



SID-Washington Innovation Challenge

About Fraym: Fraym was built to help development organizations, companies, and government agencies succeed in Africa. Our best-in-class product weaves together billions of data points from the best surveys and satellite images, to deliver hyper-local insights (down to 1 km x 1 km) in over 50 African countries, providing information about demographics, social characteristics, consumer insights, and spending habits. We use this comprehensive data platform to answer pressing questions about where to focus and how to reach specific populations. This innovative approach delivers customized analysis with unprecedented accuracy and speed.

About the project: Drawing upon over 500 household surveys, satellite imagery, and advanced machine learning techniques, Fraym is working with the African Development Bank (AfDB) to enable its prominent “10,000 Communities in 1,000 Days.” In January 2017, President Adesina and the AfDB launched a campaign to reach 10,000 vulnerable communities across 23 fragile states in Africa. These communities face concentrations of under-nourishment, low employment, limited access to basic infrastructure, low literacy rates, high levels of infant mortality, high incidence of gender-based violence, and other significant challenges.

The Bank’s first order of business was to develop a transparent, impartial approach for selecting focus communities—based on reliable data and evidence. In order to meet its ambitious goals for the initiative, the Bank also needed to move forward quickly with community selection and strategic planning. The Bank’s vision is to support these communities by delivering projects to achieve the “[High 5’s](#)” (lighting and powering, feeding, industrializing, integrating regions, and improving the quality of life), all within a period of 1,000 days. The Bank approached Fraym to help identify, understand, and prioritize the 10,000 target communities for the project.

Fraym used its data to build a platform that objectively profiles and describes target communities, illustrating which ones meet the core criteria for the initiative. Data are presented in an online, user-friendly GIS tool. This product is intended to help AfDB understand the local-level landscape in these fragile states—and use data to make important strategic decisions for the initiative in a quick and relatively inexpensive way.

Approach: Fraym worked with the Bank to create detailed indices for ‘vulnerability’ and ‘poverty.’ To do this, we incorporated a range of indicators that are strong correlates of poverty and/or vulnerability, then applied machine learning techniques to create a weighted index for each measure. Each index was built from precise, proprietary Fraym data indicators, which are produced with precision down to a few square kilometers.

Table 1: Fraym Indicators for Vulnerability and Poverty	
(1)	Percent of undernourished children under five years of age
(2)	Unemployment rate, specifically for youth and women
(3)	Lack of access to basic infrastructure, such as: <ul style="list-style-type: none">▪ Percent of households accessing an improved water source¹

¹ Improved water source includes the following types of water sources: piped water, public taps, wells, and boreholes, while unimproved sources include rivers, streams, and other open sources.

