Living Wage Report

Nicaragua

Northwest

Context Provided in the Coffee, Banana, and other labor intensive Agriculture

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Living Wage Estimate

Nicaragua

Northwest

Context Provided in Labor Intensive Agriculture

SECTION I

INTRODUCTION

1. BACKGROUND

This report estimates a living wage for Northwest Nicaragua, a region dominated by labor intensive export agriculture, such as coffee, bananas, sugar cane and tobacco. In total, this region employs up to 1 million agricultural workers every year, most of whom are paid the cash minimum wage of about USD 5 per day (in addition, workers also receive three free meals each workday).

The living wage concept refers to a salary that would allow a typical worker family to live a decent life. Decency includes access to a basic, nutritious diet in line with local preferences and possibilities; access to housing that complies with both national and international minimum standards; access to education for children through secondary school; access to health care when needed; and, finally, the living wage should be sufficient to allow the family to live together, rather than some members having to migrate and live apart to complement family incomes.

The study applied the methodology developed by Anker and Anker (2017). The Anker methodology has gained widespread acceptance among diverse stakeholders globally and has been used to estimate living wages in a wide variety of settings, such as the coffee growing area of Minas Gerais in Brazil, the banana growing region of the northern part of the Dominican Republic, the peri-urban flower growing regions of Kenya, and the sports ball producing region of North Eastern Punjab in Pakistan[1].

Most of these studies have been commissioned by the Global Living Wage Coalition (GLWC), which brings together Fairtrade International, Forest Stewardship Council (FSC), GoodWeave International, Rainforest Alliance (RA) joining forces with UTZ, and Social Accountability International (SAI), in partnership with the ISEAL Alliance and Richard Anker and Martha Anker. The shared mission of the GLWC is to provide high quality and consistent knowledge

[1] All Living Wage Reports in this series can be downloaded from here: https://www.globallivingwage.org/.

and information about living wage levels, implementation, and impact necessary for stakeholders of all types to collaborate in a non-competitive environment toward wage increases globally. This work is designed to serve the vision of the GLWC, that workers around the world can afford a decent life for themselves and their families.

This study was made possible through the generous funding support of UTZ, joining forces with Rainforest Alliance with further support provided by Fyffes.

The main principles of the Anker methodology (Anker and Anker, 2017) are the following:

- **Transparency:** The methodology clearly sets out the principles and assumptions behind the living wage estimate, so that readers understand, and have the possibility to question, what workers can afford on a living wage, and how the living wage differs from the national minimum wage and the national poverty line.
- **Normative basis:** The methodology estimates the living wage based on normative standards for nutritious food, healthy housing, adequate health care, and education of children through secondary school.
- **Time and place-specific estimates:** Since the level of development, the costs of living, and the expected standards of living vary not only over time, but also across space within a country, the methodology calls for time and place-specific living wage estimates.
- **International comparability:** The living wage estimates are comparable between countries, because they are based on the same principles everywhere.
- **Practical and modest cost:** The methodology uses a judicious mix of secondary data analysis and primary data collection and analysis, which results in reliable estimates at a modest cost.
- **Comparison with prevailing wages:** The methodology also develops principles and guidelines for measuring prevailing wages, so that it is possible to compare them with a living wage and determine gaps between prevailing wages and a living wage. All forms of remuneration including in kind benefits are considered.
- **Living wage reports are more than only a number:** Living wage reports do not just report a number, but also paint a picture of what it means to live on less than a living wage, and how the living standards would be for workers who would earn a living wage. This type of reporting facilitates effective stakeholder dialogue and value chain dialogue, and is expected to help improve conditions for the people who carry out the hardest part of the work in the value chain.

2. LIVING WAGE ESTIMATE

The gross living wage for Northwest Nicaragua is estimated at C$ 8,048 per month, which corresponds to USD 265 per month. This value was calculated for October 2017, and covers the seven states in the northwestern part of Nicaragua. It refers to the wages of agricultural workers required for decency for families who reside in rural areas as well as small and medium sized towns. It is a gross wage comprised of the basic cash salary, the legal standard bonuses (*aguinaldo* and vacation payments), and benefits paid in kind (three meals per day). This is the wage necessary for a typical family with 1.62 full-time equivalent workers and two children to pay for a nutritious diet, decent housing, health care, education, clothing and other essential expenses.

For comparison, the minimum wage for agricultural workers for the period 1 September 2017 – 28 February 2018 was C$3,773.82 per month, plus food and bonuses (Comisión Nacional de Salario Minimo, 2017). Cash bonuses (*aguinaldo*, which is paid together with the regular salary every fortnight) amount to 1/12th extra, and the value of meals provided by agricultural employers is valued at C$ 50 per working day[2]. This means that the gross minimum wage amounts to C$ 5,288 (or USD 174) per month. **The estimated living wage is therefore 52% higher than the current minimum wage.**

The minimum wage is strictly observed in Nicaragua, but during coffee harvest season (October to February), coffee workers usually earn substantially more than the minimum wage, and indeed often more than the living wage. In section 14.3 of this report we show that **the estimated living wage is about 20% higher than the average income for an agricultural worker over the whole year**.

The poverty line in Nicaragua is defined as the amount of money necessary to satisfy not only the minimum calorie intake, but also other essential expenses, such as housing, transportation, education, health, clothing, and daily household items. It was calculated by the National Statistical Institute (INIDE – *Instituto Nacional de Información de Desarrrollo*) to be C$18,310.99 per person per year in 2016. This corresponds to C$1,525.92 per month per person, or C$ 6,104 per month for a family of four people (USD 201).

A major difference between the minimum wage and the living wage estimated in this report is that the latter allows workers decent housing. Currently, the housing conditions for most agricultural workers in Northwest Nicaragua do not comply with either national or international minimum standards (see section 7.1). The main problems are dirt floors, smoke in the kitchen, and overcrowding which is a health risk for disease transmission and implies a complete lack of privacy in the sleeping arrangements. Smoke in the kitchen is a problem in

[2] This corresponds to the most common value of employer provided food reported by workers in our study region in the 2014 national household survey (C$ 1,200 per month = C$ 50 per day).

both rural and urban areas, because people prefer to use firewood to make tortillas and cook beans, both because gas is considered expensive and because the resulting food is believed to taste better.

Photo 1: The kitchen of the most prosperous woman in Oro Verde, Estelí, Nicaragua.

Photo credit: *Lykke E. Andersen.*

3. CONTEXT

Nicaragua is the biggest country in Central America. It is geographically divided into three main regions: 1) The Pacific lowlands in the west, which are hot, but with fertile volcanic soils, and home to most of the country's 6 million inhabitants; 2) the central northern highlands, with a more temperate climate, and a rugged terrain that is more difficult to cultivate, but well-suited for coffee; and 3) the Caribbean lowlands in the east, which is geographically the largest region, but covered in rainforest and sparsely populated.

Nicaragua's economy is still very much based on agriculture, with 31% of the labor force working in agriculture[3], and more than half of the country's exports being agricultural products, of which the most important are: Coffee (18.9% of total exports), meat (18.9%), cheese (5.1%), sugar (4.7%), peanuts (3.5%), beans (2.8%), cattle (1.3%) and bananas (0.7%)[4].

According to the 2011 Agricultural Census[5], there were 261,321 agricultural establishments in the country and 108,755 of these hired agricultural workers either permanently or temporarily. In total, almost 1 million agricultural workers were hired, although only 14% of those on a permanent basis.

The use of agricultural workers is highest in the central northern highlands of Nicaragua, in the states of Jinotega (197,182 agricultural workers hired in 2011), Matagalpa (168,289), Nueva Segovia (95,100), Madriz (57,481) and Estelí (43,573), but also quite high in the two pacific coast states of Chinandega (71,770) and León (33,456)[6]. These seven states clustered in the northwestern corner of Nicaragua concentrate more than 70% of all agricultural workers in the country, and these seven states comprise the geographical area covered by the present Living Wage Report (see Figure 1).

The central northern highlands (the five states colored in green tones) is where most of Nicaragua's coffee is grown, while bananas are grown in the coastal region (the two states in yellow tones).

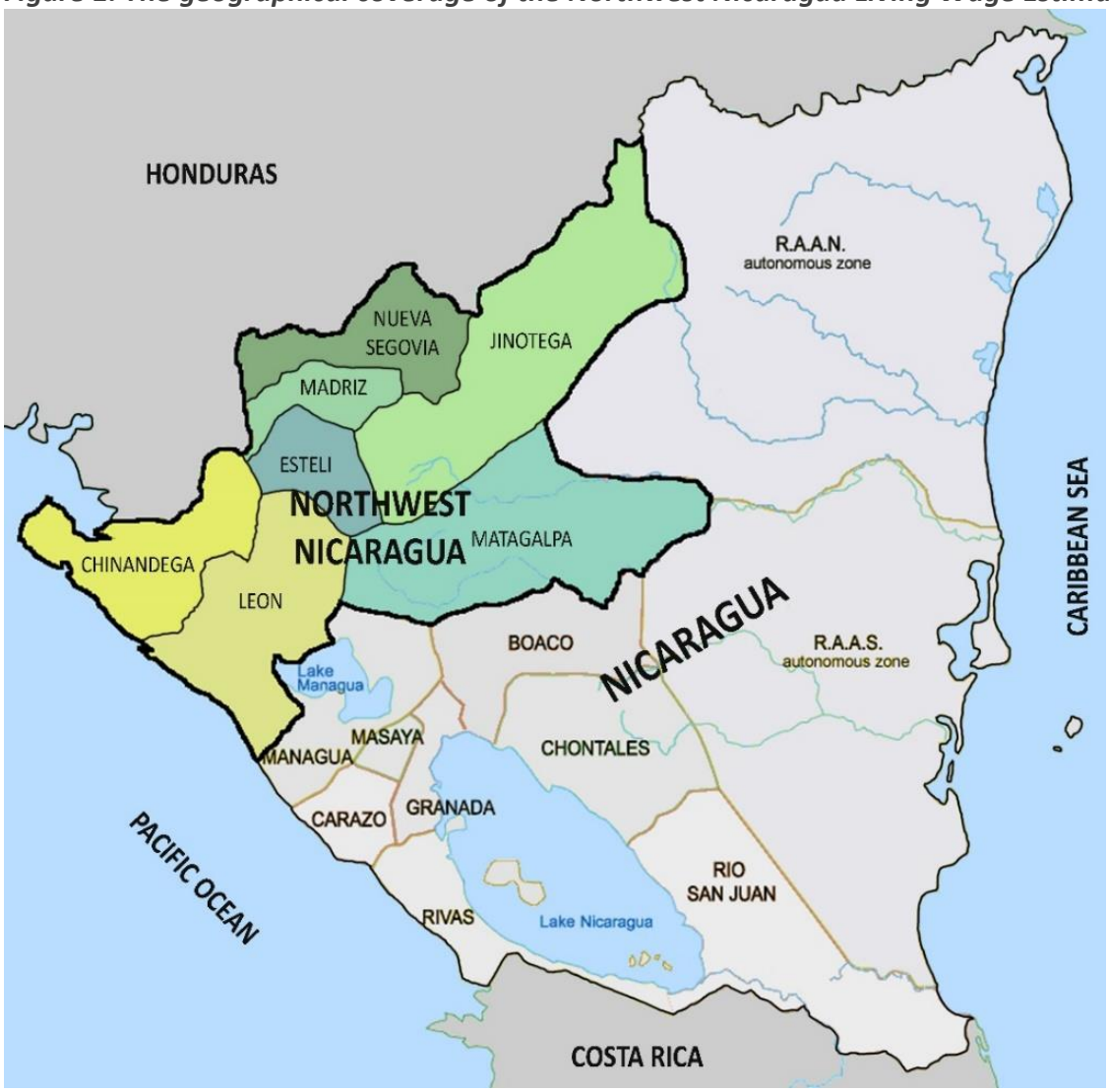
The size of this area is 33,416 km^2 (about the size of Belgium), and the population of about 2.5 million is almost evenly divided between rural and urban areas according to the 2014 household survey carried out by the National Statistical Institute. The division between rural and urban is somewhat arbitrary, though, as people live on a continuum between disperse rural settlements, small villages, bigger villages, small towns, small cities, the outskirts of bigger cities and the center of the bigger cities. The three biggest cities in the region are Matagalpa, Chinandega and Estelí with around 150 thousand inhabitants each.

The region is well-integrated by public transportation, so the rural population typically goes shopping in a nearby town once a week or bi-weekly. It is also common for part of the urban population to work in agricultural establishments, especially during peak harvest season. During the coffee harvest season (October to February), for example, the agricultural labor force temporarily increases about seven-fold [7], and people are brought in from both rural and urban areas as far as 100 km away to satisfy the need for harvest workers. In the banana

[3] CIA World Fact Book – Nicaragua: https://www.cia.gov/library/publications/the-world-factbook/geos/nu.html.
[4] Data from 2016 obtained from the Central Bank of Nicaragua: http://www.bcn.gob.ni/estadisticas/sector_externo/comercio_exterior/exportaciones/index.php
[5] Nicaragua (2012a).
[6] Nicaragua (2012a).
[7] Nicaragua (2012a).

industry, the labor force is much more constant, but also includes a great number of urban workers.

Figure 1: The geographical coverage of the Northwest Nicaragua Living Wage Estimate



Note: *This map is a sketch. National and state borders are approximate only.*

Since most of the agricultural work in Nicaragua is only temporary, workers often have to move or even migrate seasonally. Indeed, if workers were counted as an export product, they would be Nicaragua's biggest export product, by far, as remittances received from workers abroad (USD 1,264 million in 2016)[8] are three times larger than export revenues from

[8] Data on remittances in 2016 obtained from the Central Bank of Nicaragua: http://www.bcn.gob.ni/estadisticas/sector_externo/remesas/index.php.

Nicaragua's main export product, coffee (FOB value in 2016: USD 420 million)[9]. Most emigrants work in neighboring Costa Rica, but most remittances come from workers in the United States (56%), Costa Rica (20%), Spain (10%), Panama (6%) and El Salvador (1%).

4. CONCEPT AND DEFINITION OF A LIVING WAGE

The idea of a living wage is that workers and their families should be able to afford a basic life style considered decent by society at its current level of development, without having to work overtime or migrate to supplement their incomes.

