subgroup and I decided to include the two retailers with the biggest market share in Switzerland; R1 and R2 (see Table 4). My interview partners were both working in the sustainability department of their company

and were working on palm oil among other topics. In addition, they were the only interview partners during my investigations with a formal training in environmental science.

Switzerland-based companies producing foods that (potentially) contain palm oil form the second subgroup. They are listed in Table 4. Strictly speaking, the two retailers interviewed in this study are also manufacturers, because they produce a considerable amount of store-brand products. Non-retail companies of this group were contacted somewhat arbitrarily according to company size and focus as well as their agreement. The stakeholder group of manufacturers was the only group in which some companies I contacted either never replied to my interview requests or explicitly declined them. Those companies are not mentioned here. In total, I interviewed two manufacturers (P1 and P3) and included a written statement from a third producing company (P2). My interview partner at P1 was a public and agricultural affairs manager. He originally tried to organize a palm oil expert within the company to answer my questions, but the relevant persons were travelling abroad, so he decided to be my interview partner. At P3 I talked to the leader of the quality control who had investigated the company's palm oil use in the past. Some of the companies I interviewed requested to remain anonymous.

Table 4: Participating retailers and manufacturers with functions of interview partners. Entries in order of interviews.

ID	FOCUS	INTERVIEW PARTNER	ADDITIONAL REMARKS
R1	Retail	Sustainability manager	Background in environmental science
R2	Retail	Sustainability manager	Background in environmental science
P1	Various foods	Public and agricultural affairs manager	Telephone interview
P2	Chocolate	Consumer service	Written statements
P3	Soups and sauces	Quality control manager	

Similar to the process for the catering companies, the basic interview guideline in Appendix C was adapted to the different companies and the information already known about these companies, for example via the company website. The individual interview guideline was sent to the companies about a week before the appointment. Most of the companies in this category sent some additional material to me before the interview. This allowed me to adapt the guideline again and focus on unanswered questions.

Three interviews (R1, R2 and P3) were conducted in a meeting room of the company and lasted approximately one hour. One interview (P1) was conducted via telephone and lasted only half an hour. All interview partners were asked for permission to record the interviews. Due to the ample knowledge of these interview partners on the subject, these interviews were more akin to “expert conversations” than traditional question- and answer style interviews. Much more so than in the consumer interviews, the interviews did not closely follow the planned procedure and sequence. In addition to changes in sequence, additional questions were asked to elaborate emerging topics and aspects more in depth.

For the analysis of the retailer and manufacturer interviews, I chose a procedure analog to the ones outlined above. However, in this category, some important information was communicated to me in written form via email, company-confidential documents or public documents. To streamline the interview process, I also screened the companies’ websites and analyzed the documents provided to me by interview partners with regard to statements relevant to palm oil. Some of these documents were confidential and therefore the sources of their contents cannot be provided here.

3 Results and Discussion

In the following, I will first look at the research questions for each of the three groups of stakeholders and compare my findings to previous research. After describing the three stakeholder groups individually, I will compare and contrast the three groups.

3.1 Consumers

3.1.1 Knowledge and associations about the use of palm oil

Three of the ten consumers (C1, C3, C9) had virtually no previous knowledge about palm oil and thus no associations apart from the trivial ones (i.e. “oil” and “palms”). The remainder of the participants had some knowledge about palm oil, its uses and its sustainability issues. At the very beginning of the interviews, after explaining the setting and stating the topic, I asked for participants’ associations about palm oil. Some additional associations appeared when the participants were asked questions but the associations described in the following were captured without providing any more topic-related information than the subject of the interview containing the terms “palm oil” and “sustainability” and my field of study. Two interviewees (C3, C9) did not name any associations, presumably due to their complete lack of previous knowledge on the topic.

Figure 5 shows which topics participants associated most with palm oil. The most frequent topic with ten mentions in total was the uses and applications of palm oil (note that this does not imply that all consumers mentioned this topic, some participants mentioned multiple uses and others none). Three participants (C1, C4, C5) mentioned *cosmetics*, and another three (C2, C4, C8) mentioned the generally widespread use of palm oil. Other single mentions within this category were *convenience food* (C2), *Nutella* (C10), *chemical industry* (C5) and *pastry* (C4). In total, six interviewees named uses of palm oil, but only three of them associated palm oil with specific food applications. This is surprising, because about 80% of the palm oil globally produced is consumed as food.

Specific beneficial properties of palm oil were mentioned seven times. Such advantages of palm oil included *long shelf life* (C1), *good taste* (C4), *easy handling* (C8), *overall usefulness* (C5) and *healthiness* (C1). Two participants (C2, C5) mentioned the *low price* of palm oil. However, the low price was not described with enthusiasm, as the participants mentioning

it seemed to refer to possible negative implications of such a low price. In summary, half of the participants named one or more benefits of palm oil.

The six mentions of the category land reclamation were very similar: they all referred to clearing land for oil palm cultivation and each mention included an additional descriptor such as *fire* (C2), *rainforest* (C5, C7), *jungle* (C8), and *deforestation* (C4, C6). The fact that the topic of land reclamation was brought up by the majority of participants implies that many of them had heard about the danger that oil palm production poses for many rainforest habitats.

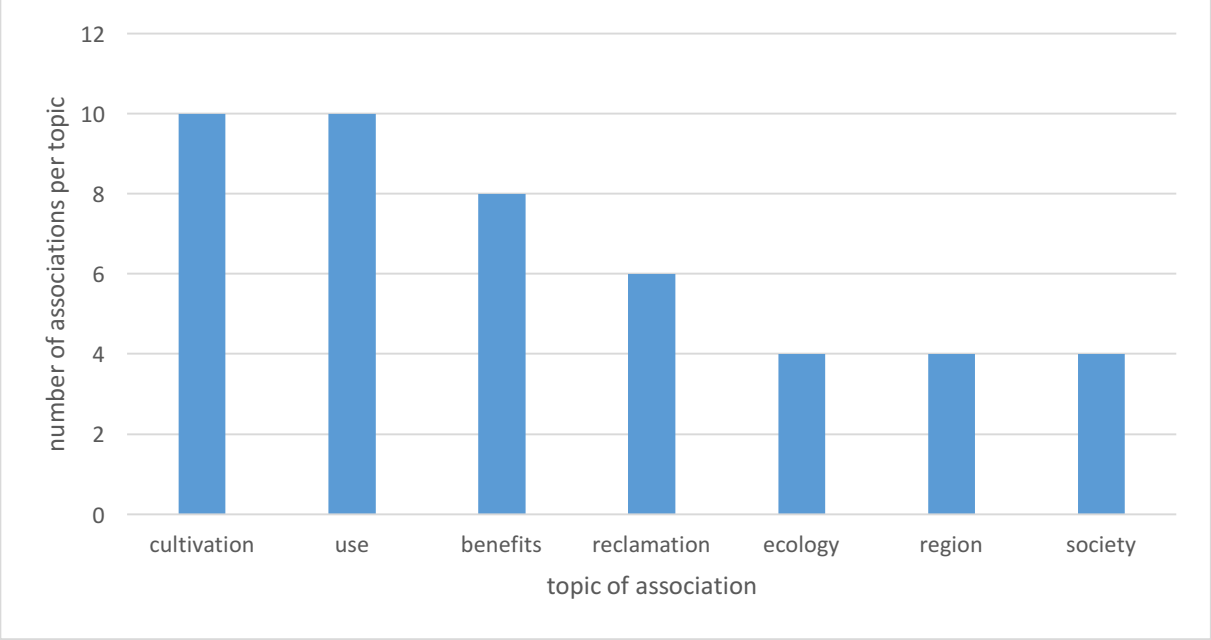

Figure 5: Consumers' associations about palm oil ordered by topic.

Terms referring to the type of cultivation were mentioned five times. Participants mentioned terms like *monoculture* (C7), *efficiency* (C4), *high land use (C6), soil depletion* (C6) and *mass cultivation (C2)*. It is remarkable that six interviewees (C1, C2, C4, C5, C6, C8) used the term *monoculture* during the later course of the interview in addition to the participant who brought it up in the very beginning. It seems as though many participants used this term as a catchphrase for cultivation methods that are harmful to the environment and undesirable agricultural practice.

Four participants associated palm oil with general ecological problems. Three of these mentions were morally and negatively charged: participants used terms such as environmental *sins* (C7), *disgrace* (C2) *and destruction* (C4). Such terms illustrate a personal

judgment. One participant (C5) stated that palm oil used to be regarded as *ecological* in the past, but that this was not the case nowadays.

Only three participants associated the characteristics of the region where oil palms are cultivated with palm oil. *Rainforest* was mentioned twice (C5, C10) and *Indonesia/Borneo* was mentioned by another participant (C8). One participant also associated palm oil with the *orangutan* (C10). However, several other participants did not state the region of cultivation as a single association, but implicitly mentioned tropical rainforests as part of land reclamation practices like deforestation, or slash-and-burn. Finally, four participants mentioned social aspects and the societal perception of palm oil. Two participants (C4, C5) stated that palm oil was *controversial.* Additional mentions in this category were *conflicts* (C6) and *oppression* (C2). This hints that although social aspects are an issue for some consumers, environmental aspects might be of greater importance and/or visibility in the group of consumers I interviewed.

