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Master's Thesis

Rethinking a water development project as a social business:

Nestlé's Creating Shared Value [CSV] activities in Côte d'Ivoire

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Abstract

The thesis builds on a consultancy report examining a water development project in Côte d'Ivoire, inter alia written by the author and his supervisor. While generally attesting a good implementation and water quality at point of collection, the study hinted at problems with recontamination at point of use, and a lack of ownership and aspiration leading to insufficient maintenance and potential system failure. To overcome the systemic weaknesses and make the project sustainable, the thesis proposes a realignment as social business. At its core, a network of water kiosks will sell treated water at a fair price. The pumps are motorized through solar panels, allowing to (partly) electrify the villages and making the entire system more aspirational. The water kiosks pay parts of their revenues to a newly introduced coordinating body, which in turn employs rotating pump mechanics and covers for maintenance and repair. To ensure support for the new venture and safe water in general, the coordinating body furthermore ensures that partner organizations continue social mobilization efforts and develops social marketing strategies for the water kiosks. As a last piece, we propose that Nestlé itself becomes active and takes over the role of an industry facilitator, using its position and capabilities to reshape the legal and institutional framework and paving the way for entrepreneurial activities in the region. The thesis examines the *Creating Shared Value* [CSV] approach (the reason Nestlé invested in the project in the first place) and argues that, in combination with developments and dynamics in the cocoa-chocolate value chain, it would be a sensible strategy for Nestlé to invest in a pilot validating the business model. At last, the most important budget lines, alternative (co-)funding options, and external risks for such a venture are discussed.

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As this thesis covers a wide area of subjects, additional information, context and learnings will be delivered throughout the paper in form of digression boxes. The thesis can be understood without reading the boxes, they will however be helpful by delivering background knowledge and case studies.

Abbreviations

ADM	Archer Daniels Midland Company
ARDS	Acute Respiratory Distress Symptom
CLCCG	Child Labour Cocoa Coordination Group
CLMRS	Child Labour Monitoring and Remediation System
CRCI	Croix Rouge de Côte d'Ivoire
CSR	Corporate Social Responsibility
CSV	Creating Shared Value
FLA	Fair Labor Association
FLO	Fairtrade Labelling Organizations International
FOB	Free on Board
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HWTS	Household Water Treatment and safe Storage
ICCO	International Cocoa Organization
IFRC	International Federation of Red Cross and Red Crescent Societies
ILO	International Labour Organization
IMF	International Monetary Fund
INR	Indian Rupees
M&A	Mergers & Acquisitions
NCDP	National Cocoa Development Plans
NTU	Nephelometric Turbidity Unit
ODF	Free of open air defecation
PBC	Public Buying Company
PHAST	Participatory Hygiene and Sanitation Transformation
POU	Point of Use
RCT	Randomized Control Trial
RDF	Rural Development Framework
RISE	Response-Inducing Sustainability Evaluation
SAI	Sustainable Agriculture Initiative
SAIN	Sustainable Agriculture Initiative at Nestlé
THCs	Terminal Handlings Costs
VIB	Vlaams Instituut voor Biotechnologie
WASH	Water, Sanitation and Hygiene
WCF	World Cocoa Foundation

1. Introduction

In October 2016, I accompanied my supervisor Dr. Andreas G. Koestler to Côte d'Ivoire on behalf of the International Federation of Red Cross and Red Crescent Societies [IFRC]. Starting in 2007 and in partnership with Nestlé SA., the international organization and its national Chapter, the Croix Rouge de Côte d'Ivoire [CRCI], inter alia built and rehabilitated a total of 171 water pumps and 7'075 latrines, and taught 143'227 people about hygiene and sanitation (Nestlé S.A., n.d.). In 2014, internal IFRC testing indicated the presence of E-Coli bacteria in some samples – suggesting that up to 58% of water points and 81% of water consumed at household level could be contaminated (Sagna 2015) – and generated criticism against the project implementation. Considering this criticism and as a standard procedure to terminate a development project of this size, the IFRC contracted Dr. Andreas G. Koestler and his company *Fontes AS* in late 2016 to conduct an independent evaluation, with the primary goal of providing and identifying guidance on how to improve water quality and surveillance. After agreeing to assist him in his research and in preparation for this master's thesis (at this time broadly outlined along the lines of social entrepreneurship and the role of the private sector in international development), we traveled to Côte d'Ivoire from October 19th to December 2nd 2016.

While partially refuting the inadequacy of water quality, our study hinted at systemic weaknesses leading to insufficient maintenance and potentially system failure. The sustainability of water infrastructure projects is a common issue throughout the developing world. While billions of investment dollars brought new services to nearly 720 million people in the last 20 years and global coverage levels are increasing – in 2010, 84% of people in developing regions were getting drinking water from an improved source – up to 900 million people still lack access to safe drinking water and 2.5 billion people suffer from missing access to basic sanitation. Furthermore, there are large disparities between urban and rural population, and between people with different socioeconomic status, with the poorest segment of rural societies most deprived of access to water and sanitation (Verhoeven, Uytewaal, & de la Harpe, 2011, p. 8; 23; 24). In recent years, it became clear that this shortage can, to a great extent, be explained with unsustainable models and insufficient maintenance, leading to system failure and cases of so-called slippage (where near-complete coverage is achieved but not sustained). Studies reveal that at any time, 30-40% of water systems in rural Sub-Saharan Africa are non-functional, resulting in billions of dollars of wasted financial investments over the years, and subsequent regression in health and quality of life (Heide, 2013; IRC International Water and Sanitation Centre, 2012, p. 5; Lien, 2017; Verhoeven et al., 2011, p. 25).

In light of this issue, the thesis at hand examines how the visited project could be adapted to overcome the observed systemic weaknesses and make it truly sustainable. A specific new set-up is proposed, aimed at making use of the existing resources and being in line with the Creating Shared Value [CSV] concept, the approach which led Nestlé to invest in this project in the first place.

In Chapter 2, the visited project is presented in detail and the findings of our study summarized. While briefly touching upon water quality, a special focus is put on systemic dynamics and issues which endanger the sustainability of the project. Chapter 3 presents our solution to the research question stated above and sketch a business model that builds on the existing infrastructure. Chapter 4 examines the reasons why Nestlé invested in this project in the first place, and why it could be wise doing so in the future. Therefore, we first analyze the Creating Shared Value [CSV] approach, a business concept built around the premise that the competitiveness of a company and the health of the surrounding communities are mutually dependent (Chapter 4.1). Nestlé was the first company to introduce this approach and the project visited is part of the Cocoa Plan (one of the company's main CSV initiatives). Thus, we break down their

interpretation of CSV, how the methodology translated into specific initiatives, and the impact and public perception of these projects (Chapter 4.2). In a next step, we expand our understanding by examining the cocoa to chocolate value chain. After looking at the value chain in an abstracted form, we shortly delve into the historic development, before studying today's landscape and the dynamics within and between the different links constituting the value chain (Chapter 4.3). Finally, we bring the two pieces – CSV as a concept and how the cocoa-chocolate chain evolved into its current state – together, cast a glimpse into the future and argue why it could make sense for Nestlé to (at least partially) finance the implementation of the model proposed in this paper (Chapter 4.4). In Chapter 5, we briefly discuss how the proposed project could be implemented. We examine the most important budget lines for this pilot and discuss the importance of setting both, the price customers pay for water and the contributions water kiosks pay to the coordinating body, at a sensible level (Chapter 5.1). In a next step, we touch upon conventional ways and partners to accumulate the initial investment, and examine the potential of applying for commercial funding options and the possibility of financing the project through contributions from within the community (Chapter 5.2). Ensuing, we discuss three important external risk areas for this pilot (Chapter 5.3). Chapter 6 removes the focus from the specific project in Côte d'Ivoire and discuss three controversial issues the author of this thesis was confronted with repeatedly in preparation and throughout the journey. We debate the concept and actors involved, and introduce personal options and insights, after exposure to the theoretical background and the reality in the field. Finally, in Chapter 7, the main points from this thesis are summarized and questions are raised for further research.

Due to the special setup of this paper – a brief, but intense exposure to an unfamiliar cultural environment and a new area of expertise – and in accordance with the supervising professor, this thesis attempts to connect personal learnings, subjective experiences and opinions, and theoretical concepts. Nevertheless, the findings on the visited project and many of the proposed ideas resulted from a cooperative effort and arose after countless discussions with Dr. Andreas G. Koestler, Dr. Urs Heierli and many more people involved in this project (be it in preparation for the travels, in Côte d'Ivoire or during an intense debriefing phase). Consequently, it is impossible to strictly accredit and cite every source of inspiration. However, all specific findings from Chapter 2, and some of the fundamental ideas in the remaining Chapters are derived from the interaction with my academic supervisors and documented in the consultancy report by Koestler, Gertsch, & Heierli (2016)

2. Water project in Côte d'Ivoire

Our visit to Côte d'Ivoire fell into the project's fourth and final phase (ending by December 2016) and the project activity already started to shift from implementation towards a phase of evaluation and securing of accomplishment. Most physical installations and implementations were finalized (or in a phase of completion) and last minor improvements done within the established program and stakeholder framework. While the project staff was rapidly winding up the visited project, a similar partnership project between Nestlé, the IFRC and the national Red Cross society was about to start in Ghana by January 2017, planned to move to full scale implementation by 2019.

As written, our task was to investigate the (conflicting) results from tests examining water quality in the project area, to present ways to improve the water quality and surveillance at both point of collection [POC] and point of use [POU] and to glean learnings and provide suggestions for improvement for future endeavors. This Chapter briefly summarizes the findings from our evaluation as presented in Koestler et al. (2016), with a special focus on systemic resilience and sustainability. To simplify this Chapter, geographic locations will only be specified when referring to a specific case. A detailed table listing all the visits and sampling activities can be found in Annex I.

Figure 1: Children pumping water at an IFRC-Nestlé project water point

Box 1: Terminology and techniques used in this thesis

For clarification, we consequently use the following terminology:

- **Water at point of collection [POC]**: water immediately at the water pump (improved water sources) before any collection into basins, buckets or jerry cans
- **Water at point of use [POU]**: water where it is consumed (mostly households, schools, medical centers, etc.)
- **H_2S test vs quantitative testing**: For this study, all sampling was conducted with H_2S tests manufactured by HLEK systems, the testing kits normally used by the national Red Cross society. A sample of a source is collected in a small glass bottle containing a treated paper strip. After being shaken and stored at room temperature for 24, respective 48 hours, the hydrogen sulfide produced during growth of bacteria reacts with iron on the paper strip, forming an insoluble, black precipitate of iron sulfide if the water was contaminated. Consequently, water testing negative means safe water (no contamination), color change means positive response indicating contamination. Generally spoken, H_2S testing offers multiple advantages over other possible water quality tests, including low costs (generally estimated at 20% of the cost of a quantitative coliform analysis), simplicity and ease of application (Anwar, Chaudhry, & Tayyab, 1999). While being more resource intensive and requiring a certain degree of specialized knowledge, quantitative testing offers the advantage to not only indicate whether a sample is contaminated, but also shows the degree of contamination (measured in E Coli per 100ml). For more information on the testing done for this study, see Annex I.

2.1. Good quality at POC, mediocre water quality at POU

When examining the internal 2014 IFRC study setting the hare running, it became clear that the report included water samples from all kinds of collection points, and not only from improved sources (such as drilled wells with a pump on top, the standard agreed on for this partnership). After excluding hand-dug wells and surface water, the data gave a somehow better picture, however still indicated that 24% of improved POCs were polluted and that 64.9% of drinking water drawn from a non-polluted improved water source tested positive at household level. The contamination of water at POC however was in contrast with internal water quality testing of the Croix Rouge de Côte d'Ivoire [CRCI], starting in June 2016 and showing that nearly all sampled POCs indicated safe water. Even though several POCs have been rehabilitated since 2014 and even though sampling methodology has improved (several members of the CRCI staff reported that in 2014, water was often sampled with a drinking beaker, exposing it to contamination), the discrepancy between the POC water quality of the 2014 report and the internal CRCI monitoring are not easy to explain. While the faulty procedure is a viable way for contamination, the impact this had on water samples is impossible to assess using only the reported data. To verify the good water quality at POC in the 2016 internal testing, we sampled 14 POCs in 8 villages throughout our field trips. All but one tested negative, and this POC tested also negative during our second visit. Because **both the internal monitoring system and our independent sampling revealed that water quality appears to be good at water points constructed/rehabilitated under the Red Cross/Nestlé partnership**, further steps of our study focused on the potential contamination of water from the points of collection to the points of use and on the sustainability of the system in general.

When sampling water quality at POU in 4 villages, 23 out of 59 households (39%) or 17 out of 39 (44%, if we only include samples taken during our first visit to each of the villages) tested positive. While the results are clearly better than the 75.5% reported in the 2014 report, they are far from the ideal of having (close to) zero contamination at POU. With water quality being good at POC and a non-negligible degree of contamination at POU, we considered possible contamination vectors during collection, transport and storage.

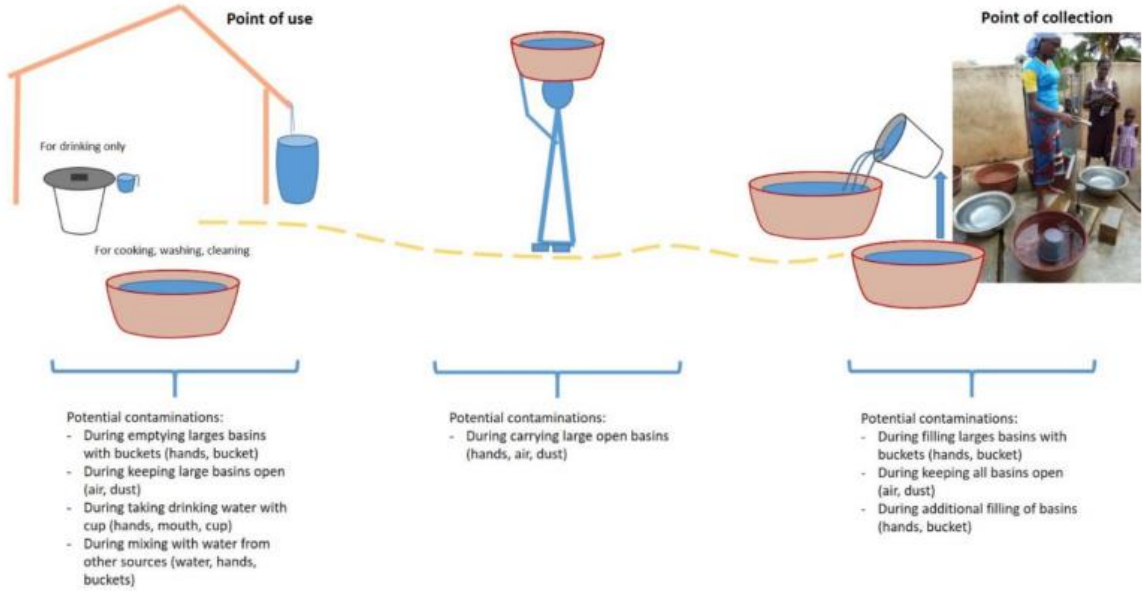

Figure 2: Potential contamination vectors of water taken at a safe point of collection during its transport and storage
Source: (Koestler et al., 2016, p. 13)

At POC, water is often continuously pumped into a large basin. From there, people use a small bucket to pour water into their own containers. The small bucket is then deposited on the floor or in the water of the intermediary basin, where it awaits the next user. This procedure exposes the freshly pumped water to different forms of contamination (for example from dirt on the floor, or from hands or from the small bucket entering the water) and contamination can easily spread to all basins. After collecting water at POC, the water is carried home and stored until consumption.

In some villages, households collect water from a variety of sources (several households in Zérédoukou and Gagoré for example reported that they collect most of their supplies from an improved POC, but that they sometimes substitute or mix their stock with water from alternative sources such as hand-dug wells (with or without a pump), rainwater or surface water), exposing them to contamination and making the assessment even more difficult. When asked, they knew about the importance of safe water, but stated that their choice was influenced by taste preferences (water tasting 'sweeter' when obtained from surface sources), social factors (a women in charge of a household did not want other villagers to see the heavy burdens her mother-in-law had to carry home from the POC), or simply convenience (several households reported that foot pumps in need of maintenance required too much effort to operate or preferred alternative water sources because of their proximity).

When studying literature on contamination of water during transportation and storage in West Africa, we found that the most cited factors are the site of storage, type and cleanliness of the storage container, handling practices, duration of storage, sanitary habits and infrastructure (Chia, Oniye, & Swanta, 2013, p. 502; Opryzsko et al., 2013, p. 658). These factors vary broadly in terms of measurability (it is easier to measure where a container is stored than to quantify a household's sanitary habits), descriptive power (in the project villages we visited, most households had a similar sanitary infrastructure, with e.g. all households owning a private latrine on the outskirts of the village) and on the effort needed to potentially improve on these factors (convincing a household to change the location of a storing container should be less complicated than to help them to sustainably overthink their sanitary practices). Based on these considerations and on the impressions from our first field visit, we decided to specially focus on following four proxies during our consequent visits and sampling: 1) Whether the storage container was covered during transportation, 2) whether the drinking water storage container in the household is properly covered (using an impermeable lid that completely seals of the container without visible gaps, thereby e.g. excluding corrugated sheets or woven lids), 3) whether the storage container is situated indoor or outdoor (outside the house, in a room without a door, or in a room with walls that do not go all the way up to the roof), and 4) how many days ago the drinking water was collected. When testing how these factors vary over time and how the variation correlates with contamination, **all factors tested showed a correlation with water quality at POU** (meaning that the presence of an indicator lead to an increased probability of water at POU being contaminated). The tests conducted do by no mean claim to be statistically significant or to have proven a direct causation between any of the proxies and water quality at household level. The positive correlation, however, is in line with the existing literature and hints at the existence of factors influencing water quality that could be changed relatively simple with a well thought-through and comprehensive mobilization campaign aiming at behavior change.

To test people's receptivity to such mobilization campaigns, we conducted a quick and simple experiment: After conducting a qualitative analysis during our second household sampling in Gagoré, we once again deployed an experienced community mobilization agent to the ten sample households. Together with a local Red Cross volunteer and focal person for this village, our mobilization agent discussed the importance

of safe water storage at household level with the inhabitants. His task was to subtly convince the households to avoid the four potential vectors of contamination outlined in the previous section.

Storing place

	HH 1	HH 2	HH 3	HH 4	HH 5	HH 6	HH 7	HH 8	HH 9	HH 10	% Indoor
26.10.2016	Indoor	Indoor	Indoor	Outdoor	Indoor	Indoor	Outdoor	Indoor	Indoor	Indoor	80%
11.11.2016	Indoor	Indoor	Indoor	Outdoor	Indoor	Indoor	Outdoor	Indoor	Indoor	Indoor	80%
13.11.2016	Indoor	Indoor	Indoor	Indoor	Indoor	Indoor	Indoor	Indoor	Indoor	Indoor	100%

Container covered during transport

	HH 1	HH 2	HH 3	HH 4	HH 5	HH 6	HH 7	HH 8	HH 9	HH 10	% Covered during transport
26.10.2016	No	Yes	No	No	No	No	No	No	Yes	Yes	30%
11.11.2016	No	Yes	No	No	No	No	No	No	Yes	Yes	30%
13.11.2016	No	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	70%

Container covered

	HH 1	HH 2	HH 3	HH 4	HH 5	HH 6	HH 7	HH 8	HH 9	HH 10	% Covered
26.10.2016	No	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes	60%
11.11.2016	No	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	60%
13.11.2016	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	90%

Collected (days ago)

	HH 1	HH 2	HH 3	HH 4	HH 5	HH 6	HH 7	HH 8	HH 9	HH 10	% Collected the same day
26.10.2016	Same day	Same day	3-4	1-2	2	2	Same day	2	Same day	2-3	40%
11.11.2016	Same day	Same day	Same day	Same day	Same day	Same day	Same day	Same day	Same day	2	90%
13.11.2016	Same day	Same day	Same day	Same day	Same day	1	Same day	Same day	Same day	Same day	90%

H2S Test - Water quality

	HH 1	HH 2	HH 3	HH 4	HH 5	HH 6	HH 7	HH 8	HH 9	HH 10	% Negative
26.10.2016	1	1	1	3	3	1	3	3	3	1	50%
11.11.2016	1	1	1	1	2	3	1	1	1	1	80%
13.11.2016	3	1	3	1	1	3	3	1	1	1	60%

Figure 3: Results of our mobilization campaign on November 11, 2016 Source: (Koestler et al., 2016, p. 16)

In the first four tables, we see how the 10 sample households collected, transported and stored their drinking water. In the fifth table, we see the water quality of each household's water storage measured with the H2S tests. In the last column of every table, we calculated a percentage of households that handled their drinking water in an ideal way (for table 1-4) or where water quality was good (table 5). If we exclude the two households whose members were not at home during our mobilization effort and did only partly/not at all receive our call-to-action (household 1 and household 6), we are able to observe a clear improvement of 3 out of 4 indicators after our mobilization effort, and the fourth indicator could be kept at its high level. After our mobilization effort, all households behaved as desired in three indicators (covered during transportation, covered storage, stored indoor) and 7 out of 8 households collected their water the same day. The results indicate that **households in the Red Cross/Nestlé project area are receptive to well thought-through mobilization campaigns and that a campaign focusing on these factors could be a relatively simple and cost-effective way of improving the water quality at household level.** However, it became clear that water quality at household level seems to be highly variable over time. Consequently, the observation of one single sampling of water quality at household level should be taken with caution. It should furthermore be noted, that changing the four factors above will not guarantee a complete eradication of contamination at household level and that zero contamination is nearly impossible. To get close to this aspiring goal and to maintain this achievement, one would need to implement a HWTS program reaching regularly all households and with a strong supply chain, and chlorination would be the only way to guarantee safe water at POU. As reported in case studies from other projects and as confirmed in many personal discussions with people in the WASH sector, the introduction of such an effort would require an increased and complex project activity over a long time and could not be done with a one-time effort.

2.2. Good initiative, but not a self-sustaining and sustainable system

All water points are managed by Water Committees established by the Red Cross. These committees usually consist of 5-8 members with distinct functions (e.g. President, Secretary, Treasurer etc.) and work on a voluntary basis. They are responsible for all strategic and operational aspects of running a POC, and collect a financial contribution from the people obtaining water from the water point (if there are several POCs in a village, the responsibility is usually split between different committees all managing their respective water point). The collected money is usually documented and safeguarded by the treasurer, with the goal of paying for maintenance or repair work once needed. In practice, however, out of the twelve Red Cross/Nestlé partnership water points we visited, only five pumps were in a satisfying condition, and seven pumps needed some maintenance work to be done, such as replacing gaskets and fixing the proper movement of the pedal piston. The small deficiencies make the process of pumping water much more strenuous (up to a point where children can no longer operate the POCs), and will, if not addressed in a timely manner, lead to a complete malfunction and much more costly repairs to restore the pumps. Additionally, all pumps would have needed some improvements in the concrete platform and protection walls, as well as improvement of the suck-away hole. While the Red Cross trained and equipped several pump mechanics (in regions where there are not mechanics offering their services), only one water committee reported to have called for a mechanic or their Red Cross focal person to carry out the necessary maintenance work (Zérédoukou), but were then unable to raise the 50'000 XOF (83.2 USD)[1] requested by the local pump mechanic. The six other villages with partly deficient water points were aware that maintenance work is necessary to ensure a continuous functioning of their POC, but did not act upon this realization for several months. Upon enquiring, no water committee managed to properly explain their inactivity. Several committees mentioned that they planned to call for a meeting but did not yet get around to do so, others explained that they thought the responsibility for maintenance/repair was with the government or international organizations such as the Red Cross.

Overall, while the water committees do a respectable job in running daily operations and collecting fees, they mostly fail to take action for the timely and preventive maintenance of pumps (to ensure continuous functioning and avoid costly repair of broken pumps). In all visited places, small preventive maintenance works should have been done to expend the lifespan of installed components and people were aware pump in their village had issues to be fixed, however, this awareness did not translate into action and only one village (Blaisekro) conducted maintenance work to overcome minor issues. That pump produced a strange noise when pumping water, making them aware that some maintenance work was necessary. After failing to report this issue for several months, a local mechanic passed through the village on his way to a neighboring settlement, and assessed and repaired the pump on the spot for approximately 35'000 XOF (USD 58.2).

Besides water committees failing to become active, the project suffers from another systemic problem: When talking to the *UCODEL* cooperative in Lakota, the reported that of their 60 villages, they estimate that approximately 65% (39) have a pump, and that only 50% thereof (20) are functioning. Of these 20 functioning pumps, 6 were rehabilitated/constructed in the context of the IFRC/Nestlé project. As with any development project, resources are scarce and the implementing organization had to prioritize certain

[1] To improve legibility, financial sums in this paper are denoted in United States Dollar (USD), except in Graphs taken from other sources). Exchange rates used in this paper are 1 USD = 601.297 XOF (Franc de la Communauté Financière d'Afrique; the currency of Côte d'Ivoire , Benin, Burkina Faso, Guinea-Bissau, Mali, Niger, Senegal and Togo) and 1 USD = 1.00125 CHF (Swiss Franc), taken from www.xe.com/currencyconverter on Mai 09, 2017.

villages. Spreading the project over wide areas seems beneficial for the donor, as it allows to report on higher numbers of people being impacted by the project. However, this also leads to a scattering of efforts. POCs were rehabilitated/constructed in villages far apart, with other villages in between without any improved water points. When efforts are not clustered, it is considerably more difficult to upkeep supply chains or for supporting industries to emerge, as they do not profit from economies of scale.

