A worldwide living wage dataset for benchmarking compensation practices in global value chains

- Technical Paper

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About Valuing Nature

Valuing Nature's mission is to help organizations integrate the value of nature and society into decision-making, by providing innovative methods, data, and experience. Samuel Vionnet founded Valuing Nature in 2015.

He is an independent consultant with ten years of experience in sustainability consulting. Before founding his organization, Samuel worked for six years with Quantis International supporting organizations worldwide on their strategies, developing and using sustainability metrics. Valuing Nature works primarily with the private sector, advising multinational companies around the world on issues that include sustainability metrics, water stewardship, risk assessment, supply-chain management, sustainability strategy, and natural and social capital accounting and valuation. His clients include Nestlé, Tetra Pak, Ikea, Novartis, Olam, Natura, Nespresso and Samsung among others. He works with a range of worldwide partners to fulfil its projects, which include the World Resources Institute, the WageIndicator Foundation, WWF, WBCSD (World Business Council for Sustainable Development) and other consultants (Quantis, Sofies, Ecometrics, South Pole Group, etc).

His current focus is on developing approaches for the valuation of human, social and natural capital and flows related to the private sector, and the integration of these results into the financial reporting of companies making it integral to decision making context.

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Executive summary

This whitepaper is the result of a collaboration between DSM, Kering, Philips, the WageIndicator Foundation and Valuing Nature.

Its objective is to develop a worldwide living wage dataset to support benchmarking of compensation practices with living wages, in global value chains. It targets in particular the private sector and multinational companies that have complex operations and supply chains covering many countries. Many companies, such as DSM, Philips and Kering, are starting to use this benchmarking activity as input for their sustainability and compensation strategies.

The following points provide the key take-aways of the project:

- A global dataset of living wages has been developed that covers 185 countries and additional regions and cities, with a strong focus on China, India and Brazil.
- An innovative approach has been used combining primary data collection (thanks to the WageIndicator Foundation work), secondary data collection and modelling; 57% of the national living wage estimates is based on primary data collected.
- Variability of living wage estimates depends on both a) methodological value-based decisions about the calculation of the living wage, and b) actual data or variability of cost of living within a given country. The family composition and number of workers per family are two of the main parameters accounting for most of the living wage estimates variability.
- The selection of the living wage benchmark, within the different options that exist, needs to be informed by the context of the company it applies to. We can define a maturity curve, moving from compliance (legal minimum wage) to living wage that covers different family situations. The most common benchmarks are the typical and standard family. For more advanced use, we argue that there is a living wage definition that could ensure even less risk for the workers' families, and implies using in its definition only one working adult per family and a number of kids based on the national fertility rate and rounded up to the next whole number. The choice of living wage benchmark is still a matter of debate in the living wage field.
- Finally, we point out some limitations in the current practices of living wage calculations based on the Anker & Anker 2017 methodology, which is often used as a reference. These limitations include retirement pension considerations, differences in socio-economic conditions and alignment of living standards among countries, social security and redistribution as well as informality linked to taxation. Those limitations are starting to be addressed in the latest estimates from WageIndicator Foundation for instance.
- We hope that this work will encourage companies to benchmark their wage practices and align or surpass the living wage thresholds for their employees and workers in their operations and value chains. The author of this paper will provide the national estimates derived from this work upon request, to support any company in benchmarking their wage practices[1].

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1 Introduction

Income inequality is a rising topic in our society and in particular in the private sector, which is the biggest direct and indirect provider of jobs in the world, thus playing a crucial role in the development of our economy and society. As such, it is more and more scrutinized by civil society, consumers, governments and non-governmental organizations (NGOs). The concept of living wage has been developed to define a wage threshold that accounts for a basic but decent life, taking into account local contexts. Living wage includes the cost of food, housing, health and education, as well as other necessary basic spending (e.g., transport, communication, etc) and unexpected events. It is calculated to account for different family situations, particularly in terms of the number of kids and working parents.