The definition of a Living Wage applied by this study as well as the Global Living Wage Coalition is the following:

> *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 idea of a living wage is neither new, nor radical. Already in 1776 Adam Smith wrote: "No society can surely be flourishing and happy, of which far greater part of the members are poor and miserable. It is equity besides that they who feed, clothe and lodge the whole body of the people should have such a share of the produce of their own labour as to be themselves well fed, clothed and lodged." Franklin D. Roosevelt wrote in 1933 that "Liberty requires opportunity to make a living – a living decent according to the standard of the time, a living which gives men not only enough to live on but something to live for." The International Labour Organization Constitution (1919) states that "Peace and harmony in the world requires provision of an adequate living wage", and the United Nations' Universal Declaration of Human Rights (1948) states that "Everyone who works has the right to just and favourable remuneration ensuring for himself and his family an existence worthy of human dignity."[10]

5. HOW A LIVING WAGE IS ESTIMATED

Figure 2 below gives a broad overview of the Anker methodology used to estimate the living wage. The main steps involved are the following:

- **Determine the size and composition of a typical family in the area of interest**. This is done using official information from the National Statistical Institute. Census data

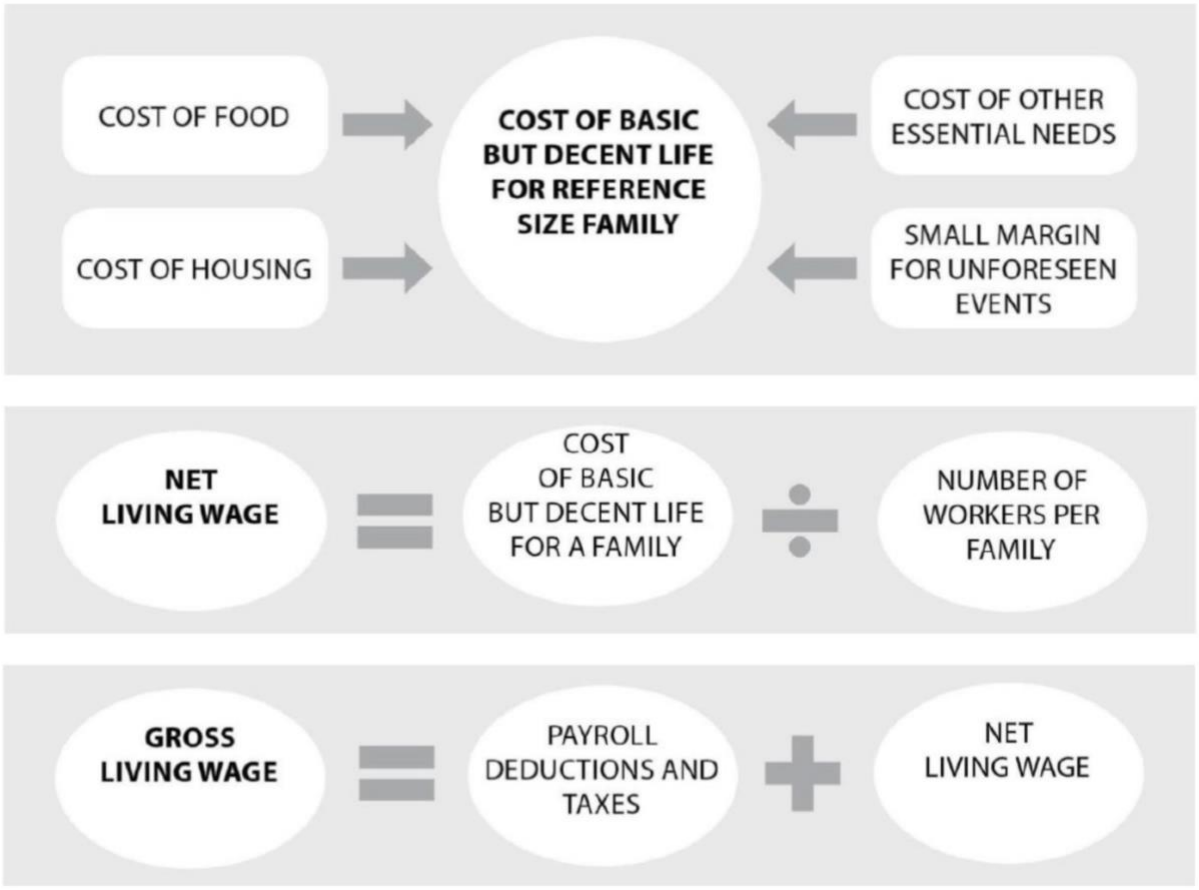
[9] Data on exports in 2016 obtained from the Central Bank of Nicaragua: http://www.bcn.gob.ni/estadisticas/sector_externo/comercio_exterior/exportaciones/index.php

[10] See Anker (2011) for more examples of how historical figures, international bodies, NGOs, governments and others describe the concept of a living wage.

would be ideal, but since the latest census in Nicaragua is from 2005, we instead use more recent household surveys and health surveys.

- **Estimate the costs of a basic but nutritious diet for the reference family**. Since food is usually the main expenditure item for agricultural workers, this step receives the most attention. It involves two main tasks: 1) develop a model diet, which complies with international recommendations concerning nutrition, but which is adapted to local preferences and possibilities, and 2) estimate the costs of this diet, considering local shopping options and local food prices.
- **Estimate the costs of decent housing for the reference family**. Since housing is usually the second biggest expenditure item for families, this step is also a priority. As there is virtually no rental market in our study region, and since people had little idea about the value of their house, rental values for decent housing were estimated using secondary data from the National Statistical Institute, which fortunately was well-suited for the purpose.
- **Estimate the costs of all other essential needs and unforeseen events.** Since food and housing typically consumes perhaps two thirds of family expenditures in low income countries, the remaining expenditures are estimated simply as a mark-up using household expenditure data gathered by the National Statistical Institute.
- **Determine the number of workers per family.** This is a number between one and two, depending mainly on local customs and local employment conditions. The number is calculated from the latest available official household survey.
- **Estimate the Gross Living Wage,** taking into account payroll deductions, taxes, and payments in kind**.** This is done using official information about tax-brackets, as well as samples of payroll information for different types of workers in the coffee and banana industries.

Figure 2: Components of a living wage estimate, moving from the cost of a basic but decent life to net living wage, and moving from net living wage to gross living wage



Source: Anker and Anker (2017).

The subsequent sections provide the details of these estimations for the case of Northwest Nicaragua.

SECTION II

COST OF A BASIC BUT DECENT LIFE FOR A WORKER AND THEIR FAMILY

6. FOOD COSTS

Food costs for a typical family of two adults and two children were estimated by first developing a low-cost, nutritious model diet consistent with local food preferences, and then calculating the costs of this diet using local food price surveys in both rural and urban areas. Finally, we deducted the value of free school meals, to arrive at the average cost of the model diet per person per day.

The estimated cost of the model diet was C$ 44.15 (USD 1.45) per person per day in Northwest Nicaragua. This implies **C$ 5,372 (USD 177) per month per family**. Details on how these estimates were arrived at are provided below.

6.1 General principles of model diet

A model diet developed according to the Anker methodology should meet WHO/FAO recommendations on nutrition in the most economical way possible, while at the same time being palatable and consistent with local food preferences and possibilities.

Specifically, according to Anker and Anker (2017), a model diet for a lower middle-income country should fulfill the following:

- The number of calories in the model diet needs to be sufficient to cover the energy needs of the family members
- At least 10% of calories must come from proteins
- Some dairy (which is rich in calcium and high quality protein) should be included in the diet
- 15‑30% of calories must come from fats
- 55‑75% of calories must come from carbohydrates.
- 325 grams of vegetables and fruits per day must be included in the model diet to help provide micronutrients and minerals.
- Maximum 30 grams of sugar per person per day.
- About 30 grams of oil per person per day.

6.2 Model diet

The basic diet of agricultural workers in Nicaragua consists of rice, beans and corn tortillas. This is eaten for breakfast, lunch and dinner, and provides the basis for an energy rich diet. In the morning and in the evening, it is usually accompanied by a cup of coffee with sugar, while for lunch workers are typically served a fruit-based drink.

This basic daily diet is complemented with what is called "improvements", such as an egg, a piece of cheese, fried plantains, or a piece of chicken. Sometimes the tortilla might by substituted by a slice of bread or pasta. Workers rarely eat meat. The ones who get beef once a week consider themselves lucky. The current observed diet among agricultural workers is thus quite austere. While it provides enough energy to carry out vigorous agricultural work, it lacks micro-nutrients and variety, which is an important reason for the high levels of stunting observed in Nicaragua[11].

The model diet used to estimate the living wage is a bit more generous in order to comply with WHO/FAO nutritional standards. It was developed through an iterative process, facilitated by the Excel calorie requirement and model diet programs that form part of the Anker methodology and which are available on the Edward Elgar website[12].

We started by calculating the average daily calorie requirement per person in our model family of four persons, which turned out to be 2,365 calories per person per day. This was found using the Schofield equations (Schofield, 1985) together with the following assumptions: The average height for adult men in Nicaragua is 1.667 meters and for women it is 1.544 meters[13]. One adult is assumed to have a vigorous Physical Activity Level (PAL), due to strenuous farm work, while the other adult/spouse and the children are assumed to have a moderate PALs.

To choose the main food items that provide these calories, we started with the Basic Food Basket agreed by the National Minimum Wage Commission in 2007, and which is still used to track inflation and poverty. The Basic Food Basket contains 23 food items, their quantities purchased per month for a family of six, and the prices in the original purchasing units. We converted this information into quantity purchased per month per person, grams purchased per day per person, and price per kg (see Table 1). These conversions make it easy to input the information into the Anker methodology Model Diet spreadsheet. The last column of Table 1 shows the percentage distribution of total food expenditure for the Basic Food Basket

[11] According to the latest Demographic and Health Survey (2011/12), the share of 0 to 5-year-old children who are stunted varies between 11.0% in León and 29.5% in Madriz (INIDE & MINSA, 2013).
[12] https://www.elgaronline.com/view/9781786431455/9781786431455.xml.
[13] NCD Risk Factor Collaboration (2016) "A century of trends in adult human height" eLife 2016;5:e13410 DOI: 10.7554/eLife.13410 cited in this Nicaraguan newspaper article: http://www.elnuevodiario.com.ni/actualidad/399307-nicaraguenses-mas-bajos-region/.

across the different items. Tortillas is the biggest item, taking up 10.5% of total food expenditure in the Basic Food Basket. This is followed by milk, taking up 9.8%.

Table 1: Food items in the Basic Food Basket of Nicaragua

Food item	Quantity purchased per month per person (a)	Grams purchased per day per person	Price per kg (Córdobas, June 2017)	Percentage of total food expenditure (%)
Rice	6.33 pounds	96	27.60	5.6
Beans	5.67 pounds	86	32.83	6.0
Sugar	5.00 pounds	76	23.94	3.9
Vegetable oil (b)	1.17 liters	19	86.24	3.0
Cow's meat	1.33 pounds	20	186.18	8.0
Pork meat	0.83 pounds	13	142.97	3.8
Chicken meat	1.33 pounds	20	87.85	3.8
Fish	1.50 pounds	23	170.46	8.2
Milk	5.00 liters	76	60.54	9.8
Eggs (c)	14 eggs	23	78.30	3.9
Cheese	1.50 pounds	23	115.28	5.6
Tortillas	9.50 pounds	144	34.46	10.5
Pinolillo (a corn and cocoa powder mix used for hot drinks)	1.67 pounds	25	60.03	3.2
Pasta	0.83 pounds	13	56.22	1.5
Bread	4.50 pounds	68	42.51	6.2
Tomatoes	2.33 pounds	35	33.42	2.5

Food item	Quantity purchased per month per person (a)	Grams purchased per day per person	Price per kg (Córdobas, June 2017)	Percentage of total food expenditure (%)
Onions	1.33 pounds	20	72.07	3.1
Potatoes	2.50 pounds	38	27.18	2.2
Pumpkin	5.33 pounds	81	14.11	2.4
Bell peppers	0.50 pounds	8	70.61	1.1
Plantains	2.67 pounds	40	15.79	1.4
Oranges	7.67 pounds	116	16.18	4.0
Cabbage	0.33 pounds	5	23.61	0.3

Notes: (a) The quantities purchased in the original document was expressed for a family of 6 persons, so we divided the quantities purchased by 6. (b) Oil is assumed to weigh 0.93 kilos per litre. (c) An egg is assumed to weigh 50 grams.
Source: *INIDE, Canasta Básica, June 2017.*

We inserted this information into the Model Diet Spreadsheet, which converted purchased grams into edible grams. The spreadsheet also scaled up all quantities, so that total calories met the 2,365 calories per person per day target calculated initially.

This Basic Food Basket diet is nutritionally rich, but it violates some of the WHO/FAO nutritional guidelines. The main problem with the diet is too much sugar. Sugar is cheap and has an extremely high caloric content, but the 76 grams per person per day in the Basic Food Basket is almost three times more than the recommended maximum amount (24-30 grams). The diet easily covers the requirements for all the different kinds on protein, but it is short on Calcium and Potassium[14].

In order to change some sugar calories to products that are high in the lacking micro-nutrients, we cut sugar to the maximum amount recommended by WHO (30 grams per person per day) and instead included:

- An extra slice of cheese per week for Calcium and energy.

[14] According to the nutrient tracking program at https://cronometer.com/.

- Half a banana per person per day for Potassium and energy.

Since the diet contains plenty of proteins (mainly due to beans and tortillas), we could cut the amount of meat, and in that way save some money. We cut out pork consumption altogether[15], and reduced beef consumption to one serving per week[16]. Since fish is very expensive, we reduced it to one family sharing one can of sardines in tomato sauce per week[17]. Instead we increased the consumption of chicken to three servings per week, as chicken is much cheaper than cow meat and fish, and added an extra egg per week.

We increased the amount of milk to the minimum recommended amount (one cup per child per day), and added an extra slice of cheese to secure sufficient calcium for adults as well.

The final model diet thus looks like this:

- Rice and beans three times a day
- Six corn tortillas per day
- One slice of bread per day
- One banana or orange per day
- Two cups of coffee with sugar per day (for adults)
- One cup of milk per day (for children)
- Five thick slices of cheese per week
- Five eggs per week
- Three servings of plantains (typically fried) per week
- Three servings of potatoes (typically fried) per week
- Three small pieces of chicken per week
- One small piece of beef per week
- One serving of canned sardines per week
- Cabbage three times a week
- 7 teaspoons of sugar per day
- 2 tablespoons of oil per day

[15] According to our quick survey, pork is usually eaten only for Christmas. Many rural families have pigs, but they are used mainly as savings vehicles. They can be sold in case of an emergency, or slaughtered for the Christmas celebrations.
[16] The agricultural workers we interviewed rarely ate beef. The ones who did, considered themselves privileged.
[17] According to our survey, canned sardines is a popular item in rural stores, since fresh fish is usually not available. Although expensive, we include a small amount in the diet in order to provide Omega-3 for brain development.

In this way, there is an "improvement" available for every meal during the week. Some typical Nicaraguan plates are shown in Photo 2.

Photo 2: Typical Nicaraguan meals with Gallo Pinto (rice and beans)

Photo credits: Cosinemosjuntos.com.

Table 2 shows the detailed contents of our model diet, and the average daily cost per person. Section 6.3 below provides details on how rural and urban prices were established and averaged.

To the costs of the 22 main ingredients, we added 2.1% for spices[18], 4% for spoilage, and 11% for variety and season variation[19], following the recommendations of the Anker methodology.

