

# Holistic High Status: Zoe Empowers Alumni Households in Rwanda

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## Executive Summary

**Introduction.** This report initiates rigorous and independent assessment of the Zoe Empowers model by analyzing the responses of alumni to a systematic survey. Zoe Empowers strives to ameliorate extreme poverty among orphaned and vulnerable children in several sub-Saharan African countries plus India. The data for this report come from Zoe Empowers' Impact Survey for African Alumni. Respondents were households in randomly selected alumni Empowerment Groups in Rwanda. They were from the class that began Zoe Empowers in 2015, graduated in 2018, and responded to the alumni survey in 2022/2023, about five years after graduation.

When asked how they think they have progressed since finishing their Zoe Empowers training, 62 percent of the alumni households said their life situation was “much better now than at graduation,” and almost all of the rest said, “better now than at graduation.” None said they were worse. Clearly these young alumni felt life had been working better for them.

**Comparing Households with the Nation and Regions on Common Indicators of Well-Being.** The first part of the research design is a comparison of these Zoe Empowers alumni with the people of the nation and regions in which they live. We use 35 common indicators from the Fifth Rwanda Population and Housing Census, 2022.

Small household size and 2.5 adults per child in Zoe's 5-Year alumni households was a big advantage. This compares to only 1.2 or 1.3 adults per child for the South, rural, and total Rwanda and even 1.9 for the fifth (top) quintile of Rwandan society. The Zoe empowerment method is playing into powerful, natural processes that lead to well-being in the person, family, and community.

The percentage of school-aged children attending school was high for the Zoe Empowers alumni households (89%) compared to the South (82%), rural (80%), and total Rwanda (81%) populations. Here is our best indication that Zoe Empowers truly can be a solution to generational poverty.

The 5-year alumni on average achieved an estimated status or prestige level higher than 74 percent of the total Rwanda population. And they did this as young, orphaned families in the poorest region of Rwanda (with the help of Zoe Empowers staff and community support.) That is accomplishment!

The alumni were functioning on average as well as or better than 83 percent of the population in the South Province where they live. They are elite in their home communities.

If the goal of the Zoe Empowers program for the children is to become self-sustaining and “never need charity again,” these young alumni seem to have done that. They have gone beyond that and achieved **Compassionate Holistic High Status**.

**Comparing Households with the Nation on Multidimensional Poverty.** The second part of the research design uses Rwanda’s adaptation of the Multidimensional Poverty Index (MPI) to compare these Zoe alumni with the nation. The MPI is a major assessment tool for measuring and monitoring poverty levels in developing countries.

The poverty distribution of the Zoe alumni households was extremely high. 87 percent of alumni households were measured as non-poor. Most of the rest were vulnerable but not poor. Only four households were classified as poor, less than 2% of the alumni households.

In rural Rwanda, where the alumni live, only two kinds of households achieved non-poor status similar to Zoe alumni, from the 98 different household types examined. These were (1) households with university-graduate heads and (2) households where the head’s main occupation was manager.

**Comparing Alumni Households with Themselves (Panel Analysis).** The final part of the report is a panel analysis comparing the alumni households with themselves at graduation (plus some comparisons with the incoming classes in 2018 and 2019).

Almost all the alumni households sustained the gains they achieved while in the Zoe Empowers program. All but three remained firmly self-sustaining.

Almost all the alumni households were flourishing (98 percent) when they graduated. However, at the time of their alumni survey, 72 percent of households were still flourishing, while 26 percent had changed from flourishing to self-sustaining (and 2 households actually fell to borderline vulnerable). This suggests that the achievements we have seen on previous measures happened after some households had retreated since graduation. The meaning here is that the alumni households declined from extremely high to very high in the years after graduation, maintaining **Compassionate Holistic High Status**.

## Section 1. Introduction

This report initiates rigorous and independent assessment of the Zoe Empowers model (zoeempowers.org) by analyzing the responses of alumni to a systematic survey. We talk directly with a random sample of Zoe Empowers alumni. Zoe Empowers strives to ameliorate extreme poverty among orphans and vulnerable children in several sub-Saharan African countries plus India. Zoe Empowers supports empowerment through a holistic three-year graduation program (Warner, pages 80-81). Total cost per child is \$341 USD for the three-year program (Zoe Empowers Review 2022).

The data for this report come from Zoe Empowers' "Impact Survey for African Alumni" (included here as an appendix). Respondents were the households in six randomly selected Empowerment Groups, selected from the 34 Zoe Empowers groups that began in Rwanda in 2015. (293 sampled households represented the 1402 households in Class 2015.) Zoe Empowerment Groups are the core of the Zoe Empowers model and usually include 20 to 35 households. These households are youth-led and child-led families composed of orphaned and other deeply vulnerable children.

The fifty-six-item questionnaire was administered by Zoe Empowers staff in personal and phone interviews during September 2022 and May/June 2023. Respondents represent the Rwanda class that entered the three-year program in 2015. Of the 293 households originally selected for graduation surveys in 2018, 243 alumni households were contacted. All contacted households completed the survey (100 percent cooperation rate). The response rate was 82.9 percent. Most of the 50 households not contacted had moved out of their communities and left no phone number. In the year before graduation, more of the uncontacted households started new businesses (61 percent) than the contacted households (50 percent), so, the empowerment groups may have lost some of their best performers. Zoe staff and I believe the responses adequately describe the circumstances of these Zoe Empowers alumni as they themselves see things.

Let us introduce these young people by asking them directly how they think they have progressed since finishing their Zoe Empowers training. Table 1 reports their responses to survey question AL-56 as frequency and percent distributions. 62 percent said their life situation was "much better now than at graduation," and almost all of the rest said, "better now than at graduation." None said they were worse. Clearly these young alumni felt life was working better for them. This is important. Their subjective assessment of the direction of their lives could be the clearest evaluation of the Zoe Empowers program that we can get. Their beliefs and feelings matter most.

Table 1. Subjective Assessment of Life Since Graduation: Households in 5-Year Alumni Empowerment Groups, Rwanda

AL-55. How would you describe your life situation now compared to how it was at the time of your graduation from the Zoe program?	5-Year Alumni	
	Number	Percent
Much better now than at graduation	149	61.8
Better now than at graduation	87	36.1
About the same	5	2.1
Worse now than at graduation	0	0.0
Much worse now than at graduation	0	0.0
Total Households	241	100.0

Data Source: Zoe Alumni Survey Sep. 2022 and May/June 2023

Nevertheless, we can also search out objective indicators of how their lives were going.

Table 2 reports another introductory item, how often they met with other Zoe Empowers graduates. By far, most met regularly (64 percent) or at least occasionally (21 percent). This suggests they continued to meet in their groups for both economic and social support, just as people generally do with their families. In fact, regular attenders were significantly more likely to be flourishing (77 percent) than infrequent attenders (50 percent). Also, this implies they had not moved to Kigali or other cities and continued their lives in the rural setting they had always known. Their rural community defined their existence.

Table 2. How Often Meet with Other Zoe Program Graduates: Households in 5-Year Alumni Empowerment Groups, Rwanda

AL-1. How often do you currently meet with other Zoe program graduates?	5-Year Alumni	
	Number	Percent
Regularly	155	64.0
Occasionally	51	21.1
Rarely	28	11.6
Never	8	3.3
Total Households	242	100.0

Data Source: Zoe Alumni Survey Sep. 2022 and May/June 2023

This analysis and report will proceed in three parts.

The first part of the research design is a comparison of these Zoe Empowers alumni with the people of the nation and regions in which they lived, using 35 common indicators

from the 2022 Rwanda Census of Population and Housing. Another way of asking “How are they doing?” is asking “Where do they fit in?” with the people and communities around them. We will eventually answer this question with one important number, 83. This is their Accomplishment Percentile. **The accomplishments of the 5-year alumni households placed them at the 83rd percentile of the population, among the elite people of Rwanda’s South Province.** This shows sustained high status for Zoe Empowers alumni.

The second part of the research design compares these Zoe alumni with the nation using Rwanda’s adaptation of the Multidimensional Poverty Index (MPI). The MPI is a major assessment tool for measuring and monitoring poverty levels in the world’s developing countries, shown each year in the United Nations’ Human Development Report. It is a non-monetary measure of poverty, used as a more comprehensive if less precise compliment to monetary measures of poverty. We will find that **only three kinds of households in rural Rwanda had more than 85 percent Non-Poor households – households with university graduate heads, households with business manager heads, and these Zoe alumni households (87 percent non-poor).** This shows holistic high status for the Zoe alumni.

The third part of the report is a panel analysis comparing the alumni households with themselves at graduation. We use an even more comprehensive measure of well-being, Zoe’s abridged Self-Sufficiency Index (the 10qSSI). **After graduation 26 percent of the alumni households went down from flourishing as graduates to self-sustaining as 5-year alumni. Yet they remained among the highest achieving people in rural Rwanda.** These data tell us we do not yet know much about why what happens after graduation happens.

## Section 2. Comparing Households with the Nation and Regions on Common Indicators of Well-Being.

An important part of assessing the success of Zoe Empowers alumni and thus of the Zoe Empowers program is documenting where and how the alumni fit into national, regional, and community life. Here we are considering the national social structure or prestige system that is Rwandan society. We can use the tools of science to do this work objectively and reliably.

Fortunately, the National Institute of Statistics of Rwanda has two excellent data sources available for free download ([www.statistics.gov.rw](http://www.statistics.gov.rw)). Our main data source is the Fifth Rwanda Population and Housing Census 2022, conducted in August 2022 and released in 2023 publications. We are fortunate to have these excellent census reports, based on interviews with all 3,312,743 Rwandan households. The second data source is the Rwandan Integrated Household Living Conditions Survey 2016/2017 (the EICV5),

based on a random sample of 14,580 households. The EICV surveys have been conducted periodically since 2006, although the 2019/2020 survey was canceled because of pandemic lock-down. This is our best source of “consumption quintiles,” the developing world’s equivalent of income distributions in the developed world. Soon we will depend heavily on these two sources for our analysis.

## The Nation in Context

If we are going to compare Zoe Empowers alumni to their nations, we need to know what this means. The next table attempts this. Table 3 shows the latest Human Development Index (HDI) for the countries where Zoe Empowers has or may have programs in the near future (plus Switzerland and the USA, for context). The HDI uses life expectancy, schooling, and national income to measure “a long and healthy life, knowledge, and a decent standard of living” (page 276, Human Development Report 2021/2022).

Table 3. Comparing Rwandan Human Development with Other Nations: 2014-2020

Country	Human Development Index	HDI rank (of 191)	Life expectancy at birth	Expected years of schooling	Mean years of schooling	GNI per capita (2017 PPP\$)
Switzerland	0.962	1	84.0	16.5	13.9	66,933
United States	0.921	21	77.2	16.3	13.7	64,765
India	0.633	132	67.2	11.9	6.7	6,570
Eswatini	0.597	144	57.1	13.7	5.6	7,679
Zimbabwe	0.593	146	59.3	12.1	8.7	3,810
Kenya	0.575	152	61.4	10.7	6.7	4,474
Tanzania	0.549	160	66.2	6.4	6.4	2,664
<b>Rwanda</b>	<b>0.534</b>	<b>165</b>	<b>66.1</b>	<b>11.2</b>	<b>4.4</b>	<b>2,210</b>
Uganda	0.525	166	62.7	10.1	5.7	2,181
Malawi	0.512	169	62.9	12.7	4.5	1,466
Liberia	0.481	178	60.7	10.4	5.1	1,289
Sierra Leone	0.477	181	60.1	9.6	4.6	1,622
Mozambique	0.446	185	59.3	10.2	3.2	1,198
South Sudan	0.385	191	55.0	5.5	5.7	768

Source: United Nations, Human Development Report 2021/2022, Table 1.