Living wages have been calculated by different organizations around the world, integrating different contexts into it. We can cite for example the work of WageIndicator Foundation[2], the Global Living Wage Coalition[3], and FairWage[4], to name just a few. Table 1 provides a review of the known initiatives addressing living wage, and some indications about their geographical scope, granularity, data sources and whether they are made public or not. A global effort to develop a globally applicable and public dataset to support the needs of global businesses has only being carried out by both the WageIndicator Foundation (public data by April 2020 for approx. 119 countries and increasing every quarter), Valuing Nature and Novartis[5] (180 countries in 2018, not updated).

	Geo. Coverage	Granularity	Updates frequency	Data sources	Availability
Valuing Nature	World	Country	No	Primary + WageIndicator + model	Public
BSR	World	Country (+US/Brazil cities)	N/A	US + Model	Private
WageIndicator	76 countries	Country + Regions + cities	Quarterly	Primary	Public/private
Asian Floor Wage	10 countries (Asia)	Country	> 3 years period	Model + primary for food	Public
Global Living Wage Coalition	21 countries/ 26 locations	Regional or city	N/A	Primary	Public
Fair Wage Network	World	Sub-national	N/A	Model + WageIndicator + secondary	Private
Others	1 or a few countries	Sub-national	N/A	Primary/model	Public

Table 1 - Review of main initiatives providing living wage data worldwide (review done end of 2019)

One of the most complete databases, public, updated and with a good level of granularity is WageIndicator, although for the purpose of benchmarking by multinational companies, some living wages estimates are still missing. Yet, it uses a consistent methodology across all countries, regions and cities and continuously collects new data.

To fill in existing data gaps, a joint effort between business partners DSM, Kering and Philips, as well as by the WageIndicator Foundation and Valuing Nature, was carried out to develop a new dataset covering

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[2] https://wageindicator.org/Wageindicatorfoundation

[3] https://www.globallivingwage.org/

[4] http://fair-wage.com/

[5] https://www.valuingnature.ch/single-post/2018/07/20/VALUING-THE-IMPACT-OF-WAGES-ON-HUMAN-CAPITAL

185 countries (see *Figure 1*), in addition to city and regional estimates. We summarize in this paper the findings and provide public access to the data at country level on demand.
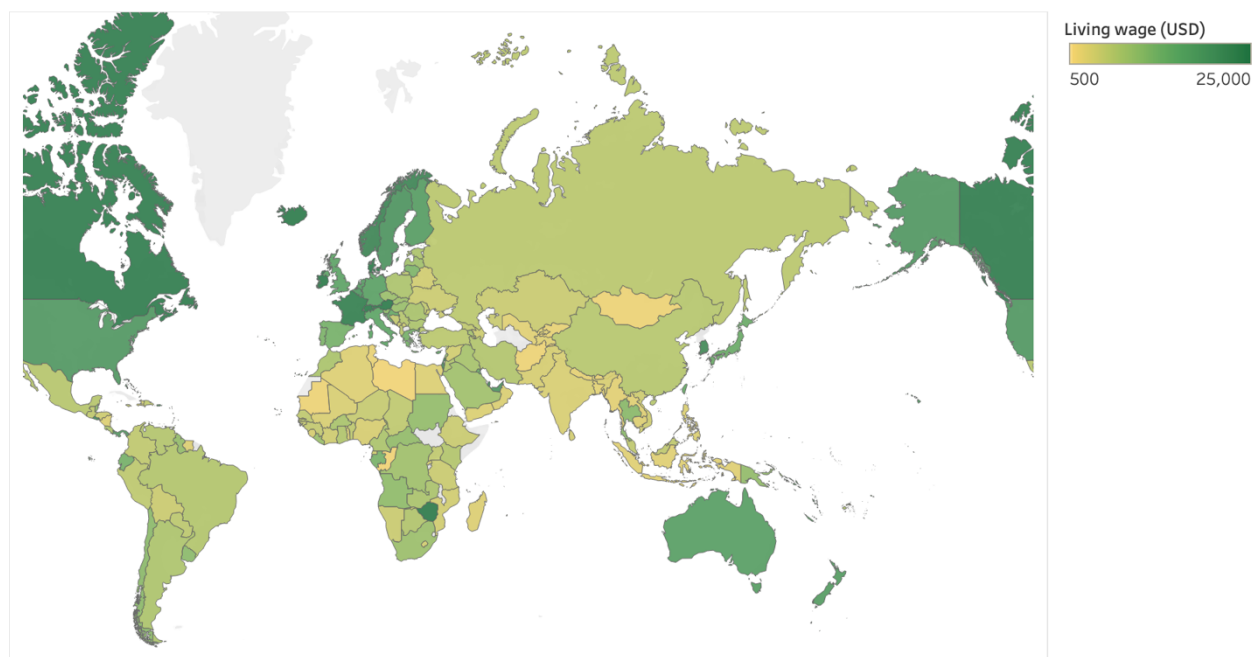

