

Measuring Value - Towards New Metrics and Methods

Prepared for: **Nestlé**

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This report was prepared by Quantis Switzerland in collaboration with AGECO. Please direct any inquiries to Quantis Switzerland and AGECO.

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Foreword by Quantis and AGECO

The challenges and opportunities of finding a balance between economic growth, environmental conservation and social well-being have been discussed at length. The growing number of sustainability initiatives in the private and public sectors demonstrates how strategic the management of the economic, social and environmental impacts of human activities has become.

Impact measurement remains one of the greatest underlying challenges of sustainability faced by academics, practitioners and organizations. While significant progress has been made from the environmental perspective, there is still much work to do in order to better assess social and socio-economic impacts and weigh the trade-offs.

Developing new tools and metrics to understand, measure and manage socio-environmental impacts is of paramount importance to organizations. By broadening how value is perceived and assessed, businesses can make better investment decisions to ensure the highest, most sustainable returns. It is a way to mitigate risks, enhance performances, reduce footprints, identify new opportunities and increase returns on investments. More comprehensive measurement leads to more comprehensive management.

This report aims to contribute to the ongoing discussions on this complex and rapidly evolving issue by providing additional insights into the ways in which environmental and socio-economic impacts could be assessed and valued.

Conducted in collaboration with Nestlé, the report provides an overview of the existing approaches in the field, explores new methodological developments and sets out recommendations on how Nestlé could assess and value its socio-environmental impacts. More importantly, it highlights the areas in which additional work is required in order to further develop current socio-environmental impact assessment knowledge and tools.

Samuel Vionnet, Sustainability Expert, Quantis

Jean-Michel Couture, Associate and Project Director, AGECO

Foreword by Nestlé

This report is the result of a study undertaken in 2014 to help Nestlé better understand the methodological approaches to the valuation of natural and social capital. The study objectives were to produce an "environmental profit and loss account" for Nestlé and to define how to carry out a similar assessment of our social impacts. We also wished to use the study to learn about this rapidly evolving area, in order to be able to better contribute to the various platforms that are developing natural and social capital protocols.

We learned a lot during this process, not the least of which is that there is still much to learn, both within Nestlé and in the community of companies, consultants, academics and civil society organisations working on the subject. We are therefore making this report available publicly in order to facilitate this learning and to encourage a debate on topics such as how to align natural and social capital valuation methodologies, and to help develop a deeper understanding of the different means and reasons for carrying out impact valuation (as we now refer to this work within Nestlé).

This is a public version of the report produced for us by Quantis and Groupe AGÉCO. We requested that Quantis and Groupe AGÉCO delete most of the figures in the original report so that the focus can be on the insights, concepts and tools. We hope it is a useful addition to the discourse.

Laurent Lanvier, Group Finance, Nestlé SA

Duncan Pollard, Stakeholders Engagement in Sustainability, Nestlé SA

Introduction: Measuring environmental and socio-economic impacts



Nestlé's business strategy is driven by the creation of shared value. The underlying notion is that the value generated by an organization's activities should not only benefit shareholders but also society and the environment, which enable these activities to occur in the first place. The strategy acknowledges the importance of doing well for doing good by taking stakeholders into account just as much as the environment in the economic value creation process. It adheres to the principle of sustainable development and its three pillars: economic performance, environmental integrity and social well-being.

Today, an increasing number of small and large businesses are moving towards this integrated vision of sustainability. But to achieve such ambitious objectives, organizations must first be able to measure the positive and negative impacts of their activities in order to adequately manage them for the benefit of the environment and society.

Recently, there has been much focus on measuring the real value of companies by accounting for their social and environmental values in their extra-financial reporting. Initiatives such as the Natural Capital Coalition¹ have been highly publicized, and the businesses involved in the project acknowledge the importance of such comprehensive disclosure through integrated reporting. Companies and NGOs are also beginning to address the topic, and the Net Positive – A new way of doing business report published in 2014² is concrete example of this.

Quantis and AGECO have therefore partnered with Nestlé to provide insights on existing initiatives and metrics by setting out preliminary results and a roadmap to support the corporation's efforts to implement the approach into its global activities.

The report first describes key concepts (section 2) to address the main variables that must be taken into account when assessing and valuing socio-environmental impacts (section 3). Section 4 presents the results of the preliminary analysis on environmental impact valuation and advances methods to measure additional social issues. Section 5 analyzes the business potential and value of the methodology for Nestlé, and, finally, section 6 discusses steps to further explore the topic and strengthen the methodology.

Socio-environmental impact valuation: concepts, definitions and approaches



Though fairly recent, the concept of measuring the real value of companies builds on existing knowledge and methodologies from several fields and disciplines. Fostered by different companies and organizations, the approach's rapid development led to the creation of new terms and definitions, which can create confusion when methods and results are communicated. This section therefore starts off by proposing a glossary of the main technical terms used in the report and continues with a discussion on the different concepts of socio-environmental impacts valuation and the underlying perspectives.

Main concepts and their definitions

Impact³: The portion of the total changes in ecosystem or human well-being conditions that occur as a result of a particular activity⁴.

Externality: The consequence of an activity experienced by third parties and whose cost is not accounted for in the financial reporting of the organization that is responsible for the activity. An externality can be either positive or negative.

Activities: The actions undertaken to operate a business or produce its products (services) and which generate potential impacts by inducing interactions with the ecosystems and society.

Ecosystem services: The benefits a society derives from ecosystems (e.g. clean air, water provision or land productivity). The Common International Classification of Ecosystem Services, among others, reviews and categorizes the various ecosystem services that exist.

Impact pathway (also causal chain or result chain): The processes that link activities to socio-environmental impacts through causal relationships. Impact pathways may be defined to assess social and environmental impacts. From a conceptual standpoint, a causal chain is made up of five key components⁵:

- Input**—the resources required to carry out an activity
 - Environmental example: square metre of water
 - Social example: monetary value of employee training
- Activity**—the flows or behaviours whose effects are to be determined and measured
 - Environmental example: energy consumption
 - Social example: employee training
- Output**—the direct result of the activity
 - Environmental example: CO₂ emissions
 - Social example: number of employees trained
- Outcome**—The changes in the conditions of a population or an ecosystem
 - Environmental example: climate change (expressed in kg of CO₂ equivalent reflecting climate global warming potential)
 - Social example: number of employees who improved their job situation (i.e. salary, position, etc.)
- Impact**—The portion of the total outcome affecting human well-being or the ecosystem
 - Environmental example: climate change (reduced ecosystem services due to extreme weather, coral reef destruction due to acidification and coastal ecosystem damage due to the rise in sea levels)⁶
 - Social example: number of employees whose well-being has improved⁷

Valuation: The methods that estimate the monetary value of negative and positive socio-environmental impacts.

Socio-environmental impact valuation: concepts, definitions and approaches

Current approaches

Different terms are used to refer to the socio-environmental impact valuation approaches. Puma, PwC and Trucost were among the first to use **environmental profits and losses** to refer to the valuation of externalities. Recently, the Natural Capital Coalition, which initially uses **natural capital accounting**, further developed the concept. In fact, the terms are slightly different: the former measures externalities while the latter assesses the ecosystem services that support business activities⁸. Both focus almost exclusively on the environmental impacts and do not cover the social component of sustainability, which, instead, is addressed in other approaches such as **social return on investment (SROI)** or **social impact assessment (SIA)**.

To date, only a few initiatives—most of which have been developed by consulting firms—address all three pillars of sustainability. This is the case, for instance, of PwC’s **total impact measurement and management (TIMM)** tool and KPMG’s **True Value** methodology. Quite new, these approaches are still evolving and have yet to address certain methodological challenges. However, they have the advantage of advancing the concept and raising awareness.

The measurement of the environmental and socio-economic impact may be defined as **the sum of an organization’s negative and positive impacts according to a baseline throughout the value chain during a defined period and, in the specific case of this project, expressed as a monetary value**. The underlying principles of this definition are detailed in the next section. The overriding idea is to be able to measure every contribution of a business according to the same scale (i.e. monetary value) in order to compare them and determine where the value is mostly created or affected. Figure 1 illustrates the concept: the coloured bars represent a positive or negative contribution to an organization’s impact valuation. Each contribution can be assessed according to the three pillars of sustainability: the economic, environmental and social aspects. The benefits of this concept from a business standpoint are further discussed in section 5.



Figure 1 – The concept of environmental and socio-economic impact valuation measurement. The contributions are all reported on the same axis and compared. Each colour corresponds to a different contribution (positive or negative).

Impact valuation metrics rules



Based on a review of the existing literature and applications, four variables that must be considered and explicitly addressed in order to measure the impact of an organization were determined: the **baseline, scope, timeline** and **position** on the impact pathway. The definition of each variable and the rules to address them in an assessment are discussed below. The implications of these rules are further explored through case studies. Finally, a major issue in current publications linked to the ownership of ecosystem services is also discussed.

Baseline

The baseline is the benchmark against which the impacts are measured and assessed. Three baselines have been set out for impact assessment⁹:

1) Reference flow baseline: The ecosystem or social impact (and value) associated with an organization's flow of activities. Here, the results are benchmarked against a reference state (or natural state when considering the environmental impact)—the state prior to when the activity took place (at any point in the past). To measure this baseline, a reference flow must be defined to scale the impact according to the business' activities. This reference flow can be a quantity or volume of products produced or a number of hours worked within a given period. The two other baselines are derived from the first.

2) Consequential baseline: The impact (and value) measured as the consequence of a change in the production system for a similar reference flow, where an organization (Nestlé, in this particular case) is replaced by another production system.

This baseline makes it possible to compare a company's impact against other benchmarks such as industry average or regional data based on the assumption that they represent an alternative system should the company cease its activities. This baseline is subject to uncertainty (e.g. what benchmark should be used? How does the alternative production system perform?). It may be determined in collaboration with experts and stakeholders.

3) Time baseline: The impact (and value) measured as the difference between two periods of time for a given reference flow. This baseline is often used to measure business performance, including social and environmental assessment.