2.3. Positive impact on population & behavioral change

Besides focusing on the hardware aspects, the Croix Rouge de Côte d'Ivoire [CRCI] was in intensive interaction with the communities and worked on mobilizing and improving the understanding of the importance of hygiene, sanitation and water handling. For their work, the national Red Cross society made use of the so-called Participatory Hygiene and Sanitation Transformation [PHAST] approach, a methodology using a sequence of participatory steps, methods and tools to enable communities to plan, organize for, and monitor their own improvements (Van Daalen, n.d.).

Overall, it managed to achieve a significant improvement in water, sanitation and hygiene [WASH] -related behavior within the project villages, an effort which translated into an overall improved health situation. While this assessment was shared by the persons encountered in communities and local authorities (village leaders, government officials, people working on the project), it was not possible for us to conduct a scientific experiment proving the causal impact the project had (ideally through a randomized control trial [RCT]). Nevertheless, to find out how the project (both the creation and rehabilitation of WASH infrastructure and the community mobilization) impacted on the population at stake, we conducted qualitative interviews with several professionals in health centers and visited schools alongside our normal activities. In these discussion, we focused mostly on their personal perception of the project as a health professional working with the recipients and on their view on future needs.

Health Centers: Overall, we visited four health centers in the project area (in Gnamboisso, Gagoré, Zérédoukou and Tabléguikou). While the first three are situated in villages with at least one improved water source, Tabléguikou's drinking water system was developed by the Deutsche Gesellschaft für Internationale Zusammenarbeit [GIZ]. As the catchment area of the local health center includes Pétimpé (a Red Cross project village at approximately 15km distance), we estimate it to be relevant for our study. The main findings of our four visits are listed below:

- When asked about the three most common diseases in their area, all health professional reported Malaria to be accountable for around 60-80% of consultations, followed by a smaller number of cases of Diarrhea and Acute Respiratory Distress Symptom [ARDS] (Tabléguikou, Gagoré, Gnamboisso) or Typhoid Fever and Anemia (Zérédoukou). Except for ARDS, all these pathologies have direct or indirect links to Water and Sanitation, with Diarrhea being the most obvious example.
- When asked about causes for and trends in the occurrence of diarrhea, all health professionals emphasized that Diarrhea is caused by a multitude of factors and that no stand-alone factor can serve as explanation/leverage point. Nevertheless, three health professionals reported a quantifiable decrease in the number of cases of diarrhea over the last years and seems to be linked to improvements in water provision in their villages (Tabléguikou, Gagoré and Gnamboisso). The health professional in Zérédouko was in office for only 8 months and had no database available allowing for sound conclusions.
- Three health professionals reported Diarrhea to be highly seasonal and explained this phenomenon with issues related to water management (consumption of unwashed fruits/fruits

washed with contaminated water in Gagoré and Zérédoukou, water shortages and unsafe storing practices at household level in Tabléguikou). One health professional wasn't aware of seasonal diarrhea patterns in his community (Gnamboisso).

- No health center had direct access to drinking water on their premises. While the health clinic in Tabléguikou features a dug-well for non-drinking purposes (which tested positive for contamination), all health centers have to rely on an improved public water point for drinking water in their vicinity (at less than 80 m distance for all health centers). No health clinic stored drinking water, all fetched it fresh whenever needed. While all health professionals were content about water quality (all sources tested negative), one health professional complained about the closing of water sources during certain times of the day and night, forcing him to first go to a person in possession of a key in case of an emergency (Gnamboisso).

Schools: To better understand the water situation at point of use for school children, we accompanied a Red Cross representative visiting latrine construction sites at three schools on October 28. Additionally, we visited three schools during our regular visits to project villages. Out of these six schools, only Djékro has a POC directly on the school's premises. In five of the villages, the closest-by water point (borehole with a pump) is at approximately 50 (Kazérébery), 120 (Gazolilié), 200 (Abatoulilié and Gagoré) and more than 2000 meters distance (Zibouyaokro). Abatoulilié does have a hand dug well on its premises, but the once installed hand pump got looted during the 2011 Civil War. The responsible teacher reported that water is now obtained from an unprotected hand-dug well in the village, located at approximately 300 meters distance. While both boreholes rehabilitated under the Red Cross/Nestlé partnership (Djékro, Gagoré) and the borehole with pump in Kazérébery tested negative, the water points in Gazolilié, Abatoulilié and Zibouyaokro were not tested. From discussions with the responsible persons and the local Red Cross staff, we learned that children at schools in the mornings have to fetch fresh water for the consumption of their teachers. For their consumption, they usually return to their home and drink from the water storage (or in some cases bring bottles filled with water from their household storage). Except for Djékro, where kids drink freshly fetched water from the borehole on the school's premises, kids are consequentially affected by potential contamination during transport and storage.

Overall, both Schools and Health Clinics normally do not have access to drinking water on their premises and rely on water points in their proximity/water brought from home. While the water quality at POCs was good for all sampled schools and health clinics, water quality at POUs depends on collection practices and transport. And as many kids bring water from their home (or drink at home before going to school), water quality for kids highly relies on storage practices at household level. When asked about the overall impact of the project, several health professionals reported a significant decrease in the occurrence of diarrhea and linked it directly to the Red Cross/Nestlé project.

As discussed above, the community mobilization is firmly established and the project managed to achieve a significant improvement in WASH-related behavior within the project villages, an effort which translated into an overall improved health situation. However, as with any community mobilization, these efforts do only become sustainable if follow-up sessions take place over an extended period. Additionally, cultural and behavioral attitudes regarding ways of handling water at the POC still focus on collecting and handling a large quantity of water within shortest time. This is somehow related to the pressure on the limited number of water points of collection (reinforced by a rapidly growing population), where pressure to pump sufficient quantities of water in brief time slots led to suboptimal procedures concerning potential contamination. Furthermore, there are still behaviors that could be improved to help improving water quality at POU.

2.4. Restrictions

First, it should be said that the sampling size and testing methodologies for this consultancy did not follow strong scientific standards, and that the results are not statistically significant. Nevertheless, although our sampling in and observations from 8 villages with 14 water points and 39 households (10 of which were sampled 3 times) are limited in number, this sample represents roughly 10% of the total IFRC/Nestlé program. While our findings do not prove causality, the indicated findings and correlations outlined between cause and effect were in line both with the scientific consensus within the field of development economics/work, and with the assessment of the situation by Dr. Andreas Koestler and Dr. Urs Heierli, two experts with long-standing experience in the field of WASH-related development work and Social Business.

3. Making the project sustainable

As seen in Chapter 2, the visited waterpoints constructed/rehabilitated under the IFRC-Nestlé partnership project deliver good water quality at POC, water quality at POU however needs to be improved. Additionally, the project appears to have sustainability issues. Even though there are water committees established to operate and maintain the points in questions, the system fails to bestow a sense of ownership upon its members. Considering these discoveries, the following Chapter presents a potential realignment of the project, with the **aim of establishing safe water delivery through a network of water kiosks equipped with aspirational technologies, a reward and maintenance structure incentivizing ownership and sustainability, social mobilization and marketing to create awareness and demand for our system, and a clear role for Nestlé.** The reform proposal is furthermore based around a paradigm shift happening in development work, urging to refocus efforts from infrastructure output to service outcome. Applied to the project in question, the focus should be shifted away from hardware installation to service delivery. People do not desire pumps, but having convenient access to safe (and tasty) water at reasonable prices. Additionally, as we aim to kindle a holistic development of the region, we will integrate and benefit local entrepreneurs whenever possible. Many development organizations bring centrally sourced hardware into a project country, and thereby exclude and weaken the local economy. It may be tempting to import needed materials from abroad or urban centers, both for financial reasons and because the supply chain might be better developed. However, this will both hinder local development, and might in the long-run be harmful for our project, as no supporting industries will emerge. Consequently, we will source everything we can on local markets – both goods and staff – and outsource services to local entrepreneurs, helping them grow their business and provide job openings in the region.

3.1. Components of the system

3.1.1. Water kiosks

While all visited water committees were aware that maintenance was needed to sustain their operations, they needed external stimuli to become active. A plausible explanation for this inactivity seems to be a lack of ownership. The community members constituting the water committees do not perceive it as their responsibility to maintain the pumps. Based on the principle that no-one should benefit from providing water to the poor, personal financial interests of committee members are not linked to the functioning of the water point under their responsibility. The water committees work on a voluntary basis and invest a significant amount of their time into safekeeping and cleaning of the infrastructure. Even though they made a highly-motivated impression and without implying bad intentions, they would undoubtedly be more inclined to keep the system running when doing so would be financially remunerated. A financial incentive on a commission basis could even lead to a completely different dynamism, as seen in Tabléguikou, where the water committee expanded the system without external stimulus.

Box 2: Tabléguikou - Case study of a community with water as a service

When visiting the Health Clinic in Tabléguikou (a neighbor village of Pétimpé, a Red Cross-Nestlé project village), we had the opportunity to examine their water system and to discuss characteristics with members of the local water committee.

The system was planned by the *Deutsche Gesellschaft für Internationale Zusammenarbeit* [GIZ] and constructed by a Chinese building company. It consists of a motorized pump connected to an elevated water reservoir, and six tap stands throughout the village. The pump was built approximately eight years before our visit, was repaired twice and had to be replaced some years ago. Even though the repair fund was not entirely sufficient to cover the costs of approximately 1'000'000 XOF (USD 1663.1), the water committees managed to collect the remaining amount at relative ease.

As a substantial difference to the Red Cross-Nestlé waterpoints, the water committees responsible for the daily operation and maintenance of the pumps work on a profit basis. At every pump, there is a responsible person (mostly young men) collecting a fee of 5 XOF for 10 liters and 10 CFA for 20 liters (USD 0.008 and 0.017), amounting to around 60'000-70'000 XOF (USD 99.8-116.4) per month for a neighborhood with approximately 500 inhabitants. The collector can keep 40% of the money and hands the rest over to the treasurer at the end of every week. Of these 60%, 10% is distributed among the water committee, 10% is given to the village chief as tax contribution, and 40% comes into a fund for maintenance and repair.

Besides managing daily operation and maintenance, the water committees planned and carried out building tap water connections for several (relatively wealthy) individuals. These households financed the connection themselves, and now pay a monthly contribution of 500 XOF (USD 0.83) and 350 XOF (USD 0.58) per m^3 drinking water. Being exposed to neighbors having a convenient and safe drinking water access in their house, more and more households requested a piped connection. The water committee drew up a plan to connect 50% of all houses in their district in one go and organized a plumber from the Water Ministry for the conceptualization. However, shortly before they could start the construction work, a regional Cholera epidemic broke out. The Ivorian government swiftly reacted and declared water to be free in the region (and paid the local water committees directly). After normality returned, the water committee struggled to reestablish the community's willingness to pay (as the people were now used to water being free) and postponed the planned network expansion indefinitely.

To increase ownership of the water committees and to create the dynamic system experienced in Tabléguikou, we will transform the POCs into so-called **water kiosks.** Local teams will pump water and sell it to the community in Jerry cans. The first cans will have to be bought at cost by customers (to ensure a sense of ownership for the used inventory), but can be exchanged for a full one at subsequent visits to the water kiosk. Buying prefilled Jerry Cans will eliminate potential contamination vectors at water points, and the narrow openings and lids will help reducing contamination during transport and storage. As seen in Chapter 2.1, contamination of water at POU can be caused by many small factors (for example whether the storage container is covered during transportation and storage correlate), introducing Jerry Cans could therefore provide substantial health benefits. Besides health benefits, providing Jerry Cans through the water kiosk allows to introduce homogeneous and branded containers (for example with a sticker sporting the logo of the water kiosks), which will in turn make safe water desirable. Despite the desirability, convincing people to change to the new system and to new containers might be difficult, and will need social mobilization and marketing (see Chapter 3.2.2).

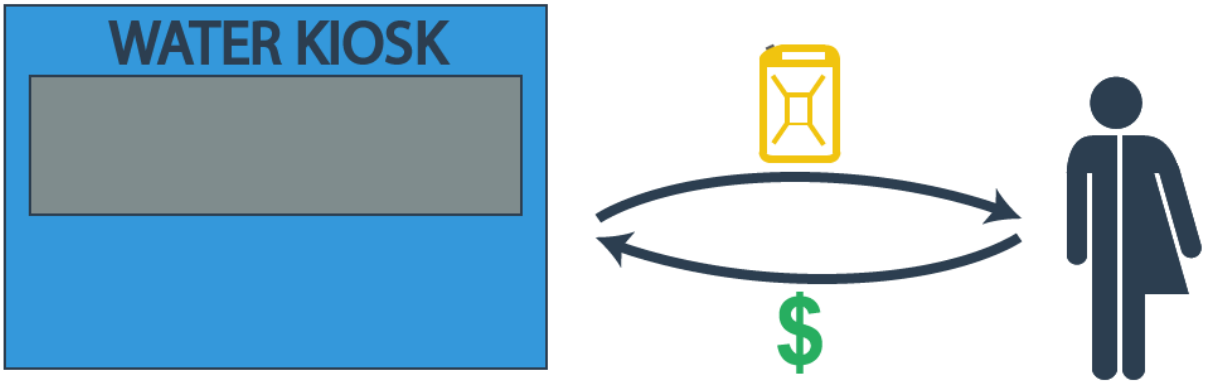

Figure 4: Basic business model proposed in this thesis. Local teams will independently operate water kiosks and sell safe water in Jerry Cans to people in their community.

It is important to mention that, like in the old system, the water points still belong to the communities. To establish ownership and increase sustainability, the service of providing safe water is newly performed by a group from within their community, whose members are paid based on their revenue. To avoid giving the other members of the community the feeling that they are expropriated by the people running the water kiosks – because they newly pay for something that belongs them anyways – it is important to collectively work out the terms for this new arrangement. The communities must be truly convinced of the personal benefits they receive in exchange for steady payments for water consumed, and will collectively choose the exact set-up of services offered in their community. This process will be time-consuming and might require several sessions, but it is crucial for the long-term sustainability to enjoy public support from the beginning. Furthermore, whenever possible and throughout all our activities, we will aim to employ local personnel, for both operational and managerial positions. Given their social embeddedness, it is more likely that they are trusted by their local community, that they get direct feedback about real needs, and that they have an accurate understanding of income and consumption habits of consumers (Aydogan, 2010, p. 23). Additionally, hiring local will create opportunities for steady employment at reasonable wages, and in turn contribute strongly to eradicate poverty (Karnani, 2007, pp. 104–105). Because of their the close cooperation the Ivorian Red Cross had with people in villages, they will be able to help find reliable locals with entrepreneurial spirits.

Being set up as a business – unlike charitable projects – the water kiosks need to finance their activities through profits. As we should prevent decreasing water consumption and are therefore face upper limits in terms of price-setting (see Chapter 5.1), it might make sense to cross-finance operations through the hosting of additional services, for example selling of everyday supplies. Many of the visited villages did not have any stores, and people had to travel long distances to buy needed goods such as groceries, articles of daily use or phone credit. However, as we aim for a region to holistically develop, it is important that we do not sell what is already available on local markets, as we should avoid driving other people out of business or prevent them from having access to jobs. Consequently, we should be careful to only offer additional services where there is no local competition.

As anywhere around the world, villages in the project area are not homogenous and the people living there have different demands and expectations. Consequently, only providing one option would inevitably mean failing to cover the whole specter of customer demands. Focusing on only the poorest segment of a population is a mistake often done by pro-poor market-driven approaches, as people tend to look up to and imitate more affluent members of their community (Heierli, 2008, p. 72). Consequentially, it will be important to employ a **modular approach**, allowing to offer services tailored to the relatively rich within

our communities, and thereby making the system more desirable for all community members and providing an incentive to aspire for a higher standard. Karnani (2007, p. 102) presents a framework to analyze quality along eight dimensions; performance, features, reliability, conformance, durability, serviceability, aesthetics and perceived quality (with the potential to further add dimensions such as availability, timeliness, convenience and customization). The customer considers all these dimensions and arrives at a subjective judgment of the overall quality of a product or service, and is willing to pay more for a product with a higher quality – the so-called price-quality trade off. To profitably serve its customers, any firm needs to make the cost-quality trade-off in a manner consistent with the price-quality trade-off made by target consumer.

Our main goal will be to introduce a sustainable and reliable provision of safe drinking water, a service for which we will and cannot provide distinct levels of quality. However, it will be possible to cover the specter of existing price quality trade-off by offering a basic service available to everyone, and additional modules adding convenience and desirability. Building up on our basic module (selling safe drinking water in Jerry Cans), we can offer more luxurious service options in line with the price-quality trade-off made by different segments of each community.

One possibility will he to offer a **home-delivery** service, where paid personnel delivers fresh water to the doorstep of paying customers daily. case study of people opting for prestigious delivery option. Distance to well, probably the longer, the more they adapt to service. However, could be perceived an ethical problem, Nestlé financed, does not want to induce child labor. Approach not viable if he does not make enough money (e.g. because of too low demand) or if it takes too much time to deliver, would require transport option.

Another possibility will be to **directly connect households** (piped system connected to an elevated tank). However, this option entails costs strongly depending on the specific setup in a community and might require a certain percentage of the population to amortize the initial investment. When connected to the water system, a household a slightly elevated price for its water usage (weekly). Additionally, the connected household will pay a monthly flat rate to the water kiosk for amortization first, and then for maintenance and repair of hardware installed. In return, the household will be included into the system of pump mechanics (see Chapter 3.2.1).

Box 3: The example of Spring Health in India

Health Spring was launched in 2010, as a first division of *Windhorse International*, a for-profit venture with the objective to provide low-cost and innovative products to people living on less than 2USD a day. The division sells affordable and safe drinking water to people living at the bottom of the pyramid in rural villages. They partner with local entrepreneurs or village shop owners, and install tanks next to their private well at an affordable price. The water in the tanks is chlorinated by a company staff and each day, a delivery boy or the local entrepreneur delivers clean water with a bicycle or trolley directly to the house of the customers. They can buy a ten-liter jerry of safe water for 3 Indian Rupees [INR], making it around sixty times less expensive than alternative products such as bottled water (1l=15INR) or packet water (150ml=2INR). Of the 3 INR, the delivery boy earns a third, and the remaining 2 INR are shared between the entrepreneur local entrepreneur and Health Spring. In the first year, the entrepreneur receives 25% of the returns, in the following years 75%, helping to repay the initial investment (Amman, 2012, p. 3; 32-34). The project started with a 10-village pilot in 2010, and gradually expanded its service to 30’000 households in over 150 villages, creating over 600 new jobs along the value chain (Amman, 2012, p. 32; Spring Health Water India Pvt, n.d.-a, n.d.-b).

3.1.2. Aspirational Technologies

Besides increasing ownership through the introduction of water kiosks, another important paradigm change to increase the project's resilience and sustainability will be to make safe water more aspirational. Throughout our journey, we experienced a sharp contrast between enthusiasm shown for safe water and for other, more aspirational products and services. We were, for example, surprised to find that people in a village called Blaisekro spend between 6'500 and 15'000 XOF (USD 10 to 24.95) on airtime per month and family, as compared to 300 XOF (USD 0.5) for safe water.

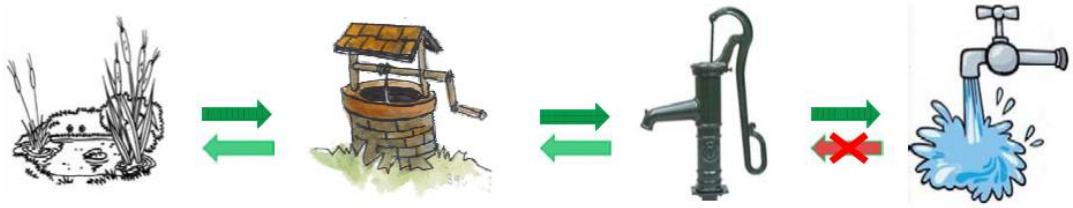

Figure 5: The desirability ladder of water sources. When problems arise in the lower parts of the ladder, people fall back to simpler technologies. However, once used to piped water, this step backwards ceases to apply. Source: (Louvat, 2017)

This is an insight shared by many development professionals in the field, with their experience showing that the perception of water as a cumbersome low level priority radically changes with the introduction of solar pumps and piped water. The more desirable and aspirational a technology, the weaker is people's willingness to fall back on a lower step on the desirability ladder. If a handpump breaks down, the perceived negative implications for users are relatively small and people simply go back to using an open well (or even directly to the pond). A setup adding more value to the users (such as a piped system or an elevated tank with tap stations in the proximity of users), is significantly more convenient and desirable, and if it breaks, users usually do everything in their power to repair the system (Louvat, 2017).

To make use of this fact without discarding the initial investments and infrastructure, we will retrofit the existing pumps with solar powered motors. The Swiss company *ennos AG,* for example, produces a portable pump with a potential output of up to 15'000 liters per day (or up to 55'000 liters if pumping hours are extended with a battery) (Ennos AG, n.d.), allowing to deliver 20 liters of water to 750 to 2750 persons[2]. This or a similar technology could be used to pump water into an elevated tank next to a water kiosk, from where it can be filled into Jerry Cans and sold to customers.

Figure 6: The sunlight pump, a portable solar powered pump that could be used to retrofit the existing water points
Source: (Ennos AG, n.d.)

[2] Motorizing the system will not only increase the resilience of the system, but is necessary to cover demand in light of a limited number of water points and a rapidly growing population (see Chapter 2.3). When visiting the project area, Dr. Andreas Koestler confidently estimated that – at the visited sites – motorizing the system and increasing the pumping rate would not lead to sinking ground-water level or groundwater-related subsidence. However, this was solely a preliminary observation, without having the resources and equipment at hand to properly assess all water points. Consequentially, when choosing the exact setup and locations, and before implementing the system, this issue should be examined in depth.

The installation of solar panels furthermore allows to (at least partially) electrify the communities. Depending on each community's demand and ability to pay for additional services, the spare energy could be used to either charge electric devices at the water kiosks and/or to directly connect households that are able to afford it. Besides fees for airtime, households without electricity have to travel to shops or affluent households in neighbor villages and pay around 100XOF (USD 0.17) per charge. As this is usually done around eight times a month (amounting 1.33 USD), offering the charging of devices as a service (be it as a pay per use or membership model) would not only generate additional income for the water kiosks, but could safe people time and money. As with the entire system, it will be important to make a modular set up (see Chapter 3.1.1), allowing communities to choose different degrees of electrification or to add more aspirational steps on the energy ladder at a later stage.

As a cost-efficient solution, it would for example be possible to acquire chargeable lights for every interested household, and leave the possibility open to include other households and connect more affluent households directly at a later stage. One such option is OOLUX, a lighting solution by the Swiss Antenna Foundation (the same organization also producing the WATA device seen in Chapter 3.1.3). The kit is equipped with a portable battery and two LED lamps with five meter cables, allowing owners to light up two different spaces or rooms for over 16 hours on a single charge. Additionally, the box features two USB ports, which can be used to charge other devices or act as an emergency battery backup in regions with frequent power outages (Antenna Technologies, 2017).

Figure 7: Oolux, a solar-powered lightning solution enabling users to charge up to two additional devices
Source: (Antenna Technologies, 2017)

When asked what change people desire most for their communities, frequent answers were improved access to education and electrification of their village – respectively the amenities connected to electricity, such as decent light in the evenings and the access to consumer electronics. Linking the introduction of aspirational pumping technologies to the expressed desire for electrification, people would have a powerful incentive to fix system failures as promptly as possible. Safe water systems usually have strong push characteristics, as consumers are unable to easily assess its benefits and reliability, particularly in areas where consumers are used to an existing source that is contaminated, but does not look, smell or taste bad (Koh, Hegde, & Karamchandani, 2014, p. 8). As the project now not only provides people with safe water but also fulfils one of their strongest desires, the system presents itself as a market pull situation. Providing electricity and introducing modern technologies will furthermore require supporting industries, and could stimulate industrial or non-farm jobs. Additionally, electricity and increased water supply will allow farmers to make use of more elaborate farming and irrigation techniques. Besides making safe water provision more aspirational and therefore resilient, these measurements could improve the life conditions in rural communities, increase the productivity of farmers, and prevent young people from leaving their communities for a life in urban centers.