One useful interpretation from Table 3 is that Rwanda **now** is very nearly a “middle income country” (“medium development” in United Nations’ terms). The UN boundary between low and medium development is an HDI of .550. Rwanda and Tanzania were

almost there in 2020. In terms of human well-being, being above average in Rwanda now signifies much more than it used to signify.

Table 4 shows the speed of human development in ZOE countries since 1990. Rwanda, Malawi, and Mozambique have been among the most rapidly developing nations in the world (ranking 8<sup>th</sup>, 7<sup>th</sup>, and 1<sup>st</sup> respectively). This speed of development appears in everything. For example, the proportion of Rwandan households with access to electricity was 5% in 2002, 18% in 2012, and 61% in 2022. This is fantastic. Indeed, healthy skeptics might assume that some portion of the success of ZOE alumni would have happened with or without ZOE.

Table 4. Comparing Rwandan Development Growth and Poverty Measures  
with Other Nations: 2014-2020

Country	Human Development Index	HDI rank (of 191)	Human development level	Average annual HDI growth 1990-2021*	% of Persons in Multi-dimensional Poverty	% of Persons Below Income Poverty Line**
Switzerland	0.962	1	Very high	0.40	na	na
United States	0.921	21	Very high	0.18	na	na
India	0.633	132	Medium	1.22	16.4	10.0
Eswatini	0.597	144	Medium	0.29	19.2	36.1
Zimbabwe	0.593	146	Medium	0.49	25.8	39.8
Kenya	0.575	152	Medium	0.63	37.5	29.4
Tanzania	0.549	160	Low	1.27	57.1	44.9
<b>Rwanda</b>	<b>0.534</b>	<b>165</b>	<b>Low</b>	<b>1.68</b>	<b>48.8</b>	<b>52.0</b>
Uganda	0.525	166	Low	1.52	57.2	42.2
Malawi	0.512	169	Low	1.71	49.9	70.1
Liberia	0.481	178	Low	0.41	52.3	27.6
Sierra Leone	0.477	181	Low	1.38	59.2	26.1
Mozambique	0.446	185	Low	2.05	61.9	64.6
South Sudan	0.385	191	Low	-1.00	na	na

Note: na means “not available”.

\*2010-2021 for Liberia and South Sudan

\*\* Purchasing Power Parity \$1.90 a day.

Source: United Nations, Human Development Report 2021/2022, Tables 1, 2, and 6.

Table 5 is our first look at placing the ZOE Empowers alumni groups in Rwandan society and getting a general picture of the scale of the regions involved. Rwanda’s enumerated 2022 population was 13.2 million. If Rwanda were a state in the United States, it would rank 5<sup>th</sup> in population size (slightly larger than Pennsylvania). This is the scale of the system we are considering. The nation is divided into five provinces. All of the ZOE

alumni sample lived in the South Province (3 million persons). The South is very rural (85%) and poor (55% with electricity). The nation is less rural (72%) and richer (61% with electricity) because of the capital, Kigali City Province (metropolitan population of 1.7 million).

Table 5. Placing the Zoe Empowerment Alumni Groups within Rwandan Regions

Nation, Province, and Districts	2022 Population	% Rural of Total Population	% of Households with Electricity	Number of Orphaned Children
Rwanda	13,246,394	72.1	61.0	569,000
South Province	3,039,642	85.2	55.1	151,000
Gisagara District	404,440	96.6	52.6	na
5-Year Alumni Groups	780	100.0	70.4	na

Note: na means “not available”.

Sources: Fifth Rwanda Population and Housing Census 2022, Main Indicators Report, Tables 1, 2, 7 EICV5, Main Indicators Report, 2017, Table 1.6, for number of orphaned children 0-17 years old, and Zoe Alumni Survey Sep. 2022 and May/June 2023.

There were 151,000 orphaned children in the South and 568,800 in the nation in 2017. However, not all of these children were destitute. Ninety percent of these children still had one living parent, and only 26 percent of them lived in the lowest “consumption quintile” (the poorest 20 percent of Rwandan society). If the target population is vulnerable, orphaned children in Rwanda, that is only about 148,000 persons (26% of 568,800). **Solving this problem seems well within the capabilities of efficient, effective, sustainable, holistic empowerment programs like Zoe Empowers.**

The Zoe alumni groups lived in the Gisagara District (404,440 population) of the South Province. Gisagara is on the Rwandan border with Burundi and poorer than the rest of the South. In fact, Gisagara was by far the poorest of all 30 districts in Rwanda in 2022 (45% of households were poor, Table 4.2 in the 2022 Census: Non-Monetary Report). This context makes the accomplishments of the 5-year Zoe Empowers alumni even more impressive.

### Common Indicators of Well-Being

Now we turn to a quick introduction of accomplishment indicators commonly used in African developing nations. This should give us a good feel for where these alumni fit in their world. Table 6 analyses 33 such key indicators, directly comparing the Zoe alumni households to the Gisagara District households, their home district in the South Province. We show this comparison as a ratio in the fourth column, the alumni value divided by the Gisagara value. For example, the percentage of households owning a refrigerator was 2.5% for the Zoe alumni and 0.4% for the Gisagara households. 2.5



divided by 0.4 equals 6.25. Thus, we can say truthfully the alumni were about 6 times as likely as Gisagara households generally to own a refrigerator. Then we rank the 33 indicators.

Table 6. Comparing Zoe 5-Year Alumni Households with Regions and the Nation on Key Accomplishment Indicators: Rwanda 2022

Key Household Accomplishment Indicators	5-Year Alumni	Gisagara District	Alumni/ Gisagara	Southern Province	Rwanda	
					Rural	Total
% owning a refrigerator .....	2.5	0.4	<b>6.25</b>	1.1	0.4	2.7
% owning a sofa .....	25.6	4.6	<b>5.57</b>	9.1	na	12.9
% with charcoal cooking .....	9.5	2.9	<b>3.28</b>	8.8	4.0	17.3
% owning a computer .....	2.9	0.9	<b>3.22</b>	2.3	0.9	4.2
% owning a motor vehicle .....	1.6	0.5	<b>3.20</b>	0.9	0.4	1.8
% engaged in aquaculture in past year .....	1.7	0.7	<b>2.43</b>	0.7	na	0.5
% owning a motorcycle .....	2.8	1.2	<b>2.33</b>	1.3	1.3	1.6
Adults per child (18+y.o./less than 18) .....	2.5	1.1	<b>2.27</b>	1.3	1.2	1.2
% with cement floor .....	37.4	17.3	<b>2.16</b>	26.4	19.9	31.2
% owning a table .....	95.9	47.3	<b>2.03</b>	58.3	na	63.3
% owning a bicycle .....	26.3	15.8	<b>1.66</b>	9.5	11.8	11.0
% owning a mattress .....	88.4	55.2	<b>1.60</b>	62.0	na	70.2
% owning a television .....	5.3	3.7	<b>1.43</b>	7.9	5.0	12.3
% owning a bed .....	98.8	70.3	<b>1.41</b>	61.9	na	60.6
% owning a radio .....	95.5	68.8	<b>1.39</b>	76.0	77.2	81.3
% engaged in livestock rearing in past year ..	87.2	63.1	<b>1.38</b>	63.6	na	50.4
% with grid electrical/solar lighting .....	70.4	52.3	<b>1.35</b>	54.9	51.4	60.9
% owning chairs .....	98.8	75.6	<b>1.31</b>	76.5	na	73.7

Table 6. Comparing Zoe 5-Year Alumni Households with Regions and the Nation on Key Accomplishment Indicators: Rwanda 2022 (continued)

Key Household Accomplishment Indicators	5-Year	Gisagara	Alumni/	Southern	Rwanda	
	Alumni	District	Gisagara	Province	Rural	Total
% use improved drinking water source .....	99.2	78.4	<b>1.27</b>	78.4	76.8	82.3
% with iron sheets roof .....	45.5	36.1	<b>1.26</b>	39.0	65.9	74.1
Number of pigs/households with pigs .....	1.7	1.37	<b>1.24</b>	1.47	na	1.59
% engaged in crop farming in past year .....	97.1	82.0	<b>1.18</b>	75.6	na	62.6
% of school-age children attending school ....	88.9	75.6	<b>1.18</b>	82.2	80.2	81.3
% engaged in agriculture in past year .....	99.6	86.4	<b>1.15</b>	81.4	83.1	68.9
Number of rabbits/households with rabbits	4	3.37	<b>1.10</b>	3.53	na	3.84
% owning their home .....	89.7	81.4	<b>1.10</b>	77.6	82.7	71.6
% owning a mobile phone .....	69.1	66.5	<b>1.04</b>	71.9	73.2	78.1
Number of goats/households with goats ....	2.2	2.12	<b>1.04</b>	2.13	na	2.35
% with access to medical care .....	98.4	97.2	<b>1.01</b>	96.9	97.5	97.3
Number of sheep/households with sheep ...	2.0	2.04	<b>0.98</b>	1.88	na	2.13
Number chickens/households with chickens	4.0	4.15	<b>0.96</b>	4.40	na	6.52
Number of cattle/households with cattle ....	1.2	1.33	<b>0.90</b>	1.38	na	1.54
Average persons per household .....	3.2	3.9	<b>0.82</b>	3.9	4.0	4.0
% of respondents (ages21-30) never married	56.4	na	na	na	46.3	50.9
% with Internet access .....	14.4	na	na	19.1	19.9	28.1

Note: na means “not available”.

Data Sources: Rwanda Zoe Empowers Alumni Survey Sep. 2022 and May/June 2023, and Fifth Rwanda Population and Housing Census 2022, Main Indicators Report, Tables 2, 28, 38, 46, 60, 64, 65, 67, 68, 75, 76, 78, 79, 81, 88, 89, 97.

So, compared to Gisagara households, these alumni households were about ...

6 times more likely to own a refrigerator

5 times more likely to own a sofa

3 times more likely to cook with charcoal (not firewood) or

own a computer or motor vehicle

2 times more likely to engage in aquaculture

usually had twice as many adults per child in the home

2 times more likely to own a motorcycle or table or have a cement floor (not dirt)

60% more likely to own a bicycle or mattress

40% more likely to own a television, bed, or radio or rear livestock

25% more likely to have electricity or iron sheet roofs, own chairs, drink clean

water, crop farm, do agriculture, or have their school-age children in school and usually had 25% more pigs.

Also, they were a little above average in owning their homes, a mobile phone, rabbits or goats, and having access to medical care.

Finally, they were below average on only three indicators. They had fewer cattle, sheep, or chickens than average. They did have fewer persons per household. But this is usually a very good thing, one of the major drivers in improving human well-being.

### Consumption Quintiles

The next few tables extend the analysis to consumption quintiles. Consumption quintiles are the developing world’s equivalent of income distributions in the developed world. They will help us locate cleanly the position of Zoe alumni in their world.