Each baseline provides a standard against which impacts (and values) can be reported and compared based on the same indicators. The choice of baseline therefore depends on the aim of the assessment. The specific case of a negative externality for Nestlé (Figure 2) illustrates this point. First, it can be assumed that if Nestlé were not in operation, another, less efficient corporation would carry out the same activity in its place (consequential baseline). This difference may be seen as a positive impact due to Nestlé's relatively better performance. It can also be assumed that, as compared to last year, Nestlé improved its efficiency and reduced its externalities (time baseline). Again, this difference leads to a positive value. However, in both cases, there are still negative externalities as compared to the reference flow baseline. In other words, based on a single set of results on Nestlé's performance, three different values (positive or negative) can be measured, and each tells a specific story from a different angle.

Impact valuation metrics rules

Still, regardless of the baseline, it is important to recall the first rule:

→ Values can only be compared if they are measured according to the same baseline.

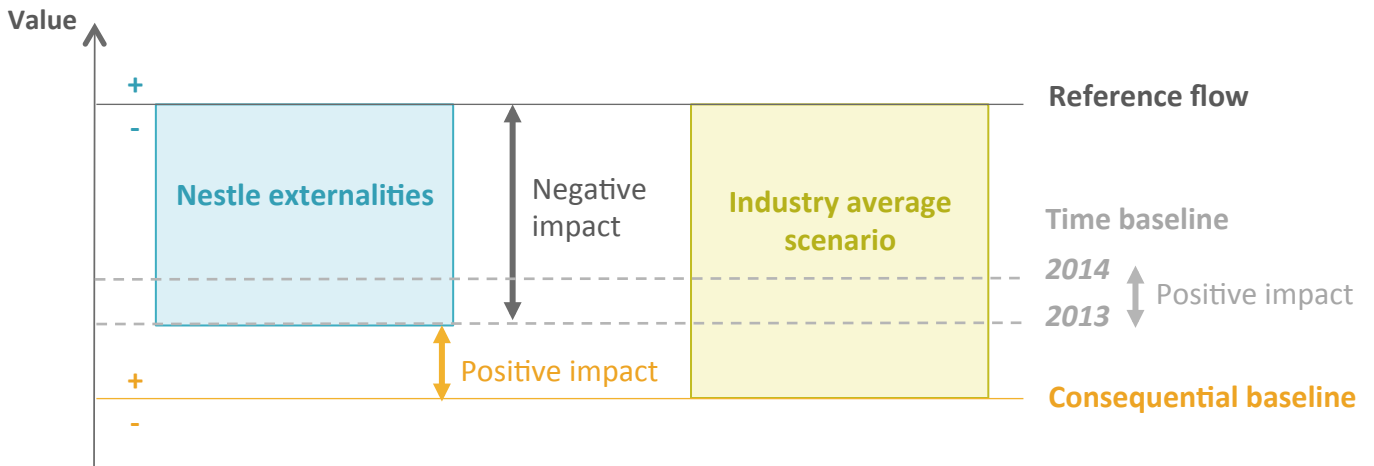


Figure 2 – Three baselines

Scope

The scope is another important aspect to ensure consistent results when comparing impacts. Most often, published values are measured at different points in the life cycle of an organization, leading to inconsistent assessments. Ideally, the results should encompass the full life cycle of a company or product (Figure 3). In practice, however, most activities are measured within a company's boundaries (scope 1). In some cases, data may be monitored among first-tier suppliers or even further upstream, as is the case for Nestlé's carbon footprint (scope 3). If the objective is to compare different impacts, data availability throughout the supply chain must be considered in order to determine similar scopes. Benchmarking should only be performed using similar scopes.

→ Values can only be compared if they are measured according to the same scope.



Figure 3 – Life cycle of an organization or product

Impact valuation metrics rules

Lessons learned from case studies: defining the scope of environmental externalities

Depending on where the assessment is conducted in a product's life cycle, impacts of a different nature and magnitude will be measured. While it is not always possible to assess them all comprehensively, it is important to take into account the biases that are introduced by considering a limited scope. The definition of the scope of water use in certain valuation studies clearly illustrates this point. In most cases, the negative externalities include water extraction on the production site and upstream operations but exclude downstream water use. The results therefore underestimate (or overestimate) the total negative impacts of the product, depending on whether the benefits exceed the losses at this stage in the life cycle. Such biases can be even more problematic if only positive (or negative) impacts are assessed at different points in the life cycle. For instance, the negative externalities of water extraction cannot be measured and compared to the benefits (in terms of water saving) of the use of the products sold downstream without considering both sides of the coin at each stage. Such issues also relate to the baseline rule stated earlier.

Time

Values must be measured according to the same time scale in order to ensure the comparability of the results¹⁰. Some activities result in long-term outcomes while others lead to short-term ones. The temporal scope must therefore be set according to the object of the assessment (see the position variable) to avoid any inconsistencies in the results. For example, health and safety activities at Nestlé or the restoration of an ecosystem are likely to provide limited short-term benefits but are expected to have significant positive impacts in the longer term. The scope will differ according to whether the assessment is focused on the activity or its impacts.

As a general rule, selecting the year of the activity as the basis for the measurement is recommended. However, a discount rate could be used to account for the expected eventual monetary flow.

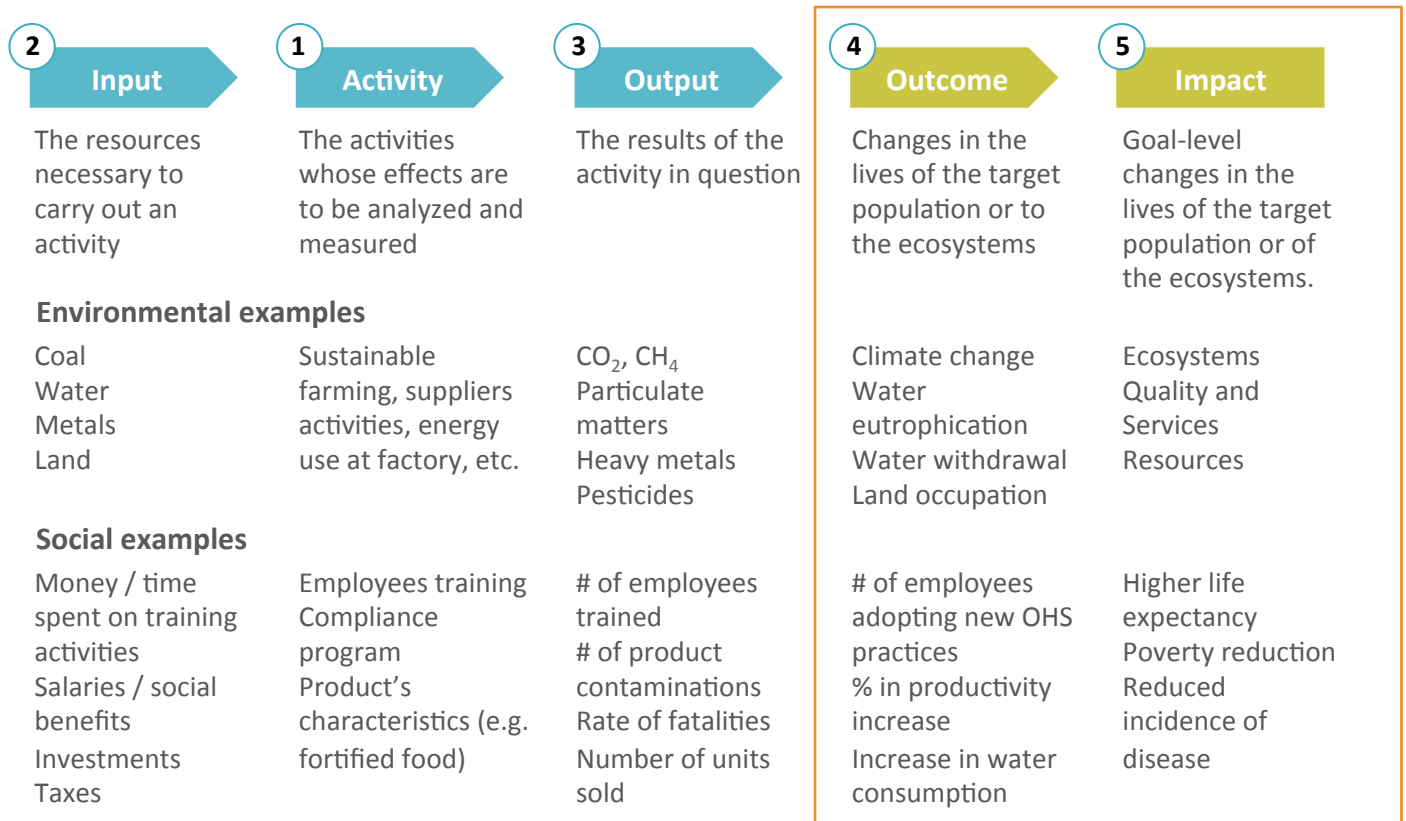
→ Values can only be compared if they are measured according to the same time boundaries.

Position (in the impact pathway)

The result of a particular activity can be evaluated from many positions along a result chain (see Figure 4), from input to impact. While input, activity and output data are usually available and easy to collect, the outcomes appear to be the most appropriate level to consider since the information is closely related to the impact and is more readily measurable¹¹. However, identifying the right outcomes to assess and measuring them is challenging. The outcomes should be meaningful (e.g. material) and together address all of the dimensions of the impact (e.g. social, economic, environmental) while remaining independent from each other to avoid double counting¹². In all cases, it is important to define where the assessment takes place on the continuum of an impact pathway (or causal chain) so as to compare (and sum) the results measured at similar positions.

→ Values can only be compared if they are measured at the same position in a causal chain (ideally at the outcome level).

Impact valuation metrics rules



Source: adapted from WBCSD 2013. See also Clark 2004.

Figure 4 – Cause effect chain linked to Nestlé’s activities and the importance of measuring an outcome/impact.

