

Living Wage Report

Managua, Nicaragua

Context: Manufacturing sector in Free Trade Zones

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TABLE OF CONTENTS

About the authors	3
Acknowledgements	4
INTRODUCTION.....	5
1. Background.....	5
2. Living wage estimate.....	7
3. Context.....	7
4. Concept and definition of a living wage.....	8
5. How the living wage is estimated	9
PART I. COST OF A BASIC BUT DECENT LIFE FOR A WORKER AND HIS OR HER FAMILY	11
6. Food costs.....	11
6.1 General principles of model diet.....	11
6.2 Model diet.....	12
6.3 Local food prices	16
7. Housing costs.....	18
7.1 Standard for basic acceptable local housing.....	19
7.2 Local housing survey	23
7.3 Rent or user cost for basic acceptable housing	28
7.3 Utilities and other housing costs.....	31
8. Non-food and non-housing costs (NFNH)	31
8.1. Step 1 of the NFNH calculations.....	32
8.2. Step 2 of the NFNH calculations.....	33
8.3. Step 3 of the NFNH calculations.....	34
9. Provision for unexpected events to ensure sustainability.....	35
PART II. LIVING WAGE FOR WORKERS.....	36
10. Family size needing to be supported by living wage	36
11. Number of full-time equivalent workers in family providing support.....	36
12. Take home pay required and taking taxes and mandatory deductions from pay into account	37
PART III. ESTIMATING GAPS BETWEEN LIVING WAGE AND PREVAILING WAGES.....	41
13. Prevailing wages for workers in the free trade zones of Nicaragua	41
13.1 Poverty lines.....	41
13.2 Minimum wage	42
13.3 Prevailing wages.....	42
13.4 Wage ladder	43
14. Conclusions and recommendations	45
References.....	47

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Finally, Carmen Barragán carried out valuable background research for the project.

Living Wage Estimate

Nicaragua

Managua

Context provided in the manufacturing sector of the Free Trade Zones

INTRODUCTION

1. Background

This report estimates a living wage for workers in the capital of Nicaragua, with a special focus on workers in the Las Mercedes Industrial Park and Free Trade Zone near the airport of Managua. The report builds on a previous living wage report carried out in the northwestern part of Nicaragua in October of 2017 covering coffee, bananas and other labor-intensive agricultural sectors where workers generally lived in small towns and commuted to work (Andersen and Hernani-Limarino, 2018). Since Managua is the richest part of Nicaragua and the Northwest the poorest region, this report will shed light on the extent to which a living wage estimated for one part of a country might be used in another part of the country.

The living wage concept refers to a salary that would allow a typical worker with a typical size family (considered to be two adults and two children for this study) to live a decent, but basic, 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 adequate 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.

This 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 Pakistan¹.

¹ All living wage reports in this series can be downloaded from here: <https://www.globallivingwage.org/>.

Most of these studies have been commissioned by the Global Living Wage Coalition (GLWC), or its members, which include Fairtrade International, GoodWeave International, Rainforest Alliance (RA), 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 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 are able to afford a decent life for themselves and their families.

This particular study was made possible through the generous funding support of Patagonia.

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 between and within countries, 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 living wage 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 what 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 monthly gross living wage (aka living wage) for Managua is calculated at C\$12,101 (USD 360). Workers, however, only need to earn C\$ 10,373 (USD 308) each month, because by law they also receive a 13th month bonus (*aguinaldo*) in December and Termination Pay at the end of contract, or at renewal of contract, which happens at least every two years. These values were calculated for November 2019, and cover the areas that are within commuting distance of the Las Mercedes Free Trade Zone near Managua Airport. It refers to the monthly wages of workers in the Free Trade Zone, required for decency for families who reside in or near Managua city. It is the monthly gross wage required that also includes legally required amounts for social security contributions and income taxes (corresponding to the concept “*Total devengado*” on the payslips). This is the wage necessary for a typical family with 1.68 full-time equivalent workers and two children to be able to pay for a low-cost nutritious diet, decent housing, adequate health care, education for children through secondary school, clothing, and other essential expenses, as well as a 5% margin for emergencies. The calculation of this living wage takes into account that workers typically have very stable jobs and receive legally mandated *Aguinaldo* (one extra month of payment in December) and Termination Pay (also one extra month of payment per year worked, typically paid out every two years).

For comparison, since January 2019, the minimum wage for manufacturing workers in the Free Zones is C\$ 5,911.39. Our estimated living wage is therefore about 75% higher than the current minimum wage.

It is interesting to compare this living wage estimate with a previous living wage estimate made for Northwest Nicaragua two years earlier (mainly for agricultural workers living in small towns). In this earlier study, we found that the living wage was 52% above the minimum wage in the agricultural sector at the time and approximately 20% above the prevailing wages. Although the monetary values are different between the two regions, the relative differences between minimum wage and prevailing wages and the living wage are similar.

3. Context

In Nicaragua, there is a system of Free Trade Zones (*Zonas Francas*), which provides special incentives for global enterprises to operate in Nicaragua (no import or export duties, and little to no taxes). While these enterprises contribute little in terms of taxes, they are very important for creating jobs for Nicaragua’s young labour force. As of October 2019, approximately 125,000 people worked in these Free Trade Zones, mainly in the textile/clothing sector, which is responsible for about 70,000 jobs, followed by the cigar industry. Exports from this system account for more than half of all Nicaraguan exports, and is increasing at a rate of about 10% per year, reaching almost USD 2.9 billion in 2019. Direct salaries paid to workers in the Free Trade Zones (that includes overtime pay and is for all

workers including higher paid workers) amount to approximately USD 450 million this year², implying an average monthly wage of around USD 300, which is at least 50% above the minimum wage, but about 17% below the estimated living wage.

The Free Trade Zone system is operated by a government entity which rents out the factory space to international companies, provides the required number of workers, who are all guaranteed to: 1) be over 18 years of age, 2) be working voluntarily, 3) have no criminal record, and 4) have no transmittable disease. Otherwise, workers have no specific qualifications, and companies will have to train them to do their jobs.

The present study focuses on workers in the Las Mercedes Free Trade Zone of Managua, but the estimated living wage is considered relevant for the other Free Trade Zones in the country as well (for example cigar workers in Estelí).

Between 51% and 70% of the workers in the Free Trade Zones are women with an average age that varies between 18 and 30 years, many of them are migrants from rural areas, with only basic education, and often single mothers. In this sense, the establishment of a living wage for this sector could have a high impact on the living conditions of a highly vulnerable population.

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 for long periods of time to supplement their incomes.

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

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

² <http://cnzf.gob.ni/es/noticias/comportamiento-y-proyecciones-de-las-zonas-francas-en-nicaragua>