Table 7 reports consumption quintiles in Rwanda. Based on the combination of many factors, the population is divided into ascending fifths. The lowest quintile (the lowest 20% of the population) is the poorest. The highest quintile is the most well-to-do 20% of the Rwandan population.

Table 7. Percent Distributions of Household Populations Over Consumption Quintiles: Rwandan Total, Urban, Rural, and South Province Populations, 2020

Consumption Quintiles	Household Population				South Province
	Rwanda	Urban	Rural	Rural/Urban	
Highest Quintile	20.0	63.2	11.2	0.2	11.7
Fourth Quintile	20.0	21.8	19.6	0.9	17.3
Middle Quintile	20.0	6.1	22.8	3.7	18.2
Second Quintile	20.0	3.5	23.4	6.7	21.7
Lowest Quintile	20.0	5.4	23.0	4.3	31.1
Total	100.0	100.0	100.0		100.0

Source: Rwanda Demographic and Health Survey 2019/2020, Table 2.5

The table also reports the consumption status of the urban population in Rwanda. Almost two-thirds (63%) of the urban population are at the top of Rwandan society (in the highest national quintile). An additional 22 percent of urban people live in the fourth quintile. This means that 85 percent of Rwandan urban people live in the top 40 percent of Rwandan society. Relatively few (15%) live in the bottom 60 percent of Rwandan life. No wonder the young and educated (and usually male) move to cities like Kigali, where there is more modern transportation, communication, employment, and wages.

In Rwanda as in most developing countries, city people and country people live in different worlds. The next column of Table 7 reports that Rwanda’s rural population is

concentrated at the middle and bottom of the consumption distribution. Sixty nine percent of the rural population is in the bottom sixty percent of Rwandan society. The next column says this differently. Rural people are 4.3 times as likely as urban people to be at the lowest quintile, almost seven times as likely to live at the second quintile, but only twenty percent (.20) as likely to live at the highest quintile. Again, this context makes the accomplishments of the rural Zoe Empowers alumni even more remarkable.

So, what are these accomplishments of the Zoe Empowers alumni? More half of the questions on the Zoe Empowers alumni survey (questions AL-22 through AL-55) repeat questions that are common to African census and survey questionnaires about living conditions. Seventeen of these items from our Zoe Empowers alumni survey can be compared directly to Rwandan regional and national consumption quintiles. These quintile-comparable items are listed in Table 8. Let's go through the list one item at a time.

Table 8 reports first that the average number of persons per household in the Zoe Empowers alumni groups was 3.2, very small compared to the regions. Household size is important because larger size usually means there are more dependent children (due to high birth rates) and fewer economically productive adults. In poor countries, this can make thriving much more difficult (though in some cases larger households can help subsistence farmers.) So, here we see generally an advantage to Zoe Empowers orphaned households (low fertility). The average household size in the South Province was 3.9 and the same 4.0 for rural and total Rwanda. Zoe alumni households even had a small advantage compared to the fifth (top) quintile at 3.3 average household size. So, these orphaned households can have some big, built-in advantages that are easy to overlook.

In the next row, the adults per child ratio tells this same story more clearly. The adults per child ratio of 2.5 in the Zoe orphaned households was a big advantage. This compares to only 1.3 adults per child for the South, 1.2 in rural and total Rwanda, and even 1.9 for the fifth (top) quintile of Rwandan society. Who could know that the tragedy of a child-led household would turn into such a strong advantage in a few short years, as those children become strong, young adults? In addition, 39% of the alumni household heads were married, presumably after graduation and because they were successful, young entrepreneurs. So, here comes another capable, compatible adult into the new family. Here again the Zoe empowerment method is playing into many powerful, natural processes that lead to well-being in the person, family, and community.

Next, the percentage of school-aged children attending school was high for the Zoe alumni households (89%) compared to the Gisagara (76%), South (82%), rural (80%), and total Rwanda (81%) populations. Here is a good indication that Zoe Empowers truly can be a solution to generational poverty.

Table 8. Comparing Zoe 5-Year Alumni Households with Regions and Consumption Quintiles on Various Accomplishment Indicators: Rwanda 2022

Household Accomplishment Indicators	5-Year	Gisagara	Southern	Rwanda		National	
	Alumni	District	Province	Rural	Total	Quintile	
Average persons per household .....	3.2	3.9	3.9	4.0	4.0	Q5	3.3
Adults per child (18+y.o./less than 18)	2.5	1.1	1.3	1.2	1.2	Q5	1.9
% of school-age children attending .....	88.9	75.6	82.2	80.2	81.3	Q4	87.6
% with access to medical care .....	98.4	97.2	96.9	97.5	97.3	Q3	96.2
% use improved drinking water source	99.2	78.4	78.4	76.8	82.3	Q5	87.4
% owning a radio .....	95.5	68.8	76.0	77.2	81.3	Q4	87.7
% owning a television .....	5.3	3.7	7.9	5.0	12.3	Q3	2.4
% owning a mobile phone .....	69.1	66.5	71.9	73.2	78.1	Q2	64.7
% owning a computer .....	2.9	0.9	2.3	0.9	4.2	Q4	0.9
% owning a bicycle .....	26.3	15.8	9.5	11.8	11.0	Q5	13.2
% owning a motorcycle .....	2.9	1.2	1.3	1.3	1.6	Q4	1.8
% owning a motor vehicle .....	1.6	0.5	0.9	0.4	1.8	Q4	0.0
% with Internet access .....	14.4	na	19.1	19.9	28.1	Q3	15.2
% owning a refrigerator .....	2.5	0.4	1.1	0.4	2.7	Q4	0.3
% with cement floor .....	37.4	17.3	26.4	19.9	31.2	Q4	31.4
% with grid electrical/solar lighting .....	70.4	52.3	54.9	51.4	60.9	Q4	64.6
% with charcoal cooking .....	9.5	2.9	8.8	4.0	17.3	Q3	8.0
% with iron sheets roof .....	45.5	36.1	39.0	65.9	74.1	na	na
% owning their home .....	89.7	81.4	77.6	82.7	71.6	na	na

Note 1: na means “not available”.

Data Sources: Rwanda Zoe Empowers Alumni Survey Sep. 2022 and May/June 2023, Fifth Rwanda Population and Housing Census 2022, Main Indicators Report, Tables 2, 28, 38, 60, 64, 65, 67, 68, 75, 76, 78, EICV5 Main Indicators Report, Tables 1.6, 1.7, 1.9, 3.5, 4.12, 4.15, and EICV5 Amenities Report, Tables 2.1, 2.2, 3.1, 3.2, 4.5, 4.7, 4.13, 4.16, 5.10, 6.1, 6.2.

Next, the percent with access to medical care was reported as 98% in the Zoe alumni survey, presumably meaning nearly everyone had access. The question in the Rwandan national survey asked about individuals with health insurance. If we assume “access” and “health insurance” mean the same thing (as in the U.S.), again the Zoe alumni were slightly ahead in each region and comparable to the middle national quintile. These are advantages and accomplishments enjoyed by these Zoe Empowers alumni.

The percentage of Zoe alumni using an improved drinking water source (99% using community standpipe or protected spring or stream) was much higher than all the regions and even beyond the 5<sup>th</sup> national quintile.

The next four accomplishment indicators deal with owning communication devices. Presumably these communication devices are how rural households get information about weather, agricultural market prices, health practices, community events, etc. In the 5-year Zoe alumni groups 95% of the households owned at least one radio. This was higher than the average in all the regions and closest to the average in the 4<sup>th</sup> national quintile (88%). The alumni group's ownership of televisions (5% of households) was higher than TV ownership in Gisagara and rural Rwanda generally but below the national percentage of 12% (because of Kigali at 36%). Ownership of mobile phones (69%) was like the national 2<sup>nd</sup> quintile and below all regions except Gisagara. Finally, even ownership of computers (3%) was higher than all the regions (except for the nation because of Kigali) and closest to the fourth national quintile (1%). So, the overall picture for ownership of communication devices repeats the pattern – really advanced young rural households from a poor region functioning at a high level compared to the nation.

The next three items deal with transportation. Transportation is important because walking takes considerable time and energy. In rural Rwanda the average time to walk to a health center in 2017 was 54 minutes each way. Imagine doing that when you are sick and/or carrying a sick child and the weather is hot or rainy! The average walking time to a source of clean water was 10.5 minutes each way, and you carry the water coming back. Average walking time to the food market was 55 minutes each way. So, transportation is important. A bicycle would reduce these times by about 75%. Plus, the bicycle can carry much more product than can a person, a great advantage to any young entrepreneur. In the Zoe alumni group, 26% of the households owned a bicycle, far above the ownership percentage for any of the regions and even beyond the nation's elite in the fifth quintile (13% bicycle ownership). Likewise, among alumni the ownership of motorcycles (3%) or motor vehicles (2%) was higher than all the regions (except for motor vehicles in the nation because of Kigali) and like the national 4<sup>th</sup> quintile.

Five accomplishment indicators remain, generally dealing with housing issues. The percentage of households with Internet access was below average for the Zoe alumni group (14%) compared to the South province (19%), rural Rwanda (20%), and the nation (28%), in the middle national quintile. On the other hand, owning a refrigerator (2%), having a cement floor (37%) rather than dirt, and having electric lighting (70%) were quite high compared to all the regions and comparable to the nation's fourth quintile. Charcoal cooking, rather than using smoky firewood, was higher for the alumni (9%) than the rural areas generally and in the middle quintile.

Finally, home ownership (rather than renting) was very high for the Zoe alumni (90%) compared to all the regions. However, we cannot get a comparison to national quintiles because renting is very prestigious in Kigali City province, and we were unable to separate Kigali from the national home-ownership quintiles. Similarly, we cannot get a national quintile comparison using iron sheet roofs (rather than local clay tiles), because the entire South was uniquely low on this characteristic.

So, this has been a lot of detail! Nevertheless, the general impression is that the Zoe alumni groups were doing very well indeed. In Appendix Tables 1 and 2, we reduce these details into one percentile number (83) to quantify precisely and objectively how the 5-year alumni groups were doing.

If you want to see these calculations, they are in the back of the report. Appendix Table 1 calculates an accomplishment score for the average Zoe alumni household which summarizes the 17 indicators into a single national consumption **quintile** score, using linear interpolation. Appendix Table 2 calculates an accomplishment **percentile** for the average Zoe alumni household (again using linear interpolation), which places these young households precisely where they fit in the status systems of the various regions. Doing this gives a good feel for how the alumni fit into their world.

The results are shown in Table 9. The Zoe alumni groups' national percentile rank was 74. This is very meaningful. It says the alumni households on average had achieved an estimated status or prestige level higher than 74 percent of the Rwanda population. And they did this as young, orphaned families in the poorest region of Rwanda (with the help of Zoe staff, overseas partners, and community support.) Now, that is accomplishment!

Table 9. Accomplishment Percentiles of the Average 5-Year Alumni Household:  
Interpolated Estimated Percentile Rank for Alumni Households  
Compared to the Rwanda Total, Urban, Rural, and South Province Populations

Rwanda	Urban	Rural	Southern Province
74.4	30.7	83.3	<b>83.5</b>

Their URBAN accomplishment percentile is 31. Their accomplishment percentile in the RURAL population is 83 and in the SOUTH Province is 83.