Figure 1 – World overview of the living wage translated in USD 2019

2   Methodological approach

We aligned our calculations with the Anker & Anker (2017) method. Its definition of a living wage is:

> *Remuneration received for a standard work week by a worker in a particular place sufficient to afford a decent standard of living for the worker and her or his family. Elements of a decent standard of living include food, water, housing, education, health care, transport, clothing, and other essential needs, including provision for unexpected events (Global Living Wage Coalition, 2016).*

The current living wage estimates are based on more than 2 million data points from around the world collected by the WageIndicator Foundation; half a million data points were collected in 2019 alone as the latest effort to feed the current data set. We prioritized countries for which additional data was needed by the partners funding this project, resulting in more precise data collections for China, India and Brazil among other countries (e.g., Eastern Europe, Northern Africa, etc). The online/offline data collection app[6] of the WageIndicator Foundation was used to collect data on the ground, in partnership with local associates.

Though living wage calculations based on primary data should be prioritized in order to obtain more relevant and precise results, this is not yet possible on a global scale. Therefore, additional data sources and methods were used to fill in the primary data gaps. These complementary approaches included:

● Custom living wage model based on secondary data on cost of living (from NUMBEO[7])

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[6] https://costofliving.wageindicator.org/#/survey

[7] https://www.numbeo.com/cost-of-living/

- Linear regression model based on the primary or secondary living wage data, and the purchasing power parity data (PPP). The PPP provides a measure of the relative difference of prices between countries, using the USA as reference.

The PPP linear regression model is definitely not the most appropriate when precision is needed, but it still allows to cover data gaps with a decent precision and quickly. Figure 2 shows the correlation between living wage estimates at country level based on primary data collected, and the PPP indicator - more precisely the price level ratio of PPP conversion factor (GDP) to market exchange rate, World Bank, 2018.
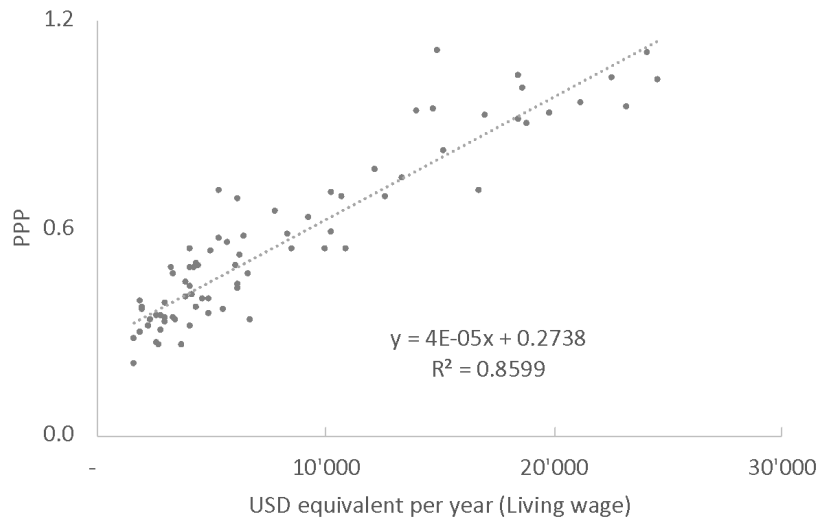

$$y = 4E\text{-}05x + 0.2738$$
$$R^2 = 0.8599$$

Figure 2 - Illustration of the living wage bottom-up dataset and correlation to the PPP value.

