Benchmarking the living income gap of smallholder farmers in southern Ethiopia

Beyene Teklu Mellisse [3], Legesse Abate [1], Akalu Teshome [1], Julia Glaser [2], Mirjam Schaap [2]

[1] Stichting Wageningen Research Ethiopia
[2] Wageningen Centre for Development Innovation
[3] Hawassa University

RAISE-FS Working paper #012

WAGENINGEN UNIVERSITY & RESEARCH

RAISE-FS Resilient Agriculture for Inclusive and Sustainable Ethiopian Food Systems

Benchmarking the living income gap of smallholder farmers in southern Ethiopia

Beyene Teklu Mellisse [3], Legesse Abate [1], Akalu Teshome [1], Julia Glaser [2], Mirjam Schaap [2]

[1] Stichting Wageningen Research Ethiopia

[2] Wageningen Centre for Development Innovation

[3] Hawassa University

Resilient Agriculture for Inclusive and Sustainable Ethiopian Food Systems (RAISE FS)
Addis Ababa, April 2024

RAISE-FS is funded by the Embassy of the Kingdom of the Netherlands in Addis Ababa (grant number 4000004753).
RAISE-FS is a programme hosted by Stichting Wageningen Research Ethiopia

RAISE-FS Working paper #012

WAGENINGEN
UNIVERSITY & RESEARCH

RAISE-FS
Resilient Agriculture for Inclusive and Sustainable Ethiopian Food Systems

Teklu B., Abate L., Teshome A., Glaser J., and Schaap M. 2024. Benchmarking the living income gap of smallholder farmers in southern Ethiopia. Stichting Wageningen Research Ethiopia, Addis Ababa. SWRE-RAISE-FS-24-027.

The ongoing discussion about the suitability of income benchmarks for rural farming households persists. Our analysis of Living Income Methodology in the *woreda*s of southern Ethiopia reveals a living income benchmark per adult equivalent per day. Approximately half of this benchmark is allocated to food costs, while other expenses fluctuate depending on market accessibility. By computing living income benchmarks, it becomes possible to compare households at the individual level and evaluate the living income gap. This working paper focuses on benchmarking the living income gap of smallholder farmers in southern Ethiopia.

Keywords: living income, benchmarking, gap, food system, Ethiopia

This working paper can be downloaded for free at: https://doi.org/10.18174/654532

RAISE-FS Working paper #012
Photo cover: Andualem Tadesse

Contents

List of tables and figures

Preface

Resilient Agriculture for Inclusive and Sustainable Ethiopian Food Systems (RAISE-FS) is a four-year program funded by the Dutch Embassy in Addis Ababa and hosted by Stichting Wageningen Research Ethiopia based in Addis Ababa, to bring about transformation in the Ethiopian food system. RAISE-FS will develop and implement a demand-driven and interdisciplinary approach to Research for Food System Transformation (R4FST) and as such contribute to the Government of Ethiopia's transformational agenda.

RAISE-FS adopts the food system approach as a Theory of Change (ToC), which helps in analysing the drivers and food system activities that contribute to the transformation of the food system by addressing leverage points, resulting in increased productivity, enhanced value chain performance, and improved human nutrition for food security while minimizing environmental impact and ensuring social inclusion.

The project aims to leverage transformation in Ethiopian food systems, covering the spectrum from food-insecure households and regions, to better-off households that are food-secure and can realize production surpluses, towards commodity commercialization efforts that contribute to rural and urban consumption demands and export.

Contact : info.raisefsethiopia@gmail.com
More information : www.raise-fs.org

List of abbreviations and acronyms

AME	Adult Male Equivalent
ETB	Ethiopian ETB
FAO	Food and Agricultural Organizations of the United Nations
FGD	Focused Group Discussion
KII	key Informant Interview
NFSS	National Food Safety System
NFNH	Non-Food Non-Housing
NGO	Non-Governmental Organization
PLC	Private Limited Company
PPP	Purchasing Power Parity
RAISE-FS	Resilient Agriculture for Inclusive and Sustainable Ethiopian Food Systems
RH	Reference Household
SDG	Sustainable Development Goals
SNNPRS	Southern Nation Nationalities and Peoples Regional State
SWR	Stichting Wageningen Research
USDA	United States Department of Agriculture
WCDI	Wageningen Centre for Development Innovation, Wageningen University & Research
WHO	World Health Organizations
WUR	Wageningen University & Research

Abstract

Different benchmarks exist to quantify the amount of income needed to live a decent life, such as the extreme poverty line and the living wage. However, there has been debate about the appropriateness of these benchmarks for rural farming households. In order to determine the living income for rural households, we evaluated the earlier published Living Income Methodology for East Africa in three *woreda*s (Hawassa Zuria, Gumer and Boloso Bombe) of southern Ethiopia. Data collection methods included focus group discussions (FGD), key informant interviews (KII), and market surveys. The living income benchmark is expressed as per adult equivalent per day (AE/day) and data collection is focused on rural households and their immediate surroundings. The living income benchmark for Hawassa Zuria *woreda* was 112.5 ETB (US$ 6.34) PPP/AME/day while 110.1 ETB (US$ 6.20) and 102.2 ETB (US$ 5.76) PPP/AME/day for Gumer and Boloso Bombe *woreda*s respectively. The food cost accounted for about half of the living income benchmark. In less market-accessible areas of Gumer and Boloso Bombe, the cost required to pay for water, family clothing, transportation, and health care was higher compared to market-accessible Hawassa Zuria *woreda*. One explanation for the variation in the cost required to buy food is the differences in the type of commonly consumed food and their corresponding price. Therefore, a comparison of the living income benchmark would be most appropriate for comparing various farming systems and regions with diverse market access, as each farming system affects the type of food produced while the cost of goods is affected by market access. Furthermore, calculating the living income benchmark for a particular area will pave the way to assess the living income gap as it allows household-level comparison of real income with the living income benchmark.

1 Introduction

Two of the seventeen Sustainable Development Goals (SDGs) that are intended to be accomplished by 2030 are eradicating poverty and ending hunger (UN, 2015). The agriculture sector is directly tied to the SDGs since it plays a critical role in enhancing food security and simultaneously generating employment opportunities (Otsuka, 2013). A potential strategy to end hunger is to better ensure food supply by raising agricultural production and broadening the range of agricultural land use (Smyth et al., 2015). The available technology, expertise, and variation in resource endowment among smallholder farmers, however, will not allow low-income countries to produce all the food required (Pawlak & Kołodziejczak, 2020). Although Ethiopia, like other emerging nations, has made significant efforts to reduce poverty, the percentage of its people living below the poverty line still remains at 20% (World Bank, 2015).

