White paper

Social Footprint

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Introduction

Environmental life cycle assessment is routinely used by organizations to evaluate and compare the environmental performance of products, services, or organizations. At Nestlé, simplified eco-design is systematically used to evaluate the environmental performance of new products being developed. This has resulted in a product pipeline that is better addressing environmental concerns, and also has greatly contributed to environmental capacity building in the R&D organization: R&D staff is today much better informed about the environmental challenges and solutions in their business. Similar systems and processes are being implemented at other organizations.

It is well understood that sustainability goes beyond environmental performance, and that the social performance of products (and the organizations in the product value chains) is of high relevance. Unfortunately, there is today a lack of a generally accepted approach or method to evaluate social performance. Furthermore, data on social issues is not widely available, and resource intensive to collect. For these reasons, studies on the social performance of products are much less widely available than that is the case for environmental studies. Similarly, at Nestlé, the process to evaluate social performance of products is currently in its early development stage, and the amount of knowledge and understanding for social issues in the R&D organization is comparatively weak. Other organizations are in a similar situation.

To overcome this situation, several organizations have attempted to develop methods and databases that take social aspects into account:

- The Roundtable for Product Social Metrics has been initiated and has published the Handbook for Product Social Impact Assessment. This organization, which is mostly composed of industry organizations has based its guidance on the UNEP-SETAC Life Cycle Initiative, and is useful to evaluate the social performance in a given supply chain. The approach is also harmonized with the WBCSD Project Social Life Cycle Metrics for Chemical Products, and has been critically reviewed by academics, NGOs, and international organizations. Given its comprehensive scope and detailed assessments, the approach is hardly suited for a systematic roll-out in an organization.
- The Social Hotspot Database (http://socialhotspot.org/) and the PSILCA (http://www.psilca.net/) databases are well-known examples of background databases that collect social indicators for industry sectors and countries. While these databases can create quantitative information on social performance of a product, they are not necessarily very useful to give direction into which indicator or social aspect should be dealt with in priority.

More recently, interest has been growing for impact pathways modeling with an endpoint in human wellbeing or utility, expressed in monetary terms. Large consortia have been behind the development of a Natural Capital Protocol (Natural Capital Coalition 2016) and a Social Capital Protocol (WBCSD 2017), the Social Return on Investment Guidance (Social Value UK, 2012), or the Impact Valuation Roundtable (e.g. Impact Valuation Roundtable 2017).

Nestlé has been actively participating in the development of the Social Capital Protocol and has carried out studies on the valuation of safety (injuries) as well as wages. It has published a separate White Paper, entitle “Social Impact Valuation” (Vionnet & Pollard, 2017), on a social impact model of employment. This paper describes the impacts that different wages levels have on health outcomes of employees (based on the social determinant of health studies), at different steps along a value chain from the farm to factory. The approach has proven to be quite useful and actionable: it clearly identifies the workers in the supply

chain that suffer most from low wages, and demonstrates what could be achieved (in terms of health benefits) if those wages were to be raised. It is envisaged that the methodology could be applied to other social issues, such as training, women's empowerment, and child and forced labor.

However, this approach relies mostly on primary data, which is time-consuming and costly to collect. Within the impact valuation community there is interest to identify alternative methodological approaches, potentially involving data from input-output tables, when actual data is either not available or would be too difficult to gather.

One such approach is the social footprint, developed by Weidema (2016), an approach that uses company specific data where available, but complements these for completeness with top-down data from global economic and physical input-output tables.

The social footprint is a monetary summary measure of income redistribution and the sum of all productivity-reducing externalities related to a specific product or activity, composed of three elements:

- Income redistribution is the overall (societal) increase (or loss) of utility ("useful-ness" of wages) caused by the transfer of money from one social group to another. Typically, transferring money from wealthy consumers to poor farmers will result in an increase of utility for the society as a whole.
- Productivity-reducing externalities are social impacts due to lack of governance, suboptimal infrastructure, corruption, etc. These are calculated as the difference between the actual value added of a work activity, and the potential value added (estimated from the current value added per work hour in the USA, adjusted for the current productivity-reducing impacts in the US economy).
- These two values can then be supplemented by the monetarized social benefits arising from any positive "creating shared value" actions taken by the companies in the supply chain.

Objectives & Scope

The present White Paper applies the first two bullet points of the social footprint method outlined above. We use two case studies from Nestlé supply chains: the production of milk (liquid milk and milk powder) in Pakistan, and the production of tomato-based sauces under the Solis brand in Spain.