With these sources of data (primary data from the WageIndicator Foundation, secondary data from Numbeo, and modelled data) we were able to cover 185 countries with living wage estimates. A specific report on the detailed methodology applied, for example to calculate the food intake requirements, is available on demand.

The trade-off between precision and geographical coverage is illustrated in Figure 3. Ideally, we should aim for the top right corner of the graph. Note that WageIndicator has this objective. We included the living wage model as well based on secondary data from Numbeo (more geographical coverage with less precision) and the living wage model based on PPP linear regression (more geographical coverage but with even less precision).
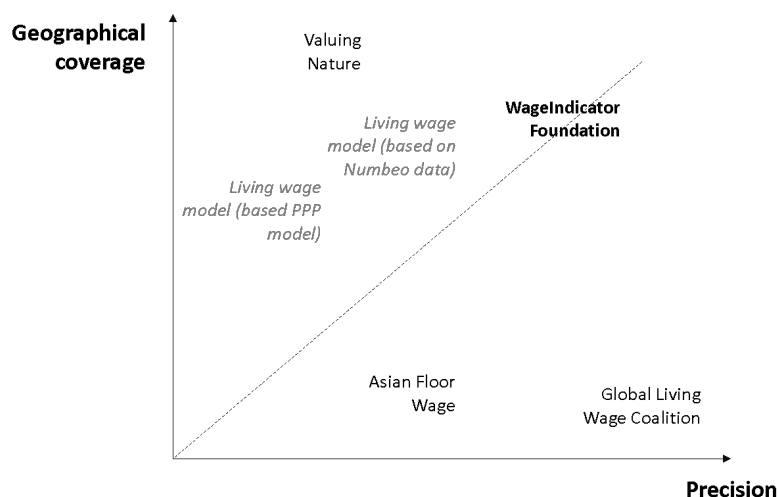
Figure 3 – Illustration of the trade-off between precision and geographical coverage. Ideally, we should aim for the top right corner of the figure in particular for an application of wage benchmarking for a complex value chain or operations.

3 Results, variability and applications

The dataset ensures the consistency of modeling between different sources of data, in particular regarding the typical family composition and the working family members. The underlying data available allows to recalculate the living wage using different data, assumptions or parameters (e.g., tax rate, family type, etc.).

From the 185 countries covered by the database:

- 106 were based on the WageIndicator primary data
- 24 additional countries were based on the Numbeo model (106 countries covered in total from Numbeo model, including the overlap with WageIndicator), and
- 55 additional countries were based on the linear regression model.

In addition, 428 cities were covered by the database:
- 284 derived from the WageIndicator covering the countries of interest from partners
- 144 from Numbeo that were not covered by the WageIndicator

In order to provide a better understanding of the data developed and its potential use and interpretation, we answer key questions that have been asked by project partners as the project developed.

3.1 How variable are the different sources of living wage at country level?

We first analyzed the correlation between the WageIndicator and the Numbeo estimates. The overlap country estimates contained 72 data points. The Numbeo model estimates were on average 30% higher than those provided by WageIndicator (for similar living wage definition, here typical family), with an important variability of 80% (standard deviation, SD). From the overlapped countries, we found out as a general rule that the Numbeo model provides higher estimates than the WageIndicator for developing countries, while developed countries estimates are lower. This trend cannot be explained clearly at this stage and would require more in-depth analysis of the data. The variation would typically come from the data source and, to a lesser extent, from the methodology (e.g. for instance the diet model was slightly different as not the same food items were available from both source data).

A comparison with the Global Living Wage Coalition data for China for selected cities resulted in a difference of -25% on average compared to the WageIndicator data (SD of 12%), showing a good convergence despite the difference of data sources, calculation methods and other differences linked to the variables chosen. The difference comes from the sources of data used, where the Global Living Wage Coalition collects solely data from specific rural locations for example, while WageIndciator uses a blend of data that include suburbs and even cities to cover the same locations.