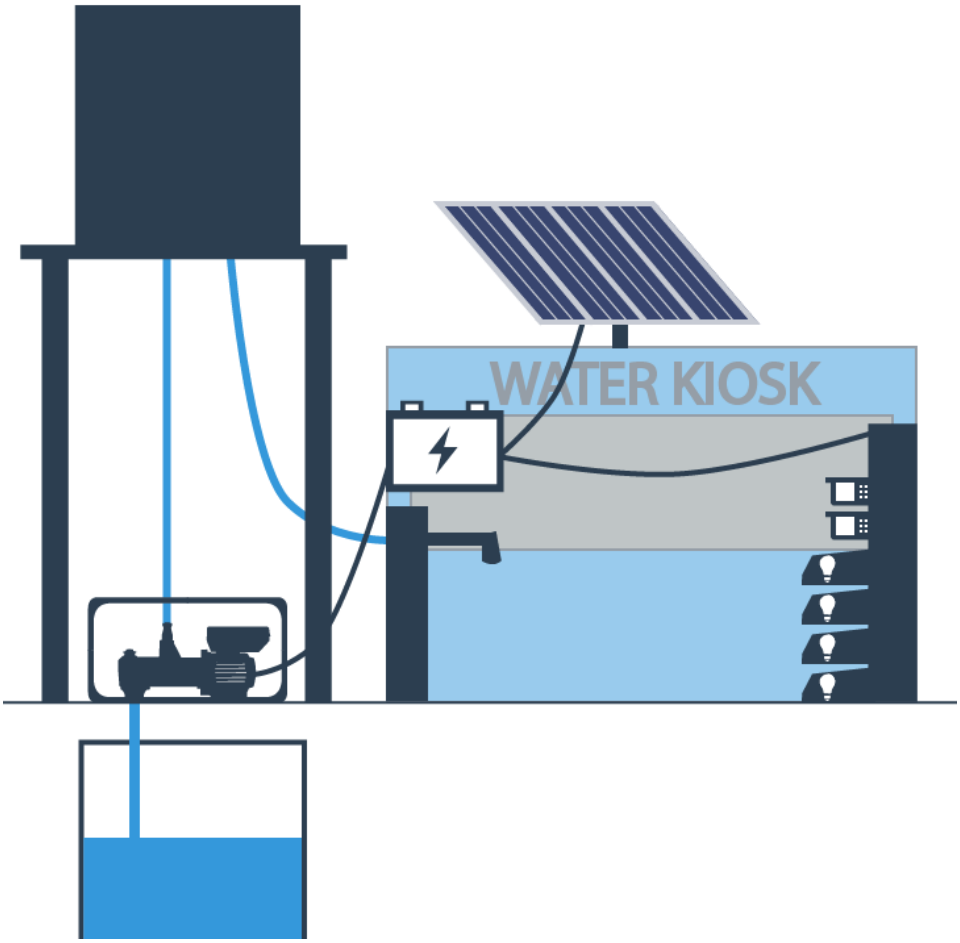

Figure 8: Motorization of existing water points through solar-powered pumps. Water will be pumped into an elevated tank, from where it can be filled into Jerry Cans and sold to customers. Additionally, the spare energy can be used to (partially) electrify the communities. It is for example possible to charge electric devices at the water kiosks, making life easier for people in communities and bringing additional income to water kiosks.

3.1.3. Treatment

The efficient handling through our staff in water kiosks and the introduction of Jerry Cans is designed to improve water quality, however does not guarantee safe water at point of use [POU]. If people for example fetch water into unhygienic drinking beavers or if it is stored for too long, water can become recontaminated. While we raised the probability of water being of decent quality with the measures discussed so far, the only way to guarantee safe water is by introducing water treatment.

Water treatment can be divided in two phases: Pre-treatment, the removal of suspended solids to clarify turbid water sufficiently for the next step, and then the actual water treatment, the improvement of the microbiological quality of water by removing pathogens (Davis & Lambert, 2002, p. 289; 314). The constructed/rehabilitated/ water points in the project area are exclusively in the form of boreholes. With this type of source and when properly constructed, water is filtered when entering through the screen, keeping the turbidity under 20 NTU (Nephelometric Turbidity Unit; a unit used to measure turbidity) and making pre-treatment unnecessary (Davis & Lambert, 2002, p. 291). The removal of disease-causing organisms can then be done through filtration and/or disinfection. However, as filtration alone does not prevent recontamination, we will focus on disinfection (and for the same reason exclude water boiling, a time- and energy-intensive treatment method with severe health disadvantages if done over open fire).

For our water to be free of pathogens throughout its journey, we will use chlorination, the most common chemical disinfection method. There also exist alternative methods of chemical disinfection (for example Iodine), which are however more expensive than chlorine and harder to procure in rural areas.

Chlorine on the other hand is widely available or can be produced relatively cheaply. It is and highly effective against a wide range of pathogens and its residuals provide protection against further contamination (Davis & Lambert, 2002, p. 336–337; 341). Chlorination can be done at source (often in bulk, where water is treated directly in the tank) or through the recipients themselves, so-called household water treatment and safe storage [HWTS] techniques. While gaining popularity due to its cost-effectivity, any HWTS system's weakness is that it relies heavily on the cooperation of individuals and on its supply chain (as people need to decide to participate, remember to treat their water every day, and have the necessary resources in stock) (Heierli, 2008, p. 25).

One important aspect of chlorination is getting the dosage right. Ideally, people would only fetch and store what they consume the same day. However, as confirmed during our travels, people often store water for several days. Additionally, water can easily be (re)contaminated during its transport, storage, or even while drinking (Heierli, 2008, p. 20). Consequentially, the dosage should be set to

- oxidize any contaminants (reacting with both organic or inorganic substances) and make the water safe to drink
- leave a residual ensuring protection, which inhibits any subsequent growth of organisms within the water supply system

While there is no evidence that the consumption of residual chlorine is harmful, it is nevertheless important to keep the dosage relatively low. High residuals give water an unpleasant taste, which could dissuade people from drinking chlorinated water and lead them to resort to unsafe sources. To determine the required dosage, water samples can be analyzed on residuals with simple color comparator kits available on the market (Davis & Lambert, 2002, p. 338). To make use of the benefits of chlorination and circumvent the downsides described above, we will introduce chlorination at level of the water kiosks. The setup with water tanks allows for batch dosing to a fixed volume of water, a simple yet effective way to get the dosage right. Alternatively and depending on the specific setup, we could evaluate employing mechanisms that allow constant rate dosing into water flowing at a steady rate – a more complex and costly method to set up, but one which does not require daily efforts from our local water kiosk staff (Davis & Lambert, 2002, p. 341)

One important aspect of introducing water treatment will be to guarantee a sustainable supply chain. Chlorine is available in urban centers, on local markets, however, the only available solution is Eau de Javel. While this product could be used in emergencies, it is not as safe as chlorine for large-scale treatment of drinking water. Consequentially, and because we will have a constant need in wide apart villages, we will focus on developing a decentralized supply chain that can survive on its own. Luckily, chlorine is quite easy to produce. The Swiss Antenna Foundation for example sells WATA, a simple to use and safe machine to transform a water and salt-solution into chlorine. The solar-powered device converts the saline solution (sodium chloride) into active chlorine (sodium hypochlorite) (Antenna Foundation, 2016b). Consequentially, the coordinating body will provide local entrepreneurs with an advance payment and help them set up their production facility. In places where there is no electricity grid and to save money on solar installations, the chlorine entrepreneurs could be integrated into a specific water kiosks and use energy from the solar panels installed for the motorization of the pump (see Chapter 3.1.2). Once running, the chlorine entrepreneurs will then run their production for their own profit, and sell the solution to water

kiosks at a predefined price. It will be crucial to set up a reliable transport structure, as chlorine has a relatively short shelf-life and starts to lose its effectiveness after only a month (Aydogan, 2010, p. 41). Consequentially, every two weeks, the chlorine entrepreneurs will deliver the solution to the water kiosk by bike, which in turn each hold one week worth of reserves. This will give them time to react to unforeseen circumstances such as electricity shortages, and allows them to order an emergency delivery from the next closest entrepreneur (or the coordinating office, as the pilot project will prospectively feature only one production site for the first water kiosks).

Box 4: Local chlorine production – Example of Tinkisso in Guinea
The Antenna Foundation delivers a proof of concept for their business model with a case study from Guinea. Supported with an initial investment, a local entrepreneur founded an NGO called Tinkisso and started to sell the chlorine solution in small bottles of 250ml for a price of 5'000 Guinean Francs (0.6 Euro). After experiencing rapid growth, they managed to break-even in 2014, making a turnover of 1.6 million Euros and employing 129 people. In 2015, they already sold 5.2 million bottles in dry seasons (reaching 1.4million consumers), and 4.7 million bottles in rainy season (Duvernay & Camara, 2016). They built up a distribution network of 144 community and 16 kiosks, however regularly struggle with road conditions and a lack of appropriate transportation means to reach their most-remote water kiosks (Aydogan, 2010, pp. 44–45).

The chlorine entrepreneurs will need to measure and guarantee the concentration of their solution, which can be done with simple to use test kits available on the international market. Additionally, water kiosks will need to be able to verify the concentration of the solution provided to them. The coordinating body will consequentially provide both water kiosks and chlorine entrepreneur with this equipment, allowing to reduce the cost per unit and safe money on import fees. Overall, the costs for chlorination will have to be incorporated into the price of water for the kiosks to remain profitable, and will slightly rise it (for a discussion on the importance of setting the price the price of water, see Chapter 5.1).

The Antenna Foundation (Antenna Foundation, 2016a) envisions that entities producing chlorine with their WATA technology could as well sell chlorine directly as a second source of income (besides providing chlorination services to communities). While the main responsibility of water kiosks remains to ensure that all sold is treated and safe to drink, they could – if they have the capacity – start selling flasks of chlorine on the side (for example for cleaning purposes or to disinfect water where no kiosk is nearby) or provide chlorination services to outside organizations. It is for example conceivable that water committees not connected to our system would like to introduce chlorination for their water points, allowing them to prevent recontamination and ensure water quality at point of use. Besides making regular chlorine deliveries and working with communities to make sure the mechanisms are properly understood, the water kiosks could provide them with the Chlorine Dispenser System developed by *Innovations for Poverty Action* (WASHfunders, 2017), a simple and low-maintenance solution ensuring the right dosage. After installing them at water points, people from the community can turn a valve and release a predefined dose of chlorine into their Jerry Can before filling them with water. Overall, this activity would help the water kiosks (or chlorine producing entities) cross-

Figure 9: An IPA Chlorine Dispenser System in action
Source: (Solutions for Water, n.d.)

finance their operations (see Chapter 3.1.1), and could provide communities with access to safe water that are not (yet) connected to our system.

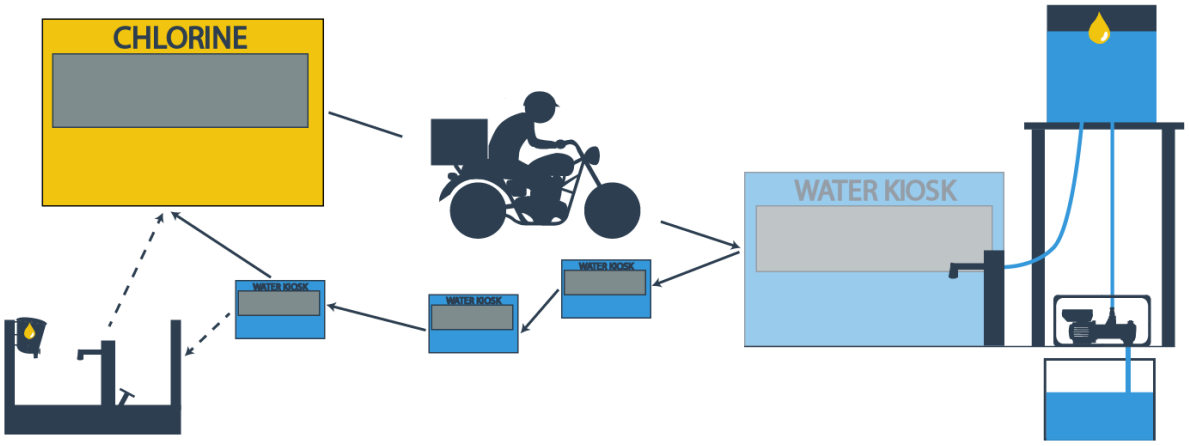

Figure 10: Creating a sustainable and self-sufficient supply chain for chlorine. Chlorine needed to treat water will be produced through independently operating local entrepreneurs, and distributed and sold to water kiosks at a predefined price. They will in turn add a fixed dose of chlorine to the water in their tanks, before selling it to their customers. Additionally, water kiosks or the chlorine entrepreneurs could deliver chlorine and dispensers to (inter alia) water committees not included in the system, helping them to treat their water and creating a second source of income.

3.2. Keeping the system going

3.2.1. Rotating pump mechanics paid through collective financing scheme

As seen in Chapter 2, while all visited pumps needed minor maintenance work, most water committees failed to become active. Besides a lacking sense of ownership and non-existent incentives (discussed in Chapter 3.1.1 and remedied through the introduction of water kiosks), water committees often simply needed a nudge in the right direction. The responsible people in Blaisekro for example were well-aware that action was needed ("the pump produced a strange noise when pumping water"), but remained inactive for several months. When a local pump mechanic passed through on his way to a neighboring settlement and offered to immediately conduct the maintenance work, the water committee made use of the opportunity.

To institutionalize this external stimulus, a newly created coordinating body[3] will contract local mechanics. These **rotating mechanics** will pass through the villages every two months and do preventive maintenance work, and repair or replace the infrastructure when needed. The coordinating office will pay the provider based on agreed performance indicators, for example regular preventive maintenance, rapid repair of failure events, monitoring of water quality, reducing costs of maintenance delivery, or the connection of a new village to the system.

[3] Ideally, this function would be taken over through the Nestlé Cooperatives, which already have a good reputation in and connection to the project villages. However, over the years, the cooperatives became involved in more and more social causes (e.g. building schools and other infrastructure to end child labor), taking over a key role in this project will probably be outside of their possibilities. Additionally, cooperatives (partly) overlap and are in direct competition on the international market, creating difficult dynamics and jealousy. For these reasons, we advise to create an independent element coordinating maintenance and repair, but to further evaluate and discuss the possibility of working with cooperatives.

Conscientious maintenance will decrease the likelihood of system failures, and if they occur, the mechanics are immediately available, minimizing the downtime and preventing that people perceive the offered services as discontinuous. When discussing the merits of water as a service (as opposed to focusing on hardware), many development professionals emphasized the importance of continuity. It is arguably more difficult to collect contributions towards a system once it is dysfunctional, which in turn prolongs the discontinuity of the service – a vicious spiral downwards that can (partly) explain the 30% of broken water systems touched upon in the introduction. Many people in developing countries never had the chance to experience continuous and safe service of basic services like water, infrastructure or education (which are perceived as basic prerequisites for the functioning of society in other parts of the world). By providing a reliable high-quality service, and by making the recipients feel as customers and not as beneficiaries, our project could not only improve the water situation, but contribute to a truly holistic development of the region. People will build up trust in service providers and learn that they can insist if a service they deserve and need is withhold from them. This could lead to a more demanding and constructive interaction with other service providers, and maybe even with the national government.

To cover for continuity, reserves should be systematically accumulated before large repairs become necessary. The importance of preventive accumulation was visible in practice, with all water committees reporting that larger investments (such as completely replacing a dysfunctional pump) would be out of their financial reach. When talking to users, it became evident that there exists an understanding that pumps do not function without any maintenance and related contributions, and that users are generally willing to contribute. There were different schemes in place to collect money from end users for operation and maintenance, however, the amounts collected were generally not sufficient to cover immediate maintenance needs, never mind bigger repairs. To pay for the pump mechanics circulating among the communities and conducting maintenance work, and to pay for more costly repairs in cases where the installation breaks down, we will introduce a **collective financing scheme.** Every water kiosks will contribute pay a monthly contribution to the coordinating body, which will in turn cover costs for mechanics and all maintenance/repair work. While this will marginally increase the price for users, their contribution will become more predictable and they see a direct benefit for linked to their payment to safe water (pump mechanics conducting maintenance work on a regular basis). Additionally, the risk of having to round up large sums in emergencies can be omitted through collective financial assistance. To prevent water kiosks from freeriding (in a sense that they will cut due care and attention for their infrastructure, as they do not have to pay for maintenance/repair), it will be important to communicate what they can contribute themselves and incentivize keeping the water point in shape, for example through a deduction on their contribution if they follow the necessary steps.

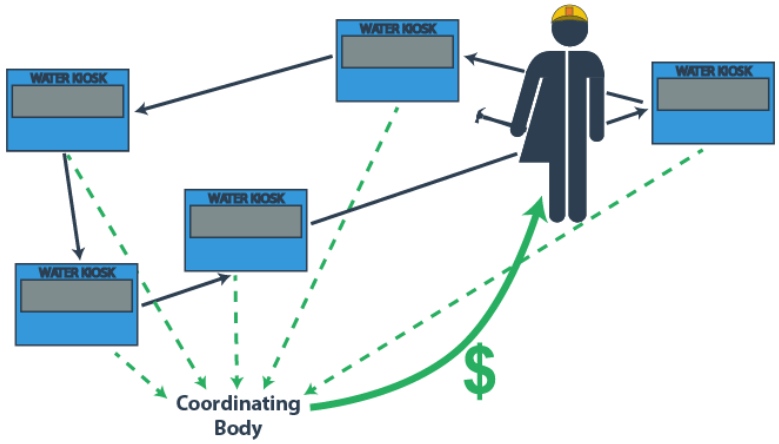

Figure 11: Rotating pump mechanics. Contracted through the coordinating body, they will regularly visit all water kiosks to maintain and repair the pumps. All water kiosks will give a share of their revenues from water sales to the coordinating body, which will in turn pay the rotating mechanics.

For this collective financing scheme, it would probably not possible to cover the financial effects through a conventional insurance companies, as losses will occur anyway – a pump breaks down at some point and maintenance work is constantly needed. However, risk of system failure will be delegated from individual communities to an independent organization (the coordinating office), meaning that the system can be classified somewhere between self- and conventional insurance. No matter the exact definition, to ensure predictability while keeping costs as low as possible, our financing scheme needs to be built around the principle of indemnity, meaning that the insurance should place the insured in the same financial position as he or she was in prior to the occurrence of the loss (Keir, 2012, p. 13.5). Consequently, our scheme will cover both maintenance and repair costs, plus the business interruption costs (the financial means needed to ensure water access to all customers and the revenue missed because of said interruption) in case where a pump breaks down. To minimize the risks and costs for such a case, we intermediary could buy external reinsurance. Like modern peer-to-peer insurances (for example Lemonade.com or TongJuBao.com) and in contrast to traditional insurance companies, the coordinating office would not work to maximize profits. Funds not paid out in claims would be completely reinvested into expanding the system or, if reoccurring, would lead to lower contributions in the next cycle.

3.2.2. Social mobilization & marketing providing the backbone

While the proposed system with water kiosks, chlorination and rotating pump mechanics will improve water quality both at POC and POU, working together with the local population and sensitizing them about the importance of safe water and sanitation will remain crucial for a sustainable development of the region. On one hand, **social mobilization** work will ensure that the system is implemented effectively – for example by preventing that people transfer water from Jerry Cans into other containers in their homes or that the improvements in water quality will lead to less engagement in improving sanitary conditions – on the other hand, it will help embed our system and create awareness needed for the population to understand the benefits of the service we offer. To accomplish this task, we will look for a continuation of the collaboration with the Red Cross, an organization with longstanding experience and a proven track record for health mobilization. Financed through contributions from each water kiosk, the coordinating body will work out a contract with our partner organization for continuous mobilization efforts. No matter the exact details of this contract, it will be crucial that the national Red Cross society is truly convinced and stands behind our project from the beginning. They have an extensive network of well

embedded and respected people in all project villages, and their support might make the difference in convincing the local population for our project. Consequently, an intense coordination will be needed from the beginning, financed through a startup funds and before the water kiosks generate any revenues (see Chapter 5.1).

No matter the source, financial means will be limited and it is crucial that the local Red Cross works out and employs simple and cost-effective measures. A starting point could be to focus on small amendments with the potential to greatly improve water quality, such as the four factors we studied for our consultancy (whether the storage container was covered during transportation, whether the drinking water storage container in the household is properly covered, whether the storage container is situated indoor or outdoor, how many days ago the drinking water was collected; see Chapter 2.1). Water being sold in Jerry Cans would already eliminate two of those four pain points. To our surprise, the basins usually used for water handling are significantly more expensive than Jerry Cans on local markets (3.2U SD for a 30l basin or 5.5 USD when a second basin is bought as cover, as compared to 0.8-1.6USD for a 25l Jerry Can depending on the quality and robustness). However, water basins are the traditional way of collecting water in this region, and when asked for the reasons to use the more expensive and unsafe option, people usually reported that albeit they use Jerry Cans to transport drinking water to their plantations, they prefer basins at home for convenience reasons (one does not need to tilt the container but can simply enter with a drinking cup). The head of the only visited household that used a Jerry Can as water storage was a local Red Cross volunteer and well-aware of its health benefits. While this indicates that it could be possible to convince people to change to a safer (but less convenient) option, it will nevertheless be crucial for our project to be accompanied by well-planned social mobilization efforts.

Additionally, it could be wise to work with multiplicators such as schools and health centers. Besides sending volunteers to schools, the Red Cross could also evaluate hygiene promotion programs specific for teachers, which in turn reach out to students. One proven way is for example to let school kids bring a sample of their household drinking water to school and test it on bacterial contamination, allowing for a graphical visualization of contamination (Amman, 2012, p. 86)). Through this focus on multiplicators, many kids can be reached with relatively low effort, and they can in turn significantly impact the whole community through their families. Overall, social mobilization would make our good system even stronger and provide knowledge and understanding for people to buy our product.

As a second pillar, we will employ a technique called **social marketing** – the use of marketing principles and techniques to advance a social cause, idea or behavior (Heierli, 2008, p. 73). This relatively new toolbox started with the insight that products and marketing strategies designed for poor people mostly distinguish themselves solely by being radically affordable, and that nearly no emphasis is put on making them appear desirable. While products for affluent people are designed and marketed to appeal people's desire for prestige, status, lifestyle and wellbeing, messages targeted at poorer people often focus solely on functionality (Amman, 2012; Heierli, 2008, p. 22). This becomes especially obvious when examining the market for water, with safe water from pumps often labeled as a charity product and not much more desirable than water from unimproved sources, while bottled water became a lifestyle product. Over the last years, social businesses became aware of this discrepancy and started to make use of conventional marketing techniques. An initiative promoting cook stoves (as alternative to cooking on open fire), in rural India, for example, found that highlighting that their product brings cleaner houses and decreases cooking time had a stronger impact than focusing on health arguments (Koh et al., 2014, p. 33). As another example, Spring Health (see Box 3), in their quest to sell safe water, focuses strongly on building a brand identity. They worked together with a well-known design firm, to create recognizable t-shirts and baseball

caps for staff members, design unique jerry cans, and brand their water tanks and kiosks with posters (Amman, 2012, p. 34).

Parallel to these examples, there are techniques that can be used to position our service as a prestigious and desirable product, both in terms of the message and its delivery. It would for example be possible to produce stickers for the Jerry Cans or badges to put next to the door of customers, signaling that the carrier invested in safe water and cares for his family. Other possibilities are get-together or annual festivities for members, creating a sense of membership and exclusivity. Additionally, we can for example create special (non-)monetary incentives or goodies for customers regularly purchasing water at water kiosks. It might make sense to begin these marketing efforts by focusing on people that are relatively easy to convince – which for example are already highly aware of the importance of safe water and put more than usual care in safe storage and transport – as these early adopters can increase both visibility and desirability of our product (Amman, 2012, p. 48).

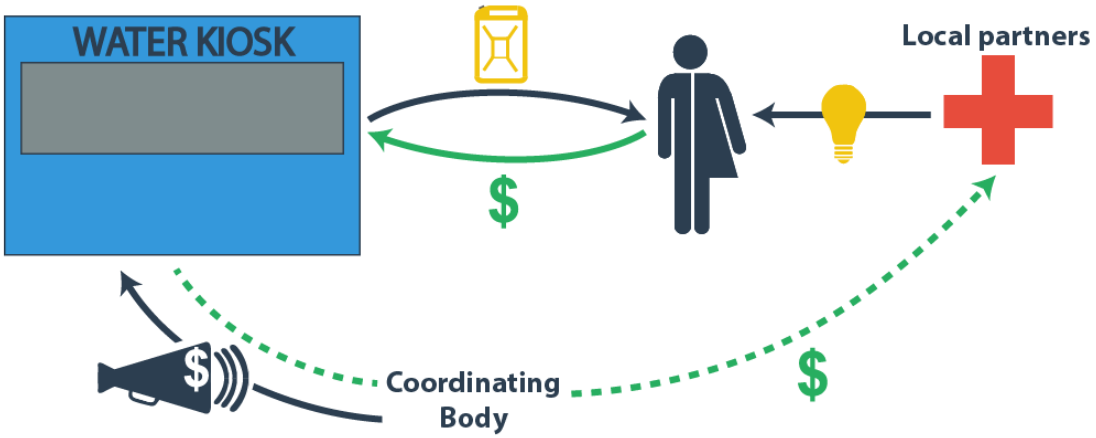

Figure 12: Social Mobilization and Marketing. The water kiosks will give a share of water sales to the coordinating body, which will in turn finance local partner organizations to work with our customers and sensitize them about the importance of safe water and hygiene standards. Additionally, the coordinating body will work out social marketing strategies and materials, and provide them to water kiosks to help promote safe water amongst customers.

Overall, a thorough adoption of improved water and sanitation standards is crucial for a truly holistic development and for the success of our project, but it can take years to change long-standing habits and entrench necessary social and infrastructure developments. By combining social mobilization and marketing, and by linking the knowledge about improved health to more desirable factors like status and lifestyle, it should be possible to significantly accelerate this process.

