

EWB-CU Rwanda Surveys 2017

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1. INTRODUCTION

This paper will hopefully be updated often as I continue to find interesting and meaningful solutions in the data. The purpose is to better understand how the systems we build affect the people using them, what we could do to make the system work better for the people, and any other important or interesting things we may find.

2. DATA SET

The data is from surveys from 2016, given to people in the area of our systems. We have survey data from four sites, Nyarutosho, Gasebya, Ntarama, and Munini. Each of these places either has a system already or is going to get one. We also have a few surveys from the water board, the board in charge of managing and caring for the systems. Note that, while the surveys had short answer questions as well as multiple choice, the only questions I will be analyzing are the multiple choice. This is because we have not had all the surveys translated, so I cannot read the short answer. We will be doing a more qualitative analysis on those answers, so I do not expect to write about them here.

3. CODE

The code is in python3, using numpy and pandas. I have been using Jupyter notebooks, which you may recognize from some of the comments. I have tried to make the comments in my code be intuitive to anyone who would like to understand what it means, but that is also something that is under improvement.

4. RESULTS

4.1 Board Surveys

There were three multiple choice questions on the surveys to the board. Each of the surveys had the same five choices:

- (a) Much less
- (b) A little less
- (c) About the same
- (d) A little more
- (e) Much more

Below is a look into how each of the questions were answered and what it could mean.

4.1.1 *Compared to before the rainwater catchment system was built, how has the installation of a rainwater catchment system changed the amount of free time available?*

The first question had several different answers. We were expecting people to choose either "A little more" or "Much more." However, we had two people choose "Much less". This is unexpected since we are building water systems in the area, we would expect people to have more free time, since they are not using all their time to get water. This was not isolated to a place, the two that put a were from Nyarutosho and Ntarama. This does match with a similar question from the general survey where answers were similarly spread out. Whether this is a translation error, in that the question was confusing to people, or whether there is some cultural thing we are missing remains to be determined.

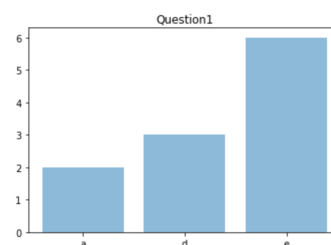


Figure 1: Answers to question 1 in the board surveys

4.1.2 *Compared to before the rainwater catchment system was built, how has the installation of a rainwater catchment system changed the health within the community?*

Everyone answered much better to this question. This is good, but it would be preferable to know whether this question was just more clear on what the "correct answer" would be or whether this is a valid result. In the general survey section of this question, there will be more information.

4.1.3 *Compared to before the rainwater catchment system was built, how has the installation of a rainwater catchment system changed the overall income within the community?*

Everyone answered much more to this question as well.

4.2 General Surveys

The general surveys were given to members of the community who use the system by leaders in their community.

There were ten surveys given at each site except Munini, which had eleven. This means there were a total of 41 surveys. There were five different multiple choice questions, with topics related to how the systems were being used and how the systems were affecting the community.

4.2.1 Do you treat the water before use?

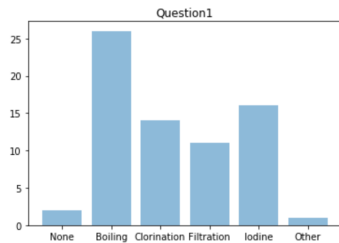


Figure 2: How water is treated before use

Of the people surveyed, only two people, both from Munini, did not treat the water in any way before use. Note there was a comment on the survey that answered other, but the comment has not been translated yet. In most places, it seems only one option was chosen, perhaps the most often used. But in Gasebya, most answers had three or more options chosen, perhaps listing all of the things they would do. It would be interesting on the next surveys to get a better understanding of whether people in Gasebya do use more ways to treat their water than the other places or whether it was a mis-communication.