Are consumers aware of their own consumption of palm oil? Table 5 indicates the interviewees' knowledge about products containing palm oil as well as their self-indicated consumption of palm oil. Four participants were able to name several examples of products containing palm oil and/or stated that they read the labels of all the foodstuffs they buy. These participants were marked as "high knowledge". Four participants did not seem to be aware that palm oil was included in products other than the ones explicitly stated in the interview question. They were marked as "low knowledge". Consequently, two participants who seemed to have some basic knowledge were marked as "medium knowledge". This corresponds to the study of (Giam et al., 2015), in which about half of the participants were able to correctly identify palm oil containing products.

The second column of Table 5 shows the self-indicated consumption of palm oil. One participant (C1) declared that he was not able to estimate his level of palm oil consumption, which was noted as "unknown". Five interviewees (C2, C3, C4, C5, C10) stated that they hardly consume palm oil. While three of them did not realize that some foods they consume in fact contain palm oil, two consumers (C2, C4) stated that they actively avoid this ingredient to some extent. These interviewees were marked as "low consumption" with the additional remark "boycott" if applicable. Disdier et al. (2013) and Pearson et al. (2014) found similar boycott rates at roughly 25 and 20% of participants in larger samples. A 56-

year-old female interviewee (C5) stated that she did not understand the rationale behind palm oil use in general: *"I asked myself, why is this [sic] palm oil even needed? I don't really need palm oil myself."* One participant (C6) indicated that as a vegan she often consumed products containing "vegetable oil", correctly assuming that this frequently refers to palm oil. This participant was marked as "high consumption". The remaining three participants (C7, C8, C9) were somewhere in between. They stated that they regularly consume some foods containing palm oil but did not rate their consumption as high. These participants were marked as "medium consumption". In general, several consumers disapproved of palm oil use in Switzerland to various extents. This is different from the study in Singapore that showed little preconception about or rejection of palm oil per se (Giam et al., 2015).

Table 5: Consumers' knowledge and self-declared consumption of foods containing palm oil.

ID	KNOWLEDGE	CONSUMPTION
C1	Low	Unknown
C3	Low	Low
C8	Low	Medium
C9	Low	Medium
C5	Medium	Low
C7	Medium	Medium
C2	High	Low (boycott)
C4	High	Low (boycott)
C6	High	High
C10	High	Low

The participants' knowledge about foods containing palm oil was estimated by asking them about examples. They were also asked to indicate their personal consumption of these

foods. There are two reasons, why the answers to this question do not measure absolute consumption. Firstly, a lack of knowledge about the widespread use of palm oil in general and about the products that typically contain palm oil in particular, probably leads to systematically underrating the consumption of consumers with low knowledge. Secondly, since palm oil is often associated with environmental and social issues, some consumers might underreport their palm oil consumption for reasons of social desirability. Hence, it is likely that the absolute consumption of the participants is significantly higher than the reported consumption.

The perceived benefits of palm oil have already been mentioned above, as several participants associated beneficial properties with palm oil. When explicitly asked about the benefits of palm oil, four participants (C2, C3, C8, C10) mentioned the low price – two of them implied this from the land use explanations I had provided. Two participants (C4, C8) mentioned the pleasant or neutral taste of palm oil. Likewise, two participants (C1, C4) assumed that palm oil was a healthy fat. This might be because they assess plant foods in general and in this context plant oils as healthy. One interviewee explained (C1) that the long shelf life was a benefit of palm oil. One participant (C7) verbalized that palm oil could be used in many applications with equal properties to other oils, while another participant (C8) mentioned the favorable processing properties of palm oil. Finally, one participant (C6) mentioned the ecological advantages of palm oil as opposed to fats of animal origin such as butter. Since no other property was stated as often as the low price of palm oil, this seemed to be perceived as the main advantage of palm oil.

3.1.2 Perception of the sustainability of palm oil

How do consumers perceive the sustainability of palm oil? Unsurprisingly, those consumers that did not have any previous knowledge about palm oil were also not aware of the related sustainability issues. A 42-year-old male participant (C1) did not associate palm oil with any risks or disadvantages before the interview: *"A vegetable oil like this can't be that bad?! It's cultivated and pressed. For me, other oils such as olive oil don't have anything bad about them either."* The two aspects "knowledge about the use and origin of palm oil" and "sustainability perception" seem in fact to be closely intertwined. Consumers who had only limited previous knowledge about palm oil mainly knew about deforestation for oil palm plantations. Even those participants who had above average knowledge about palm oil had

a strong focus on sustainability issues and their knowledge about other aspects, for example the cultivation, was limited. Two interviewees (C7, C9) stated that they might have seen oil palm plantations in the past but both were not completely sure and expressed doubts if what they had seen had really been oil palms. It can be assumed that the strong focus of participants' palm oil knowledge on its sustainability issues originates from the public discourse about this topic and possibly also campaigns and reports about deforestation, hazes and conflicts related to oil palm cultivation. The reasons for consumer perception of palm oil sustainability will be analyzed below.

Do consumers perceive oil palm plantations as a risk to biodiversity? One interviewee (C1) challenged, whether biodiversity was even an important aspect of sustainability in general and another participant (C2) did not talk about biodiversity, despite criticizing palm oil per se. One participant (C3) believed that oil palm plantations might even be favorable for biodiversity because planting them adds to the number of plants growing in a certain area. One interviewee (C5) interpreted biodiversity mainly with regard to the variety of oil palm cultivars in plantations. She assumed that the limited variety of cultivars went along with low biodiversity. A 29-year-old man (C9) did not seem to understand the link between palm oil and biodiversity at first, assuming that harvesting palm fruits would merely deprive the apes of their food, when he asked me: *"Do orangutans feed on palm oil?"* After having learned about deforestation he became strongly in favor of protecting orangutans and biodiversity. In general, consumers perceived the plantations as harmful to biodiversity at least to some extent. Two interviewees (C7, C9) stated that oil palm plantations and the related deforestation posed a serious threat to biodiversity. The remaining four participants (C4, C6, C8, C10) described how land clearing and monocultures were harmful for biodiversity. However, one participant (C9) also mentioned that agriculture in general was replacing the original flora and fauna - oil palms not being an exception. While roughly half of the participants perceived oil palm plantations as a threat to biodiversity, the rest of the interviewees seemed to have troubles understanding the concept of biodiversity and/or its connection to deforestation and palm oil. Despite the fact that I provided a general explanation about biodiversity before asking this question, several participants asked for clarification during the interview.

Are oil palm plantations perceived to be a significant contributor to climate change? Apparently not. The majority of participants (C1, C2, C6, C8, C9, C10) said they were unable to estimate whether oil palm plantations have a considerable impact on global climate, as can be seen in Figure 6. One interviewee (C4) speculated that oil palms might even be beneficial in fighting climate change because their cultivation is more efficient than that of other oil plants. Conversely, one participant (C5) perceived oil palm plantations as a serious threat to global climate. The remaining two participants (C3, C7) indicated that the contribution of oil palm cultivation to climate change was limited or negligible, compared to other contributors of climate change, such as cattle farming. It seems as though most consumers are unable to estimate the degree to which palm oil plantations, or more specifically deforestation for palm oil plantations contribute to climate change. This is not surprising for several reasons. Firstly, climate change is a complex topic, in particular to laypeople. Secondly, the knowledge of many participants about palm oil and the related environmental issues was very limited before the interview. Finally, people are probably more aware of certain contributors to climate change such as car and traffic than they are aware of tropical deforestation as a source of greenhouse gases. To fully grasp the connection between palm oil and global warming, one has to understand how palm oil is connected to deforestation for oil palm plantations. Furthermore, one has to realize that deforestation leads to a release of greenhouse gases into the atmosphere, as the carbon-density of oil palm plantations is considerably lower than that of tropical rainforests. In addition, one needs to compare deforestation to other contributors to climate change. Understanding these links is a difficult task that not many laypeople seem to be able to carry out without further support or information.

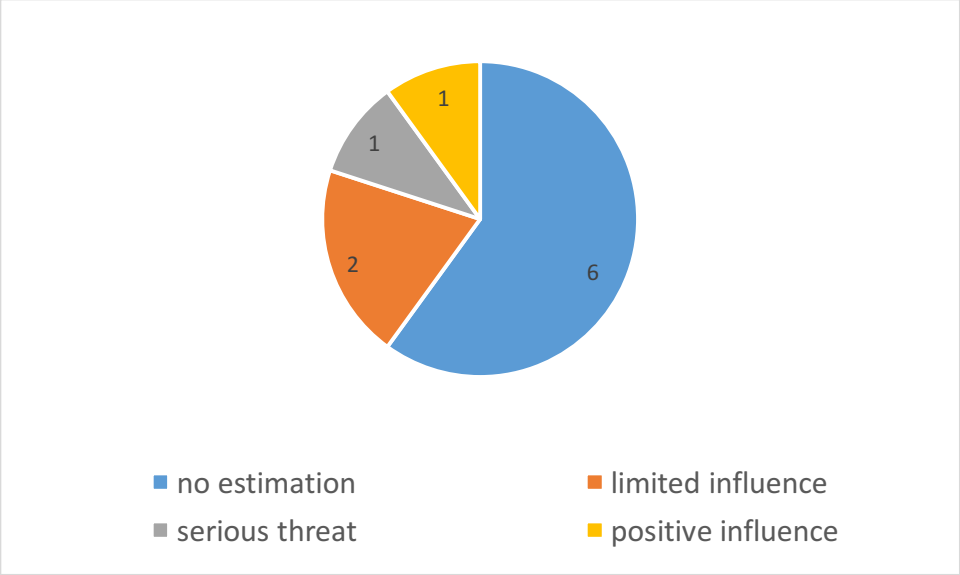

Figure 6: Are oil palm plantations contributing to global climate change? Perceptions of 10 participants.