Box 5: Knowing your customer

When designing these marketing strategies, it will be of utmost importance to clearly define and understand our customers, as recent studies showed significant differences in buying behavior between people living at less than two dollars a day and people with higher incomes. Some of these findings are:

- One common mistake when designing products or messages for relatively poor people is to assume that they are solely motivated by the price. Several studies did show that a substantial portion of (urban) poor people in developing countries are willing to pay extra for a designer label. Researchers found that this is mainly motivated by two reasons: First, a labelled product serves as a status symbol and gives the buyer the feeling of belonging to the society. Second, it can serve as a mean of differentiation from people who cannot afford these products, making it desirable (Barki & Parente, 2010, p. 14).

- Studies in Brazil showed that people living on less than two dollars a day prefer more informal and friendlier relationships when shopping, as compared to people with a higher-income. They for example strongly value personal service, are more likely to mistrust large corporations, or prefer face-to-face trust between people over trust towards institutions or contracts. One explanation might be that many people living on less than two dollars have a limited reading ability, and therefore rely strongly on the vendor's advice and trustworthiness (Barki & Parente, 2010, p. 18)
- While products, services and messages directed to the richest segments of populations stress the idea of exclusivity and differentiation from "middle class masses", poorer people are more receptive to the message of inclusivity, suggesting that they consume like and belong to the middle class (Barki & Parente, 2010, p. 14).
- Low-income consumers often have a positive perception of abundance, whereas customers with a high income usually prefer clean visuals. A crowded store with its products openly displayed, for example, indicates that it has a generous and well-led management, is well stocked, and has low prices (Barki & Parente, 2010, p. 20). In combination with the halo effect (claiming that positive perceptions of some attributes of a brand influence a more favorable perception of other brand attributes), such details can lead to strong stances towards or against a certain store. In a study in Brazil, conventional supermarkets were evaluated very highly in many attributes, such as courtesy and friendliness of service, visual merchandising, facilities, and store atmosphere. These positive evaluations then exercised a contagious effect on other aspects, and customers, for example, felt that the prices charged were fair. On other hand, for discount stores selling no-frills products, the negative objective evaluation (people being discontent with store atmosphere, impersonal service and conspicuous surveillance) minimized the positive perception of de facto lower prices (Barki & Parente, 2010, p. 16).

In this box, we briefly mentioned some of the key differences from recent literature. This box is simply meant to highlight the importance of knowing one's customer, and aims to serve as a starting point for this new branch of literature. However, we can by no means presume that the information from other countries is transferable to Côte d'Ivoire, and will have to be work together with people knowing the local market and involve actual customers to custom-tail our efforts to the local conditions.

3.2.3. Clear Roles – Nestlé becoming an industry facilitator

For any new venture, the first few months are decisive and filled with obstacles. Its business model must be defined, proven and refined, customers need to be acquired and capital secured, and conditions must be created to accelerate growth. However, overcoming these steps can prove especially challenging for businesses pioneering new business models in developing economies. First, poorer people are often much more risk-averse in their consumption-behavior and less likely to spend resources on unfamiliar products. They furthermore often do not have access to the information channels people in richer economies have and are less-well informed about available solutions to their needs, and are scattered across remote rural areas or informal settlements in urban areas. Second, pioneer firms in such countries compete in much weaker business environments. There are for example fewer marketing agencies, distributors or retailers to work with, and it is much harder to recruit the right personnel or to obtain a credit with a mainstream financial institution. However, this pioneer gap – the phenomenon that firms in developing countries are often starved of capital and support at critical stages of their development – and the mentioned scaling barriers do not only exist at the level of a firm or its value chain, but in the industry ecosystem around it. Public goods, such as hard infrastructure, market information, industry know-how, or standards defining product quality, are often insufficient or missing. Additionally, government regulations, laws and procedures regularly impede the emergence and prospering of an industry, be it through extractive tax

systems or a lack of compliance between national legislation and municipal practice. Overall, these scaling barriers are difficult for a firm to resolve on its own. And even if they have the resources, it might be unwise to do so. By definition, public goods are enjoyed by the whole industry and when providing them, free-riding competitors could gain an unassailable advantage (Koh et al., 2014, pp. 6–15). To overcome this difficulty, Koh et al. (2014, p. 16) propose that one or more facilitating bodies, so-called *industry facilitators* – typically actors not themselves from within the industry – resolve scaling barriers at both enterprise and wider business ecosystem level.

Besides providing (parts of the) funds (see Chapter 5.2) for the venture proposed in the precedent sub-Chapters, Nestlé SA. could greatly help the project and the region by clearly defining its role and stepping up as an industry facilitator. As a part of their CSV activities and coordinated through its national subsidiary, this role could help local entrepreneurs in the water sector and surrounding industries to overcome the pioneer gap. In accordance with the CSV approach (see Chapter 4.1), helping to improve the business environment in rural Côte d'Ivoire would help both emerging water service suppliers and the supporting industry, and would in the long-term improve the cocoa-farmer's livelihood and productivity. Below, we will briefly examine three possible ways a multinational organization like Nestlé could support its project, strategic partners and the industry:

- **Benefitting local entrepreneurs:** Analog to Nestlé Côte d'Ivoire 's CSV program *Maggi Mammies* – inter alia teaching vendors of Maggi cubes helpful business skills such as accounting, helping them to become literate end equipping them with bicycles to increase their reach – the national subsidiary could make use of and provide their in-house skills to local water entrepreneurs. The national staff could for example offer marketing trainings at regional cooperative headquarters for local water and chlorine entrepreneurs. This activity outside of their daily routine could not only be highly rewarding for Nestlé Côte d'Ivoire 's employees, but would also help pro-poor product and service providers to be successful and reach the scale phase (Heierli & Polak, 2000, p. 73).
- **Removing external constraints to market and business creation:** In rural parts of Côte d'Ivoire, the lack of basic facilities such as electricity and good roads handicaps local businesses in their daily live, and prevents a sustainable regional development. Besides, social norms and institutions are often not strong enough to ensure enforcement of laws and to guarantee basic rights. Local entrepreneurs, for example, told us about their difficulties when registering their business as a legal entity, preventing them from entering binding contracts or receiving finances with commercial banks. Consequently, the local Nestlé subsidiary could greatly help our project and the surrounding industry by using their connections and status as a successful company to reach out to government officials, and help streamline and speed up processes.
- **Serving as representative:** Government policies have a strong influence on the emergence and growth of local industries (Karnani, 2007, p. 107). However, small businesses (including cocoa farmers) are often not or only loosely-organized and struggle to make their interests heard. Here, a powerful economic actor like the national Nestlé subsidiary, could empower industries by representing their interests at policy level and by lobbying on their behalf. As an example, land tenure in Côte d'Ivoire is directly linked to the issue of nationality, obstructing big proportions of small scale farmers from accessing credits for fertilizers or better yielding crops (Cocoa Barometer Consortium, 2015, p. 15). By working together with government officials, Nestlé could not only increase productivity of their farmers, but would also strengthen local entrepreneurs and emerging industries in the project area

4. Motivation to invest

After discussing how the project should be redesigned to make it more sustainable, we will investigate why Nestlé invested in the project in the first place, and why it should consider to (partly) finance the proposed changes. Therefore, we will first examine the Creating Shared Value [CSV] approach, a business concept built around the premise that the competitiveness of a company and the health of the communities around it are mutually dependent (Chapter 4.1). In Chapter 4.2, we will then break down Nestlé's interpretation of the CSV concept, and examine their methodology (Chapter 4.2.1), how this methodology translated into specific initiatives (Chapter 4.2.2), and the impact and public perception of these projects (Chapter 4.2.3). In a next step, we expand our understanding by examining actor involved in the cocoa to chocolate value chain (4.3.1) and shortly delving into the historic development of the market (Chapter 4.3.2), before studying today's landscape and the dynamics within and between the different links of the value chain (Chapter 4.3.3). Finally, in Chapter 4.4, we will bring the two pieces – CSV as a concept and how the cocoa-chocolate chain evolved into its current state – together and present a short glimpse into the future. We argue, that, because the underlying motivation and reasons inter alia bringing Nestlé to finance the visited project still apply, it could make sense for the Swiss multinational to (at least partially) finance the implementation of the suggestion proposed in this paper.

4.1. CSV as a concept

Creating Shared Value [CSV] as a concept emerged from a series of articles written by Michael Porter and Mark Kramer, two world-renown business strategists. With their famous article *The big Idea – Creating Shared Value*, Porter & Kramer (2011, p. 4) set themselves the high goal of reinventing capitalism, arguing that this task was made necessary by businesses being increasingly viewed "as a major cause of social, environmental, and economic problems. […] Even worse, the more business has begun to embrace corporate responsibility, the more it has been blamed for society's failures. The legitimacy of business has fallen to levels not experienced in recent history. This diminished trust in business leads political leaders to set policies that undermine competitiveness and sap economic growth. Business is caught in a vicious circle". The development of CSV, however, began more than a decade earlier, with work from several authors focusing on the nonprofit sector and examining how foundations can create social value. Over time, the focus shifted to how corporate philanthropy can create both social and economic value, thereby introducing that using social programs should parallelly enhance competitiveness, a notion central to CSV (Crane, Pallazzo, Spence, & Matten, 2014, p. 131). By 2006, this discourse evolved into a debate of how to integrate *Corporate Social Responsibility* [CSR] into the core business of a corporation and CSV as a term emerged for a first time in an essay called *Strategy & Society – The Link Between Competitive Advantage and Corporate Social Responsibility* by Porter & Kramer (2006). The CSV concept is built around a simple formula, which promises to create shared value by systematically linking for profit thinking with social concerns, defined as "policies and operating practices that enhance the competitiveness of a company while simultaneously advancing economic and social conditions in the communities in which it operates" (Porter & Kramer, 2011, p. 6). When delving deeper into CSV, Porter & Kramer emphasize three ways companies can create economic value by creating societal value:

- **Reconceiving products and markets:** The first area where companies can create shared value is by innovating their products or distribution methods to meet needs in underserved markets. Meeting these requirements can in turn trigger fundamental innovations, that also have application in a company's traditional market. As an example, Porter & Kramer inter alia cite the example of Vodafone's M-PESA service in Kenya, providing mobile banking services to poor

people. As noted by Porter & Kramer (2011, pp. 7–8), this first way of creating shared value is inspired by Prahalad & Hart's (2002) idea of serving the bottom of the pyramid by redesigning products and involving poorer communities in the value chain.

- **Redefining productivity in the value chain**: This area for creating shared value is built around the congruence between societal progress and productivity, and the conviction that societal problems inflict costs in the firm's value chain. Through enhanced resource utilization, process efficiency and quality, better technology can bring major improvements for a company and its stakeholders. Porter & Kramer (Porter & Kramer, 2011, pp. 8–11) especially emphasize the importance of productivity and the potential to reduce costs through improved energy use and logistics, resource use, procurement, distribution, employee productivity and local production.
- **Enabling local cluster development**: Companies are affected by the communities, supporting entities and infrastructure around it. Productivity and innovation in such a network are strongly influenced by clusters of firms, related businesses, suppliers and services providers, and the infrastructure and framework conditions (such as academic programs, trade associations or standards organization) available. Companies aware of this interconnectedness can create shared value and increase their productivity by building or strengthening a cluster, or by overcoming gaps in the infrastructure and framework conditions (Porter & Kramer, 2011, pp. 12–15)

Box 6: The main conceptual benefits and weaknesses of CSV

+ One of the big achievements of CSV (as compared to earlier concepts also dealing with societal ramifications caused by private corporations) is that it succeeded to gain a substantial following of practitioners. The most cited explication for this success are the authors' reputation in the field of strategic management, their ability of conceptualizing an organizations social responsibility in appealing managerial language, and the carefully chosen audience by publishing the article in the Harvard Business Review (Beschorner, 2013, p. 108; Crane et al., 2014, p. 132). These factors are especially important for people working on advancing social causes within companies. Often faced with resistance and seen as a factor causing costs, being able to fall back on a concept designed by world renown business strategists strengthens their position. Additionally, and due to its vague nature (a feature that is sometimes cited as one of the concepts' biggest weaknesses), CSV can serve as an umbrella concept capturing a broad variety of frameworks seeking to re-embed capitalism within society (such as CSR, non-market strategies, social entrepreneurship, social innovation, BoP etc.) and makes it accessible to a broad range of people (Crane et al., 2014, p. 133).

+ As a core proposition, CSV activities must present themselves as a win-win for the corporation and its stakeholders. By showing that the problems it tackles do not have to be disconnected from a firm's core business or externally imposed, social goals get unequivocally elevated to a strategic level (Crane et al., 2014, p. 132). Instead of proposing a defensive concept that strives to minimize reputation risks, corporations are encouraged to use their abilities, resources and management capabilities to help society progress (Beschorner & Hajduk, 2015, p. 230), which in turn helps them with being perceived as a valid part of society. CSV as a solution to this challenge seems convincing for practitioners and scholars alike (Crane et al., 2014, p. 133), and brings some much-needed inputs and a specific conceptual framework to debates about *caring* or *conscious* capitalism. As written in the last point, people pushing for more social responsibility usually face resistance when proposing new initiatives because of their financial implications. Reframing the social question as a win-win can help them tip the scale towards action.

- Porter & Kramer (Porter & Kramer, 2011, p. 6) define shared value as any policy or operating practice, which enhances "the competitiveness of a company while simultaneously advancing economic and social conditions in the communities in which it operates". While looking intuitive at a first glance, its components reveal conceptual flaws and tensions that are difficult to reconcile. Porter & Kramer state that shared value is not "about sharing the value already created by firms […]. Instead, It is about expanding the total pool of economic and social value" (2011, p. 5). Following this statement, any business activity adding economic value could be understood as shared value creation. But without further defining what counts as social value, the quantification of shared value remains an arbitrary judgement. This vagueness leaves broad margins for companies to define shared value on their own and critics complain that initiatives tend to "focus on particular win-win project with high economic returns but neglect the true underlying social or environmental problems" (Von Liel, 2016, p. 168). This shortcoming is exacerbated by the competitiveness imperative behind CSV. Profit maximization is kept as the superseding goal of the company, while societal progress is only perceived as a vehicle to become more competitive over the long run. When faced with limited resource, firms will conceivably prioritize projects that improve their competitiveness the most (Beschorner, 2013, p. 109; Crane et al., 2014, p. 152). Overall, this deficiency shows that the authors do not want to admit that shared value creation also contains re-distributional consequences for an economy and, where social and economic outcomes are not aligned, CSV does not provide guidance. Given their line of argumentation, Porter & Kramer would need to answer that all business practices are appropriate, as long as they comply with legal standards and do not harm performance in the long run, and as long as the business gains sufficient legitimacy in eyes of its stakeholders (Beschorner, 2013, p. 110). In practice, however, many corporate decisions related to social and environmental problems do not present themselves as win-wins, but rather in terms of dilemmas, with colliding worldviews, identities, and values. Activists fighting for the abolition of child labor, for example, will perceive any kind of compromise as a sellout and threat to their identity (Crane et al., 2014, p. 136). In the end, corporations are incentivized to satisfy the most important stakeholders, without being forced to consider (potentially justified) claims of other stakeholders (Beschorner, 2013, p. 110; Beschorner & Hajduk, 2015, p. 222). And given the complexity of social and environmental problems, this might simply drive corporations to invest more in easy problems and decoupled communication strategies (Crane et al., 2014, p. 137).

- In one of their earlier essays, Porter & Kramer (2006, p. 80) acknowledge that, if applied correctly, CSR "can be much more than a cost, a constraint or a charitable deed – it can be a source of opportunity, innovation, and competitive advantage". This statement is surprising, especially after reading their 2011 article. While CSV is presented as a joint value creation where both company and community win, CSR is portrayed as mostly reactionary and reputation focused philanthropy, with little connection to a company's core business and incompatible with profit maximization. Many critics pointed out that this is an incomplete perception of CSR, and only true if one neglects the conceptual developments made over the years, with strategic CSR literature stipulating that CSR can yield substantial business-related benefits for the firm while satisfying the demands from multiple stakeholders (Beschorner & Hajduk, 2015, p. 221; Burke & Logsdon, 1996, p. 496; Crane et al., 2014, p. 134). Overall, it appears that Porter & Kramer (intentionally) fail to give due acknowledgement to and do not engage in the nuances of ideas that preceded CSV. This critique does by no means invalidate the advantages of their concept described above. While distancing themselves from concepts such as CSR might be a strategic move – the authors inter alia prevent using normative terms, such as responsibility or justice, a linguistic change allowing a skeptical mainstream to adapt CSV (Beschorner & Hajduk, 2015, p. 221) – presenting CSV as a completely

novel contribution to the discussion (instead of an incremental further development and fusion of already existing concepts) seems dubious and questions the authors scientific honesty.

- A third substantial restriction of CSV is the question about its impact, or how much it can contribute to the reshaping of capitalism and its relationship to society. First, not all societal demands meet a corresponding supply. This is especially true in cases where there is no market or quantifiable utility for a good, or where consumers cannot afford to pay the (full) price for social goods or services. Porter & Kramer (2011, p. 14; 17) admit that "not all societal problems can be solved through shared value solutions", but believe that the principle of shared value will help to overcome the divide of responsibilities between businesses and governments, and expect the latter to solely contribute by creating an institutional framework that increases efficiency for businesses. This limited government role is built on the assumption that corporations will comply with legal and moral standards. However, reality showed that, even if companies are seriously committed to reduce social problems in their supply chain, compliance remains a serious challenge especially in contexts where governments are unable or unwilling to enforce violations (Crane et al., 2014, p. 140). Second, even if we assume that the value to be added can be clearly defined, it might be that firms and society have different (and sometimes competing) economic and social interests. While Porter & Kramer do not directly address this question, they admit that "some companies will surely continue to reap profits at the expense of societal needs", but immediately counter that "such profits will often prove to be short-lived" and that "shared-value focuses companies on the right kind of profits" (Porter & Kramer, 2011, p. 17). They however fail to demonstrate how this will happen, and fail to discuss the possibility that working towards one social value might harm a distinct set of stakeholders/the same stakeholders in another way; Crane et. al (2014, pp. 137–138) for example evoke the example of a company producing recyclable guns. Porter & Kramer's answer to the underlying question – who should decide which social needs have to be satisfied within a society and according to what criteria? – is that businesses are more effective than other actors (especially governments and non-profit organizations) at marketing products and services that increase social value (Porter & Kramer, 2011, p. 7). However, while such a role for businesses within society may indeed increase the social value in absolute terms, it does not address the questions of inclusiveness, democratic legitimacy and a potential crowding-out effect of state intervention in the social sphere (Matten & Crane, 2005, pp. 175–176).

4.2. Nestlé's CSV interpretation

After reading about the CSV approach, this Chapter will show how Nestlé translates the theory into practice, an illustrative example to examine this adaptation process. First, Nestlé is the world's largest food and beverage company, with goods sold worth nearly 90 billion USD in 189 countries and in 2015 alone. Overall, its agricultural raw material sourcing totals at approximately 21.67 billion USD each year. To make these abstract numbers graspable: Of the 30'000 cups of coffee sipped around the world each second, one-fifth are estimated to be cups of Nescafé (The Economist, 2017b, p. 47). The sheer scope of its operations however also entail vulnerability. Pursuing 5-6% annual growth – a target internally defined as organic growth – would mean about 120'000 additional hectares of land needed for sourcing in any given year (Goldberg & Fries, 2013, p. 5). Second, Nestlé was one of the first companies to implement the CSV concept. When CSV as a concept was coined for the first time by Porter and Kramer in 2006, the authors started to work with Nestlé as external consultants. This cooperation led to Nestlé's 2006 report on creating shared value in Latin America, and from 2008 onwards, to biannual, company-wide CSV reports (Crane et al., 2014, p. 131).

4.2.1. Methodology

In their *Nestlé in Society - Creating Shared Value and meeting our commitment* reports[4] [or short: CSV reports], Nestlé works with a formal materiality process to identify the issues that matter most to their business and stakeholders, a tool designed to gather insight on the relative importance of specific environmental, social and governance issues. The findings are used to define 19 Materiality Issues, each with associated goals, and risks and opportunities for Nestlé's reputation, operations and finances (King, 2013; Nestlé S.A., 2016c, p. 8). Below, we see the synthesis of the value chain analysis for the materiality issue *Rural Development:*

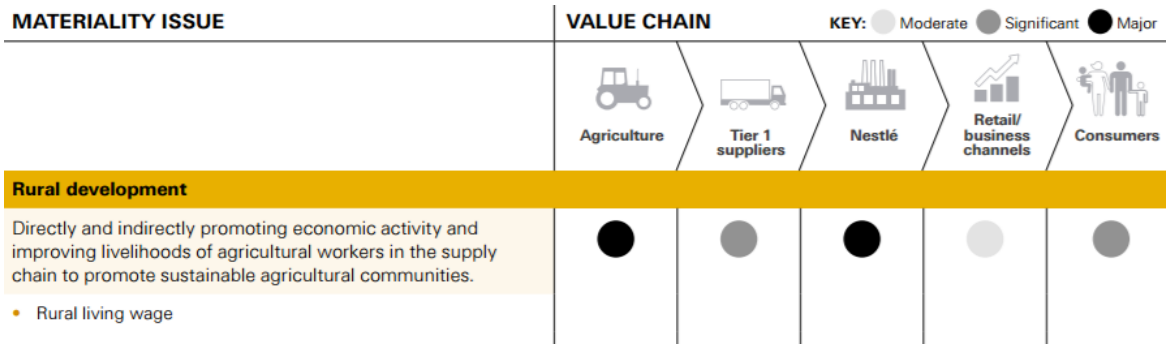

Figure 13: Nestlé's Materiality Issues. The importance is defined for of each step in the value chain, using a scale ranging from moderate, over significant to major. Agriculture also includes smallholder farmers with whom Nestlé does not have direct relationships, while Tier 1 refers to suppliers in direct commercial relationships with Nestlé. Source: (Nestlé S.A., 2017, p. 14)

The 19 material issues are then summarized and mapped in the Nestlé materiality matrix, showing the degree of concern for stakeholders on the y-axis, and the impact on Nestlé on the x-axis:

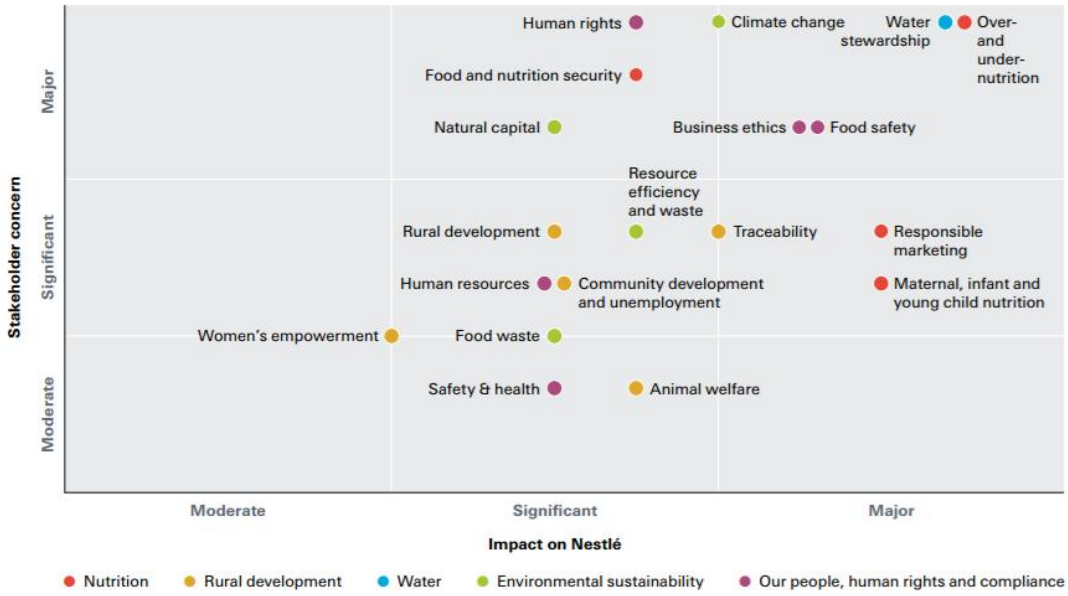

Figure 14: Nestlé materiality matrix Source: (Nestlé S.A., 2016c, p. 8)

[4] As the full 2016 *Nestlé in Society - Creating Shared Value and meeting our commitment* report was not released at the time this thesis was written, the following Chapter will be a combination of the 2015 CSV report (Nestlé S.A., 2016b) and the summary of the 2016 report (Nestlé S.A., 2017).

In a next step, the issues are organized under six CSV sub-categories: **Nutrition**; **Rural Development**; **Water**; **Environmental sustainability; Our people, human Rights and Compliance**, marked with assorted colors in Figure 14. These sub-categories are then translated into 42 commitments, which are publicly updated and reported upon on an annual basis. Extensive internal reviews in 2015, for example, lead Nestlé to expand its then 39 commitments by three.

Figure 15: Commitments taken on in the 2016 CSV report Source: (Nestlé S.A., 2017, pp. 10–11)

Every commitment is then explained in depth in the CSV report, and Nestlé reports on initiatives it took and the progress up to date, before presenting objectives to be achieved by 2020.