In Pakistan, milk is sourced from local production (partly based on small-scale farmers, partly based on large dairy estates). Milk is processed in a large Nestlé production center and sold to the local market, predominantly to the emerging middle class in urban areas.

The case study on tomato products is on the same value chain as the study on Social Impact Valuation, reported above. In this value chain local farmers (supported by seasonal workers) supply to an intermediate processing company, which then supplies to Nestlé. Carrying out two different approaches on the same value chain allows us to benchmark the two methods and provides valuable insights that will guide future development of social footprinting and social impact valuation. The results of the comparison are presented in the second part of the Discussion section of this White Paper.

Methodology: Social Footprint Model

The social footprint is composed of three elements, of which only the first two are included in the simple screening version of the social footprint applied in the pilot assessments:

- *The income redistribution impact:* Calculated as the increase (or loss) in utility caused by the transfer of money from one societal group to another (here: the money spent by consumers to buy a food product and its transfer to the groups that contribute to the production of this product), by weighting the spending and income for each group by their relative marginal utility of income:

  $$Utility = \left(\frac{averageIncome}{subgroupIncome} \right) \wedge \delta$$

  where both incomes are corrected for purchase power and δ is the elasticity of marginal utility of income. For our calculations we use a value for δ of 1.24, with a 95% confidence interval of 1.14-1.35. The subgroup incomes are corrected for purchase power using the World Bank's ratios of Purchase Power Parity to the market exchange rate.
- *The productivity impact of missing governance:* Calculated as the difference between the actual purchasing-power corrected value added and the potential value added when all productivity impacts are internalized. The potential value added is calculated with the same average value per work hour for all countries, calculated by correcting the productivity of the USA for the current impacts on the US economy from unemployment and underemployment, avoidable health impacts, trade barriers and missing education. The resulting value is 1.87 (range 1.57-2.12) times the current purchase-power corrected value added per work hour in the USA. For the second pilot study on processed vegetables a slightly lower multiplier of 1.75 (range 1.47-1.99) was applied, where only the ultimately avoidable health impacts were included. This overall *productivity impact of missing governance* can – with additional data sources and disaggregation according to the causal factors – be further specified with respect to impacts from, *e.g.*, missing education, trade barriers, health, unemployment and other aspects of missing physical and social infrastructure, making the method open for further refinement and detail in areas of specific interest for a particular product or project. In the second pilot study on processed vegetables, we include a specification of the contributions to the productivity impact from *insufficient education, insufficient health care, insufficient clean water and sanitation,* and *undernutrition.*
- *The potential credits for positive action:* The calculation of productivity and well-being improvements resulting from specific enterprise expenditures obviously requires additional enterprise- and site-specific data, in contrast to the valuation of the first two elements of the social footprint, and is therefore not included in the simple screening version of the social footprint used in this report.

The social footprint method is described in more detail in Weidema (2016). The methodology for the more specific contributions to the productivity impact is provided in Weidema (2017).

Case studies

Dairy in Pakistan

The foreground data have been supplied by Nestlé, primarily from the financial report of Nestlé Pakistan Limited for the year ended 31 December 2014. The background data are from Exiobase version 2.3.

The value added in the Pakistan case study is mostly driven by the raw milk supply; see Table 1. 42% of value added originate from this activity, and after utility-weighting this accounts for almost 80% of the income redistribution impact, highlighting that small scale farmers in Pakistan are the greatest benefiters of money transfer in the dairy supply chain: middle class consumers in urban areas transfer money to poor farmers in rural areas, which enables these farmers to improve their livelihoods.

Table 1: Value added and utility-weighted value added (income redistribution impact) and productivity impacts in the dairy supply chain in Pakistan

	Value added	Utility-weighted value added	Utility-weighted productivity impact
Trade	12%	9%	10%
Dairy processing	17%	6%	5%
Raw milk supply	42%	79%	79%
Other	29%	6%	21%

Utility-weighted productivity impacts are also driven by the raw milk supply (due to the fact that raw milk supply is the highest contributor to work hours in the dairy supply chain) and the utility-weighting also here contributes to the high weight given to this activity.