Purchasing Power Parity (PPP) 2.15 US dollars per capita per day was set in 2017 as the threshold for extreme or international poverty for low-income nations (World Bank, 2022). In 2017, the number was adjusted to reflect growing prices based on the national poverty thresholds of the world's 15 worst economies. (World Bank, 2022). The international poverty line has been used as an indicator to assess the progress of efforts made to reduce poverty (Debebe & Zekarias, 2020). However, the indicator is very broad, and it does not take country or region-specific realities into account. For hired workers, a more context-specific poverty line, known as the living wage, was developed (Anker, 2008). However, this indicator is not applicable to self-employed farm households. So, a new indicator, called living income benchmarking, was introduced to measure a decent standard of living for East African smallholder farming households (van de Ven et al., 2021).

Since living wages are only applicable to employed communities, it is crucial that living income benchmarking be applied to self-employed communities, such as smallholder farming communities. Living income benchmarking would help to answer the question of how much a typical household in a particular place needs to earn from all income sources in order to achieve a decent standard of living. This creates an opportunity to compare living income benchmarks to the total annual household incomes and ultimately calculate the living income gap of the particular area. Calculating the living income gap paves the way for tailored development options that would bridge the living income gap.

A recent study by van de Ven et al. (2021) developed the idea of living income to benchmark the living income of smallholder farmers in East Africa. The benchmark was developed because there are few indicators that can be used to determine whether the income of farming households is enough to afford a decent living (van de Ven et al., 2021). A living income is defined as having enough money to provide a respectable quality of life for every member of the household, which is measured by taking into account the price of a healthy diet, decent housing, and other non-food expenses for things like clothing, transportation, health care, and education (Komives et al., 2015). Contrary to the poverty line, a living income benchmark can be applied for a specific sample location, better reflecting the region's actual cost of living. It answers the question: 'How much does a typical household in a particular place need to earn from all income sources in order to achieve a decent standard of living?" (van de Ven et al., 2021). The answer to the question creates an opportunity to compare living income benchmarks to the total annual household incomes of agricultural households. The living income benchmark would help to calculate the living income gap and understand how much more farming households need to receive to achieve a living income (IDH, 2023; Oxfam International, 2021). A debate over the appropriateness of using living wages as a measure of self-employed households' income led to the creation of living income benchmarking for East Africa.

In line with this, a Dutch Government-funded project called RAISE-FS is working on food system transformation. One of the aims of the project is to improve the lives of smallholder farmers. To that end, the first step taken was to benchmark the living income and that was followed by assessing the living income gap in three food system typologies in southern Ethiopia. The project also seeks to assess to what extent

small-scale food producers in the intervention area are closing the gap between their real annual income and a living income benchmark.

The three *woerdas* (Gumer, Boloso Bombe, and Hawassa Zuria) purposively chosen for the project have different features. While Boloso Bombe *woreda* represents the food insecure food system, Gumer *woreda* represents the high potential food system; Hawassa Zuria *woreda* is included in the study because it represents the commercial food system. The specific objectives of the study were:

- To obtain insights into the benchmark(s) for living income.
- To obtain insights on how benchmarks might vary across *woreda*s and how many. different benchmarks are needed to meaningfully report on living income gaps.

A second report investigates the size of the gap between the current income of rural households and the living income benchmark calculated in this report. See https://doi.org/ 10.18174/656192

2 Methodology

2.1 Description of the study area

In terms of geographic scope, this study was conducted in Sidama and Southern Nation Nationalities and Peoples Regional State (SNNPRS) of Ethiopia from which three *woredas* were purposefully selected. As noted earlier, while one of the *woredas*, Hawassa Zuria, (chosen from Sidama) represents the commercial food system, the other two *woredas* (Boloso bombe and Gumer), selected from SNNPRS, represent the food insecure and high potential food systems. Within each *woreda*, the project baseline survey was conducted in two *kebeles*. As shown in Figure 1 below, the *kebeles* where the surveys were conducted included: Jara Damuwa and Lebu korom (from Hawassa Zuria *woreda*), Bombe Zuria, and Ajora/Gedela (from Boloso Bombe), and Aselecha and Bordona Denber (from Gumer *woreda*). The living income benchmark was calculated at the *woreda* level.