4.2.2. Translation into specific initiatives – cocoa production in Côte d'Ivoire

In this Chapter, we examine how the commitments presented in the previous Chapter are translated into specific, by looking at the example of the cocoa value chain in Côte d'Ivoire and at the objectives formulated for 2020. While most of the six CSV sub-categories touch upon Nestlé's cocoa value chain, CSV activities in this area happen mostly around the two core topics **water** and **rural development:**

Engage with suppliers, especially those in agriculture

Throughout its sourcing activities in Côte d'Ivoire, Nestlé acts to reduce water usage in its agricultural supply chain by introducing better agricultural techniques at farm level (including waster efficiency and quality, drought and flooding resilience, wastewater and organic waste treatment, and farm intensification methods). Part of this training is done through the Cocoa plan, part through workshops organized in the context of the *Sustainable Agriculture Initiative at Nestlé* [SAIN; see Box 7]. Additionally, Nestlé's research and development teams support the selection and propagation of drought-resistant cocoa plantlets (Nestlé S.A., 2017, p. 31; see Chapter 5.2).

Raise awareness on water conservation, and improve access to water and sanitation across our value chain

The project we visited in Côte d'Ivoire is Nestlé's local interpretation of their commitment to improve access to water and sanitation. While normally mostly focused on providing Water, Sanitation and Hygiene [WASH] services for their workers at Nestlé premises, this specific case focuses on farmers upstream in their supply chain (Nestlé S.A., 2017, p. 31).

Roll out rural development baseline assessments to understand the needs of farmers

Diagnostic tools such as the Response-Inducing Sustainability Evaluation [RISE] and the Rural Development Framework [RDF] help analyze needs of farmers delivering agricultural inputs to Nestlé, and make sure that Nestlé follows a consistent approach to rural development and that all CSV activities assess significant issues on the ground. The tools were first developed for the coffee supply chain, then rolled out to other categories (Nestlé S.A., 2016a, 2017, p. 24).

Improve farm economics among the farmers who supply us

Nestlé works with and is dependent on farmers to source safe and high-quality raw materials. One of the key factors for this is farm economics – the idea, that farms need to generate enough income to enable farmers a decent living and to retain young farmers. Based on the results from the RDF, Nestlé aims to improve farm economics in Côte d'Ivoire and six other priority sourcing locations. Through programs like the Nescafé Plan and the **Cocoa Plan**, they launched various projects focusing on productivity, quality, costs and price premiums (for example various fora in Côte d'Ivoire to empower women in agriculture) (Nestle S.A., 2017, p. 24).

Improve food availability and dietary diversity among the farmers who supply us

This commitment aims to tackle the fact that farmers and their families sometimes have insufficient food or dietary diversity for themselves, leading to health and other problems. In 2016, Nestlé was part of a study to gather nutritional information on Côte d'Ivoire and Ghana, and based on these insights and the RDF baseline, they are training farmers on nutrition, promote intercropping, and help farmers develop and maintain kitchen gardens and livestock (Nestlé S.A., 2017, p. 24).

Implement responsible sourcing in our supply chain and promote animal welfare

To work towards traceable and responsibly sourced ingredients, Nestlé defined its 12 priority categories – the raw ingredients Nestlé sources in the largest quantities or which are most important for their business – and set the goal, that by 2020, 80% of resources sourced directly (Tier 1) must be from externally audited suppliers compliant with the Nestlé Supplier Code (establishing standards such as minimum age and safety requirements). Of raw materials sourced from upstream suppliers (with whom Nestlé does not have a direct relationships), 80% needs to be traceable and 70% in line with the *Responsible Sourcing Audit Programme*, a nearly industry-wide protocol with external audits conducted by partners such as the World Wildlife Federation or Greenpeace (Goldberg & Fries, 2013, pp. 10–11; Nestlé S.A., 2017, p. 25).

Roll out the *Nestlé Cocoa Plan* with cocoa farmers

The Cocoa Plan is Nestlé's main conceptual tool to "improve the livers of farmers and their communities" and encompasses many of the activities seen above. The plan is equipped with 110 million USD for the period between 2010 and 2019 and structured around three pillars: **Better Farming**, the efforts to improve productivity and increase income of farmers. Under this pillar, Nestlé for example researched, grew and distributed 2.2 million higher yielding saplings free of charge, with the goal of distributing 12 million by 2019 (See Chapter 5.2). **Better Live**, a pillar focusing on social aspects and interactions, under which the company inter alia tackles the issue of child labor. Nestlé for example set up the *Child Labour Monitoring and Remediation System* [CLMRS] in partnership with the *Fair Labor Association* [FLA] and the *International Cocoa Initiative*. They furthermore built or refurbished 40 schools in Côte d'Ivoire alone, based on the logic that the opportunity costs of child labor increase with access and quality of schools. Additionally, this pillar encompasses a wide variety of initiatives, for example the WASH project at the core of this thesis or projects around gender issues. The third pillar is **Better Cocoa,** the plan to drastically increase the purchase of cocoa through the Nestlé Cocoa Plan (as opposed to sourcing through other channels). Nestlé increased cocoa purchases through the plan from 15'000 tons in 2010 to 140'933 tons in 2016 (adding up to 34% of total purchases), and plans to increase this number to 230'000 tons by 2020 (Goldberg & Fries, 2013, p. 9; 14; Nestlé Cocoa Plan, n.d.; Nestlé S.A., 2016c, p. 7; 121-122, 2017, p. 26; Swinnen & Squicciarini, 2016, p. 82).

Box 7: The complicated world of (partly-overlapping) sustainability programs in the cocoa industry

As seen above, Nestlé's CSV endeavors resulted in a net of interconnected and partly overlapping initiatives. Other actors from within the industry also became active over the last decade, resulting in a multitude of programs with similar aims and names. In this box, we will present and structure a selection of the most important and far-reaching initiatives within the cocoa-chocolate value chain:

First, there are several **initiatives from within the food and chocolate industry**. The World Cocoa Foundation [WCF] – an international membership organization promoting sustainability in the cocoa sector – for example launched **CocoaAction** in 2014. The plan aims to conduct trainings for 300'000 farmers by 2020, with a special focus on increasing their productivity and improving the situation of women and children in cocoa. The initiative serves as a platform and brought together twelve of the biggest multinationals in the industry – Archer Daniels Midland Company [ADM], Armajaro, Barry Callebaut, Blommer Chocolate Company, Cargill, ECOM Agroindustrial, Ferrero, The Hershey Company, Mars Inc., Mondelēz International, Nestlé and Olam International (Cocoa Barometer Consortium, 2015, pp. 15–16). Another example is the **Sustainable Agriculture Initiative [SAI]**, a platform to facilitate knowledge-sharing and to promote sustainable agriculture practices. This process started with the *Sustainable Agriculture Initiative at Nestlé* [SAIN], a program to encourage good agricultural practices among its suppliers. After recognizing that most barriers to sustainable agriculture

are systemic, Nestlé created the SAI together with Unilever and Danone in 2002. In 2017, the platform already comprises of 72 active members, including big brands such as Coca-Cola, PepsiCo, General Mills, Kraft and McDonalds (Goldberg & Fries, 2013, p. 7; SAI Platform, 2010).

As a next form, there are several initiatives by a single **corporation/a partnership of a few companies**. If we look at the example of Nestlé, the company structured its SAIN activities around their highest-volume agricultures materials; coffee, cocoa, milk, and vegetables and grain. Over time, the company constructed plans, targets and tools for more sustainable sourcing in each of these value chains, resulting in corporate initiatives such as the Nescafé Plan, the RISE tool for dairy production and the **Nestlé Cocoa plan**.

Another form to increase sustainability are **platforms for public private partnership or civil society initiatives**, often working on specific issues, and bringing together national development agencies and civil society organizations (mostly from consuming countries with corporations present in the value chain). One famous example is the **Cocoa Barometer Consortium**, a coalition of NGOs working to bring extensive certification into the cocoa production, closely monitoring business practices and publishing the annual *Cocoa Barometer* (Mugglin, 2016, p. 25). At the same time, there are many individual NGO's engaging in advocacy work, implementing programs in producing nations and helping farmers to launch networks of cooperatives. Additionally, most producer countries are in the process of setting up National Cocoa Development Plans [NCDP]. While these approaches differ widely, many encompass a wide range of sustainability issues and social measures (Cocoa Barometer Consortium, 2015, p. 11).

On the **consumer side**, there are many different national initiatives toward sustainable cocoa, with differing goals and pathways. While the multi-stakeholder forum in the Netherlands is aiming for 100% sustainable consumption by 2022, the German Initiative on Sustainable Cocoa is committed to at least 50% certified consumption by 2020. Other countries, such as Belgium and Switzerland, are less progressed in creating multi-stakeholder initiatives, and there is still no significant public debate in countries such as the United Kingdom, France or Italy (Cocoa Barometer Consortium, 2015, p. 14). At this point in time, the only real action from the American government seems to be the *Child Labour Cocoa Coordination Group* [CLCCG], an initiative in cooperation with the Ivorian and Ghanaian governments.

Overall, a variety of initiatives with social and sustainability goals are active within the cocoa industry, often with similar-sounding names and goals, and cases where they clearly overlap. Additionally, most programs reach only a fraction of all cocoa farmers they target, and multi-corporation initiatives often cover mostly farmers already included in individual members' own programs. Besides, critics argue that initiatives are usually not ambitious enough. CocoaAction's members, for example, control most of the world's chocolate market, making the goal of reaching 300'000 farmers less ambitious (Cocoa Barometer Consortium, 2015, p. 17). Nevertheless, there was much progress towards sustainability and social production methods, and many promising initiatives emerged over the last years. For them to have a holistic impact, it will be crucial that we see ever-more consolidation and streamlining, and that the different actors make use of synergies and come together for multi-stakeholder dialogues.

4.2.3. Impact and public perception

In 2014, Monique van Zijl publicly stated that "by adopting and implementing policies that hold suppliers to account for zero tolerance for land grabs, the food giant [Nestlé] will be able to assure consumers that its suppliers are not driving communities, farmers, or indigenous peoples off their land. Moreover, through using its convening power to collaboratively tackle land rights with other stakeholders, it is stepping up as a true land rights champion" (OXFAM Blog, 2014). Coming from an OXFAM's campaign manager – an organization, which harshly criticized Nestlé and many other multinationals in the past – this quote might

surprise people not familiar with Nestlé's development over the last years. Contrary to the widespread negative public perception (at least in Switzerland, home country to both Nestlé and the author of this thesis; see Chapter 6.1.2), the multinational repeatedly scores good grades in rankings analyzing the social and environmental impact (or improvement) of big food and beverage companies. In OXFAM's *Behind the Brand* ranking, for example, they consistently earned the highest score of all multinationals, only to have been overtaken by Unilever in March 2016.

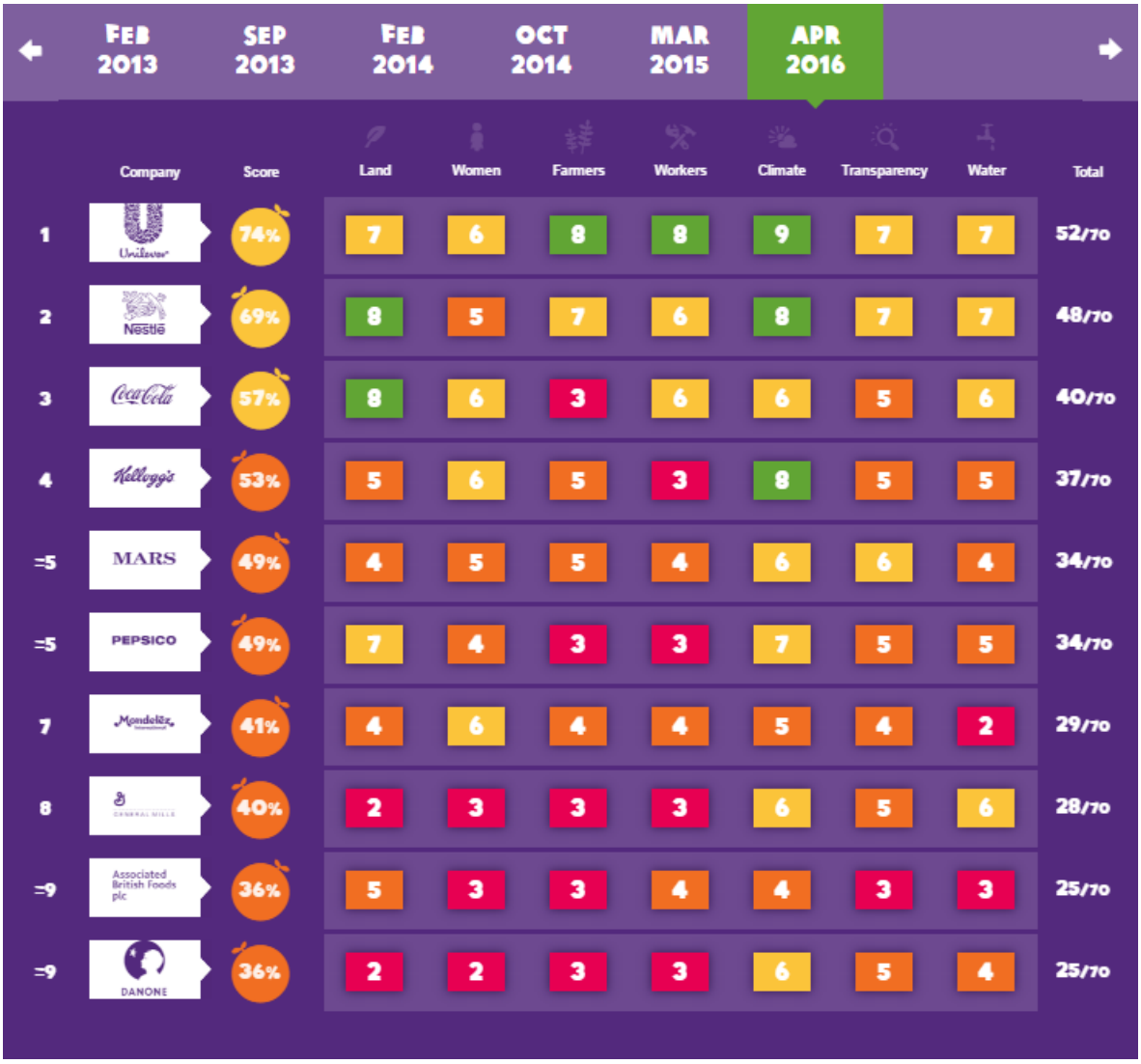

Figure 16: OXFAM's Behind the Brand Scorecard. The annually appearing ranking evaluates each food and beverage multinational's impact in seven categories – land rights, access and sustainability of usage; women's rights in the supply chain; support for small-scale farmers growing the commodities; rights of farm workers in the supply chain; climate change mitigation and adaptation commitments; transparency at a corporate level; and water rights, access to water and sustainable use of it – and gives each company a grade on a scale from 1 to 10, resulting in an potential overall best score of 70 points. Source: (OXFAM International, 2016a, 2016b)

In another analysis by Swinnen & Squicciarini (2016, pp. 80–81), comparing the 18 members of Chocosuisse (Switzerland's main association of chocolate producers) on their commitment towards transparency, sustainability, certification, abolition of child labor, and whether they have a comprehensive

CSR (or CSV) strategy and reporting, Nestlé scored 7 out of nine points, and was only beaten by Barry Callebaut and Mondelez[5].

Overall, it can be said that Nestlé gets a lot of credit for their CSV activities from civil society organizations and think tanks, and that rankings comparing different companies' initiatives towards sustainability and social fairness generally attest Nestlé to be an "[…] industry leader in sustainability and in making its operations more sustainable, both in the chocolate sector and other products" (Swinnen & Squicciarini, 2016, p. 82). These rankings do by no means signify that Nestlé has no room for further improvement, but are signs of a more productive dialog between civil society organizations and the multinational in question, an interaction in the past mainly characterized by harsh criticism, threats and legal battles, and (sometimes empty) promises. One of the most famous cases illustrating this change in discussion culture is the fight against child labor on cocoa plantations:

Box 8: Changing discussion culture and the role of CSV – the example of Child Labor

In response to a 2001 BBC report denouncing "slave-like working conditions" of up to 15'000 children on plantations in Côte d'Ivoire and Ghana, United States Senator Tom Harking and Congressman Elliot Engel demanded that all cocoa imports to the United States henceforth come from child-free production. Fearing to lose the 13 billion USD strong market, the World Cocoa Foundation and the Chocolate Manufacturers Association agreed on the so-called Harking-Engel Protocol, promising to create a transparent certification system, which would in turn guarantee that products containing cocoa beans would be produced without (the worst forms of) child-labor. In addition, several multinationals including Nestlé sat together with unions, consumer and human-rights organizations and founded the International Cocoa Initiative, aiming to promote responsible labor standards for the sector. But despite these efforts and promises, a new BBC reportage in 2005 showed that nearly nothing changed (Mugglin, 2016, pp. 17–19) and as a result, the human rights organization *Global Exchange* filed a lawsuit in the United States against Nestlé, ADM and Cargill on behalf of former child laborers (Chacon, 2005). In response and in coordination with the civil society, the big industry players requested an extension for their deadline and promised to source 50% of cocoa without the use of child labor by 2008. After missing this target, the cocoa industry promised a full-fledged certification system for cocoa from Côte d'Ivoire by 2010. Ensuing inaction lead once again to a new agreement, promising to reduce the worst forms of child labor by 70% by 2020 (Mugglin, 2016, pp. 19–20), thereby finally digressing from the promise of child-labor free cocoa. Part of the agreement was an action plan demanding transparency how corporations participate financially in the fight against child labor and the promise to henceforth engage in an open discourse about shortcomings.

Even though the 2010 documentary *The Dark Side of Chocolate* revealed that not much had changed by then, the new-found openness led to a significantly improved discussion culture within the industry. While players like Cargill or Mars decided to wait for the storm to pass, Nestlé and the International Cocoa Initiative started to openly admit shortcomings, while conceding that they cannot guarantee the complete eradication of child labor (Mugglin, 2016, pp. 20–21). One year later, Nestlé – as the first food and beverage group – applied to join the Fair Labor Association [FLA], an international initiative striving to improve working conditions globally. To be accepted, an applying corporation needs to comply with the so-called *Workplace Code of Conduct*, based on the standards defined by the *International Labour Organization* [ILO]. These standards inter alia guarantee fair payment for workers, freedom of association and the right to collective bargaining, and prohibit child- and forced-labor, and

[5] The analysis in question however uses dichotomous variables (assigning a score of 1 for a category where the corporation is active in some form or 0, when a company did not take or communicate any action), undermining its meaningfulness and explaining the big differences to the *Behind the Brand* ranking seen above.

discrimination on the basis of race, color, sex, religion, political opinion, and national or social origin (International Labour Organization, 2017; Mugglin, 2016, pp. 21–22). After the first visit of FLA inspectors in 2012 revealed that child labor was still widespread on Nestlé farms in Côte d'Ivoire , José Lopez (Executive Vice President and Chief Operations Officer at that time) famously stated that "the use of child labour in our cocoa supply chain goes against everything we stand for. As the FLA report makes clear, no company sourcing cocoa from Côte d'Ivoire can guarantee that it doesn't happen, but what we can say is that tackling child labour is a top priority for our company" (Nestlé S.A., 2012). Two reports later, the FLA still found child labor, insufficient health care facilities and an under-representation of women in leading positions within local cocoa cooperatives. However, instead of publicly denying these allegations, Nestlé immediately admitted the shortcomings, and reacted by inter alia introducing new surveillance systems and trainings. Nevertheless, in 2016, a consumer protection law firm filed a class-action lawsuit against Nestlé and other chocolate producers, and the US Supreme Court started to look into another lawsuit by Malian plaintiffs (Mugglin, 2016, pp. 23–24).
Overall, the way how Nestlé reacts to and communicates problems in their value chain changed drastically. Instead of deflecting and giving empty promises, the multinational managed to establish a culture of open discussion, now allows independent examinations and managed to achieve incremental, but positive results. However, the problem of child labor in cocoa plantations still exists and Nestlé will probably not be able to abolish these practices in the next years, and definitely not by themselves. In the past years, the governments of both Ghana and Côte d'Ivoire have made steps to combat child labor, approaching it through a regional angle and collaborating with the civil society and trade unions. While the issue seems to be more open for discussion at the level of policy makers, doing so seems to remain difficult at community level. A major reason for this is the confusion between child labor – which is forbidden in both countries and defined by the ILO as work, that a) deprives children of their potential and their dignity, b) deprives them of their childhood and c) is harmful to physical and mental development – and child work. Many critics argue that banning the latter (children occasionally helping on the farm of their parents, given that this practice does not conflict with the child's education and development) could in fact put the child at a disadvantage. It is for example difficult to argue why children should not be allowed to help their parents by taking over easy tasks during school holidays (such as sorting out low quality beans with their older siblings). I personally believe that this issue is not as black-and-white as usually portrayed and, while we need to do everything to prevent child labor, we as consumers and members of the civil society should be careful to condemn practices in distant countries without knowing the local conditions. When discussing this issue, members from within the industry often raised the same concerns and admitted being unsure whether eradicating all forms of child labor (including child work) is meaningful and feasible. However, being a representative of a leading multinational, they will never be able to admit this publicly and ensured us that they will continue fighting to end every form of child labor.

While many issues in the cocoa value chain (such as poverty, gender discrimination, dismal working conditions and the worst forms of child labor) are still existent and in need of improvement, Nestlé (and many of its competitors) now openly admits deficiencies, commits to improve upon them and makes first steps in the right direction. However, due to a lack of independent third-party evaluations, it is nearly impossible to properly assess the impact of individual companies' initiatives. This can be partly explained the unwillingness to report on sensible data and precarious conditions within their value chains. The companies usually report success stories in their annual reports, without going in debt on failures and lessons learned from faced challenges. A regularly shared concern is that the publication of negative outcomes will lead to harsh and unnuanced criticism by non-governmental organizations and the media. However, without exchanging best and worst practices, a lot of time and money is wasted in approaches that have already produced insufficient (or sometimes counterproductive) results. Therefore, Nestlé's

publications of evaluations and corrective actions through their partnership with the Fair Labour Association are a major step forward, albeit only covering a small part of their cocoa supply chain (Cocoa Barometer Consortium, 2015, p. 16). Generally, larger companies are more likely to be involved in transparency and social initiatives than smaller or medium-sized enterprises (such as e.g. local chocolatiers). This could be due to a lack of knowledge or money to invest in such activities within small companies, or the fact that their bigger counterparts are under intense scrutiny. Overall, Nestlé and many other companies are making steps in the right direction, however, it seems that collective industry initiatives do not have the impact in producing countries necessary for a true transformation of the cocoa sector (Cocoa Barometer Consortium, 2015, p. 16; Swinnen & Squicciarini, 2016, p. 79) – at least for now.

4.3. Cocoa market - necessity to improve productivity

After examining the CSV approach and Nestlé's interpretation, we will examine the cocoa value chain and market, and the dynamics between actors involved. As with any product or industry, the cocoa value chain differs depending on the specific country and on dynamics in the global market. Nevertheless, to reduce complexity and to gain a basic understanding of this convoluted environment, we first examine an abstracted, stereotypical cocoa value chain (Chapter 4.3.1), before delving into market power dynamics and developments (Chapter 4.3.2), and today's landscape (4.3.3).

4.3.1. The cocoa-chocolate value chain

Broadly speaking, the typical cocoa-chocolate value chain consists of nine actors: The first link in the value chain is the **farmer** growing and harvesting the pods (fruits containing 20-50 beans). After extraction, the beans are cleaned, fermented and sun-dried. Afterwards, the cocoa is transported to local collection points and **cooperatives**. Sometimes, local traders serve as intermediaries and transport the goods to **international transport companies** stationed at national ports, more often, these companies acquire the raw materials directly at the level of cooperatives and ship them to major processing ports outside the country. Depending on the **national government**'s policies, the tax authorities (often represented through the marketing boards; *Le Conseil du Café-Cocoa* in Côte d'Ivoire) collect their share based on the Free on Board [FOB], the price for a ton of cocoa when loaded on a ship in the producing nation's port. **Traders** – often the same companies transporting the cocoa – then buy and sell cocoa, both in physical form or on commodity exchange markets. At destination, the cocoa is cleaned and warehoused at the port, or transported directly to **processing facilities**. There, the nibs (cocoa beans without shells) are roasted and grinded into a paste called cocoa mass[6] (or cocoa liquor). This mass is then pressed, leading to cocoa butter (extracted fat) and cocoa cakes (no-fat cocoa material, can be pulverized into cocoa powder). After being transferred to **manufacturers**, they combine cocoa butter and powder, sugar (and additional ingredients, such as milk powder for milk chocolate). In a next step, they then conche (knead and smoothen) the mixture and turn it into couverture (an intermediate chocolate product, which can exist in liquid form or in blocks), before processing the couverture into its final form and shipping it to **retail** and **consumers**

[6] Due to their similar sounding name and properties, the terms cacao and cocoa are mostly used interchangeable. Technically speaking, the terms allow to deduce the degree of processing the (once) raw material went through. It isn't until after the cacao beans are roasted and processed that they are called cocoa (Newberry, 2015). However, in everyday use, the term cocoa clearly made the race and is used almost exclusively by most organizations in the field (including Nestlé). For simplicity reasons and because this paper analyses the market for cacao beans that are purchased for processing, throughout this paper we will refer to all forms on the cacao-cocoa-chocolate value chain as cocoa.

(Cocoa Barometer Consortium, 2015, pp. 29–34; Swinnen & Squicciarini, 2016, pp. xxv–xxvi; World Cocoa Foundation, n.d.).

