Revisiting household coordinates for CCAFS Baseline in the initial regions: East Africa, West Africa, & Indo-Gangetic Plains

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Introduction

In 2010-2012, the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) implemented a baseline in 15 sites across three initial target regions: East Africa, West Africa and Indo-Gangetic Plains. The baseline was setup in such a way that the households selected could be a revisited after five and ten years. The aim is to track behavioral change over time in each of the sites by collecting agricultural and household data. Through analyzing the collected data, the aim is to promote a food-secure world through the provision of science-based efforts that support sustainable agriculture and enhance livelihoods while adapting to climate change and conserving natural resources and environmental services (Förch et al. 2011).

Objective

The baseline households in the 15 sites were recently revisited to re-establish the location and accuracy of the earlier global positioning system (GPS) data, as the team had found some inconsistencies. This was achieved by revisiting each of the surveyed 140 households in each of the sites (see Table 1: CCAFS Initial Sites):

Table 1: CCAFS Initial Sites

<table>
<thead>
<tr>
<th>Country</th>
<th>Site Name</th>
<th>Site ID</th>
<th>Sampling Frame Name</th>
<th>Sampling Frame ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenya</td>
<td>Nyando</td>
<td>KE01</td>
<td>Katuk Odeyo</td>
<td>01</td>
</tr>
<tr>
<td>Kenya</td>
<td>Makueni</td>
<td>KE02</td>
<td>Wote</td>
<td>02</td>
</tr>
<tr>
<td>Uganda</td>
<td>Albertine Rift</td>
<td>UG01</td>
<td>Hoima</td>
<td>03</td>
</tr>
<tr>
<td>Uganda</td>
<td>Kagera Basin</td>
<td>UG02</td>
<td>Rakai</td>
<td>04</td>
</tr>
<tr>
<td>Tanzania</td>
<td>Usambara</td>
<td>TZ01</td>
<td>Lushoto</td>
<td>05</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>Borana</td>
<td>ET01</td>
<td>Yabero</td>
<td>06</td>
</tr>
<tr>
<td>Burkina Faso</td>
<td>Yatenga</td>
<td>BF01</td>
<td>Tougou</td>
<td>07</td>
</tr>
<tr>
<td>Ghana</td>
<td>Lawra-Jirapa</td>
<td>GH01</td>
<td>Lawra</td>
<td>08</td>
</tr>
<tr>
<td>Mali</td>
<td>Segou</td>
<td>MA01</td>
<td>Cimzana</td>
<td>09</td>
</tr>
<tr>
<td>Niger</td>
<td>Kollo</td>
<td>NI01</td>
<td>Fakara</td>
<td>11</td>
</tr>
<tr>
<td>Senegal</td>
<td>Kaffrine</td>
<td>SE01</td>
<td>Kaffrine</td>
<td>12</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>Khulna</td>
<td>BA04</td>
<td>Morrelganj</td>
<td>16</td>
</tr>
<tr>
<td>India</td>
<td>Haryana</td>
<td>IN17</td>
<td>Karnal</td>
<td>41</td>
</tr>
<tr>
<td>India</td>
<td>Bihar</td>
<td>IN16</td>
<td>Vaishali</td>
<td>40</td>
</tr>
<tr>
<td>Nepal</td>
<td>Mid-Western Terrai</td>
<td>NE03</td>
<td>Rupandehi</td>
<td>36</td>
</tr>
</tbody>
</table>
Methodology

The revisits required the interviewers to obtain a smart-phone and identifying a suitable guide, ideally someone who lived in the village, to take them to the outlined households in each site. Each site included seven villages with 20 selected households per village.

It was agreed that the Open Data Kit (ODK) would be used to keep the revisits at a low cost. The ODK is a free open-source set of tools that can help organizations author-, field- and manage mobile data collection solutions. In this case, it provided an online, soft questionnaire template for the surveyors. The questionnaire included identification of the households, auto capture of the GPS reading and the option to take a photo of each of the households. The revisits were done in collaboration with the University of Reading. See sample questions and the field guide protocol in Appendix 1.

The interviewers had a checklist with all the households and the names of the household members as well as a site map with the spatial distribution of the villages (See Appendix 2 for more detail on the field interview protocol and the information that was uploaded to CCAFS servers). The photographs taken by the interviewer (see sample photos in Annex I), the log from each site and any relevant information from the visited households served as additional information.

Findings

This report outlines the results from the household revisits, which primarily include the re-establishment of the baseline coordinates for each of the households in the three original region sites.

East Africa

In Nyando Kenya, four of the initial baseline household residents had moved out, and one head of the household had died. It was decided that the new household members would replace the old ones to ensure 140 households per site. In another village, a spelling error was corrected. In Makueni Kenya, one household had relocated to another area, while in another the head of the household had passed on. The household lists were subsequently updated and the households were replaced with the new ones.