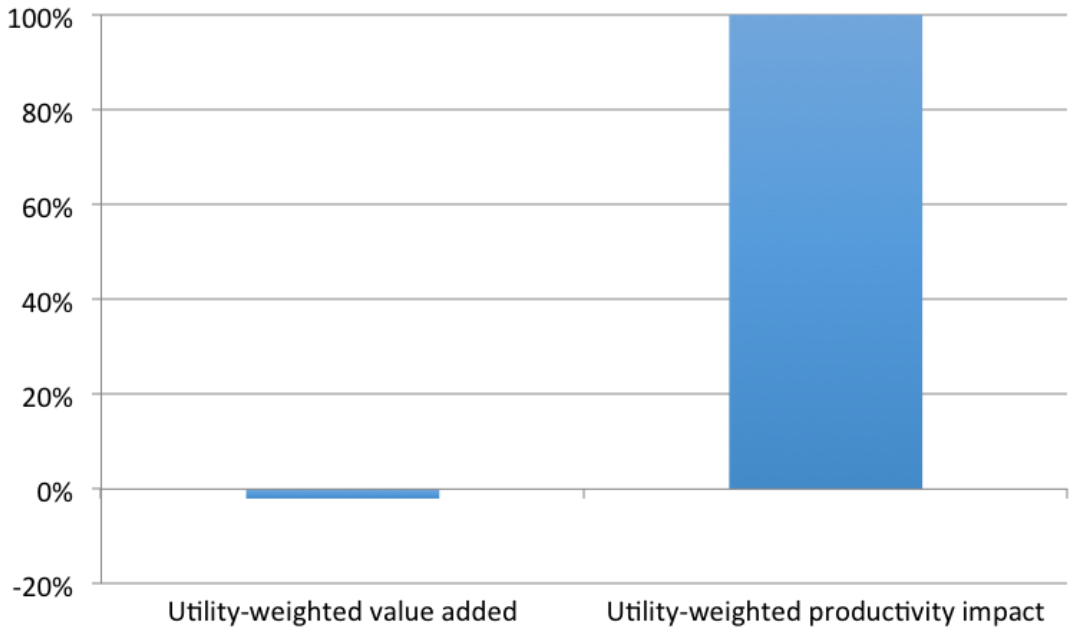

Figure 1: Comparison of utility-weighted value added (income redistribution impact) and productivity impacts in the dairy supply chain in Pakistan. Note that positive numbers indicate negative (undesirable) impacts.

When comparing the total amount of productivity impact with income redistribution impact (Figure 1), one can see that the productivity impacts far outweigh the income redistribution impact. This is not surprising, given the way productivity impacts are calculated, and knowing that the average productivity in Pakistan is 45 times below that of the USA.

Tomato production in Spain

Foreground data was used for the tomato production (accounting data from a sample of 29 producers, and total of work hours per hectare), for the primary tomato processing (total fresh and processed mass; number of workers employed permanently and in the harvest season) and for the secondary tomato processing (the input of raw materials and packaging materials; electricity and natural gas input in energy units; water input in volume; proportion between revenue and net operating surplus for the years 2010-2015). All other data were obtained from the industry averages in Exiobase version 3.3.10.2c.

The tomato production case study was a cradle to gate study, implying that – in contrast to the Pakistan dairy study – the wholesale and retail trade activities are not included. As can be seen in Table 2, the value added is quite evenly distributed across stages of the supply chain, with a relatively high value for packaging – reflecting the high amount of packaging materials that are being used in this product for processed vegetables. The productivity impacts show an even higher share coming from packaging, which is explained by a relatively high share of the upstream activities for packaging material production are taking place in low-income countries. In contrast, vegetable production and processing, taking place in a developed country, have a relatively low share of the productivity impacts.

Table 2: Value added and utility-weighted value added (income redistribution impact) and productivity impacts of the different elements in the vegetables supply chain.

	Value added	Utility-weighted value added	Utility-weighted productivity impact
Vegetable processing	24%	10%	1%
Vegetables	8%	10%	2%
Processing of other agricultural ingredients	8%	12%	12%
Packaging	28%	32%	41%
Other	32%	36%	44%

Similar to the case study on dairy, the productivity impacts far outweigh the beneficial impact of the redistribution of the value added; see Figure 2. Again, this is related to the fact that the productivity in the supply chain is very much below the benchmark (the potential productivity). The difference is less pronounced than in the Pakistan dairy case (the redistribution impact is 6% of the productivity impact here, against 2% in the Pakistan dairy case), reflecting that the redistribution effect from wealthy consumers to poor producers is less pronounced here.