This analysis, which addresses expected or typical variations among data sources, provides users of living wage estimates with an understanding of the potential variability of living wage calculations. We suggest that living wage estimates should be communicated as a range acknowledging variability among data, rather than a single absolute value. Also, users have to keep in mind that the parameters reflecting the household situation (e.g., number of kids, number of adults and employment rate) highly influences the results, as illustrated in the next paragraph.

3.2 How variable is the living wage estimate using different household situations?

A few variables have a significant influence on living wage estimates, including the number of workers in the family, and the number of kids or family members in general. Additionally, other methodological variables generating variability may include non-food and non-housing costs (as data is less reliable on those topics), the income tax rate, as well as other payroll deductions.

Illustration of how living wage modifications were made focusing on the two main variables previously mentioned (number of workers and number of kids) and the Numbeo model for Brazil, is presented below:

- Typical family: 1.7 kids (fertility rate in the country) + 56% employment rate for the second parent (the other works full time)
- Standard family: 2 kids + 80% employment rate for the second parent
- Typical family modified with 5 kids (only the kid number has been changed)
- Typical family modified with 2 full time working parents
- Typical family modified with one working adult only (the other one does not bring any income)

Figure 4 illustrates the variability of the results, using the typical family wage as the baseline (BRL 22.462 per year) for our calculations. We observe a wide variability, in many cases higher than the variability of the results.
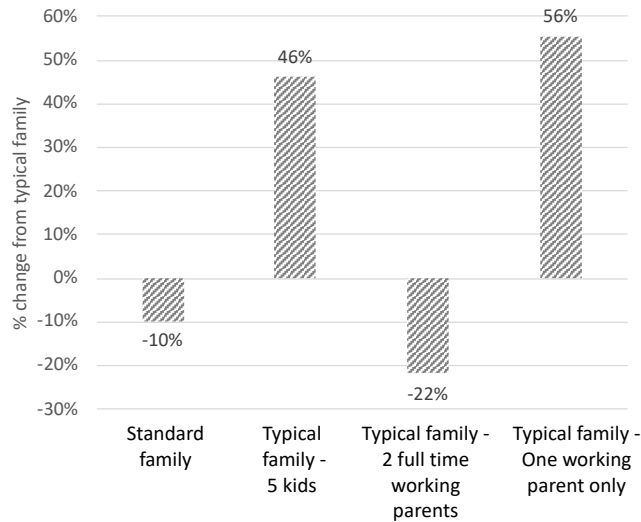
Figure 4 - *Illustration of the variability of living wage estimates for Brazil when considering family composition variables (variation in % from the typical family estimate, baseline = 0).*

3.3   Are country average estimates very different from cities/regions estimates?

Naturally there are variations in the living wage estimates within a country, which in most cases represent differences of cost of living between countryside and urban areas, and also differences between cities. The following example illustrates the living wage variability for different cities in China (Figure 5). As expected, most of the cities have a cost of living higher than the country, except one city analysed in the data set. The city type greatly influences the living wage estimates, particularly due to the cost of housing, and to a lesser extent, the cost of food. A similar comparison done for countryside results in less variability.
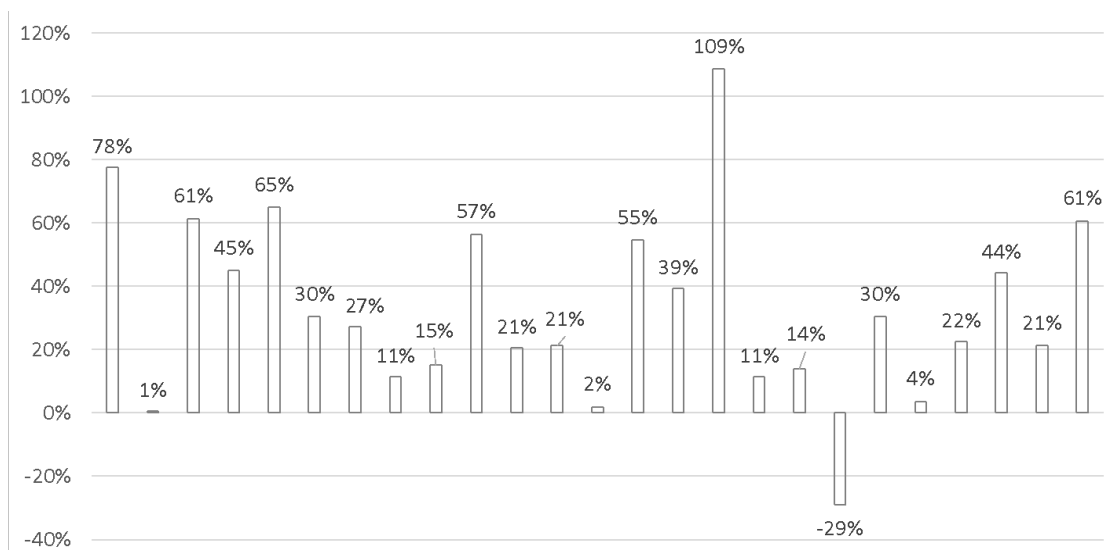

