

# ANKER LIVING WAGE AND LIVING INCOME REFERENCE VALUES FOR DEVELOPING COUNTRIES: HOW THEY ARE ESTIMATED

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*July 2020*

## Introduction

Anker Reference Values for living wages and living incomes are based on a new methodology developed by Richard Anker, Martha Anker, and Ian Prates. This will greatly increase the number of developing countries for which credible and internationally comparable living wage and living income estimates are available. These Reference Values take advantage of the availability of 40 internationally comparable, quality-assured Anker methodology studies carried out primarily under the auspices of the Global Living Wage Coalition. Anker Reference Values are much less expensive to produce than full benchmark studies, but are none-the-less still internationally comparable and easily updated every year. Reference Values will enable discussions about living wages and living income to take place in countries where it has not yet been possible to organize and fund a full quality-assured Anker methodology living wage or living income benchmark study.

## Background

Living wages and living incomes are needed to ensure decent work and a decent living standard for workers. Anker methodology is the widely accepted gold standard for measuring living wages and living incomes (Anker and Anker, 2017).<sup>1</sup> It has played an important role in catalyzing wage and income improvements in global supply chains. The Global Living Wage Coalition (GLWC) and the Living Income Community of Practice (Li CoP) definitions of living wage and living income are now widely accepted:

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<sup>1</sup> Anker methodology estimates a living wage using a judicious combination of primary and secondary data. It estimates the cost for a typical family in a location of a basic but decent living standard – the living income. This consists of a nutritious diet that is consistent with local food preferences and WHO nutritional standards for calories, macro nutrients, and fruits and vegetables; healthy housing that meets international and local housing norms; other expenses that definitely includes sufficient funds for adequate health care and education for children through secondary school which are considered human rights; and a small margin for unexpected events and sustainability. The cost of this basic but decent standard of living for a family is then divided by the number of full-time equivalent workers expected to provide support for the family. Finally, required income tax and mandatory payroll deductions payable on a living wage are added so that workers receive sufficient take home pay. Studies are carried by experienced independent researchers and are subject to a strict quality assurance process.

Living wage is:

“Remuneration received for a standard workweek 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, transportation, clothing, and other essential needs including provision for unexpected events.” Global Living Wage Coalition

Living income is:

“Net annual income required for a household in a particular place to afford a decent standard of living for all members of that household.” Living Income Community of Practice

## Why Anker Reference Values are needed

The demand for living wage and living income estimates has surged as more and more companies and organizations recognize the importance of living wages and living income for sustainability and want to measure and monitor gaps between prevailing wages for employees to living wage and between incomes of smallholder farmers to living income. Yet at present, many countries do not have a quality-assured Anker methodology living wage or income study and benchmark estimate to use to monitor gaps. Thus, the issue arises about what living wage and living income estimates stakeholders should use for countries when a quality-assured Anker methodology living wage or income study is not yet available.

## Anker Reference Values for living wage and living income

Anker Reference Values have been developed to meet this urgent need for credible and internationally comparable living wage and living income estimates for developing countries without as yet a quality-assured Anker methodology living wage or living income benchmark study. These Reference Values are not meant to replace quality-assured Anker methodology studies and benchmark estimates – but rather to enable the measurement of approximate gaps to living wages and living incomes for developing countries where it has not yet been possible to organize and fund a quality-assured Anker methodology study.

## Methodology used to estimate Anker Living Wage and Living Income Reference Values

Anker living wage and living income Reference Values build on the knowledge gained from 40 quality-assured Anker methodology living wage and living income studies carried out in 23 developing countries. This new methodology, which is described below, is based on a multivariate regression analysis of results from these 40 studies. All of these studies were closely supervised and quality-assured by Richard Anker and Martha Anker. To increase comparability further, results of these studies were further harmonized to make sure that all used the methodology described in Anker and Anker (2017),

since these studies were done over eleven years from 2008-2019 as the methodology was being refined. This high degree of quality and comparability is essential and the keystone for successful development of the Anker Reference Value methodology.