4.2.2 From where do you get water primarily? (circle all that apply)

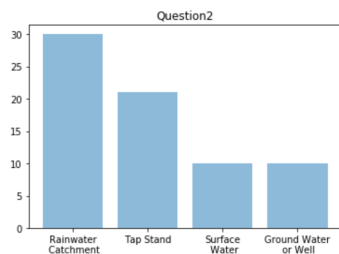


Figure 3: Where the community gets water

This had the same problem as the first question. The surveys from Gasebya had all answers circled, probably because they answered as all the places they get water. The people from Munini answered that they solely got their water from the tap stand. Nyarutosho and Ntarama both answered that they solely got their water from the catchment system. Again, we run into that because Gasebya answered in a different way from Nyarutosho and Ntarama, the data is a little skewed. The confusion may have come from the question both stating the primary place they got water and asking to circle every one that applied. One thing we should look into is creating more clear questions, so those conducting the surveys know what we are asking for.

4.2.3 If you use the rainwater catchment system and compared to before the system was built, how much time do you spend getting water?

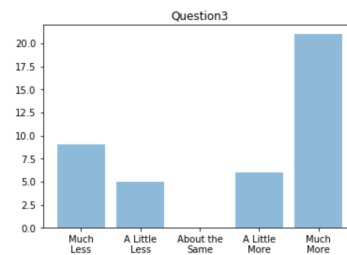


Figure 4: How much more or less time people have

This is the same question were the problems were in the board surveys. This question had other issues, such as being lettered from f-j, instead of from a-e. There may have been some translation errors, the issues were across all places except Gasebya. Gasebya answered only e, much more. The rest of the places had about half e, but the other answers were spread around. There could be more to the answers to this question, and we may want to pursue it further in future surveys.

4.2.4 If you use the rainwater catchment system and compared to before the system was built, how was your health changed?

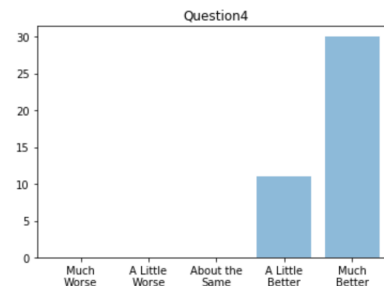


Figure 5: How the health has changed

Most people put much more on this. When broken down by location, only Munini had most people say a little more. This is interesting because Munini was also the place where people said they did not treat the water. This could be something to look into more in future surveys. Gasebya was the only place where everyone said much more. Nyaruthosho and Ntarama both had a couple people say a little more.

4.2.5 If you use the rainwater catchment system and compared to before the system was built, how has your income changed?

It would be interesting to see whether the income of the entire area has changed, or whether this is correlated to our systems. Again, Gasebya gave only much more answers. Munini gave only a little more. Nyarutosho gave about half much more and half a little more. Ntarama gave mostly much more, with a few little more. Again, I think the best way to understand this data is to find other data to determine whether the incomes of the entire area is going up, or whether this increase in income is due to the systems.

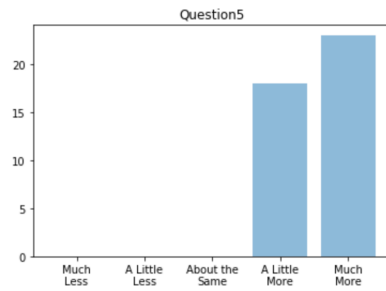


Figure 6: How the income has changed

5. CONCLUSIONS

Some things we could improve for the next surveys are to make sure the questions make sense to everyone giving them. We should make our wording clearer, both for ourselves and for the survey takers.

We may also want to look into who is giving surveys in Gasebya, they seem to have different patterns of asking questions. The data from Gasebya was often very different from the data from other places. This happened in terms of how the questions were answered and what answers were given.

Something else we could look into is teaching about water treatment, especially in Munini. Munini had the least increase in health and there were people there who did not treat their water at all. This is also something we could look into to see whether we got a good sample or not.

6. REFERENCES