Lessons learned from case studies: using financial metrics as impact indicators

Earnings, revenue and other financial metrics are often used in valuation studies as impact indicators, reflecting an organization’s (socio-)economic contribution to society. However, from a causal chain perspective, earnings should be considered as an economic output related to the company’s activities rather than an outcome, since the funds will impact stakeholders only after they are reinvested (in the company, among shareholders, in the community, etc.). While this information is a meaningful one to measure and disclose, it cannot be compared (or added) to environmental externalities, which are an environmental outcome. The two results are not in the same position on the causal chain. The same holds true for other financial metrics such as wages paid and purchasing costs, for instance.

Impact valuation metrics rules

Ecosystem services versus externalities

Despite its increasing popularity among companies, the concept of ecosystem services is misunderstood in many publications, and clarification is therefore called for. As previously mentioned, ecosystem services are functions provided by the environment that support human activity. By operating a business and carrying out activities, society takes advantage of these services and, more importantly, interacts with them. These interactions may alter the service or even put an end to it. It is therefore crucial to differentiate between the value of the services themselves, which cannot be attributed to an organization, and the value of a change (positive or negative) in the environment's capacity to provide the services, which can be attributed to an organization's activities. Though related, the concepts of ecosystem services and of externalities should not be confused.

Ecosystem services: Account for the fact that a business relies on nature and ecosystem services to operate. This is typical natural capital accounting. Ecosystem services usually represent a positive value provided to a business or society. However, this value cannot be attributed to a company since it is not generated by its activities but rather by nature itself.

Externalities: Account for the ways an organisation affects, inter alia, ecosystem services and should be considered when measuring a socio-environmental impact. They should be taken into account by the enterprise that created them.

What should be measured? How?



While the idea of valuing environmental and socio-economic impacts is gaining in importance, what should actually be measured and how it should be measured are still highly debated questions due to the lack of consensus or standard in this field¹³. One of the objectives of this project was to address the issue by taking into account existing work in the field and referring to Nestlé’s specific context and ongoing initiatives. This iterative process combines a top-down and bottom-up approach and led to preliminary results and recommendations on how such assessments could serve to evaluate Nestlé’s activities.

What should be assessed?

In light of the maturity of the tools and the earlier work carried out by Nestlé on its environmental footprint, different approaches were used to determine the relevant issues to assess from the environmental and social perspectives.

In the first case, issues were easy to identify since Nestlé had already measured its global environmental impact according to a set of life cycle assessment (LCA) indicators. The valuation methodology and preliminary results are presented in the following section. The three issues that contribute the most to Nestlé’s overall externalities—namely climate change, water use and land use—were prioritized. These issues were also prioritized based on the overall sustainability context and the focus of Nestlé’s business activities (food systems).

The social issues were more challenging to review and select. The matter was first addressed by listing the material issues identified by Nestlé in its corporate social responsibility (CSR) publications. The topics, which are a series of activities, outcomes and impacts, were clustered in order to identify the main social issues that could be addressed (see Table 1).

Table 1 – Material social issues relevant to Nestlé

Clusters	Related issues
Nutrition	Food and nutrition security – Food safety – Over-and-under-nutrition – Nutrition, health and wellness – Quality assurance and product safety – Nutrition
Labour rights	Human rights – Employee relations – Human rights in our business activity – Leadership and personal responsibility – Child labour
Occupational health and safety (OHS)	Employee H&S – Safety and health at work
Rural development	Rural development – Women empowerment and equality – Community relations – Agriculture and rural development – Health and safety (for communities)
Sanitation & Water stewardship	Water stewardship – Water access
Business relations	Business integrity – Governance and transparency – Public policy, advocacy and lobbying – Product labelling – Product marketing and communications – consumer communication – Supplier and customer relations

Source: Nestlé (2013) Nestlé in society – Creating Shared Value and meeting our commitments 2013 – Full report. 402 pages.

What should be measured? How?

Following the valuation metrics rules (see section 3) and given the importance of developing sound and operational metrics for social impacts, each cluster was reviewed in order to select those 1) that refer activities¹⁴ that could be assessed at an outcome level and 2) for which methodologies were readily available or could be developed with a reasonable level of effort. The selected clusters—namely nutrition, occupational health and safety (OHS) and rural development—are listed in Table 2.

Table 2 – Selected social issues (✓) that should be first assessed by Nestlé

Clusters	Activities ¹			Ongoing work
	Corporate behaviours	Product characteristics	Business operations	
Nutrition	Weakly	Mostly	Partly	Yes
Labour rights	Mostly	-	Partly	No
OHS	Partly	-	Mostly	Yes
Rural development	Partly	-	Mostly	Yes
Sanitation & Water stewardship	Partly	-	Partly	No
Business relations	Mostly	-	Weakly	No

¹ All three groups of activities can be expressed in output. However methods to translate these inputs into outcomes are more complex to develop when it comes to corporate behaviours. Impacts related to products characteristics and business operations should be first considered in a pilot.

Based on the ongoing work conducted by Nestlé, Table 3 further details the assessment methods proposed to evaluate the social impacts for the three selected issues of concern. It shows that additional research is required to fully operationalize the valuation approach for this pillar (except in the case of OHS). The methodologies are further explored in section 4.3.

Table 3 – Overview of the assessment approach for the three selected social issues

Clusters	End-point indicator	Method	Further research	Data collection
Nutrition	DALY	Partly (ongoing)	Moderate – high	Moderate – high
OHS	DALY	Existing	Low	Low
Rural development	Wealth / Food security	Partly (literature)	Moderate – high	Moderate – high

What should be measured? How?

Figure 6 summarizes the prioritized issues to measure Nestlé’s shared value. Second priority issues are also listed to highlight the fact that other matters could become a priority in the future. For the environmental pillar in particular, only three issues were prioritized even though more were included in the preliminary calculations presented in the next section.

Pillar	Prioritized issues	Second priority issues (either lower relevance or correlated to prioritized issues)			
Social	Nutrition	Business relations			
	Rural development	Labour rights			
	OHS	Sanitation & water stewardship			
	Economic contribution	Others (list non exhaustive)			
	Pollution impact (on humans)	Ionizing radiation	Respiratory effects	Ozone layer depletion	Photochemical oxidation
Environmental	Climate Change	Terrestrial acid/nutri	Freshwater eutrophication	Ocean acidification	Freshwater acidification
	Water use	Mineral extraction	Marine eutrophication	Corals	Plastics impact
		Green water	Terrestrial ecotoxicity	Depletion of fish stock	Marine toxicity
	Land use	Non-renewable energy	Freshwater ecotoxicity	Other ecosystems services (e.g. forests, etc)	

Legend

- Is already partially calculated
- Can be calculated with some development

Figure 6 – Overview of prioritized issues relevant to Nestlé

Figure 7 provides an overview of the difficulty of assessing Nestlé’s prioritized issues according to the three baselines. The complexity was determined based on existing methodology and data.

Pillar	Prioritized issues	Initial flow	Consequential baseline	Time baseline
Social	Nutrition	Hard to assess	Require some development	Can be easily calculated
	Rural development	Hard to assess	Require some development	Can be easily calculated
	OHS	Hard to assess	Require some development	Can be easily calculated
	Economic contribution	Hard to assess	Require some development	Can be easily calculated
	Pollution impact	Can be easily calculated	Hard to assess	Can be easily calculated
Environmental	Climate Change	Can be easily calculated	Hard to assess	Can be easily calculated
	Water use	Can be easily calculated	Hard to assess	Can be easily calculated
	Land use	Can be easily calculated	Hard to assess	Can be easily calculated

Legend

- Can be easily calculated
- Require some development
- Is hard to assess, will require value judgment

Figure 7 – Qualitative ranking of existing methodologies and data to assess Nestlé’s prioritized issues

What should be measured? How?

Valuation of environmental externalities

A preliminary screening assessment of Nestlé’s environmental externalities was carried out based on the life cycle assessment that had already been calculated for Nestlé’s entire life cycle. Since the LCA provided results that are not monetized, existing published valuation factors¹⁵ were used for the issues that were addressed¹⁶.

Figure 8 illustrates the externalities measured based on activity type: upstream, downstream and direct operations. The results are first presented according to the reference flow baseline. Climate change, water use and land use dominate the impact, and human toxicity and resources are not far behind.

It must be acknowledged that the calculation relies on valuation factors that were developed in a different context than Nestlé’s. For example, they do not account for the regional differences in Nestlé’s activities.

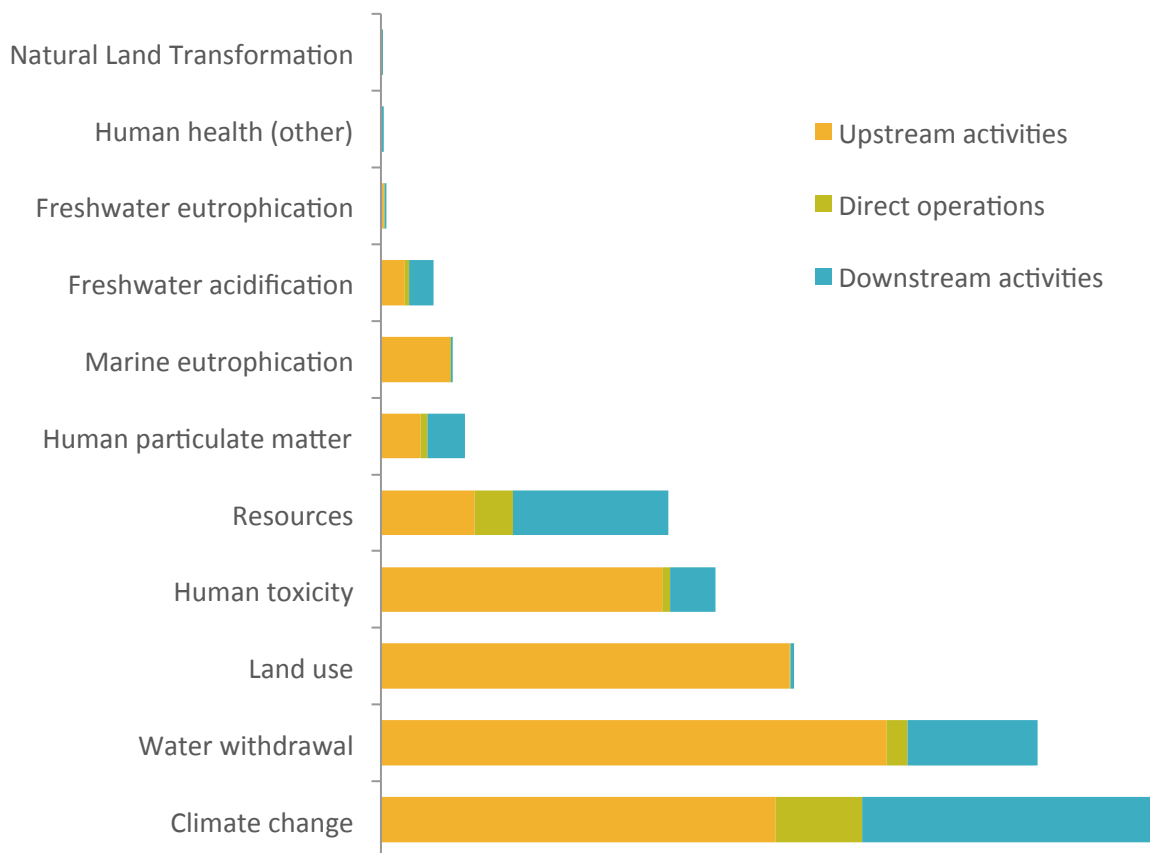


Figure 8 – Nestlé’s total environmental externalities throughout its life cycle

What should be measured? How?