In Usambara Tanzania, it was discovered that ten household residents had moved to other villages that were not within the site. In two other villages, four families had lost the head of their household. These households were subsequently replaced.
In Albertine Rift Uganda, eleven household residents had moved to other areas not within the site, and in three of the households the head of the house had passed on. In another area there was a mismatch in the household ID:s, with subsequent corrections carried out. In Kagera Basin Uganda, four households had moved to other areas and three heads of the households had passed on. As a result, new household heads were identified and replaced the old ones. Interviewers also corrected four names.

In Borana Ethiopia, seven households moved to different villages in other areas and four household names had to be corrected.

**West Africa**
It was possible to locate most of the original households in the West Africa region. In some instances, some households had very similar names, and therefore had to be differentiated by their neighbors’ names where possible.

In Tougou and Niger Fakara in Burkina Faso, all the households were found except one in each. In Kaffrine Senegal, most of the households were not located in their previous outlined position in all the villages. In Cinzana Mali, five households had relocated to other areas. In one of the villages GPS capability was compromised. The GPS was not able to make any readings even after all the settings were checked. The enumerator noted that all the other households in the village were still there.

In Lawra Jirapa Ghana, the team had difficulty with the pronunciation of some of the names but once that was solved, it was easy to identify the households with the help of the guide.

**Indo-Gangetic Plains**
In Bagerhat Bangladesh, the database had the wrong name for one of the villages, which made it difficult to identify the households. There were three households that could not be traced. This can be because their names were noted down wrong from the start or the households themselves had provided the wrong names. Four households had moved away from the site while four others had lost their household heads. Two households had separated and were now living separately. There were two separate instances where a son and father were considered as two households yet they were living together.

In Rupandehi Nepal, six households had their names captured wrongly in our database and one household could not be traced. Seven homes had lost their heads of the households, and three
others had moved to neighboring villages. There were two separate instances where a son and father were considered as two households yet they are living together.

In Karnal Haryana India, two household heads had passed on and two other households could not be found based on the names in the database. There was one case where a selected household farmed in the village but lived in the city.

In Vaishali and Bihar India, one village was difficult to find since it was identified by two names. Six households had different names from what was in our database. Eight households had migrated to nearby villages and five household heads had passed on. There were cases where it was difficult to identify the households since they had similar names to the other people living around them. Seven households had the GPS location re-taken since some shared coordinates.

**Conclusion**

The CCAFS revisit, to re-establish GPS coordinates, showed that the majority of the selected households were still made up of the same residents and were living in the same villages and areas. This is important information, as the baseline team will soon revisit these villages as part of the Baseline Survey work. The GPS activity did reveal that the original and the recently collected GPS points were fairly similar (see Figure 3). Using an enumerator sourced at each village made the exercise much faster as they knew where almost all the households were.

**References**

Appendix I Open Data Kit

Smart phones running on android with capability of reading GPS were used during the re-visit. The forms for the fieldwork were developed using Open Data Kit (ODK) and contained the following information:

1. Site ID
2. Block ID
3. Village ID
4. Household ID
5. Name of household head
6. Name of respondent
7. Sex of respondent
8. Relationship of respondent to household head
9. Household type
10. Household size
11. People in household under 5 yrs
12. People in household over 60 years

All of these come from the data originally recorded during the household baseline survey fieldwork.

The form will enable the person in the field to collect the following additional information:

13. Automatic GPS reading
14. One or more photographs of the dwelling and its surroundings
15. Was the household found? Yes/No
16. If the household was not found explain what was done to find it
17. If the household was not found explain the reasons
18. Other comments from the consultant

ODK collect data on smartphones and stores it on the cell phone until the data collector is either in a place with mobile network or with access to Wi-Fi to upload the data to the servers.

Appendix II- Field Protocol; Use of GPS to locate villages and households

A current database on the roads, town names (especially local administrative names) were not accessible through the databases. The best would be to have a backdrop of Google maps. Since Android phones will be used in future baseline activities, the interviewer could be able to zoom into site and with help of surrounding landmarks, roads and local names be able to locate the village. This captures the entire site, so when in the site even if there’s no connectivity this will help work as a backdrop to refer to, see example of Bangladesh villages;
Overview maps were provided for each of the site, see Figure 1, and a zoomed in to per village map with correspondent household numbers indicated on the map, see Figure 2. This enabled the consultant get relative locations of the villages and read off corresponding household names from household baseline data provided in printed table form for each site. Once the household is located then procedure in appendix I was followed. This was replicated across all sites.

Figure 1: Sample overview map for CCAFS households in Khulna
Figure 2: Sample Zoomed in map of all households in one village
Figure 3: Sample map comparing initial and revisited household positions. Shows slight shift in the positions out of accuracy of the GPS, but still relative household positions are maintained.
Appendix III- Sample photos

To the left, a household member from Kagera and to the right a household member at her homestead in Borana (Photo credit: Kirimi F)