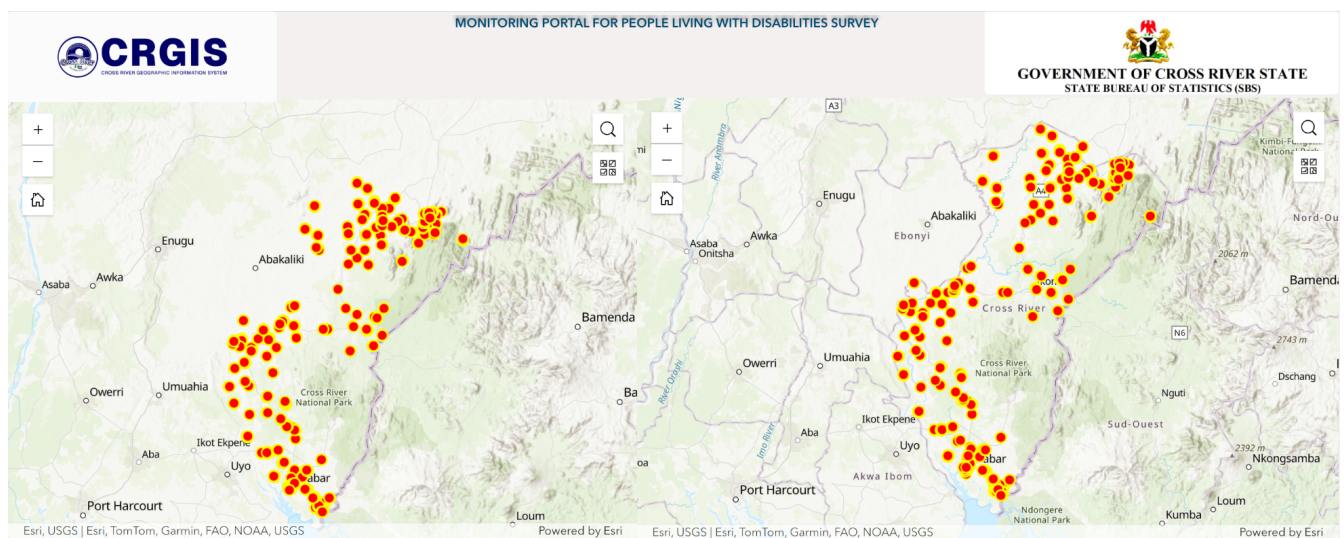


PORTFOLIO CASE STUDY

Statewide Disability Survey Data Collection System

Cross River State, Nigeria

A connected Survey123 workflow for household listing, disability screening, sampling, field assignment and detailed interviews.



Statewide monitoring portal. Geographic field activity across Cross River State, shown at a regional scale with no respondent pop-ups or household attributes.

I designed and implemented the digital data collection workflow for a statewide survey of persons with disabilities, supported by international development partners.

Role Survey system design, Survey123/XLSForm development, workflow configuration, testing and field deployment support.

Tools ArcGIS Survey123 · Survey123 Connect · XLSForm · ArcGIS Online · ArcGIS Notebooks · Python

CONTEXT & APPROACH

Two visits. One connected workflow.

The challenge

The survey required more than digitizing a questionnaire. Field teams first had to list structures and households within assigned Enumeration Areas (EAs). Households then had to be sampled before enumerators returned for detailed interviews.

The system needed to preserve the connection between visits, support multiple teams across the state and remain practical where connectivity was limited.

01 Listing Survey

First visit: record structures and households, capture GPS locations and collect disability/functional screening information needed for selection.

02 Main Survey

Second visit: open the assigned household, confirm the prefilled details, build the household roster and follow the applicable detailed interview sections.

I designed the two survey instruments and the workflow connecting them, keeping household and assignment information linked across both stages.