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.”³

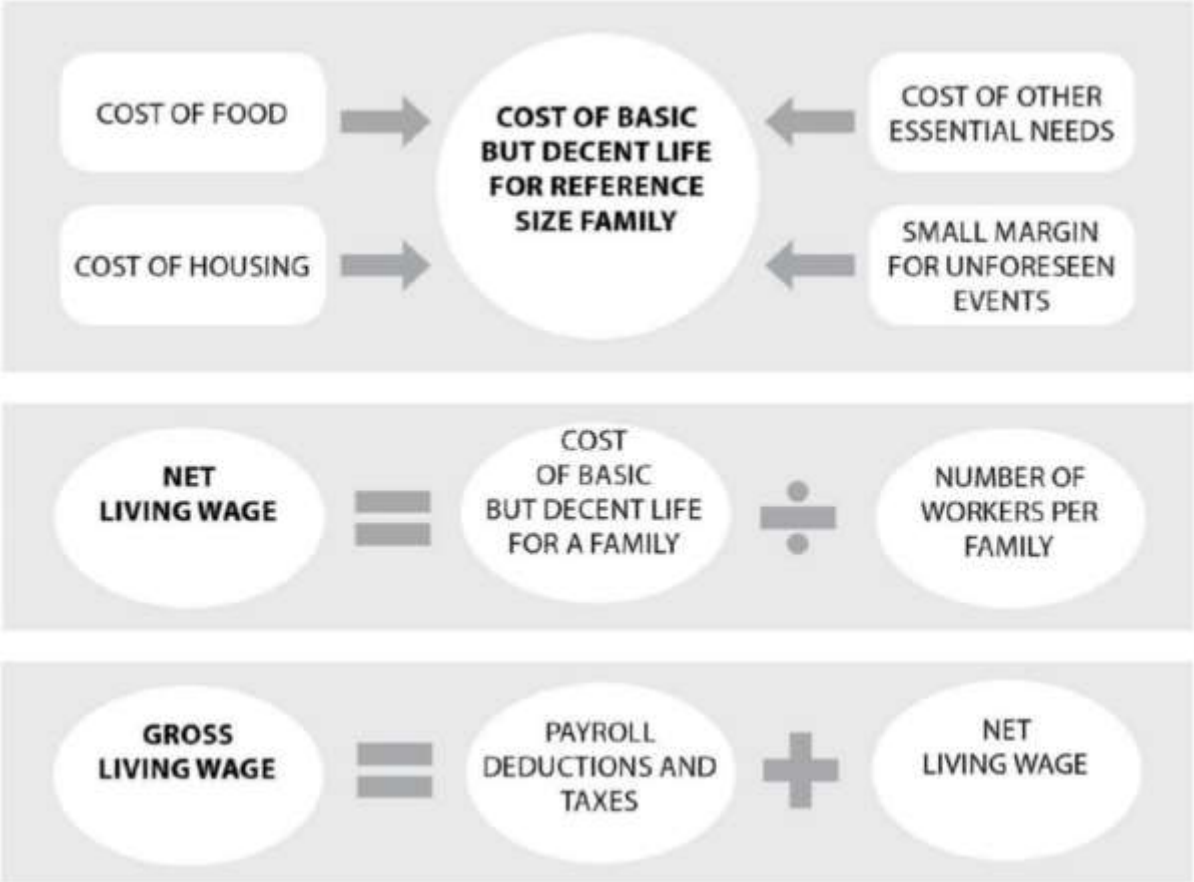
5. How the living wage is estimated

Figure 1 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 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 in developing countries, 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 food availability, 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. Rental value for decent housing was estimated using secondary data from the National Statistical Institute as well as visits to local housing.
- **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 about working and local employment conditions. The number is calculated from the latest available official household survey data on labor force participation rates, unemployment rates, and time-related underemployment rates.
- **Estimate the Gross Living Wage,** taking into account payroll deductions, income taxes, and payments in kind. This is done using official information about tax-rates and tax brackets and information on common in kind benefits if any.

³ See Anker (2011) for more examples of how historical figures, international bodies, NGOs, governments and others describe the concept of a living wage.

Figure 1: 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 Managua, Nicaragua.

PART I. COST OF A BASIC BUT DECENT LIFE FOR A WORKER AND HIS OR HER 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 relative food prices, and then calculating the costs of this diet using a combination of local food price surveys in the markets and supermarkets where Free Trade Zone workers typically buy their groceries, as well as data from the official price surveys carried out by the National Statistical Institute in the metropolitan area of Managua.

The estimated cost of the model diet was C\$ 59.81 (USD 1.78) per person per day in Managua, Nicaragua. This implies C\$ 7,277 (USD 216) 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 availability as well as relative food prices.

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.
- Maximum of 34 grams of oil per person per day.

6.2 Model diet

The basic diet of 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. 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 be substituted by a slice of bread or pasta. While this diet provides enough energy to carry out work, it lacks micro-nutrients and variety, which is an important reason for the high levels of stunting observed in Nicaragua, and even in the capital Managua.⁴

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 website⁵.

We started by calculating the average daily calorie requirement per person for our reference size family of four persons (two adults and two children), which turned out to be 2,242 calories per person per day. This was determined 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 adult women it is 1.544 meters⁶. All family members are assumed to have a moderate Physical Activity Level (PAL), since they are living in the city, and are thus not likely to engage in hard physical work, like agriculture.⁷

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 and their quantities purchased per month for a family of six. 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 high caloric content, but the 76 grams per person per day in the Basic Food Basket is almost three times more than the WHO recommended maximum amount (30 grams). The diet easily covers the requirements for all the different kinds on proteins, but it is short on calcium and potassium⁸.

⁴ According to the latest Demographic and Health Survey (2011/12), the share of 0 to 5-year-old children in Managua who are stunted is 14.2% (INIDE & MINSa, 2013).

⁵ <https://www.elgaronline.com/view/9781786431455/9781786431455.xml>.

⁶ 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/>.

⁷ This means that the model diet used in this report has fewer calories per family member (2,242 calories) than the model diet used in the earlier living wage study for Northwest Nicaragua (2,365 calories) which focused on the agricultural sector and so assumed that one adult in the reference family had vigorous physical activity.

⁸ According to the nutrient tracking program at <https://cronometer.com/>.

We cut sugar to the maximum amount recommended by WHO (30 grams per person per day) and instead included:

- Two extra slices of cheese per week for calcium and energy.
- Half a banana per person per day for potassium and energy.

Since the diet contains sufficient proteins (due partly to a considerable amount of beans), we could cut the amount of meat, and in that way save some money. We reduced beef consumption to one serving per week, and since fish is expensive, we reduced it to one family sharing one can of sardines in tomato sauce per week⁹. Instead we increased the consumption of chicken to two servings per week, as chicken is much cheaper per protein than cow meat and fish. We also added an extra egg per week.

According to an FAO review of national guidelines on milk and dairy consumption (Muehlhoff et al., 2013), most of the guidelines reviewed for developing countries recommended at least 1 glass of milk or dairy per day for children, and this is included in our model diet.

The final model diet thus looks like this:¹⁰

- Rice and beans three times a day
- Four 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)
- Pinolillo (a corn and cocoa hot drink) five times per week
- One cup of milk per day (for children)
- Four slices of cheese per week
- Five eggs per week
- Three servings of plantains (typically fried) per week
- Three servings of potatoes per week
- Two servings of chicken per week
- One small piece of beef per week

⁹ According to our fieldwork, we found that canned sardines is a popular item, since fresh fish is usually not available. Although a bit expensive, we include a small amount in the diet in order to provide Omega-3 for brain development.

¹⁰ The main differences between our Managua model diet and the model diet we used for Northwestern Nicaragua are: (i) fewer calories in our Managua model diet, because of less vigorous physical activity at work; (ii) fewer tortillas in our Managua model diet, because workers in Managua were observed to eat fewer tortillas and to buy all of their tortillas rather than prepare many of them at home as they did in the Northwest; (iii) added 1 pork meal per week, because this was observed to be common; and (iv) added some Pinolillo drink that was found to be widely consumed.

- One small serving of pork 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.

In this way, there is an “improvement” available for every meal during the week. Some typical Nicaraguan plates are shown in Photo 1.

Photo 1: Typical Nicaraguan meals with Gallo Pinto (rice and beans)



Photo credits: Cosinemosjuntos.com.

Table 1 shows the detailed contents of our model diet, and the average daily cost per person. Section 6.3 below provides details on how food prices were determined.

To the costs of the 24 main ingredients, we added 2.1% for spices¹¹, 4% for spoilage, and 11% for variety and seasonal variation¹², following the recommendations of the Anker methodology.

¹¹ The CPI index for Nicaragua includes salt, 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, salt, and condiments account for approximately 2.1% of food expenditure.

¹² We assume in this report that the prices collected in November are representative of prices over the whole year, except for fruits and vegetables that have high seasonal variation in prices. Also since there is not much variety in our model diet, an addition of 11% is recommended by the Anker methodology for lower-middle income countries 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 1: Contents and costs of our model diet for Managua, 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	144	144	28.66	4.14
Tortilla (maize)	200	200	35.27	7.05
Bread (white)	25	25	44.09	1.10
Pasta	14	14	61.05	0.87
Potato	31	42	39.95	1.66
Plantains	30	46	17.64	0.81
Beans, pinto	85	85	47.13	4.01
Milk	120	120	30.00	3.60
Cheese	27	27	119.05	3.21
Egg	31	36	86.67	3.10
Beef	12	15	176.37	2.61
Chicken	24	35	77.16	2.72
Pork	12	16	143.30	2.29
Canned sardines	15	15	171.96	2.58
Cabbage	35	44	17.86	0.78
Onion	35	39	64.82	2.52
Tomato	35	38	30.86	1.19
Pumpkin	35	50	16.42	0.82
Orange	35	48	15.39	0.74
Banana	35	47	11.02	0.52
Oil	30	30	30.00	0.90
Sugar	30	30	26.46	0.79
Coffee	7	7	176.37	1.23
Pinolillo	27	27	66.14	1.81
Total cost of model diet excluding additional costs indicated below				51.07
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				59.81

Source: Authors' elaboration.