What about other sustainability aspects? Judging from my interviews, it seems as though social sustainability is a lesser concern than ecology with regard to palm oil. Still, four participants (C2, C5, C8, C10) mentioned social aspects of oil palm cultivation. One participant (C2) described how the plantations impede self-sufficiency and subsistence of the local population, leaving them as “slaves”. This aspect was also described by other participants in different terms: one (C5) assumed that “slave work” was common in these plantations, and another participant (C8) feared that big corporation might gain a lot of power by owning the plantations. Yet another participant (C10) said that land is taken from the local population to be converted into plantations.

Apart from social sustainability, participants mentioned other sustainability issues that were not explicitly asked about in the interview. Six participants (C1, C6, C7, C8, C9, C10) talked about negative influences on soil quality. Aspects like erosion, accumulation of toxic substances and nutrient depletion were mentioned. The high number of interviewees who discussed soil health and quality without an explicit pointer to the topic is quite remarkable, especially compared to other ecological aspects like climate change and biodiversity that received comparatively little attention. Many participants seemed to have a picture of a particular process in mind. According to their imagination, the land is cleared of its natural vegetation - rich tropical rainforest - and used for oil palm plantations. After a while, the plantations are abandoned by the companies, and the soil remains depleted of nutrients and enriched in toxins. Further sustainability issues were named only once each: transport

distances (C1), packaging (C1), pesticide and herbicide use (C3) and the input of fossil energy (C5).

In general, do consumers see the "bigger picture" of the sustainability of palm oil? Do they take into account the environmental impacts of alternative oils? To answer these questions, I looked for statements in which consumers weighed advantages and disadvantages, critically considered alternatives, drew comparisons, or set the topic into a bigger context. Four interviewees (C1, C2, C4, C10) stated in one way or another that oil palms per se are not unsustainable and that the damage arises from the sheer amount of cultivation. On the one hand, two of them (C1, C2) explained that other crops cultivated in such high amounts would also be connected with substantial negative effects on the environment. On the other hand, two participants (C4, C10) held the view that the relative efficiency of oil palms would turn into a disadvantage, if it led to a very high total area of cultivation. Another aspect of seeing the "bigger picture" includes examining alternatives. More than half of all participants (C1, C5, C6, C7, C9, C10) critically considered alternatives in one way or another. They wanted to know what the alternatives were, stated disadvantages of alternative oils, or simply stated that alternative crops have negative influences on sustainability as well. Finally, half of the consumers (C2, C4, C5, C7, C9) remarked that the sustainability of palm oil depended fundamentally on the cultivation methods and that its use could be justifiable if the right methods were guaranteed. One 34-year-old man stated: *"I certainly think we need palm oil - just as other things are needed as well. I don't think it should be banned. It is an important commodity. But it's the method of cultivation that should be changed."* In general, consumers in my study seemed to put higher importance on ecological aspects of sustainability than on social aspects. The "fair palm oil market" perspective (see Table 1) described by D'Antone and Spencer (2014) is hardly adopted by the interviewees in my sample, while the characteristics described for the other market versions often appear in their statements.

The consumers' perceptions of palm oil were outlined above. What influenced their knowledge and perception of palm oil and its sustainability? Half of the participants (C2, C4, C5, C7, C8) remembered reports they had read, seen or heard. Some mentioned newspapers or magazines, others mentioned TV or radio and one person (C4) mentioned both an exhibition about food ("Zürich isst" in 2015) which also included information about

palm oil and an exhibition in the botanical garden of Zurich. There was no typical source of information standing out. The other half of the participants (C1, C3, C6, C9, C10) said they could not remember having seen any reports on palm oil. None of the consumers had watched the report in the television show “Kassensturz” (see 2.1). Only one participant (C5) could think of a campaign against palm oil from the past. None of the participants had previously seen the video from the Greenpeace campaign (see Figure 7) which I showed them towards the end of the interview. After having watched the campaign video, three interviewees (C1, C3, C9) stated that it had changed their perception of the topic. These three interviewees were consumers that had had no previous knowledge about palm oil and its risks. One participant (C1) was particularly shocked when watching the video because during the whole interview he had been convinced that palm oil was a virtually miraculous product with only minor disadvantages. Seven participants (C2, C4, C5, C6, C7, C8, C10) stated that the video did not change their perception of palm oil, because they had been aware of the issue before. However, one of them (C6) explained that while the information about deforestation had not been new to her, the campaign video had helped her to bring the topic back to her awareness.

Figure 7: Snapshots of a campaign video to stop Nestlé from sourcing unsustainable palm oil (Greenpeace UK, 2010).

In the interviews I asked participants about media and campaigns with regard to palm oil. It is important to understand that influences on knowledge and perception are manifold and their implications are complex. The Elaboration Likelihood Model describes how people's motivation to thoroughly reflect on a topic and form their own opinion depends on various factors (Cacioppo & Petty, 1984). According to the model, motivation, ability and other factors increase the likelihood that individuals follow the *central path* to decision making and carefully consider the available information instead of saving energy on the *peripheral path* by relying on cues (Cacioppo & Petty, 1986). This model not only applied when participants had been exposed to information about palm oil in the past, but also at the time of the interviews, when I asked them to remember what they had seen, read or heard about palm oil. Even if individuals had been exposed to similar information, processing of the information might have differed. In a more thorough examination of influences on knowledge and attitudes about palm oil, the Elaboration Likelihood Model should be taken into account.

The Theory of Planned Behavior is helpful to describe and understand consumer behavior related to palm oil. The theory specifies critical influences on an individual's behavior. According to Ajzen (1991), *attitude*, *subjective norm* and *perceived behavioral control* affect a person's *intention* to perform a *behavior*. The person's *intention*, together with the direct influence of *perceived behavioral control*, eventually determines the observed *behavior*. In the context of palm oil, the *attitude* toward the *behavior* might refer to the perceived sustainability of palm oil and the perceived importance of sustainability as an attribute. This aspect was examined in section 3.1.1. The *subjective norm* captures the perceived social pressure. Is consuming palm oil perceivably disdained among peers or society in general? The consumer interviews in this study did not investigate such social influences in depth. With regard to consumption of sustainable palm oil, the *perceived behavioral control* refers to whether products with sustainable palm oil are accessible and affordable to consumers. This is discussed in section 3.1.3.

Did the campaign video influence the participants' intended behavior? Two participants (C1, C3) stated that after having watched this video, they wanted more information on the topic. A 50-year-old woman (C3) felt ashamed for her lack of previous knowledge on the issue: *"Why did I know nothing about this topic until now?"* Two participants (C6, C9) stated that it might influence their behavior, at least temporarily. All the interviewees stated that such videos can be beneficial in one way or another by raising awareness, drawing interest or exerting pressure. However, many of the participants also expressed doubts. They suspected that these campaigns might only reach individuals that are already protecting the environment. Others regretted that campaigns often over-simplify issues and they feared that such graphic depictions might also lead to rejection.

3.1.3 Action and behavior

In terms of a more sustainable future of palm oil, I was interested in the consumers' shopping behavior with regard to palm oil. Are labels influencing their decisions? Do they know palm oil labels? Are products with sustainable palm oil available to them? None of the interview participants were able to describe any palm oil labels ad hoc. When they were presented with pictures of the two labels Green Palm and RSPO that can be seen in Figure 8, six participants (C1, C2, C3, C4, C7, C10) stated that they had never seen any of the two labels. Four participants (C5, C6, C8, C9) said they had never seen the RSPO label but might have seen the Green Palm label before. However, none of them were sure about this. Only two participants (C1, C3) stated that they trust labels in general, while the majority (C2, C4, C5, C6, C7, C9, C10) characterized themselves as fairly skeptical with regard to labels. The two participants who stated to be generally trusty towards labels had no previous knowledge about palm oil. In general, many participants explained that more information was needed to judge a label's trustworthiness or that labels generally keep their promises but the promises were not very comprehensive. When asked about the availability of products with sustainable palm oil or alternatives without palm oil, the results were similar to the recognition of the labels. Two participants (C4, C6) stated that they had noticed products marketed as palm-oil free in stores. None of the participants had noticed products containing sustainable palm oil. However, two participants (C7, C8) said that they had not been paying particular attention to this aspect in the past.

Figure 8: Palm oil labels shown to participants.
Left: GreenPalm (GreenPalm, 2006). Right: RSPO Trademark Logo (RSPO, 2011).