[18] The CPI index for Nicaragua includes eight different types of spices and condiments, which together account for 0.878% of total expenditure. Since food expenditure on average accounted for 41.46% of total expenditure in 2016, it means that spices account for approximately 2.1% of food expenditure.

[19] There is very limited seasonal variation in food prices in Nicaragua. The analysis in section 6.3.1 below of food prices over the last 5 years shows that food prices in September, October and November are not statistically different from the rest of the year. There is also little variety in the diet, but the addition of 11% is recommended by the Anker methodology to allow for typical variation in diets (e.g. other fruits and vegetables, other meats or fish, etc.) as well as special events like Christmas, birthdays, and national holidays which require something extra.

Table 2: The contents and costs of our model diet for Northwest Nicaragua

Food item	Edible grams per person per day	Purchased grams per person per day	Average cost per kg (C$)	Average cost per person per day (C$)
Rice	125	125	27.18	3.41
Tortilla (maize)	300	300	20.94	6.28
Bread (white)	25	25	47.77	1.19
Pasta	15	15	44.95	0.68
Potato	33	44	31.31	1.38
Plantains	30	46	11.02	0.51
Beans, pinto	85	85	24.89	2.12
Milk	122	122	11.33	1.38
Cheese	27	27	86.71	2.31
Egg	36	41	60.60	2.46
Beef	12	15	162.59	2.41
Chicken	36	53	74.03	3.92
Canned sardines	15	15	147.18	2.21
Cabbage	35	44	17.46	0.76
Onion	35	39	34.17	1.33
Tomato	35	38	32.69	1.26
Pumpkin	35	50	23.13	1.16
Orange	35	48	9.50	0.46
Banana	35	47	8.77	0.42
Oil	30	30	41.67	1.25
Sugar	30	30	23.70	0.71
Coffee	7	7	154.32	1.08
Total cost of model diet excluding additional costs indicated below				**38.66**
Percentage added for salt, spices, condiments, and sauces				2.1%
Percentage added for spoilage and waste				4.0%
Percentage added for variety and seasonal price variations				11.0%
Total cost of model diet, including additional costs indicated above				**45.28**

The nutritional summary of this diet is the following:

- 2,365 calories
- 12.2% from proteins
- 24.8% from fats
- 63.0% from carbohydrates
- 325 grams of fruits and vegetables and pulses per day

- 30 grams of sugar per day
- 30 grams of oil per day

It thus complies with all the WHO/FAO nutritional guidelines listed in Section 6.1.

The cost of this model diet (C$45.28 per person per day) coincides almost exactly with the cost of the Basic Food Basket as calculated by the National Statistical Institute for the period September 2016 – August 2017 (C$ 45.84), despite the differences in methodology, family size and geographical coverage.

6.2.1 Deducting the value of free school lunch

Through the Integral Program of School Nutrition (*Programa Integral de Nutrición Escolar* – PINE), the Government of Nicaragua provides free school lunches to pre-school and primary school children in all public schools[20]. The municipalities with the greatest nutritional challenges, the so-called Dry Corridor (*Corredor Seco*) receive extra rations, so that they also can serve school breakfast. These municipalities are all located within the Northwest region of Nicaragua, but do not cover the whole region, so to be on the safe side we will assume only one free school meal per day. The ages almost universally covered by the free school meal are from 5 years to 12 years, and the meal is received 180 days per year.

Following Anker and Anker (2017), we use the following formula to calculate the replacement value of free school lunches:

> *Replacement value of free lunch provided in school = (# years of school during which free lunch is provided ÷ 18 years as a child) × (number of school days in year ÷ 365) × (average value of free lunch for relevant age groups from Excel program)*

According to the Model Diet Worksheet, the average value of lunch for the 5-12 year age group (1 year of pre-school and 6 years of primary school) is C$ 11.80, so the formula works out as follows:

$$Replacement\ value = \frac{7}{18} \times \frac{180}{365} \times C\$\ 11.80 = C\$\ 2.26$$

Since we assume two children in the typical family of four, we will deduct (2 children/4 family members or 0.5) x C$ 2.26 = C$ 1.13 from the cost of the model diet per person per day. The

[20] In reality, the government provides the ingredients (rice, beans, corn, oil, and cereal) and the families take turns preparing lunch for the children.

adjusted daily cost of the model diet is therefore calculated at C$ 44.15 for Northwest Nicaragua.

6.3 Local food prices

The costs of the food items listed in Table 2 were obtained through surveys of urban markets and supermarkets in the cities of Jinotega, Matagalpa, Estelí, and Chinandega, as well as small rural shops in Jinotega, Matagalpa, Estelí, Nueva Segovia and Chinandega. In addition, we carried out a special survey to understand the shopping patterns of rural households. Conducting a special survey was necessary, because the food prices collected every month by the National Statistical Institute only refer to the Managua metropolitan area, which cannot be expected to be representative for the more rural Northwest Nicaragua. Our surveys were carried out during September, October and November of 2017.

Workers at the big farms have the option of buying their groceries directly from the on-farm store and have the expenses deducted from their next pay-check. This is obviously very convenient, and some farm owners even sell the products at cost, thus providing their workers access to products at competitive urban prices. More commonly, though, farm owners make a business out of the on-farm store and sell products at a premium (the same price as the nearby rural stores). As part of our price survey, we obtained the buying and selling records of the on-farm store of one of the biggest coffee-producers in Nicaragua for three weeks during September 2017. This was very useful for establishing commonly bought goods, as well as buying prices (urban prices) and selling prices (rural prices).

The initial list of items that were costed was based on the items in the Basic Food Basket (Table 1), but we added other items that we observed that people bought frequently. For example, we asked in the on-farm shops what were the most popular food items, and thus decided to include canned sardines in tomato sauce in the model diet, instead of the fresh or frozen fish in the Basic Food Basket, as the latter was not a realistic option for agricultural workers.

Establishing costs in urban areas was relatively easy, as markets and supermarkets have all products available, and, due to strong competition, there is little variation in prices between different sellers.

In rural areas, however, it is much more difficult to establish the costs of the different items, both because rural shops do not always carry all items on the list and because rural households do not only shop in rural shops. They typically go shopping in urban areas once a week or twice a month. In addition, they grow their own vegetables and raise their own farm animals.

Prices for rural residents were therefore established as a weighted average of: 1) prices for products bought in rural shops, 2) prices for products bought at urban markets and 3) prices for products produced at home. The weights obviously differ by product, and in order to

establish the approximate proportions for each product, we carried out an additional quick survey of shopping habits among rural people in Estelí and Nueva Segovia. First we established how big a share of each product was typically self-produced (e.g. all, approximately half or none), and then we divided the remaining share into either typically urban or typically rural, giving 2/3 weight to the most dominant, cheaper option, but allowing 1/3 for emergency/impulse shopping.

The weights resulting from this procedure are presented in Table 4. These weights were used together with the price surveys of rural and urban markets (Table 3) to calculate the final prices for rural households.

Table 3: Results of price surveys in rural and urban shopping locations in Northwest Nicaragua

Food item	Median cost per pound in urban shops (C$)	Median cost per pound in rural shops (C$)
Rice	12.00	14.00
Tortilla (maize)	13.50	8.00
Bread (white)	20.50	24.00
Pasta	20.00	22.35
Potato	13.80	15.00
Plantains	6.00	6.00
Beans, pinto	13.00	12.50
Milk	14.00	10.00
Cheese	46.00	45.00
Egg (dozen)	48.71	36.00
Beef	75.00	70.00
Chicken	36.00	40.00
Canned sardines	65.16	74.78
Cabbage	7.50	10.00
Onion	15.00	16.50
Tomato	15.00	14.50
Pumpkin	10.73	10.00
Orange	6.27	3.50
Banana	6.00	2.50
Oil	42.00	40.00
Sugar	10.50	12.00
Coffee	75.00	60.00

Source: *Results of surveys of 22 urban markets and 15 rural shops spread across the departments of Jinotega, Matagalpa, Estelí, Nueva Segovia and Chinandega.*

Table 4: Shopping patterns of rural people in Northwest Nicaragua

Food item	Share bought in rural store	Share bought at urban market	Share produced at home	Price when produced at home (C$/pound)
Rice	33.3%	66.7%	0.0%	-
Tortilla (maize) [a]	0.0%	0.0%	100.0%	5.50
Bread (white)	66.7%	33.3%	0.0%	-
Pasta	33.3%	66.7%	0.0%	-
Potato	66.7%	33.3%	0.0%	-
Plantains	16.7%	33.3%	50.0%	2.00
Beans, pinto	33.3%	16.7%	50.0%	6.50
Milk	33.3%	16.7%	50.0%	6.00
Cheese	33.3%	16.7%	50.0%	20.00
Eggs (dozen)	0.0%	0.0%	100.0%	24.00
Beef	50.0%	50.0%	0.0%	-
Chicken	16.7%	33.3%	50.0%	25.00
Canned sardines	33.3%	66.7%	0.0%	-
Cabbage	33.3%	66.7%	0.0%	-
Onion	66.7%	33.3%	0.0%	-
Tomato	66.7%	33.3%	0.0%	-
Pumpkin	66.7%	33.3%	0.0%	-
Orange	33.3%	16.7%	50.0%	0.25
Banana	33.3%	16.7%	50.0%	0.25
Oil	33.3%	66.7%	0.0%	-
Sugar	33.3%	66.7%	0.0%	-
Coffee	66.7%	33.3%	0.0%	-

Notes: [a] Price indicated is based on the cost of the ingredients.

Source: *Author's elaboration based on a quick survey of shopping habits in the rural parts of Estelí and Nueva Segovia. Respondents lived between 15 and 25 km from an urban market, and most went shopping there once a week. A few only once a month, and the rest twice a month.*

To arrive at the final prices reported in Table 2, we simply averaged prices for rural and urban households, as the population in Northwest Nicaragua is evenly divided between rural and urban areas. It should be pointed out that the model diet is a bit cheaper to secure in rural areas than in urban areas because of home production, but it also requires more work and planning.

Photo 3 shows a few sellers of vegetables, rice and beans at the two main markets in Matagalpa. This is a favorite shopping place for people and businesses in the central highlands of Nicaragua. Photo 4 shows a typical on-farm shop, widely used by coffee workers, because of its convenience and because of the credit provided, but with a very limited supply of fresh food.

Photo 3: The markets in the city of Matagalpa concentrate several hundred sellers, and thus offer great variety and competitive prices

Photo credit: *Lykke E. Andersen.*

Photo 4: The on-farm shop at Finca El Paraiso, in the state of Matagalpa

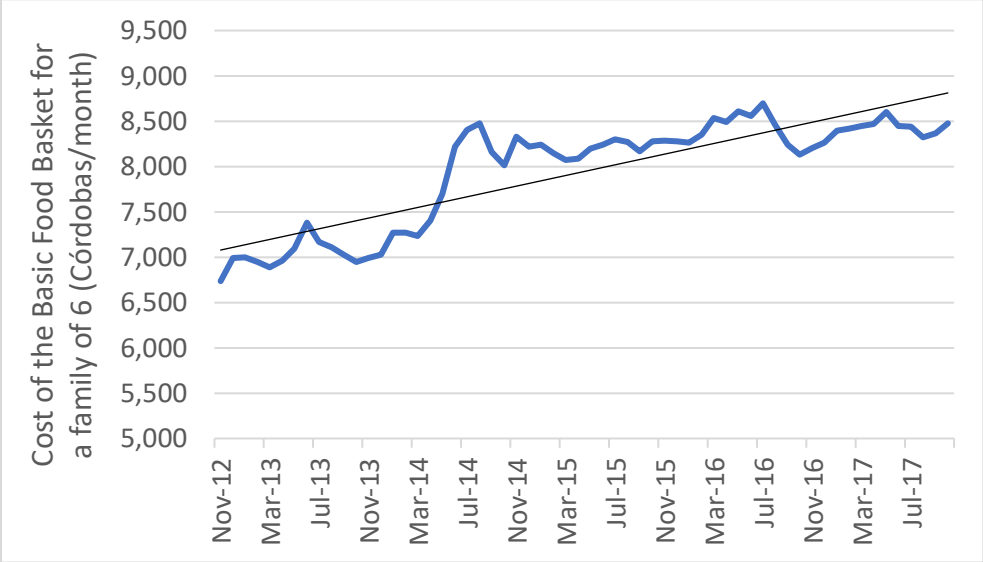
Photo credit: *Lykke E. Andersen.*

6.3.1. Seasonality and food price inflation

Since our food price survey was carried out during the months of September, October and November only, rather than over a whole year, we have to check whether these months are typical of the whole year, or whether there is significant seasonal variation. In order to do that we collected the price of the Basic Food Basket as calculated and published by the National Statistical Institute every month on their homepage (www.inide.gob.ni). We plotted this data for the last 5 years (specifically the 60 months from November 2012 – October 2017, see Figure 3) and conducted a statistical analysis to determine both the trend and the seasonal patterns. The slope indicates average annual food price inflation of 5.3%, but the graph shows that inflation has been substantially lower during the last 3 years. Indeed, the price of the Basic Food Basket in October of 2017 was the same as in August of 2014.

The estimated coefficient for the seasonal dummy[21] for September-October-November was slightly negative (-1.96%), but not statistically significant, so seasonal variation is not a problem that affects our estimation of the living wage.

Figure 3: Evolution of monthly food prices in Nicaragua over the last 5 years



Source: *Authors' elaboration based on data from INIDE.*

[21] A dichotomous variable which takes the value 1 for the months September, October and November, and the value 0 for all other months.

7. HOUSING COSTS

Housing costs for our living wage were estimated by adding together the rental/user costs of a basic acceptable dwelling and the utility costs (water, electricity, cooking fuel, and waste elimination).

We estimated decent housing costs for a family of four in Northwest Nicaragua to be C$ 3,010 per month (equivalent to USD 99 per month), comprised of C$ 2,280 (USD 75) for rental costs and C$ 730 (USD 24) for utilities.

This value is almost double the amount estimated in the Basic Consumption Basket calculated by the National Statistical Institute for August 2017 (C$ 1,578, comprised of C$ 900 for rent, C$ 145 for water, C$ 269 for electricity, and C$ 263 for cooking fuel). The reason for this large difference is that the rental cost included in the Basic Consumption Basket has not been updated since 2007, which means that the value has been eroded by inflation and by now is clearly insufficient to cover the costs of a minimally acceptable dwelling.

Since housing costs is the main item that makes our Living Wage differ from the Minimum Wage, we explain in great detail below how we have arrived at these estimates.

7.1 Standard for basic acceptable local housing

The Living Wage should be sufficient to cover the rental costs of a home that satisfies both minimum international housing standards as well as national standards.

International standards are based around the following principles for adequate housing:

- Durable structure
- Sufficient living space
- Access to safe water
- Access to sanitary toilet and washing facilities
- Adequate lighting
- Adequate ventilation
- Adequate food storage
- Separation from animal quarters
- Protection from cold, damp, heat, rain, wind or other threats to health, structural hazards and disease vectors

As national standards, we use the criteria applied in the Unsatisfied Basic Needs (UBN) methodology used in Nicaragua (INIDE, 2014). Three of the dimensions in the UBN

methodology reflects inadequate housing conditions due to overcrowding, lack of basic services, and inadequate construction materials.