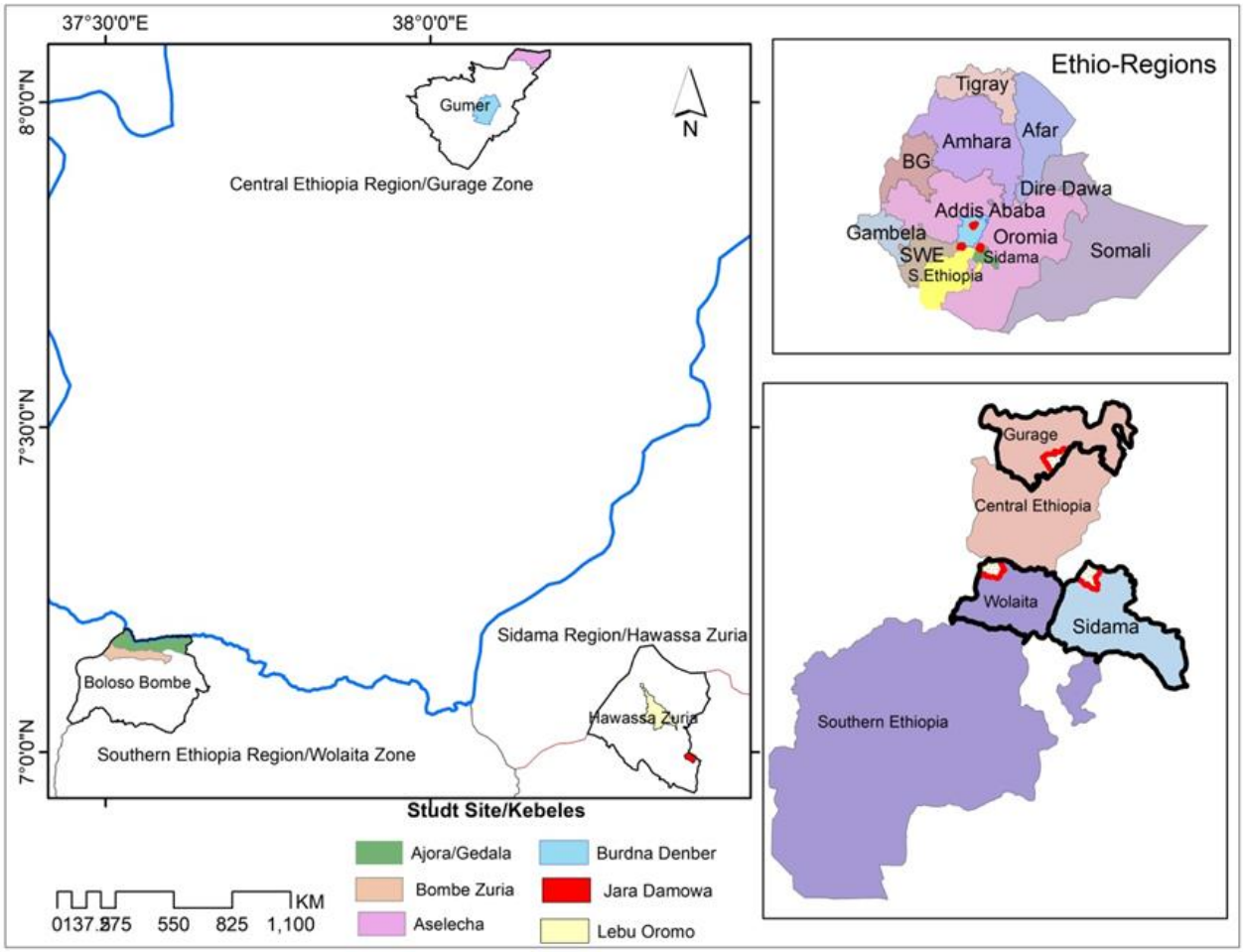

Figure 1 Map of the study area

2.2 Sampling design and study participants

To assess the living income benchmark, various data collection methods such as key informant interviews (KIIs) focus group discussions (FGDs), secondary reports, and participant household surveys were employed. Data gathered from these sources were then triangulated. The size and composition of reference households were obtained using a household survey administered among 328 respondents: 109 respondents from Hawassa Zuria, 108 from Gumer, and 111 for Boloso bombe *woreda*s. While a total of 308 sample households participated during the baseline survey, the remaining 20 took part in innovation piloting.

FGDs and KIIs were conducted to assess costs related to housing, food, and non-food non-housing (health care, education etc). Participants of the FGDs and KIIs were selected only among the respondents who participated in the baseline survey or RAISE-FS. Data regarding the cost of education, health care and transport were collected through KIIs and FGDs; major stable food types were also identified using these two gathering tools. In terms of composition, the FGDs conducted were of three types: One FGD consisted of mixed groups (young and elder older male, female, youth male); the second was composed of female participants of different age groups, and the third had male participants of different age groups. Altogether, a total of nine FGDs consisting of 10-12 members were conducted. Furthermore, *kebele* level health extension centres and schools were visited to collect data on the annual average cost of an individual living in the area.

Food prices for the three *woreda*s were collected in June 2023 at multiple vendor locations, covering central open-air markets and small shops in Hawassa city for Hawassa Zuria *woreda*, and the *woreda*'s capital town for Gumer (Arekit) and Boloso Bombe (Bombe).

2.3 Data collection

For this study, the living income benchmark was calculated using the cost of basic decent housing, the cost of a nutritious low-cost diet, other non-food costs (education, health care and transport) and miscellaneous costs. The height of the costs was collected through FGDs, KIIs and a market survey. In line with the study by van de Ven et al. (2021), the living income benchmark covers four major expenditure groups: food, housing, non-food non-housing (NFNH) and social duty and unforeseen costs.

Table 1 Criteria and variables for living income benchmark

no	Criteria	variables
1	Food cost	low nutritious diet cost and miscellaneous cost*
2	Housing cost	value of owner-occupied house, utilities, maintenances and tax cost
3	Non-food and non-housing cost	health care cost, education cost and other non-health and non-education cost
4	Social duty (edir)	Edir, festivals
5	Unforeseen cost**	costs incurred unexpectedly

**Miscellaneous costs (16% of Low-cost nutritious diet costs) = 1.16 × Low-cost nutritious diet costs.*

***Unforeseen costs (10% of Living income) = (Food costs + Housing costs + NFNH costs)/10.*

Source: van de Ven et al. (2021)

2.4 Assessing the living income benchmark

A short list of guiding questions was used to assess the living income benchmark (see Table 2). These questions are linked to the Living Income Survey, which includes data collection guidelines, and the Living Income Diet Tool. As noted by van de Ven et al. (2021), both tools are used to rapidly benchmark the living income in a rural area in a transparent and consistent way.

Table 2 Guiding questions to estimate the living income benchmark in a particular time and place

no	Guiding questions
1	Reference household size and composition
	What is the average number of adult males, adult female and children (<18 years old) per household?
2	Food costs
	What are the cheapest and most consumed foods per food group, available at vendor locations where reference households commonly shop for cheap foods?
	For these foods: what is the current price (per kg or L)?
	For foods with strongly fluctuating prices within a year (>25%), what is the most common price throughout the year (per kg or L)?
3	Housing costs
	5. What are the local minimum standards for decent housing for a reference household, considering local standards in relation to the international housing standards?
	6. What are the annual housing costs for a house that complies with these local minimum standards for decent housing?
4	Health care costs
	7. What are the costs of basic health care insurance; which health care service types are (not) covered?
	8. What are the costs of health care services not covered by the basic insurance?
5	Education costs
	9. How many years of education are officially counted for completion of primary and lower secondary school?
	10. What are the household out-of-pocket expenses per child for one year of public education at each these education levels?

2.5 Reference household size and composition

The average household size and composition of male and female adults, and children (<18 years old) is referred to as the *reference household*. To assess the role of agriculture in rural development and food security in less developed countries, the living income per adult male equivalent (AME) was calculated for rural families based on households' energy needs. In the unit, AME, men, women and children are included, unlike assessing AME based on national statistics on labour participation (Anker & Anker, 2017b). One AME requires 2,500 kcal per person per day. Females are equivalent to 0.82 AME (2050 kcal/day) and children (0-18 years) to 0.75 AME (1,875 kcal/day) (FAO/WHO/UNU, 2001a). This allows to easily calculate the living income related to food and nutritional needs for households of different sizes based on their composition, including extended families.

2.6 Methods for living income benchmark calculation

Given below is a description of how the specific components of the living income benchmark (food costs, housing costs, non-food non-housing costs) are calculated.

2.6.1 Food costs

The household energy needs were calculated based on age, sex, body size physical activity and a low-cost diet from current to low cost, covering 20 foods and 11 food groups as per the advice of Anker and Anker (2017b). For the food cost calculation, the lowest cost nutritious diet was considered based on the Woman Dietary Diversity Score (FAO, 2010), which ensures sufficient food options for a nutritious and micronutrient-sensitive diet. The nine food groups which were considered are starchy staples, vegetables, fruits, meat, fish and seafood, eggs, milk and milk products, legumes nuts and seeds, and fats and oils.