To interpret, their accomplishments (31st percentile) may not be very impressive to an urbanite from Kigali, but they are very high for rural Rwanda and the South Province (83rd percentile).

So, here is the number to remember, **83**. **On average, the members of the Zoe alumni groups were functioning as well as or better than 83 percent of the population in**

**the South Province where they lived (or as close as we can get to where they lived.) They were elite in their home communities.**

**If the goal of the Zoe Empowers program is for the children to become self-sustaining and “never need charity again,” these young alumni have done that. They have gone beyond that and already achieved sustained high status.**

### Implications

What are some implications of this elite status for these young Zoe Empowers households? Here are some brainstorms. Please add your own.

1. **Pride.** These young alumni can feel pride in their accomplishments as individuals and families and as Zoe Empowerment Groups. They can remember that they developed habits of flexible thinking, hopeful attitudes, group consultation, and hard and disciplined work that are good for themselves and everyone.
2. **Gratitude.** They can remember that many people were with them from their beginning with Zoe Empowers. Community leaders and families, mentors, government officials, group members, the founder of the Zoe Empowers model, Zoe Empowers staff, and overseas partners were with them. And our Father in Heaven. They are not alone.
3. **Generosity.** They can discover for themselves that generosity leads to the best life possible. They can strive for the common good, meet everyone’s needs together (including their own), and help people effectively. Here is a major source of happiness.
4. **Responsibility.** High standing implies responsibility to strive for the common good and find ways to help effectively. People are depending on them now.
5. **Danger.** It is hard to realize that being rich can be dangerous. The temptation is strong to accumulate possessions and comforts and segregate from people rather than strive for the common good.
6. **Training.** Zoe Empowers may want to establish one last training session for new graduates. The topics could be (1) how to be rich successfully and (2) what to expect in alumni life.
7. **Self-sustaining.** The Zoe Empowers program itself might strive to become self-sustaining by helping alumni groups partner with new Zoe Empowers groups. Let overseas partners focus on expanding rather than maintaining Zoe Empowers.



Table 10 shows that the Zoe alumni just may be able to do it – to become rich successfully. In response to questions on their graduation survey, 95% said they assisted poor or vulnerable people without asking for payment, 6% said they had adopted additional children, and 81% said they hire orphans or vulnerable people. These answers indicate they practiced generous leadership during their time in the program.

Table 10. Practicing Generous Leadership: Zoe Rwanda Class 2015 at Graduation

Altruism Questions	Number			Percent		
	Yes	No	Total	Yes	No	Total
In the last year, did you assist any poor or vulnerable people in your community (outside of your working group) without asking for payment?	230	13	243	94.7	5.3	100.0
Have you adopted any additional children from the community into your family or into your working group?	14	229	243	5.8	94.2	100.0
Do you hire orphans or vulnerable people to help with your business or crops?	196	47	243	80.7	19.3	100.0

Data Sources: Zoe Graduation Survey, January 2018.

### Section 3. Comparing Alumni Households with the Nation on Multidimensional Poverty

The next part of the research design compares these Zoe alumni with the nation using Rwanda’s adaptation of the Multidimensional Poverty Index (MPI). The MPI is a major assessment tool for measuring and monitoring poverty levels in the world’s developing countries, shown each year in the United Nations’ Human Development Report. It is a non-monetary measure of poverty, used as a more comprehensive if less precise compliment to monetary measures of poverty. It seeks to address poverty in all its dimensions.

The Census Non-Monetary Poverty report (page 8) has a good description of how the measure works: “The MPI methodology identifies a set of indicators in which households or individuals are deprived, and summarizes their poverty profile in a deprivation score. Households or individuals are identified as multidimensionally poor if their deprivation score exceeds a cross-dimensional poverty cut-off.”

The dimensions, indicators, and weights we are using are shown in Table 11. We match the Rwandan indicators as closely as we can. The Rwandan indicators themselves are an adaptation of the international methodology. This shows the flexible nature of the MPI, allowing for cultural differences as well as data limitations. Please notice how comprehensive is the measure.

Table 11. Percent of Persons Deprived on Multidimensional Poverty Indicators:  
Rwanda and Zoe 5-Year Alumni, 2022

Dimensions, Component Indicators, and Weights	Household is deprived if ...	Rwanda	5-Year Alumni
<b>EDUCATION, 1/3</b>			
Years of Schooling, 1/6	No household member has completed primary school (from census or Zoe graduate survey).	29.4	0.3
School Attendance, 1/6	Any school-aged child is not attending school.	5.5	2.6
<b>HEALTH, 1/3</b>			
Child Mortality, 1/6	Any child died in the previous five years (census).	7.3	NA
Nutrition, 1/6	Household eats less than 2 meals/day and says they do not eat enough (Zoe survey).	NA	0.9
Health Insurance, 1/6	Household has no medical insurance (census) or has no access to medical care (Zoe survey).	4.6	2.7
<b>LIVING STANDARD, 1/3</b>			
Electricity, 1/18	Household does not use electricity for main source of lighting.	37.7	27.4
Sanitation, 1/18	Household has unimproved sanitation facility (census) or toilet is inadequate with no roof and no concrete floor (Zoe graduate survey).	7.4	0.0
Drinking Water, 1/18	Household does not have access to improved drinking water source.	20.8	0.1
Flooring/Housing, 1/18	Household has dirt, sand, or dung floor.	67.2	59.0
Cooking fuel, 1/18	Household cooks with solid fuel such as dung, wood, or crops (charcoal excepted).	76.7	87.9
Assets ownership, 1/18	Household does not own more than one of radio, TV, telephone, bike, motorbike, refrigerator and does not own a car or truck.	56.2	25.6

Note: NA means “Not Applicable”.

Data Sources: Rwanda Zoe Empowers Alumni Survey Sep. 2022 and May/June 2023, and Fifth Rwanda Population and Housing Census 2022, Thematic Report: Measurement and Mapping of Non-Monetary Poverty, 2023, Table 3.2.

There are three dimensions of deprivation (education, health, and living standard), each weighted as 1/3. The Education Dimension has two indicators, years of school completed and school attendance, each accounting for 1/6 of the overall deprivation score. The Health Dimension also has two indicators, each accounting for 1/6 of the overall deprivation score. The international MPI definition uses child mortality and nutrition indicators. Because of data limitations, Rwanda used child mortality and health insurance. Because of Zoe data limitations, we have used nutrition and access to medical care. The Living Standard Dimension uses six indicators, each accounting for 1/18 of the overall deprivation score. These are electricity, sanitation, drinking water, flooring, cooking fuel, and asset ownership.

The overall deprivation score is the sum of the weights on which the household is deprived. Thus, the score varies from 0 to 1. According to international standard, a household and its members are grouped in categories as follows:

Severely Poor	.50 or higher
Moderately Poor	1/3 to less than .50
Vulnerable to Poverty	.20 to less than 1/3
Non-Poor	less than .20

Consequently, to be considered multidimensionally poor, a household must be deprived in at least two education or health indicators, one education or health indicator and three standard of living indicators, or six standard of living indicators.

Tables 12 through 17 below present the poverty distribution of the Zoe alumni compared with the poverty distributions of various other kinds of persons or households. Table 18 summarizes the same comparisons with 321 types of households, all that are reported from the 2022 Census. We are seeking to know the Zoe alumni by finding other households with similar levels of well-being.

Table 12. Poverty Percent Distributions of Persons: Zoe 5-Year Alumni, Gisagara District, Southern Province, and Rural, Urban, and Total Rwanda, 2022

Poverty Status	5-Year Alumni	Southern Province			Rwanda		
		Gisagara	Rural	Total	Rural	Urban	Total
Non-poor	88.5	32.7	36.0	40.8	36.4	72.7	47.0
Vulnerable	9.7	22.1	25.7	24.2	26.2	13.9	22.6
Moderately Poor	1.4	33.4	29.8	27.3	29.2	10.3	23.7
Severely Poor	0.4	11.8	8.5	7.8	8.1	3.1	6.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of Persons*	780	404.4	2,604.9	3,039.6	9,390.6	3,855.8	13,246.4
% necessary to move UP to match Alumni	0.0	55.8	52.5	47.7	52.1	15.8	41.5

\*Number of persons in thousands for Southern Province and Rwanda.

Data Sources: Rwanda Zoe Empowers Alumni Survey Sep. 2022 and May/June 2023, and Fifth Rwanda Population and Housing Census 2022, Thematic Report: Measurement and Mapping of Non-Monetary Poverty, 2023, Tables 4.1 and 4.2.

Table 12 reports poverty distributions of persons for Zoe alumni and selected areas of Rwanda. The second column of numbers in Table 12 shows the poverty distribution of persons in the Zoe alumni households. The alumni were extremely high. 88 percent were non-poor. Most of the rest were vulnerable but not poor. Only four households (15

persons) were classified as poor, less than 2% of the alumni households. One 3-person household was severely poor. These were their areas of deprivation. Three of these four poor alumni households lacked access to medical care, two of the four households had children not attending school, and all had dirt floors, no electric lighting, and cooked with firewood. However, we will see these conditions much more frequently in almost any other kind of household.

The other columns in Table 12 show the poverty distributions in Rwandan regions. In Gisagara District, the Zoe alumni's home area, only 33 percent of persons were non-poor. 33 percent were moderately poor, and 12 percent were severely poor – a striking contrast with the alumni.

The number at the bottom of the column is very useful to us. It shows the minimum percentage of the Gisagara population that would have to move UP to the non-poor category to match the Zoe alumni distribution. (This is called the Index of Dissimilarity.) At least 56 percent of the Gisagara population would have to move up to the top to match the Zoe alumni. We can hope and pray that this will happen as soon as possible. We can expect that our alumni households are demonstrating for their neighbors how this can happen!

Our story is the same in the other parts of Rwanda. In the rural and total South Province, 52% and 48% would have to move up to non-poor status to achieve well-being like the Zoe alumni. In rural and total Rwanda, 52% and 42% would have to move up. Only in urban Rwanda, that “other world” at 16%, does the difference narrow substantially. But even here, the alumni would be distinguished.

Table 13 compares the Zoe alumni households with all households having children in Rwanda, classified by orphaned status. The first two columns of percent distributions show all alumni households and alumni households with children (about half of alumni households). Their poverty profiles are essentially the same. But all the other columns are very different. In households with double orphans (both mother and father died), fully 65% would have to move up. The other columns are similar, including households having children where both parents are alive (50% would have to move up). And, please remember, most of the Zoe alumni households themselves had or were orphaned children.

Table 14 compares the Zoe alumni households with all Rwandan households where there were working adults, with and without children. 36% with children and 31% without children would have had to move up to achieve non-poor status like the alumni.

Table 13. Poverty Percent Distributions of Households with Children (ages 0-17)  
by Orphaned Status of the Children: 5-Year Alumni and Rwanda, 2022

Poverty Status	All 5-Year Alumni	Households with Children (ages 0-17)				
		5-Year Alumni	Mother died, Father died	Mother died, Father alive	Mother alive, Father died	Mother alive, Father alive
Non-poor	87.3	86.5	22.4	24.3	29.8	37.8
Vulnerable	11.1	11.1	19.8	23.3	23.3	25.4
Moderately Poor	1.2	1.6	36.4	37.5	35.5	27.9
Severely Poor	0.4	0.8	21.3	14.8	11.4	9.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
N of Children*	243	126	45,637	112,665	356,049	5,377,007
% necessary to move UP to match All Alumni	0.0	0.8	64.9	63.0	57.5	49.5

\*Number of households for Alumni. The number of children is not the base for the percentages.