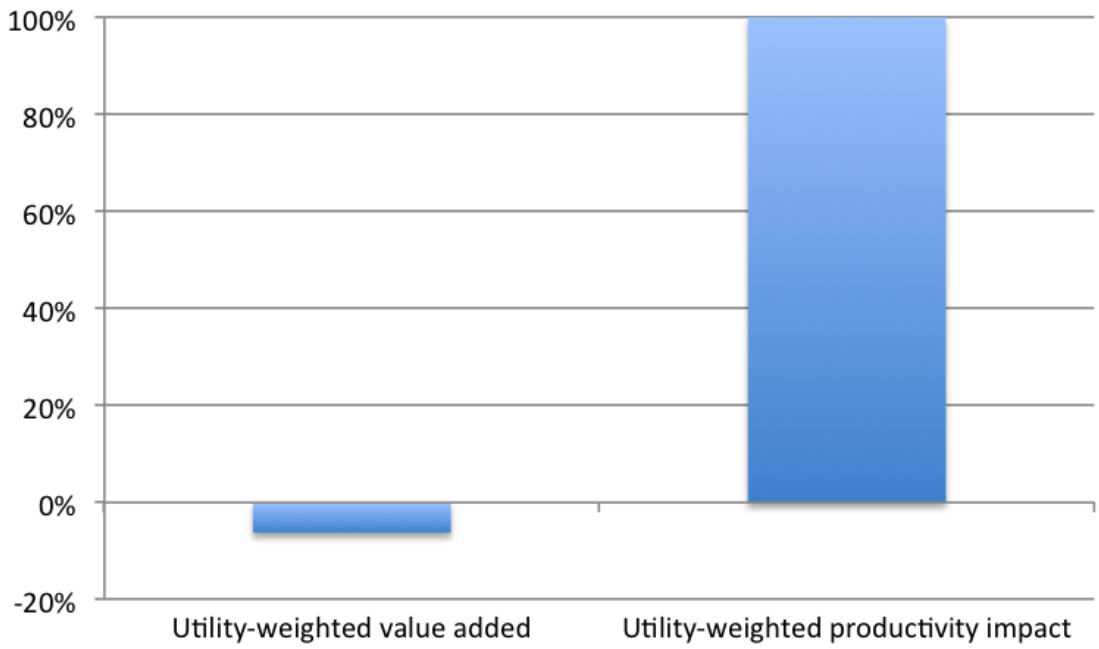

Figure 2: Comparison of utility-weighted value added (income redistribution impact) and productivity impact in the vegetable supply chain. Note that positive numbers indicate negative (undesirable) impacts.

In the case study on tomato products, a more detailed identification of the contribution from specific pathways to social outcomes was performed. The productivity impacts are thus split into 5 categories; see Figure 3: insufficient education, insufficient health care, insufficient clean water, undernutrition, and other impacts. The relatively large "other impacts" category reflects that there are many more causes for social impacts than those individually measured. Thus, it is somewhat disappointing to see that the vast majority of social impacts cannot currently be allocated to a precise cause. Out of the impacts that can be allocated, "insufficient education" is by far the most important impact, confirming the importance of the training programs that are given to small-scale farmers in those two case studies, but also in other development and cooperation projects worldwide.