## Study countries included in the statistical analysis

Countries and locations included in the statistical analysis were places where Global Living Wage Coalition members or Tiffany and Co. (which has a policy of paying a living wage to workers in its factories worldwide) had a particular interest. This means that study countries were not randomly selected. Despite this, study countries are spread fairly evenly across the developing world. Eight are in Africa, eight are in Latin America, and seven are in Asia.<sup>2</sup> Approximately one-third of the living wage and living income estimates included in the statistical analysis are for rural areas and two-thirds are for urban areas that are fairly equally distributed between large cities and smaller towns or cities.<sup>3</sup> Overall, study countries cover 68% of the population of the developing world.<sup>4</sup>

Eight study countries had living wage and living income estimates for more than 1 location.<sup>5</sup> For these countries, each study estimate was treated as a separate observation in the regression analysis when the living wage studies were done for substantially different locations (e.g. for a rural and an urban area; or for a large city and smaller city) or for quite different years. China was treated differently because six studies were done for six different very large cities for the same year. To avoid undue influence on results of these six China studies done in 2015, the average of the living wages and living incomes for these six cities was used in regressions as results for these six cities are not fully independent of one-another and in addition explanatory variables used were for all-China.<sup>6</sup>

## Description of statistical analysis and dependent variables

The purpose of the statistical analysis was to find significant and robust relationships between our harmonized and internationally comparable net living wage and living income estimates for counties

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<sup>2</sup> The 8 African countries are: Botswana, Ethiopia, Ghana, Kenya, Malawi, Mauritius, Namibia, and South Africa. The 8 Latin America countries are: Brazil, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Mexico, and Nicaragua. The 7 Asian countries are: Bangladesh, Cambodia, China, India, Pakistan, Sri Lanka, and Vietnam. There are more studies in the statistical analysis than are available on the GLWC website, because 9 studies were done confidentially for Tiffany and Co., four studies were not yet published by GLWC, and one study was a living income study.

<sup>3</sup> One reason for more urban than rural estimates is because several studies focusing on an agricultural industry found that most of the workers live in an urban area and commute to work. This occurred, for example, for flower farm workers in Kenya and Ethiopia; banana plantation workers in Colombia; and coffee workers in Brazil.

<sup>4</sup> It is worth noting that there were no study countries in Eastern Europe, former Soviet Union, or North Africa. This means that Anker Reference Values for these types of countries need to be treated with additional caution. Nor were there any study high-income developed countries, and for this reason Anker Reference Values are not estimated for high-income developed countries at the present time.

<sup>5</sup> There are 2 for Bangladesh, 7 for China, 2 for Dominican Republic, 2 for Ghana, 4 for India, 2 for Kenya, 2 for Pakistan, 2 for South Africa, and 3 for Vietnam.

<sup>6</sup> A seventh China study, which was done for Xian in 2009, was treated as a separate observation in regressions, because GDP per capita in real terms in China was much lower in 2009 than in 2015.

and locations with national characteristics of study countries using readily available data from credible sources such as the World Bank, ILO, United Nations and FAO. And then to use the best and most robust of these relationships to estimate Anker living wage and living income Reference Values for countries without as yet a quality-assured Anker methodology benchmark study.

Net living wage (i.e. take-home pay) and living income were the dependent variables. It is worth noting that this statistical analysis did not try to explain the gross living wage (aka living wage) which adds mandatory payroll deductions and income taxes to the net living wage. The reason is that tax rates and tax regimes around the world are idiosyncratic to each country (and sometimes locations) and do not follow an easily discernable pattern. Mandatory payroll deductions and income taxes paid by workers earning a living wage are just as likely to be high for poorer developing countries as they are for better off developing countries. For this reason, Anker Living Wage Reference Values (i.e. gross living wage) are estimated by adding the amount of mandatory payroll taxes and income tax that workers would need to pay if they earned a living wage to our estimated net living wage.

Living income estimates do not require the subsequent step done for living wage of adding income taxes or mandatory payroll deductions, because smallholder farmers do not usually pay taxes and if smallholders do pay taxes this is assumed to be a business expense.