The low share of consumers knowing about the palm oil labels was remarkable. Surprisingly, out of the four people claiming they might have seen the Green Palm label before, two (C8, C9) had very low previous knowledge about palm oil (compare Table 5). Furthermore, out of four interviewees with relatively high previous knowledge about palm oil, only one stated to recognize the Green Palm label. It seems as though even consumers with a considerable awareness of the sustainability issues of palm oil are not knowledgeable about more sustainable alternatives.

I also asked participants which criteria should be satisfied by a label for sustainable palm oil. The answers did not show a consistent pattern. Some consumers took organic or Fairtrade labels as an example and said that a palm oil label should fulfill those criteria. Others focused on specific aspects, for example pesticide use, protection of animals or that the local population should benefit from the palm oil profits. Surprisingly, only two consumers (C4, C5) specifically mentioned that such a label should guarantee the abandonment of deforestation for plantations. To set the consumers' statements into a wider context, I also asked them about their general shopping behavior with regard to sustainability. Six participants (C2, C4, C5, C6, C7, C8) stated in some way or another that they take sustainability into consideration as much as possible when shopping for food. The other four participants (C1, C3, C9, C10) considered sustainability to some extent. The self-reported frequency of palm oil consumption has already been described in section 3.1.1. When I specifically asked the consumers if they regularly check whether the products they buy

contain palm oil, five consumers (C2, C4, C5, C6, C10) said they had been considering it (to various degrees).

Finally, I was interested in investigating if consumers are willing to pay a premium for more sustainable versions. I asked them how much more they would be willing to pay for a product containing no palm oil, or sustainably labeled palm oil. Eight participants (C1, C2, C3, C4, C5, C6, C7, C8) explicitly stated that they were willing to pay more for a product containing no palm oil, or sustainably labeled palm oil. Some participants (C1, C7) added that they would only pay more if they knew that certain sustainability criteria were fulfilled. One participant (C9) referred to being a student and said he would be willing to pay double if he had a reliable income. The extent to which consumers were willing to pay for more sustainable product versions varied tremendously. Many consumers did not want to specify a number. The ones who did state numbers varied between 10 and 25% with one consumer (C4) willing to pay up to 700% (sic!) extra for a sustainable version of some products. Giam et al. (2015) calculated a WTP of about 10% for deforestation-free palm oil, which is slightly lower than what I observed. In a future study, it should be more thoroughly analyzed if and how much more consumers in Switzerland are willing to pay both for sustainable palm oil and alternatives to palm oil and what sustainability criteria need to be fulfilled to justify an increase in price. Caution should be exercised not to blur these different aspects in order to be able to draw meaningful conclusions.

After speaking with the consumers about the disadvantages of palm oil, I wanted to focus on perspectives and prospects of a more sustainable palm oil production. What are the consumers' ideas to improve the sustainability of palm oil? The various aspects mentioned by the participants painted a colorful picture and were far from pointing into the same direction. Preventing deforestation was only one mention among many. There were some suggestions referring to land use indirectly: these included entertaining smaller plantations in already degraded areas or increasing the overall efficiency in order to decrease the total land use for palm oil. On the other hand, many suggestions dealt with the way the plantations are managed or set up. They aimed at lowering the environmental impact of the plantations in general or decreasing the detrimental outcomes of deforestation. Such measures included: refraining from monocultures, resettling forest animals, keeping the cultivated area to a certain percentage of the total area, or switching to organic agriculture

or permaculture. One participant (C10) also emphasized taking care of soil fertility to increase the lifespan of the plantations.

Many of the consumers' suggestions to improve the sustainability of palm oil generally seem feasible. Some of their suggestions are already part of the RSPO criteria (RSPO, 2013). In addition, switching to organic agriculture or refraining from monocultures might have ecological benefits. However, it is unclear whether the ecological advantages of such measures outweigh the disadvantages of an increased total land use due to lower productivity. Fitzherbert et al. (2008) point out this tradeoff and conclude that the potential of biodiversity-friendly management might be low. Furthermore, while resettling might save some bigger mammals, it is certainly unfeasible for flora and fauna as a whole and does not compensate for habitat loss.

Some of the proposals also went beyond the topic of deforestation and dealt with other aspects of sustainability. One interviewee (C9) suggested nationalizing the plantations. Another idea (C8) was to involve the local population and to plant (other) food crops on a certain part of the plantation surface, at the disposal for the local community. Stakeholder involvement is undoubtedly an important aspect of increasing the sustainability of palm oil and has already been discussed in chapter 1.3. One participant (C3) suggested using other parts of the palms as well, such as the palm's wood or leaves. Two participants (C1, C9) proposed extending palm oil cultivation to other (suitable) areas of the world, albeit with different rationales. While one participant (C1) mainly hoped to decrease transport distances this way, the other interviewee (C9) aimed to (more evenly) distribute the environmental burden connected to palm oil cultivation.

3.2 Catering companies

3.2.1 Use and origin of palm oil

There was one aspect about which all interviewees agreed: pure palm oil is not used as a direct cooking ingredient in any of the five companies I interviewed. However, palm oil does find its way onto the plates of the guests. Which products used in catering typically contain palm oil? Table 6 shows a classification of the products mentioned by the caterers into three groups (pre-processed ingredients used to cook and prepare food, pastries and bakery products, and packaged snacks and sweets). The lines between these groups are of course

not clear-cut. Note that the table does not necessarily include all palm oil containing foods used in catering but only examples mentioned in the interviews.

Table 6: Classification of palm oil containing products in catering and their typical palm oil content.

	Products	**Palm oil content**
Pre-processed cooking ingredients	soup bases (stock powder and paste) sauce bases (demi-glace), dessert mix, spice mix, mashed potato mix, sandwich spread	typically low (except in sandwich spread)
Pastries and bakery products	croissants, donuts, pastry	typically high
Packaged snacks and sweets	candy bars, chocolates	variable

How much palm oil is used in catering? None of the companies had a precise knowledge about the amount of palm oil used annually. One caterer (G2) ventured a rough estimation by filtering in their software for products containing palm oil. He stated that about 10 - 15% of the articles (in total about 700 articles) listed by their main supplier contained palm oil. This number seems rather low. Palm oil might still be listed as vegetable oil in some cases, lowering the percentage. Furthermore, the product range available to this caterer might contain certain product groups without palm oil that are not typically available in normal supermarkets, further distorting the ratio. My interview partner estimated that roughly 3% of the total (monetary) purchasing volume went towards products containing palm oil. All the other caterers were unable to provide even a rough estimation on the amount of palm oil they buy, process and sell. There are various reasons for this. Firstly, the systematic knowledge about ingredients varied among the caterers. While some companies used a software program with the possibility to filter for a single ingredient, others did not have this option. Many ingredient lists do not specify the exact amount of the individual ingredients. Apart from the sheer quantity of palm oil containing products used, processed

and sold in catering, this further complicated a meaningful estimation of palm oil quantities in catering.

The origin of the palm oil in the products proved difficult to answer as well. Knowledge about the palm oil supply chain is very limited among the companies I interviewed. As described above, palm oil is not used in catering as a fat for cooking, but rather processed as an ingredient in a multitude of foodstuffs. According to the caterers, this renders it unfeasible if not impossible to trace the origin of the palm oil. The only knowledge available about the origin and certification of palm oil stems from statements on packages or inquiries with manufacturers. One caterer (G2) said that the origin of the palm oil was largely unknown and the effort to find out more would be immense. However, this interview partner also assured that products with palm oil as a main ingredient (such as sandwich spread) contained RSPO certified palm oil. Another caterer (G3) admitted their knowledge about the origin of their palm oil was very limited, but added that they were working on increasing this knowledge. He explained that random inquiries with suppliers had shown that their major suppliers used certified palm oil.

Why do caterers use palm oil? What are the perceived benefits? It seems as though caterers do not use palm oil out of conviction. Two caterers (G1 and G2) stated that using palm oil was not a conscious decision. According to them, recipes and formulations are developed by the industry and the palm oil content of a product does not provide the rationale to buy it. One might assume that the comparatively low price of palm oil was a benefit of products containing it. However, one caterer (G2) mentioned this aspect and disagreed. According to him, the low price of palm oil was of minor importance, due to the low total palm oil content in the end product. It is likely that this caterer was referring to certain product groups, such as stock powder. Some foods, in particular pastry and croissants typically contain a significant amount of palm oil and would most likely be more expensive if the palm oil was replaced by other suitable fats, such as butter. Two caterers (G4 and G5) did perceive direct benefits of palm oil, stating that the oil had health advantages in certain applications, such as deep-frying, that it was convenient in certain applications (i.e. for spreadability and consistency of sandwich spreads) and that it can be eaten by people of various religions and convictions – unlike butter, suet or lard. It is interesting to remark that both caterers who explicitly mentioned benefits of palm oil are in fact striving to reduce its

use (see below). This implies that those caterers who have more knowledge on palm oil are not in favor of its use or vice versa.