Further calculations were carried out to present the results on the upstream activities for each main business unit and region, commodity, affected biome and time scale. The biome and time perspectives are illustrated in the same results.

The Figure 9 shows the summary of externalities valuation per biome type based on the fact that human health and resources are not biomes as such and were grouped in the interest of simplification. It is important to note that some of the externalities have yet to be assessed in the results (e.g. plastic impact on the marine biome). Also, the variability of the valuation factors is an important point to consider when interpreting the results. The climate change impact in particular was not easy to split between biome types since the valuation factor is aggregated per ton of CO₂-eq emission.

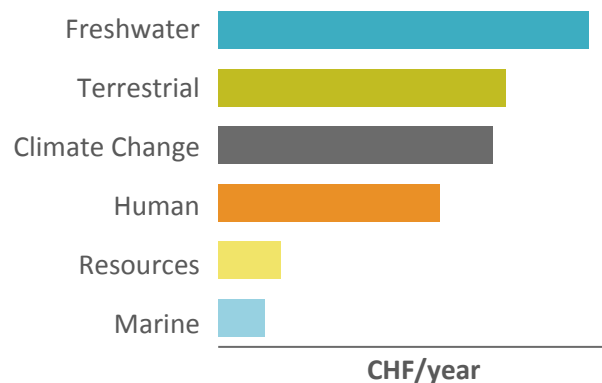


Figure 9 – Externalities valuation per biome type

Figure 10 shows the initial analysis of Nestlé’s externalities valuation from the perspective of time. Not all externalities occur at the same time: some already happened, others are happening in the year of the assessment (short term) and others still happen in the longer term (specifically climate change).

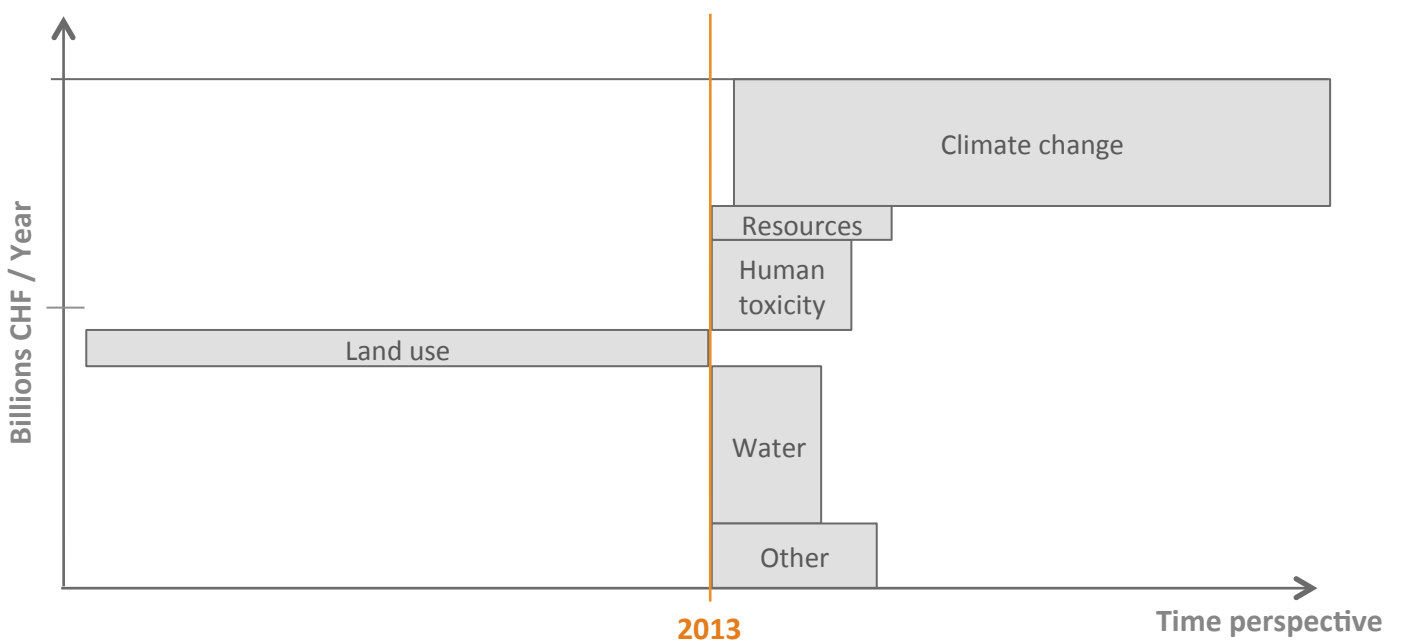


Figure 10 – Externalities valuation from time perspective, initial assessment

What should be measured? How?

Additional specific topics to address the issue of uncertainty—green water, greenhouse gases emissions, land use and freshwater valuation—are explored here.

Green water¹⁷ is typically an issue of related to the imputation of ecosystem services or externalities (presented in section 3.5) and should not be accounted for in Nestlé's externalities. Green water represents an ecosystem service that is a public good and which supports Nestlé's business. Its value has nothing to do with Nestlé's externalities, which are measured as Nestlé's influence on the ecosystem service while it is used for crop production. It is related to land use: if crops are grown in a field instead of natural vegetation, the natural level of evapotranspiration of water is affected and thus indirectly influences the water resources at the watershed level. This effect is assessed through *net green water*, which is not well developed at this time. Certain publications¹⁸ provide insight on how to calculate it but it remains outside the scope of the current project.

The carbon pricing used in this screening assessment is relatively high (109 CHF/tonne of CO₂-eq¹⁹), especially as compared to the carbon prices used by corporations and in business decisions (within a range of US\$10-60/tonne of CO₂-eq²⁰). It considers all externalities in a holistic way in the long term and is not focused on short- or medium-term risks. For this latter perspective, a smaller carbon price may be used to reflect the risk of internalizing part of the externalities due to climate change. While, in the short or medium terms, businesses may face a tax system on GHG emissions, it is unlikely that the tax will apply to all of Nestlé's value chain.

Rather, the tax could target scopes 1 and 2 of Nestlé's GHG emissions. Moreover, the pricing may account for a conservative estimate of externalities to ensure its credibility and wide acceptance in the private sector. This is illustrated by current trading schemes in California and Europe, for example, where the price per tonne of carbon is one-tenth the value used in this report.

Land use change was assessed based on an average calculation of ecosystem service loss on various land types. The land use ecosystem services vary significantly based on location and land use. Values ranging from a few hundreds to thousands of USD have been reported²¹. Recent developments²² in land ecosystem services valuation will be useful to consider when refining the value in Nestlé's further studies.

Freshwater valuation is based on the model developed by Trucost²³, which uses published data from TEEB (in particular in the US) to extrapolate an average value for in-stream water use. It also correlates the value to the water scarcity of the location where the water is used. This valuation is not optimal because it relies on a different type of water use than Nestlé's (mostly for irrigation). It is based on published data from 1996 and the correlation with water scarcity is thought to be more complex than determined by Trucost. Figure 11 illustrates the current Trucost value/scarcity curve with an example of the value/scarcity curve developed by Quantis for another project. This variation in valuation could significantly influence the valuation of Nestlé's externalities.

What should be measured? How?

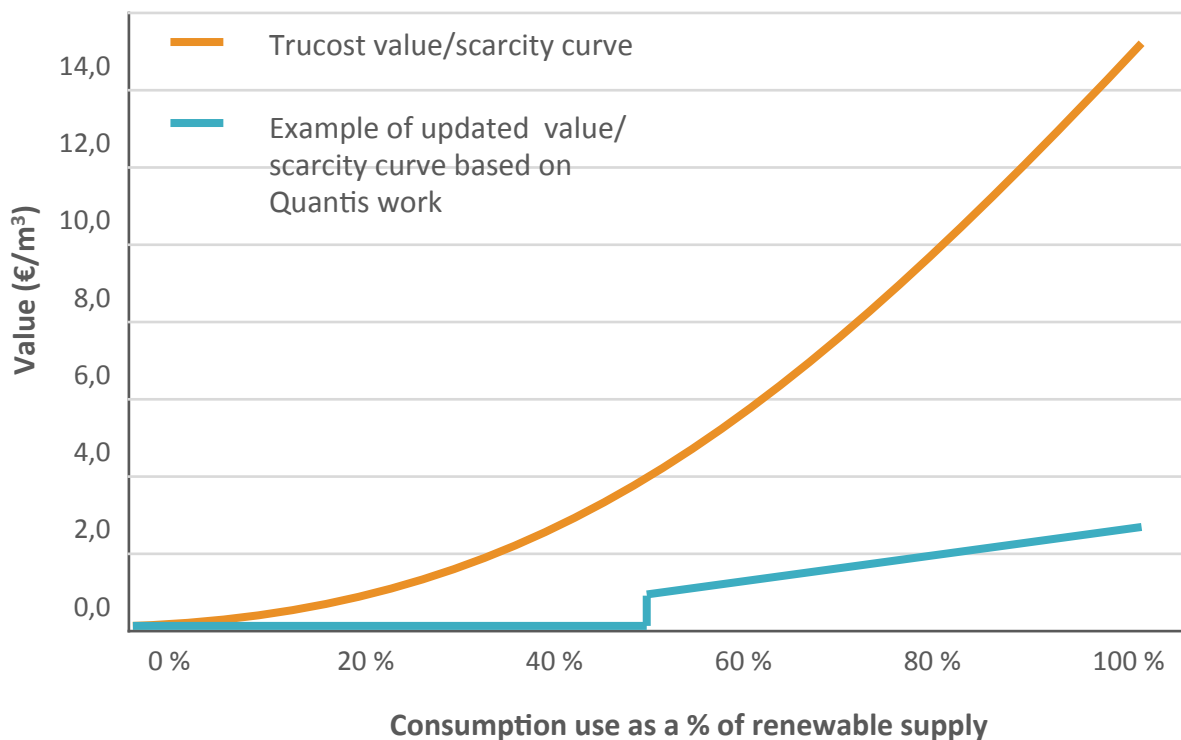


Figure 11 – Water valuation value/scarcity curves based on Trucost estimates and Quantis’ example of a corrected curve