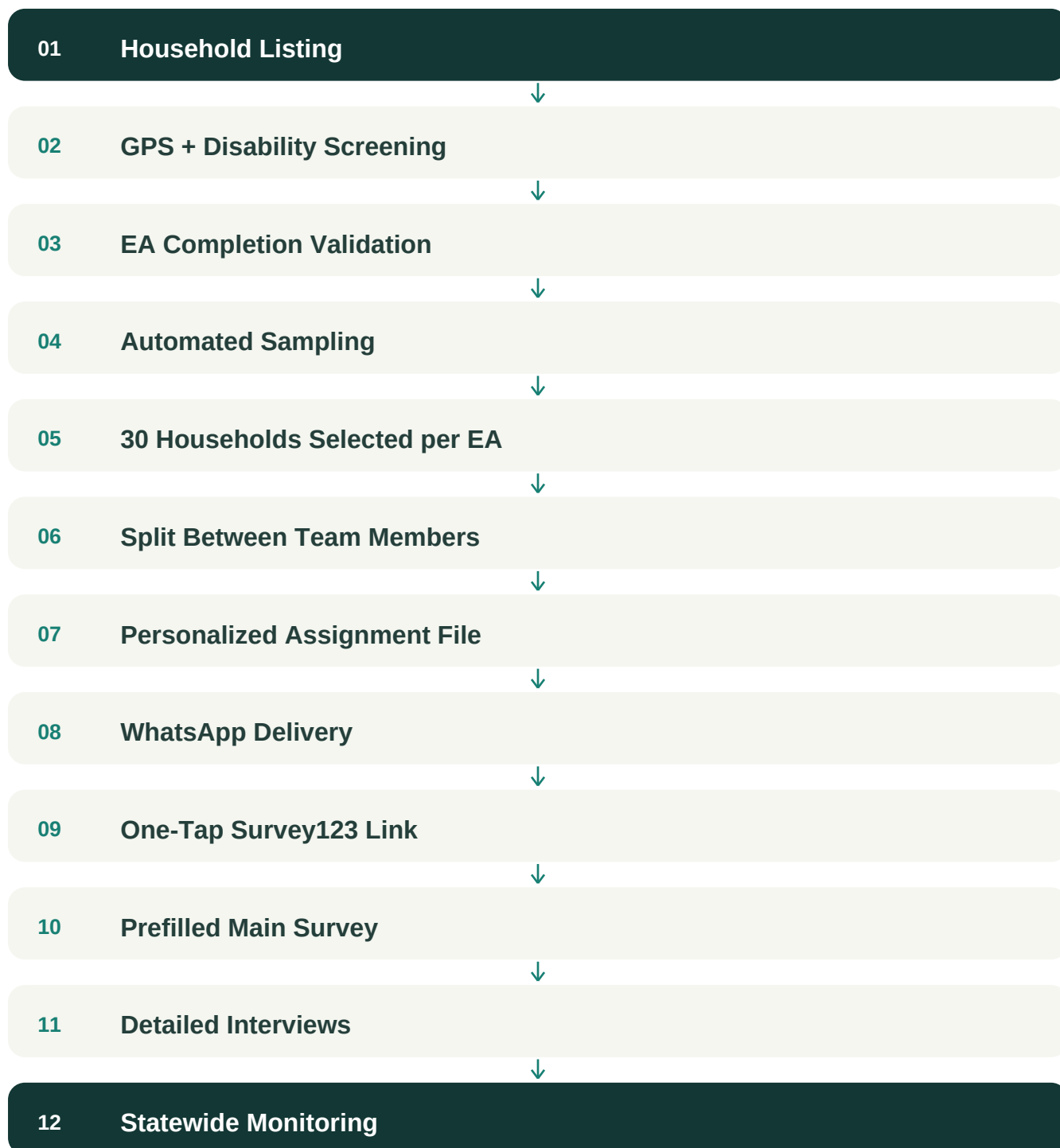
Saving time and cost

Household listing and the main survey are usually carried out as separate exercises. Connecting them in one coordinated workflow saved time and cost by streamlining the transition from listing to interviews, automating sampling and assignment, and reducing repeated data entry.

WORKFLOW DIAGRAM

From listing to monitoring

The complete field pathway. EA = Enumeration Area.



SAMPLING & QUALITY CONTROLS

A field sample built from completed listings

An ArcGIS Notebook processed listing records and applied the agreed sampling rules. The workflow targeted **30 households per EA**. This was a sampling rule, rather than a reported completion metric.

Where at least 30 disability households had been identified, 30 were selected from that group. Where fewer were available, all identified disability households were retained and additional households were selected to complete the sample.

```

raise ValueError(
    f"EA {ea} has {len(parents)} parent listing submissions {object_ids}. "
    "The agreed workflow requires one completed listing per EA. Resolve the duplicate before sampling."
)

parent = parents[0]
p = parent.attributes
if not _is_yes(p.get("have_all_structures_and_househo")):
    raise ValueError(
        f"EA {ea} is not ready. Listing record {p.get('objectid')} did not confirm that the EA is fully listed."
    )

listing_enumerator_id = str(p.get("enumerator_id") or "").strip()
team_lead_id, team_mate_id = _team_ids(ea, listing_enumerator_id)

structures = listing_structures.query(
    where=f"parentglobalid={_sql_text(p.get('globalid'))}",
    out_fields="*",
    return_geometry=True,
).features
if not structures:
    raise ValueError(f"EA {ea} has no submitted structures.")

structure_by_aid = {}

```

Notebook validation excerpt. Checks require one completed listing per EA and confirmation that the EA has been fully listed before sampling proceeds. Browser and account details have been cropped out.