Table 5 below tabulates a series of relevant housing quality variables for Northwest Nicaragua, distinguishing between rural and urban areas, as well as Central highlands and Pacific coast. Only families of 2-7 members are included in the calculations, as this is the sample we consider relevant for the living wage estimate (i.e. we exclude single person households and extended households). The last column explains what is considered adequate according to national standards.

Table 5: Current housing conditions based on the 2014 EMNV household survey

Characteristics	Rural (%)	Urban (%)	Central highlands (%)	Pacific coast (%)	Acceptable standard according to the Nicaragua Unsatisfied Basic Needs methodology
Roof					
Zinc/concrete/tile	98.0	99.2	99.3	97.7	The first category is considered adequate everywhere; thatch only in rural areas.
Thatch	0.7	0.2	0.0	1.1	
Waste/other unaccept.	1.3	0.6	0.7	1.2	
Floor					
Cement/tile/brick	32.1	75.8	47.8	64.0	The first category is considered adequate everywhere; wood only in rural areas.
Wood	0.5	0.5	0.6	0.4	
Earth/other unaccept.	67.4	23.7	51.6	35.6	
Exterior walls					
Cement/stone/brick/adobe	67.7	87.5	76.3	80.1	Only the first category is considered acceptable for all areas. Wood acceptable in rural areas.
Wood	25.4	5.2	19.9	8.1	
Zink	3.0	5.1	2.1	6.9	
Bamboo, etc.	0.9	0.2	0.6	0.5	
Rubble or waste	2.5	1.5	1.1	3.2	

Characteristics	Rural (%)	Urban (%)	Central highlands (%)	Pacific coast (%)	Acceptable standard according to the Nicaragua Unsatisfied Basic Needs methodology
Other unacceptable	0.5	0.6	0.0	1.3	
Lighting source					
Electricity	69.1	98.6	76.9	94.5	The UBN methodology does not include lighting source.
Solar panel	8.1	0.0	5.7	1.5	
Kerosene	8.4	0.1	5.9	1.6	
Other unacceptable	14.4	1.3	11.5	2.4	
Cooking fuel					
Wood	90.6	33.3	70.5	48.1	The UBN methodology in Nicaragua does not consider cooking fuel.
Gas/Propane	8.7	66.1	29.1	50.9	
Coal	0.3	0.2	0.1	0.2	
Electricity	0.3	0.2	0.1	0.5	
Water source					
Piped into dwelling or yard	35.3	90.1	55.6	74.5	The first option is considered acceptable for all areas, but the second only for rural areas.
Public tap/well	39.1	4.9	24.4	17.5	
River, lake, other unacceptable source	25.6	5.0	20.0	8.0	
Toilet facility					
Toilet or latrine	88.0	97.2	91.1	95.0	Any kind of toilet or latrine is acceptable according to the UBN methodology of Nicaragua. Nothing is not acceptable.
Nothing	12.0	2.9	8.9	5.0	
Number of bedrooms					

Characteristics	Rural (%)	Urban (%)	Central highlands (%)	Pacific coast (%)	Acceptable standard according to the Nicaragua Unsatisfied Basic Needs methodology
0	24.8	17.8	17.4	26.6	The UBN methodology does not specify a minimum number of bedrooms, but only the number of persons per bedroom (see next).
1	36.6	23.7	32.8	26.0	
2	28.6	34.9	34.8	27.7	
3	8.7	17.2	11.5	15.2	
4+	1.3	6.4	3.5	4.5	
Number of persons per bedroom					
]0-2]	29.6	50.8	39.4	42.0	According to the UBN methodology in Nicaragua, the household should have no more than 4 people per bedroom in urban areas and no more than 5 in rural areas.
]2-4]	34.9	25.6	34.3	24.2	
]4-5]	5.5	3.1	5.1	3.2	
]5+	30.0	20.5	21.2	30.6	
Consumer durables					
Cell phone (%)	85.6	93.9	89.5	90.4	The UBN methodology does not include these items.
Internet (%)	0.2	3.3	1.9	1.6	
Cable TV (%)	5.7	51.1	28.1	30.4	

Notes: Only the Central highlands and Pacific coast regions are included, and only households with 2-7 members. All calculations in this table are made using the analytical weights provided by the National Statistical Institute (Peso2), to correct for non-proportional sampling of the survey.

Source: *Author's calculations based on the EMNV 2014 survey.*

As can be seen from these tabulations, the main problems related to housing quality are: dirt floors, especially in rural areas (more than half of households in the Central highlands); overcrowded bedrooms (more than 30% of households in the Pacific coast region have more than 5 persons per bedroom); and lack of access to improved water sources (20% of households in the Central highlands collect their water from a river, lake or other unprotected source); and inadequate exterior walls in rural areas (25% have wood walls that as shown below are often inadequate).

In Table 6 we combine national and international minimum standards, in order to develop a specific minimum housing standard for our study area.

Table 6: Housing standard for study area, complying with both international minimum requirements and national standards according to the Unsatisfied Basic Needs methodology

Housing characteristics	International minimum requirements	National standard according to Unsatisfied Basic Needs methodology	Housing standard for study area
Materials			
Walls	Durable material providing protection from elements	Cement/stone/brick/adobe. Wood acceptable in rural areas	Cement/stone/brick/adobe (wood not acceptable because typically poorly joined – see Photo 5)
Roof	Durable material without leaks	Zinc/concrete/tile. Thatch acceptable in rural areas	Durable material without leaks (thatch not acceptable)
Floor	Durable material	Cement/tile/brick. Wood acceptable in rural areas	Durable material (wood can be acceptable if adequate)
Amenities			
Toilet	At least pit latrine with slab	Toilet or latrine	Toilet or latrine
Water	Safe water not far from home (maximum 30 minutes total collection time per day)	Piped water within property for urban areas. Nearby public tap/well acceptable for rural areas	Piped water within property for urban areas. Nearby public tap/well acceptable for rural areas
Electricity	Generally yes, but not required if not common in study area	-	Electricity required because most households in Nicaragua have electricity
Ventilation & Lighting			
Ventilation quality	Good ventilation. Especially important when cooking indoors	-	Good ventilation required when cooking with wood indoor

Housing characteristics	International minimum requirements	National standard according to Unsatisfied Basic Needs methodology	Housing standard for study area
Lighting	Adequate	-	Electric lighting required
Number of windows	Sufficient for adequate lighting and ventilation	-	Sufficient for adequate lighting and ventilation
Living Space			
Number of square meters of living space	≥30 sq m. (increases with economic development)	-	At least 36 sq. m. for a family of four given that Nicaragua is a lower middle income country
Number of rooms	≤ 2 persons per room excluding kitchen and toilet	No more than 4 people per bedroom in urban areas and no more than 5 in rural areas.	≤ 2 persons per room excluding kitchen and toilet. This implies at least 1 bed room and 1 living room for reference family of 4
Kitchen location	If kitchen is inside house, adequate ventilation for cooking needed	-	Good ventilation required when cooking with wood indoor
Condition	In good state of repair	-	In good state of repair
Environment	Not a slum. No site hazards such as: surface water drainage, industrial pollution, danger of landslides, flood zone	-	Not a slum and no obvious site hazards.

Source: *Authors' elaboration.*

Photo 5 shows images of bedrooms and kitchens in four different houses with wooden exterior walls. Due to the large cracks between wood planks, these walls do not provide protection from rain, wind, heat, cold and disease vectors, and are therefore not considered acceptable in our housing standard.

Photo 5: Images of bedrooms and kitchens with wooden exterior walls, rural Northwest Nicaragua

Photo credits: *Lykke E. Andersen.*

In the rural areas of Northwest Nicaragua, toilet and washing facilities are usually separate from the main house. Photo 6 shows some examples. Since the water is cold, most people prefer to wash with a bucket of water and a wash cloth instead of a shower. Notice that this is considered acceptable in our housing standard.

Photo 6: Typical rural latrines and shower stall separate from the main house, rural Northwest Nicaragua

Photo credits: *Lykke E. Andersen.*

Medium and large coffee producers provide on-farm housing, especially during harvest season for workers who arrive from far away. We visited coffee farms before the peak season, so most beds were empty, but the images in Photo 7 give an impression of the living conditions for coffee workers. During harvest season, these dormitories fill up with temporary workers, who spend several months crammed together with up to 50 workers per room. This kind of housing is not considered acceptable (too many people per room), and it

is also not counted as an in-kind benefit in our calculation of salaries, since workers still have to maintain a permanent dwelling in their home area.

Photo 7: Examples of on-farm dormitories, rural Northwest Nicaragua

Photo credits: *Lykke E. Andersen.*

7.2 Rent or user cost for basic acceptable housing

In order to determine the rental/user cost for basic acceptable housing in Northwest Nicaragua, we combined the analysis of the 2014 household survey carried out by the National Statistical Insitute with our own rapid assessments in the field. The official survey covered more than 2,500 single-family dwellings in Northwest Nicaragua, while we visited only about 24 families, so the official data is obviously much more reliable, and is therefore given much more weight in our calculations. In addition, almost all of the households in the official household survey has data either on paid rent (4.1%) or self-assessed rent (95.9%), while we had a hard time extracting a rental value from the families we visited. We finally brought along an ex-employee of the Municipal Government of Condega (a small town in the center of Northwest Nicaragua) to help us establish the rental value of the houses we visited. With his help, we established that decent housing for a family of four could certainly be secured for less than USD 150 per month.

However, it is one thing to observe the presence or absence of a toilet in the official data set, and something else entirely to actually see (and experience) the conditions under which workers typically go about their personal hygiene (see Photo 6). It is one thing to observe wooden exterior walls in the data set, and quite something else to see what that means in reality (see Photo 5). Indoor air pollution caused by wood-fired stoves is widely known to be detrimental for the health of especially women and young children, who spend a lot of time

around the domestic hearth[22]. However, it is considered acceptable by our local housing standard. Indeed, even relatively wealthy households will cook their beans and tortillas on a wood-fired stove, since the resulting food is considered to be tastier (see Photo 1). Still, it is shocking to feel the sting in the eyes when entering such a kitchen.

Given their tight budget constraints, families often face important trade-offs when constructing their house. They can either make a spacious house using cheap materials (e.g. dirt floors, tin roof, and wooden walls covered with newspaper pages), or they can make a smaller house using better materials, but at the cost of cramped living quarters. Several of the brick houses we visited had just one big room, which was divided into bedrooms and living room with no more than sheets of fabric or plastic hung on a line.

With the benefits of the vivid impressions from the fieldwork in Northwest Nicaragua, we still consider the hundred-fold more abundant data collected by the trained survey personnel of the National Statistical Institute to be more reliable. Our strategy for calculating rent for decent housing is therefore to identify the rent of houses that just comply with the minimum requirements for decent housing, but no more, and use this rental value, as reported in the official survey, to estimate the rental costs of decent housing.

From the 2014 household survey, we chose a sub-set of houses for analysis based on the following restrictions:

- Households located in either the central northern highlands or the Pacific coast study areas.
- Households with two to seven members (excluding one-person households and multi-family households).
- Houses with an imputed rent between USD 10 and 150 per month (less than USD 10 is considered very clearly unrealistic for any kind of dwelling, and our field work indicated that USD 150 was very clearly enough for decent housing).

For this sub-sample of 2,142 households, we analyzed compliance with minimum requirements in the following seven dimensions of decent housing (according to the standards explained in Table 5):

- Exterior walls ok
- Roof ok
- Floor ok

[22] WHO (2016) Household air pollution and health. Factsheet No. 292. http://www.who.int/mediacentre/factsheets/fs292/en/

- Water access ok
- Toilet facilities ok
- Electricity ok
- Sufficient rooms (no more than 4 persons per bedroom)

Table 7 shows that we have 2,132 houses in our sample, and that the median rent value for these is USD 38 per month. Almost half of these do comply with the minimum requirements in all seven dimensions analyzed. Median rent for those that comply with seven dimensions is USD 68 per month, while the median rent for houses complying with only six of the seven dimensions is USD 38 per month. The USD 30 established in the Basic Consumption Basket will pay for a house that satisfies only five of the seven dimensions. The dimensions that are not fulfilled at USD 30 are usually a decent floor and sufficient bedrooms.

Table 7: A tabulation of houses in Northwest Nicaragua, compliance with minimum standards, and estimated rent (modest houses with 2-7 inhabitants only)

Number of dimensions of adequate housing fulfilled	Number of houses surveyed in the 2014 EMNV survey[1]	% with exterior walls ok	% with roof ok	% with floor ok	% with water access ok	% with toilet facilities ok	% with electricity ok	% with sufficient bedrooms	Median rent (USD/ month)
1	9	11%	78%	0%	0%	0%	11%	0%	19
2	45	11%	84%	0%	9%	40%	36%	20%	19
3	98	22%	90%	2%	22%	79%	65%	19%	19
4	223	30%	100%	7%	56%	92%	87%	28%	19
5	271	76%	100%	18%	70%	96%	96%	45%	27
6	440	96%	100%	61%	82%	97%	100%	64%	38
7	1045	100%	100%	100%	100%	100%	100%	100%	68
Total	**2132**	**83%**	**99%**	**65%**	**82%**	**95%**	**95%**	**72%**	**38**

Notes: [1] Only including households in the Northwest with 2-7 members and rent between USD 10 and 150 per month.
Source: *Authors' calculations based on data from the 2014 EMNV household survey.*

Only 8% of the 1045 houses that comply with all 7 dimensions of housing quality are located in rural areas. Thus, in order to secure minimally acceptable housing, workers may have to move to an urban area.

Table 7 does not take into account some of the more subjective housing standards, such as the level of lighting and the environmental quality of the area in general, since this information is not available in the official survey. Nor is the size of the dwelling taken into account. According to our own survey of housing in the region, there was a curious shortage of windows in the dwellings. In terms of lighting, this is somewhat compensated for by the big cracks in the wooden walls during daytime (see, for example, Photo 5), but even solid brick houses have few windows, and the ones that are there are often made of wood, rather than glass, thus still leaving the rooms rather gloomy (see Photo 8). Thus, many of the houses complying with the seven dimensions listed in Table 7, do not comply with the international minimum standard of sufficient windows for adequate lighting. The estimated rent of USD 68 should therefore be considered a lower bound for rent for decent housing.

Photo 8: Examples of brick houses with wooden windows, urban Northwest Nicaragua

Photo credits: Lykke E. Andersen.

The quality of the surroundings, on the other hand, is generally good. The region of Northwest Nicaragua is relatively sparsely populated and stunningly beautiful. Still, it is an area inherently exposed to hurricanes, earthquakes and volcanic eruptions, so there is always some latent risk. We visited during tropical storm Nate in October of 2017, and while the water was knee deep in the streets some of the time, the houses we visited were dry and safe.