The variability of the results (upstream activities only) was further explored by considering the extreme scenarios to understand the maximum range. Only the land use, water use and climate change valuation factors were changed²⁴, and the range varied from 1.9 to 258 billion CHF, which are highly unrealistic given that the extreme values were taken from the most sensitive ecosystems (wetlands and virgin rainforests), and it is unlikely that Nestlé exclusively operates on these types of territories.

Depending on the baseline, environmental externalities are not always negative. Figure 12 shows positive externalities that were explored considering the time baseline, which is the easiest to calculate. The improved efficiency of Nestlé factories (direct operations) was assessed in terms of greenhouse gas emissions, water use and the eco-design initiative to reduce packaging. The health and safety result was added to the figure for benchmarking purpose and will be further detailed in the following section. The casualties increased between 2012 and 2013, and this resulted in a net loss of shared value.

Ideally, this figure would be extended to other Nestlé activities, including environmental and social topics such as sustainable farming initiatives and economic contributions.

What should be measured? How?

Time baseline
2012 - 2013

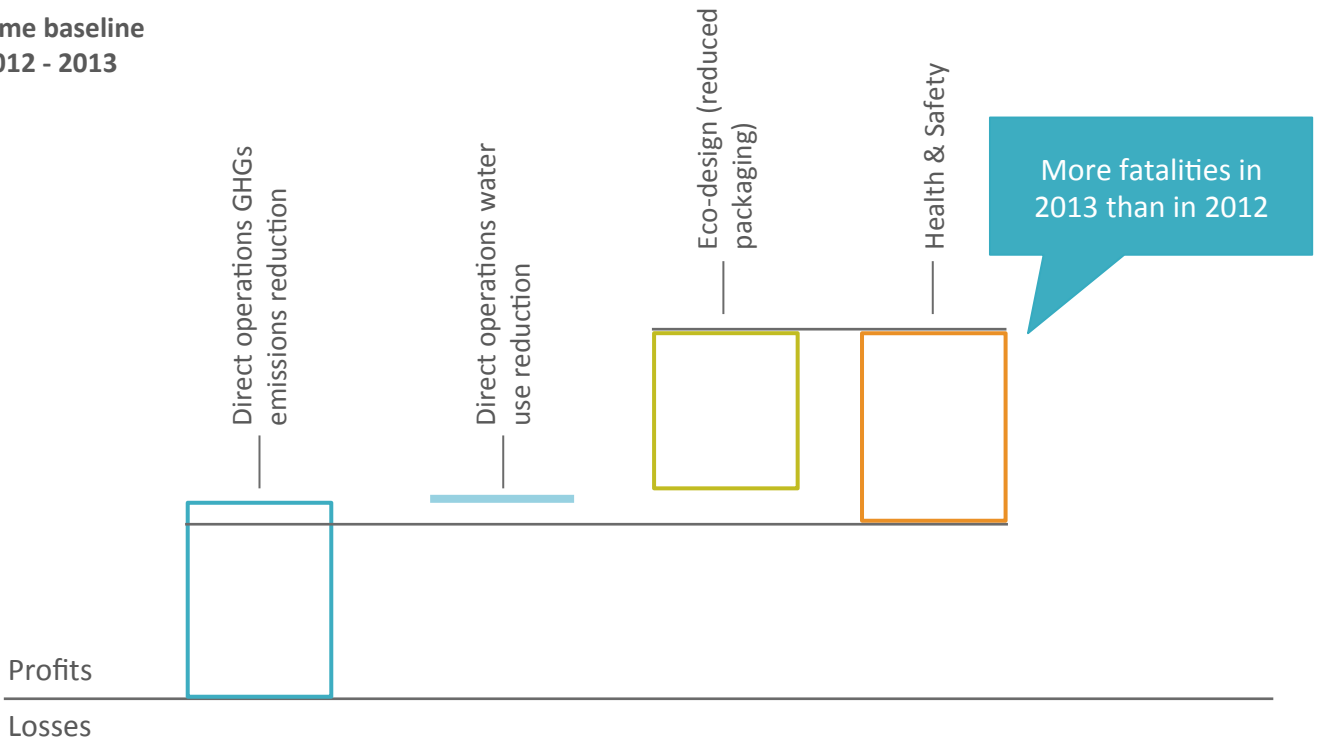


Figure 12 – Time baseline shared value of Nestlé activities on direct operations. Casualties (OHS) were added to the figure for benchmarking purposes.

What should be measured? How?

Valuation of social externalities

This section explores how the occupational health and safety (OHS), nutrition, sustainable agriculture and economic contribution valuations can be further developed and outlines preliminary ideas for exploration purposes only. Further research and development is required before implementation. The assumptions on which these ideas are based have, however, been validated following discussions with Nestlé experts.

Occupational health and safety

The assessment of the OHS issue at Nestlé draws heavily on the ongoing work conducted by the corporation to assess the estimated cost of injuries and the value created by avoiding them. The work aims to account for Nestlé's direct and indirect cost of injuries based on cost estimations (expressed in DALYs) and the industry average to compare Nestlé's performance on a consequential baseline. Based on these data and assumptions, impact indicators were developed for each of the three baselines (see Figure 13). This perspective broadens the original assessment, which only focused on the relative (and positive) performances as compared to an industry benchmark. In this case, the absolute impact of injuries is also considered (reference flow) and includes a time comparison (2013 vs. 2012) that both show negative values. So far, the results have only been collected for the first scope (Nestlé's operations). Depending on data availability, extending the scope to the entire supply chain should not be an issue.

Several benefits stem from this approach:

- Data are available at the outcome level and make it possible to assess impact according to the three baselines (consequential, reference and time).
- The outcome can be fully attributed to Nestlé's business operations (though in the case of disease, the exact cause and Nestlé's responsibility can be difficult to determine).
- The outcome (DALY indicator) is a very good proxy for the impact on human well-being and no further data manipulation is suggested.

Still, further work is required to complete the assessment methodology. For instance:

- The results could be enhanced by also taking into account the value of the shared OHS knowledge for the other stakeholders (contractors, families, community).
- Additional improvements would also include refining the benchmarks and the DALY valuation and calculation.
- Healthier workers are also more productive ones: OHS impact assessment could be extended to assess employees' economic and financial well-being based on their overall working conditions.
- The valuation could be extended to Nestlé's overall supply chain (per product categories, for instance).

What should be measured? How?

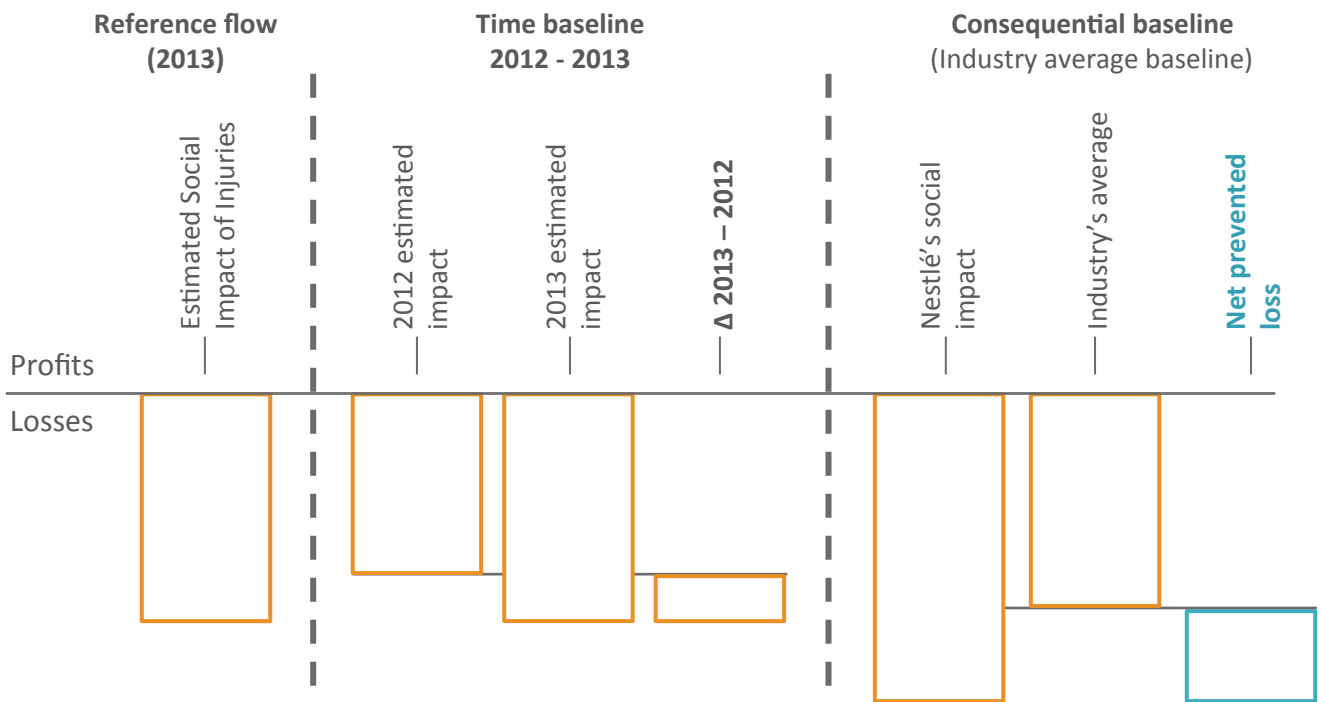


Figure 13 – Valuation of Nestlé’s OHS impact according to the three baselines

Rural development

Given that a significant part of Nestlé’s purchases comes from rural areas located in developing countries, the rural development issue is a strategic one²⁵. Contrary to the OHS issue, no specific work is currently being carried out by Nestlé to assess the impacts on this particular issue. There are, however, several ongoing initiatives to address rural development in many business units. Nespresso’s AAA coffee sourcing program is one of them²⁶.