Data Sources: Rwanda Zoe Empowers Alumni Survey Sep. 2022 and May/June 2023, and Fifth Rwanda Population and Housing Census 2022, Thematic Report: Measurement and Mapping of Non-Monetary Poverty, 2023, Table Annex C.12, and Thematic Report: Socio-economic Status of Children, 2023, Table 6.2.

Table 14. Poverty Percent Distributions of Households with a Working Adult  
With and Without Children: Zoe 5-Year Alumni and Rwanda, 2022

Poverty Status	All 5-Year Alumni	Households with a Working Adult					
		With Children		Without Children		Total	
		5-Year Alumni	Rwanda	5-Year Alumni	Rwanda	5-Year Alumni	Rwanda
Non-poor	87.3	86.5	51.0	87.6	55.9	87.0	52.1
Vulnerable	11.1	11.1	22.6	11.5	17.8	11.3	21.5
Moderately Poor	1.2	1.6	19.5	0.9	22.5	1.3	20.2
Severely Poor	0.4	0.8	6.9	0.0	3.8	0.4	6.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N of Households	243	126	1,708,177	113	507,852	239	2,216,029
% necessary to move UP to match All Alumni	0.0		36.3		31.4		35.2

Data Sources: Rwanda Zoe Empowers Alumni Survey Sep. 2022 and May/June 2023, and Fifth Rwanda Population and Housing Census 2022, Thematic Report: Measurement and Mapping of Non-Monetary Poverty, 2023, Table Annex C.11.

Table 15 compares the Zoe alumni households with all households in rural Rwanda classified by the educational attainment of the household head. Alumni households were far, far ahead of rural households with no formal educational attainment (68% must go up to match the alumni). These were mostly older adults raised in pre-modern Rwanda. However, going from no educational attainment to more education, the differences with alumni households narrow dramatically. 50% of rural households with primary educated household heads would have to go up to match alumni households, as would 18% of rural households with secondary educated heads. But university graduates were different.

Table 15. Poverty Percent Distributions of Households By Heads' Education Level:

Zoe 5-Year Alumni and Rural Rwanda by Education Level, 2022

Poverty Status	All 5-Year Alumni	Rural Rwanda Household Heads' Education Level				
		None	Primary	Secondary	University	Total
Non-poor	87.3	19.3	37.3	68.9	87.9	36.4
Vulnerable	11.1	22.3	28.7	24.9	10.8	26.2
Moderately Poor	1.2	44.6	27.1	6.1	1.7	29.3
Severely Poor	0.4	13.9	7.0	0.5	0.5	8.1
Total	100.0	100.0	100.0	100.4	100.8	100.1
N of Households	243	641,770	1,429,291	237,431	39,964	2,348,456
% necessary to move UP to match Alumni	0.0	68.0	50.0	18.4	-0.6	50.9

Data Sources: Rwanda Zoe Empowers Alumni Survey Sep. 2022 and May/June 2023, and Fifth Rwanda Population and Housing Census 2022, Thematic Report: Measurement and Mapping of Non-Monetary Poverty, 2023, Table 5.9.

In rural Rwanda the only school attainment level that matched the non-poor status of Zoe alumni was households with university-graduated heads. That was a small number of elite households (only 40,000 in rural Rwanda). However, few alumni respondents were college-educated. Only 1% had completed college at the time of the graduation survey (68% completed primary school, and 30% finished secondary school). So, with common education, the alumni were achieving at the same high level as educated elites.

Table 16 compares the Zoe alumni households with all households that owned one or more businesses. In rural Rwanda 43% of such households would have had to move up to achieve non-poor status like the alumni households. And even in urban Rwanda the alumni would have been ahead. 11% of urban business-owning households would have had to move up to match them.

Table 16. Poverty Percent Distributions of Households which Own One or More Businesses: Zoe 5-Year Alumni and Rural, Urban, and Total Rwanda, 2022

Poverty Status	All 5-Year Alumni	Households which Own One or More Businesses			
		5-Yr. Alumni	Rural	Urban	Rwanda
Non-poor	87.3	87.0	44.1	76.5	52.4
Vulnerable	11.1	11.3	26.0	13.3	22.8
Moderately Poor	1.2	1.3	24.1	8.1	20.0
Severely Poor	0.4	0.4	5.8	2.0	4.8
Total	100.0	100.0	100.0	100.0	100.0
N of Households	243	239	554,819	188,441	744,895
% necessary to move UP to match All Alumni	0.0		43.2	10.8	34.9

Data Sources: Rwanda Zoe Empowers Alumni Survey Sep. 2022 and May/June 2023, and Fifth Rwanda Population and Housing Census 2022, Thematic Report: Measurement and Mapping of Non-Monetary Poverty, 2023, Table 5.10.

Table 17 compares the Zoe alumni households with all households that had business(es) with employees. In rural Rwanda 28% of such households would have had to move up to match the alumni. However, in the urban areas, these employer households did it. They had achieved non-poor status a little beyond the alumni households (5% ahead). But they were a really small, elite grouping – only 15,369 or 0.5% of all the households in Rwanda. Such were the achievements of the young alumni, way down in the poorest part of the nation!

Table 17. Poverty Percent Distributions of Households with Business(es) and Employees: Zoe 5-Year Alumni and Rural, Urban, and Total Rwanda, 2022

Poverty Status	All 5-Year Alumni	Households with Business(es) and Employees			
		5-Yr. Alumni	Rural	Urban	Rwanda
Non-poor	87.3	86.3	59.8	91.0	77.8
Vulnerable	11.1	11.8	22.4	6.0	12.8
Moderately Poor	1.2	1.4	14.3	2.6	7.6
Severely Poor	0.4	0.5	3.5	0.4	1.9
Total	100.0	100.0	100.0	100.0	100.0
N of Households	243	212	11,722	15,369	27,589
% necessary to move UP to match All Alumni	0.0		27.5	-5.1	9.5

Data Sources: Rwanda Zoe Empowers Alumni Survey Sep. 2022 and May/June 2023, and Fifth Rwanda Population and Housing Census 2022, Thematic Report: Measurement and Mapping of Non-Monetary Poverty, 2023, Table 5.10.

Table 18 summarizes all the 321 comparisons with Zoe alumni household poverty status that are available to us from the 2022 Census. The table identifies in **bold type** all the categories of households that had 85 percent or more non-poor. These types of households then matched or exceeded the alumni’s 87 percent non-poor, as measured by the Rwandan multidimensional poverty method.

Table 18. Categories of High Achieving Households (at least 85% non-poor) That Were Similar to Zoe 5-Year Alumni Households: Rural, Urban, and Total Rwanda, 2022

The Only High Achieving Households Similar to Zoe 5-Year Alumni Households (87.3% Non-poor)	Percent Non-Poor of Total Households		
	Rural*	Urban	Rwanda
<b>EDUCATION</b>			
Household head was a college graduate.	<b>87.9</b>	<b>97.5</b>	<b>95.4</b>
Household head was a secondary school graduate.	69.1	<b>92.8</b>	82.0
Household head was a vocational school graduate.	67.3	<b>88.9</b>	75.1
<b>OCCUPATION</b>			
Household head’s main occupation: manager	<b>88.9</b>	<b>97.2</b>	<b>95.6</b>
Household head’s main occupation: professional	79.1	<b>95.1</b>	<b>88.9</b>
Household head’s main occupation: technician	69.9	<b>93.2</b>	<b>86.2</b>
Household head’s main occupation: clerical	70.3	<b>93.9</b>	<b>87.6</b>
Household head’s main occupation: service and sales	66.3	<b>86.0</b>	78.9
Head’s main occupation: machine operator/assembler	65.2	<b>90.9</b>	80.5
Household head was self-employed and had employees.	59.8	<b>91.0</b>	77.8
<b>HOUSING</b>			
Household lived in an apartment building.	NA	<b>100.0</b>	<b>100.0</b>
Household lived in a modern urban planned area.	72.9	<b>86.7</b>	<b>86.5</b>
Lived in a compound of buildings for their household only.	54.6	<b>90.9</b>	71.0
Household included at least one non-relative.	61.0	<b>91.4</b>	80.2
Housing wall material was burnt bricks with cement.	36.4	<b>92.9</b>	<b>86.2</b>
Housing wall material was stones with cement.	72.9	<b>93.5</b>	<b>85.0</b>
Housing wall material was burnt bricks without cement.	76.2	<b>94.5</b>	<b>89.7</b>
Housing wall material was cement blocks.	67.7	<b>89.9</b>	78.7
Housing roof material was industrial tiles.	36.4	<b>97.0</b>	69.9
Household has access to the Internet.	80.8	<b>95.2</b>	<b>91.0</b>
Total Number of Household Comparisons Examined	98	98	125

\*NA means “not applicable”.

Data Source: Fifth Rwanda Population and Housing Census 2022, Thematic Report: Measurement and Mapping of Non-Monetary Poverty, 2023, Tables 5.1-5.11 and Annex Tables C.2-C.3, C.5-C.7, C.11, C.12, C.16.



**In rural Rwanda, where the alumni live, only two kinds of households achieved non-poverty status similar to Zoe alumni, from the 98 different household types examined (in a spreadsheet). These were (1) households with university-graduate heads and (2) households where the head's main occupation was manager.**

From urban Rwanda, there were 20 types of households that matched or exceeded the alumni, from 98 different household types examined. For the nation as a whole, there were 11 types of such achieving households, from 125 household types examined. You can see them in the table, for example, households that lived in a modern urban planned area.

Such were the achievements of young Zoe alumni, way down in the poorest part of the nation! This shows the holistic high status of the Zoe alumni. These are extraordinary achievements, especially considering where these young people began when Zoe first found them in 2015!

## Section 4. Comparing Alumni Households with Themselves (Panel Analysis)

The final part of the research design is a panel analysis comparing these Zoe alumni with themselves at graduation. Here we are examining CHANGE in the well-being of these young people. How did things go for them between graduation and the time of the alumni survey?

Our primary tool for objective analysis is a short version of Zoe Empowers' SSI. Over the years Zoe Empowers staff (with the assistance of SAS, Inc.) developed an excellent seventy-four-item index called the Self-Sufficiency Index (SSI). The SSI has proven very useful for several years in various Zoe Empowers countries.

The alumni survey questionnaire included 10 key questions from the SSI (questions AL-10 to AL-19) which cover all the areas of emphasis in the Zoe Empowers model (except education). For clarity, we call the abbreviated version of the SSI, the "10 question SSI" or 10qSSI.

Table 19 shows these ten questions. Please read them. These questions have been included on every Zoe Impact Survey ever conducted – incoming, midpoint, graduation, and alumni in several countries. They form an invaluable resource for understanding Zoe Empowers. Also, please notice the 10qSSI is even more comprehensive than the multidimensional poverty index. There are items assessing nutrition, housing, community attachment, health, child rights, income, and spiritual/mental health strength. The 10qSSI yields a very holistic assessment of well-being.