### Potential explanatory variables

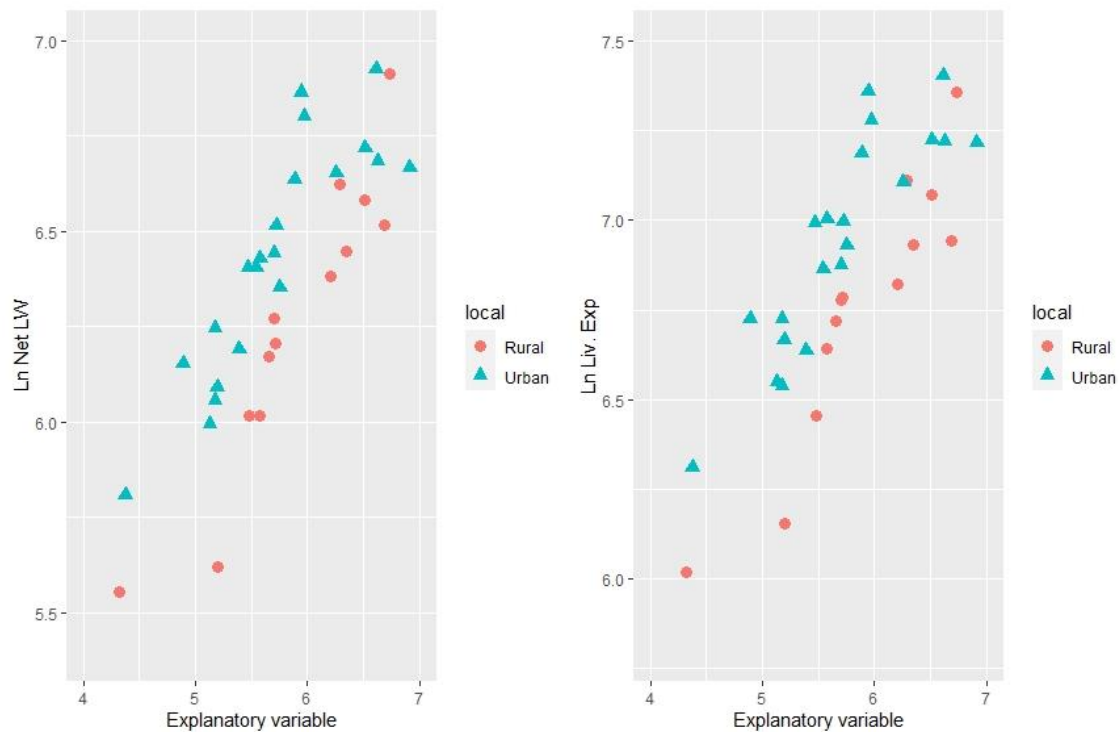
A number of explanatory variables were investigated. To be considered, variables needed to be: (i) available online on an annual basis for almost all countries in the world from a reputable organization, such as World Bank, ILO, FAO and United Nations, and (ii) reasonably expected to be related to net living wage and living income. The first criterion was important if we were to be able to estimate Reference Values annually in future for almost all developing countries, while the second criterion was important to reduce the possibility of finding spurious relationships which is an ever-present problem with international cross-country analyses. Explanatory variables investigated included measures of household income, food prices, living costs, social assistance expenditure, household income inequality, rural-urban and big or small city location, fertility rates, and labor force participation rates.

Values of potential explanatory values were always for the year of the living wage study. Monetary values for both dependent and explanatory values were expressed in World Bank purchasing power parities (PPP) for private consumption to increase international comparability, which is common practice in international cross-country studies. Various functional forms were investigated with the best fits found to be nonlinear.

Explanatory variables were added to regression equations one at a time as well as in combination. The reason for this approach was because intercorrelations and limited number of degrees of freedom always make it difficult to separate out independent effects of explanatory variables in cross-country statistical analyses. In this way, we were able to examine how robust results for explanatory variables were to inclusion of other explanatory variables.

## Regression results

The figure below provides a scatterplot of study values using log scales. There is a clear relationship with development with furthermore urban locations having higher living wages and living incomes compared to rural locations. The final regression equations explained around 85 percent of the variation in net living wages and living incomes for locations with a quality-assured Anker methodology study. This high level of explanation adds confidence to the final model equations and therefore to Anker Reference Values estimated based on this model equation. This also means that Anker Living Wage and Living Income Reference Values are consistent with existing living wage and living income estimates from quality-assured Anker benchmark studies.



## Sensitivity analysis

Sensitivity analysis and repeated stress testing is very important for cross-country statistical analyses, especially those with relatively few degrees of freedom such as our analysis, because such analyses are prone to finding significant spurious relationships which would clearly be problematic for prediction purposes. Three sensitivity analyses were carried out to make sure that observed significant relationships are robust.

First, study observations were omitted one at a time as well as groups of similar countries to test whether the size or significance of regression coefficients were affected by the omission of particular countries. If omitting one country or one group of countries renders a significant relationship insignificant, this relationship may be spurious and is in any case probably not robust enough to include in a final regression equation to predict living wage or living income.

