



Building sustainable geospatial data resources for financial inclusion

October 2016

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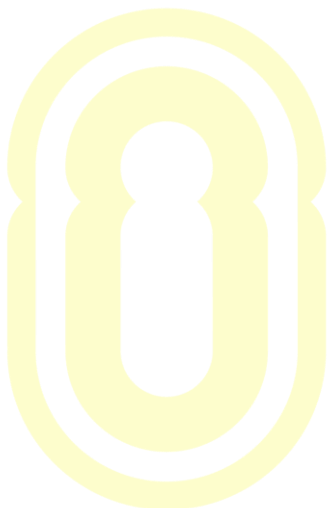
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Advancing Financial Inclusion

Acknowledgements

The authors of this note would like to thank Kennedy Komba of the Alliance for Financial Inclusion and Clarissa Kudowor of the Bank of Ghana for their valuable input, as well as Tyler Radford of the Humanitarian OpenStreetMap Team, Abe Tarapani of Premise, and Charl van Heerden of BrandWorx.



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i2i is funded by the Bill & Melinda Gates Foundation in partnership with The MasterCard Foundation.

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1. Introduction

Geospatial mapping, or GIS as it is commonly known, has become popular amongst regulators, particularly those looking to capture locational information on issuers of electronic money, and their agents. Without sufficient evidence to guide decision-making around GIS initiatives, central banks are charging ahead and are encountering stumbling blocks on the way. This paper aims to give central banks, and those that advise them, meaningful models and realistic expectations in the area of geospatial mapping.

Purpose: The purpose of this paper is to present the potential value that geospatial data has for regulators and the sustainability of different data collection methodologies that regulators can drive for GIS. It reviews two recent pilot projects and one ongoing project, to test different geospatial data collection models and compares them to previous models employed by the Bill & Melinda Gates Foundation and its partners.

Methodology: This report draws on the existing work by the Bill & Melinda Gates Foundation on geospatial data, specifically the processes used to collect the data for FSPmaps.com, as well as interviews with representatives from national banking authorities.

Structure: The remainder of this report is structured as follows:

- **Section 2** explores the value of geospatial data, why it should be collected, and why this is the time to focus on the sustainability of geospatial data initiatives.
- **Section 3** considers the regulatory use cases for geospatial data.
- **Section 4** evaluates the potential innovative data collection models for mapping financial access points, including agents.
- **Section 5** outlines three pilot projects testing innovations in geospatial data collection.
- **Section 6** presents key considerations for regulators looking to advance the sustainability of their GIS initiatives for financial inclusion.



2. Why focus on the sustainability of geospatial data?

The public-sector push for using geospatial data for financial services, and specifically for financial inclusion, comes in the context of over three years of funding and leadership from the Financial Services for the Poor team at the Bill & Melinda Gates Foundation and its partners. GIS offers new opportunities to measure financial inclusion beyond standard supply-side data, which at best measures the penetration of financial access points or product usage as either a raw number or as a proportion in relation to the population (Broens Nielsen & Slind, 2013).

This section explores the value of geospatial data and makes the case for why it should be collected, as well as why now is the time to focus on the sustainability of geospatial data initiatives.

GIS data offers new and important insight into distributional challenges in financial inclusion¹. Standard supply-side data has the advantage of being easily collected by aggregating the compliance reporting of financial service providers (FSPs), to regulators like central banks and telecommunications agencies, and it is easily comparable across countries. However, like their economic analogue, Gross Domestic Product (GDP), these statistics on their own give no sense of the distribution of financial services within a country. They cannot tell us if some people face significantly greater barriers to inclusion than others.

Geospatial data, on the other hand, can tell us about distribution effects. Data visualisation platforms let us see where access points — including agents, bank branches, ATMs, and even post offices or pawn shops, depending on the local context — are in relation to population density or specific groups of interest, such as low-income individuals. Furthermore, through analysing raw data with increasingly accessible and affordable software, we can make calculations of more meaningful indicators. For example, we can calculate the percentage of the population within five kilometres of an access point — and then we can plot on a map where access is poorest.

Buy-in by regulators for the potential of geospatial data. Regulators driving the adoption and use of geospatial data recognise its potential for FSPs and policymakers. GIS can identify market gaps and opportunities for FSPs to allocate resources to. For policymakers, it assists in understanding the spatial impact of their interventions on the accessibility and usage of financial services in their market, particularly amongst low-income individuals. Regulators driving this initiative are also aware of the need for them to play a central role in creating an ecosystem of geospatial data and analysis.

Two emerging groups of regulators moving ahead with collecting geospatial data. Increasingly regulators in developing countries are testing approaches to collect geospatial data. Largely, they fall into two groups.