Figure 5 - *Comparison of living wage variability among cities within a country (China), as a % of change compared to the country average (baseline = 0%).*

3.4 How to use the global living wage dataset?

This global dataset is not always as precise as locally developed living wage studies, like carried out by the Global Living Wage Coalition. There is a clear trade-off between geographical coverage and data precision. The objective of our study is first to enhance the ability of multinational organisations to benchmark easily their wage practices in their value chain and operations, and to provide a solid and practical starting point that facilitates and unifies future efforts to improve data availability at a local/community scale. We think that managed uncertainty is better than no data at all, data is transparently reported to allow for interpretation.

The dataset collected has been developed for applications in global value chains and it has been successfully used by companies, some of which are partners of this project, as a benchmark for comparing direct wages and wages paid by their suppliers. It is a way of prioritizing resources to identify geographic areas, operations, sectors and/or suppliers for which a gap to obtain living wage estimates still exists, despite remaining uncertainties. Whenever it would be used for specific studies, we recommend refining estimations with locally collected data (i.e. using the data collection app from WageIndicator Foundation) to increase precision, thereby increasing the relevance of the living wage estimates.

3.5 Which estimate to use (single family, standard or typical family, etc)?

Given that the living wage is not a single figure, but rather a range based on a specific household situation, different organisations use different types of living wages. This is not a methodological issue, but a value-based judgement. We have to position this debate within a maturity curve for organisations looking to improve their practices, moving from compliance (legal minimum wage) towards a standard or typical family living wage. Those two latter estimates are commonly used and recommended in the living wage field (typical and standard family). However, we argue that the debate could look in the future to integrate an additional, more ambitious type of living wage as is described below.

A typical family is more statistically correct if you compare it to a large group of persons, given that it uses national statistics to obtain the number of children and working adults. Standard family always considers 2 children, which is more correct than let's say 1.8 children or 2.4 children (which could be used in the typical family). However; in countries that have on average a number of children above 2 for instance, the standard family is inaccurate (it would underestimate the living wage). On top of this issue, the typical family estimate uses the national employment rate to obtain the employment rate of the second adult, while the standard family uses 80%. It is quite unlikely that such a rate of employment is achieved in many countries. We therefore came to the conclusion that - even though those estimates are statistically valid - the use of a different estimate may be considered in the future to ensure a living wage that would cover most situations encountered in a country. A more ambitious living wage level could be obtained by taking into account:

- **Number of kids**: fertility rate rounded to the upper round number (e.g., a 1.7 fertility rate, we would consider 2 kids)
- **Number of working adults**: Even if part time working is probably a trend in our society, in particular in developed countries, it is not the reality of many other countries. We would recommend to either use two working adults or only one (as opposed to a non-round number like 1.7). The use of two working adults would likely reflect the situation of the poorest households in most countries and would lower the living wage estimates; however, considering that in many cases, the risk of losing unsecure jobs is a real threat and that the margin accounted for unexpected events in the living wage is small (5% of the total cost of living), using one working adult would ensure a more reasonable living wage estimate, although higher. It would ensure a certain resilience for the households receiving this living wage for one of the working parents.

There is yet no common or unified consensus on this matter, and engagement of the wider community working on living wage would be required to ensure a common position.