Second, we investigated how explanatory variables that were generally or sometimes statistically significant were related to each of five determinants of net living wage (food costs, housing costs, non-food non-housing costs, family size, and number of workers per family). The more that results were consistent with a priori expectations (e.g. urban location should have its strongest effect on housing costs), the greater the confidence in results. This is a strong sensitivity test given the relatively few study observations available and so degrees of freedom.

Third, because four quality-assured Anker living wage benchmark studies were completed after the statistical analysis was completed and model equation estimated, it is possible to observe how the living wages and living incomes in these four new living wage benchmark studies compare to the living wages and living incomes Reference Values predicted by our model equation. Results of these comparisons were reassuring. Living wage and living income benchmark estimates in three of these four new benchmark studies were similar to the predicted Reference Value as they fell within the equation's confidence interval (see margin of error below). These three studies were done in areas considered to be typical for the country. While the living wage and living income benchmark estimates for the fourth country were much higher than our predicted Reference Value, because this benchmark study was done in the most highly developed and expensive part of the country and so was expected to have a high living wage and living income for that country.

The three types of sensitivity analyses undertaken increased confidence in our final regression model equation.

### Separate rural and urban Anker Reference Values

The regression models estimated allow for separate Anker Reference Values for rural and urban areas for each developing country, because whether a study location was rural or urban was found to be significantly related to net living wage and living income with values lower in rural locations compared to urban locations. This means that although Anker Reference Values are not location-specific within countries (e.g. not for region A or C, or for city X or Y) - unlike Anker methodology living wage and living income benchmark estimates which are for a specific location - there are separate rural and urban Reference Values for each country. This is a big improvement compared to typical approaches used to estimate national poverty lines (which are often the same for the entire country) and World Bank international poverty lines (which have only three values for all developing countries). Note that while it is reasonable to believe that living incomes and living wages are lower in small towns and cities compared to large cities, we were not able to isolate this effect statistically possibly due to an insufficient number of degrees of freedom.<sup>7</sup>

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<sup>7</sup> While large cities had higher net living wages and living incomes than smaller cities and towns *ceteris paribus* in the statistical analysis, this relationship was found to be highly sensitive to: (i) excluding certain country observations and (ii) the definition for large cities. As a result, we did not think that results were sufficiently robust to use to predict living wages and living incomes for non-study countries. It is hoped that as new quality-assured Anker living wage and living income studies are done, it will be possible to pin down the differential effect on net living wage and living income of big cities compared to smaller cities and towns.

## Margin of error

Anker Reference Values are derived from best fit regression equations and so have a margin of error or confidence interval around them. This is around + or – 10% for a 95% confidence interval for developing countries.

Since Reference Values indicate average living wage and average living income for rural areas and urban areas in each developing country, they are not location-specific values for any particular rural region or any particular town or city. This means that the margin of error can be greater than 10% from the mean for unusual locations within countries. This should not be surprising given the large variation in living conditions and costs found in some countries. In India, for example, there is a 70% difference between the highest and lowest state rural poverty lines and a 41% difference between the highest and lowest state urban poverty lines. We found a margin of error with a 95% confidence interval of around + or – 35% of our average rural or urban living wage or living income estimates for specific locations within a country. The Anker research Living Wage and Living Income Research Network is currently working on methods to make adjustments for within country variations in living wages and living incomes estimates.

## Unusual countries and adjusting Reference Value

Reference Values are primarily based on results of a regression equation. But countries and locations can be unusual in ways that affect living wage and living income. For this reason, adjustments are sometimes made to the equation predicted living wage and living income when a country is unusual. For example, living wages and living incomes is lower in social welfare states where government provides goods and services which are paid for by households in most countries. For example, in addition to providing free and quality education and medical care, the government of Mauritius funded or subsidized much of existing housing; it also requires firms to provide or pay for transportation of workers to and from work. In such countries, the equation predicted living wage and living income Reference Values are adjusted downward. In countries with unusually low (or high) full-time labor force activity, the equation predicted living wage is adjusted upward (downward), because there are relatively few (many) full-time workers per family providing support through their labor. There can be there can be other unusual situations such as countries having unusually high food prices which sometimes occurs in small countries and island states or in countries with a government policy of self- sufficiency in food. This raises the living wage and living expenses because people need to pay more for food.

Reference Value estimates are also systematically sense-checked in various ways. For example, Reference Values are compared to other wage and economic indicators as well as living wage and living income estimates (either Reference Value estimates or benchmark study estimates) for similar and neighboring countries. Views of national experts and stakeholders are also solicited. When the equation predicted living wage and living income Reference Values are considered to be too high or too low and there are good explanations for why, a small adjustment is made to a country's equation predicted Reference Values.