With this initiative in mind and based on the literature on farmers’ well-being and rural development, impact pathways were explored in order to develop an assessment methodology for the issue. Specifically, it was possible to identify two main outcomes that should be considered in such an assessment, namely the farmers/households income (or economic wealth) and food security level (Figure 14). Both constitute two major proxies of well-being in relation to rural development in developing countries²⁷.

What should be measured? How?

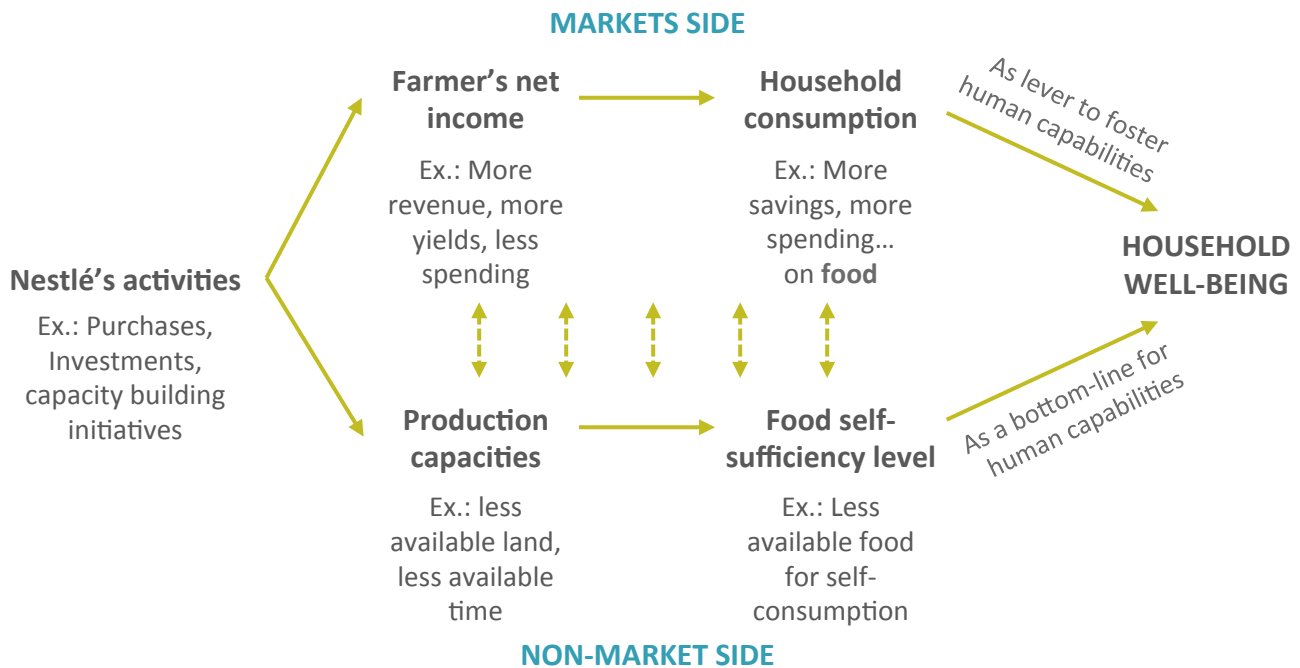


Figure 14 – Schematic cause-effect chains defined to assess Nestlé's contribution to the shared value for sustainable agriculture

Given that Nestlé's contribution to rural development is, for the most part, related to its purchases (volume and value including premiums and other market tools), investments in productive assets (infrastructures) and capacity-building initiatives (training, extension, etc.), its impacts can be assessed in terms of economic contribution to local actors' capabilities following Amartya Sen's terminology (i.e. ability to fulfill oneself), mainly through wealth increases²⁸ and food security.

While the pathways must still be refined and indicators must still be developed, it is possible to leverage existing data to model and test such assessments.

This development is also possible by building on existing knowledge and concepts stemming from other concepts in the social sciences that are not yet connected (e.g. bottom of the pyramid, coping strategies, etc.).

Figure 15 shows how this assessment could be carried out. Here again, the three baselines could be considered, where the reference flow refers to the current impact induced by Nespresso's activities, the time baseline to the progression of the performance in time and the consequential baseline to the comparison to a control population. Here, it is assumed that the economic contribution will have an absolute positive impact, while the food security issue is negative by definition. Such assumptions should be reviewed in a pilot project.

What should be measured? How?

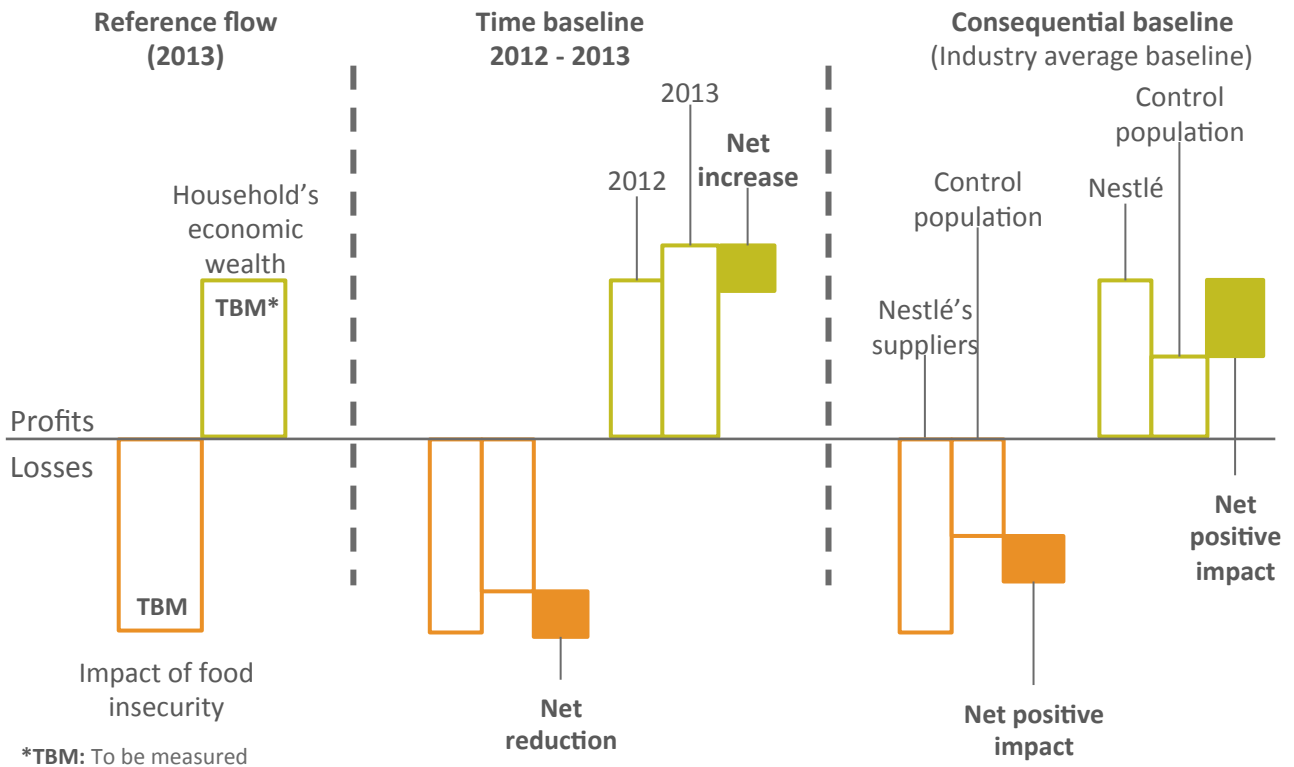


Figure 15 – Example of the valuation of Nespresso's impacts on rural development

This approach yields interesting benefits, including:

- The economic data (income, prices, costs, etc.) are already available and national statistics are also accessible to document household spending patterns.
- The effect of Nestlé's initiatives related to market conditions and production capacities would be included in these economic variables (contracting and price stabilization, training and input cost reduction, extension and yields increases, etc.).
- The assessment could be complemented by also taking into account economic contribution at the community level by using, for example, an input/output database or socio-economic studies for more specific results.

The main challenges include:

- Economic outcomes must be measured in the short term but also in the mid- and long-runs to capture all of the contributions to household well-being (e.g. temporal scope).
- The methodology is currently focused on Nespresso's scope 2 (first-tier suppliers), and further development is required to extend it to the other scopes.
- The direct and indirect interactions between market (e.g. income, assets, wealth) and non-market (e.g. food security) variables has yet to be explored.

What should be measured? How?