- The **first group** is leading efforts by requiring their regulated financial institutions to report on the location of their activities using geospatial coordinates, specifically agents of electronic money issuers. This group includes central banks from Tanzania (Bank of Tanzania, 2015), Ghana (Bank of Ghana, 2015) and Myanmar (Central Bank of Myanmar, 2016). In their efforts to gather data to better understand the landscape in which they operate, challenges occur in the FSPs ability to comply. For example, the commercial value FSPs currently see in collecting and analysing this data varies widely by market and type of provider, which could contribute to diminished buy-in and drawn-out efforts in effective collection. In some cases, the

¹ This logic spurred the funding of massive data collection efforts in several of the Bill & Melinda Gates Foundation's priority countries (available on the FSPmaps.com platform), and institutions in some of those countries have since taken over the funding and coordination of subsequent rounds of data collection.



regulations are ahead of the capability of banks to evaluate the data in a meaningful way and additional training for technical analysts at central banks is needed.

- The **second group** of central banks are taking a more consultative approach with financial institutions and other regulatory bodies to build consensus on the public good of making this data available, as well as on the practicalities of generating the data. The central banks of Kenya and Uganda, for example, are convening working groups with regulators from capital markets, insurance and telecommunications to share information and analysis and to harmonise their policies.

Despite buy-in and action, there has been little usage of geospatial data. Regardless of the approach taken, regulators are forging ahead with the drive to adopt GIS. For example, the Bank of Tanzania (BoT) tracks the “% of people within 5km of a financial access point”, using geospatial data to measure progress. However, despite these efforts, there has been little observed usage of geospatial data by FSPs or policymakers in these markets. To date, few regulators have used the data in their policymaking or supervisory processes. Similarly, the availability of online maps and analysis tools, such as FSPmaps.com, has yet to have the intended effect of catalysing FSPs to expand their footprint to currently underserved areas. We know of some providers, typically mobile network operators, that collect and analyse proprietary geospatial data (Cheston, et al., 2016), as well as some that have incorporated the data funded by the Bill & Melinda Gates Foundation. However, there has yet to be widespread adoption.

This gives rise to a critical question for the future of geospatial data:

How do we ensure geospatial data is embraced as a tool for promoting financial inclusion?

The remainder of this report explores the use cases that could drive the wider adoption of geospatial data and introduces new approaches that can support the sustainable collection of geospatial data.



3. Regulatory use cases for geospatial data

For central banks to invest resources and capital into geospatial data collection efforts, there needs to be value beyond simply understanding the proximity of financial access points to low-income individuals. However, to date there is limited evidence of which use cases provide enough value to justify that investment decision.

Whilst this paper does not present evidence of use cases this section does identify several interesting possibilities based on conversations with regulators through the Alliance for Financial Inclusion (AFI) and with staff from quasi-public entities like national switches. It is important to note that the data and infrastructure needed to support these use cases could translate to more use cases for other stakeholders. With that in mind, regulators would benefit from building coalitions, as we are beginning to see in some markets.

Evaluating compliance with regulatory requirements

In the cases where regulated institutions are required to report their geolocations, regulators – in their supervisory function – can go to the physical place of a reported access point and verify if financial services are indeed being offered there as claimed². For example, in South Africa, providers report their geospatial coordinates to demonstrate their compliance with regulations and industry standards on equal access.

Informing policies

Central bankers acting in their policy-making function, as well as their colleagues in the national treasury, could benefit from knowing the geographical distribution of financial services. Some central banks have incentive schemes to encourage providers to expand access to under-served populations; others, like Nigeria's, choose certain areas in which to test new policies (Loeb, 2014). Policymakers trying to digitise government payments to civil servants, pensioners or beneficiaries of social welfare schemes, or collection of taxes and other revenues, need to know which institutions will be good partners. Geospatial data can illustrate the difference between providers that are concentrated in big cities and those that have greater coverage.

Improving supervision

Some central banks are using geospatial data to develop an agent registry. This has the potential to improve supervision by taking on some of the delegated responsibility for agent oversight from providers, and giving regulators a direct line into agent networks' operations. The Bank of Ghana (BoG) is currently receiving technical assistance for such an effort, and the Bank of Tanzania's (BoT's) guidelines allow for that possibility. In Ghana, agents' geolocations would be one component of their records in the registry, confirming their identity. Amongst other uses, a registry would allow regulators – or providers, collectively – to create a kind of agent blacklist. This could potentially reduce fraud for consumers and fraud-related management costs for providers.

Understanding private sector strategies

Counting points could also help regulators understand providers' strategic priorities. Some areas of the country could see rapid growth in mobile money agent networks, whilst bank agents see growth elsewhere. By adding a spatial dimension to the aggregate data regulators typically see, this data could reveal threats to competition or other risks.

² Note that the locations alone do not tell us about the performance or viability of the access points.



In addition, if regulators could access the geolocations of merchants with point-of-sale devices, they could see where and to what extent providers are trying to strengthen their acquiring business, particularly for debit cards. For example, we have engaged with regulators who are optimistic about card growth in their markets, without knowing that banks have switched their focus to mobile POS. Regulators in neighbouring countries could also collaborate to identify trends amongst providers that offer services in both markets.