	Purchase price (USD)	Sales (USD)	Value Added (USD)	Contribution to Total Value Added (%)	Profit (USD)
Farmers	664	1'874	1'210	6.6	1'210
National Transport	1'874	1'971	97	0.5	?
International Transport	1'971	2'219	248	1.4	?
Taxes/Marketing Board in producing country			774	4.2	?
Traders	2'993	3'038	45	0.2	?
Processors & Grinders	3'038	4'434	1'395	7.6	211
Manufacturer	4'434	10'858	6'425	35.2	870
Retail & Taxes in consuming country	10'858	18'917	8'058	44.1[7]	473
	Total Value Added		**18'253**	**100%**	

Prices per ton of cocoa

Table 1: Prices and Value Added in the Cocoa-Chocolate value chain. The values are always in USD and for one ton of cocoa (or what this one ton was transferred into). The first two columns show the purchase price of this one ton (or the input needed to produce said ton in case of the farmer) and the sales price realized by each actor. The third and fourth columns show the value added by each actor (how much more expensive this ton became through his actions) and his contribution to Total Value Added. In the fifth column, we see how much profit an actor reaps.
Source: Data from (Cocoa Barometer Consortium, 2015, pp. 29–38)

Within the value chain, the value added and the remuneration for their contribution differs substantially between actors. Farmers have the largest profit per ton of cocoa in the value chain; an Ivorian producer for example has a profit of almost 60% on the cocoa sold. But the small scale and low productivity of production (as compared to what yields could be achieved with more elaborate inputs) means that their total absolute annual income remains low. In terms of total value added (the difference between the cost associated with producing one ton of cocoa and the end price for the chocolate sold produced with said ton of cocoa), their work is relatively unproductive and contributes only 6.6%. The export price (the FOB; see previous paragraph) is highly volatile – reaching its peak usually during harvest season – and the share a farmer receives varies from nation to nation. Ghana and Côte d'Ivoire for example introduced a fixed minimum price, curbing this fluctuation for farmers (Cocoa Barometer Consortium, 2015, p. 30). While both governments also stipulated how much of the FOB is allocated for transport from farm to port, other countries have no such regulations. As a rule of thumb, inland transportation costs amount to 0.5% of the total value added, with half of it being contributed through local transport and half through storage and handling at ports. There are major differences between exporting countries in terms of taxation on cocoa. In Nigeria for example, the state collects virtually no taxes on cocoa exported, consequently, farmers receive a relatively high percentage of the FOB. In Ghana and Côte d'Ivoire, on the other hand, the state levies taxes of 20-30% on the FOB, amounting to 4.2% of total value added. To compensate for low transportation costs (0.3% of total value added), shippers usually charge relatively high Terminal Handlings Costs [THCs] at the consuming nation's ports (1.1% of total value added), adding up to 1.4% of total value

[7] In the original graphs in Cocoa Barometer Consortium (2015, pp. 29–38) , the value is indicated with 44.2, evidently a rounding error leading to a total sum of added value of 100.1%.

added. Traders buying (or the companies transporting) the cocoa then often bring the raw materials to commodity exchange markets, both to protect themselves and to profit from market fluctuations. Overall, the traders, banks and investments funds employing a variety of financial instruments make up around 0.2% of the total value added (Cocoa Barometer Consortium, 2015, pp. 32–33). After processing the cocoa beans, the cocoa mass is usually sold to manufacturers. Besides, processors often realize additional profit by buying cocoa mass, cocoa butter and cocoa powder on the international market, refining and mixing these products with other volumes (called dilution), and then selling them as first quality ingredients. Processing companies can additionally decide to stock butter, mass and powder, and take advantage of differences in market prices. Overall, processors and grinders contribute around 7.6% of total value added. Manufacturers then transform the ingredients into the final product and sell them to retailers, which in turn sell the chocolate to consumers. These two final links of the chain contribute the lion's share, with 35.2% and 44.2% respectively (Cocoa Barometer Consortium, 2015, pp. 34–35)

4.3.2. Historic development – Geographical focus

The cocoa plant originated around 3'000BC in South and Central America and was used both as drink and monetary medium of exchange. After the Spanish discovery of the *New World*, the consumption and production of drinkable chocolate spread over to Europe. In the late nineteenth century, raising income and scientific discoveries (allowing for product diversification) led to increasing consumption in Europe, at the same time as cocoa production spread to Africa and Asia (Swinnen & Squicciarini, 2016, p. 19; 39). By the beginning of the twentieth century, the processes of modern chocolate manufacturing were in place, allowing to scale up production while guaranteeing the quality and stability of the product. These factors, in combination with falling transport costs and import taxes, and increased purchasing power and demand in Europe and North America, lead to a robust growth in production of cocoa beans between 1870 and 1940, the so-called *First Chocolate Boom*. After 1975 and up until today, emerging economies started to consume more and more chocolate (especially Asian countries, see below), leading to a skyrocketing of cocoa bean production and driving the so-called *Second Chocolate Boom* (Swinnen & Squicciarini, 2016, pp. 20–21). Along with consumption, the origin of cocoa beans changed dramatically as well:

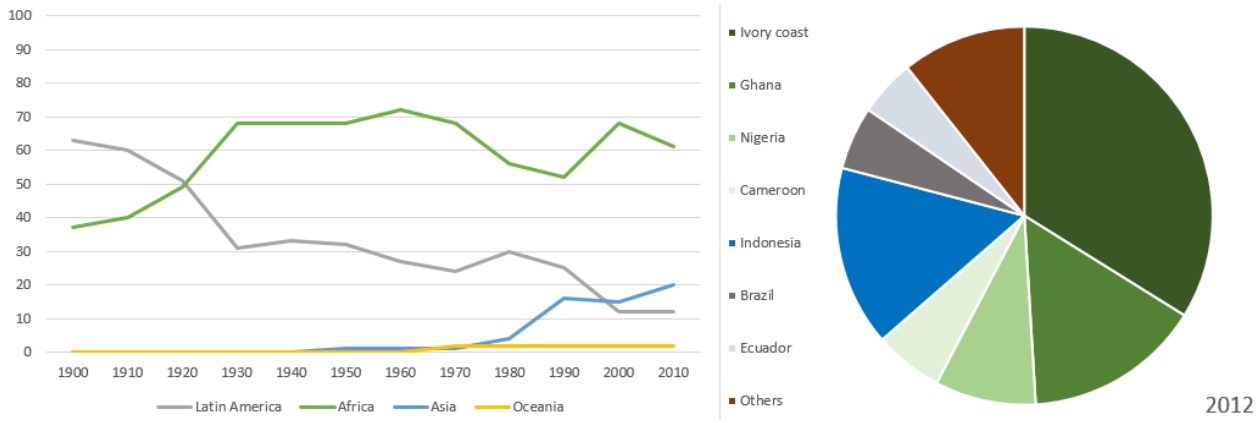

Figure 17: Cocoa bean world production, over time and in 2012 Source: Data from (Swinnen & Squicciarini, 2016, pp. 23–24)

In 1900, cocoa production was spread roughly equally between Africa, South America and Central America, with the principal producing countries being São Tomé and Principe (32%), Ecuador (36%) and Trinidad and Tobago (27%). Soon after, African countries started to rapidly ramp up production, and by 1930, Africa became the world's leading cocoa producing continent. In the 1970s, Asia started to appear as an important producer – mostly led by a combination of policy reforms and improved economic incentives in

Indonesia – and, by 2010, the continent already accounted for 20% of world production. Africa remains the biggest producer of cocoa beans (61% in 2010), and in 2012, seven countries (the Ivory Coast, Indonesia, Ghana, Nigeria, Cameroon, Brazil, and Ecuador) together accounted for 89% of the world cocoa production. The Ivory Coast alone is responsible for 34% of the world' s crop, and Ghana and Indonesia come second, each with 15% (Swinnen & Squicciarini, 2016, pp. 23–24)

However, while these countries traditionally mostly exported raw materials, the cocoa-producing countries share of processing increased significantly since 1995 and today, around 48.1% of total grinding takes place in producing nations (as compared to 38.9% in 1974). Stimulated by 1980s liberalizations of the cocoa sector in Africa and the and takeovers of local cocoa companies and investments by multinational companies in the 1990s and 2000s, producing countries started to process raw materials and even produce intermediary products (See Chapter 4.3.3) (Swinnen & Squicciarini, 2016, pp. 25–26).

1961	Cocoa Beans	Cocoa Butter	Cocoa Paste	Cocoa Powder and Cake	All Cocoa Products
	Net Exports	Net Exports	Net Exports	Net Exports	Net Exports
Africa	375.35	2.96	0.00	2.01	380.32
Asia	−10.11	−6.20	−0.16	−1.26	−17.73
Europe	−301.76	−5.55	−1.66	15.80	−293.17
North America	−163.50	−13.21	−8.00	−10.43	−195.14
Latin America	79.62	19.17	−0.26	0.17	98.70
Oceania	−3.34	−3.13	−0.03	−0.31	−6.81
2011	Cocoa Beans	Cocoa Butter	Cocoa Paste	Cocoa Powder and Cake	All Cocoa Products
	Net Exports	Net Exports	Net Exports	Net Exports	Net Exports
Africa	6728.72	455.19	550.25	72.30	7806.46
Asia	−1460.38	708.85	−59.91	317.76	−493.68
Europe	−5735.75	−724.98	−739.62	331.45	−6868.90
North America	−1657.60	−461.30	−84.90	−767.97	−2971.77
Latin America	566.49	126.66	25.09	−102.28	615.96
Oceania	192.85	−81.61	−45.89	−125.62	−60.27

Table 2: Net exports of cocoa beans and intermediary cocoa products by region, 1961 and 2011 (in million USD)
Source: (Swinnen & Squicciarini, 2016, p. 27)

Nevertheless, Africa and Latin America remain net exporters of cocoa beans, while Europe, Asia and North America remain net importers of cocoa beans. Regarding the intermediate products (cocoa butter, paste, powder, and cake), the trade picture reflects changes in regional processing. For instance, the increase in processing functions in cocoa beans producing countries led Africa to become a large net exporter of all derivatives, and Asia became a large net exporter of cocoa butter and cocoa powder and cake.

4.3.3. Today's supply chain – Dynamics within and between the different links

When zooming in on specific actors and links of the cocoa -chocolate chain, we see a strong concentration, both on a horizontal (within the same link of the chain) and on a vertical (between different segments) level. However, while individual players consolidate through mergers and acquisitions [M&A] and guard over an ever-bigger part on their level and ensuing links, the supply structure remains fragmented, as no actor does all different links of the supply-chain in-house. The market is furthermore characterized by a strong concentration in the intermediate industry, and a (comparatively) mixed set of manufactures and producers of raw material (Cocoa Barometer Consortium, 2015, p. 7; Swinnen & Squicciarini, 2016, p. 28). For a closer examination of the characteristics and developments within the different links, we will

distinguish between cocoa production and trade, cocoa grinding, and processing and chocolate manufacturing (following the structure proposed by Swinnen & Squicciarini (2016, pp. 30–33)), but add the link of retailers and consumers):

- **Cocoa production and trade:**
  One-third of humans are smallholder farmers and their families, producing nearly 70% of food consumed worldwide on 60% of the planet's arable land (Locke, 2015). The same characterization holds for the cocoa production, with over 90% of the world's beans being grown on about five million small farms, averaging between one and five and hectares. While production in West Africa happens mainly on these small farms, larger plantations are found in Brazil, Ecuador, and Malaysia (Swinnen & Squicciarini, 2016, p. 28). As described, most cocoa farmers sell their product to cooperatives, who in turn resell the beans to exporters or, increasingly, local cocoa grinding companies. The nature of this system changed dramatically over the past two decades. Cocoa was a major source of government revenue for developing countries after their independence (in Ghana, for example, the implicit taxation on cocoa farmers increased from 20% in 1960 to more than 80% around 1980), leading to a high degree of state regulation. While their official objective was to achieve price stabilization for farmers and to assure the product's quality, state-controlled bodies – the so-called marketing boards – controlled all aspects of production and export. In the 1980s and 90s, the state-controlled bodies were confronted with historically low world market prices, increased competition from countries with (relatively) free market conditions (mainly Indonesia and Malaysia), and the International Monetary Fund [IMF] and World Bank insisting on reduced producer taxation as part of structural adjustment programs. All these factors combined lead to a wave of market liberalizations (between 1998 and 2002 in Côte d'Ivoire). Many (para)statal companies have been privatized or liquidated and private companies took over trade, leading to cocoa farmers receiving higher shares of the world market prices. While the companies entering the market were mostly local in the first years after the liberalization, soon foreign companies took over most of them (either directly or through agents), and most local traders are now subsidiaries of multinational companies or in joint ventures with multinationals (Swinnen & Squicciarini, 2016, pp. 28–29).

Company	Share (in %)
Cargill	14
Archer Daniels Midland (ADM)	11
Olam	8
Barry Callebaut	7
Armajaro	7
Cemoi	4
Noble	4
Touton	3
Ecom	3
Novel	2
Public Buying Company (PBC)	11
Other African companies	26

Table 3: The largest cocoa trading companies in 2011 (in % of West and Central Africa's total cocoa trade)

Source: (Swinnen & Squicciarini, 2016, p. 30)

In 2011, only 37% of all cocoa beans traded in West and Central Africa were purchased (and exported) by African companies, of which the Public Buying Company [PBC] controlled nearly a thrid (11%). Five companies (Cargill, ADM, Olam, Barry Callebaut, and Armajaro) dominate the rest of the cocoa export market, with a joint share of 47% (Swinnen & Squicciarini, 2016, pp. 29–30). While trading (and processing and manufacturing, more on this in the subsequent two sections) is strongly organized and concentrated, the farmers are often barely organized. This leads to low

farm-gate prices (in comparison to world market prices) and growth in the sector barely reaches them (Swinnen & Squicciarini, 2016, p. 72). They often struggle to break-even and their work is made more difficult by the fact that their communities usually lack basic infrastructure such as roads, education, health care and other support structures. Over the past decades, the size of cocoa farms has decreased and at the same time, many farmers suffer from unsure tenancy rights on their land, or are sharecroppers or subtenants on cocoa plots owned by large-scale landowners. The legal incertitude in turn can create all sorts of complexities, including obstructions to obtain credits for fertilization or crop diversification (Cocoa Barometer Consortium, 2015, p. 15).

- **Cocoa grinding and processing:**
  As most traders also have active operations as cocoa grinders, the concentration described above swapped over to grinding as well. In 1990, there were over forty grinders in Europe, a number that has decreased to only nine in 2000. By 2008, about two-thirds of worldwide grinding was carried out by just ten firms, with the three biggest companies (ADM, Cargill, and Barry Callebaut) controlling a joint share of 41%.

Company	Share (in %)
Archer Daniels Midland (ADM)	14
Cargill	14
Barry Callebaut	13
Blommer	6
Petra Foods	5
Cadbury	3
Nestlé	3
Ferrero	2
Cémoi	2
Kraft Foods	2
Other grinders	36

Table 4: The largest cocoa grinders in 2008 (in % of the world's total cocoa grindings)

Source: (Swinnen & Squicciarini, 2016, p. 31)

Cocoa grinders also strengthened their position through vertical integration into chocolate processing, which, as a result, has also become more concentrated. Additionally, downstream players increasingly started to outsource activities such as the production of cocoa liquor, butter, or couverture, leading to conglomerates conducting all steps from trading, over grinding, to industrial-processing in-house (Swinnen & Squicciarini, 2016, pp. 30–31). Cargill (from whom Nestlé obtains its cocoa), for example, acquired *General Cocoa Company Holland B.V*. and *Gerkens'* cocoa production in 1987. In 2005, the company further consolidated its position by buying facilities in Vietnam and by acquiring the German industrial chocolate facility *Schierstedter Schokoladenfabrik GmbH & Co*. In 2008, they invested over 100 million USD to establish a new processing plant in Ghana. And after taking over AMD's global chocolate business (a merger receiving a great deal of scrutiny and finally approved by the European Commission in 2015), the company is a leading player in cocoa trading, processing, and manufacturing of semi-finished products and couverture, both in cocoa-producing and chocolate-consuming countries (Cocoa Barometer Consortium, 2015, p. 7; European Commission, 2015; Swinnen & Squicciarini, 2016, p. 31). Overall, the three companies Cargill, ADM and Barry Callebaut, are among the top four biggest trading, grinding, and processing companies (see Tables 3 and 4), and control a big part of the so-called 'middle segment' of the value chain. Moreover, as all firms invested considerably in capacity expansion and new factories in the recent past, the International Cocoa Organization [ICCO] expects that their share will continue to expand (Swinnen & Squicciarini, 2016, pp. 31–32).

- **Chocolate manufacturing:**
  Swinnen & Squicciarini (2016, p. 32) divide chocolate manufacturers into three broad types, based on size and business interests: The first category, the **global confectioners**, consists of a small group of globally active and large multinational firms manufacturing branded consumer goods. Between the 1970s and 1990s, more than 200 takeovers took place among these manufacturing companies, resulting in 17 firms with a combined market share of about 50% of the global chocolate market by 2001. The top four companies amongst them had a joint market share of 26% in 2001, which increased to 39% by 2004 (Swinnen & Squicciarini, 2016, p. 32). And by 2013, the top four chocolate manufacturers Mondelēz International Inc., Mars Inc., Nestlé SA, and Ferrero Group had a joint market share of 48.7%, with Mondelēz International Inc. alone – formed through the merger of Cadbury and Kraft Foods Inc., two leading chocolate confectioners – controlling 14.7% (Cocoa Barometer Consortium, 2015, p. 7; Swinnen & Squicciarini, 2016, p. 32).

Company	Share (in %)
Mondelēz International Inc. (USA)	14.7
Mars Inc. (USA)	14.1
Nestlé SA (Switzerland)	12.2
Ferrero Group (Italy)	7.7
Hershey Food Corp (USA)	6.6
Private Label (USA)	4.6
Chocoladefabriken Lindt & Sprüngli AG (Switzerland)	3.7
Obiedinenye Konditery UK (Russia)	1.9
Other	34.5

Table 5: The largest chocolate manufacturers in 2013 (company's share in % of the world's total production)

Source: (Swinnen & Squicciarini, 2016, p. 32)

The second group, the **large merchants of industrial chocolate**, were already touched in the previous section. While they are mostly active in upstream segments such as cocoa processing and industrial chocolate manufacturing, some became increasingly present in the consumer section of the market. A part of this integration happened because of the already discussed strategy of chocolate manufacturing companies to outsource certain manufacturing activities, in order to cut costs and to focus more on specific brands (a process which requires ever bigger budgets for marketing, product development and innovation). An example for this process is Nestlé handing over the *Lion* Bar production to Barry Callebaut, showing that manufacturers do not only subcontract the production of liquid chocolate to processors, but even the manufacturing of the final chocolate products (Swinnen & Squicciarini, 2016, pp. 32–33).
The last group are the small and medium-sized **artisanal chocolatiers and gourmet chocolate manufacturers**. While there is relatviely few data available about this group, they remain important in for example the Belgian chocolate market, where they make up more than 90% of chocolate producing companies (Swinnen & Squicciarini, 2016, p. 33).

- **Retailers and consumers**
  Worldwide retail volume has increased from 5.6 to 7.15 million between 2000 and 2013, while the retail value more than doubled (from 51 billion to 110 billion USD). Still more than half of all confectionary retail (both in volume and value) at end of this period. However, this share stayed only constant because the growth in Eastern Europe offset the falling share of Western Europe. North America's share of world volume fell from 31% in 2000 to 22% in 2013 (and in value from 25% in 2000 to 18% in 2013), leading experts to believe that this market is close to saturation. The share of the rest of the world on the other hand increased significantly, both in volume and value. The largest increase in volume occurred in the Middle East and Africa, where the chocolate confectionary retail volume has more than doubled since 2000 (+104%). The growth in volume between 2000 and 2013 was also strong in Asia Pacific and Latin America, where the chocolate

retail volume increased by 87% and 82% respectively. The growth in chocolate retail value was especially strong in Eastern Europe (+316%), the Middle East and Africa (+239%), Latin America (+228%), Australasia (+219%), and Asia Pacific (+113%).

Geographies	2000				2013				Growth in volume between 2000 and 2013 (in %)	Growth in value between 2000 and 2013 (in %)
	Volume (in 1000 tons)	Share (in %)	Value (in million US$)	Share (in %)	Volume (in 1000 tons)	Share (in %)	Value (in million US$)	Share (in %)		
World	5,598	100	51,314.50	100	7,147	100	109,991.30	100	+28	+114
Total Europe	2,799	50	25,942.00	51	3,622	50	56,344.70	52	+29	+117
Western Europe	2,030	36	21,545.10	42	2,242	31	38,057.40	35	+10	+77
Eastern Europe	769	14	4,396.90	9	1,380	19	18,287.30	17	+79	+316
North America	1,727	31	13,005.00	25	1,542	22	20,184.80	18	−11	+55
Latin America	360	6	3,688.10	7	654	9	12,098.20	11	+82	+228
Asia Pacific	461	8	6,231.90	12	861	12	13,262.10	12	+87	+113
Australasia	87	2	997.90	2	133	2	3,180.20	3	+53	+219
Middle East and Africa	164	3	1,449.60	3	335	5	4,921.30	4	+104	+239

Table 6: Chocolate consumption by region (in 1000 tons and million USD) and their respective share of total volume/value in 2010 and 2013 Source: (Swinnen & Squicciarini, 2016, p. 35)

At the country level, the United States of America remains the largest chocolate confectionary market with a share of 16% of total world confectionary retail value in 2013, followed by Russia (10%), the UK (9%), Germany (7%), and Brazil (6%). However, caused by strong economic growth, rising incomes, and a youthful population, consumption in emerging economies is rising quickly and the gap starts to disappear. Growth between 2000 and 2013 was especially strong in India (+432% in volume and +666% in value), China (+210% and +433%), and Brazil (+108% and +426%) (Swinnen & Squicciarini, 2016, p. 36).

Overall, the consumption patterns clearly show that a convergence is occurring, with chocolate consumption stagnating in richer regions and consumption growing quickly in poorer countries. However, at this point, the consumption levels are still far apart. In 2013, Western Europe, Australasia, and North America had similar chocolate consumption levels in kilogram per capita, with 4.6, 4.8, and 4.4 kg/capita respectively. Eastern Europe has doubled its per capita consumption, from about 2.3 kg per capita in 2000 to 4.2 kg in 2013. Despite strong growth, India (0.7kg/capita) and China (at 1.0 kg/capita), the two countries with the strongest growth in volume and value, are still far behind (Swinnen & Squicciarini, 2016, p. 37).

4.4. Bringing the pieces together – the near future of the cocoa-chocolate value chain

The financial investments into the visited project managed to improve the living conditions of farmers and their families in one of Nestlé's main cocoa sourcing regions. As written in Chapter 2.3, the improved access to safe water and sanitation translated into tangible health benefits. Despite this progress, people in the project area are still constrained by the daily burdens of underdevelopment. Safe water is sometimes recontaminated before consumed and the project does not reach all communities in the region. Additionally, the project suffers from systemic sustainability issues and a missing sense of ownership, entailing insufficient maintenance and the danger of slippage. To preserve the achievements and funds invested into the project, and to maximize its impact, it could make sense for Nestlé to invest into the pilot proposed in Chapter 3.

Additionally, the adaptions to the existing system are clearly in line with the CSV concept. They lead to the creation of shared value in ways Porter & Kramer envisioned, both by increasing productivity within Nestlé's supply chain and by enabling local cluster development. Fostering entrepreneurship and stable supply chains (both for our project and for supporting industries) will connect the rural poor to new

markets for resources and services, and lead to an overall improved business environment. This in turn leads to better living conditions (inter alia improved health and nutrition) among Nestlé's suppliers and helps increase productivity – a virtuous circle. Besides providing better lives for cocoa farmers, the project could help with better farming practices (another main pillar of Nestlé's Cocoa Plan). The motorization of pumps will not only ease access to drinking water, but could help famers overcome lacking access to water (and for example allow them to introduce drip-irrigation systems), one of the main productivity constraints for agriculture.

Helping farmers to become more productive does not only improve their incomes and lives, but could prove vital for Nestlé itself. Fueled by increased consumption in emerging economies, the demand for chocolate grew significantly over the last years and is expected to rise further. This trend, in combination with an increasing number of farmers turning towards higher-return crops, and the political and social developments in West Africa (a region experiencing an ever-stronger rural exodus among young people, and major political and social upheavals over the past decades), led Mars Inc. to forecast cocoa bean shortages of up to one million tons by 2020 (Cocoa Barometer Consortium, 2015, p. 7; Reidy, 2015). The predicted imbalance between supply and demand falls together with the ever-increasing consolidation in processing, manufacturing and retail, resulting in an intensified competition between powerful multinationals to satisfy the growing demand. Additionally, consumers from (mostly) Western countries become increasingly sensitized to the living conditions of farmers and the inefficient use of scarce natural resources in the supply chain, and place more and more value on sustainable and ethical production. Encouraged by numerous campaigns, media and public awareness is now a major driving force behind the move to (higher) standards and certification, and manufacturers (need to) engage increasingly in projects and partnerships to stay competitive (Cocoa Barometer Consortium, 2015, p. 13; 85; Goldberg & Fries, 2013, pp. 1–2; Swinnen & Squicciarini, 2016, pp. 76–77).