The nutritional summary of this diet is the following:

- 2,242 calories
- 12.3% of calories from proteins
- 25.0% of calories from fats
- 62.7% of calories from carbohydrates

- 325 grams of fruits and vegetables and pulses per day
- 30 grams of sugar per day
- 30 grams of oil per day

Our model diet thus complies with all the WHO/FAO nutritional guidelines listed in Section 6.1.

The cost of this model diet (C\$59.81 per person per day) corresponds to C\$ 7,277 per month for a family of four. This is 23% less than the cost of the Basic Food Basket as calculated by the National Statistical Institute for July 2019 (C\$ 9,472) which is for a family of six, while we use a model family of four.

6.2.1 School lunch

In theory, the Government of Nicaragua provides free school lunches to pre-school and primary school children in all public schools through the Integral Program of School Nutrition (*Programa Integral de Nutrición Escolar – PINE*). However, according to our interviews with workers, this is not a reliable service in urban areas, and children bring their own food to school. In the best of cases, the program provides some of the ingredients for a school meal (rice, beans, and oil), but the parents still have to cook the meals and add the “improvements”.

Thus, we decided not to make any adjustments to the cost of the model diet due to free school lunches. If the program had been reliable providing a full lunch, it would have caused a small reduction in the cost of our model diet, but since it is unreliable, we decided not to take it into account.

6.3 Local food prices

The costs of the food items were obtained from two main sources: 1) Our own price survey carried out at the markets, supermarkets, and neighborhood shops where Free Trade Zone workers usually buy their food; and 2) the survey collected every month by the National Statistical Institute (INIDE) in the Managua metropolitan area. The first was collected during November 2019, while the latest information available from the National Statistical Institute was from July 2019.

We feel that the food prices we collected represent well food prices faced by typical workers, because we went to places where workers shop and got prices of foods which workers typically buy. Thus, we decided to use the median price from our own survey conducted in November 2019, except for fruits and vegetables that have such high seasonal variation, that the prices found in November might not be representative for the whole year. For the seven fruits and vegetables for which the difference between the minimum price and the maximum price during the period August 2018 – July 2019 were more than 50% (all fruits and vegetables, except bananas and plantains), we used the average monthly price found by

INIDE during August 2018 – July 2019, and added 4% for inflation to bring the value up to November 2019.

In the case of white bread we collected prices both for bread rolls and sliced bread. The bread rolls bought at markets and small neighborhood shops were considerably cheaper than the sliced bread found in supermarkets, so we used the cheaper option for our model diet. Similarly, we collected prices of cooking oil both for a variety of bottled brands and for generic cooking oil, which you can buy much cheaper at the market if you bring your own bottle to be filled. In this case we also used the cheaper option. Finally, in the case of milk, we used the price of liquid milk, which is cheaper than powdered milk, although the families interviewed tended to use powdered milk for lack of a refrigerator. However, once they earn a living wage, they should be able to afford a refrigerator.

Photo 2 shows pictures from some of the markets visited in Managua and Tipitapa where workers do most of their grocery shopping. Some items are also bought in supermarkets, such as Palí and Maxi Palí, which have competitive prices for many of the products.

Photo 2: Typical markets where workers buy groceries, Managua and Tipitapa



Photo credits: Lykke E. Andersen.

Table 2: Results of the food price surveys in Managua and surrounding areas where workers from the Free Trade Zone live and buy their food

Food item	Units	Median price from our own price survey, November 2019 (C\$/unit)	Average price reported by INIDE, August 2018 - July 2019 (C\$/unit)	Final price used for model diet calculations (C\$/unit)
Rice	Pounds	13.00	13.24	13.00
Tortilla (maize)	Pounds	16.00	17.04	16.00
Bread (white)	Pounds	34.05	21.49	20.00
Pasta	Pounds	27.69	28.81	27.69
Potato	Pounds	10.00	17.42	18.12
Plantains	Pounds	8.00	8.75	8.00
Beans, pinto	Pounds	21.38	15.51	21.38
Milk (liquid)	Liter	30.00	28.60	30.00
Cheese	Pounds	54.00	70.62	54.00
Egg	Dozen	52.00	52.68	52.00
Beef	Pounds	80.00	88.86	80.00
Chicken	Pounds	35.00	43.79	35.00
Pork	Pounds	65.00	64.60	65.00
Canned sardines in tomato sauce	Can (425 g)	78.00	-	78.00
Cabbage	Pounds	5.00	7.79	8.10
Onion	Pounds	20.00	28.27	29.40
Tomato	Pounds	20.00	13.46	14.00
Pumpkin	Pounds	7.08	7.79	8.10
Orange	Pounds	4.50	6.71	6.98
Banana	Pounds	5.00	-	5.00
Oil	Liter	35.00	35.34	30.00
Sugar	Pounds	12.00	12.17	12.00
Coffee	Pounds	80.00	-	80.00
Pinolillo	Pounds	30.00	28.36	30.00

Source: Authors' elaboration.

7. Housing costs

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

We estimated decent housing costs for a family of four in Managua to be C\$ 5,023 per month (equivalent to USD 149 per month), comprised of C\$ 4,125 (USD 123) for rental costs and C\$ 898 (USD 27) for utilities.

This value is three times the amount included in the Basic Consumption Basket calculated by the National Statistical Institute for July 2019 (C\$ 1,610.77, comprised of C\$ 900 for rent, C\$ 152.55 for water, C\$ 319.31 for electricity, and C\$ 238.91 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 its value has been eroded by inflation and by now is clearly insufficient to cover the cost of a minimally acceptable dwelling.

Since housing costs is the main item that makes our Living Wage differ from the Basic Consumption Basket used to help determine the Minimum Wage, we explain in 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 norms and standards.

International standards are based around the following principles for adequate healthy 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
- Not in slum or location with site hazard

As national standards, we rely to a good extent on the criteria in the Unsatisfied Basic Needs (UBN) methodology used in Nicaragua (INIDE, 2014). Three of the dimensions in the UBN methodology reflect inadequate housing conditions due to overcrowding, lack of basic services, and inadequate construction materials.

Table 3 below tabulates a series of relevant housing quality variables for Managua. Only families with 2-7 members are included in the following calculations, as this is the sample we consider relevant for the living wage estimate (i.e. we exclude single person households that do not have children and extended family households). The last column explains what is considered adequate according to national standards.

Table 3: Current housing conditions in Managua based on the 2014 EMNV household survey and UBN methodology norms

Characteristics	Managua (%)	Acceptable standard according to the Nicaragua Unsatisfied Basic Needs methodology
Roof		
Zinc/concrete/tile	99.7	The first category is considered adequate.
Waste/other unacceptable.	0.3	
Floor		
Cement/tile/brick	79.0	The first category is considered adequate.
Wood/Earth/other unacceptable	21.0	
Exterior walls		
Cement/stone/brick/adobe	83.6	Only the first category is considered acceptable.
Wood	3.8	
Zinc	11.3	
Bamboo, etc.	0.1	
Rubble or waste	1.2	
Other unacceptable	0.1	
Lighting source		
Electricity	99.1	The UBN methodology does not include lighting source.
Solar panel	0.3	
Kerosene	0.1	
Other unacceptable	0.5	
Cooking fuel		
Wood	14.9	The UBN methodology in Nicaragua does not consider cooking fuel.
Gas/Propane	83.1	
Coal	0.2	
Electricity	1.4	
Water source		
Piped into dwelling or yard	93.3	Only the first option is considered acceptable.
Public tap/well	0.4	
River, lake, other unacceptable source	6.3	
Toilet facility		
Toilet or latrine	96.3	Any kind of toilet or latrine is acceptable according to the UBN methodology of Nicaragua. Nothing is not acceptable.
Nothing	3.7	
Number of bedrooms		
0	24.3	

Characteristics	Managua (%)	Acceptable standard according to the Nicaragua Unsatisfied Basic Needs methodology
1	16.7	The UBN methodology does not specify a minimum number of bedrooms, but only the number of persons per bedroom (see next).
2	34.4	
3	17.7	
4+	6.9	
Number of persons per bedroom		
]0-2]	49.9	According to the UBN methodology in Nicaragua, the household should have no more than 4 people per bedroom in urban areas (implies 1+ bedroom house is acceptable).
]2-4]	21.9	
]4-5]	2.0	
]5+	26.2	
Consumer durables		
Cell phone (%)	91.5	The UBN methodology does not include these items.
Internet (%)	4.4	
Cable TV (%)	80.0	

Source: Authors' elaboration.