Nutrition

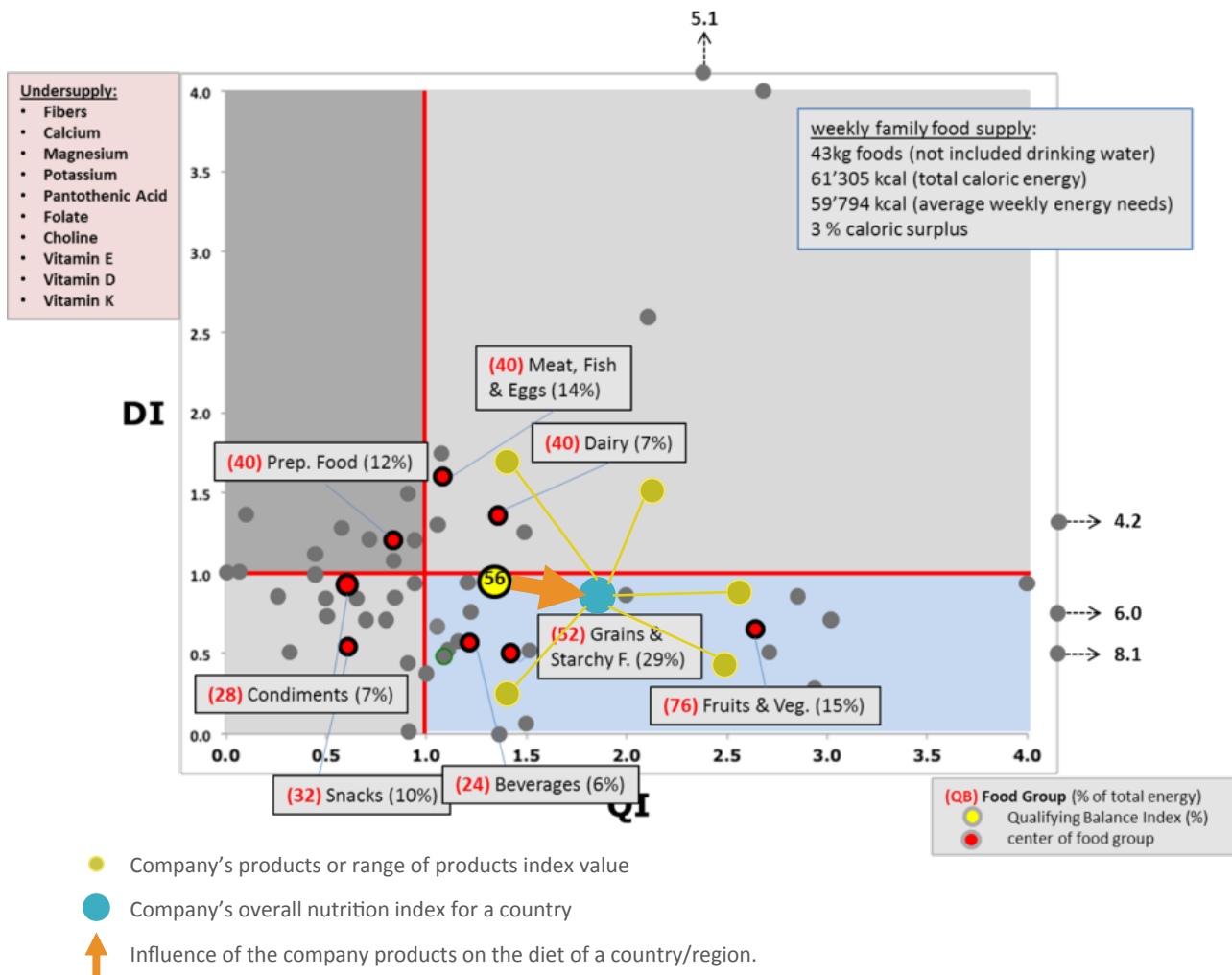
Nutrition is Nestlé's core business. It is also a complex issue related to several social, environmental and economic variables. A recently published initiative developed by Nestlé, the Nutrition Balance Concept (NBC)²⁹, was used to develop an assessment methodology. The tool makes it possible to measure the extent to which a particular diet contributes to sustainable nutrition³⁰. Based on a profile of 28 essential nutrients, it assesses the contribution based on two indices: a qualifying index (Qi) and a disqualifying index (Di). While the former measures the presence of positive nutrients for health (vitamins, fibres, etc.), the former weighs those with a negative influence passed given thresholds (sugar, salt, fat, etc.). The difference between them is the qualifying nutrient balance score (QB).

The idea is to use the index to benchmark a company products' offer in a particular market based on the country's average diet in order to determine whether this company contributes positively or negatively to the population's nutritional needs. Specifically, the method would be to use the NBC at a national or regional level to determine how this company's products influence population diets. The following data is required:

- Diet of the country/region (available through statistics or proxy)
- Sales of the company's products in the country/region (per type of product, nutritional facts required at minimum)

In Figure 16, the grey dots represent the food items consumed by a given population, the red dots the food groups and the yellow index the final equilibrium point of the diet. The green dots representing the company's products were added for information purposes only. The blue dot stands for the company's overall index. Based on this assumption, the company's product portfolio in this particular country positively contributes to the average diet by bringing more qualifying products than disqualifying ones (see the orange arrow). Based on this contribution, the impact could be measured in terms of public health using different sources and data (including World Health Organization statistics). The analysis could first be conducted at a general level per country and for an average value for all products of a particular company. However, a breakdown may be needed to better identify the benefits and impacts. The additional parameters to consider could include socio-demographic variables (income classes, gender, age groups, etc.) and a breakdown per product or product range instead of an average value for all the company products.

What should be measured? How?



Source: adapted from N. Espinoza-Orias, Nestlé Research Center.

Figure 16 – Nutrition balance concept with the contribution of a random company added (illustration of the concept)

Figure 17 shows how these impacts could be measured according to two of the defined baselines³¹. Since a given company is expected to sell qualifying and disqualifying products, negative and positive impacts are expected to be assessed, with the net impact being the difference between both scores. As for the rural development methodology, further research is still required to refine the pathways and assessment method.

What should be measured? How?

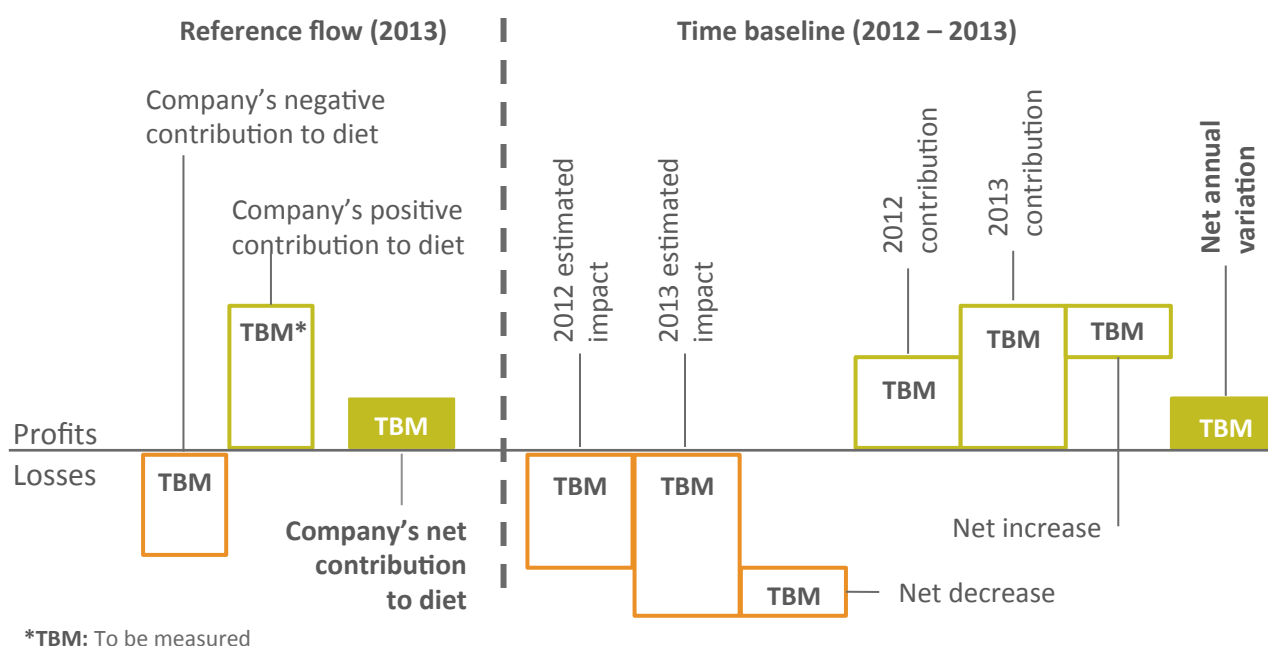


Figure 17 – Example of the valuation of a company's impacts on nutrition

Among the benefits of the approach are:

- The relationship between nutrition and health is strong. An adapted DALY-based NBC indicator may therefore be considered as a good proxy to measure the impact of nutrition on society.
- The assessment methodology allows for different levels of evaluation, from aggregated (corporate or national level) to very specific ones (products or sub-regional, population groups levels).
- Using DALYs also makes it more consistent with the OHS measurement methods.
- The method relies on an implicit diet benchmark, which remains less subjective than a consequential one.

Still, there are challenges and it is important to recall that several manipulations would be required to value the contributions, including 1) turning the company's product nutrition facts into an overall NBC indicator, 2) benchmarking this score with national/regional diets (needs), 3) measuring the contribution to public health (DALY) and 4) valuing these DALYs. Assumptions and methodological developments are required at each step.

Furthermore, data availability to document diet may be an issue in certain countries. A company's market presence may also be insignificant in certain regions or specific to a limited range of products.

What should be measured? How?

Economic contribution

Nestlé's economic contribution (taxes, salaries, purchasing) is significant. However, as previously mentioned, this contribution must be considered as an output produced by the corporation's economic activities rather than as an outcome per se.

This output can be assessed using economic models such as an input/output database, which references all the economic flows between economic sectors and countries (import and export). The database also lists the number of workers, their level of expertise and environmental flows such as greenhouse gas emissions, etc. The WIOD database is one of the most up to date (<http://www.wiod.org/>) and could be used for this purpose. It is also possible to develop or adapt models using expert consultations (focus groups and Delphi method) for more regionalised and specific results.