Table 19. Zoe Empowers' Abridged Self-Sufficiency Index (10qSSI):  
Responses of Combined Zoe Incoming Classes 2018 and 2019

Survey Items	SD	D	A	SA
	0	1	2	3
The number of meals I eat per day on average. ....	345	114	1	0
I do not beg for food. ....	303	148	7	2
I eat enough each day that I am satisfied. ...	376	84	0	0
I live in an adequate/safe house. ....	328	132	0	0
I feel that I am a valuable member of the community. ....	365	90	3	1
I am not often ill. ....	291	79	84	6
I have access to medical care. ....	389	70	1	0
I know my rights and can enforce them. ...	343	116	1	0
Through my work, I can provide sufficient food, clothing, school expenses, and other necessities for my household. ....	357	102	1	0
I feel that God loves me. ....	275	178	7	0

Data Sources: Zoe Empowers Impact Surveys 2018 and 2019.

Each of the 10 questions is scored 0 to 3, usually meaning strongly disagree, disagree, agree, or strongly agree. The overall index is easy to understand and calculate, merely sum the ten items and divide by ten. Possible index scores vary from 0 to 3.

A household and its members are grouped in categories as follows:

label:	range:	typical low:	typical high:
Flourishing	2.6 to 3.0	4 2's and 6 3's	all 3's
Self-Sustaining	1.7 to 2.5	3 1's and 7 2's	5 2's and 5 3's
Vulnerable	0.6 to 1.6	4 0's and 6 1's	4 1's and 6 2's
Suffering	0.0 to 0.5	all 0's	5 0's and 5 1's

So, Flourishing typically means 6 or more “strongly agrees”, Self-sustaining typically means 7 “agrees” up to half “strongly agrees”, Vulnerable typically means mostly “disagrees” up to 6 “agrees”, and Suffering typically means all “strongly disagrees” up to half “disagrees”. We hope this helps the interpretation of the index as a holistic measure of well-being.

Table 19 also shows the responses to each item from the 470 households of the Incoming classes 2018 and 2019 in Rwanda, taken very soon after they were already accepted into the program. We include their responses to illustrate the likely condition

of our Rwanda Class 2015 when they were recruited to Zoe. (The survey program began in 2018, when Class 2015 was graduating.) You can see that zero answers predominate (73% of the responses were zero.) In fact, 36 percent of the households answered **all zeroes! Can you imagine? We call that suffering.**

Table 20 reports the self-sufficiency distributions of the 2018 and 2019 classes at their Incoming to Zoe. For the 2018 class, 96% were suffering, and the rest were vulnerable (to suffering). 59% of the 2019 class were suffering and the rest vulnerable. We can assume our Class 2015 alumni began like this as well, though we will never know.

Table 20. Self-Sufficiency Percent Distributions of Incoming Zoe Households:  
Rwanda Classes 2018 and 2019

Self-Sufficiency Status	Incoming Zoe Empowers Classes			
	2018		2019	
	Number	Percent	Number	Percent
Flourishing	0	0.0	0	0.0
Self-Sustaining	0	0.0	0	0.0
Vulnerable	8	4.3	112	41.2
Suffering	180	95.7	160	58.8
N of Households	188	100.0	272	100.0

Data Sources: Zoe Empowers Impact Surveys 2018 and 2019.

Table 21 shows responses to each item from the 243 households of our Class 2015 Zoe alumni, both at graduation and as 5-year alumni. The results are almost the exact opposite of Table 19 for Classes 2018 and 2019 at Incoming. You can see that the answers coded “3” predominate. (At graduation 84% of the responses were three, as were 70% for 5-year alumni.) In fact, at graduation 47 percent of the households answered ALL threes and 17 percent as alumni. Compared to Table 19, these are amazing transformations. Imagine the joy of the graduates and alumni! We have been with graduating Zoe groups. Their joy is indescribable.

Table 22 reports the self-sufficiency distributions of the 2015 class at graduation and as 5-year alumni. **At graduation, 98% of the households were flourishing, and the others were self-sustaining. As alumni, 72% were flourishing, and the rest were self-sustaining, except for two borderline vulnerable households.**

Table 21. Zoe Empowers' Abridged Self-Sufficiency Index (10qSSI): Rwanda

Ten Survey Items	SD	D	A	SA
	0	1	2	3
<b>Responses of Class 2015 at Graduation</b>				
The number of meals I eat per day on average. ....	0	0	14	228
I do not beg for food. ....	0	0	13	230
I eat enough each day that I am satisfied. ...	0	0	39	204
I live in an adequate/safe house. ....	0	1	67	175
I feel that I am a valuable member of the community. ....	0	0	22	221
I am not often ill. ....	0	0	18	225
I have access to medical care. ....	0	0	10	233
I know my rights and can enforce them. ...	0	0	64	179
Through my work, I can provide sufficient food, clothing, school expenses, and other necessities for my household. ....	0	1	101	141
I feel that God loves me. ....	0	1	38	204
<b>Responses of Class 2015 as 5-Year Alumni</b>				
The number of meals I eat per day on average. ....	0	6	121	116
I do not beg for food. ....	1	4	14	224
I eat enough each day that I am satisfied. ...	3	0	91	149
I live in an adequate/safe house. ....	0	2	111	130
I feel that I am a valuable member of the community. ....	8	5	54	176
I am not often ill. ....	13	6	52	172
I have access to medical care. ....	3	1	33	206
I know my rights and can enforce them. ...	0	0	64	179
Through my work, I can provide sufficient food, clothing, school expenses, and other necessities for my household. ....	0	1	101	141
I feel that God loves me. ....	0	1	38	204

Data Sources: Zoe Empowers Impact Survey 2018, and

Rwanda Zoe Empowers Alumni Survey Sep. 2022 and May/June 2023

Table 22. Self-Sufficiency Percent Distributions of Class 2015  
at Graduation and 5-Year Alumni Survey

Self-Sufficiency Status	Zoe Empowers Rwanda Class 2015			
	Graduation		5-Year Alumni	
	Number	Percent	Number	Percent
Flourishing	237	97.5	176	72.4
Self-Sustaining	6	2.5	65	26.7
Vulnerable	0	0.0	2	0.8
Suffering	0	0.0	0	0.0
N of Households	243	100.0	243	100.0

Data Sources: Zoe Empowers Impact Survey 2018, and

Zoe Empowers Alumni Survey, September 2022 and May/June 2023.

Table 23 directly shows the amount of CHANGE for each question during the five years after graduation. For example, on the meals per day question, 7 households added one meal per day, 116 stayed the same, but 114 went DOWN one meal daily, and 6 households went down 2. Really? The bottom panel expresses these as percentages. 47.7% stayed the same, but 49.4% (= 2.5 + 46.9) went down on meals per day.

Reading the table as a whole, we see that **most households maintained their same level on each question in the years after graduation (except meals per day). But when they did change, they usually went down.** This is especially true for the most sensitive questions – meals per day (49% went down), paying for household necessities (38% went down), eating enough (32% went down), and adequate housing (31% went down).

What ideas might explain these declines? The first idea is response shift. This means people’s standards changed between the earlier and the later surveys. For example, what a respondent saw as adequate housing earlier may have seemed inadequate later. Their standards had shifted. A related example is simple maturing. Graduates in all kinds of programs can overestimate their future success, then become more realistic over time. Their maturity changes their expectations. A second idea about declines after graduation is the COVID effect. We know the Rwandan national economy declined during 2020, the year of nationwide COVID lock-down, and still was recovering in 2021. The lock-down was in the middle of our 5-year alumni’s post-graduation period and might explain some of the declines. A last idea about the declines is actually a host of new hypotheses. We really need to ask Zoe Africa staff if they think the declines were real and what they think may have caused those changes.

Additionally, we could gain clarity on these issues by looking at other Zoe households – in different nations and time periods, using at graduation the more objective questions in the alumni survey.

Table 23. Change for Zoe Rwanda Class 2015 Households from Graduation to 5-Year Alumni, 2018 to 2023

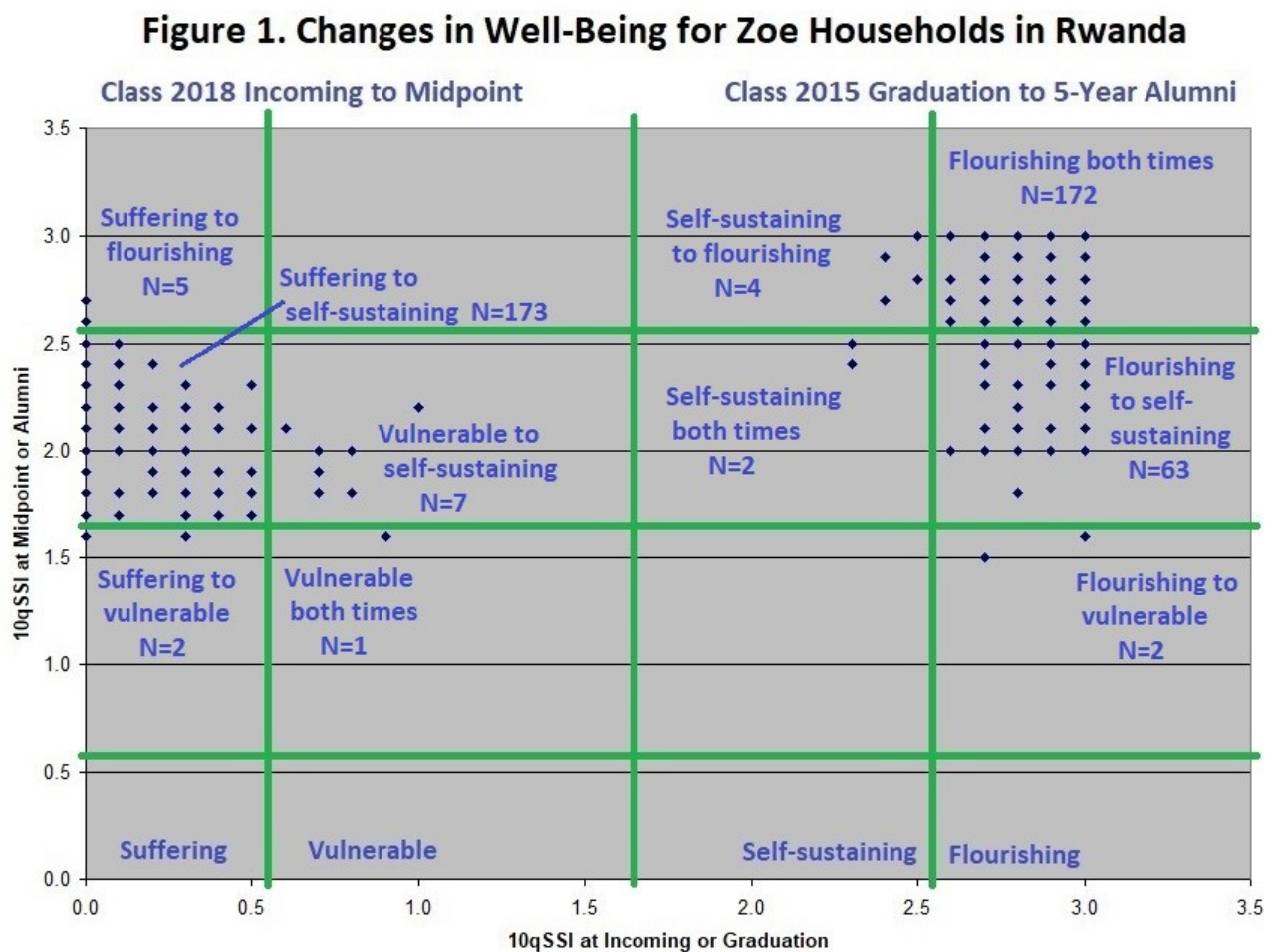
Ten Survey Items	Number of Households Who Changed ...						
	Down 3	Down 2	Down 1	Same	Up 1	Up 2	Total
<b>Number</b>							
The number of meals I eat per day on average. ....	0	6	114	116	7	0	243
I do not beg for food. ....	0	5	14	212	12	0	243
I eat enough each day that I am satisfied. ....	0	2	76	143	22	0	243
I live in an adequate/safe house. ....	0	2	74	136	30	1	243
I feel that I am a valuable member of the community. ....	8	3	49	170	13	0	243
I am not often ill. ....	13	6	49	160	15	0	243
I have access to medical care. ....	3	1	32	198	9	0	243
I know my rights and can enforce them. ...	0	0	60	170	13	0	243
Through my work, I can provide sufficient food, clothing, school expenses, and other necessities for my household. ....	0	1	91	138	13	0	243
I feel that God loves me. ....	0	1	36	183	23	0	243
<b>Percent</b>							
The number of meals I eat per day on average. ....	0.0	2.5	46.9	47.7	2.9	0.0	100.0
I do not beg for food. ....	0.0	2.1	5.8	87.2	4.9	0.0	100.0
I eat enough each day that I am satisfied. ....	0.0	0.8	31.3	58.8	9.1	0.0	100.0
I live in an adequate/safe house. ....	0.0	0.8	30.5	56.0	12.3	0.4	100.0
I feel that I am a valuable member of the community. ....	3.3	1.2	20.2	70.0	5.3	0.0	100.0
I am not often ill. ....	5.3	2.5	20.2	65.8	6.2	0.0	100.0
I have access to medical care. ....	1.2	0.4	13.2	81.5	3.7	0.0	100.0
I know my rights and can enforce them. ...	0.0	0.0	24.7	70.0	5.3	0.0	100.0
Through my work, I can provide sufficient food, clothing, school expenses, and other necessities for my household. ....	0.0	0.4	37.4	56.8	5.3	0.0	100.0
I feel that God loves me. ....	0.0	0.4	14.8	75.3	9.5	0.0	100.0