A selection of cheap and commonly consumed foods was identified within each food group from the available foods at multiple local vendors, such as open-air markets and small village shops. To ensure sufficient options for a low-cost nutritious diet, prices were collected for at least three foods of acceptable quality per food group. Of the three foods collected, two of them were the cheapest (per kg or L) and the other was the most commonly consumed food. For all foods selected, current prices (at the moment of collection) were collected from 5-10 different vendor locations, depending on price variability. In case of strong fluctuations throughout the year (>25%), the most common prices (throughout the year) were also collected from the same vendor locations and used in the calculations. Cost adjustment was done for starchy staples, vegetables and fruits because of their seasonal availability. For both the current and the most common price, the median price was used.

The Living Income Diet Tool was used to calculate the lowest-cost diet per AME meeting all dietary requirements for energy, carbohydrate, protein, fat, and a selection of micronutrients. That was done based on the most common deficiencies in lower-income countries in agreement with the work of (Beal et al., 2017) (see **Table 3**). Dietary requirements are such that both females and males cover their minimum requirements; for example, the threshold for iron is adequate for women and consequently slightly higher than strictly needed for males and the assumption is that foods are distributed among household members according to their needs. Finally, the food cost was calculated based on the nutrient contents of each food and its price. Nutrient contents of foods were considered based on the nutrient composition of the raw purchased product, the average waste factor of its food group (https://ndb.nal.USDA.gov; http://www.fao.org/infoods/infoods/tables-and-databases/en/), and the average retention factor per nutrient after preparation (e.g. boiling, frying) specified for the food group based on (USDA, 2007).

Table 3 Nutritive requirements in the Living Income Diet Tool

Dietary components	Required intake per AME	Unit	Source
Energy	2,500 (2,400 – 2,600)[2]	kcal/day	(FAO/WHO/UNU, 2001b)
Carbohydrate	≥ 344	g/day	(WHO/FAO, 2003)
Protein	≥ 63	g/day	(WHO/FAO, 2003)
Total lipid (fat)	≥ 42	g/day	(WHO/FAO, 2003)
Calcium, Ca	≥ 833	mg/day	(WHO/FAO, 2004)
Iron, Fe	≥ 36	mg/day	(IOM 2001)
Zinc, Zn	≥15	mg/day	(IZiNCG, 2004)
Vitamin A	≥ 99	IU/day	(WHO/FAO, 2004)
Vitamin C, total ascorbic acid	≥ 43	mg/day	(WHO/FAO, 2004)
Folate, DFE	≥ 320	µg/day	(WHO/FAO, 2004)
Thiamine	≥ 1.0	mg/day	(WHO/FAO, 2004)
Riboflavin	≥ 1.1	mg/day	(WHO/FAO, 2004)
Vitamin B	≥ 2.0	µg/day	(WHO/FAO, 2004)

In addition to the calculated cost, 4% was added to cover food waste, an average for low income countries as specified by (FAO, 2010) and 2% to account for additions like salt, spices and condiments. Another 10% was added to the food costs to allow some variation in the diet.

2.6.2 Housing costs

The minimum standard for basic healthy housing used for setting the benchmark is based on international standards for healthy housing adjusted to conditions in Southern Ethiopia, and that includes material availability, climate, and the reference household size and composition. The housing construction should be able to sustain about 50 years without major repairs – also called the 'expected service life' of the house (van de Ven et al., 2021). Estimation of housing costs was done by 1) defining a standard for basic healthy housing for a reference household living in the research *woreda*s, and 2) estimating the annual costs of a house that meets these standards. To assess the housing conditions, a combination of secondary reports, local observations, and data from KIIs as well as FGDs were used. The expected service life of a house was checked, and the lifetime of houses was reported by FGD participants of each study area.

To estimate the cost of a standard house, data were collected from various FGDs. FGD participants were asked about the criteria to be used for characterizing the best house based on the type of wall, roof and floor. FGD participants were also asked to estimate: 1) total costs of constructing the house including all materials and labour and the expected service life; 2) annual utility costs, including water, electricity, cooking fuel, heat, and lighting; 3) annual costs for routine maintenance and repairs; and 4) annual costs for taxes, levies, fees and house insurance. Finally, construction costs were divided over the expected service life.

2.6.3 Non-food non-housing costs

Non-food non-housing costs (NFNH) cover costs incurred on education, health and other basic needs including clothing and footwear, transport, and communication. The NFNH costs were collected from FGDs conducted with the study participants. Given below is a description of non-food non-housing costs linked with health care and education.

2.6.4 Healthcare costs

Costs of health care include all annual household out-of-pocket expenses to cover basic health care based on the locally available services. Healthcare costs were collected using a combination of secondary reports (local healthcare facility patient records, etc.), KIIs (e.g., interviews conducted with staff in local clinics and healthcare extension officers) and FGDs. During the FGDs, it was attempted to identify the most common diseases; to find estimates of the average number of healthcare visits for the identified diseases; and obtain estimated costs incurred per visit. Added to that, health care extension officers of each *Kebele* were asked about the validity of information collected during FGD. Data on the average visit of one household per year were also obtained from records.

2.6.5 Education costs

Education costs include all annual household out-of-pocket expenses to cover decent public primary and lower secondary education for all children in the reference household. As reported by(UNESCO, 2000), in most countries, education is compulsory starting at the age of 5 to 7 until the age of 11 to 18 years, roughly covering primary and lower secondary school. The recent Ethiopian education system includes eight years of primary education (ages 7-14) and 4 years of secondary education (ages 14-18). For this study, only public schools were considered with the assumption that the majority of rural households send their children to public school and the public school is expected to provide education of sufficient quality. Information was generated through KIIs and FGDs conducted with participants (e.g., local education experts and parents/caretakers of school children). Household out-of-pocket expenses cover only parental responsibilities for essential needs for a child to go to school (e.g., school fees, clothing/uniform, and materials such as books). The total education costs per child are assessed and divided over 18 years, giving the average annual education costs per child.

2.6.6 Social duty costs

Social duty costs, which include costs for *edir*, *mahiber* and other costs which would be incurred for social cohesion, were assessed using focus group discussions.

2.7 Total budget for living income benchmark

The total living income benchmark includes the sum of estimated costs for food, housing, NFNH, and social duty per reference household, plus a margin for unforeseen events (10% is added to the calculated living income budget).