As can be seen from these tabulations, there are three main problems with the houses in the metropolitan area of Managua according to the UBN methodology:

- 28% of houses suffer from over-crowding according to the UBN methodology (more than 4 persons per bedroom)
- 21% of houses have dirt floors
- 16% of houses do not have acceptable exterior walls.

In Table 4, we combine national and international minimum standards, in order to develop a specific minimum living wage healthy housing standard for our study area.

Table 4: 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 for urban areas according to Unsatisfied Basic Needs methodology	Housing standard for study area
Materials			
Walls	Durable material providing protection from elements	Cement/stone/brick/adobe.	Cement/stone/brick/adobe (wood not acceptable because typically poorly joined; zinc walls not acceptable because typically flimsy)
Roof	Durable material without leaks	Zinc/concrete/tile.	Durable material without leaks (thatch not acceptable)
Floor	Durable material	Cement/tile/brick.	Durable material (wood can be acceptable if adequate)
Amenities			
Toilet	At least pit latrine with slab	Toilet or latrine	Toilet or latrine with concrete slab
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 in house or yard
Electricity	Generally yes, but not required if not common in study area	-	Electricity required because most households in Managua have electricity
Ventilation & Lighting			
Ventilation quality	Good ventilation. Especially important when cooking indoors	-	Good ventilation required when cooking indoors
Lighting	Adequate	-	Electric lighting required

Housing characteristics	International minimum requirements	National standard for urban areas according to Unsatisfied Basic Needs methodology	Housing standard for study area
Number of windows	Sufficient for adequate lighting and ventilation	-	Sufficient for adequate lighting and ventilation
Living Space			
Number of square meters of living space	36-48 m ² for lower-middle income country	-	At least 36 m ² 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 and hallways	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 bedroom 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 indoors
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 site hazards.

Source: Authors' elaboration.

7.2 Local housing survey

During the field work carried out in November of 2019, and with the generous collaboration of a group of workers from the Free Trade Zone, we managed to visit 15 homes of people working in or near the Free Trade Zone in Managua. The homes were located in varying distances from the work place, ranging from within easy walking distance to almost two hours away with public transportation.

Photo 3 shows a few photos from neighborhoods close to the Las Mercedes Free Trade Zone in Managua, where many workers either own or rent a small house. The quality of their

houses is generally very poor. At least 70% of the worker homes we visited had flimsy exterior walls of zinc (compared to 74% of houses having cement or stone or brick walls in Managua) and about 40% had dirt floors (compared to 21% of houses in Managua), neither of which is acceptable according to our living wage healthy housing standard or the UBN housing standard. Since it is difficult to build a window into a zinc wall, most homes we visited had no windows. Even the homes we visited with concrete walls often did not have glass windows, but instead had wooden windows, which were rarely opened.

Even in houses with adequate walls and floors, a common problem is the lack of a sufficient number of rooms for the family. This compares to 76% of houses in Managua having 1 or more bedrooms. In many cases, a house simply has one big room, with a kitchen in one corner and sleeping areas delimited by flimsy fabric walls (such as a sheet hanging on a line or stapled onto a wooden frame). Examples are shown in Photo 4 below.

Workers usually have a rudimentary kitchen in the corner of their house (see Photo 5), where they cook with gas. Most of the worker homes we visited either did not have a refrigerator, or the one they had didn't work (compared to 57% of houses in Managua having a refrigerator). Nor was there usually piped water inside the home, but rather in the backyard. Latrines were also typically outside the house in the backyard (see Photo 6). These housing conditions were well below what is typical in Managua (see Table 3).

Photo 3: Photos from neighbourhoods close to the Las Mercedes Free Trade Zone in the outskirts of Managua (Alexis Arguello, Monte Fresco and Santa Elena)



Photo credits: Lykke E. Andersen.

Photo 4: Examples of room divisions made of fabric



Photo credits: Lykke E. Andersen.

Photo 5: Typical kitchens in a corner of the house



Photo credits: Lykke E. Andersen.

Photo 6: Typical latrines in the back yard



Photo credits: Lykke E. Andersen.

Table 5 presents a summary of the homes visited, ordered by the estimated/actual rental cost.

Table 5: Housing units surveyed in or near Managua, Nicaragua

# of inhabitants	Estimated monthly rent	Size and rooms	Comments	Acceptable standard?
1 adult, 1 child	C\$ 1000 (USD 30)	25 m ² , 1 room	Zinc walls and dirt floor, water every second day, almost 4 hours of commute every day	No
2 adults, 1 child	C\$ 1200 (USD 36)	20 m ² , 1 room	Rented room with shared bathroom. Within walking distance of work	No
1 adult, 1 child	C\$ 1200 (USD 36)	35 m ² , 1 room	Precarious zinc walls, no windows, within walking distance of work	No
1 adult, 1 child	C\$ 1500 (USD 45)	30 m ² , 1 room	Dirt floor, flood hazard, water is free because of bad quality, within walking distance of work	No
2 adults, 3 children	USD 50	30 m ² , 1 room	Zinc walls, dirt floor, new, within walking distance of work	No
9 adults, 5 children	USD 80	50 m ² , 2 rooms	Extended family, 10 people sleeping in one room, 4 in the other room, more than 2 hours of commuting every day	No
1 adult, 1 child	USD 80	42 m ² , 2 rooms	Dirt floor, more than 2 hours of commuting every day	No
3 adults, 2 children	USD 80	55 m ² , 2 rooms	Zinc walls, dirt floor, flood risk, within walking distance of work	No
2 adults, 2 children	USD 80	42 m ² , 2 rooms	Bathroom shared with neighbors, no windows, water free because of bad quality	No
3 adults, 2 children	USD 100	56 m ² , 1 room divided by fabric walls	Dirt floor, water is free because of bad quality, within walking distance of work. Previously rented a decent home for USD 130	No
2 adults, 2 children	USD 150	42 m ² , 2 rooms	Solid construction, but with water in the backyard, and only one window that doesn't open. Within walking distance of work. Used to rent a decent house with 3 rooms for USD 150	Almost
2 adults, 2 children	USD 150	45 m ² , 2 rooms	Good quality home within walking distance of work. Water is free because of bad quality	Yes
5 adults	USD 150	46 m ² , 3 rooms	This family could afford a decent house because they were 4 working adults and a university student.	Yes
5 adults, 1 child	USD 200	300 m ² , 3 rooms	Good quality construction, which includes a neighborhood bar	Yes
3 adults, 3 children	USD 250	170 m ² , 3 rooms	Good quality construction, which includes a neighborhood grocery store. The river sometimes floods the garden.	Yes

Source: Authors' elaboration.

According to our admittedly limited housing survey in or near Managua, the homes of factory workers typically do not qualify as decent and healthy housing. Even workers who had worked continuously for more than 20 years in the Free Trade Zone had not managed to save sufficiently to secure a decent home. The few homes that we found to be of decent quality either had an unusually high number of income earning adults, a small business associated with the home, or had savings/remittances from someone working abroad.

Our survey suggests that the monthly rental costs of a decent home would be in the USD 100-150 range, but due to the very small sample size, it is better to confirm the precise value to be used from the much larger survey carried out by the National Statistical Institute. This is what we do in the next sub-section.

7.3 Rent or user cost for basic acceptable housing

In order to narrow down the rent value for basic acceptable healthy housing in the metropolitan area of Managua, we combined the results of our own rapid assessment with the analysis of the 2014 household survey carried out by the National Statistical Institute. The official government survey covered more than 2,000 single-family dwellings in the Metropolitan area of Managua, while we visited only 15 worker families with at least one person working in the Free Trade Zone, so the official data is obviously more reliable in terms of the sheer quantity of houses. On the other hand, our field visits were to locations near the Free Trade Zone and we were able to determine through observation the condition of houses, which is not always possible from the official survey.