Checks before the next field visit

Validation could stop an EA from sampling when its listing had not been confirmed complete. The notebook also checked for conflicting parent submissions and missing structure records.

The assignment output surfaced listing-quality issues, including missing phone information, so field teams could see where contact details were unavailable.

ASSIGNMENT & DELIVERY

The sample becomes a usable field assignment

Selected households were split between team members. Each enumerator received an EA-specific assignment file through WhatsApp, with a direct action to open each household in Survey123.

HOUSEHOLD ASSIGNMENT

EA [removed] | Enumerator [removed]

Sanitized reconstruction · illustrative rows

01 Household [removed]

Structure, PWD flag and sample ID shown in source

[Open Survey123](#)

02 Household [removed]

Structure, PWD flag and sample ID shown in source

[Open Survey123](#)

03 Household [removed]

Structure, PWD flag and sample ID shown in source

[Open Survey123](#)

Quality note: some households have no phone number in the original listing.

Reconstructed from the supplied assignment HTML. The original had 15 allocated households and included selection order, structure, address, household head, phone, disability flag and sample ID. All identifying values and live survey links are omitted here.

One tap carries the assignment forward

The original links supplied enumerator, EA, structure, household and sample information, along with household-head, region/LGA and phone fields where available. This reduced repeated entry during the follow-up visit.

MOBILE COLLECTION

Prefilled details. A clearer second visit.

CROSS RIVER STATE PERSONS WITH DISABILITY AND SOCIAL INCLUSION S...

Team Mate ID
Automatically filled from the selected Enumerator ID.
REMOVED FOR PUBLICATION

Team Lead ID
Automatically filled from the selected Enumerator ID.
REMOVED FOR PUBLICATION

A4 Enumeration Area ^{*}
Automatically supplied by the assigned-household WhatsApp link.
REMOVED FOR PUBLICATION

A5 Household Number ^{*}
Automatically supplied by the assigned-household WhatsApp link.
REMOVED FOR PUBLICATION

A5a. Assigned Sample Household ID
Automatically supplied when this form is opened from an assigned-household WhatsApp link. It remains blank for a direct Collect interview.
REMOVED FOR PUBLICATION

A6 Name of Household Head
Automatically supplied by the assigned-household WhatsApp link.
REMOVED FOR PUBLICATION

INFORMED CONSENT
Read the following statements to the respondent

Opening an assigned-household link populated the corresponding fields in the Main Survey before the detailed interview began.

The mobile screen explicitly identifies fields supplied by the assigned-household WhatsApp link, including the EA, household number and sample household ID.

Designed for field use

Permanent Enumerator IDs supported assignment and form identification. Forms could be prepared on mobile devices for collection with limited connectivity, then synchronized when a connection was available.

The connection between assignment and interview was part of the operational workflow, alongside form design and sampling.

Prefilled Main Survey on mobile. Household-head, team and sample identifiers have been removed from the pixels.

INTERVIEW LOGIC

Detailed interviews follow eligibility

The Main Survey used household-member repeats and conditional logic. Each person was entered into a roster and assessed using functional assessment questions. Responses determined whether disability-specific sections became applicable.

Eligible members could proceed into sections covering education, employment, health, assistive devices, transport and social participation. The form handled the applicability of sections for each household member.

Household roster

Keep demographic and assessment information associated with the correct person.

Functional assessment

Use responses to determine eligibility for the detailed sections.

Conditional interview

Open applicable sections for eligible household members.

Logic summary based on the approved case-study narrative. It describes the routing approach without reproducing individual respondent records.

CAPABILITIES DEMONSTRATED

Connecting forms, data and field operations

I designed and implemented the connected field-data workflow, from household listing through sampling, assignment, interviews and statewide monitoring. Compared with running listing and the main survey as separate exercises, the integrated workflow saved time and cost through automated sampling and assignment, a simpler handover between stages and less repeated data entry.

Survey123 & XLSForm

Complex forms, repeats, calculations, validation and conditional interview logic.

Survey workflow design

Connecting listing, sampling, assignment and follow-up interviews.

GIS & location data

GPS capture and geographic monitoring of field activity.

Python & ArcGIS Notebooks

Processing listing records and supporting sampling and field assignment.

Field deployment

Enumerator identification, mobile collection, WhatsApp delivery and limited connectivity.

Data quality

Form validation and workflow checks before sampling and reassignment.

Publication note: supplied screenshots have been cropped or anonymized. The assignment panel is a sanitized reconstruction; no raw assignment HTML, respondent contact details or live survey links are included. Time and cost savings are described qualitatively; no numerical savings or completion metrics are claimed.