2.8 Data analysis

The data were analysed using the Statistical Package for Social Sciences (SPSS version 20) software and Microsoft Excel 2013. The results were then summarized and presented using means, percentages, tables and graphs.

3 Results

3.1 Reference household size and composition

Reference Household (RH) size and composition in Hawassa Zuria *woreda* for Sidama region and Gumer and Boloso Bombe *woreda* of SNNPR state of Ethiopia is shown in Table 4. Reference household sizes were: 4.8 AME in Hawassa Zuria, 4.1 AME in Gumer, and 4.9 AME in Boloso Bombe *woreda*s.

Table 4 RH composition for Hawassa Zuria, Gumer and Boloso Bombe *woreda*s of the study area

Age & gender group	**Individuals/RH**			**AME/individual**	**AME/age & gender group**		
	Hawassa Zuria	Gumer	Boloso Bombe		Hawassa Zuria	Gumer	Boloso Bombe
Adults, male	1.8	1.3	1.5	1.00	1.8	1.3	1.5
Adults, female	1.7	1.4	1.4	0.82	1.4	1.2	1.1
Children (<18)	2.2	2.3	2.9	0.75	1.6	1.7	2.2
AME (Adult male equivalent) per reference household					4.8	4.1	4.9

3.2 Costs per item of the living income benchmark

3.2.1 Diet composition and food costs

In the three *woreda*s, maize, *kocho*, *Taro* and potatoes were the main starchy foods, and chickpeas, faba beans, and haricot beans were the most popular legumes, nuts, and seeds (see Table 5). Nutrient contents of *kocho,* which were lacking in the USDA Food Composition database, were also reported in related studies ((Tsegaye and Struik, 2001; Tuffa, 2019). Results of the Living Income Diet Tool show that the minimum costs for a nutritious diet were 51.8 ETB (US$ 2.92) PPP/AME/day or 90,498.2 ETB (US$ 5,098.32) PPP/RH/year for Hawassa Zuria *woreda*. On the other hand, 48.1 ETB (US$ 2.71) PPP/AME/day or 71,985.3 ETB (US$ 4,055.51) PPP/RH/year for Gumer and 47.6 ETB (US$ 2.68) PPP/AME/day or 85,078.9 ETB (US$ 4,793.18) PPP/RH/year were found to be the minimum costs for a nutritious diet for Bolos Bombe *woreda*s (see Table 5). The most common prices throughout the year were used for maize, *kocho*, *taro*, kale, tomato, cabbage, banana, chicken eggs and cow milk because their current price differed >25% (ranging from -83% to +69%) from the most common price throughout the year.

Table 5 Composition and costs for a low-cost nutritious diet calculated with the Living Income Diet Tool for the three *woredas* of the study area based on local market prices in AME

Food (sub)group	Food	Market price, June '23 ETB/kg	Calculated amount purchased g/AME/day	Calculated food costs 2023 ETB (US$) PPP/AME/day
Hawassa Zuria				
Starchy staple	Maize grain	24.5	357	8.7 (0.49)
	Kocho	24.8	265	6.6 (0.37)
Legumes nuts and seeds	Chick beans	30.0	183	5.5 (0.31)
Dark green leafy vegetable	Kale	16.5	50	0.9 (0.05)
Vitamin A rich vegetables	Tomato	28.5	65	1.8 (0.10)
Other vegetables	Chilli pepper	34.0	70	2.3 (0.13)
Other fruits	Banana	52.5	75	3.9 (0.22)
Eggs	Chicken egg	196.0	70	13.7 (0.77)
Milk	Cow milk	15.0	75	1.1 (0.06)
Low-cost nutritious diet costs				44.6 (2.51)
Miscellaneous food costs (16% of low-cost nutritious diet costs)				7.1 (0.402)
Total food costs (US$ PPP/AME/day)				**51.8 (2.92)**
Gumer				
Starchy staple	Potato	8	287	2.3 (0.13)
Legumes nuts and seeds	Faba beans	65	177	10.8 (0.61)
Dark green leafy vegetable	Kale	10	60	0.5 (0.03)
Vitamin A rich vegetables	Tomato	30	80	2.5 (0.14)
Eggs	Chicken egg	190	95	18.1 (1.02)
Milk	Cow milk	9	180	1.6 (0.09)
Low-cost nutritious diet costs				41.5(2.34)
Miscellaneous food costs (16% of low-cost nutritious diet costs)				6.6(0.37)
Total food costs (US$ PPP/AME/day)				**48.1(2.71)**
Boloso bombe				
Starchy staple	Kocho	30	357	10.7 (0.60)
	Taro	30	265	8.0 (0.45)
Legumes nuts and seeds	Haricot beans	34	183	6.2 (0.35)
Dark green leafy vegetable	Kale	27	50	1.4 (0.08)
Vitamin A rich vegetables	Tomato	22	65	1.4 (0.08)
Other vegetables	Head cabbage	24.5	70	1.8 (0.10)
Other fruits	Banana	20	75	1.4 (0.08)
Eggs	Chicken egg	70	130	9.1 (0.51)
Milk	Cow milk	13	75	0.9 (0.05)
Low-cost nutritious diet costs				40.8 (2.31)
Miscellaneous food costs (16% of low-cost nutritious diet costs)				6.6 (0.37)
Total food costs (US$ PPP/AME/day)				**47.6 (2.68)**

US$ 1 PPP = 17.75 ETB in 2023 (Databank World Bank, 2023 https://data.worldbank.org/indicator/PA.NUS.PPP/; Values in parenthesis indicate US$

3.2.2 Housing costs

Data collected from all the focus groups across all locations indicated that the minimal criterion for a reference family is a living area of at least 42 m^2 as opposed to 30 m^2, with one living room and at least two bedrooms. It was learnt that the toilet/bathroom and kitchen may be located outside the housing unit. Estimated annual housing costs for a reference family in Hawassa Zuria was US$ PPP 38,748 ETB (US$ 2,183), including construction costs (PPP 22,117 ETB (US$ 1,246) over 28 years instead of 50), plus routine maintenance and repairs costs and utility costs (Table 6). The presence of termites and silt soil texture were mentioned as reasons for the lower expected service lifetime of houses in Hawassa Zuria *woreda*.

For Gumer *woreda*, the estimated annual housing costs for a reference household was ETB (US$) PPP 27,104 (1,527), including construction costs (PPP 18,993 ETB (US$ 1,070) over 58 years) plus routine maintenance and repairs costs and utility costs. Longer predicted service lives of homes in Gumer were attributed to the superior soil features and comparatively moderately cold temperatures. In Boloso Bombe, the estimated annual housing costs for a reference household were found to be PPP 24,087 ETB (US$ 1,357), including construction costs (PPP 16,437 ETB (US$ 926) over 48 years) plus routine maintenance and repairs costs and utility costs (see Table 6). Taxes, levies and house insurance costs were not common in all three study sites.