Data Sources: Zoe Graduation Survey Jan. 2018 and Zoe Alumni Survey Sep. 2022 and May/June 2023

Nevertheless, focusing on these declines distracts us from seeing the more important implication. The actual meaning here is that **the alumni households declined from extremely high to very high in the years after graduation.** This is shown in Figure 1.

Figure 1 is a scatterplot showing the precise change in 10qSSI for the individual households. Each dot on the right is one or more alumni households of Class 2015, showing their change after graduation. Each dot on the left is one or more households of Class 2018, showing their change from Incoming to the Midpoint of their Zoe program years. (The midpoint survey for Class 2019 was canceled because of pandemic lock-down.)

The horizontal axis reports the earlier 10qSSI for each household, at incoming for Class 2018 or graduation for Class 2015. The vertical axis reports the later 10qSSI, at midpoint for Class 2018 or as 5-year alumni for Class 2015. Each axis shows the levels of well-being, from suffering through vulnerable and self-sustaining to flourishing.



For Class 2018 on the left, we see that nearly all the households started the Zoe program in suffering condition (96%, in fact, from Table 20). But by midpoint, ALL but three were self-sustaining or (a few) flourishing.

For Class 2015 on the right, we see that nearly all the households graduated from the Zoe program in flourishing condition (98%, in fact, from Table 22). However, five years

after graduation, 63 households had fallen from flourishing – but not very far. With only three exceptions, all were firmly self-sustaining with a 10qSSI of 2.0 or higher. A typical meaning of 2.0 10qSSI (that is, all 2's) is eating two meals per day and answering “agree” on each of the other nine questions. With only three exceptions, all the alumni households firmly maintained their well-being.

Two instructive cases, shown in Figure 1, were just below the borderline between self-sustaining and vulnerable. One was a large household headed by a female. She was often sick, lacked medical care, and her household was not eating nearly enough. At the same time, she had her Empowerment Group, attended their meetings regularly, felt valuable in the community, had sufficient income, and felt God loved her. She was neither alone nor hopeless. If anything, these Empowerment Groups have shown they are competent and caring, especially of their own. One senses her family had the resources to deal with the difficult situation. They were not destitute.

The other case was a young male living alone. He had no business, no livestock, no agriculture, poor health, and did not feel valuable in his community. But he did have his Empowerment Group, attended their meetings regularly, felt God loved him, and had sufficient income. So, he also was neither alone nor hopeless. Here one senses the young man might find employment through his Empowerment Group and maybe get married soon after. Such things do happen for people who have resources around them. He also was not destitute.

**Such cases show the wisdom of including socioemotional resources when thinking about poverty.** Indeed, extensive research in human well-being shows that human connections are primary, along with sufficient income. The 2023 World Happiness Report (page 53) identifies six main factors that most influence happiness (well-being), based on millions of interviews since 2005 in 137 nations. The two main factors are sufficient income and social support. Income is measured as national Gross Domestic Product per capita, and social support is measured as “having someone to count on in times of trouble”.

We can be thankful that the Zoe Empowerment method uses such a wide-ranging, comprehensive approach to the empowerment of orphaned and vulnerable children and youth. The results are amazing. These young households have achieved amazing things, including holistic high status.



## Section 5. Conclusions

1. When asked how they think they have progressed since finishing their Zoe Empowers training, 63 percent of the alumni households said their life situation was “much better now than at graduation,” and almost all of the rest said, “better now than at graduation.” None said they were worse than at graduation (Table 1).
2. On 30 of 33 common indicators of well-being, the Zoe alumni were above average compared to their home district, Gisagara (Table 6). For example, they were six times more likely to own a refrigerator and twice as likely to have a cement floor (not dirt).
3. The Rwanda 5-year alumni were functioning on average as well as or better than 83 percent of the population in the South Province where they live (Table 9). They were elite in their home communities.
4. Only three kinds of households in rural Rwanda had more than 85 percent non-poor households (Table 18) – households with university graduate heads, households with business manager heads, and these Zoe alumni households (87 percent non-poor).
5. At graduation, 98% of the households were flourishing, and the others were self-sustaining. As alumni, 72% were flourishing, and the rest were firmly self-sustaining, except for two borderline vulnerable households (Table 22).
6. Most households maintained their same level on each of 10 comprehensive well-being questions in the years after graduation. But when they did change, they usually went down (Table 23) yet remained firmly self-sustaining (Figure 1).
7. To try to understand long-term success after graduation, we need to (1) ask many more Zoe Empowers graduates and alumni our alumni questions and (2) ask the opinions and knowledge of Rwanda Zoe staff about these matters.
8. These Zoe Empowers children and youth have gone beyond sustained escape from poverty and have achieved **Compassionate Holistic High Status**.

# Appendix 1: Calculating Alumni Accomplishment Percentiles

Appendix Table 1 calculates an accomplishment score for the average alumni household, which summarizes the 17 common indicators from Table 8 into a single national consumption **quintile** score using linear interpolation.

Appendix Table 2 calculates an accomplishment **percentile** for the average alumni household (again using linear interpolation), which places these young households precisely where they fit in the status systems of the various regions. Doing this gives a better feel for how the alumni fit into their world.

Part A of Appendix Table 1 shows the midpoints of the national quintiles estimated for 2022. (Fictitious ranks 0.5 and 5.5 are extrapolated out beyond ranks 1 and 5.) From this we can pinpoint where the alumni households land on their quintile rank for each indicator. For example, the alumni reported “% with charcoal cooking” as 9.5 percent. In the bottom row of Part A, 9.5 fits between 8.0 for rank 3 and 13.8 for rank 4, but closer to rank 3. We can pinpoint the position of the alumni by interpolation: national quintile rank =  $3 + (9.5 - 8.0) / (13.8 - 8.0) = 3.26$ . So, the alumni were .26 of the distance between the middle of quintile 3 and the middle of quintile 4. We record this value of 3.26 in the next-to-last row of Part B of Appendix Table 1. This is the national quintile rank on charcoal cooking for the alumni groups.

Similarly, we have pinpointed the national consumption quintile rank for each indicator and recorded the results in Part B of Appendix Table 1. Finally, when we calculate the average of the indicator quintile ranks, we have the **average quintile rank** over the 17 common indicators (all that are available to us from national reports). This average quintile rank is where the alumni fit within the Rwandan prestige hierarchy (we think).

The Zoe Empowers 5-year alumni group had a national average quintile rank of 4.22 which is close to the top of the 4<sup>th</sup> national quintile. (The 4<sup>th</sup> quintile centers at 4, the midpoint, and varies from 3.5 to almost 4.5.) That is a very high position and the main take-away from this study.

It is easy to convert this average quintile rank into a national Accomplishment Percentile by linear interpolation as follows. The 4<sup>th</sup> national quintile includes the national population status-ranked from the 60<sup>th</sup> to the 80<sup>th</sup> percentile and centered on the 70<sup>th</sup> percentile. This is equivalent to a national quintile from 3.5 to 4.5 and centered on 4.0. Because the alumni national quintile rank is  $(4.22 - 3.50) / (4.5 - 3.5) = .72$  of its interval, the equivalent national percentile is  $.72 * (80 - 60) + 60 = 74.4$ .

This is very meaningful. It says the Zoe Empowers 5-year alumni on average had achieved an estimated status or prestige level higher than 74.4 percent of the Rwanda

population. And they did this as young, orphaned families in the poorest region of Rwanda (with the help of Zoe staff, overseas partners, and community support.) Now, that is accomplishment!

Appendix Table 1. Calculating an Accomplishment Score for Zoe Alumni: Rwanda, 2022

Household Accomplishment Indicators	Estimated Midpoints of National Quintiles, 2022						
	Q1	Q2	Q3	Q4	Q5		
	0.5	1	2	3	4	5	5.5
Average persons per household .....	5.2	4.9	4.43	4.0	3.8	3.3	3.0
Adults per child (18+y.o./less than 18)	0.7	0.8	0.98	1.2	1.4	1.9	2.2
% of school-age children attending .....	61.4	66.4	76.54	81.7	87.6	98.3	100.0
% with access to medical care .....	76.1	80.1	87.95	96.2	100.0	100.0	100.0
% use improved drinking water source	75.9	77.2	79.76	82.2	82.3	87.4	89.9
% owning a radio .....	50.7	57.3	70.50	79.3	87.7	99.9	100.0
% owning a television .....	0.0	0.4	1.66	2.4	8.3	37.7	52.5
% owning a mobile phone .....	44.9	51.5	64.67	74.7	85.1	100.0	NA
% owning a computer .....	NA	0.0	0.13	0.3	0.9	15.3	22.5
% owning a bicycle .....	2.1	4.1	8.02	11.4	15.8	13.2	17.0
% owning a motorcycle .....	NA	0.0	0.00	0.2	1.8	4.5	5.8
% owning a motor vehicle .....	NA	0.0	0.00	0.0	0.0	7.4	11.1
% with Internet access .....	4.8	6.7	10.44	15.2	24.2	66.7	88.0
% owning a refrigerator .....	NA	0.0	0.00	0.0	0.3	10.6	15.8
% with cement floor .....	2.9	5.7	11.25	17.7	31.4	71.1	90.9
% with grid electrical/solar lighting .....	9.4	15.9	29.03	43.4	64.6	100.0	NA
% with charcoal cooking .....	0.1	1.3	3.68	8.0	13.8	46.7	63.2

Note: Ranks 0.5 and 5.5 are extrapolated beyond ranks 1 and 5. NA means “not applicable”.