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

- Households located in the metropolitan area of Managua.
- Households with two to seven members (thereby excluding one-person households and multi-family households).
- Houses with rent or an imputed rent value between USD 10 and 150 per month. By imposing these limits we ensure a selection of modest houses, which excludes both houses that are being provided almost for free for some reason (usually kind relatives), but also excludes “luxurious” houses, which would drive up the averages.

For this sub-sample of 2,072 households, we analyzed compliance with minimum requirements in the following seven dimensions of decent housing (according to the standards explained in Table 3):

- Exterior walls ok
- Roof ok
- Floor ok

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

Table 6 shows that the median rent value for these 2,072 houses in our sample is USD 57 per month. Almost half of these houses comply with the minimum requirements in all seven dimensions analyzed. Median rent for those that comply with all seven dimensions is USD 100 per month, while the median rent for houses complying with six of the seven dimensions is USD 38 per month. The USD 30 used in the Basic Consumption Basket by the government will pay for a house that satisfies only four of the seven dimensions. The dimensions that are not fulfilled at USD 30 per month are usually a decent floor and sufficient number of bedrooms.

For the purpose of establishing a rental cost for our living wage estimate, it seems reasonable to use USD 100, which is the median rent in 2014 for non-luxurious houses (with rental value between USD 10 and USD 150) with 2-7 inhabitants in Managua, Nicaragua that have the seven basic dimensions of decent housing of the UBN methodology (see Table 3). To this, we added 23% to allow for inflation between 2014 and 2019. **The rental cost of decent housing for our model family based on government data is therefore USD 123 (C\$ 4,125) per month.** This value seems very reasonable in light of our own housing survey in the areas inhabited by Free Trade Zone workers.

Table 6: A tabulation of houses in Managua, 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	2	0%	0%	0%	0%	50%	50%	0%	19
2	22	0%	95%	0%	5%	36%	64%	0%	21
3	66	12%	95%	6%	30%	61%	89%	6%	19
4	185	17%	100%	9%	79%	90%	98%	7%	30
5	189	72%	100%	30%	83%	89%	99%	26%	38
6	453	94%	100%	78%	89%	98%	100%	41%	38
7	1155	100%	100%	100%	100%	100%	100%	100%	100
Total	2072	85%	100%	77%	91%	96%	99%	68%	57

Notes: Only including households in the Managua metropolitan area 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.

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 sample of modest 2-7 person households in Managua, Nicaragua in the 2014 EMNV household survey. Table 7 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 UBN dimensions listed in Table 3. Presumably the latter reflects the costs for a family that can afford decent housing (i.e. earns a living wage).

Table 7: Median monthly expenses for water, electricity, gas, and firewood, for houses in Managua 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 Managua Nicaragua with 2-7 members, with rent between USD 10 and 150/month	2,072	100	200	295	0	C\$ 595 (USD 23)
Only households that comply with the seven dimensions of decent housing listed in Table 3	1,155	130	300	300	0	C\$ 730 (USD 28)

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

We used the value of C\$730 from 2014 but increased this by the inflation rate from 2014 to 2019 of around 23%, implying C\$898 per family per month for 2019. This value was also confirmed as reasonable by our own survey of utility costs among factory workers.

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 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 household expenditure data.

A four-step approach was used to estimate NFNH costs for the living wage. First, we used household survey expenditure tabulations by the National Statistical Institute for 2014, for different income levels (INIDE, 2016b). In Step 2, we adjusted 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 expenditures out of food and into the NFNH category because they are not included in our model diet. In Step 3, we calculated 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 costs, 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 in-depth post check adjustments were needed. This step is therefore omitted in the present report, but a detailed discussion of step 4 can be found in Andersen and Hernani-Limarino (2018) for the case of Northwest Nicaragua.

In summary, we find the NFNH costs for the Managua Living Wage to be 66% of food costs. Since food costs were estimated at C\$7,277 (USD 216) per month per family, this means that **NFNH costs amount to C\$4,803 (\$143) per month per family (i.e 0.66 times C\$7,277).**

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

8.1. Step 1 of the NFNH calculations

Table 8 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 expenditure 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 expenditure on NFNH items corresponds 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 in urban Nicaragua. This means that we should not use the ratio found for extremely poor or poor households. 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 we feel that this column provides a good point of departure for our living wage estimate.

Table 8: 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 expenditure weights of the Nicaraguan Consumer Price Index (Banco Central de Nicaragua, 2010). The CPI uses expenditure weights for 298 different products and services, which makes it possible to single out the items that we consider unnecessary for a living wage (cigarettes, lottery tickets, and a private car), as well as items that should be moved from one major group category to another (alcohol and the service and profit part of food eaten away from home should be moved from the food category to the NFNH category).

Unfortunately, the weights of the currently used CPI are a bit old (2006), 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 weights, 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 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 for a living wage. According to the CPI expenditure weights, the

expenditure on lottery tickets is slightly higher than cigarettes at 0.585%. We 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 rule them out altogether. According to the CPI expenditure weights, 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 0.448% 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 expenditure weights, 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 adopt this share for our calculations. This means that 4.7% is deducted from the Food category and transferred to the NFNH category “Other”.

The final adjustment we make is for private vehicle ownership, which is not considered necessary for decency. In the CPI expenditure weights, 5.113% of expenditures are dedicated to private transportation, while only 3.815% is 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 assume that people could save about 50% by switching from a private vehicle to public transportation. This means that we transfer 1.2% from transportation to the eliminated category “Excess private vehicle costs”.

Table 9 shows the adjusted structure of household expenditures.

8.3. Step 3 of the NFNH calculations

In summary, we find the estimate of NFNH costs for Managua to be 66% of food costs. Since food costs were estimated at C\$7,277 (USD 216) per month per family, this means that NFNH costs amount to C\$4,803 (USD 143) per month per family.

Table 9: Adjusted structure of household expenditures (third quintile), 2014

Major expenditure group	
Composition of consumption (%)	
Food	46.1
Housing	21.2
- Rental cost	12.9
- Water, electricity, gas, etc.	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: Author's adjustment to the original calculations by INIDE/EMNV 2014 for the third quintile of the household expenditure distribution.

9. 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).

Nicaragua is unusually exposed to natural hazards, such as earthquakes, volcanic eruptions and hurricanes.¹³ Still, insurance is almost non-existing, so households have to be able to withstand and recover from such events.

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\$ 855 (USD 25) per month per family to cover unexpected events and discretionary spending.**

¹³ <https://www.radiolaprimerisima.com/files/doc/MapaDOS14032018.pdf>

PART II. LIVING WAGE FOR WORKERS

10. 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 for this reason 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 Nicaragua.

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 Managua of 4.10 persons.¹⁴

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 woman¹⁵. A small share (2.2%) of these children die before they turn five,¹⁶ so a reference family of two children under 18 living at home with their parents is a good assumption.

11. 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 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. In Nicaragua, workers normally work 48 hours per week.

¹⁴ The EMNV 2014 divides all Nicaraguan households into four regions. Our calculations refer to the households located in Managua metropolitan region.

¹⁵ According to the World Bank's World Development Indicators for 2015.

¹⁶ According to the World Bank's World Development Indicators for 2015.

The other adult in the family 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 the metropolitan area of Managua, which according to the 2014 household survey was 32.4 hours per week¹⁷ (see Table 10 below). This average includes people who are temporarily unemployed, on unpaid sick leave, on unpaid vacation, studying, or 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 Managua can be calculated as:

$$1 + \frac{32.4}{48} = 1.68$$

Table 10: Average work hours per week for people of prime working age (25-59 years) in Managua 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 Managua Nicaragua			Implied number of full-time equivalent workers per family
	Men	Women	Average	
Managua	38.5	26.3	32.4	1.68

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 was: "How many hours per week do you usually work in this occupation?". Only households from the Managua metropolitan area were included, and only households with 2-7 members. All calculations in this table were 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.

12. 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 7% of their cash salary¹⁸.

¹⁷ 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.

¹⁸ The percentage is applied to the ordinary salary as well as the *Aguinaldo* (1/12 of the ordinary salary).