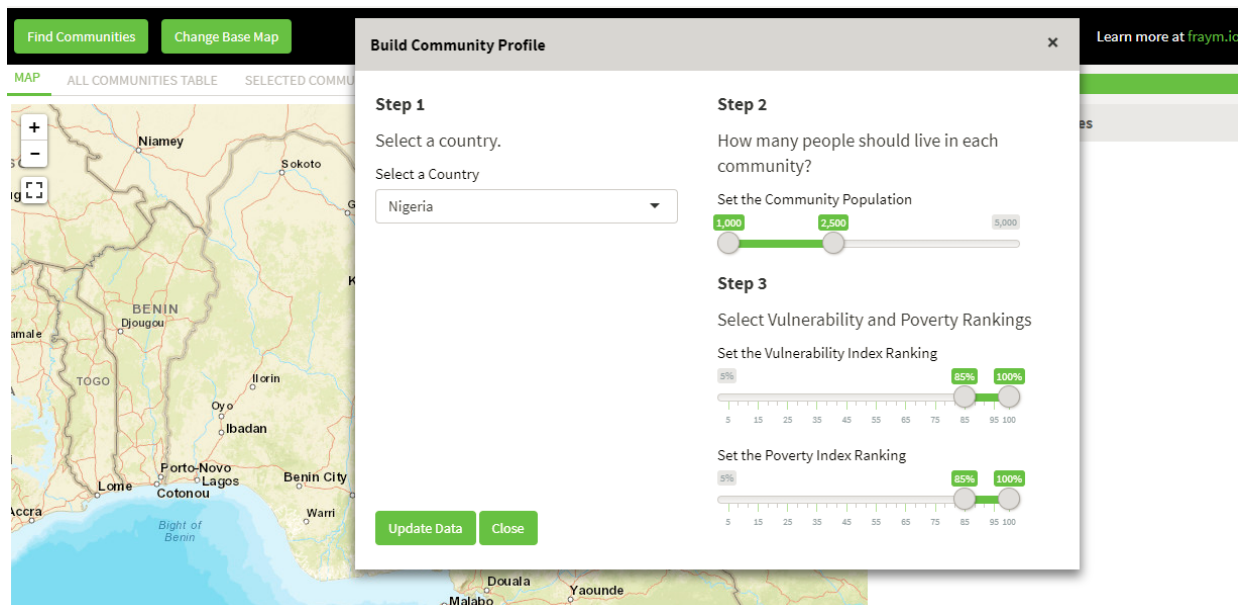


<ul style="list-style-type: none">▪ Percent of households accessing improved sanitation facilities²▪ Average distance to the nearest health facility▪ Percent of households with access to electricity
(4) Adult and youth literacy rates
(5) Infant mortality rate
(6) Societal norms around tolerance of violence against women
(7) Percent of community dependence on charcoal for cooking

After defining the poverty and vulnerability indices, Fraym constructed spatial surfaces that highlighted concentrations of poverty/vulnerability with precise detail across 18 countries (and counting). Then we built a tool that combines these surfaces with satellite imagery to pinpoint specific poor and vulnerable communities, and to describe their characteristics, as we outline below:

The “10,000 Communities” Platform

Step 1: Build Community Profile



² Improved sanitation facilities include flushing toilets and latrines, while households without a facility (e.g. open defecation) are considered unimproved.



Step 2: View Communities that Meet Criteria

Find Communities Change Base Map Learn more at fraym.io

MAP ALL COMMUNITIES TABLE SELECTED COMMUNITIES TABLE

2597 Communities Shown

Most populated Communities

Place Name	ADM2	Community Population
Madaka	Gagarawa	2,498
Kuka-Suguriwa	Nangere	2,497
Balajan Bula-Kabu	Chibok	2,496
Rumji	Gada	2,495
Tsaro	Illela	2,493
Unguar Makarya Sabuwa	Ajingi	2,493
Billabirin	Jakusko	2,492
Kurfa	Kebbe	2,491
Yankabawa	Kware	2,490
Yan Tuba	Babura	2,490
Dan Tudu	Sabon	2,489

Step 3: View Community's Characteristics

Find Communities Change Base Map

MAP ALL COMMUNITIES TABLE SELECTED COMMUNITIES TABLE

Site ID: NGA48063
 Population: 1,564
 Vulnerability Ranking: 90%
 Poverty Ranking: 90%
 Nearest Named Population Center: Tunga Musa
 ADM1 Name: Kebbi
 ADM2 Name: Bagudo



What worked well: From this engagement, Fraym has been able to use rich preexisting data, coupled with advanced machine learning techniques, to provide granular details about communities in fragile states across Africa—**at a fraction of the time and cost typically required to get this kind of insight**. Additional learnings include:

- For a project as large in scope and as highly prioritized as the 10,000 Communities Initiative, it was necessary to create a streamlined, standardized, and objective way to select communities.
- Fraym is able to pinpoint exactly where these communities are, including information such as the nearest city center, to help them be tracked down.
- Additionally, Fraym’s proprietary tool makes it so that AfDB team members can log into and access the information whenever and wherever needed.

What did not work well: While the project is still underway, Fraym has already gained valuable learnings and takeaways from this engagement. To Fraym’s knowledge, never before has 10,000 different communities been identified across 23 different fragile countries. The massive size of this undertaking presented at least three examples of challenges in getting to “scale.”

- First, although Fraym has an unmatched database of household survey across Africa, identifying comparable definitions for the vulnerability and poverty indices across all 23 proved difficult. In conjunction with our AfDB partners, Fraym solved this challenge by identifying alternative variables to substitute in a handful of cases that presented similar outcomes.
- Second, in several more sparsely populated fragile countries, such as Mauritania and Chad, Fraym had difficulty in identifying enough sizeable communities for the planned interventions.
- Third, the computational power needed to process gigabytes of input data through millions of models took an enormous amount of time. The models for the first county took nearly three days to run. Fortunately, cloud computing solutions, like Amazon Web Services, allowed Fraym to switch to more powerful machines with flexible storage to reduce the processing time to a couple of hours per country.

Lessons learned: By utilizing its database and analytic techniques and methodology, Fraym has been able to assist the Bank with an objective process for selecting these vulnerable communities. Together, Fraym and the AfDB have pinpointed communities that meet the poverty and vulnerability thresholds, enabling the Bank to avoid the pitfalls of personal and structural biases and political influence. While Fraym certainly complements but does not replace on-the-ground data collection used in project implementation, it is a way to quickly and relatively cost-effectively inform high level strategy and decision making. Furthermore, Fraym’s platform is an efficient way to work across large institutions, facilitating the spread and access data and information. Fraym's innovation represents an opportunity for the development community to plan and target more effectively by extracting much more value from existing data.

For more information on the project, please contact the Fraym team at info@fraym.io.