In terms of the size of houses, this is not reported in the EMNV 2014 survey, but during our field work we found that houses were usually of acceptable size (at least 6 x 6 meters for a family of four). As long as the number of bedrooms is sufficient, the size of the house is usually also sufficient.

The current level of rental cost in the Basic Consumption Basket established by the National Minimum Wage Commission is C$900, corresponding to roughly USD 30 per family per month. The rental cost in Córdobas has stayed constant at C$900 since it was introduced ten years ago (in September of 2007), but since the exchange rate at that time was 18.63 NIO/USD, rather than the current 30.40 NIO/USD, it meant a rent of about USD 48 per month per family at the time when the level was originally decided. The rent in the Basic Consumption Basket has thus not been keeping up with inflation, and must by now be considered much too low.

For the purpose of our Living Wage estimate, we chose the median rent in 2014 for non-luxurious houses with 2-7 inhabitants in Northwest Nicaragua that complied with the seven basic dimensions of decent housing (see Table 7), and added 10% to improve the window situation and allow for modest inflation between 2014 and 2017. **The rental cost of decent housing for our model family is therefore set at USD 75 (C$ 2,280) per month.**

7.3 Utilities and other housing costs

We estimated the cost of utilities (water, electricity, cooking fuel and waste collection) in a similar way, using the same samples of modest 2-7 person households in Northwest Nicaragua in the 2014 EMNV household survey. Table 8 shows the median costs for each utility for the full sub-group, as well as for the sub-sub-group that complies with decent housing in all the seven dimensions listed in Table 7. Presumably the latter reflect the costs for a family that can afford decent housing (i.e. earns a Living Wage).

For our Living Wage estimate we will use the estimate of USD 24 per month per family (equivalent to C$730 in October 2017) as the costs of utilities associated with decent housing.

Table 8: Median monthly expenses for water, electricity, gas, and firewood, for houses in rural and urban Northwest Nicaragua (modest houses with 2-7 inhabitants only), 2014

Sub-group analyzed	Number of houses surveyed in the 2014 EMNV survey[1]	Cost of water (C$/ month)	Cost of electricity (C$/ month)	Cost of cooking fuel (C$/ month)	Cost of waste collection (C$/ month)	Total utility costs per family per month[2]
All households in Northwest Nicaragua with 2-7 members, with rent between USD 10 and 150/month	2132	85	130	290	0	C$ 505 (USD 19)
Only households that comply with the seven dimension of decent housing listed in Table 7	1045	110	200	300	10	C$ 620 **(USD 24)**

Notes: [1] Only including households in the Northwest with 2-7 members and rent between USD 10 and 150 per month. [2] The exchange rate applied for October 2014 was 26.33 NIO/USD.
Source: Authors' calculations based on data from the 2014 EMNV household survey.

8. NON-FOOD AND NON-HOUSING COSTS (NFNH)

While food and housing account for the main part of expenditures for a typical worker household on a living wage, there are other essential expenses that should be allowed for as well. Health and education are considered human rights, and people also need to spend money on clothing, personal hygiene, transportation, communications, and certain durable goods.

While food and housing costs are estimated based on normative standards for a nutritious diet and healthy housing standards, non-food and non-housing (NFNH) costs are estimated as a mark-up based on an estimated ratio of NFNH costs to food costs according to secondary data.

A four-step approach was used to estimate NFNH costs for the living wage. First, we used household survey expenditure tabulations calculated by the National Statistical Institute for 2014, for different income levels (INIDE, 2016b). In Step 2, we adjust some of the expenditure categories in order to be consistent with the Anker methodology (Anker and Anker, 2017). This basically means excluding expenses considered unnecessary for a living wage (e.g. tobacco and lottery tickets), while moving restaurant expenditures and alcoholic beverages out of food and into the NFNH category because they are not included in our model diet. In Step 3 we calculate the NFNH costs for our living wage by multiplying the adjusted NFNH to Food expenditure ratio by the cost of the living wage model diet. Step 4 of the Anker

methodology requires a rapid post check for health care and education, to ensure that sufficient funds are available for these crucial items. Fortunately, in Nicaragua, both health care and education are publicly provided and largely free, so no adjustments were needed.

In summary, we find the NFNH costs for the Northwest Nicaragua Living Wage to be 66% of food costs. Since food costs were estimated at C$5,372 (USD 177) per month per family, this means that **NFNH costs amount to C$3,545 ($117) per month per family**.

The remainder of the section provides details on how these estimates were arrived at.

8.1. Step 1 of the NFNH calculations

Table 9 shows that food and housing are the main two expenditure items for households in Nicaragua, across the entire income spectrum (Quintile 1 corresponds to the poorest 20% of households and Quintile 5 to the richest 20%). However, food takes up a much larger share of total consumption in the poorest quintile (58.4%) than in the richest quintile (31.6%). In contrast the richest quintile spends a lot more on housing (32.8%) than the poorest quintile (19.3%).

These systematic variations imply that the ratio of NFNH costs to food costs vary by quintile. The poorest quintile has a ratio of only 0.38, implying that their expenditure on NFNH items correspond to 38% of their food expenditures. In contrast, for the richest quintile the expenditure on NFNH items correspond to 113% of food costs.

For the Living Wage estimate we should use the ratio for families that have achieved a decent, but frugal standard of life. This means that we should not use the ratio found for extremely poor or poor people. The official poverty rate in Nicaragua in 2014 was 29.6%, so about half the households in the second quintile are considered poor. The third quintile is the first quintile that has no poor households in it, so this column provides a good point of departure for our Living Wage estimate. The last two quintiles mainly correspond to the wealthier population in the capital city of Managua (which concentrates about a quarter of the country's population), so these are not relevant for our Living Wage estimate.

Table 9: Structure of household expenditures, 2014, by consumption quintile

Major expenditure group	Quintile					Total
	1	2	3	4	5	
Total consumption (C$/person/year)	10,772	17,273	24,279	34,176	71,862	31,674
Composition of consumption (%)						
Food	58.4	55.2	51.7	46.4	31.6	42.3

Housing	19.3	19.9	21.2	23.9	32.8	26.7
- Rental cost	11.9	11.7	12.9	15.0	23.0	17.7
- Water, electricity, gas, etc.	7.4	8.2	8.3	8.9	9.8	9.0
Health	4.7	4.6	5.3	5.9	5.4	5.3
Education	4.0	4.8	4.8	5.4	4.9	4.9
Transportation	2.0	3.5	4.1	4.7	7.2	5.4
Personal expenses	10.2	9.9	10.0	10.1	10.7	10.4
Use of durable goods	1.4	2.1	2.8	3.6	7.4	4.9
Other	0.0	0.0	0.0	0.	0.1	0.0
NFNH expenditure/food expenditure						
NFNH/food	0.38	0.45	0.52	0.64	1.13	0.73

Notes: Food includes alcohol, tobacco, and meals away from home in INIDE/EMNV expenditure data.
Source: INIDE/EMNV 2014. Estimates cover all of Nicaragua and all types of households.

8.2. Step 2 of the NFNH calculations

Some adjustments to these expenditure patterns are needed in order to comply with the Anker Living Wage methodology. To make these adjustments, we use the information contained in the weights of the Nicaraguan Consumer Price Index (Banco Central de Nicaragua, 2010). The CPI contains expenditure weights for 298 different products and services, which makes it possible to single out the items that are not considered necessary (cigarettes, lottery tickets, and a private car), as well as items that should be moved from one category to another (alcohol and the service and profit part of food eaten out should be moved from the food category to the NFNH category).

Unfortunately, the weights of the currently used CPI are a bit old (2006), and they represent only urban areas, but it is the only information we have available.

The first adjustment is to remove cigarettes from consumption altogether, as it is neither necessary, nor desirable. According to the CPI, cigarettes account for 0.432% of average total expenditures. Applying this share to the total per capita consumption of C$ 24,279 (3rd quintile), we find that people spend an average of C$ 105 per year on cigarettes (about USD 4 per year per person). This is a small amount. Thus, the adjustment is small and of little consequence, but we will move 0.4% from the Food category to the Eliminated category.

The second adjustment is to remove the expenditure on lottery tickets, which is also not considered necessary. According to the CPI, the expenditure on lottery tickets is slightly higher than cigarettes at 0.585%. We will make the adjustment by moving 0.6% from the Personal expenses category to the Eliminated category.

The most important adjustment is to move alcohol, and the service and profit part of food eaten away from home from the food category to the NFNH category. We do this because these expenses are not part of the model diet developed in Section 6, but neither do we want to be petty and moralistic and rule them out altogether. As American President Franklin D. Roosevelt (1944) said, 'Liberty requires opportunity to make a living – a living decent according to the standard of the time, a living that give man not only enough to live by, but something to live for.'

According to the CPI, rum and beer account for 0.448% of total expenditure (more than cigarettes, but less than lottery tickets). This is a very modest level (USD 4 per year) which we feel should be allowed in the NFNH category. Thus, we transfer 0.5% from the Food category to the NFNH category "Other".

More important is the share spent on take-away food and meals and drinks consumed outside the house. According to the CPI, this amounts to 9.370% of total expenses. Some of this expenditure is indeed food, but part is composed of services (such as cooking, washing dishes, serving) and other costs (such as rent and electricity) and profit. According to Anker and Anker (2017), the food share constitutes about 50% of the costs of meals away from home in neighboring Costa Rica, and we will adopt this share for our calculations. This means that 4.7% should be deducted from the Food category and transferred to the NFNH category "Other".

The final adjustment we will make is for private vehicle ownership, which is not considered necessary for decency. In the CPI, 5.113% of expenditures are dedicated to private transportation, while only 3.815% are spent on public transportation. If we apply this percentage distribution between private and public transport (57.2% for private and 42.3% for public) to the 4.1% for transport for third quintile, we get 2.3% for private and 1.8% for public transport. Following Anker and Anker (2017) we will assume that the people could save about 50% by switching from a private vehicle to public transportation. This means that we will transfer 1.2% from transportation to the eliminated category "Excess private vehicle costs".

It is worth mentioning that medium and large coffee and banana farms typically provide transportation for their workers, so expenditure on transportation is generally low for our population of interest, and this is also reflected in the low expenditure shares dedicated to transportation in Table 10.

Table 10: Adjusted structure of household expenditures (third quintile), 2014

Major expenditure group	
Composition of consumption (%)	
Food	46.1
Housing - Rental cost - Water, electricity, gas, etc.	21.2 12.9 8.3
Health	5.3
Education	4.8
Transportation	2.9
Personal expenses	9.4
Use of durable goods	2.8
Other (including alcohol, services & profit of meals away from home)	5.2
Eliminated expenditures (%)	
Cigarettes	0.4
Lottery tickets	0.6
Excess cost of private vehicle compared to public transport)	1.2
NFNH expenditure/food expenditure	
NFNH/food	0.66

Source: Authors' adjustment to the original calculations by INIDE/EMNV 2014 for the third quintile of the household expenditure.

8.3. Step 3 of the NFNH calculations

In summary, we find the preliminary estimate of NFNH costs for the Northwest Nicaragua Living Wage to be 66% of food costs. Since food costs were estimated at C$5,372 (USD 177) per month per family, this means that NFNH costs amount to C$3,545 (USD 117) per month per family.

9. POST CHECKS OF NON-FOOD AND NON-HOUSING COSTS

According to Table 10, health and education together account for about 10% of household expenditure, despite the fact that both are supposed to be publicly provided for free in Nicaragua. The purpose of this section (Step 4 of the NFNH calculations) is to verify that this spending is indeed enough to secure decent health care and education services.

9.1 Health care post check

Nicaragua has made rapid progress in terms of health during the last five decades, and is now doing considerably better than the World average in terms of life expectancy at birth (75.0 years for Nicaragua versus 71.9 years for the World), infant mortality (1.68% for Nicaragua versus 3.05% for the World), and maternal mortality rate (150 per 100,000 live births in Nicaragua versus 216 for the World)[23].

According to the latest Demographic and Health Survey (2011/12), the most common illnesses for young children are respiratory infections, fever, and diarrhea[24]. For men, the main health problems are caused by violence and road injuries[25]. For women, the main health problems are very varied. The biggest include back pain, depression, migraine, iron-deficiency anemia and diabetes[26]. The latter two problems stress the importance of assuring a better diet, lower in sugar and higher in Iron.

According to the same source, 32.7% of men and 38.9% of women in Nicaragua had health problems during the 30 days prior to the survey[27]. 46.0% of the sick men and 52.6% of the sick women consulted a health care provider for their problem. This means that, on average a man visits a health care provider 1.8 times per year, while women visit a health care provider 2.5 times per year. Young children (0 to 5 years old), on the other hand, get taken to the doctor on average 16.2 times per year.[28] That suggests very easy access to public health care.

In addition to the short visits to a health care provider, 5.0% of men and 8.4% of women

[23] World Bank World Development Indicators. Latest year available.

[24] 2011/12 DHS Report, Table 27.

[25] https://vizhub.healthdata.org/gbd-compare/.

[26] https://vizhub.healthdata.org/gbd-compare/.

[27] 2011/12 DHS Report for Nicaragua, Table 52.

[28] According to the 2011/12 DHS Report, Table 27, 62.3% of all children younger than 5 were taken to the doctor during the two weeks prior to the survey.

were admitted to a hospital or clinic during the year prior to the survey.

According to the 2014 EMNV household survey, virtually all hospitalizations were free for the patients, while people are more likely to pay for minor problems, which can be solved at a pharmacy. Consultations with a doctor are also usually free of charge, whereas medicines are free only half the time.

This situation was confirmed by our field work. When asked about costs related to the birth of their youngest child, mothers usually reported that it was completely free of change. Only one young father reported that the birth of his first-born child was very expensive - C$4000 (USD 133) - but after a little bit of digging, it turned out those expenses were mainly for the taxi to the city in the middle of the night and for housing and feeding the mother-in-law, whose presence the wife insisted upon.

Generally, people reported that health care was free, but that sometimes they had to pay for medicine, if it was not available at the public health care center. Large employers, both in the coffee and the banana industry, had on-farm health facilities, so that workers didn't even have to go to the nearest public health care facility.

Given the generally good results of the free public health care system in Nicaragua, we concluded that there was no need to modify the health care expenditures calculated by the National Statistical Institute.

9.2 Education post check

In contrast to the relatively good results of the public health system in Nicaragua, the public education system shows considerable weaknesses. Even the data on key education indicators in Nicaragua are scarce (no data since 2010 in the World Bank's World Development Indicators).

While enrollment rates have increased considerably between 2000 and 2010 at all levels, and public spending on education has increased substantially, permitting more (and slightly better educated) teachers per student (see Table 11), the quality of education is still very low. Nicaragua participated in UNESCO's Third Regional Comparative and Evaluative Study (TERCE) of standardized testing in 2013, and came out with reading, math and science skills for 3rd graders and 6th graders near the bottom of the region (number 13 out of 15 participating countries) (FUNIDES, 2017a).