Workers earning less than C\$ 100,000 per year do not pay income tax (see Table 11). However, the part of the cash salary that exceeds C\$ 8,333 per month (USD 248) is taxed at the rate of 15%, and this is sometimes observed for Free Trade Zone workers.

Table 11: 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 (2012). Ley de Concertación Tributaria, Art. 23.

With these final pieces of information, we have all the components necessary to estimate the living wage for the metropolitan area of Managua.

Table 12 is the most important table of this 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 Managua to achieve a minimally acceptable living standard amounts to C\$17,958 (USD 534).

In Part II, we divide these family expenses by the number of full-time equivalent workers in the family (1.68) and add compulsory social security contributions to the INSS and income taxes, in order to arrive at a gross monthly living wage of C\$ 12,101 (USD 360). This is what a worker on average needs to earn per month to cover family expenses, assuming that the spouse earns 68% of that salary as well.

Some of a worker's wage is not paid every fortnight, but rather accumulated in two larger payments: 1) *Aguinaldo*, or 13th month, is paid in December of each year, and 2) Termination Pay, which also corresponds to an extra month payment per year worked. Termination Pay is a legally mandated cash payment that is paid by the end of a work contract. If a worker only works for six months, they will get Termination Pay of half a monthly salary. Most workers in the Free Trade Zone work for the same company for many years, though, and in order to avoid that obligations accumulate over time, employers usually pay out the Termination Pay every two years, and renew the work contract. These larger payments contribute to cover necessary family expenses, but are typically used on irregular, larger expenses, such as clothing, furniture, household appliances, or home improvements, while the fortnightly salary is used to cover daily expenditures, such as food and transportation.

Thus, in Part III, we deduct *Aguinaldo* and Termination Pay to arrive at the base living wage per month, which is the monthly salary (before deductions), which corresponds to the concept "*Total Devengado*" on a regular payslip. The base living wage is calculated at C\$

10,373 (USD 308) per month. This assumes that workers receive a 13th month payment every year as well as Termination Pay every two years.

Table 12: Calculation of the base and gross living wage for Managua, Nicaragua

	Local currency (C\$)	USD ^a
PART I: FAMILY EXPENSES		
Food cost per month for reference family^b (1)	7,277	216
Average food cost per person per day (adjusted for free school meals)	59.81	1.78
Housing costs per month (2)	5,023	149
Rent per month for acceptable housing	4,125	123
Utility costs per month	898	27
Non-food non-housing costs per month (3)	4,803	143
Preliminary estimate of NFNH costs ^c	4,803	143
Health care post check adjustment	0	0
Education post check adjustment	0	0
Additional amount (5%) for sustainability and emergencies (4)	855	25
Total living costs per month for basic but decent living standard for reference family (5) [(5)=(1)+(2)+(3)+(4)]	17,958	534
PART II. NET AND GROSS LIVING WAGE PER MONTH		
Net living wage per month based on 1.68 full-time equivalent workers per family (6) [6=(5)/1.68]	10,689	318
Statutory deductions from pay (7)	1,412	42
Social security contribution to INSS (7%) ^d	847	25
Income tax ^e	565	17
Gross living wage per month (8) [(8)=(6)+(7)]	12,101	360
PART III. HOW GROSS LIVING WAGE IS RECEIVED		
Aguinaldo (1/12 th of gross monthly living wage) (9) ^f	864	26
Termination payment (1/12 th of gross monthly living wage) (10) ^g	864	26
Gross monthly living wage received each month (11) [(11)=(8)-(9)-(10)]	10,373	308

Notes: ^a The exchange rate used for November 2019 was 33.64 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 7% social security contribution to INSS is deducted from the cash wage, the aguinaldo and the termination payments.

^e The income tax rate is 15% of the amount of the gross cash wage exceeding C\$ 8,333.33.

^f Aguinaldo is paid in December and corresponds to one extra month of payment per year.

^g This assumes that contracts are renewed regularly, so termination payments, corresponding to one extra month of payment per year, is paid at least every second year.

Source: Authors' calculations.

In addition to the gross living wage, employers pay 22.5% in social security contributions directly to the state. This means that if the employer pays a living wage, the total cost to the employer would be C\$ 12,101 * 1.225 = C\$ 14,824 per month (USD 441).

Table 13 lists key assumptions used for the calculation of the living wage for Managua, Nicaragua.

Table 13: Key values and assumptions used for calculating the living wage for Managua, Nicaragua

Key values and assumptions	
Exchange rate of local currency to US\$	33.64 C\$/USD
Number of full-time workers per couple	1.68
Number of work hours in a normal week	48
Reference family size	4
Number of children in reference family	2
NFNH to Food ratio	0.66

Source: Values derived in previous sections of this report.

PART III. ESTIMATING GAPS BETWEEN LIVING WAGE AND PREVAILING WAGES

13. Prevailing wages for workers in the free trade zones of 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. In this section, we compare our living wage to the national poverty line, the minimum wage, and the prevailing wages in the Free Trade Zone of Managua in what is called a wage ladder.

13.1 Poverty lines

The latest official report on poverty and inequality in Nicaragua (INIDE, 2016a) establishes the national poverty line at C\$18,310.99 per person per year, and the extreme poverty line at C\$11,258.93 per person per year. These correspond to C\$50.17 (USD 1.49) and C\$30.85 (USD 0.92) per person per day, respectively.

Those poverty lines sound very low, but we have to take into account that a US dollar in Nicaragua has more purchasing power than a US dollar in United States. Indeed, the conversion factor from Nicaraguan Córdobas to Purchasing Power Parity (PPP) adjusted International Dollars is 11.725¹⁹ rather than the 33.64 C\$/USD indicated by the official exchange rate in November of 2019. Thus, the national poverty line translates into 4.28 PPP\$ per person per day, which is actually above the international poverty line wage for lower-middle income countries of 3.2 PPP\$ per person per day of C\$2,717 (i.e. $3.2 * 11.725 * 30.41 * 4 / 1.68$)²⁰.

Thus, it is reasonable to use the national poverty line in our wage ladder. To make the values comparable, we convert the annual poverty line per person of C\$18,310.99 into the monthly income needed to to keep a family of four, with 1.68 full-time workers at the national poverty line. The result is C\$3,633 (i.e. $(18,310.99 / 12) * 4 / 1.68$), which corresponds to a monthly salary of USD 108. Our living wage is 3.3 times the national poverty line wage and 4.5 times the international poverty line for lower-middle income countries, which demonstrates how inadequate both poverty lines are.

¹⁹ According to the World Bank's World Development Indicators, PPP conversion factor, private consumption (LCU per international \$) - Nicaragua, for 2018, found here: <https://data.worldbank.org/indicator/PA.NUS.PRVT.PP?locations=NI>

²⁰ See: <https://blogs.worldbank.org/developmenttalk/richer-array-international-poverty-lines>

13.2 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.

Since January 2019, the minimum basic wage is C\$5,911.39 per month for the industrial sector in the Free Trade Zone²¹. At C\$10,373, our calculated gross monthly living wage is thus 75% higher than the monthly minimum wage. In addition to the monthly minimum wage, workers receive a 13th month bonus *aguinaldo* and Termination Pay. When the prorated values of these two bonuses are added to the monthly minimum wage, the total value per month of the minimum wage is C\$6,896.

13.3 Prevailing wages

Factory workers are generally paid a base salary of C\$5,911 (USD 178) per month for 48 hours of work, corresponding to C\$28.71 (USD 0.87) per hour. This base salary coincides with the legal minimum wage.

However, factories generally have a system of production bonuses, which allows workers to work extra time as well as achieve bonuses for reaching production goals. We obtained detailed payment information for a sample of 95 production line workers who all worked full-time the month preceding our fieldwork²². For this sample, we found an average monthly salary of C\$8,470 (USD 252). This is about 18% below our estimated living wage assuming payment of both *aguinaldo* and Termination Pay.