## Mandatory payroll deductions and income tax due on living wage

Mandatory payroll deductions and income taxes that would need to be paid on a living wage are added to the estimated net living wage (i.e. take-home pay required for decency) to calculate the Anker Living Wage Reference Value. A Living Wage Reference Value is the pay which is sufficient to cover the cost of a basic but decent standard of living and pay any mandatory payroll deductions and income taxes that would need to be paid on a living wage. The reason why mandatory payroll deductions and income taxes are calculated separately based on national laws (and local laws when relevant) and not modeled in an equation is because tax laws are idiosyncratic to each country (and sometimes location) and cannot be predicted by a model equation. Taxes are not considered when estimating Anker Reference Values for living income, because small holder farmers in developing countries do not often pay taxes, and if they did pay taxes on their farm income, we consider this to be a business expense.

## Future updating of Anker Reference Values

The plan is to update Anker Reference Values every year in future to take into consideration: (i) inflation (to ensure that purchasing power of Anker Reference Values are maintained), (ii) economic development (to ensure that Anker Reference Values take into consideration improvements in living standards and expectations as countries develop), and (iii) mandatory payroll deductions and income tax for living wages (to ensure that take home pay is sufficient).<sup>8</sup> Future updates will also consider results of new quality-assured Anker living wage and living income benchmark studies and possible model improvements.

## Anker Reference Value country report profiles

Since it is important that Anker Reference Values are understood and used properly by stakeholders and others given their limitations, they need to be presented in context. For this reason, Anker Reference Values will be presented in country profiles that include context in terms of the geography of the country, the demographic situation, the economy as it relates to the global supply chain, poverty (general levels and regional variation), standards of living, and labor market conditions. In addition, a wage ladder or family income ladder graphically compares the Anker Reference Value with other widely used wage or income indicators such as minimum wage, average wages, and poverty line wages. In countries where information is available by region within rural and urban areas, regional variations within countries are highlighted.

## Within country variation in living wages and living incomes

As Anker Reference Values indicate typical or average living wages and living incomes for rural and urban areas for each country, the issue necessarily arises as to how Anker Reference Values could be

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<sup>8</sup> It is expected that the model equation used to predict Anker Reference Values will be updated and improved around every two years as new quality-assured Anker methodology living wage and living income studies are completed and vetted. This would be similar to what the World Bank does when it updates its purchasing power series and international poverty lines, although they do this roughly around every 5 to 10 years.



adjusted to be relevant for specific locations within a country. When there is a strong interest of a stakeholder or industry in paying living wages and living incomes, it is possible to analyze regional differences in living costs and incomes within a country to enable an informed conclusion regarding whether Anker Reference Values are likely to be higher or lower for the specific location(s) in question and estimate approximately by how much. The Anker Living Wage and Income Research Network is currently looking into how best to do this analysis and draw conclusions about regional adjustments.

## Conclusions

Anker Reference Values provide valuable new information on living wages and living incomes for rural and urban areas of developing countries without as yet a quality-assured Anker methodology study. These Anker Reference Values are based primarily on model equations that were estimated from a detailed regression analysis of 40 quality-assured Anker methodology living wage studies in 23 developing countries. These equations were able to explain around 85 percent of the variation in net living wages and living incomes for these countries and locations. This means that Anker Reference Values are consistent with results from available quality-assured Anker living wage and living income benchmark studies.

Anker Reference Values are not intended to replace quality-assured Anker methodology living wage and living income studies. They are numbers with some context – which is unlike quality-assured benchmark studies that involves months of research, collection of data on local living conditions and living costs, and interaction with local stakeholders as well as a comprehensive and detailed report. Rather, Anker Reference Values are intended to serve as approximate reference values to facilitate action for countries that do not yet have a quality-assured Anker methodology living wage or living income study, perhaps because it has not yet been possible to field a quality-assured benchmark study or because it is not possible to justify the cost of a benchmark study for countries with small numbers of producers in the global supply chain. Anker Reference Values are expected to be especially useful in identifying hot spot countries where prevailing wages and incomes are very low compared to workers’ needs. It is expected that the first set of Anker Reference Values released will be followed by Reference Values for many other developing countries in future – as lessons are learned and digested on how to present and use Anker Reference Values to catalyze wage and income improvements for workers and families.