As stated, the project would not only improve living conditions and productivity of farmers, but envisions to support local industries and to foster entrepreneurship. In their role as industry facilitator and by helping to transform the project into a social business, Nestlé would empower people to create a perspective for themselves and could spark dynamism towards a holistic development of the region. The demographic change in Côte d'Ivoire – as in many (West) African countries, Côte d'Ivoire's total fertility rate is higher than the replacement fertility rate[8], resulting in an ever-younger population – makes non-farming jobs an absolute necessity. The proposed project and its supporting industries could create such opportunities. Besides, electrification will be necessary to seize opportunities and will help the communities to gear themselves for future developments. A research collaboration between Barry Callebaut and the Belgian institutes *KU Levuen* and *Vlaams Instituut voor Biotechnologie* [VIB], for example, found that adding certain yeast starter cultures to cocoa decreases the growth of unwanted fungi during fermentation, and thereby prevents losses and improves quality of the final product (Meersman et al., 2015; Nieburg, 2014). While being a long way from implementation, this and other growth enhancing technologies will empower farmers to capture a larger percentage of the value added throughout the cocoa-chocolate chain, but require as basis an improved infrastructure (for example to incubate the starter cultures before handing them over to farmers) and overall development of the region.

[8] The *Total Fertility Rate* compares figures for the average number of children that would be born per woman if all women lived to the end of their childbearing years and bore children according to a given fertility rate at each age. The *replacement fertility rate* is the rate at which women give birth to enough babies to sustain population levels (Central Intelligence Agency, 2016a, 2016b).

5. How to progress – Setting up a pilot

After setting out the different interlocking parts of our social business in Chapter 3, we will briefly discuss how the project could be moved towards implementation. To validate the business model before committing too much funding, to provide a clear and affordable buy-in for funding bodies, and to allow applying learned lessons before rolling out the project on a larger scale, we propose to first develop and test a pilot project. Choosing a relevant and suitable area for this pilot will be crucial for its success, as the local characteristics will in turn determine the exact interpretation of the business model. We propose that the people implementing the project will – through an assessment with both cooperatives and the national Red Cross society, the two actors with the most experience and connections in the project area – chose a cluster of villages based on the following criteria:

- all villages chosen are located within the smallest possible distance from each other, belong to the same cocoa cooperative, and should be of a certain size (allowing to make use of economies of scale and clustering[9])
- all water points within the chosen villages are already improved, enabling us to take advantage of established structures and frameworks (such as ownership by cooperatives and operational supervision by water committees) and allowing to cover all water sources available to the local population without needing to invest large initial investments
- our local contacts (the local Red Cross volunteers, the available water committees, and the responsible cooperative) and the chosen communities should a have genuine interest to explore new ways of development

However, it will not be possible to choose a specific location or work out all details of the business model without being present in the project region, as both will depend strongly on unpredictable local determinants such as available human resources, reception and participation through the local population, service providers and partners to work with, or the technology available on local markets. Thus, this Chapter does not attempt to provide a detailed walkthrough of a fully defined pilot, but aims to raise and answer fundamental questions facilitating a potential implementation. To better understand the proposed system, we first sketch a blank budget for the coordinating body illustrating its revenue paths and expenses, and discuss two underlying factors influencing all budget lines and the project's long-term success (Chapter 5.1). In a next step, we discuss potential funding sources to kickstart and potentially scale up the project (Chapter 5.2), before discussing potential risks (Chapter 5.3).

[9] Because the prices for water will have to be kept relatively low (see Chapter 5.1), the margins to reinvest and expand the system will be low. Consequentially, it might make sense to focus on relatively large villages first, allowing to reap economies of scale and to give the supporting industries a broader customer base, before bringing the alterations to smaller villages.

5.1. Budget considerations

Revenue
Share of sales from Water Kiosks
Share of sales from Chlorine Production

Expenses
Investments (CAPEX)
Retrofitting of pumps and installation of water tanks
Building materials, decoration and labor to set up water kiosks
Jerry Cans
Installation of chlorine production device
Installation of solar panels & batteries
Installation of hardware for (partial) electrification of households
Initial stock of chlorine (until production is ramped up)
Chlorine tap stations
Operational costs (OPEX)
Payments for Maintenance & Repair
Social Mobilization (paying for partners' efforts)
Social Marketing (preparing materials, strategies and trainings for water kiosks)
Office rent
Payroll

Total Income
Total Expenses
Balance

Pilot project costs
Revolving fund (covering initial investments + operational costs until covered through revenue)
Planning, external consultation
Project costs: Fieldwork # days
Project costs: travel, accommodation
Contingency / Management Reserve

Figure 18: Simplified budget for the coordinating body leading the pilot

Setting a sensible price for water: Charging people for water is still somewhat controversial, with many people arguing that drinking water should be free of charge and that it is every government's responsibility to ensure unlimited access for its citizens. However, charging a price high enough to sustain the water network on its own is of utmost importance for its long-term survival. If water is free of charge (or if the price is too low), the system remains reliant on external funding (be it through the government or donors) and fails when the funds dry up or are delayed. Even temporarily undercutting the profitability threshold might prove dangerous, as it is nearly impossible and extremely time-consuming to reestablish people's willingness to pay once they experienced a period of water being freely available or unusually cheap. Governments in developing countries for example regularly declare water to be free before elections or in times of crisis (as exemplified by the example of Tabléguikou; see Box 2), and then struggle to return to the proven system. While the government in Côte d'Ivoire declared that drinking water must be free for its citizens, this appears to be more political rhetoric than reality. Most citizens pay for drinking water and,

when in private discussions with our local contacts, government officials admitted that it would be unfeasible to sustainably provide its citizens with safe water free of charge. However, straight out repealing said right would be political suicide and service providers – such as SODECI, the national semi-public drinking water provider – circumvent the declaration by charging for the service provision (instead of charging for the provided water).

On the other hand, while prices must be sufficient to cover expenses, we should avoid that water becomes too expensive. Setting the price too high would decrease our customers nominal purchase power and potentially force him to reduce his water consumption (Karnani, 2007, p. 97). Reducing the water consumption in turn could have a detrimental impact on the project population's health. As shown in recent studies, the quantity of available water is more important for sanitary conditions than its quality (up to a certain point of contamination), and minimum standards of domestic hygiene are generally not possible as long as people do not have access to at least 20 liters per day (Heierli, 2008, p. 19). The importance of sensibly setting the water price is amplified by the fact that poor people often pay more than people in more wealthy countries, both in absolute and in relative terms (Heierli, 2008, p. 18).

Box 9: Water prices in the project region and in European cities

In the project region, the fee paid for water varies widely. In most villages, people pay a monthly flat rate per household and month, ranging from 83 XOF in Gagoré to 800 XOF in Djékro (USD 0.14 to 1.33). As water committees usually restrict consumption to three basins per household and day, the water price per m^3 ranges from 30 XOF in Gagoré, to 296 XOF in Djékro (USD 0.05 to 0.49). Of the visited IFRC-Nestlé project villages, only the water committee in Zérédoukou did introduce a pay per use model, with members paying 25 XOF per bowl fetched (approximately 30 liters for USD 0.04), resulting in a price per m^3 of 833 XOF (USD 1.39). To put these prices into perspective: Urban households in Abidjan and Lakota with running water inside their apartment pay a total of around 263 XOF and 278 XOF per m^3 (USD 0.44 and 0.46).

City	Price per m^3 (2016), USD	Price per year (20l per person and day), USD	GDP per capita (PPP) in 2016	Percentage used for water
Gagoré	0.05	0.365	3'600	0.01%
Djékro	0.5	3.65	3'600	0.101%
Zérédoukou	1.4	10.22	3'600	0.294%
Abidjan	0.44	3.212	3'600	0.089%
Lakota	0.46	3.358	3'600	0.093%
	Price per m^3 (2012), USD	Price per year (20l per person and day), USD	GDP per capita (PPP) in 2012	
Milan	0.79	5.767	29'800	0.019%
Geneva	2.36	17.228	44'900	0.038%
Prague	3.80	27.74	27'000	0.103%

Table 7: Price paid for water, comparison between Ivorian and European cities.
Source: Info from (Central Intelligence Agency, 2013, 2016a; Federal Statistical Office Switzerland, 2012)[10]

If we compare these figures to water prices in European cities, the price range per m^3 of drinking water extends from 0.79 USD in Milan (making it the cheapest European city), over 2.36 USD in Geneva (where the IFRC is located), to 3.8 USD in Prague (making it the most expensive European city) (Federal Statistical Office Switzerland, 2012). If we exclude the unusually low water price in Gagoré, the absolute

[10] Calculated with a December 2012 exchange rate of 1CHF=0.72 Euro,
taken from http://www.x-rates.com/average/?from=EUR&to=CHF&amount=0.6&year=2012 on Mai 12, 2017.

prices per m^3 of drinking water are comparable or even higher than the water price in Milan, the European city with the lowest water price. This is especially surprising when comparing the affluence of the two countries, with the GDP per capita in Italy being more than eight times higher than in Côte d'Ivoire. While the absolute prices per m^3 in Geneva and Prague surpass any price in Côte d'Ivoire, relating the prices to the GDP per capita shows that people in the project area pay a comparable (or often even higher) percentage for their minimal water needs. The same holds true for an intra-country comparison, with the relatively wealthy urban regions of Abidjan and Lakota paying less for water provision than their rural counterparts.
However, the explanatory value of the comparisons drawn in this box should be enjoyed with caution. First, people with more convenient access tend to consume more water, increasing the percentage of their income used to these effects. Additionally, water prices, water usage and GDP per capita are not easy to measure and might differ from source to source. Nevertheless, the numbers shown here support the statement that poorer people often pay more for their water than people in more wealthy countries. This is especially shocking when we recall the striking differences in quality, with a convenient setup of safe-to-drink tap water in European cities and relatively safe water in urban areas in Côte d'Ivoire, and water of (sometimes) questionable quality at public POCs in rural Côte d'Ivoire.

Overall, setting the price right will be crucial for our project, its long-term sustainability, and for the population at stake. The price will have to be determined in a way that it enables users to contribute regular and realistic payments, which in turn amount to a sufficient turnover. Generally, the price of water needs to be set in a way that in any month (after an initial startup phase) revenues for water kiosks are sufficient to pay for all operational expenses (covering treatment of water, maintenance and repair work, living wages for all employees, social mobilization and marketing) and allow to pay predefined share for the coordinating office (allowing to build up a revolving fund for system expansion; see next point). After calculating the amount needed and verifying whether it matches the local ability and willingness to pay, we will define a framework (clearly laying down the bandwidth of the acceptable prices, ranging for just enough to make the system sustainable to what can maximally be charged for a Jerry Can of safe water), and then leave the price-setting to the team running the water kiosk and thereby enable entrepreneurial initiative and flexibility.

Setting a sensible contribution to be paid to the coordinating body: Another crucial point for the proposed system will be to set a sensible timeframe for water kiosks and chlorine manufacturers to turn profitable. Setting the percentage to be paid to the coordinating body will be crucial for the survival of the newly created water kiosks and chlorine entrepreneurs, as we do not want to cash-drain them in the crucial setting up phase with unforeseen expenses. In the case of Spring Health India (see Box 3), the water entrepreneurs receive 25% of returns in their first year (and thereby help to repay the initial investment), and 75% in the following years. While it is not possible to calculate a sensible percentage before having all necessary budget information, it can be said that the share should decline substantially after (a defined percentage of) the initial investments is paid back, motivating entrepreneurs to sell high quantities and to scale up quickly. Additionally, while the ideal percentage should be defined in a way that appears attractive for entrepreneurs, it must be sufficient to cover the cooperation body's operational costs (thereby making the whole venture sustainable and independent from donor money) and build up reserves for a potential system expansion. The capital needs of the coordinating body will furthermore depend heavily on the type of funding the project relies on. If the project is based on donations, the coordinating body's required share of water and chlorine sold will be substantially lower (or it can reinvest a bigger portion of their share into system expansion), as compared to when the project is (partially) financed through commercial investors demanding a high return (see Chapter 5.2). Working in a country where many businesses operate

in an informal manner (as many deals are done under the counter and often without official records), it will be crucial for our system to introduce a simple and effective bookkeeping and billing system, allowing the coordination body to clearly track water and chlorine sales and to collect its share. In water kiosks, it would be possible to introduce water meters, which can be regularly read by members of the coordinating body or pump mechanics passing through the villages. For the contribution on chlorine sold, it would be conceivable to cross-compare the data provided from chlorine entrepreneurs with purchase receipts from water kiosks, which we could in turn incentivize by allowing them to deduct expenses partially if the receipts for chlorine bought and water sold add up.

5.2. Potential funding sources

As elaborated in Chapter 4, it could make sense for Nestlé to finance a pilot based on this proposal, both to secure and maximize the impact of past investments, and to enable people producing cocoa a decent livelihood and increased productivity. However, depending on the company's ability and interest to (partially) finance such a pilot, there are several potential additional/alternative funding sources. In this Chapter, we will briefly mention usual ways social businesses find (co-)financing, before delving deeper into two more innovative and unconventional methods:

The most common way is to look for co-financing from within the international development community and to apply for a grant or program-related investment from foundations like the *Bill & Melinda Gates Foundation*, or to look for support from national funds like the *Swiss Bluetec Bridge*, an initiative funded by the *Swiss Agency for Development and Cooperation* to accelerate sustainable access to water and sanitation in rural areas of developing countries through Swiss social entrepreneurs (Shaffer, 2015; Swiss Bluetec Bridge, n.d.). Additionally, it could be possible to team up with another private company. Over the last years, CSV, CSR initiatives and alternative forms of corporate social engagement became ever more considerable, and they are estimated to continually rise (McPherson, 2014). Partnering with other local or international businesses – in the spirit of CSV ideally invested in or with a special interest in the region – could lead to financial or in-kind contributions, and might thereby prove beneficial for both sides. Over the last years, we furthermore saw the emergence of crowdfunding as an alternative to finance projects. Between 2014 and 2015, global crowdfunding platforms more than doubled, from 16.2 to 34.4 billion USD (Helmer, 2015). Even though most these funds can be attributed to commercial start-ups and corporations, more and more social businesses use crowdfunding, both to obtain start capital, and to raise media attention, engage private supporters, and to attract corporate and private donors (Briggman, n.d.).

- Besides looking for funding from within the international development community or from crowdfunding, one could apply for **commercial funding options**, a possibility regularly overlooked for social businesses – with only 65% of social enterprises using commercial funding (as compared to 80% of for-profit businesses) and 71% relying on grants (as compared to 6% of for-profit businesses). The underrepresentation can be partially explained through the nature of the social businesses itself, with commercial banks usually requiring high collaterals, angel investors favoring fast returns and venture capitalists preferring businesses operating with higher margins. This mismatch is called the financial-social return gap, with a social business that could provide substantial social value, but the cost of private funding outweighs the monetary return for investors (Bugg-Levine, Kogut, & Kulatilaka, 2012; Salman, 2011). To overcome the financial-social return gap, an increasing number of social entrepreneurs started to make use of financial engineering tools recently, channeling investments from financial markets by offering different

risks and returns to different kinds of investors (Shaffer, 2015). Analogous to the way conventional companies are funded, a social business can for example take up 50% of the required funds in form of a grant, and offer the remaining 50% to a financial investor at twice the initial return (for example 10% return on 50'000 USD, instead of 5% on 100'000 USD). Only covering parts of the required funds will in turn allow the donor to invest in additional social businesses. The *Bill & Melinda Gates Foundation* for example started issuing loan guarantees, and thereby leverages its donations by enabling social businesses to raise commercial debt at a low rate. Another example is the *Bridges Social Entrepreneurs Fund*, providing its partners with a quasi-equity debt security, nota bene enterprises usually structured as nonprofit and therefore not allowed to obtain equity capital. However, while these securities are technically a form of debt, their returns are indexed to the organization's financial performance (just like an equity investment). As a result, the security holder does not have a direct claim on the governance and ownership of the enterprise, but the terms and conditions of the loan are designed to incentive the management to operate efficiently and make it possible for social enterprises to offer banks and other profit-seeking lenders a competitive investment opportunity (Bugg-Levine et al., 2012). Overall, these new tools can help social businesses get access to commercial financial markets, offering them both funding and non-financial values (such as connections to a network of advisors or technical assistance). And with Nestlé as funding body or strategic partner, it should be possible for our venture to obtain commercial funding at favorable rates.

- As a second innovative financing path, our project could implement that (parts of) the funds needed to kickstart our services in a village are collected through **contributions from within the community**. This is going against a widespread belief that people living in poorer communities (like the ones visited in rural Côte d'Ivoire) have absolutely no possibility to invest in anything but goods that are essential for survival. However, while it is true that people living in relative poverty should be cautious about where they want to spend the little money they have and will think critically about the benefits a product offers, they nevertheless make strategic investments and pro-actively manage their finances. In an extensive study examining the financial portfolios of 250 households in Bangladesh, India and South Africa over time, Collins, Morduch, Rutherford, & Ruthven (2009, p. 3; 15) found that while many poor households were frustrated by the quality and reliability of instruments available to manage their incomes, all had both savings and debt of some sort, and no household used fewer than four types of financial instrument during the year. This does not mean households living in relative poverty have spare income. But exactly because the income is low, highly uncertain, and because the financial opportunities to leverage and smooth income to fit expenditure are extremely limited – the so-called triple whammy of poverty – money management has to be well-understood and is a fundamental part of everyday life. The need to transform irregular income flows into a dependable resource and to reconcile high risks with low reserves, and the difficulty of raising lump sums to seize opportunities and pay for bigger expenses leads to a high total cash turnover relative to total net income in all three countries, ranging between 75 and 330% of annual income, and reaching as high as 500% for some households (Collins et al., 2009, p. 3; 16-18; 174-175).
  Overall, the study shows that when provided with fitting financial tools, poor people can invest outside of daily expenses. Based on that understanding, we could envision mechanisms to provide safe water and village electrification as a shared investment between investor and users, and through value created within the cocoa-chocolate chain. These shared investments will improve the livelihood of users and increase their productivity, which could in turn be invested in further

improvements, thereby creating a virtuous circle. The study presented above found that poorer people especially need financial innovations to build savings over the longer term. They should be highly structured and involve some sort of regularity, thereby promoting self-discipline and reliability (Collins et al., 2009, pp. 180–183). Consequentially, we could draw up an agreement with communities that we either a) pay upfront for the initial investments needed and people repay us partly through small amounts over a defined period of time, or b) that we collectively agree on a sum the community has to contribute by a certain date, and then build the promised infrastructure once the goal is achieved.

Luckily, the cocoa growth cycle is ideal for small and repeated payments, as the harvest is spread over several months twice a year. In Côte d'Ivoire, the main crop is usually ripe between October and March, and the remaining 15-20% (called mid crop) between May and August. As pods are only suitable for harvest for 3 to 4 weeks before beginning to germinate and as the pods do not all ripen at the same time, it is necessary to harvest small quantities at regular intervals (International Cocoa Organization, 1998, 2014). Farmers in the region on average till around four to five hectares, as confirmed in meetings with local cooperatives. As a hectare in this region currently yields 300-500 kilograms of cocoa a year, a farmer harvests between 1'200 and 2'500 kg. The farmers then sell the cocoa to cooperatives in bags of approximately 65 kilograms, translating to between 18 and 38 bags at a unit price of around 118.9 USD. At a guaranteed minimum price of 1'100 XOF (1.83 USD) per kilogram, this amounts to a yearly income of 2'195 to 4'573 USD (or 1'756 to 3'887 USD for the main crop). Now, if every farmer would for example commit to cede 5 kg per bag for one main crop, this would amount to 135 to 592.8 USD per farmer, and still leave him/her with 92.3% of the main and the entire mid crop. To make these numbers graspable: Practitioners estimated that retrofitting an existing handpump in the project area with a solar-powered pump like the *ennos sunlight pump* (including solar panels, batteries, a water tank, chlorine dosage equipment, and required construction material and labor) would costs roughly 6'000 USD. Obviously, the price will depend strongly on the chosen setup, technology and location. Nevertheless, a price in this order of magnitude means that the sketched financing mechanism could allow communities of as few as 11 to 45 farmers to finance the most important infrastructure by themselves, making this a viable potential way to kickstart the project.

As the farmers receive the money when selling their goods to the local cooperatives, it would make sense to cooperate with them and strive that they directly deduct the farmers' contributions. Many of the cooperatives already offer loan offers for their farmers to purchase fertilizer with partner companies. They reported to seldom face problems with farmers not paying back the loans, mainly because their livelihood depends on their partnership with cooperatives and because they repeatedly need new credits for fertilizer every farming season. Consequentially, it could be possible to explicitly link the farmers' payments of agreed contribution towards our project to the assessment of their creditworthiness for fertilizer, and thereby insure a high (re)payment rate. The cooperatives should be interested in partnering with our project and collecting contributions from farmers, as Cargill (the company buying the cocoa from cooperatives and supplying it to Nestlé) demands that cocoa from Côte d'Ivoire is UTZ certified (see Box 10). In order to receive the certification and the premium paid per kilo, the UTZ *Code of Conduct* inter alia demands "Access to decent housing, clean drinking water and health care for workers and their families" (UTZ, n.d.). Once a year, the *Bureau Veritas* conducts independent audits and the cooperatives must remedy (potential) shortcomings to obtain the certification for the next business year. Therefore, and as assured in discussions with the management of two local entities,

the cooperatives should be highly interested in working together with a project aiming to improve their communities' access to safe water.

Box 10: The role of certification for sustainable development and CSV

Certifications (and the fair trade-movement in general) are not really integrated into CSV activities, as they mostly aim to redistribute instead of creating value (Porter & Kramer, 2011, p. 5). Nevertheless, parallel to the developments described in Chapter 4.2, Nestlé increasingly began to certify their products. Parts of Nestlé's cocoa, for example, and a high proportion of beans sourced through the Cocoa Plan are *UTZ* certified, the biggest among the three most-famous certifiers (the others being the Fairtrade Labelling Organizations International [FLO] and the *Rainforest Alliance*). Each of these standards has its own focus area and theory of change, the UTZ certification for example is most open to free market principles and does not define a minimum price for its products (Mugglin, 2016, p. 25). The premiums paid to farmers also vary widely, ranging from 5% for UTZ certified cocoa (the lowest premium), to 18% or more in recent years for organic cocoa (Swinnen & Squicciarini, 2016, p. 77).

Except for Mondelēz and Nestlé, all major chocolate manufacturers have committed themselves to use 100% sustainable and/or certified cocoa by 2020, be it through standard body certifications, their own standards or a hybrid approach (Cocoa Barometer Consortium, 2015, p. 25). As visible below, Nestlé's coverage of certified cocoa in 2013 amounted to roughly a tenth of its total usage (48'000 out of 430'000 tons), a ratio that they were able to improve up to a fourth by 2015, with the goal of reaching one third by 2018 (Cocoa Barometer Consortium, 2015, p. 26; Mugglin, 2016, p. 26).

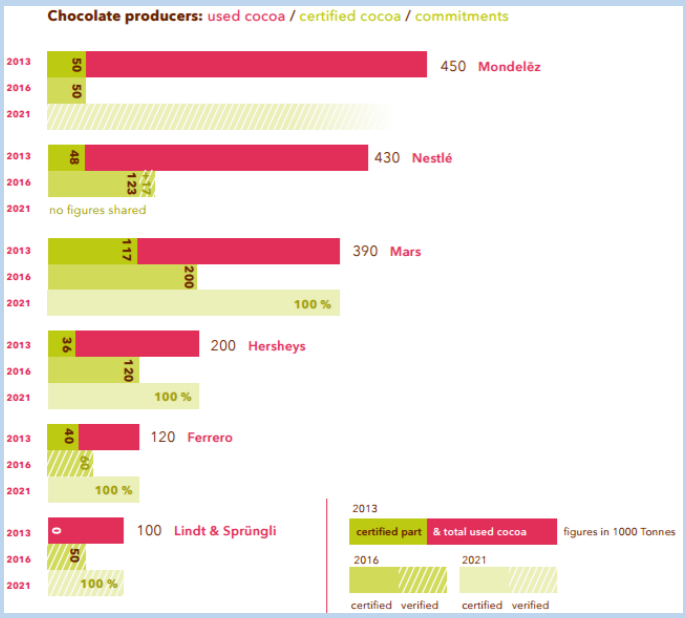

Figure 19: Relation of certified to used Cocoa, current state and commitments for the future Source: (Cocoa Barometer Consortium, 2015, p. 26), visually edited.

In 2015, the three big standard bodies certified nearly 1.4 million tons of cocoa, roughly 30% of the world production. However, cocoa is often certified by more than one body, and some experts believe that 33% to 50% only exists on paper. Additionally, in some certification standards, the certificate on purchased cocoa powder can be exchanged for an equal amount of certified butter or mass. As cocoa powder is not needed to produce chocolate, manufacturer can sell their products as 100% certified, even when only 60-80% of the purchased volume of cocoa is certified. This practice was initially put forward as a tool to kick-start the mainstreaming

of sustainable cocoa, but is now in the process of being phased out – UTZ will phase it out by 2018, while the other two certification bodies already stopped this practice (Cocoa Barometer Consortium, 2015, p. 28). At the same time, there continues to be confusion about the available amount of certified cocoa. While some companies claim that they cannot increase purchases of certified cocoa due to a lack of supply, farmers indicate that production of certified cocoa is far higher than demand (Cocoa Barometer Consortium, 2015, p. 25).
Overall, certification can lead to better social and environmental conditions on farms, but cannot automatically be equated to a sustainable cocoa business. Most standards were written with larger plantations in mind and struggle to reflect the problems faced by smallholders (such as missing access to training and financial institutions, volatility of world market prices, lack of local infrastructure and agricultural inputs, or land use and tenure conflicts). Furthermore, for it to be effective, certification needs all involved actors to fulfil their roles. Standard bodies need to set sensitive standards and fair premiums, auditing organizations have to work independently, and the certified cocoa has to be demanded by customers. When criticizing certification, these components are often used interchangeably and standard bodies wrongly blamed for all mistakes (Cocoa Barometer Consortium, 2015, p. 20).