Table 6 Overview of estimated housing costs for a house complying with local minimum standards for decent housing for a reference household in rural areas of Hawassa Zuria, Gumer, and Boloso Bombe *woreda*s of southern Ethiopia for 2023

Cost item	Hawassa Zuria	Gumer	Boloso Bombe
	ETB (US$) PPP/RH/year		
Construction costs	22,117 (1,246)	18,993 (1,070)	16,437 (926)
Routine maintenance and repairs	10,434 (587.8)	1,686 (95)	6,798 (383)
Taxes, levies, fees and house insurance	0	0	0
Utilities (water, electricity, cooking fuel)	6,195 (349)	6,426 (362)	852 (48)
Total housing costs	38,748 (2,183)	27,104 (1,527)	24,087 (1,357)
	ETB (US$) PPP/AME/day		
Total housing costs	22.2(1.25)	18.1 (1.02)	13.5 (0.76)

Values in parenthesis indicate US$

3.3 Non-food non-housing costs (NFNH) costs

3.3.1 Health care

The healthcare system in all three *woreda*s of the study area includes public facilities (dispensaries) in all villages. Basic health care insurance is available for all villagers through the government. The membership covers all public health care costs for all household members, including doctor consultation and complete treatment with medicine and laboratory tests for all common diseases (Malaria, typhoid fever, blood pressure and pneumonia).

The FGDs showed that health care insurance does not cover all household expenses on health care. That was because medicines are regularly out of stock and have to be purchased privately. Total health care costs for Hawassa Zuria, Gumer and Boloso Bombe were PPP 2,275.6 ETB (US$ 128.2), 2,600.4 ETB (US$ 146.5) and 5,637.4 ETB (US$ 317.6), respectively (see Table 7). The annual payment for health care insurance was PPP 500.6 ETB (US$ 28.2) per household per year in both Hawassa Zuria and Gumer while PPP 334.5 ETB (US$ 21.1) per household per year in Boloso Bombe.

Medical costs differed across the three *woeredas*. While Boloso Bombe had the highest medical costs, Hawassa Zuria *woreda* exhibited the lowest costs. The medical costs of Gumer were found to be somewhere in the middle of the two *woreda*s (see Table 7). The Boloso Bombe *woreda*'s greater medical costs were

attributed to the lack of access to markets and roads. The *woerdea's* few pharmacies and lack of competition provided pharmacies the freedom to determine their own prices.

Table 7 Estimated health care costs per person (US$ PPP) and per reference household (RH) per year for rural areas of Hawassa Zuria, Gumer and Boloso Bombe *woredas* of Sidama and SNNPR state of Ethiopia, for 2023

Cost item	Hawassa Zuria	Gumer	Boloso Bombe
	ETB (US$) PPP/RH/year		
Basic health care insurance	500.6(28.2)	500.6 (28.2)	334.5 (21.1)
Doctor consultation, public	Insurance	Insurance	Insurance
Medicine from pharmacy	1,775.0 (100.0)	2,099.8 (118.3)	5,262.9 (296.5)
Laboratory (self-)test	-	-	-
Total health care costs	2,275.6 (128.2)	2,600.4 (146.5)	5,637.4 (317.6)
	ETB (US$) PPP/AME/day		
Total health care cost	1.3 (0.073)	1.7 (0.098)	3.2 (0.178)

3.3.2 Education

The total education costs were 12,061 ETB (US$ 679.5) PPP per child or 26,533 ETB (US$ 1,495) PPP/RH/year for Hawassa Zuria; 8,476 ETB (US$ 477.5) PPP per child or 19,493 ETB (US$ 1,098.2) PPP/RH/year for the Gumer; and 9,402 ETB (US$ 529.7)PPP per child or 27,268 ETB (US$ 1,536.2) PPP/RH/year for the Boloso Bombe *woredas* (see Table 8).

Table 8 The estimated education costs (ETB/US$ PPP) for a reference household (RH) per year, in rural areas of three woredas of southern Ethiopia, for 2023

Cost item		Hawassa Zuria	Gumer	Boloso Bombe	Unit
Primary education	Clothing	2,576 (145.1)	1,693 (95.4)	4,684 (263.9)	ETB (US$) PPP/child/year
	Materials	1,296 (73.0)	1,159 (65.3)	781 (44.0)	ETB (US$) PPP/child/year
	Fees	0.0	0.0	0.0	ETB (US$) PPP/child/year
	Transportation	1,857 (104.6)	905 (51.0)	0	ETB (US$) PPP/child/year
	Duration	8	8	8	Year
Secondary education	Clothing	2,425 (136.6)	2,934 (165.3)	1,235 (69.6)	ETB (US$) PPP/child/year
	Materials	1,826 (102.9)	870 (49.0)	868 (48.9)	ETB (US$) PPP/child/year
	Fees	227 (12.8)	213 (12.0)	144 (8.1)	ETB (US$) PPP/child/year
	Transportation	1,857 (104.6)	2,536 (142.9)	563 (31.7)	ETB (US$) PPP/child/year
	Duration	4	4	4	Year
Full costs per child		12,061 (679.5)	8,476 (477.5)	9,402 (529.7)	ETB (US$) PPP/child
Average costs per child per year[1]		669 (37.7)	470 (26.5)	522 (29.4)	ETB (US$) PPP/child/year
Children per RH		39 (2.2)	41 (2.3)	51 (2.9)	Children/RH
Total education costs		26,533 (1,494.8)	19,493 (1,098.2)	27,268 (1,536.2)	ETB (US$) PPP/RH/year
Total education costs		15.1 (0.85)	13(0.73)	15.3 (0.86)	ETB (US$)PPP/AME/day

1 Full costs per child for 12 years of education, divided by 18 years of parental financial responsibility.

3.4 Other Nonfood non-Housing (other NFNH)

The other non-food and non-housing costs were obtained through FGDs and KIIs. The total other NFNH costs were ETB 18,824 ETB (US$ 1,060.5) PPP/RH/year for Hawassa Zuria and 27,147 ETB (US$ 1,529.4) PPP/RH/year and 22,148 ETB (US$ 1247.8) PPP/RH/year for Gumer and Boloso bombe respectively (Table 9). While Gumer had the highest transportation costs 3,694 ETB (US$ 208.18) PPP/RH/year) followed by

Boloso Bombe (1,633 ETB (US$ 92.08) PPP/RH/year), Hawassa Zuria had the lowest costs (470 ETB (US$ 26.5) PPP/RH/year). In Hawassa Zuria, the community had the opportunity to select the least expensive mode of transportation because of the availability of a variety of modes of transportation including motorbikes, *Bajajs*, cars, and carts. The communities living in more remote *woredas* like Gumer and Boloso Bombe, on the other hand, have fewer transportation options because of little competition among transport companies there. As a result, they are forced to incur more transport costs. Similarly, communities in Gumer and Boloso Bombe *woredas* pay more for clothing.