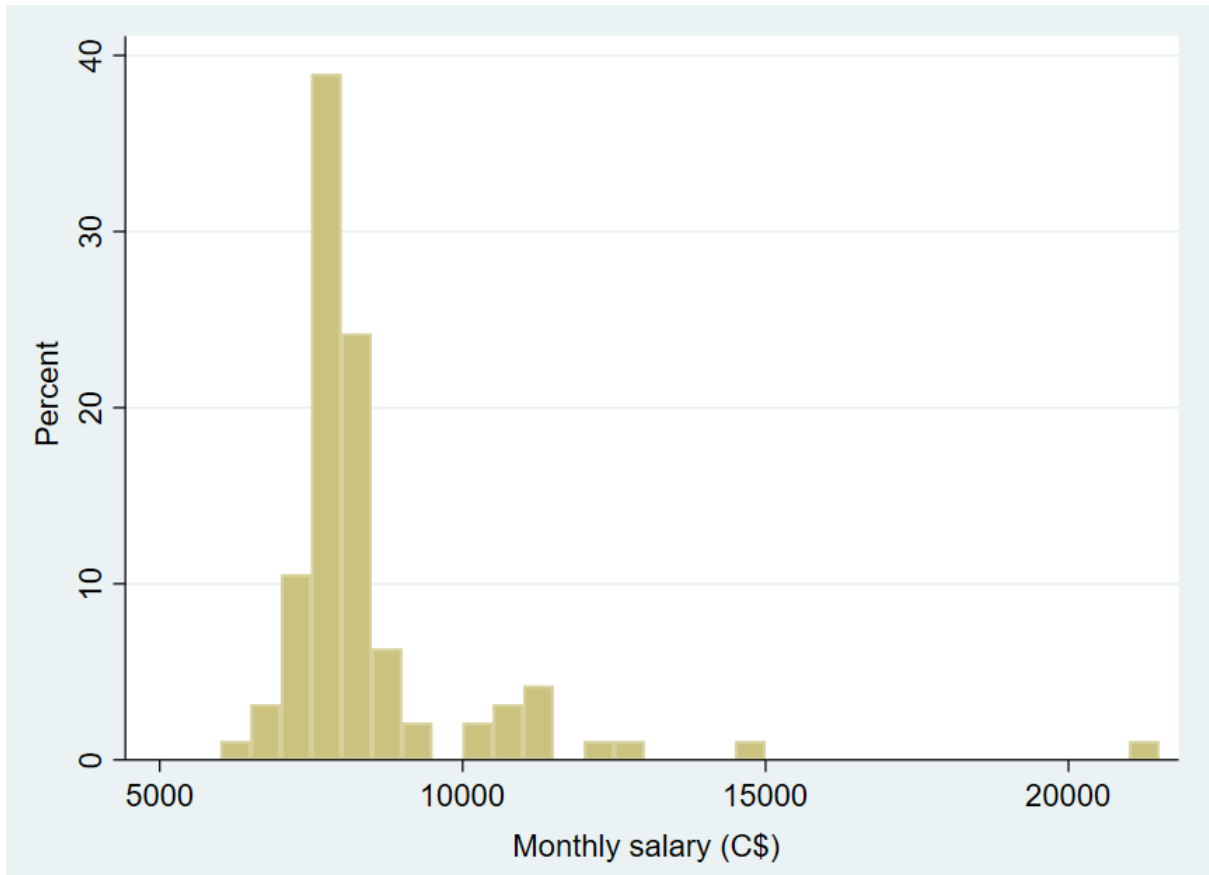
On average, these 95 workers worked approximately 30 hours extra per month, with one worker in our sample reaching as high as 42 hours extra in the month analyzed. Overtime work is very attractive for workers, as they on average earn almost three times more per hour for this extra effort which triggers overtime pay and production bonuses (on average C\$85 per hour of extra time worked).

There is quite a lot of variation in the production bonuses, though, leading to a distribution of monthly wages as shown in Figure 4. About 62% of workers earned between C\$7,500 and C\$8,500 per month, while about 13% earned as much as a living wage (working overtime and being lucky to be assigned particularly well paid tasks) – although they did not actually earn a living wage as defined by the GLWC and many others, because a living wage must be earned in normal working hours.

²¹ <https://www.elnuevodiario.com.ni/economia/482648-salario-minimo-zonas-francas-nicaragua/>

²² The salary information was from a random sample of 95 production line workers in the Free Trade Zone Las Mercedes. These workers are probably not representative of all production workers in the Zone though.

Figure 4: Distribution of monthly salaries for sample of factory workers



Source: Author's calculations based on a sample of 95 pay slips for factory workers in the Free Trade Zone Las Mercedes in Managua.

13.4 Wage ladder

Figure 5 presents a simple wage ladder for Managua. It compares our monthly living wage with three other relevant monthly incomes.

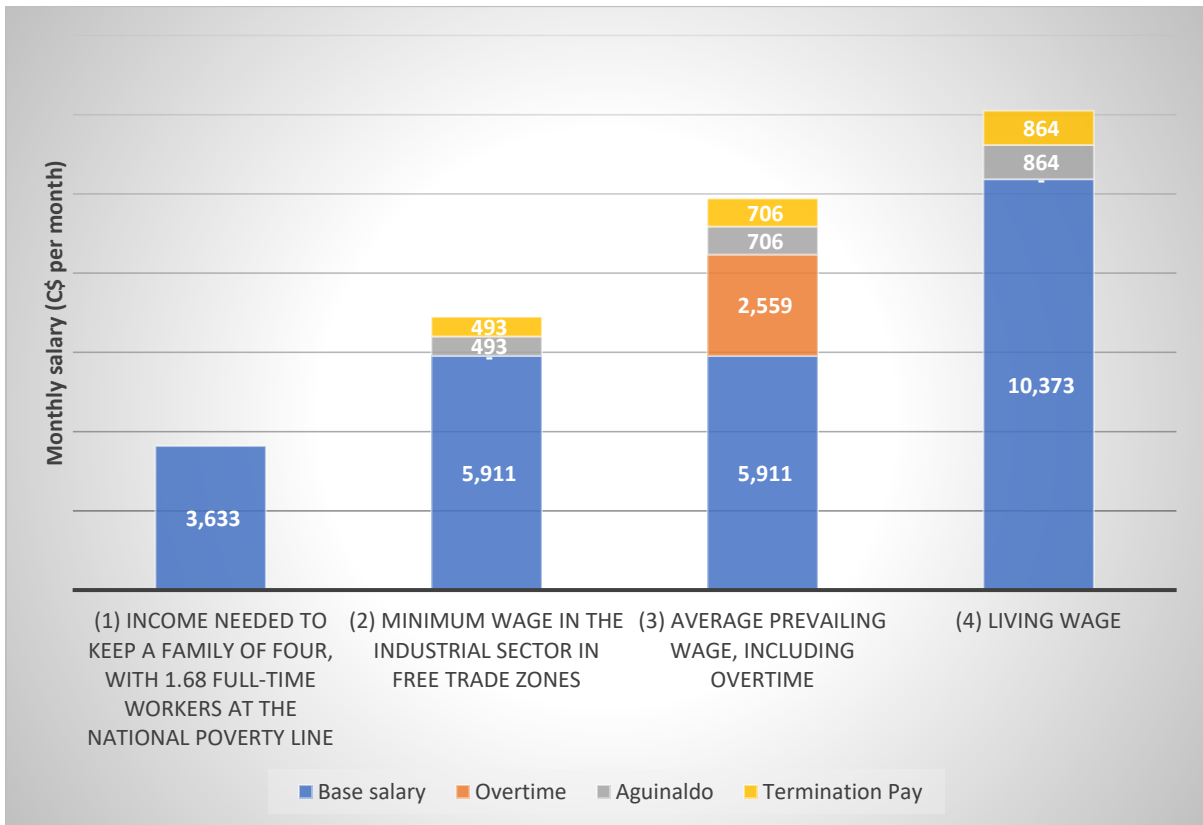
The first bar is the monthly income that would be needed to keep the model family of four, with 1.68 workers just at the national poverty line.

The second bar is the minimum wage for workers in the Free Trade Zone companies.

The third bar is the average prevailing wage, including overtime work, for 95 workers whose pay information we were provided. They are not necessarily representative for the rest of the Free Trade Zone, though and are probably better paid than usual.

The fourth bar - our living wage - is still higher.

Figure 5: Wage ladder for Managua, Nicaragua



Note: The World Bank international poverty line wage equals C\$2,717. The average prevailing wage is based on information for a sample of 95 workers in the Free Trade Zone.

Source: Author's calculations.

Our living wage is 3.3 times the national poverty line wage (and 4.5 times the World Bank international poverty line wage for a lower-middle income country such as Nicaragua). Our living wage is 75% higher than the minimum wage.