3.2.2 Actions and behavior

Nowadays it is not surprising that all the caterers I interviewed ascribed a central role to sustainability, even though their sustainability efforts might focus on different aspects. While some companies (G2 and G3) consulted external experts and had highly professional sustainability programs in place, others used more traditional criteria such as sourcing regionally and seasonally or even organically (G1, G4 and G5). But what are their strategies with regard to palm oil? This aspect showed great variation among my interview partners. For three caterers (G1, G2 and G3), palm oil had not been a meaningful issue in the past. They stated that they focused on other aspects of sustainability and that their customers were not interested in this topic. However, one caterer (G2) explained that palm oil will be included as a criterion in future bidding and procurement procedures for foods from manufacturers or importers. When new products or product groups are included, their palm oil content will be assessed alongside many other already existing criteria. One caterer (G3) stated that they were currently working on increasing their knowledge about the palm oil supply chain.

In contrast to the three caterers depicted above, two caterers (G4 and G5) had been actively working on eliminating palm oil from their kitchens and buffets. Since 2015, one company (G4) had a directive in place that explicitly refers to palm oil. Their list of forbidden products includes: frying fats of vegetable origin, plant based alternatives to cream, margarine and sandwich spreads. In addition, the directive explicitly says: “Furthermore, we recommend to forgo palm oil and fat” (company directive, confidential information, 2015). My interview partner explained that Swiss butter was their preferred source of fat, apart from sunflower, canola and – to some extent - olive oil. He mainly stated nutritional reasons for this decision, apart from ethical reasons. I suspect that this company’s strong general focus on local sourcing of food provides an additional explanation for their attempts to eliminate palm oil. When I tried to find out how the abstinence from palm oil looks in practice, I was surprised to realize that my interview partner did not seem to have an accurate picture of the wide dissemination of palm oil in foodstuffs. Some of the resolutions had been put into practice: my interview partner explained to me that a certain (palm oil containing) sandwich

spread was no longer used in the restaurants. However, when I asked about pastry and bakery products, he stated that it might be possible that they contained palm oil but that he did not know exactly. He also explained to me that some packaged products sold over the counter, such as “Lindor-Kugeln” (chocolate bites with a creamy filling) contained palm oil but were still sold because alternatives did not exist. In other words: in this particular case, consumer demand was more important than perceived sustainability.

One other catering company (G5) had been trying to eliminate palm oil for an even longer period of time. According to my interview partner, the company adopted a palm oil exit strategy approximately six to seven years ago and had been increasing its efforts to enforce it in the last two to three years. While products with palm oil were still used, this company seemed to have a much clearer picture of which products contain palm oil. My interview partner described a project where they changed the frying fat of frozen French fries in collaboration with the supplier. In the past, this supplier had used palm oil in the frying process. After negotiations with the caterer, the supplier reconstructed the production line and switched to other oils. According to my interview partner, the adaptation of the relevant machines involved investments of about two hundred thousand Swiss francs due to a necessary change of the freezing process. In contrast, an international manufacturer of donuts did not show any interest in changing its recipes when he was contacted by the caterer. The interview brought up another example of an effort to decrease the use of palm oil. When my interview partner was contacted by a cookie manufacturer about a potential promotion of their cookies, he realized that the cookies in question contain palm oil. Subsequently, it was decided that palm oil containing products like these cookies can still be ordered and sold by the restaurants, but special promotions are no longer allowed. This decision is a middle ground between consumer demand and perceived sustainability.

What made this caterer go to such great lengths trying to eliminate palm oil? My interview partner seemed to know the RSPO criteria quite well and held the view that palm oil was unsustainable, regardless of its RSPO certification status. He stated that their company did not want to support neither slash-and-burn, nor monocultures and was highly convinced that oil palm plantations on a grand scale were inevitably linked to deforestation. He summarized that their motives for elimination of palm oil were purely ethical.

3.2.3 Sustainability perception and communication

The customer feedback about palm oil is another aspect which unifies all the caterers I interviewed. None of the caterers had ever received any customer inquiries about palm oil and no systematic surveys on palm oil had been conducted. Consequently, it was also not possible to determine a possible influence of campaigns and media reports on their reactions. The complete lack of consumer feedback on palm oil is especially remarkable for the two caterers which try to eliminate palm oil and confirms the statement of the caterer (C5) described above, who stated that the company's efforts to eliminate palm oil from their kitchens and buffets were ethically motivated. The last two interviews also included a question about the sustainability requirements of business clients. Both caterers (G4 and G5) indicated that palm oil was not among the sustainability or health criteria typically established by companies or institutions commissioning a canteen or cafeteria.

The palm oil strategies of the different companies have been outlined in section 3.2.2. Two caterers (G4 and G5) are actively working to reduce their use of palm oil. How are these efforts communicated to restaurant guests, business clients, or the general public? The caterers remarked that they were not communicating their palm oil strategies because no one had asked them about this topic in the past. One caterer pursuing an exit strategy (G5) stated that they did not openly communicate this to the public, because the strategy had not been fully implemented. He explained that alternatives to palm oil were still lacking in several areas. This lack of communication about palm oil may provide a further explanation for the fact that consumers do not inquire about palm oil with caterers.

3.3 Retailers and manufacturers

3.3.1 Use and origin of palm oil

The two interviews with retailers revealed a wide spectrum of foodstuffs containing palm oil. This may be partially due to the nature of the retail business, and partially due to my knowledgeable interview partners. One retailer in particular (R2) mentioned product groups that I did not come across in other stakeholder interviews, namely ice cream and breakfast cereals. Other mentions were margarine, chocolate spread, sweets, bakery products, savory snacks ("Apérogebäck"), convenience food, ready-made dough and pastry, and chocolate. Both retailers also act as manufacturers, because they offer an extensive share of store-

brand-products to their customers. Store-brands account for about 50% (R1) and 90% (R2) of their assortment, respectively. The data and information about palm oil they provided largely relate to the store brands. While the retailer with the lower share of store-brands (R1) processes about 2500 t of palm oil per year in foodstuffs, the other one (R2) processes 6000 t per year. They both had a clear picture of the total amounts used because they oblige their suppliers to report their own palm oil use. In general, my interview partners from retailers seemed to have considerable knowledge about their palm oil use and the reasons for using it. When asked about the perceived benefits of palm oil, their replies were quite comprehensive. They mentioned industrial properties, such as the neutral taste and the high melting point as well as health advantages, because the oil can be saturated without producing trans fatty acids. One retailer (R1) explicitly mentioned the sustainability of palm oil, thanks to the low relative land use. It was also stated that animal fats were forgone out of consideration for vegetarians.

Both retailers had a similar public pledge to only use sustainable, RSPO certified palm oil (see section 3.3.3). Both retailers aimed for physically sustainable (i.e. segregated or Identity Preserved) palm oil as a minimum standard. While one retailer (R2) reported to use 98% segregated palm oil in 2015, the other one (R1) reported 92.7% palm oil of segregated or higher standard. The remainder was mainly covered with RSPO Book & Claim certificates. In general, the producing countries of the processed palm oil were known to the retailers. Surprisingly, Indonesian palm oil did not seem to be used, despite being the biggest global producer of palm oil. Instead, the two retailers listed Madagascar, Cambodia, Solomon Islands, Papua New Guinea, Ivory Coast, and Malaysia as countries of origin for palm oil and palm kernel oil. Both retailers also pointed out that the two palm oil importers in Switzerland, Florin and Nutrisuisse, now only offer RSPO certified palm oil. However, it still seems to be difficult to source and use 100% physically sustainable palm oil, in other words, segregated palm oil. My interview partners named two main reasons for this. On the one hand, specific fractions of palm oil might not be available on the market in a sustainable version. On the other hand, suppliers sometimes process intermediate, semi-finished goods which already contain palm oil and are difficult to control. To increase the overall sustainability of palm oil, both retailers also asked the manufacturers of brand products to use certified palm oil, but this had not been fully implemented at the time of the interviews.

The other manufacturers in this group - the ones who did not act as retailers - were less homogenous and the information I gathered in my interviews was comparatively limited. All three manufacturers specified the total amount of palm oil used annually. In addition, all of them indicated that they used RSPO certified palm oil only. However, the share of different RSPO certificates varied considerably among them.

Company P1 produces various foodstuffs (potentially) containing palm oil, such as sweets, ice cream and convenience food. This company used 16% segregated palm oil (sustainability report, 2015). In the past, the rest of its palm oil volume used to be covered with Green Palm certificates. Despite stating that the "palm oil supply chain is notoriously complex and often opaque", they reported that 82% of the processed palm oil was traceable to the mill at the end of 2014 (sustainability report, 2015). It remains to be elucidated why the share of physically sustainable palm oil used by this company remains so low. One explanation would be that there is not enough segregated or Identity Preserved palm oil available to the company on the market. However, according to an interview in the Guardian with the RSPO secretary general, nearly half of the certified palm oil produced in 2012/2013 was sold as conventional palm oil, because it failed to find a buyer on the market (Balch, 2013). Another possible reason could be that certified sustainable palm oil is produced, but the structures for segregated supply chains are still insufficient. Finally, the reasons for the low share of segregated palm oil in this company might simply be financial.