3.6 Benchmarking living wages with organization's wages

In the context of benchmarking living wages with organization's wages, it is common to:

- Use yearly equivalent wages from the organization, which includes additional mandatory salaries during the year (usually at the end, but not always).
- Include guaranteed in-kind benefits such as transportation, food or housing, but not only limited to those. It is important to not consider any performance based in-kind benefit that is not guaranteed for the worker.

In practice and based on our experience while developing the project with our team and partners, in-kind benefits are rarely accounted for in a first analysis, given its calculation complexity over a wide range of employees and regions.

We recommend being aware of country inflation rates and changes in the political contexts, which might change significantly the living wage estimates from one period to another. Finally, we recommend using the highest estimate for living wage to do a first analysis in order to avoid under-reporting and to highlight the areas at risk of wages paid below the living wage levels. In general, direct operations of global companies have seldom pay levels below living wages. Very often the issue lies on the path of contractors and in the supply chain of the multinational companies, where it is a challenge to collect data on prevailing wages, although approaches exist.

3.7 Potential future improvements in living wage calculations

While the further development of this worldwide dataset (which is consistent with the Anker & Anker methodology), we noticed some potential areas of improvement that could be considered in future methodology updates. These points are:

- **Social benefit redistribution**: Many countries provide support targeted at the poorest fraction of their population, which could be accounted for in the living wage estimates. Ideally, a living wage would ensure a basic but decent life without support from the state. However, in some countries, this system is so much embedded in common practices, that it would also be wrong not to consider it in the living wage estimates.

- **Informality and taxation**: When considering suppliers and contractors in particular, we are often talking about informal workers that are not paying taxes or very little, indirectly. It would be wrong to not account for taxes for this segment of the population, whether it is in the living wage estimate or in the organization/supplier wage benchmark. The methodology requires to include it of course, but in practice, it is sometimes forgotten.

- **Retirement conditions**: It seems that retirement is very often not considered in living wage estimates, although it is a major issue for poor people in many countries and is often not provided by the state or the companies hiring workers. It would be fair to consider some level of savings in the calculation of the living wage that could go into a retirement fund or capital (whatever the form it can take, such as a house, land, bond or stock, etc).

- **Alignment of standard of living across countries**: in practice when comparing living wages across countries, we observe a different standard of living reflected in the cost of living data

collected. For example, different countries have different typical sizes of habitation or comfort. The result of those differences is that a living wage across countries does not guarantee exactly the same level of living, but more a locally acceptable level of living in a given country. A better definition and accounting of the standard of living for calculating cost of living would be required.

- **Accounting for socio-economic conditions**: Different countries have specific socio-economic conditions, which directly affect family living standards (e.g., access to a formal and mature job market, access to public education, access to a functioning health system, among others). When comparing living wages between developed or developing countries, those aspects are not well accounted for, although they influence the living standards and the living wages. Social services would in theory lower the living wage, or on the contrary, the absence of a social security would increase the living wage. The first is often accounted for, while the second generally is not. Further alignment would be required within the global dataset to account for this fact.

4   Recommendations and future steps

The current dataset allows global organizations to benchmark their compensation practices with the living wage, including the ones of their contractors and suppliers. It is hoped that the dataset generated will help the deployment of the living wage concept and target in the corporate sector in particular. This dataset does not replace however the effort from other organizations and NGOs developing local and more precise living wage estimates whenever they are needed. Both efforts will likely continue to complement and enrich the public living wage estimates.

WageIndicator Foundation with the support of Valuing Nature will ensure the continuous update (every quarter) of the global living wage dataset estimation that evolves over time to account for changes in local conditions in every country or location around the globe. Living wages are not statics, but dynamics and a level of update is required in benchmarking applications. We recommend checking the regular updates published by the WageIndicator and contact the authors to obtain more information about this world living wage dataset.

Finally, and most importantly, we want to remind any organization willing to address the living wage issue in their operations or value chain that the living wage is not an end, but one of the starting points to improve labour conditions worldwide.

Please contact the author to get access to the full database (sv@valuingnature)