Table 11: Evolution of key education indicators for Nicaragua, 2000-2010

	2000	2010
Pre-school (3 years)		
School enrollment, preprimary (% gross)	31.1	58.3
- Female	31.8	59.2
- Male	30.5	57.4
Pupil-teacher ratio, preprimary	26.0	21.2
Primary (6 years)		
Adjusted net enrollment rate, primary (% of primary school age children)	85.9	98.4
- Female	87.3	99.7
- Male	84.6	97.2
Pupil-teacher ratio, primary	35.7	30.2
Secondary (5 years)		
School enrollment, secondary (% net)	35.0	48.9
- Female	38.2	53.0
- Male	31.9	45.1
Pupil-teacher ratio, secondary	32.0	30.8
School enrollment, secondary, private (% of total secondary)	30.5	21.8
Trained teachers in secondary education (% of total teachers)	44.6	52.6
Public education expenditure		
Government expenditure on education, total (% of GDP)	3.0	4.5
Government expenditure on education, total (% of government expenditure)	14.6	22.8

Source: World Bank World Development Indicators.

The study by FUNIDES (2017a) reports substantial differences in student performance between public and private schools. Still, the share of secondary level students who attend private school has been falling from 30.5% in 2000 to 21.8% in 2010 (see Table 11). In Northwest Nicaragua in particular, attending private school is rare. According to the 2014 EMNV household survey, only 11.9% of 5 to 17-year-old children attended private school in our region of study. Thus, we will not consider private school necessary for decency.

All the agricultural workers we interviewed indicated that education for their children was free of any charges. School uniforms are not used, and school books are provided for free. Many Nicaraguan schools participate in the international One Laptop per Child program, and we met several coffee worker children who had their own XO computer (in total, 25,000 such computers have been distributed in Nicaragua). Children attending public school in Northwest Nicaragua are provided with either one or two free school meals every day.

Photo 9: School children at the Siles Plantation in Jinotega with XO laptop from the One Laptop per Child program

Photo credit: Lykke E. Andersen

Given that the Anker and Anker (2017) methodology does not permit downward adjustment of education expenditure, we will maintain the education expenditure information carefully estimated by the National Statistical Institute (see Table 10).

10. PROVISION FOR UNEXPECTED EVENTS TO ENSURE SUSTAINABILITY

Unforeseen events and expenses can quickly throw workers living at a basic life style into poverty and debt from which it is difficult to recover. For this reason, it is common when estimating a living wage to add a small margin above the cost of the basic quality life allowed for by a living wage. Without such a margin, a living wage is not sustainable (Anker and Anker, 2017).

Northwest Nicaragua is a region unusually exposed to natural hazards, such as earthquakes, volcanic eruptions and hurricanes. Still, insurance is almost non-existing, so households have to be able to withstand and recover from such events. Also, since most agricultural work is

temporary, there is a risk of not finding work every single week of the year, so workers need a cushion while searching for the next job.

The Anker and Anker (2017) methodology recommends adding 5% to the costs of living in order to cover unexpected events. Using this recommended value, we add **C$ 596 (USD 20) per month per family to cover unexpected events and discretionary spending.**

SECTION III

LIVING WAGE FOR WORKERS

11. FAMILY SIZE NEEDING TO BE SUPPORTED BY LIVING WAGE

The living wage is a family concept, and, for decency, a living wage should be sufficient to support a family in the location where they work. The larger the size of the family, the larger a Living Wage would be needed to support it (Anker and Anker 2017).

In this report we have chosen a **reference family size of four (two adults and two children).** This choice is based on four pieces of information. First, four is the minimum nuclear family size required to sustain a population over time, and it is also the minimum reference family size permitted by the Anker methodology (Anker and Anker 2017). Second, according to the latest Nicaraguan household survey (2014), four is the most common family size in Northwestern Nicaragua, both in the Central Highlands and in the Coastal region, and both in rural and urban areas.

Third, once we exclude one-person households (which are not relevant for the Living Wage, which is a family concept) and large households with more than seven members (which are probably extended families), we find an average household size for our region of 4.13 persons[29]. The average size the same in both the Central Highlands (4.12) and the Coastal region (4.13), but slightly higher in rural areas (4.20) than in urban areas (4.06).

Fourth, a reference size family of four is also supported by the fact that the Total Fertility Rate in Nicaragua is 2.2 births per woman[30]. A small share (2.2%) of these children die before they turn five[31], and not all of them will live at home at the same time, so a reference family of two children under 18 living at home with their parents is a good assumption.

12. NUMBER OF FULL-TIME EQUIVALENT WORKERS IN FAMILY PROVIDING SUPPORT

Since the living wage is a family concept, there may be more than one income earner in the family, and the costs of a decent living standard would be shared by these workers. The larger the number of full-time equivalent workers in the family, the smaller the required living wage.

In our reference family of two adults and two children, we assume that one adult in the family works full-time, that the spouse works part-time, and that none of the children work. Children

29 The EMNV 2014 divides all Nicaraguan households into four regions. Our calculations refer to the households located in the Central and Pacific regions, and excludes those from the Managua metropolitan region and the Atlantic region.
30 According to the World Bank's World Development Indicators for 2015.
31 According to the World Bank's World Development Indicators for 2015.

below the age of 18 are assumed to be in school, and a living wage should be sufficient to avoid child labor.

According to the Anker & Anker (2017) methodology, we assume that one of the adults works full-time, such as on a certified coffee or banana farm. In Nicaragua, workers normally work 8 hours per day, 6 days per week, which means that a standard work week is 48 hours.

The other adult in the household is assumed to work the average number of work hours observed for men and women of prime working age (25-59 years old) living in 2-7 person households in Northwest Nicaragua, which according to the 2014 household survey was 29.7 hours per week[32] (see Table 12 below). This average includes people who are temporarily unemployed (remember that most agricultural work in Nicaragua is seasonal), on unpaid sick leave, on unpaid vacation, studying, uninterested in working for whatever reason (such as for family care, child care, or household work), or otherwise unable to work at the time of the survey.

Given this information, the number of full-time equivalent workers per family in Northwest Nicaragua can be calculated as:

$$1 + \frac{29.7}{48} = 1.62$$

Table 12: Average work hours per week for people of prime working age (25-59 years) in Northwest Nicaragua and implied number of full-time equivalent workers per family

Area	Average hours per week worked by 25-59 year old men and women in 2-7 person households in Northwest Nicaragua			Implied number of full-time equivalent workers per family
	Men	***Women***	***Average***	
Northwest Nicaragua	**39.3**	**20.0**	**29.7**	**1.62**
- Rural	40.3	12.9	26.6	1.55
- Urban	38.2	25.9	32.1	1.67

Notes: The hours worked is the sum of "usual" hours worked in the primary occupation and in the secondary
occupation. The question asked in the survey is: "How many hours per week do you usually work in this occupation?". Only the Central highlands and Pacific coast regions are included, and only households with 2-7 members. All calculations in this table are made using the analytical weights provided by the National Statistical Institute (Peso2), to correct for non-proportional sampling of the survey.

Source: Authors' calculations based on the EMNV 2014 survey.

[32] Sum of hours normally worked in primary and secondary occupations. Overtime work (more than 48 hours per week) was eliminated, so as to be consistent with the Anker & Anker (2017) living wage methodology, which assumes that a living wage should be earned within normal working hours, without the need for overtime.

As can be seen in Table 12, work hours tend to be higher in urban areas than in rural areas, mainly because women are more likely to find paid work in urban areas than in rural areas. This implies that the number of full-time equivalent workers is a bit lower in rural areas (1.55) compared to urban areas (1.67).

Since food costs also tend to be lower in rural areas (due to more auto-production of food), this partially off-sets the lower number of full-time equivalent workers and so its effect on rural and urban living wage estimates.

13. TAKE HOME PAY REQUIRED AND TAKING TAXES AND MANDATORY DEDUCTIONS FROM PAY INTO ACCOUNT

Mandatory deductions from wages reduce the amount of take home pay workers receive. These need to be taken into account when calculating a living wage, to ensure that workers have sufficient net income to cover their living costs.

Salaried workers in Nicaragua pay social security contributions to INSS (Instituto Nicaraguense de Seguridad Social) amounting to 4.25% of their cash salary[33].

Workers earning less than C$ 100,000 per year do not pay income tax (see Table 13). Thus, as long as the relevant cash part of the living wage is less than C$ 8,333 per month (USD 274), it is not necessary to take income tax into account.

Table 13: Income tax schedule in Nicaragua (IR):

Annual income bracket	Tax rate	Base	Excess
[1 – 100,000]	0%	0	0
[100,001 – 200,000]	15%	0	100,000
[200,001 – 350,000]	20%	15,000	200,000
[350,001 – 500,000]	25%	45,000	350,000
>500,000	30%	82,500	500,000

Source: Nicaragua (2012b). Ley de Concertación Tributaria, Art. 23.

With these final pieces of information, we have all the components necessary to estimate the living wage for Northwest Nicaragua.

[33] The percentage is applied to the ordinary salary plus the Aguinaldo (1/12 of the ordinary salary), but not to the vacation payment (1/12 of the ordinary salary), nor to the value of the free meals provided as an in kind benefit.

Table 14 is the most important table of the whole report, as it summarizes the calculation of the living wage. Part I of the table shows that the monthly expenses necessary for a typical family of four in Northwest Nicaragua to achieve a minimally acceptable living standard amounts to C$12,523 (USD 412). In Part II we divide these expenses by the number of full-time equivalent workers in the family (1.62) and add compulsory social security contributions to the INSS, in order to arrive at a gross monthly living wage of C$ 8,048 (USD 265).

Table 14: Calculation of the net and gross living wage for Northwest Nicaragua

PART I: FAMILY EXPENSES	Local currency (C$)	USD[a]
Food cost per month for reference family[b] (1)	**5,372**	**177**
Average food cost per person per day (adjusted for free school meals)	44.15	1.45
Housing costs per month (2)	**3,010**	**99**
Rent per month for acceptable housing	2,280	75
Utility costs per month	730	24
Non-food non-housing costs per month (3)	**3,545**	**117**
Preliminary estimate of NFNH costs[c]	3,545	117
Health care post check adjustment	0	0
Education post check adjustment	0	0
Additional amount (5%) for sustainability and emergencies (4)	**596**	**20**
Total living costs per month for basic but decent living standard for reference family (5) [(5)=(1)+(2)+(3)+(4)]	**12,523**	**412**
PART II. LIVING WAGE PER MONTH		
Living wage per month based on 1.62 full-time equivalent workers (6) [6=(5)/1.62]	**7,730**	**254**
Statutory deductions from pay (7)	**318**	**10**
Social security contribution to INSS (4.25%)[d]	318	10
Income tax[e]	-	-
Gross living wage per month (8) [(8)=(6)+(7))	**8,048**	**265**

Notes: [a] The exchange rate used for October 2017 was 30.40 córdobas per USD.
[b] Reference family size is two adults and two children.
[c] Based on an estimated NFNH/food ratio of 0.66.
[d] The 4.25% social security contribution to INSS are deducted from the cash (basic) wage and the *aguinaldo*.
[e] The living wage is so low that it is exempted from income tax.

Source: Authors' calculations.

This gross living wage is paid partly in cash and partly in kind (three meals per day for 24 days per month, assuming that workers take two paid vacation days per month, as is their right). The value of food is estimated at approximately C$ 1,200 per month[34], which means that the gross cash wage has to be around C$ 6,848 per month (including *aguinaldo*).

Table 15 lists the key assumptions used for the calculation of the living wage for Northwest Nicaragua.

Table 15: Key values and assumptions used for calculating the living wage for Northwest Nicaragua

Key values and assumptions	
Exchange rate of local currency to US$	30.40 C$/USD
Number of full-time workers per couple	1.62
Number of full-time workdays per month during coffee harvest (4 months per year)	26
Number of full-time workdays per month outside coffee harvest season (8 months per year)	24
Number of hours work in normal week	48
Reference family size	4
Number of children in reference family	2
Preliminary NFNH to Food ratio	0.66

Source: Values derived in previous sections of this report.

[34] According to the Anker methodology (Anker & Anker, 2017), in-kind benefits cannot exceed 30% of the gross living wage. Thus, the 15% for all three meals in Nicaragua is considered acceptable even though this percentage exceeds the 10% maximum normally allowed for any one in-kind benefit.

SECTION IV

ESTIMATING GAPS BETWEEN LIVING WAGE AND PREVAILING WAGES

14. PREVAILING WAGES FOR AGRICULTURAL WORKERS IN NICARAGUA

One important reason for estimating a living wage is to determine if workers receive a living wage and if employers pay a living wage.

Coffee bushes growing in the shade of banana palms in the Central Highlands of Nicaragua. Photo credit: Lykke E. Andersen.

It is quite complicated to obtain an accurate estimate of the distribution of prevailing wages in the agricultural sector in Northwest Nicaragua, for several reasons. First, the data from the latest household survey (2016) has still not been made publicly available for detailed analysis, so we only have access to micro-data from 2014, but we know from other studies that earnings in the coffee sector have increased significantly since then (FUNIDES, 2017b). Second, even if we did have access to the micro-data from 2016, the information was collected in October and the income information reported corresponds to September, before the start of the coffee harvest season, so the data would not be representative for the whole year, and as we will see below, agricultural incomes tend to be significantly higher during the coffee harvest season.

For these reasons, we will make two main comparisons in this section. First we will compare the estimated living wage with the established minimum wage, which all full-time agricultural

workers are guaranteed. The minimum wage constitutes a lower bound for prevailing wages. This comparison is explained in detail in section 14.1 below.

However, some workers receive more than the minimum wage, at least some of the time, either because they have supervisor responsibilities, or because they are paid by unit of production. The latter modality is particularly important for the large number of seasonal coffee workers employed during harvest season (October to February). We will therefore also calculate a typical average monthly wage over a whole year, considering that most agricultural workers in the region would earn a minimum wage for most of the year, but substantially more than the minimum wage during the coffee harvest season, when the high demand for workers push wages up. This calculation is explained in section 14.2 below.

14.1 Comparison with the gross minimum wage

In Nicaragua, the National Minimum Wage Commission determines the minimum wage in different industries, and these minimum wages are widely respected. There is a public Labor Inspection Unit (Dirección General de Inspección del Trabajo), which checks whether employers comply with the legislation, and imposes fines on employers that break the rules.

Appendix A contains the minimum wages that were in place at the time of the fieldwork (October 2017). For the agricultural sector, the minimum wage was set at C$ 3,773.82 per month + food (three meals per day). In addition to this basic wage, workers receive a bonus (*aguinaldo*), which corresponds to one extra month of pay per year, but it is paid every fortnight on a prorated basis instead of at the end of the year. They also have the right to one month of paid vacation. We distribute that right across the year, assuming that workers take two paid vacation days per month.