The Swiss chocolate manufacturer P2 did not use palm oil in their chocolate base, but certain chocolate fillings did contain palm oil (personal communication, 8/3/2016). They did not state an exact number, but wrote that they use about 0.005% of the world production of palm oil. This accounts to roughly 300'000 t of palm oil annually, assuming a world production of 61.4 million t for 2014/2015 (United States Department of Agrigulture, 2016). According to their own statement, 100% segregated palm oil was sourced and processed (personal communication, 8/3/2016). Stated reasons for using palm oil included the outstanding melting behavior and melting point, the neutral taste, and the possibility to refrain from using hydrogenated vegetable oil. It is likely that the company rejects hydrogenated vegetable oil for health reasons.

The third Swiss food manufacturer (P3) used palm oil in soup and sauce powders and pastes. Due to their composition and texture, the palm oil content in the pastes is generally

much higher than in powders. The company stated using palm oil for its beneficial technological properties: the products are manufactured and consumed at room temperature and the oil thus needs to be solid at room temperature. In addition, the long shelf life is of considerable importance, because the soup pastes with their high fat content are kept at room temperature and must not get rancid within the shelf life of a year or more. My interview partner also told me about the developments in the food industry. According to her perception, the use of different fats and oils changed over time in response to different "hot topics" and scandals. In the past, suet was used until the BSE crisis made the industry switch to peanut oil. Afterwards, the high allergen content of peanuts led to the use of hydrogenated sunflower oil. At the time of the interview, the industry mainly used palm oil for health [and other] reasons, but many consumers were challenging this choice with inquiries and requests. The total yearly palm oil use in their own production was about 600 t. This company uses about 60% segregated, and about 40% mass balanced palm oil. They would prefer to use segregated palm oil only, but were reliant on certain palm oil fractions that are not or hardly available in segregated versions. The company knew the country of origin for most of the palm oil processed, but was not actively trying to gather more information on the supply chain.

3.3.2 Actions and behavior

Both retailers were actively working on improving the sustainability of palm oil by various efforts and measures. They were members of the Retailers Palm Oil Group (RPOG) and the Palm Oil Innovation Group (POIG). In addition, they were working on a stricter set of standards, the so-called RSPO next and were collaborating with NGOs. However, one interview partner (R2) also told me that it is not possible for manufacturers in Switzerland to request palm oil that meets their own specific criteria, because the refineries in Switzerland cannot implement these criteria and differentiate the corresponding palm oil. Ideas for the future included implementing a stronger collaboration with the refineries, and improving the situation and sustainability of smallholders. Both retailers agreed that alternative oils should only be used in applications where they effectively provide an improvement, to prevent shifting [sustainability] problems to other areas. One interview partner (R2) told me that while a total abandonment of palm oil was both undesirable and unrealistic, the company tried to keep the total amount constant. In applications where it is feasible and

reasonable, recipes are sometimes adapted to other oils. My interview partner from the other retailer (R1) stated that the alternative to palm oil was sustainable palm oil, not other plant oils and explained that an abandonment of palm oil would not be more sustainable or ecological by and large.

After having bought RSPO Book & Claim certificates for a substantial part of their palm oil use, P1 decided to phase out these certificates as of January 2015 and was now relocating these funds towards partnership activities to increase the sustainability of palm oil (sustainability report, 2015). The company was also venturing to establish their own guidelines for responsible sourcing with provisions for protection of peatland and high carbon-forests. In addition, they introduced a traceability document that suppliers had to fill in quarterly. In collaboration with The Forest Trust (TFT) the company was also establishing a project to share best practice with smallholders. P2 was an active member of the RSPO (personal communication, 8/3/2016), but did not state any other efforts to increase the sustainability of palm oil. Similarly, the third manufacturer I interviewed (P3) was not actively working to increase the sustainability of palm oil apart from sourcing RSPO segregated palm oil.

3.3.3 Sustainability perception and communication

Are retailers confronted with consumers' concerns about palm oil? Both retailers stated having considerable customer feedback about palm oil – more so than related to other individual commodities or ingredients – and they both agreed that inquiries typically increased after media reports, for example "Kassensturz" or reports about the fire hazes in Indonesia. In addition to media coverage, they noticed a rise in customer inquiries after the duty of declaration for palm oil had taken effect in the beginning of 2016. Neither of the retailers had conducted any systematic surveys on consumer perception of palm oil. One of my interview partners (R1) had the impression that inquiries about the healthiness of palm oil used to be more prevalent in the past. My interview partner at R2 told me that health issues of palm oil were much more prominent in Western Switzerland, where palm oil was often seen as harmful or dangerous to health.

How do retailers communicate their efforts to increase the sustainability of palm oil? Both retailers published pledges to use only sustainable palm oil and both include general information about palm oil on their websites (company website, 2016; company website,

2012). One retailer (R1) stated that they generally refrain from printing the RSPO label on products, because to them, the RSPO standard was a minimal standard that would need to be printed on all (palm oil containing) products and they generally did not advertise minimal standards. It was possible to print the statement “contains certified sustainable palm oil” on a product, but this was not the standard approach.

Both retailers I interviewed had a similar, proactive approach towards palm oil in all of the areas I touched upon. Both were working to increase the sustainability of palm oil by various means and neither of them strived for the elimination of palm oil. With regard to palm oil, the differences between the two retail companies were small.

According to my interview partner at P1, consumers frequently inquired about palm oil, often in relation to media events or campaigns. To his knowledge, there had never been a systematic survey of consumer perception of palm oil conducted by the company. Palm oil origin was not communicated on product packaging. My information about consumer feedback on palm oil from P2 is limited. Judging from the fact that some information about palm oil was made publicly available on the company’s website (company website, 2015), it is likely that they were confronted with inquiries at least to some extent. Furthermore, my request for a personal interview was declined with the explanation that they received too many requests about palm oil to be able to personally respond to them. The third manufacturer (P3) got many consumer inquiries about palm oil, albeit some of them from countries other than Switzerland. According to my interview partner, consumers often did not differentiate whether a product contains 0.5% or 30% palm oil. The number of inquiries would be the same for both products. The company had not conducted any systematic surveys of consumer acceptance of palm oil to date. Several business clients had requested products or product lines without palm oil. Despite having the necessary certification, the RSPO logo was not printed on individual products with very few exceptions. The company (at the behest of its business clients) generally preferred labeling a product as palm oil free or else not to draw unnecessary attention to the palm oil content of products.

3.4 Comparison of the stakeholder groups

Of the three stakeholder groups, retailers and manufacturers seemed to have the clearest picture of the favorable properties of palm oil. Both retailers and manufacturers were able

to pinpoint a multitude of reasons for the use of palm oil. This is not surprising: manufacturers are the ones who consciously decide to process palm oil and thus have to be aware of its specific properties. The retailers also intentionally investigated various critical commodities, such as palm oil. In comparison, the catering companies named few aspects that were mainly related to the use of palm oil in catering. Many caterers stated that they did not care about the benefits of palm oil. Because they did not actively decide to use palm oil, they depended on the manufacturers and their products. Finally, the knowledge of consumers about the benefits of palm oil was very variable. While some interviewees had a substantial knowledge about the properties of palm oil, others had simply never thought about its benefits before.

The company interviews also showed a discrepancy in general knowledge about palm oil. Retailers and manufacturers seemed to have more knowledge about palm oil than caterers. Again, this is of little surprise. The palm oil in the kitchens of the caterers had not found its way there by means of an active decision process and my interview partners typically were no experts in the field. The retailers' and manufacturers' wider knowledge about palm oil and its sustainability issues seemed to be reflected in a more balanced view of the topic. While caterers were either not focusing on increasing the sustainability of their palm oil uses or working to completely eliminate its use, retailers and manufacturers seemed to weigh both advantages and disadvantages without demonization. This may in part be because they are more directly dependent on palm oil and its elimination would be a drastic step. In addition, the retailers and two of the manufacturers I interviewed were very big companies with designated sustainability departments.

There is also a remarkable gap between the consumer feedback that caterers on the one hand and retailers and manufacturers on the other hand received about palm oil. While none of the caterers had received any questions about palm oil from consumers, retailers and manufacturers were regularly confronted with inquiries. There are various attempts to explain this. First of all, meal descriptions at canteens and cafeterias typically contain the main components of the meal, such as the type of meat or vegetables and side dish. Apart from allergens, a detailed list of ingredients is generally not provided. Packaged foods available in retail on the other hand provide a full list of ingredients. Therefore, consumers might have more knowledge and awareness about the ingredients of packaged products. A

second possible explanation for the discrepancy in consumer feedback is that canteens and cafeterias typically focus on fast and affordable food. Many students and professionals do not want to overstretch their lunchbreak and have a limited budget for lunch. This attitude might keep them from speculating too much about the palm oil content of their lunch, because they literally need to get back to work.

Caterers did not publish any information about palm oil. This makes sense because the knowledge of catering companies about the extent of their palm oil use was very limited and because of the low consumer interest to date. In contrast, both retailers and two of the manufacturers proactively published information both about palm oil, its sustainability and their own palm oil use. However, despite communicating about palm oil on their websites and in reports, the retailers and manufacturers generally refrained from printing RSPO or other palm oil sustainability labels on products. It seems as though information about palm oil was communicated to consumers only as much as demanded by them. Furthermore, the fact that many companies refrained from printing palm oil labels on individual products, conforms to the observation that most consumers had not seen the RSPO or Green Palm labels before.