Table 9 Overview of the estimated NFNH costs (US$ PPP) for a reference household (RH) per year, in rural areas of three woredas of southern Ethiopia for 2023

Cost item	Hawassa Zuria	Gumer	Boloso Bombe
	ETB (US$) PPP/RH/year		
Transportation of the HHs	470 (26.5)	3,694 (208.1)	1,633 (92.0)
Communication	848 (47.8)	1,101 (62.0)	1,234 (69.5)
Water	493 (27.8)	3,839 (216.3)	396 (22.3)
Energy	960 (54.1)	840 (47.3)	721 (40.6)
Family cloth	13,449 (757.7)	15,167 (854.5)	15,407 (868.0)
Social duty (payment for *edir*, festivals etc)	2,600 (146.5)	2,506 (141.2)	2,764 (155.7)
Total other NFNH costs	18,824 (1,060.5)	27,147 (1,529.4)	22,148 (1,247.8)
			ETB (US$) PPP/AME/day
Other NFNH costs	10.7 (0.605)	18.1 (1.022)	12.4 (0.698)

3.5 Living income benchmark and income gap

Based on data presented previously, the living income benchmark expressed in ETB (US$) PPP per adult male equivalent per day is estimated at 112.5 ETB (US$ 6.34) in rural Hawassa Zuria; 110.1 ETB (US$ 7.54) at Gumer; and 102.2 ETB (US$ 5.76) at Boloso bombe *woredas* (Table 10). The living income benchmark and the share of the different cost items for the three *woredas* are quite similar. The benchmark for Boloso bombe was slightly lower than that of the Gumber and Hawassa Zuria *woredas*.

Table 10 The estimated living income in ETB (US$) PPP/AME/day for a reference household for the three woredas of the study area for 2023

Cost item	Hawassa Zuria	Gumer	Boloso Bombe
	US$ PPP/AME/day		
Food	2.92 (46%)	2.71 (44%)	2.68 (47%)
Housing	1.25 (20%)	1.02 (16%)	0.76 (13%)
Health care	*0.073 (1%)*	*0.098 (2%)*	*0.178 (3%)*
Education	*0.85 (13%)*	*0.73 (12%)*	*0.86 (15%)*
Other NFNH	*0.605 (10%)*	*1.022 (16%)*	*0.698 (12%)*
NFNH	*1.53 (24%)*	*1.85(30%)*	*1.74(30%)*
Unforeseen	0.64 (10%)	0.62 (10%)	0.58 (10%)
Total living income benchmark	112.5 (6.34) (100%)	110.1 (6.2) (100%)	102.2 (5.76) (100%)

The food cost accounts for 47% of the total living income in Boloso bombe *woreda* followed by Hawassa Zuria (46%) and Gumer (44%). The NFNH accounted for equally 30% of Gumber and Boloso Bombe although it accounted for less than 25% in Hawassa Zuria (Figure 2)

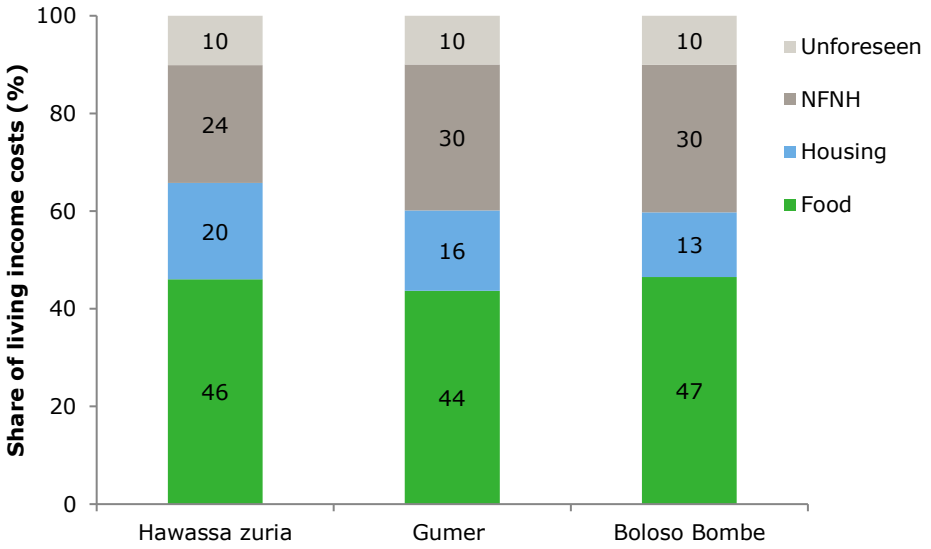

Figure 2 Share of food, housing NFNH and unforeseen costs to the total living income.

4 Discussions

The food costs account for 47% of the total living income in Boloso bombe *woreda* followed by Hawassa Zuria (46%) and Gumer (44%) (Figure **1**). In a related study by (van de Ven et al., 2021) that assessed the living income benchmarking in three African countries, a comparable finding was reported. More specifically, the study found that food costs accounted for 41% in Tanzania, 37% in Uganda and 44% in Ethiopia. The variation in the type of commonly consumed food and its corresponding price was attributed to the variation in the share of food cost among the three *woreda*s (see Table 5 Composition and costs for a low-cost nutritious diet calculated with the Living Income Diet Tool for the three *woreda*s of the study area based on local market prices in AME). In Hawassa Zuria, housing costs make up 20% of the benchmark for total living income, followed by Gumer (16%) and Boloso Bombe (13%). The higher housing cost in Hawassa Zuria was due to higher cost of labour compared to the other two *woreda*s. Understandably, the cost of living in Hawassa Zuria was also higher as compared to that of the other *woreda*s (see Table 10).

As discussed earlier, health care, education, transportation, communication, water, electricity, family clothing, and social responsibility costs are all included in the Non-foods Non-Housing (NFNH) costs. In comparison with that of the Hawassa Zuria *woreda* the NFNH costs account for 30% of the benchmark for total living incomes in the Gumer and Boloso Bombe *woreda*s (Figure **2**). The greater NFNH costs in Gumer were attributable to higher costs of water, family clothing, and transportation. In contrast, higher costs for health care and family clothing were seen in Boloso Bombe *woreda*s (Table 9 and Table 10). The three *woreda*s' varying levels of market access were the cause of the disparity in housing and NFNH costs between them.