- Three areas for which the economic contribution should be first measured were determined:
- Wages (across the entire value chain)
- Taxes (not only direct taxes but indirect ones as well)
- Profit

The I/O tables can provide information on how the economic indicators are transformed in society into social values (wages, infrastructure, wealth, etc.). These models are already increasingly applied in the economic field. AGECO/Quantis could therefore apply them to Nestlé.

Net added value of valuation methodology



To a certain extent, this way of measuring the shared value created by Nestlé relies on information that is already known by Nestlé. The benefits of this type of methodology are discussed here.

Holistic vision of Nestlé's shared value: Shared value is a complex concept that is difficult to measure and report on. The methodology presented here can partly respond to the challenge of obtaining a holistic view of the shared value created by Nestlé considering all three pillars of sustainability: economic, environmental and social. Given the differences in issues and metrics, the economic valuation method constitutes one of the most promising tools to measure Nestlé's contribution on society.

Communication and awareness building: Sustainability topics are sometimes hard to communicate and are often developed in isolation. For example, corporate environmental impacts are not very well known outside the small community working in the field. This challenge can be partially solved by using the valuation methodology. By expressing the results in monetary units, the sustainability performance becomes more intuitive and straightforward to communicate.

Prioritizing business actions/benchmarking: Businesses must invest in activities that provide the best return on investment (ROI). Currently, many investment decisions are based on qualitative information or on stakeholder perceptions. The valuation methodology can bring more relevant information to the decision-making process based on the ROI of each sustainability action that is undertaken. While stakeholder perceptions will remain very important, the decisions will be oriented towards the actions that have the greatest impact on shared value. Being able to identify the most important sustainability topics is crucial to create the maximum shared value.

Negative and positive impacts: Within the sustainability field, initiatives tend to only look at one side of an activity. Environmental impact assessment considers the negative impact of a business on the ecosystems; sustainable farming certification determines the positive impact of a business on its supply chain, etc. This valuation method bridges both sides of the equation, providing significant information to understand the complexity of impact valuation.

Innovation process and project tool: In business decisions, anticipation is crucial, and the valuation method has a place within Nestlé's innovation processes. The lessons learned through this project could fairly easily be transposed into an operational tool to guide decision-making at Nestlé.

Anticipation of trends/image risk: Valuation methods are quickly gaining momentum and have been deployed in several organizations. Being able to understand how they work and contributing to their development will make it possible to catch up with this fast evolving trend and take the lead in its evolution.

Looking forward



The findings outlined in this report lay the groundwork for the deployment of the measurement approach at Nestlé. Still, certain topics must be further developed before being fully operational. The authors propose to explore these priority topics through specific case studies:

- A. Sustainable farming valuation model
- B. Nutrition valuation model
- C. Environmental valuation factors and influence of regionalization
- D. Economic contributions
- E. Measurement of positive shared value

The authors also recommend that Nestlé initiates formal discussions with active stakeholders and in particular with the WBCSD, the Natural Capital Coalition and the other businesses and organizations that have recently contributed to the field through various reports and case studies. Since the topic is at the crossroads of many disciplines and calls for different expertise, the development of the approach and methodologies should be carried out in collaboration with partners within multi-stakeholder platforms.

Additional case studies should also be conducted by corporations in order to test and refine the methodologies. These approaches should be released to the public since transparency and knowledge sharing are essential at this stage to bring credibility and rigour to this new field.

This report is therefore meant to be an additional building block in the process. Ultimately, the objective is to move from an exploratory stage to a fully operational one so that businesses and organizations can leverage these new metrics to make decisions based on a more comprehensive understanding of the value they are creating.

Notes

1. Information about the Natural Capital Coalition initiative is available online [<http://www.naturalcapitalcoalition.org/>]
2. Forum for the Future, The Climate Group, WWF (2014) Net Positive – A new way of doing business. Position Paper.
3. There are many accepted definitions of the concept of impact, especially in socio-economic literature. See Mass and Liket (2010) for a review of some of the existing definitions used in the literature (cf. Maas, K. E. H. and K. C. Liket. (2010), 'Social Impact Measurement: Classification of Methods', in R. Burritt et al. (eds.), Environmental Management Accounting, Supply Chain Management, and Corporate Responsibility Accounting (Springer Publishers, New York)).
4. As per this definition, the impact is 1) a consequence of a particular activity and 2) to be measured at the outcome level (see the definition of result chain). See Clark C, Rosenzweig W, Long D and Olsen S. (2004). 'Double Bottom Line Project Report: Assessing Social Impact' in Double Bottom Line Ventures; Methods Catalog, Viewed 28 May 2010 [online].
5. This summary of the causal impact chain is adapted from WBCSD (2013). Measuring socio-economic impact – A guide for business. Available online: [<http://www.wbcd.org/impact.aspx>].
6. The example is based on the IPCC characterization model as used in environmental life cycle assessment (E-LCA) where the same indicator is used at the outcome level (midpoint, in E-LCA lexicon) and the impact level (endpoint).
7. The notion of human well-being (social impact) is subject to several interpretations, which explains why impacts are usually assessed at the outcome level.
8. It is important to note that the authors do not make an explicit distinction.
9. To some extent, these three baselines refer to the absolute, relative and trend terminology used in other contexts (e.g. finance). To avoid confusion, a distinct terminology is proposed in this report to describe the baselines in the specific context of socio-environmental impact assessment and valuation.
10. This variable should not be confused with the timeline used to measure the reference flow (i.e. the number of units produced in 2012). See the baseline variable.
11. Even so, most publicly released valuation studies refer to output (e.g. salaries, cost reductions, etc.) rather than outcomes to assess a company's impacts on human well-being and ecosystem quality.
12. Since an outcome generally results from more than one activity, an impact on human well-being or the environment is related to more than one outcome. It is therefore important to make sure that the measured outcomes are not significantly correlated to each other or part of the same causal chain. For instance, injury rates and work income can be considered as two relatively independent outcomes that impact the workers' well-being, while farming income and asset levels would be considered too correlated (i.e. they share the same impact pathway).
13. The review of the existing literature and applications in this field clearly demonstrated the conceptual and practical challenges of adopting a normative approach, especially from the socio-economic perspective.
14. Impacts can be induced by different kinds of activities which can be clustered in three different groups, namely Business behaviours (i.e. practices carried out by the company during its operations, which vary according to its policies, such as training and working conditions), Product characteristics (i.e. intrinsic characteristics of the product or service put on the market, such as quality, safety, nutritional value) and Business operations (i.e. the economic contributions induced by the company's production activities, including employment, investments and taxes). All three groups of activities can all be expressed in output but methods are not always readily available to translate those outputs into outcomes on well-being, especially when it comes to corporate behaviours.

Notes

15. The valuation factors express the cost of an activity supported by the ecosystems and the society, which is not internalized by the organization responsible for the activity (e.g. a company). More precisely, valuation factors are used to translate environmental impacts of activities, measured in various units such as kg of CO₂-equivalent, into monetary units.
16. Quantitative results are not published here for confidentiality reasons as well as most data sources.
17. Green water is water evapotranspired by crops grown by humans. The water is from the natural cycle (e.g. rainwater or natural soil moisture).
18. Nunez et al. (2013) Estimating water consumption of potential natural vegetation on global dry lands: building an LCA framework for green water flows, *Environmental Science and Technology*
19. Adapted from Stern (2006) *Stern review on the Economics of Climate Change*, UK: Her Majesty's Treasury
20. CDP (2014) *Use of internal carbon price by companies as incentive and strategic planning tool*
21. Van der Ploeg, S. and R.S. de Groot (2010) *The TEEB Valuation Database – a searchable database of 1310 estimates of monetary values of ecosystem services*. Foundation for Sustainable Development, Wageningen, Netherlands.
22. Koellner et al. (2013), *UNEP-SETAC guidelines on global land use impact assessment on biodiversity and ecosystem services in LCA*, *International Journal of Life Cycle Assessment*, 18:1188-1202. Margni et al. (2013), *Integrated indicator for land use in life cycle impact assessment based on ecosystem services*, CIRAIG, *Proceeding of LCA XIII conference*
23. Puma (2011) – *Puma's environmental profit and losses account for the year ended 31 December 2010*.
24. Carbon valuation ranged from 10 to 200 CHF/tonne CO₂-eq, water withdrawal from 0.04 to 26 CHF/m³ and land use from 0.006 to 1.856 CHF/m².
25. While specifically explored in the context of agricultural production in developing countries, the issue could be also addressed in the larger perspective of community development.
26. Other known initiatives include Nestlé's Rural Development Framework (RDF) and Nescafé Plan.
27. See for instance CIAT and University of Vermont (2014). *Thin months Revisited, Final Report – Public Version*, May 7; Caswell, M., V.E. Méndez and C.M. Bacon (2012). *Food security and smallholder coffee production: current issues and future directions*. ARLG Policy Brief no. 1. Agroecology and Rural Livelihoods Group (ARLG), university of Vermont. Burlington, VT, USA. Available online: http://www.uvm.edu/~agroecol/CaswellEtAl_FoodSecurityCoffeeARLG%20pb1_12.pdf; Beyer (2008). *The Impacts of Fair-Trade Coffee in Producer Countries*. Department of Economics Carleton University, Ottawa, Ontario April 21.
28. While net incomes can be considered as the outcome of an economic activity and are often considered as a proxy of farmers' (or households') well-being, it is possible to identify indicators further downstream in the causal chain. In order to more precisely quantify the outcome/impact of Nespresso's economic contribution, we suggest looking at how this increased income is spent and how the increased consumption level impacts the household's well-being. This pathway and methodology, which will build on existing data, should be explored in a pilot project.
29. See the presentation "Connecting the dots: Assessing sustainable nutrition at Nestlé" presented at the LCA Food conference in San Francisco, October 9 2014.
30. Sustainable nutrition is here defined as "The physical and economic access to sufficient, safe and nutritious food and water to fulfill dietary and cultural needs to enable an active and healthy lifestyle, without compromising the ability of future generations to meet these needs."
31. The consequential baseline could perhaps be considered by referring to a company operating in a similar market, such as Kraft or Mondalez. This scenario has not been explored at this stage.