Both my interview partner from retail (R2) and my interview partner at a producing company (P3) touched upon a so-called palm oil “Röstigraben”. There seemed to be a difference in perception of palm oil between German- and French-speaking parts of Switzerland. As my interviews with Swiss German consumers showed, (ecological) sustainability seemed to be the main “issue” about palm oil. When asked about associations and benefits of palm oil, healthiness did not seem to be an important aspect. However, my interview partner from retail told me that palm oil was discussed much more in terms of its healthiness in the western part of Switzerland. She speculated that people in the French-speaking cantons are often influenced by the public discourse in France. This factor was independently confirmed by my interview partner at P3. Her company also supplied the French market. Palm oil was considered extremely unhealthy by their French customers and business partners. However, the information I gathered about the differences between the French- and the German-speaking part of Switzerland is extremely limited and remains to be elucidated further in the future.

4 Conclusions, Gaps and Implications

A considerable share of consumers seemed to be concerned about the sustainability of palm oil in food. While some efforts could be put into increasing consumers' awareness about palm oil, this raised awareness should come along with more knowledge. There are two aspects in particular which are not widely known among Swiss consumers. Firstly, the interviews indicated that Swiss consumers - even informed and concerned consumers - did not know about the comparably low land use of oil palms. Furthermore, they might not realize how low relative land use is beneficial for sustainability. Increased knowledge and understanding about the relative land use of different plant oils might decrease the share of consumers who prefer buying alternatives to palm oil. This is supported by Disdier et al. (2013), who found that 8% of consumers decided to boycott the palm-oil-free product, i.e. the product with an alternative oil after receiving land-use information. Secondly, while many consumers preferred sustainable palm oil and seemed to be willing to pay a premium for products containing certified sustainable palm oil, they did not seem to know that the two biggest retailers and many food manufacturers in Switzerland already used certified palm oil to a considerable extent. Even though there was certainly still a lot of room for improvement in Swiss companies' efforts to increase the sustainability of palm oil and to prevent deforestation, much had already been implemented. Even so, it seemed as though many of the already existing efforts and initiatives left consumers unaffected or unsatisfied. In their communication, retailers and manufacturers should therefore put more focus on closing these two knowledge gaps. Advantages and drawbacks of printing palm oil sustainability labels should be examined thoroughly and pose an opportunity for further research. In addition, land use information should be communicated to consumers. More knowledge about these two aspects would allow consumers to make more sustainable decisions related to their palm oil use.

Despite the distinct concerns of some consumers about palm oil, its use in canteens and cafeterias seemed to be a blind spot to them. The interviews showed that palm oil was used in catering in a multitude of pre-processed and packaged products, such as pastry, mixes for soups and sauces, sandwich spreads, and sweets. However, none of the caterers used palm oil directly in its refined form. Caterers did not know the amount of palm oil they buy in the form of processed foods and were unable to provide any accurate numbers due to its

widespread use. Neither did they know much about the sustainability and certification of the palm oil they bought processed in foods from their suppliers. Out of the five caterers I interviewed, three did not have palm oil on the radar. On the other hand, two caterers were already working to eliminate palm oil from their business activities. Ethical convictions within the companies, or anticipation of future customer inquiries, seemed to be the driving force behind these efforts, as there had not been any customer inquiries about palm oil at all for any of the caterers.

In contrast, customer inquiries about palm oil were typical for retailers. They transparently communicated their palm oil use to the public on the company websites. However, palm oil labels were often not printed on individual products, reportedly because the certification according to the RSPO was only a minimal standard, applying to the predominant part of the product range. By and large, manufacturers also refrained from printing palm oil labels on individual products. Together with the retailers' eschewal to print palm oil labels, this might explain the low recognition of the labels by consumers in Switzerland. Despite the lack of labels on products, sourcing certified sustainable palm oil seemed to be typical for Swiss manufacturers. However, according to the manufacturers and retailers I interviewed, specific fractions of palm oil were still hard to source in sustainable versions. In the 2013 Palm Oil Buyers' Scorecard (WWF Deutschland, 2013), both retailers I interviewed received excellent ratings. Two manufacturers received very good marks, while the third one was above average. Most likely, the situation has changed considerably since 2013. Back then, many companies promised to switch to 100% sustainable palm oil. Unfortunately, the Palm Oil Buyers' Scorecard published two years later (WWF Deutschland, 2015) focused on German companies exclusively. Therefore, the current state of affairs for the Swiss food industry with regard to physically sustainable palm oil remains cloudy. See also (Anwander et al., 2015) for a recent analysis of the relevance of palm oil in Switzerland.

Those manufacturers that did not start to evaluate the sustainability of their palm oil supply chain in the past should start to focus on this task now. The topic is important to a considerable and probably increasing share of consumers. Failing to analyze the potential to improve the sustainability of palm oil might not only result in detrimental consequences for the rainforests and the global climate, but also negatively affect a company's reputation.

What are the limitations of my study? Due to the qualitative approach of the investigation and the relatively low sample size, the generalization of the results is limited in particular for consumers and manufacturers. First of all, the group of consumers I interviewed was recruited from my personal environment. While I put great care in avoiding bias and not including close peers, I did not work with a randomized sample of consumers. With the exception of one participant (C7), all interviewees were Swiss and had no recent immigration background. This distribution is not representative for the Swiss population with its share of almost 25% people of foreign nationality (Bundesamt für Statistik, 2016). All the participants I interviewed live in the cantons of Zurich and St. Gallen, and seven of them in the city of Zurich. The Romandie and the Ticino, as well as many regions in the German-speaking parts of Switzerland, rural areas in particular, have not been included. The sample of retailers is more reliable. The selection process was more systematic because it included all the caterers operating at ETH and UZH (University of Zurich) and one canteen at a research institution. All the retailers and manufacturers I interviewed were assessed rather positively in the Palm Oil Buyers' Scorecard 2013 (WWF Deutschland, 2013), therefore I did not analyze any companies with no commitment to increase the sustainability of their palm oil and it is questionable whether such companies would have agreed to answer my questions. The two retailers I interviewed are in all likelihood the most sustainable retailers in Switzerland. When talking to companies, I was probably referred to a (if not the most) knowledgeable person inside the institution with regard to palm oil. However, I am not sure if this was the case in all the companies, particularly for the manufacturers. From one caterer and one manufacturer, I only received written statements, which reduced the profoundness and comprehensiveness of the data. Similarly, in another producing company, the interview was conducted via telephone with an interview partner who was no expert on palm oil. There is an additional aspect about my interview partners at companies to keep in mind. Most interviews were conducted with one interview partner only. While many interview partners checked back with other members of the company, the data I gathered from companies remains somewhat restricted to the knowledge and perception of individuals.

Where do we go from here? I hope that my results serve as a starting point for further qualitative and quantitative research on stakeholder perception of palm oil. There are still

many open questions about the perception of palm oil. On the one hand, increased knowledge about sustainability perception would help to ensure that consumers' needs and demands with regard to palm oil are met by companies. On the other hand, research on sustainability perception might identify further knowledge gaps that prevent consumers from taking sustainable decisions. In addition, increased knowledge about the public perception of palm oil can also help in shaping policy to make sure it is based on society's needs. A logical next step would be a systematic survey of Swiss consumers, possibly including French- and Italian-speaking parts and also rural areas of Switzerland. Special attention could be laid on the question whether consumers know about the low relative land use of palm oil compared to other oils. In addition, it might be interesting to determine a WTP for products with physically sustainable palm oil. To find out more about individual palm oil consumption levels and patterns of Swiss consumers, other research methods might be more appropriate, for example food diaries or photographing and analyzing the contents of consumers' fridges, kitchen cupboards or shopping baskets. With regard to caterers, it would be particularly interesting to follow caterers with palm oil exit strategies over time and investigate how the strategies are implemented and communicated to the public. With regard to retailers, it could be fruitful to look at other, less sustainable retailers than the ones I interviewed. The same is true for manufacturers. A bigger and more versatile sample of Swiss companies processing palm oil would be necessary to draw meaningful conclusions and to allow some generalization. Special focus could be laid on investigating the two Swiss palm oil importers Florin and Nutrisuisse and assessing the availability of sustainable versions of specific palm oil fractions. In addition, it might be helpful to analyze the companies' use or disuse of palm oil labels more in depth. However, it is likely that some companies do not want to talk about their palm oil use, as several retailers and manufacturers refused to provide information for the compilation of the palm oil buyers' scorecard (WWF Deutschland, 2013). The interviews confirmed that palm oil is a touchy topic for many consumers and several NGOs have focused their efforts on individual companies (Greenpeace, 2011). Several of the companies I contacted declined my interview requests in the first place, and some of the companies I interviewed requested to remain anonymous.