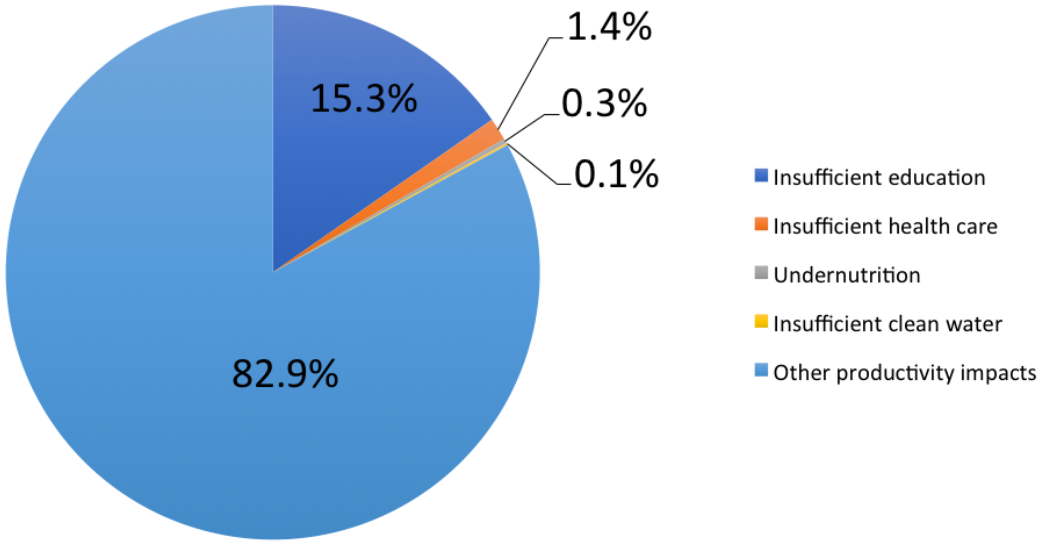

Figure 3: Origin of social impacts for the vegetable case study

Discussion

The use of the social footprint method, as presented in the current white paper, has proven to be useful to identify the location of social impacts along the supply chains of the products under study. Marked differences are visible between the two case studies, in particular with regards to the importance of packaging materials: while packaging materials contribute very strongly to the social footprints of the Solis tomato products in Spain, packaging is almost absent from the assessment on dairy in Pakistan. For dairy, on the other hand, the small-scale farmers show up as the key hotspot in the social footprint. This confirms what common sense would suggest: social impacts in emerging economies are very high (in particular as compared to industrialized countries) and the poorest members of society in emerging economies (here: the small-scale farmers) suffer the most. On the other hand, this finding also confirms that programs to improve the social conditions in a value chain are most promising in emerging economies and with the poorest members of society.

The outcomes of the comparison with the Social Impact Valuation (Vionnet & Pollard, 2017) study are presented in detail in the following sections. This comparison has also suggested that the current Social Footprint model can be further improved to:

- Better account for the social redistribution of labor income, taxes, and operation surplus
- Better distinguish and specify impact pathways from value added of production to health impacts
- Better account for the efficiency of public services in supplying wellbeing outcomes per unit of financial resources

These improvements will be implemented in future versions of the model.

Comparison and possible alignment with Social Impact Valuation Model

The great benefit of the Social Footprint method lies in the use of widely available background information from databases to assess social impacts top-down. As opposed to many other approaches, this means that some initial data is available for practically any specific case study, drastically reducing the overall cost of social footprint assessments. The quality of the available data may sometimes be problematic: the databases contain information on key sectors of OECD countries, as well as other world regions. In some cases, sub-country data might be required, or the country in which a case study takes place might not be available in the database. In other cases, the resolution of economic sectors might be insufficient. This is where the Social Impact Valuation method has it strength: it is by definition a bottom-up approach (currently) focused on employment with accurate and high-resolution data. Therefore, data availability might, in some cases, be challenging.

The two models also answer different questions and therefore use different impact pathways: The Social Impact Valuation model directly relates income to health outcomes. The Social Footprint model takes the enterprise value added (including taxes & profits) and relates it to that part of the avoidable health burdens that cannot be attributed to specific causes to the enterprise in proportion to its share of the national value added. The Social Impact Valuation model can thus be seen as specifying that share of the avoidable national health impacts that are directly related to insufficient private income, while the Social Footprint value also includes the part that is related to insufficient funding of public service systems.

On the other hand, there are also some minor methodological value choices that can be brought in alignment quite easily: The two models differ in the way they assign a monetary value to a health outcome (measured in DALY, disability-adjusted life year). Furthermore, there is today no agreement on what baseline / reference level should be used in such comparisons (e.g., any loss of utility as a negative impact versus living wage as the baseline). Both models can be run with different baselines.

The following table presents the results of both models: the income-related part of the health impacts. The absolute value of impacts is different, given the Social Impact Valuation model only includes the share of the avoidable national health impacts that is directly related to insufficient private income, whereas the Social Footprint model also includes the part that is related to insufficient funding of public service systems. For ease of comparison, the contribution by the different life cycle stages are also displayed in indexed form, with the Nestlé Factory as 1 (see column entitled “[indexed]”).

	Social Impact Valuation model		Social Footprint model	
	[DALY]	[indexed]	[DALY]	[indexed]
Nestlé Factory	0.52	1	11.61	1
Pre-processing	5.34	10.4	12.59	1.08
Agricultural supply chain	2.32	4.5	5.81	0.5

In summary, the two models come to similar conclusions on common elements, but are different with regard to the type of questions that they are optimally suited for: The Social Footprint model is best suited for organization-wide top-down assessments with limited detail. The Social Impact Valuation model is best suited to directly assess health impacts of income inequalities.

References

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