According to both our calculations and our experiences in several Free Trade Zones of Nicaragua (especially textile and cigar factories, which account for the vast majority of manufacturing jobs in Nicaragua), manufacturing workers earn well above the poverty line wage, but are still far from earning a living wage. We estimate that our living wage is at least 65% higher than prevailing wages without overtime (and 22% higher than prevailing wages including overtime - although it is important to keep in mind that a living wage needs to be earned in normal working hours).

The main problem for factory workers is that they cannot earn a decent salary, especially within normal working hours (48 hours per week). To help cope with this situation, they typically engage in considerable overtime work each month in order to earn much needed additional income.

Workers like overtime work because it pays 2-3 times more than normal work hours even though it complicates family life. Factory owners dislike overtime work because it is so expensive, but they need to make sure they fulfil their orders.

It seems to be in everybody's interest to make sure that production targets can be met within normal working hours, with some flexibility.

14. Conclusions and recommendations

Our estimate is a gross living wage (aka living wage) of C\$12,101 (USD 360) per month for workers in the Free Trade Zone of Managua, Nicaragua. This means that workers need to earn C\$10,373 per month (USD 308), because workers also receive *aguinaldo* (1/12th of the base salary paid every year in December) and Termination Pay (1/12th of the base salary paid in pro-rated terms by end of contract, or renewal of contract, which typically happens every two years).

This living wage is 75% higher than the minimum wage, and at least 65% higher than our estimate of prevailing wage without overtime. Our living wage is only 22% higher than our estimate of prevailing wage with overtime pay, although a living wage should be earned in normal working hours. Our living wage is 3.3 times the national poverty line wage, and 4.5 times the World Bank poverty line wage both of which are clearly too low for Nicaragua.

This living wage was calculated for November 2019. While the fieldwork was done only in areas within commuting distance of the Las Mercedes Free Trade Zone in Managua, our impressions are that it is relevant also for other Free Trade Zones of Nicaragua.²³

The living wage is the wage necessary for a typical family in or near Managua, with 1.68 workers and two children to pay for a nutritious, but low-cost diet, basic acceptable healthy housing, adequate health care, education through secondary school for children, and clothing and other essential expenses considered necessary for basic decency. It needs to be earned in normal working hours.

It is important to note that although factory workers in Free Trade Zones in Nicaragua do not currently earn a living wage, this type of work is still considered one of the best options for workers without university education in Nicaragua. Thus, people who manage to access one of these jobs tend to stay in it for many years.

²³ This view is supported both by secondary data for urban areas, and by our own impressions from fieldwork for the Living Wage Report for Northwest Nicaragua (Andersen and Hernani-Limarino, 2019), where we spent one day visiting cigar factories and cigar factory worker homes in the city of Estelí.

While the current minimum wage (corresponding to the base salary without overtime or production bonuses) is enough to feed a family on the typical, frugal Nicaraguan diet of rice, beans and corn tortillas, it is not sufficient to also afford better nutrition and decent housing nor many other necessary basic expenses. It was observed that many workers in the Managua Free Trade Zone, who have worked continuously for decades, still live in precarious housing with flimsy outer walls made of zinc iron sheets, and even flimsier inner walls made of fabric. And due to long working hours, most worker families rely on the help of relatives to take care of their children.

Another major challenge observed during the fieldwork was that workers relied on very expensive informal loans, not only for emergency expenses, but also for housing investments and often for monthly expenses. Almost all workers we interviewed had this type of high-interest loans, with the lowest interest rate observed being 96% per year, and the highest 20% per month, despite inflation being only around 4% per year.

In conclusion:

- Factories – and the global value chain - need to make sure that workers can earn a living wage within normal working hours (48 hours per week), while still maintaining incentives for efficient, high-quality work. This may require analyzing production processes to identify specific bottle-necks and inefficiencies, but more importantly, it requires valuing and appreciating each employee, and making sure that they are thriving emotionally and physically, so that they can produce high-quality work consistently during many years. It also helps if they are proud of the products they produce and know that they won't quickly end up in a landfill. Even after optimizing processes and motivation, however, higher pay per unit of output may be needed to reach a living wage.
- Many workers work overtime to increase their wages, and this brings with it many problems for workers and production. Raising wages towards a living wage could help to alleviate the current reliance on overtime.
- Two major problems identified for workers in the Free Trade Zone in Managua are the very poor housing they currently live in, and their use of extremely high interest loans. Workers simply do not earn enough at present to afford basic decent rental housing or to make improvements to owned houses without resorting to extremely expensive loans (up to 20% interest per month).

REFERENCES

- Andersen, L. E. & Hernani-Limarino, W. (2018). Living Wage Report, Northwest Nicaragua: Context provided in the Coffee, Banana and other labor-intensive agriculture. Global Living Wage Coalition, Series 1, Report 20. August.
<https://www.globallivingwage.org/wp-content/uploads/2019/01/2017-LW-Nicaragua-Benchmark.pdf>
- Anker, R. and Anker, M. (2017). Living wages around the world: Manual for measurement. Edward Elgar Publishing. Cheltenham and Northampton.
- Anker, R. (2011). Estimating a living wage: A methodological review. International Labour Office. Geneva.
- Banco Central de Nicaragua (2017). Informe de Remesas Familiares Primer Trimestre 2017. Managua. Junio.
http://www.bcn.gob.ni/publicaciones/periodicidad/trimestral/remesas/Remesas_1.pdf.
- Banco Central de Nicaragua (2010). Índice de Precios al Consumidor. 2006=100. Nota Metodológica. Managua. Enero.
<http://www.bcn.gob.ni/publicaciones/metodologias/documentos/MetodologiaPC2006.pdf>.
- Comisión Nacional de Salario Mínimo (2017) Acta No. 1. 17/02/2017.
<http://www.mitrab.gob.ni/bienvenido/documentos/acuerdos/ACTA%20ACUERDO%20DE%20LA%20COMISION%20DE%20SALARIO%20MINIMO%202017.pdf>.
- FUNIDES (2017a) “La calidad de la educación en Nicaragua.” Managua: Fundación Nicaragüense para el Desarrollo Económico y Social. Only a presentation of the study is available on-line: <http://funides.com/media/attachment/calidad-de-la-educacion-presentacion.pdf>.
- FUNIDES (2017b) “Disponibilidad de mano de obra para el corte de café.” Managua: Fundación Nicaragüense para el Desarrollo Económico y Social.
- Global Living Wage Coalition (GLWC). 2016. Available at www.isealalliance.org/sites/default/files/GLWC_who_we_are.pdf [Accessed 21 September 2016].
- INIDE & MINSA (2013). Encuesta Nicaragüense de Demografía y Salud 2011/12: Informe Preliminar. Instituto Nacional de Información de Desarrollo & Ministerio de Salud. Managua, junio.
- INIDE (2014). Encuesta de Medición de Nivel de Vida EMNV 2014. Managua: Instituto Nacional de Información de Desarrollo.
- INIDE (2016a). Reporte de Pobreza y Desigualdad EMNV 2016. Managua: Instituto Nacional de Información de Desarrollo.

INIDE (2016b). Encuesta Nacional de Hogares sobre Medición de Nivel de Vida 2014.

Managua: Instituto Nacional de Información de Desarrollo. Febrero.

Muehlhoff, E., Bennett, A. and McMahon, D. (2013). Milk and dairy products in human nutrition. Rome: FAO. <http://www.fao.org/3/i3396e/i3396e.pdf>

Nicaragua (2012). Ley de Concertación Tributaria.

([http://legislacion.asamblea.gob.ni/SILEG/Iniciativas.nsf/0/3636a2c1dc3dae2606257654006000c2/\\$FILE/Ley%20No.%20822,%20Ley%20de%20concertaci%C3%B3n%20tributaria.pdf](http://legislacion.asamblea.gob.ni/SILEG/Iniciativas.nsf/0/3636a2c1dc3dae2606257654006000c2/$FILE/Ley%20No.%20822,%20Ley%20de%20concertaci%C3%B3n%20tributaria.pdf))

Schofield, W. N. (1985). "Predicting basal metabolic rate, new standards and review of previous work". *Human Nutrition Clinical Nutrition*, 39, Suppl 1: 5–41.