With the goal of creating a sustainable future, further efforts should be undertaken to improve the sustainability of palm oil. This includes stopping tropical deforestation, improving the management of oil palm plantations both by big companies and smallholders and sharing of best practice among them. Legislation should be improved and supply chains need to be adapted to make physically sustainable palm oil the norm - not only in Switzerland, but on the international markets. Understanding the perception of stakeholders along the supply chain helps with this goal. For a sustainable and long-term solution regarding palm oil production, society - research, policy, industry and consumers - should focus on holistic solutions that take into account all the sustainability aspects of palm oil and its alternatives: the diversity of species and habitats, the global climate, land use, the rights and future of local communities and more. It is crucial not to over-simplify the complex topic of palm oil. Palm oil has become a universal commodity with both beneficial and promising properties but also significant impacts on sustainability. Glorifying or demonizing its use will not benefit the rainforests, global climate or society in the long run.

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Appendix

Appendix A: Interview Guideline for Consumers

Welcome to the interview and thank you for your participation. I study environmental natural science at ETH Zurich. In my master thesis, I am investigating the perception of the sustainability of palm oil. I am interested in individual views and opinions and I want to be able to understand them as good as possible. Therefore, there are no right or wrong answers. In order to analyze your opinions and thoughts after the interview, I would like to record our conversation with your permission. The recordings are confidential and for research purposes only. Are you ok with this?

The interview should not last more than half an hour. Just tell me what comes to your mind and please also tell me if you cannot think of anything, or if you first want to think about something for an instant. If you do not understand a question or a concept, you can ask at any time.

***

What comes to your mind when you hear the term palm oil?

Do you have a personal opinion on palm oil? What is your opinion?

Examples of products that contain palm oil are margarine, puff pastry, Nutella and many more. How often do you consume palm oil in the foods you eat? Which foodstuffs containing palm oil do you consume?

Now I want to give you some information on palm oil. Oil palms are grown in the tropics, mainly in Malaysia and Indonesia and are used to produce palm oil and palm kernel oil. Oil palm cultivation is an important source of income in the origin countries. Compared to other plant oils, the smaller land use is beneficial: The yield per cultivated area is up to eight times bigger than for other oil crops. This implies that less land is used for a certain amount of oil. However, oil palm cultivation often occurs at great social and environmental cost, such as land conflicts or deforestation.

Do you think that products with palm oil have benefits that products without palm oil do not have? If yes, which benefits? Advantages could relate to product properties, price, human health impacts or other aspects.

How beneficial do you think is the low land use of palm oil compared to other plant oils?

Do you think that products with palm oil have drawbacks that products without palm oil do not have? If yes, which ones?

Do you know anything about oil palm cultivation? Where is oil palm cultivated? How is it cultivated?

A resource is used sustainably if the natural system maintains its ability to provide its function in the future.

Are you aware of any aspects that are not sustainable about the use of palm oil? If yes, what kind of aspects?

Biodiversity refers to the diversity of species and ecosystems. The extinction of a species or the disappearance of a habitat are negative influences on biodiversity.

Do you think the use of palm oil is linked to a danger to biodiversity? What are possible dangers and how serious are they?

Oil palm cultivation can be linked to climate change because in certain cases rainforest land is cleared for plantations. This releases CO2 into the atmosphere.

Do you think the use of palm oil is linked to a danger to the global climate? What are possible dangers and how serious are they?

Does the use of palm oil affect sustainability in other ways? If yes, how? How serious are these impacts?

Do you know any possibilities to improve the sustainability of palm oil?

Do you know labels for sustainable palm oil? Which ones?

Have you seen these labels before?

Do you trust in labels for sustainable palm oil?

What should a label for sustainable palm oil imply in your opinion?

In general, how important is sustainability, or ecology to guide your purchase and consumption decisions?

What is your personal shopping behavior towards palm oil? Do you usually aim to buy products with sustainable palm oil or alternatives without palm oil? Do you pay attention to labels?

Are you willing to pay more for products that include sustainable palm oil or products that do not contain palm oil? How much in %?

How accessible are products without palm oil or products with sustainable palm oil for you? Have you noticed such products in stores?

Do you remember a newspaper or television report about palm oil from the past? If yes, please describe them. Did you watch the report about palm oil in "Kassensturz" on the 19th of January 2016?

Do you remember any campaigns against palm oil from the past? If yes, please describe them.

https://youtu.be/VaJjPRwExO8

Do you remember this video? Do you remember the campaign against Nestlé to use sustainable Palm Oil?

Did/Does this campaign influence your perception of palm oil?

Did you change your shopping behavior after you saw this campaign? Or will you change your shopping behavior?

Do you think that campaigns like this are beneficial for sustainability? How and why?

Do you have a personal opinion on palm oil? What is your opinion?

***

Is there something you'd like to say about this topic that has not come up so far?

Were there any questions that were too difficult, ambiguous or awkward to answer?

***

How many people live in your household? Who is responsible for food shopping?

How old are you?

What is your level of education?

Appendix B: Interview Guideline for Catering Companies

In what foodstuffs or types of foodstuffs that you sell, do you think, is palm oil included?

How much palm oil does your company use or sell in total per year?

Do products that contain palm oil have benefits over products without palm oil – for example relating to product properties, price or human health impacts? If yes, which ones?

What do you know about the origin of the palm oil included in the foodstuffs you sell?

Does your company have any general sustainability claims towards the public?

Does your company have any sustainability claims specific to palm oil?

Are you already using certified sustainable palm oil? To what extent do you use sustainable palm oil? Why?

Would you be willing to use certified sustainable palm oil?

How easy is it to procure sustainable palm oil?

What is more important for your company: the benefits of products with unsustainable palm oil (e.g. lower price) or the sustainability benefits related to products with sustainable palm oil? How do you align these?

Is your company prepared to pay more for products with sustainable palm oil? If so, how much (%)?

Are business partners which commission a restaurant making demands on the sustainability of palm oil?

Do you have customer inquiries about sustainable palm oil or palm oil in general?

Do you do market polls on palm oil acceptance with your customers?

What is the demand for sustainable palm oil from your customers?

Do you remember any campaigns against palm oil from the past? If yes, please describe them.

Do you think that this particular campaign or similar campaigns influenced your customers' perception of palm oil? How?

Did your company change its behavior after this campaign or after other campaigns?

Do you think campaigns like this are beneficial for sustainability? How and why?

Appendix C: Interview Guideline for Retailers and Manufacturers

In what foodstuffs or type of foodstuffs that you sell, is palm oil included?

How much palm oil does your company use or sell in total?

Do products with palm oil have benefits over products without palm oil – for example related to product properties, price, human health impact? If yes, what kind of benefits?

How much do you know about the palm oil supply chain? What do you know about the origin of the palm oil sold in your stores/products?

How easy is it to procure sustainable palm oil or products with sustainable palm oil?

Do you make any sustainability claims to the public specific to the palm oil you sell?

To what extent do you use sustainable palm oil? Why?

Would you be willing to use sustainable palm oil?

What is more important for your company: the benefits of products with unsustainable palm oil (e.g. lower price) or the sustainability benefits related to products with sustainable palm oil? How do you align these?

Is your company prepared to pay more for products with sustainable palm oil? If so, how much (%)?

Do you have customer inquiries about sustainable palm oil or palm oil in general?

Do you do market polls on palm oil acceptance with your customers?

What is the demand for sustainable palm oil from your customers?

Do you remember any campaigns against palm oil from the past? If yes, please describe them.

Do you think that this particular campaign or similar campaigns influenced your customers' perception of palm oil? How?

Did your company change its behavior after this campaign or after other campaigns?

Do you think campaigns like this are beneficial for sustainability? How and why?

Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

Eigenständigkeitserklärung

Die unterzeichnete Eigenständigkeitserklärung ist Bestandteil jeder während des Studiums verfassten Semester-, Bachelor- und Master-Arbeit oder anderen Abschlussarbeit (auch der jeweils elektronischen Version).

Die Dozentinnen und Dozenten können auch für andere bei ihnen verfasste schriftliche Arbeiten eine Eigenständigkeitserklärung verlangen.

Ich bestätige, die vorliegende Arbeit selbständig und in eigenen Worten verfasst zu haben. Davon ausgenommen sind sprachliche und inhaltliche Korrekturvorschläge durch die Betreuer und Betreuerinnen der Arbeit.

Titel der Arbeit (in Druckschrift):

How do different stakeholders perceive palm oil in food and its impact on the environment?

Verfasst von (in Druckschrift):
Bei Gruppenarbeiten sind die Namen aller Verfasserinnen und Verfasser erforderlich.

Name(n):	**Vorname(n):**
Zoller	Nora Blue

Ich bestätige mit meiner Unterschrift:
- Ich habe keine im Merkblatt „Zitier-Knigge" beschriebene Form des Plagiats begangen.
- Ich habe alle Methoden, Daten und Arbeitsabläufe wahrheitsgetreu dokumentiert.
- Ich habe keine Daten manipuliert.
- Ich habe alle Personen erwähnt, welche die Arbeit wesentlich unterstützt haben.

Ich nehme zur Kenntnis, dass die Arbeit mit elektronischen Hilfsmitteln auf Plagiate überprüft werden kann.

Ort, Datum	**Unterschrift(en)**
Zürich, 25.05.2016	N. Zoller

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