As discussed above, the farmers should be able to invest some of their income into safe water and electrification, if provided with fitting financial tools. The prospect of both rising productivity and prices over the next years should make it easier for farmers to contribute to the financing of investments in their region. In a research center in Zambakro and as a part of their CSV activities, Nestlé agronomists are experimenting with cocoa strains from all over the world to grow higher-yielding and disease-resistant strains, which are distributed to farmers free of charge to rejuvenate old trees. In combination with practical training provided to farmers on-site and in the field, these measures are expected to increase cocoa yields per hectare and year from 300-500 kilograms up to 2 tons without the help of chemical fertilizers (or even three 3 tons, if farmers make use of micro irrigation systems). Additionally, the prices paid to producers are constantly rising. While farmer received 750 XOF (1.25 USD) per kilo in 2015, the guaranteed minimum price for producers rose to 1’100 XOF (1.83 USD) per kilo – a price increase of over 46% in a little bit more than two years – and is expected to keep on rising because of the strong growth in demand (Le Conseil de Café-Cocoa, 2017; World Cocoa Foundation, n.d., p. 12).
Overall, the financing mechanisms presented in this section could empower the population in the project area to achieve access to safe water with their own means. However, we will have to communicate clearly that they still need to pay for water at the kiosks and jointly define the exact terms of this cooperation. If we manage to convey the impact these investments could have on their life and provide fitting financial tools, it should be possible to ignite their passion. And as we have seen on our visit to a project village called Blaisekro, poor people manage very well to free up income for what they truly desire – with a group of men reporting that they spend between 6’500 and 15’000 XOF (USD 10 to 24.95) per month on airtime for their household’s mobile phone, as compared to an average of around 300 XOF (USD 0.5) for safe water.

5.3. Risks

After discussing commercial funding and the empowerment of communities through fitting financial tools as potential funding mechanisms, we will briefly discuss potential risks associated with the project at hand. As with the budget and required funds, the internal risks will depend strongly on local determinants (such as the chosen location and specific set-up), and on a careful and sound implementation. Consequentially, we will focus on the three most important external risk areas, both in term of likelihood and consequence. This Chapter by no means intends to provide an exhaustive list of potential risks. It can serve as a starting point for discussions, but should be transformed into a thorough risk assessment before implementation.

5.3.1. Weak institutions endangering the system

One major source of risk for the proposed social business lies in the relatively weak and unstable governmental institutions. In its latest evaluation for Côte d'Ivoire in its *rule of law index*, the World Justice Project (2016b) especially emphasized the widespread corruption, the problem of the government not being open (in a sense that it does not share information, or empowers people with tools to hold the government accountable and participate in public policy deliberations), and the weak enforcement of regulations and insufficient criminal justice. Overall, Côte d'Ivoire is attested a rule of law score of 0.46 on a scale from 0 to 1 (with 1 indicating complete adherence to the rule of law; as a comparison, its direct neighbors Ghana and Burkina Faso scored 0.58 and 0.48 respectively), putting the country on the 87th place of 113 countries rated worldwide (World Justice Project, 2016a, p. 5; 10, 2016b).

And while the World Justice Project attested Côte d'Ivoire a relatively high political stability in 2016, it will prospectively have to lower the score for the 2017 edition. After the 2002-2011 civil conflict ended, the country entered a phase of economic expansion, with an average annual GDP growth of 9% since 2012. However, this economic growth leaves out a substantial share of the population, and in January 2017, parts of the military revolted demanding back pay of wages and better living conditions. After they blocked access to cities and casernes for several days, the government agreed to pay an estimated 19'500 USD to each of the approximately 8,500 mutineers. This payout in turn startled other civil servants inter alia discontent with their low and often irregular low wages, and lead to a 180,000-strong civil servant strike in March, closing down public schools and curtailing hospital services (Lyngaas, 2017b; Lyngaas & Searcey, 2017). In May then, parts of the military once again revolted, blocking streets into several cities and seizing control of the national military headquarters and the Defense Ministry in the center of Abidjan (Reuters, 2017). The government did send in elite forces to quell a military mutiny that has already left one soldier dead and five civilians wounded (Lyngaas, 2017a), the outcome of this confrontation was however uncertain and the revolt unresolved at the time this thesis was printed.

Overall, the political uncertainty, the weak and unstable institutions, and the low adherence to the rule of law might complicate doing business in this country, leading the World Bank Group (2017) to rank Côte d'Ivoire 142nd on the *ease of doing business*. While these circumstances do by no means make our project impossible, we will need to take precautionary measures to ensure the working and sustainability of our project. During the January revolt, for example, the military police fired shots near the port of Abidjan, temporarily disrupting commerce and backlogging shipments of cocoa exporters (Lyngaas, 2017b). As such blocks and similar disturbances could occur again, we should carefully assess the business implications for our project of political and institutional risks, and ensure that the interlocking parts of the system all work during potential states of emergency. It could for example be necessary to build in reserves for chlorine being delivered to water kiosks or to put greater emphasis on security related questions, offering water kiosks to safeguard revenues with innovative methods such as mobile money.

5.3.2. Risk of (further) undermining the government

Even though this argument relates to the previous points, it is crucial enough to state it separately: The proposal to provide access to safe water in the project area is built on the fact that the government fails to do so in the first place. However, by introducing continuous service delivery completely separated from the states' activities, we might further undermine the state (or at least its responsibility to provide safe water). This is a problem inherent to social businesses, concepts such as CSV and the development work in general. By creating value in fields typically associated with the government (such as education, public health, infrastructure or access to safe water), these actors divert pressure from the government already failing or refusing to fulfill its functions (Karnani, 2007, p. 108) and could disincentivize it to assume responsibility in the future. Additionally, such endeavors are usually organized as a project, with a clear start, mode of action and end date. Each donor or investor has its own requirements and procedures for recipient countries to comply with, and the projects are often running in parallel to a country's own policies and institutions. This can in turn increase costs for developing countries and tie a sizable proportion of administrative capacity, weaken public financial management skills and undermine domestic capacity development, and in the end impair state-ownership or even create parallel structures competing with the state (The Economist, 2017a; Verhoeven et al., 2011, p. 11).

Overall, to avoid the risk of weakening the government's role and impeding a truly holistic development of the region, and to avoid despotism and obstacles put in the way by officials feeling undermined in their competences, it will be crucial for our project to work closely with and involve the national and local authorities. The coordinating body (and Nestlé, in its role as potential financier and industry facilitator; see Chapter 3.2.3) will have to pro-actively start a constructive cooperation and dialogue, and see where forces can be pooled. One local government official in Divo, for example, told us that while he has the personnel capacities to do more, the financial contributions he receives from the national government are barely sufficient to provide water to the cities and a few villages in his district. In such cases, it could make sense to pool efforts and – whenever possible without endangering the project – to channel inputs through the government, allowing the state to take over responsibility and gradually fill into its designated role.

5.3.3. Change evoking resistance

While implementing the range of action proposed in Chapter 3, we should be aware and anticipate risks evoked through change. First, even when we are as inclusive as possible, there are nearly always people that prefer the status quo. It is for example likely that former members of water committees will fear to lose influence because of the new system. Second, we should be aware that commercial success can create risks, especially in an environment with relatively weak institutions (see Chapter 5.3.1). Besides rent-seeking through political actors, it is for example conceivable that established businesses feel threatened, and make use of their market power and connections to impede the pilot in its crucial startup phase (Koh et al., 2014, p. 75; Sahlmann, 2008, pp. 26–27). Because of these two factors, it will be crucial for the success of this project to sensibly moderate change, and organize a well thought-through transition. We should be in constant exchange with people on the ground, receptive to input and work out benefits and ways to include different stakeholder groups. A special focus should be on institutional partners and their members – for example local Red Cross workers and volunteers, or cooperative representatives. They worked in and are well-connected within the communities, and their outspoken support (or lack thereof) could well define whether our project turns out to be a success. Ideally, and as written in Chapter 3, we will employ locals, both in strategic and operational positions. Context matters strongly to make pro-poor businesses work (Aydogan, 2010, pp. 51–52), and team-members from within the communities are best suited to help understand and deal with geopolitical and socio-anthropological barriers.

6. The bigger picture - personal learnings

In this last Chapter, we will abstract from what was written so far and shift the focus away from the project in Côte d'Ivoire. We delve into three independent questions to discuss the CSV concept and actors involved, and bring in personal options and insights after having been exposed to both the theoretical background and the reality in the field.

6.1.1. A desirable concept in general?

One problem of concepts such as CSV is that it can (serve to) dehumanize people. The concept demands that both the corporation and its shareholders must benefit from initiatives, and that the value should be created along the corporation's core business. Providing safe water to people in need outside a company's business activities – for example in the hypothetical case of a drought occurring in a close-by region not connected to a company's core business – would not be in line with the CSV concept. I do by no mean intend to imply that Nestlé (or other companies using CSV) would not go out of their way and help humans in need, simply because they are not contributing to the core business. But while such concepts can make it easier for CSV personnel to bring about change and use a company's resources for the benefit of its shareholders, they can as well be used to argue why a company should not become active.

From the perspective of farmers, one could ask whether it is desirable that improving their situation helps Nestlé creating more value. As seen in Chapter 4.3, the cocoa market is already strongly skewed towards one side, and focusing on increased productivity makes farmers even more dependent on multinationals (in the absence of local demand and if not done side by side with increased productivity for crops other than cocoa). The thousands upon thousands of rubber trees lining the streets in rural Côte d'Ivoire serve as a vivid reminder for such a case where focusing on monocultures and relying on exports went wrong: When world market prices started to rise for rubber, Ivorian farmers wanted part of the fortune and started to plant caoutchouc trees on their plots (encouraged by both buyers and international organizations/NGOs). By the time the rubber became harvestable, the oil price had spiraled downwards, leading to synthetic rubber being cheaper than its natural counterpart. The money and time invested into these trees was mostly lost, and farmers did have no funds left to change to more lucrative crops. As seen in Chapter 4.4, the demand for chocolate is skyrocketing. While this trend is predicted to remain constant for the next years, there is no guarantee that farmers focusing on cocoa (encouraged by Nestlé providing them with more lucrative plantlets) could not one day face the same problem. Another country could for example significantly increase production and/or undercut prices through a subsidy, or rising oil prices could increase transport costs and make West African cocoa comparatively expensive, de facto cutting the country off from overseas markets and leaving it with an overproduction that cannot be absorbed by the local market. Consequently, to encourage a holistic long-term development for their farmers, buyers should tie higher productivity in cocoa production to agricultural diversification.

However, despite these warning words, programs to increase productivity on smallholder cocoa farmers can also be perceived as a big chance, a sector afflicted by poor agronomic practices and a loss of produce to diseases. Particularly in West Africa, the ageing plantations, and a lack of access to improved planting materials and farming equipment pose a significant risk for farmers who already struggle to make an income. Furthermore, reaching markets can be a daunting challenge for farmers, especially when the only access is through difficult roads in remote areas. In such an environment, programs like Nestlé's Cocoa Plan can bring a lot of value. And even if without them, the sheer presence of multinationals and international trade brings a lot of income into a poor region without many economic alternatives. Locke

(2015) summarizes the situation by stating that multinationals and the "fact that [they] do buy from smallholders does contribute more than foreign aid ever could".

6.1.2. Give multinationals credit (when deserved)

As the son of a Swiss midwife who grew up with the *Baby Milk scandal*[11], I was exposed to an environment skeptical of Nestlé since childhood. After agreeing to accompany my thesis supervisor to Côte d'Ivoire and when discussing this voyage with friends and family, I was nevertheless surprised how widespread and intense the aversion seems to be, with arguments ranging from a general skepticism towards multinationals to bad-practices associated with Nestlé. Mostly, it was questioned whether a company like Nestlé ever acts out of another intention than maximizing its profits and whether I, a person very much concerned about questions of social equality and environmental sustainability, should be "complicit in whitewashing Nestlé's wrongdoings".

This negative connotation became increasingly bewildering during my travels, especially after seeing promising initiatives like the research center in Zambakro (see Chapter 5.2) and after discussions with many passionate and caring people involved in Nestlé's CSV activities (both working directly at Nestlé or in subsidiaries/at a lower tier of the Cocoa supply chain). Skepticism and social activism was direly needed in the past – if we think back to successful public campaigns forcing Nestlé to become more open for discussion and laying the groundwork for today's CSV activities – and remains important today in areas where human rights are actively violated by companies such as Nestlé. Nevertheless, I became convinced that being too pessimistic could be counterproductive in helping Nestlé change for the better. Yes, there is still a lot that could be improved, both in how Nestlé conducts business – there will be room for improvement as long as negative social and environmental externalities are not fully internalized – and in how their CSV practices are implemented. But even if not all practices of a multinational deserve merit, poorer people in developing countries would probably benefit from a more nuanced public discourse.

One consequence of this climate of skepticism is that it disincentivizes a transparent and honest dialogue. Communication of negative outcomes of corporate and CSV activities most certainly leads to harsh criticism by the civil society and headlines in the press like "child labor still widespread in projects of Nestlé." While this gives the victims of such practices a voice, it prevents companies from sharing both best and worst practices, and thereby leads to the upholding of approaches that have already proven to be insufficient. Actors within the industry started to tackle this fear of negative publicity with concepts such as *context reporting*, which allows stakeholders to understand a measurement against broader sustainability trends. When speaking about positive developments and negative externalities caused by business practices, many companies for example started to compare their ecological footprint with alternative products (how much resources are needed to produce beer, as compared to diary drinks), or

[11] In 1974, the British civil society organization *War on Want* published a report called *The Baby Killer*, criticizing Nestlé for promoting bottle feeding in poor communities and holding them responsible for ensuing infant illnesses and deaths. Nestlé sued a Swiss publisher of a German translation for libel, and after a two-year trial, the court ruled in favor of Nestlé, but commented that the company should "modify its publicity methods fundamentally". Being interpreted as a moral victory, the trial generated world-wide publicity, led to Nestlé boycotts in many countries, and culminated in a 1979 WHO meeting calling for the development of an international code of marketing for infant and early child feeding practices. The campaign is widely viewed as a role model for how civil society organizations can take considerable influence on multinational companies and led to a widespread and long lasting deterioration of Nestlé's reputation (Mugglin, 2016; Muller, 2013).

with competitors or processes along the value chain (for example comparing the water used to produce chocolate to the quantity needed to source the raw materials) (Goldberg & Fries, 2013, p. 15).

While such tactics are designed to help the public understand the complexity of producing goods within a global supply chain, they are dependent on the audience's willingness to engage in such a dialogue. And the world of a multinational like Nestlé is indeed more complex than portrayed in the media and in public campaigns, with multiple tiers of suppliers, more than 300'000 employees, and operations in nearly every country and in the context of a variety of cultures and realties. This context makes agreeing on goals that suit everyone nearly impossible, and internal change is slowed by organizational resilience, even if strongly desired by individual (or nearly all) employees.

Additionally, it can be discussed whether improving the lives of suppliers is the responsibility of a company such as Nestlé. As seen, the IFRC-Nestlé partnership project does by no means span the entire region, and we estimate that it only covers around 10% of all cocoa sourcing communities in Côte d'Ivoire. While acknowledging the contribution made towards the human right to water and sanitation (and considering the United Nations General Assembly's Resolution 64/292 stipulating that clean drinking water and sanitation are essential to the realization of all human rights), I personally think it is unacceptable for Nestlé that not all their business partners have access to safe water. However, the fact that the Ivorian state does not have the means or does not want to provide basic infrastructure and services to its citizens, does not automatically transfer this responsibility to Nestlé.

Overall, it can be said that Nestlé's impact through CSV projects is not there yet where it is intended to be, and that the project visited in Côte d'Ivoire has some serious caveats. But while highlighting shortcomings and trying to remedy them, the public should not forget to appreciate how far Nestlé has come within a brief period and despite a highly complex environment, both within the company itself and considering the complex reality faced in Côte d'Ivoire.

6.1.3. Wrongly perceived as only driving up costs?

The often-heard assertion that multinationals solely use social commitments to whitewash their otherwise reprehensible activities is built on the assumption that CSV as a concept entails costs for a corporation, and that the company in question needs to make some return from it to offset expenses (for example in form of an improved public perception). However, acknowledging only the costs of CSV activities without acknowledging the benefits draws a distorted picture:

As seen in Chapter 4.4, the demand for chocolate grew significantly over the last years and is expected to rise further. Considering the predicted shortage, investing into the living conditions and productivity of farmers (and thereby making the profession more appealing future generations of farmers) should not be considered as cost factor, but rather as a necessity for the long-term survival of any company in the market. Additionally, while the demand for chocolate increased strongly in emerging economies, consumers in Western markets increasingly demand healthier products with a transparent and fair supply chain. Right after taking office, the new Nestlé-CEO Ulf Mark Schneider was pressured by some stakeholders into selling off businesses that seem most at risk of long-term decline (such as frozen food) and focus investments towards healthy products and health-related innovation (The Economist, 2017b, p. 48). However, not only Nestlé's customers did become more demanding, the same holds true for potential employees. At a meeting with participants from different private market actors, a representative from Barry Callebaut explained that, when choosing their future employer, graduates are no longer interested

in working for a company solely aimed at increasing its profits, and programs creating value for the entirety of stakeholders become more and more important to compete in the market for talent.

Besides giving a competitive edge in the market for talent and customers, CSV activities (or more general; responsible sourcing and production) can also generate savings and create value within a company. A Nestlé program designed at trimming waste at factories, for example, is credited with saving around 1.5 billion USD a year (The Economist, 2017b, p. 48). While this example is quite straightforward, CSV initiatives can also pay off in more indirect ways. One representative from a private company also engaging in CSV activities told us that they profit strongly from the invaluable learning opportunities when cooperating with NGOs and international organizations. Being exposed to differences in organizational culture, he especially cherished new insights into ways of dealing with failure, with private actors often dismissing employees in managerial positions and blaming them for crises, while NGOs aim to keep the expertise inhouse and learn from mistakes. While this is only a subjective assessment from one individual, it is obviously true that companies can learn from cooperation with partners operating in different realities. Additionally, such partnerships can serve as an opportunity for motivated employees to test and refine their expertise in completely different contexts. It is for example conceivable that experts from Nestlé consult social businesses in their area of expertise. Doing so will not only help the new venture and improve its processes, but can serve as a highly-rewarding and hands-on opportunity for personal and professional growth.

7. Conclusion

The consultancy report of Koestler et al. (2016) – which served as a baseline for this thesis – revealed that the visited waterpoints constructed/rehabilitated under the IFRC-Nestlé partnership deliver safe water at point of collection. Water quality at point of use however needs to be improved. Additionally, our study hinted at systemic weaknesses, leading to insufficient maintenance and potential system failure. Even though there are water committees established to operate and maintain the points in question, the system fails to bestow a sense of ownership and aspiration upon the communities. Considering these shortcomings, the thesis at hand proposed to realign the project and ensure safe water delivery through a network of water kiosks, where treated water is sold at a fair price. To motorize the pumps, the system is electrified with solar panels, in addition allowing to (partly) electrify the villages and making the entire system more aspirational. The water kiosks pay parts of their revenues to a newly introduced coordinating body, which in turn employs rotating pump mechanics and covers for maintenance and repair. To ensure support for our project and safe water in general, the coordinating body arranges that partner organizations continue social mobilization efforts – ideally the national Red Cross society, already familiar with the project and well-connected in the area – and develops social marketing strategies and provides fitting materials to the water kiosks. As a last piece, we propose that Nestlé itself becomes active and takes over the role of an industry facilitator, using its position and capabilities to reshape the legal and institutional framework as well as paving the way for entrepreneurial activities.

Past investments into the visited project improved the living conditions of farmers and their families in one of Nestlé's main cocoa sourcing regions. However, despite the progress, people in the project area are constrained by the daily burdens of underdevelopment and the project suffers from systemic sustainability issues, entailing the danger of slippage. To maximize its impact, to increase productivity and living conditions of farmers, and to preserve the achievements and funds already invested into the project, it would make sense for Nestlé to (partly) finance the proposed pilot. To accumulate the needed initial investment, it would furthermore be possible to apply for commercial funding or to create financing mechanism, allowing the communities themselves to (contribute to) fund their inclusion into the system.

To validate the business model before committing too much funding, to provide a clear and affordable buy-in for funding bodies, and to allow the application of first learnings, we propose to develop and implement a pilot, before rolling out the project on a larger scale. The characteristics of said pilot will depend strongly on local determinants and technologies chosen, and it is not possible for this thesis to draw up an exact implementation plan or budget. However, setting both the price users pay for water and the contributions water kiosks pay to the coordinating body to sensible levels will be crucial for its success and sustainability. Appointing them too low would make the system financially unviable, while being set too high could stifle consumption of water and entrepreneurial engagement. We discussed risks for a potential pilot, and emphasized the danger of weak institutions (especially political uncertainty and the low adherence to the rule of law, resulting in a suboptimal climate for doing business). The importance of involving local officials in our activities and the risk that we could otherwise further undermine the government in the exertion of its responsibilities was addressed. Furthermore, we pointed out the importance of close cooperation with communities and people involved in the project in the past, to ensure their cooperation and prevent them from impeding the new venture because they feel left out.

In preparation, and for water as a service-business models in general, the following two research questions should inter alia be answered:

- How should a business delivering water as a service deal with people who (temporary) cannot afford to pay for it? To comply with the government declaring water to be free for citizens, we need to allow basic access for everyone and charge for increased convenience. Technically, it would be possible to dismantle our system and enable people to pump water manually after business hours. However, this would be stigmatizing and disenfranchising, and could expose them to unsafe water. On the other hand, if we want to ensure that everyone is included in our system, based on what criteria do we grant reductions or provide the service for people who cannot afford it? And how do we prevent these practices from undermining the general willingness to pay for our services?
- At what point and how should we include delivering water for non-drinking purposes? In rural West Africa, agriculture accounts by far for the greatest consumption of water, totaling more than 70% of all withdrawals. Access to irrigation is central to crop productivity, however often a highly inefficient process with nearly half of the water being lost through evaporation and transpiration. Should we help farmers by giving out untreated water at a lower rate? However, how do we prevent people from using this mechanism to buy cheaper drinking water, and thereby undermine the system and nullify the health benefits? Or should we set prices to incentivize efficient usage? Recent studies found a low price sensitivity for water amongst farmers (Cominelli, Galbiati, Tonelli, & Bowler, 2009, pp. 671–672), meaning that increased water prices would not guarantee efficiency, but could in fact have negative consequences for equity and local food security. Consequentially, should we think about connecting safe water delivery to mechanisms providing farmers with more efficient irrigation technologies?

Overall, by increasing ownership, setting incentives for involved people and bringing in aspirational technologies, the business model proposed in this thesis could maximize the impact and increase the sustainability of the visited project. However, even though we briefly touched case studies of social businesses operating in similar ways, the ideal setup and location of a pilot needs to be researched in the field and the business model validated in this context.

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Appendix I

Date	Village	POC sampled	GPS coordinates	Sampled households	Meetings
21.10.2016	Pétimpé	PMH 1 PMH 2	N5.43077 W5.12467 N5.43063 W5.12319		
	Gnamboisso	PMH 1 PMH 2	N5.35468 W5.14427 N 5.36001 W5.14381		Health Center
26.10.2016	Gagoré	PMH 1 PMH 2 PMH 3 PMH 4 Surface Water School well	N6.02467 W5.37538 N6.02470 W5.37449 N6.02560 W5.37445 N6.03025 W5.37428 N6.02528 W5.38053	10	
28.10.2016	Kazérébery	School PMH	N5.51426 W5.15399		School
	Gazolilié		N5.55063 W5.41023		School
	Abatoulilié		N5.59304 W5.36134		School
05.11.2016	Djékro	PMH 1 PMH 2 2 Wells	N5.93855 W4.30508 N5.16525 W3.06151	9 (10 planned)	School
11.11.2016	Gagoré	PMH 3	N6.02560 W5.37445	10	
12.11.2016	Gagoré				Health Center
	Lakota				Pump Mechanic
13.11.2016	Gagoré	PMH 3	N6.02560 W5.37445	10 (H_2S + Quantitative)	School
14.11.2016	Zérédoukou	PMH 1 Well	N5.55399 W5.02422 N5.55316 W5.02411	10	Health Center
15.11.2016	Tabléguikou	Tapstation Well	N5.44454 W5.18172 N5.44419 W5.18126		Health Center
26.10.2016	Djékro	PMH 1 PMH 2	N5.93855 W4.30508 N5.16525 W3.06151		School
	Lakota				UCODEL Cocoa Cooperative
27.11.2016	Blaisekro	PMH		10	
	Zibouyaokro		N6.23484 W6.04023		School
	Kouadiokro	PMH	N6.22187 W6.03019		
	Gagnoa				UCDG/USCRG Cocoa Cooperative

Declaration of Authorship:

I hereby declare

- that I have written this thesis without any help from others and without the use of documents and aids other than those stated above,
- that I have mentioned all sources used and that I have cited them correctly according to established academic citation rules.

Kaspar Gertsch	22.05.2017
	Date