Part B. Alumni's National Quintile Ranks

Household Accomplishment Indicators	5-Year Alumni	
	Alumni Value	Quintile Rank
Average persons per household .....	3.2	5.25
Adults per child (18+y.o./less than 18)	2.5	5.50
% of school-age children attending .....	88.9	4.12
% with access to medical care .....	98.4	3.57
% use improved drinking water source	99.2	5.50
% owning a radio .....	95.5	4.64
% owning a television .....	5.3	3.50
% owning a mobile phone .....	69.1	2.44
% owning a computer .....	2.9	4.14
% owning a bicycle .....	26.3	5.50
% owning a motorcycle .....	2.9	4.71
% owning a motor vehicle .....	1.6	4.22
% with Internet access .....	14.4	2.91
% owning a refrigerator .....	2.5	4.21
% with cement floor .....	37.4	4.15
% with grid electrical/solar lighting .....	70.4	4.16
% with charcoal cooking .....	9.5	3.26
<b>Average of Indicator Quintile Ranks</b>		<b>4.22</b>

Appendix Table 2 goes further to convert this national accomplishment percentile into regional Accomplishment Percentiles. Here we locate the alumni in the prestige hierarchies for the national, urban, rural, and South Province populations. Appendix Table 2 does it this way. Part A expresses the percent distributions from Table 7 as cumulative percent distributions. It then identifies the boundaries of each quintile for the total, urban, and rural populations as well as the South Province. We are getting closer to where our Zoe Empowers alumni live their lives.

For example, for Rwanda as a whole, the lowest quintile is the 20% of the population with the lowest consumption. The boundaries of this lowest quintile are a low of 0% to just under 20% of the population. The boundaries of the 2<sup>nd</sup> quintile are 20% to just under 40% of the national population. And so on, up to 100%.

The urban cumulative percent distributions functions similarly. The bottom 20% of the national population includes 5.4% of the urban population (as we saw in Table 7). So, the category boundaries for urbanites in the lowest national quintile are 0% to just under

5.4%. The category boundaries for urbanites in the 2<sup>nd</sup> national quintile are 5.4% to just under 8.9% (The cumulative 8.9% includes 5.4% in the first quintile plus 3.5% in the second quintile, as shown in Table 7.) And so on, up to 100.0%. In the same way, we can calculate quintile boundaries for the rural and South Province populations, shown in Part A of Appendix Table 2.

Appendix Table 2. Calculating Percentile Ranks for the Accomplishments of Alumni Households, 2022

Part A. Cumulative Percent Distributions of Household Population Over Consumption Quintiles: Rwanda Total, Urban, Rural, and Southern Province Populations

Consumption Quintiles	Quintile's Boundaries							
	Rwanda		Urban		Rural		Southern Province	
	from	to	from	to	from	to	from	to
Highest Quintile	80.0	100.0	36.8	100.0	88.8	100.0	88.3	100.0
Fourth Quintile	60.0	80.0	15.0	36.8	69.2	88.8	71.0	88.3
Middle Quintile	40.0	60.0	8.9	15.0	46.4	69.2	52.8	71.0
Second Quintile	20.0	40.0	5.4	8.9	23.0	46.4	31.1	52.8
Lowest Quintile	0.0	20.0	0.0	5.4	0.0	23.0	0.0	31.1

Source: Table 7 of this report

Part B. **Accomplishment Percentiles of the Average 5-Year Alumni Household:**

Interpolated Estimated Percentile Rank for Alumni Households

Compared to the Rwanda Total, Urban, Rural, and South Province Populations

Zoe Groups	Rwanda	Urban	Rural	Southern Province
5-Year Alumni	74.4	30.7	83.3	<b>83.5</b>

Now in part B of Appendix Table 2, we can convert by interpolation our alumni's known national percentiles into their percentile ranks compared to the urban, rural, and South populations.

The Zoe Empowers 5-year alumni group's national percentile rank is 74.4, which is  $.72 = (74.4 - 60) / (80 - 60)$  of the way through the 4<sup>th</sup> quintile. So, their URBAN Accomplishment Percentile is  $30.7 = 15.0 + .72 (36.8 - 15.0)$ . Similarly, their Accomplishment Percentile in the RURAL population is 83.3 and in the SOUTH Province is  $83.5 = 71.0 + .72 (88.3 - 71.0)$ . To interpret, their accomplishments (31<sup>st</sup> percentile) may not be very impressive to an urbanite from Kigali, but they are very high for rural Rwanda and the South Province (83<sup>rd</sup> percentile).

# Appendix 2: Zoe’s Impact Survey for African Alumni

## Impact Survey: Africa Alumni (In-person format)-Rev 7

This survey will be used to analyze and improve the ZOE program.

All personal information gathered will remain confidential.

<b>Basic Information:</b> (To be filled out by program facilitator/interviewer)						
BI-1	Date (dd/mm/yy format) ..... ____ / ____ / ____					
BI-2	Participant ID number (3-digit code) ..... <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table>					
BI-3	Interviewer ID number (3-digit code) ..... <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table>					
BI-4	Empowerment Group number (5-digit code) ..... <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table>					
BI-5	Empowerment Group Start Date (mm/yy) ..... ____ / ____					

Survey Instructions: Please circle the number that corresponds to your response.

When boxes are provided, please enter a number.

AL-1	How often do you currently meet with other Zoe program graduates?	Never ..... 1	
		Rarely ..... 2	
		Occasionally ..... 3	
		Regularly ..... 4	
AL-2	Are you the head of your household?	Yes ..... 1	
		No ..... 2	
AL-3	What is your age (estimate if not known)? .....		
AL-4	How many members of your household are 18 years old or older? .....		
AL-5	How many members of your household are younger than 18? .....		
AL-6	Total number of SCHOOL-AGED children in your household .....		
AL-7	How many of these SCHOOL-AGED children currently attend school full or part time? .....		
AL-8	What is your marital status?	Never married ..... 1	
		Married ..... 2	
		Other ..... 3	
AL-9	What is your gender?	Female ..... 1	
		Male ..... 2	
AL-10	How many meals (food serving of any type) do you eat each day?	I often don't eat every day ..... 0	
		One meal ..... 1	
		Two meals ..... 2	
		I can afford 3 meals if I want ..... 3	

			SD	D	A	SA
AL-11		I beg for food .....	1	2	3	4
AL-12		I eat enough food each day that I am satisfied .....	1	2	3	4
AL-13	Please answer	I live in an adequate/safe home .....	1	2	3	4
AL-14	1=Strongly Disagree (SD)	I feel that I am a valuable member of the community .....	1	2	3	4
AL-15	2=Disagree (D)	I am often ill .....	1	2	3	4
AL-16	3=Agree (A)	I have access to medical care .....	1	2	3	4
AL-17	4=Strongly Agree (SA)	I know my rights and can enforce them .....	1	2	3	4
AL-18		Through our work, the members of my household can provide sufficient food, clothing, school expenses, and other necessities for our needs .....	1	2	3	4
AL-19		I feel that God loves me .....	1	2	3	4
AL-20		This household has a business or businesses which provide income .....	1	2	3	4
AL-21	How many people do you hire to help with your business(es), crops, or livestock? .....					
AL-22	During the last 12 months, did any member of this household engage in the following?	Crop farming .....			Yes	No
AL-23		Livestock rearing .....			1	2
AL-24		Aquaculture .....			1	2
AL-25	What was the main purpose of the main agricultural production?	For own consumption only (Subsistence) .....				1
		Mainly for own consumption and also for sale .....				2
		Mainly for sale and also for own consumption .....				3
		For sale only (Commercial).....				4
		No agricultural production .....				5
AL-26	How many of each of the following livestock are currently owned/reared/managed within this household?	Goats .....				
AL-27		Pigs .....				
AL-28		Chickens .....				
AL-29		Other poultry .....				
AL-30		Cattle .....				
AL-31		Sheep .....				
AL-32		Rabbits .....				
AL-33		Guinea pigs .....				
AL-34	Is your dwelling unit owned, rented, or provided by institution/employer?	Owned/family occupied .....				1
		Rented .....				2
		Institution/employer .....				3

AL-35	What is the main material used for the roof?	Grass Thatch ..... 1 Iron Sheets ..... 2 Tiles ..... 3 Asbestos ..... 4 Cement/Concrete ..... 5 Other ..... 6
AL-36	What is the main material used for the floor?	Earth/Sand ..... 1 Dung ..... 2 Wood Planks/Shingles/Timber ..... 3 Palm/Bamboo ..... 4 Parquet/Polished Wood ..... 5 Vinyl or Asphalt Strips ..... 6 Ceramic/Porcelain Tiles ..... 7 Cement/Concrete ..... 8 Other ..... 9
AL-37	What is the source of energy the household mainly uses for lighting?	Electricity ..... 1 Solar ..... 2 Battery ..... 3 Paraffin ..... 4 Candles ..... 5 Firewood ..... 6 Grass/Straw ..... 7 Other ..... 8
AL-38	What is the source of energy the household mainly uses for cooking?	Electricity ..... 1 Solar ..... 2 Paraffin ..... 3 Charcoal ..... 4 Firewood ..... 5 Straw/Shrubs/Grass ..... 6 Gas ..... 7 Other ..... 8



		Yes	No
Does any member of this household own any of the following items?	Stand Alone Radio .....	1	2
	Any Other Radio .....	1	2
	Television .....	1	2
	Mobile Phone .....	1	2
	Computer/Laptop/Tablet .....	1	2
	Internet access .....	1	2
	Refrigerator/Deep Freezer .....	1	2
	Table .....	1	2
	Chairs .....	1	2
	Sofa .....	1	2
	Sleeping mat .....	1	2
	Mattress .....	1	2
	Bed .....	1	2
	Bicycle .....	1	2
	Motorcycle/Scooter .....	1	2
	Motor Vehicle .....	1	2
What is the main source of drinking water for members of this household?	Piped into Dwelling/Yard/Plot .....		1
	Community Standpipe .....		2
	Protected Well .....		3
	Protected Spring .....		4
	Borehole .....		5
	Bottled Water .....		6
	Unprotected Well .....		7
	Unprotected Spring .....		8
	Stream/River/Lake .....		9
	Other .....		10
How would you describe your life situation now compared to how it was at the time of your graduation from the Zoe program?	Much better now than at graduation .....		1
	Better now than at graduation .....		2
	About the same .....		3
	Worse now than at graduation .....		4
	Much worse now than at graduation .....		5

Thank you for answering our questions.

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Who is the author? I am a sociologist-demographer (PhD. University of Chicago, 1976) who retired in 2001 as a research-active Professor at Louisiana State University in Shreveport. My wife, Carrie, and I have been familiar with Zoe Empowers since 2008 and have partnered with 21½ Empowerment Groups (1,870 children and youth). We have traveled to Kenya, India, Rwanda, and Liberia to meet many of these young people and visit their businesses and homes.