In addition to that, workers receive three meals per work day. There are several options for estimating the value of food provided by the employer. One option is to use the replacement cost of the model diet for an adult with a vigorous activity level (calculated at C$ 58.85 per day) which is received on average 24 days per month. This would imply a value of C$ 1,412 per month). However, this would exaggerate the value, since workers are not actually provided the model diet, but rather a somewhat cheaper diet with fewer complements. One of the large and relatively generous employers interviewed estimated the cost of food provided at C$ 1,400 per month per worker. Workers typically value the meals provided somewhat lower. According to the 2014 household survey, the most typical value assigned by workers was C$ 1,200, which correspond to C$50 per day.

If we value the meals provided at C$ 1,200 per month, we arrive at a gross monthly minimum wage of C$ 5,288 for an agricultural worker, corresponding to USD 174 per month. See calculations in Table 16.

Social security contributions are deducted from that, though. These amount to 4.25% of 13/12 of the basic wage.

Table 16: Basic minimum wage, bonuses, in kind benefits, and deductions

	C$/month	USD/month
Basic minimum wage (BW)	**3,773.82**	**124**
+ Paid *aguinaldo* (1/12 * BW):	314.49	
Total cash wage (13/12 * BW):	**4,088.31**	
+ food (24 days * C$ 50 per day)	1,200.00	
Gross minimum wage (Total cash wage + food)	**5,288.31**	**174**
- Social Security (4.25% * 13/12 *BW):	-173.75	
Net minimum wage	**5,114.56**	**168**

Source: Authors' calculations.

At C$ 8,048, our calculated gross living wage is thus about 52% higher than the average gross minimum wage.

The basic minimum wage for the agricultural sector in Nicaragua has been increasing steadily during the last decade, with regular negotiations every 6 months. Table 17 shows the agreed basic wage for the agricultural sector for the latest 20 negotiation periods (June 2007 – February 2018). The table also shows the nominal increase negotiated each time. The increases were quite high in the beginning of the period, as they had to be in order to keep up with inflation. However, since 2008 the increases in the minimum wage have been systematically higher than inflation, allowing for a substantial real increase in the purchasing power of the minimum (see Figure 4).

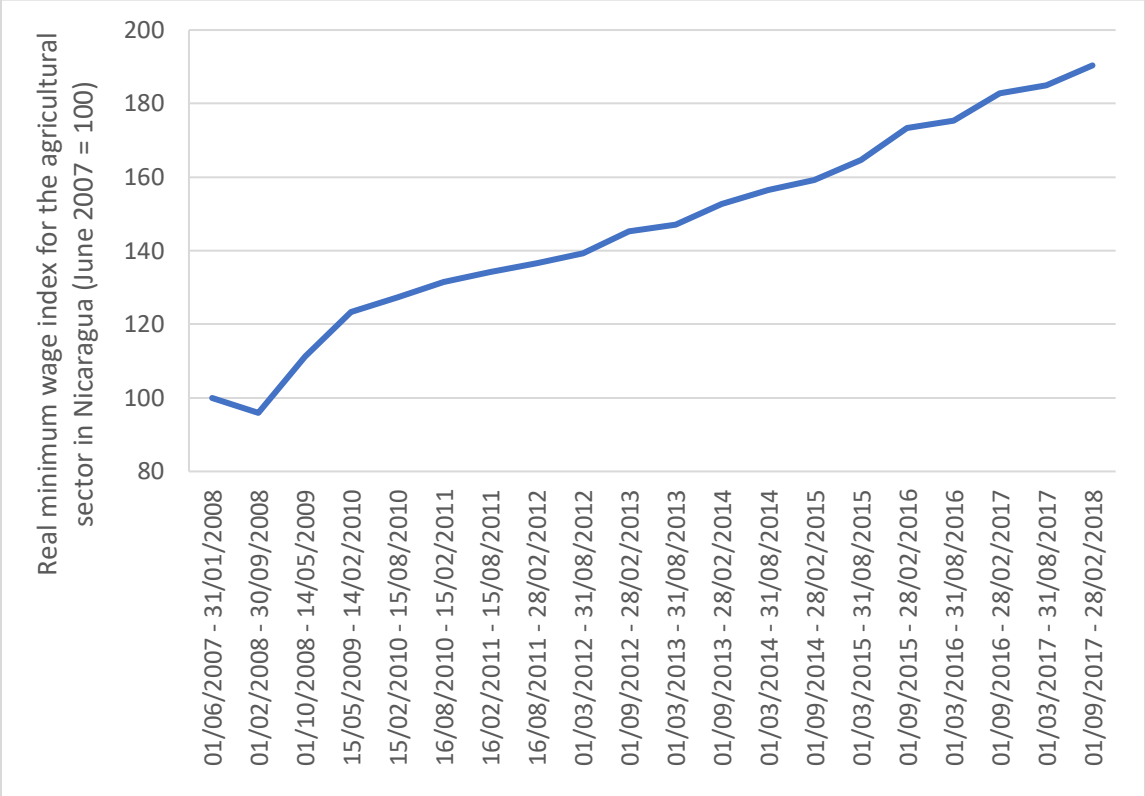
Table 17: History of the legal basic minimum wage in the agricultural sector in Nicaragua

Period	Basic minimum wage (C$/month)	Increase since previous minimum wage change	Consumer Price Index (Base 2006=100)
01/06/2007 - 31/01/2008	1,025.90		106.1
01/02/2008 - 30/09/2008	1,179.80	15.001%	127.2
01/10/2008 - 14/05/2009	1,392.15	17.999%	129.6
15/05/2009 - 14/02/2010	1,573.13	13.000%	131.9
15/02/2010 - 15/08/2010	1,667.52	6.000%	135.5
16/08/2010 - 15/02/2011	1,767.57	6.000%	139.1
16/02/2011 - 15/08/2011	1,891.29	6.999%	145.8
16/08/2011 - 28/02/2012	2,004.76	6.000%	151.8
01/03/2012 - 31/08/2012	2,145.09	7.000%	159.3
01/09/2012 - 28/02/2013	2,273.80	6.000%	161.9
01/03/2013 - 31/08/2013	2,421.60	6.500%	170.2
01/09/2013 - 28/02/2014	2,566.89	6.000%	173.8
01/03/2014 - 31/08/2014	2,705.11	5.385%	178.8
01/09/2014 - 28/02/2015	2,850.78	5.385%	185.1
01/03/2015 - 31/08/2015	3,014.41	5.740%	189.4
01/09/2015 - 28/02/2016	3,187.43	5.740%	190.2
01/03/2016 - 31/08/2016	3,330.86	4.500%	196.4
01/09/2016 - 28/02/2017	3,480.74	4.500%	196.9
01/03/2017 - 31/08/2017	3,624.32	4.125%	202.6
01/09/2017 - 28/02/2018	3,773.82	4.125%	205.0

Notes: In addition to this basic minimum wage, workers are entitled to three meals per workday, as well as *aguinaldo* and payments for paid vacation not taken.

Sources: For minimum salaries: Nicaragua (2016), complemented with information from all the minimum wage agreements available from the Ministry of Labor: http://www.mitrab.gob.ni/documentos/salario-minimo. For CPI: Banco Central de Nicaragua: http://www.bcn.gob.ni/estadisticas/precios/IPC/index.php.

Figure 4: Evolution of the real basic minimum wage in the agricultural sector in Nicaragua, 2007 - 2018 (June 2007 = 100)



Sources: Authors' calculations based on the information presented in Table 17.

Between May 2009 and February 2018, the rate of increase in the real basic minimum wage (i.e. wage adjusted for inflation) has been very stable, averaging 5.4% per year. This means a steady, sustained increase in the purchasing power of minimum wage workers in Nicaragua. In the past 10 years, the real purchasing power of the agricultural minimum wage has nearly doubled.

According to our experience visiting coffee and banana farms in Northwest Nicaragua, the prevailing minimum wage is strictly observed. Indeed, the demand for agricultural workers is currently so high that there is no need for anybody to work for less than the minimum wage. According to a recent study of the coffee sector by FUNIDES (2017b) (Fundación Nicaragüense para el Desarrollo Económico y Social), the coffee sector is experiencing a strong and increasing labour shortage. During the 2015/16 season, 38% of coffee producers could not find enough workers for the harvest. By the 2016/2017 season, this percentage had increased to 71%, and all projections point to an increase in scarcity due to a variety of factors, including: i) Migration (Costa Rica and the USA pay a lot better), and ii) change to other sectors (all other sectors pay better).

The increasing scarcity of labour also manifests itself in rapidly increasing payments to coffee harvesters. The payment for collecting a can (20 pounds) of coffee berries increased by 13.1% between the 2015/16 and the 2016/17 season (from C$ 35.80/can to C$40.50/can). In addition, coffee producers lure in workers with additional benefits: 98% provide food and housing (since almost all provide food and housing, they can distinguish themselves by the quality of food and housing), 67% provide transportation, 56% offer entertainment (movies, sports activities, etc.), 47% offer infirmaries that can take care of minor health problems, and 35% offer child care (FUNIDES, 2017b).

14.2 Comparison with typical wages over a whole year

While work in the banana sector is very stable over the whole year, most agricultural activities are seasonal, and coffee especially so. During the coffee harvest season (October to February), the agricultural labor force in Northwest Nicaragua temporarily increases about seven-fold [35], and people are brought in from both rural and urban areas as far as 100 km away to satisfy the need for harvest workers. In order to attract all these additional workers, the salaries offered during harvest season have to be significantly higher than during the rest of the year.

Coffee harvesters are paid approximately C$ 40 per can of coffee berries collected, and the average number of cans collected is 8 per day[36], 26 days per month. Thus, average monthly cash earnings during peak harvest season is about C$ 8,320. In addition to that, they receive three meals per day, worth approximately C$ 1,300 per month (C$ 50/day). They do not receive *aguinaldo* nor vacation payments, however. Thus, the gross income during peak harvest season is about C$ 9,620 per month, which is considerably higher than both the minimum wage and our estimated living wage. But that level of income is only possible during the coffee harvest season.

In order to arrive at a reasonable approximation for a typical average wage for an agricultural worker over a whole year, we will assume that he/she receives the gross minimum wage (C$ 5,288) for 8 months per year and works as coffee harvest worker for 4 months per year (earning C$ 9,620 per month by averaging 8 cans per day for 26 days per month). In this way, workers would work hardest (8 hours per day, 6 days per week) during the four months of high salaries, and take 16 paid vacation days during the low season.

[35] Nicaragua (2012a).

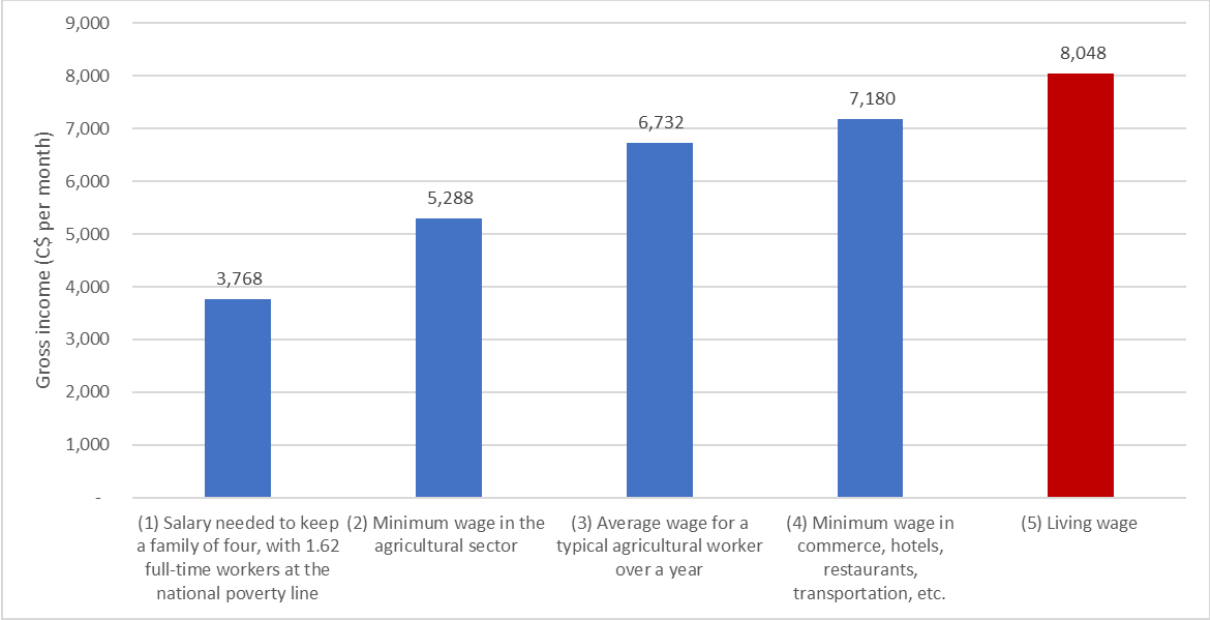
[36] There is quite a lot of variation around this average value, depending both on the worker and on the coffee crop. We were told that a nimble and determined coffee-picker on a well-managed farm can collect 12-14 cans per day during peak harvest season, but that the average over the whole harvest season is around 8 cans per day.

With these assumptions, we arrive at a typical average agricultural gross wage over a whole year of C$ 6,732 per month. Obviously, there is some variation around this value, but this is our best estimate for the average prevailing wage in the agricultural sector of northwest Nicaragua. **In conclusion, our estimated living wage is about 20% higher than the average prevailing wages.**

14.3 Wage ladder

Figure 5 presents a simple wage ladder for Northwest Nicaragua. It compares our gross monthly living wage (red bar) with other relevant monthly gross incomes. The first bar is the gross salary necessary to keep a family of four with 1.62 full-time workers just at the national poverty line. The second bar is the gross income for minimum wage workers in agriculture, assuming they work 12 months per year receiving the minimum wage plus *aguinaldo* and meals 24 days per month, while taking two paid vacation days per month, as is their right. The third bar represents the average income for a typical agricultural worker over an entire year, assuming that he/she receives the minimum wage for 8 months per year and works as coffee harvest worker for 4 months per year (averaging 8 cans per day, 26 days per month). The fourth bar shows the minimum wage in competing sectors, such as transportation and commerce, also assuming that workers take two days of paid vacation per month.

Figure 5: Wage ladder for Northwest Nicaragua



Notes: The value of free meals in cases (2), (3) and (5) is fixed at C$ 1,200 per month, assuming that workers work 24 days per month, taking two days of paid vacation per month. Case (3) is calculated under the assumption that a typical worker would work 8 months per year at minimum wage and 4 months per year as coffee harvest worker averaging 8 cans per day, 26 days per month.

Sources: Authors' calculations.

While our estimated living wage is 52% higher than the current minimum wage in the agricultural sector, and 20% higher than the average wage for a typical agricultural worker over a whole year, reaching the level of our estimated living wage is clearly not an impossible goal.

15. CONCLUSIONS

Our estimate for a gross living wage for Northwest Nicaragua is C$ 8,048 per month, which corresponds to USD 265 per month. This value was calculated for October 2017, and covers the seven states in the northwestern part of Nicaragua, where coffee and bananas are grown. It refers to the wage required for decency for families who reside in rural areas as well as small and medium sized towns. The gross living wage is comprised of the basic cash salary, the legal standard bonus (*aguinaldo*), and benefits paid in kind (three meals per day).