5 Conclusion

The living income benchmarking approach, which is adapted from the living wage methodology and earlier studies of living income benchmarking for East Africa, was tested for three rural *woreda*s of southern Ethiopia. It would be possible to contextualize the living income benchmarking to the level of agricultural households, which include all ages and genders of the household family members, by converting the reference households into adult male equivalents. The total living income benchmark between the three *woreda*s did not substantially vary because the share of the different cost items for the three *woreda*s was almost similar. Food cost accounts for about half of the living income cost, which calls for the need to design sustainable development options that could enhance food production and productivity. However, variations in the cost of constructing a house, family clothes, medicine, water and transportation were observed among the three *woreda*s. The two main factors causing variation in living income benchmarks among the three *woreda*s were disparities in access to markets and variations in the type of widely consumed food and their accompanying prices. Thus, the farming system and market access should be taken into account when considering which benchmark is representative of which part of the population.

References

Anker, R., 2008. Living wages around th world: A new methodology and internationally comparable estimates. Int. Labour Rev. 145, 309–338. https://doi.org/10.1111/j.1564-913X.2006.tb00037.x

Anker, R., Anker, M., 2017. Living wage report Kenya with a focus on rural Mount Kenya area. Context provided in horticulture industry (Series 1. report 10).

Beal, T., Massiot, E., Arsenault, J.E., Smith, M.R., Hijmans, R.J., 2017. Global trends in dietary micronutrient supplies and estimated prevalence of inadequate intakes. PloS One 12, e0175554. https://doi.org/10.1371/journal.pone.0175554

Debebe, S., Zekarias, E.H., 2020. Analysis of poverty, income inequality and their effects on food insecurity in southern Ethiopia. Agric. Food Secur. 9, 16. https://doi.org/10.1186/s40066-020-00269-3

FAO, 2010. Food and Agriculture Organization of the United Nations. Food and Agriculture Organization of the United Nations.

FAO/WHO/UNU, 2001a. uman energy requirements. Report of a joint FAO/WHO/UNU Expert consultation (eport of a joint FAO/WHO/UNU Expert consultation). Food and Nutrition Technical Report Series: FAO, Rome.

FAO/WHO/UNU, 2001b. Human energy requirements. Report of a joint FAO/WHO/UNU expert consultation. Rome.

IDH, 2023. Roadmap on Living Income (Newsletter). Netherlands.

IZiNCG, 2004. Assessment of the risk of zinc deficiency in populations and options for its control., Food and Nutrition Bulletin. International Nutrition Foundation for the United Nations University, Tokyo, Japan. https://doi.org/10.1177/15648265040251S204

Komives, K., Grunze, S., Krain, E., Tschanz, A., Daniels, S., Don Seville, D., 2015. Defining, Calculating and Using a Living Income Benchmark in the Context of Agricultural Commodities. ISEAL Alliance, GIZ and Sustainable Food Lab.

Otsuka, K., 2013. Food insecurity, income inequality, and the changing comparative advantage in world agriculture. Agric. Econ. 44, 7–18. https://doi.org/10.1111/agec.12046

Oxfam International, 2021. Living income from right to reality. Oxfam GB for Oxfam International under. https://doi.org/10.21201/2021.8212

Pawlak, K., Kołodziejczak, M., 2020. The Role of Agriculture in Ensuring Food Security in Developing Countries: Considerations in the Context of the Problem of Sustainable Food Production. Sustainability 12, 5488. https://doi.org/10.3390/su12135488

Smyth, S.J., Phillips, P.W.B., Kerr, W.A., 2015. Food security and the evaluation of risk. Glob. Food Security. 4, 16–23. https://doi.org/10.1016/j.gfs.2014.08.001

Teklu B., Alemayehu G., Teshome A., Glaser J., and Schaap M. 2024. Living income gap of smallholder farmers in southern Ethiopia. Stichting Wageningen Research Ethiopia, Addis Ababa. SWRE-RAISE-FS-24-027. https://doi.org/10.18174/656192

Tsegaye, A., Struik, P.C., 2001. Enset (*Ensete ventricosum* (Welw.) Cheesman) kocho yield under different crop establishment methods as compared to yields of other carbohydrate-rich food crops. NJAS Wagening. J. Life Sci. 49, 81–94. https://doi.org/10.1016/S1573-5214(01)80017-8

Tuffa, A.C., 2019. Value Chain and Nutritional Analyses of Warqe Food Products in Relation to Post-harvest Losses (PhD Dissertation). Swedish University of Agricultural Sciences, Sweden.

UN, 2015. Transforming our world: The 2030 Agenda for Sustainable Development with its 17 SDGs.

UNESCO, 2000. he right to education: Towards education for all throughout life (World education report 2000). UNESCO.

USDA, 2007. USDA table of nutrient retention factors (No. release 6). Beltsville: Beltsville Human Nutrition Research Centre.

van de Ven, G.W.J., de Valença, A., Marinus, W., de Jager, I., Descheemaeker, K.K.E., Hekman, W., Mellisse, B.T., Baijukya, F., Omari, M., Giller, K.E., 2021. Living income benchmarking of rural households in low-income countries. Food Secur. 13, 729–749. https://doi.org/10.1007/s12571-020-01099-8

WHO/FAO, 2004. Vitamin and mineral requirements in human nutrition, Second edition., World Health Organization. Geneva. https://doi.org/92 4 154612 3

WHO/FAO, 2003. Joint WHO/FAO Expert Consultation on Diet, Nutrition and the Prevention of Chronic Diseases. Geneva.

World Bank, 2022. Fact Sheet: An Adjustment to Global Poverty Lines. World Bank, New York.

World Bank, 2015. A measured approach to ending poverty and boosting shared prosperity: Concepts, data, amd the twin goals (Policy Research Report). World Bank, Washington DC.

Resilient Agriculture for Inclusive and Sustainable Ethiopian Food Systems (RAISE FS)

www.raise-fs.org

Stichting Wageningen Research Ethiopia

www.wur.eu

Resilient Agriculture for Inclusive and Sustainable Ethiopian Food Systems (RAISE-FS) is a four-year program funded by the Dutch Embassy in Addis Ababa and hosted by Stichting Wageningen Research Ethiopia based in Addis Ababa, to bring about transformation in the Ethiopian food system. RAISE-FS will develop and implement a demand-driven and interdisciplinary approach to Research for Food System Transformation (R4FST) and as such contribute to the Government of Ethiopia's transformational agenda.