The living wage is the wage necessary for a typical family in Northwest Nicaragua with 1.62 workers and two children to pay for a nutritious, but low-cost diet, minimally acceptable healthy housing, adequate health care, education through secondary school for children, and clothing and other essential expenses considered necessary for basic decency.

The estimated living wage is 52% higher than the current minimum wage in the agricultural sector in Nicaragua and about 20% higher than average prevailing wages over a whole year. While the current minimum wage is enough to feed a family on the typical, frugal Nicaraguan diet of rice, beans and corn tortillas, with a few modest complements, and also to cover other necessary basic expenses, it is not sufficient for workers to afford minimally acceptable housing. We have calculated that the rental cost of minimally acceptable housing in Northwest Nicaragua is about USD 75 per month for a family of four. This would allow, in the long run, for a small home of at least 36 m^2 with durable materials for roof, walls and floors (currently most agricultural workers have dirt floors in their houses), windows for illumination and ventilation (instead of permanent holes in the exterior walls, as shown in Photos 5 and 9), piped water on the property, electricity (even if just from a solar panel), a dedicated kitchen without too much smoke, an acceptable latrine (but not necessarily a shower), and at least one dedicated bedroom for the family of four.

Few families (less than 5%) in Northwest Nicaragua rent their home, but with USD 75 per month they could gradually construct one (using mainly their own labor), that would eventually (about 15 years later) comply with our minimum standards. USD 75 is not quite enough to service a 15-year mortgage on a decent house (we estimate that a decent house costs at least USD 10.000 in this region), even if the family manages to secure a subsidized loan for social housing (7.5% interest). Thus, a living wage would not instantly secure decent housing, but it would help workers move towards that goal within a couple of decades.

It is worth highlighting both how hardworking the agricultural workers in Nicaragua are, and how modest their demands are. The standard work week in Nicaragua is 48 hours -- at least

20% longer than that of most of the coffee drinking consumers in Europe who benefit from their hard work.

Currently, almost all formal agricultural workers in Northwest Nicaragua earn at least the legal minimum wage, and some even earn a living wage (on average, over a whole year). Thus, the challenge is to increase the incomes of the lowest-paid part of the agricultural workforce by around 52%, so that they also reach a living wage.

This is not an impossible ambition. Over the last 10 years, the minimum wage (which is strictly observed) in the agricultural sector in Nicaragua has increased steadily by more than 5% per year in real terms, increasing the purchasing power of the minimum wage by 90% since 2007. Thus, if this persistent trend continues, the minimum wage would approach the living wage within 8 years.

There are basic economic forces that support a continuation of the trend. Nicaraguan agricultural workers are some of the lowest paid in the entire hemisphere, but the supply is limited and competition for them is strong, especially during the coffee harvest season. Due to the mountainous topography of the coffee fields, it is impossible to mechanize, and producers are finding it increasingly difficult to find enough workers for the harvest. In the 2016/2017 harvest season, 71% of coffee producers reported that they had not been able to secure enough workers for the harvest, despite offering 13% higher salaries than one year earlier (FUNIDES, 2017b). Thus, it is necessary for producers to offer higher salaries to secure enough workers to prevent their crops from rotting in the field. These increased production costs should be shared by the rest of the supply chain, not just the coffee producers. Thus, there is a need for collective engagement of the full supply chain to make sure that coffee production is sustainable and that workers are receiving a living wage.

Another trend that works in the direction of helping households secure incomes that cover minimally acceptable living standards is the increase in female labor force participation. The dramatic fall in fertility rates observed over the last couple of decades means that women no longer have to stay at home and look after children their whole life, but can instead seek paid work that helps cover family expenses. Job opportunities for women are increasing in the region, especially in urban areas. The central highlands in Nicaragua has developed a very active cigar-industry lead by migrants from Cuba, and this has created a lot of manufacturing jobs, for which women have at least as good access as men.

We hope this study will contribute to bringing together the relevant stakeholders to work for tangible improvements in the wage and living conditions of the hardworking and well deserving workers in Nicaragua.

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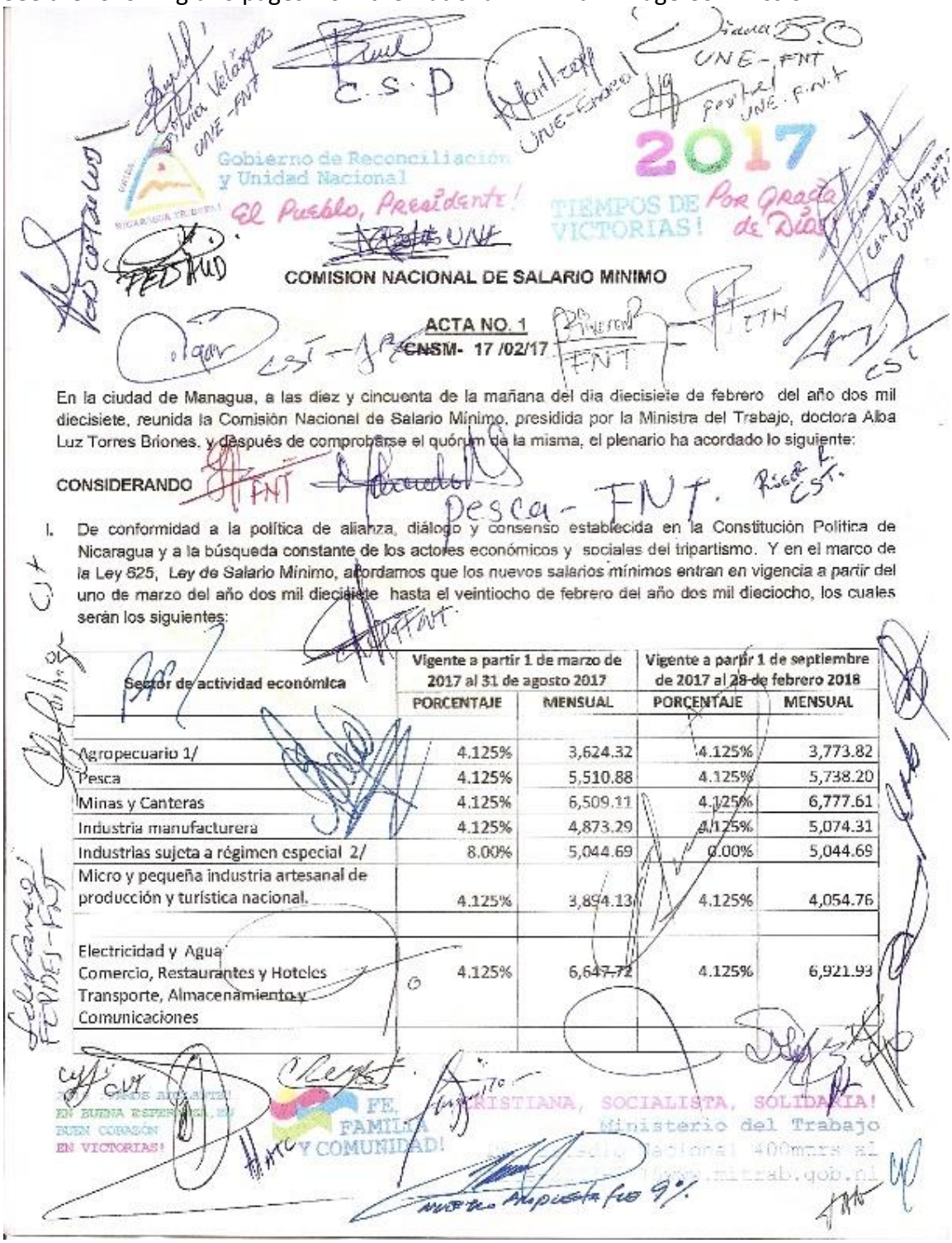
APPENDIX A: CURRENT MINIMUM WAGE AGREEMENT

See the following two pages from the National Minimum Wage Commission.



COMISION NACIONAL DE SALARIO MINIMO

ACTA NO. 1

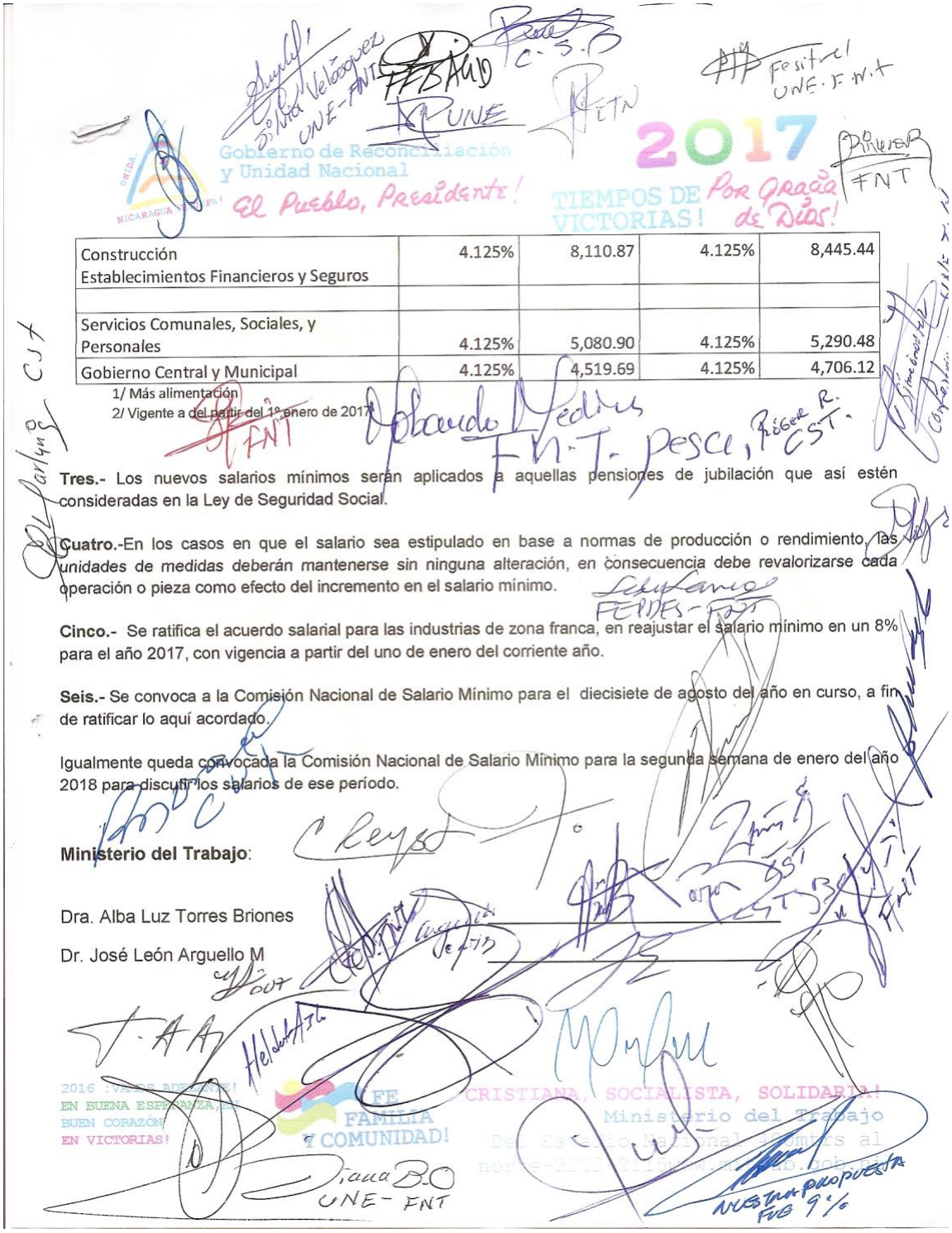
CNSM- 17 /02/17

En la ciudad de Managua, a las diez y cincuenta de la mañana del dia diecisiete de febrero del año dos mil diecisiete, reunida la Comisión Nacional de Salario Mínimo, presidida por la Ministra del Trabajo, doctora Alba Luz Torres Briones, y después de comprobarse el quórum de la misma, el plenario ha acordado lo siguiente:

CONSIDERANDO

I. De conformidad a la política de alianza, diálogo y consenso establecida en la Constitución Política de Nicaragua y a la búsqueda constante de los actores económicos y sociales del tripartismo. Y en el marco de la Ley 625, Ley de Salario Mínimo, acordamos que los nuevos salarios mínimos entran en vigencia a partir del uno de marzo del año dos mil diecisiete hasta el veintiocho de febrero del año dos mil dieciocho, los cuales serán los siguientes:

Sector de actividad económica	Vigente a partir 1 de marzo de 2017 al 31 de agosto 2017		Vigente a partir 1 de septiembre de 2017 al 28 de febrero 2018	
	PORCENTAJE	MENSUAL	PORCENTAJE	MENSUAL
Agropecuario 1/	4.125%	3,624.32	4.125%	3,773.82
Pesca	4.125%	5,510.88	4.125%	5,738.20
Minas y Canteras	4.125%	6,509.11	4.125%	6,777.61
Industria manufacturera	4.125%	4,873.29	4.125%	5,074.31
Industrias sujeta a régimen especial 2/	8.00%	5,044.69	8.00%	5,044.69
Micro y pequeña industria artesanal de producción y turística nacional.	4.125%	3,894.13	4.125%	4,054.76
Electricidad y Agua Comercio, Restaurantes y Hoteles Transporte, Almacenamiento y Comunicaciones	4.125%	6,647.72	4.125%	6,921.93



Construcción	4.125%	8,110.87	4.125%	8,445.44
Establecimientos Financieros y Seguros				
Servicios Comunales, Sociales, y Personales	4.125%	5,080.90	4.125%	5,290.48
Gobierno Central y Municipal	4.125%	4,519.69	4.125%	4,706.12

1/ Más alimentación
2/ Vigente a del partir del 1º enero de 2017

Tres.- Los nuevos salarios mínimos serán aplicados a aquellas pensiones de jubilación que así estén consideradas en la Ley de Seguridad Social.

Cuatro.-En los casos en que el salario sea estipulado en base a normas de producción o rendimiento, las unidades de medidas deberán mantenerse sin ninguna alteración, en consecuencia debe revalorizarse cada operación o pieza como efecto del incremento en el salario mínimo.

Cinco.- Se ratifica el acuerdo salarial para las industrias de zona franca, en reajustar el salario mínimo en un 8% para el año 2017, con vigencia a partir del uno de enero del corriente año.

Seis.- Se convoca a la Comisión Nacional de Salario Mínimo para el diecisiete de agosto del año en curso, a fin de ratificar lo aquí acordado.

Igualmente queda convocada la Comisión Nacional de Salario Mínimo para la segunda semana de enero del año 2018 para discutir los salarios de ese período.

Ministerio del Trabajo:

Dra. Alba Luz Torres Briones

Dr. José León Arguello M