Building awareness amongst consumers

A public-facing web portal hosted or funded by the central bank could be a valuable service for consumers, especially under two conditions: (i) if either their own provider does not make its own locations easy to find online or (ii) if there is sufficient interoperability amongst providers so that consumers could pick their nearest access point, regardless of whether they were a client of that provider. This use case could be even more powerful if the map's points could be filtered to show if locations that provide specific services, are likely to be operational at a certain time, and have a low frequency of consumer complaints.

4. Evaluating data collection models

The use cases identified in Section 3, such as including geolocations in an agent registry to improve supervision, require the collection of geospatial data. This section evaluates the potential innovative data collection models for mapping financial access points, including agents.

Data collection models

Geolocation data has traditionally been collected using **third-party providers**. For example, the data for FSPmaps.com was collected by a South African research firm called BrandWorx (previously Brand Fusion), whose enumerators identified the geolocations of financial access points and conducted interviews about their operations and transaction activity³.

Innovations in geospatial data collection has largely been focussed on two alternative approaches: crowdsourcing and self-collection.

Crowdsourcing, or similar collection models, can be designed to build on existing agent registries. Surveyors or volunteers, for example, could be given a pre-defined list of mobile money agents to "tag". They could even aid in developing a registry and be tasked with assigning unique identification numbers to agents and recording which services they offer. Data could then be validated with the individual providers.

Self-collection by providers' could take on many forms. Providers could submit the geolocations of their access points once, in a single Excel file, soon after the issuance of the regulations. They could also be required to update the list every six or 12 months. In Myanmar, providers are required to report new locations within two weeks. Providers could also be required to report the volume and value of transactions at each geolocated access point, over an agreed compliance reporting period.

Some regulators, seeing the explosion in the amount of data produced by mobile money operators from their agent networks and client bases, are beginning to explore the use of "RegTech". One form this could take is direct access (through an application program interface, or API) for regulators to view provider data. This could then feed automated dashboards and analysis tools. In this model, regulators

³ Some of the more sensitive data are not included on FSPmaps.com but have been used for separate analysis.



“pull” data from providers on-demand or at set intervals, rather than rely on providers to “push” data in compliance reporting. Note, this method would still require providers to identify their geolocations.

By imposing some kind of compliance requirements on providers, regulators can pass on some of the cost of collection to them. Self-collection and direct reporting of geolocations would require an investment from the FSPs, but these marginal costs could be offset. For example, FSPs could realise some cost savings or new revenues from incorporating geospatial analysis into their business, even with a small investment (Mutemi & Loeb, 2015). And even if just a few providers in a given market make early investments in this capacity, competitive pressures could drive wider adoption.

However, with mandated self-collection and reporting, regulators would be limited to receiving data on the institutions they directly oversee. This may include SACCOs, post offices, money transfer operators, and many other types of institutions that are not e-money issuers but were covered under FSPmaps.com’s third-party data collection efforts. To recreate the breadth of FSPmaps.com, regulators would need to supplement the data with crowdsourcing or a third-party collection method.

Criteria for understanding fit

In the short-term, regulators and other champions of geospatial data in those markets covered by FSPmaps.com, likely want to evaluate their options for extending the life of that public resource. In addition, stakeholders in markets not covered by FSPmaps.com will want to evaluate their options for their first step into geospatial data.

Whilst we continue to gather information about the pilot projects discussed in this paper, and the early experiences of some central banks, we have already identified some criteria with which to assess data collection models. The following outlines these criteria and some the key considerations for evaluating data collection models.

- **Number of points identified.** This is the simplest means of comparing the various data collection models. The number of points identified by the data collection method should be at least as good as an independent research firm. The OpenStreetMaps (OSM) and Premise models discussed in the Section 5 have good news on that front, but there are still complicating factors. For example, each round that BrandWorx, who did the original data collection for FSPmaps.com, collected geospatial data involved an increasing range of financial access point types, eventually including, in some markets, non-financial access points such as schools and health facilities. A simple comparison of absolute values of points identified may therefore be unfair to earlier efforts, since these pilots did not tackle comparable ranges.
- **Ability to replicate the model within the country at a meaningful frequency.** The location of agents rarely move, even for providers with massive agent networks, although some go out of business or decrease their level of activity. The frequency of collection required for accurate geospatial data may therefore not be too onerous for either regulators’ or providers’. Further, there are other options to collect activity-level data from existing data collection exercises. For example, both groups could link more frequent data on transactions to the relatively fixed geolocation data to identify when an agent has gone out of business.
- **Accuracy or comprehensiveness of identified points.** Even with the best intention to be as comprehensive and accurate as possible, there are still data points that do not make it into the geospatial mapping process. For example, despite the best efforts by the Bill & Melinda Gates Foundation to be as comprehensive as possible for FSPmaps.com, each time a new round of data was disseminated, providers reported that some of their points had not been captured. This was despite FSPs consent to the various rounds of data collection,



enumerators' letters of endorsement, and support in persuading agents reluctant to speak with unknown researchers. In some cases, such as bank branches, it is easy to resolve any discrepancies, but it is more challenging for mobile money agents who could be based in office buildings and hidden from any outside data collection model. Third-party models could improve the comprehensiveness if the collection tools were pre-loaded with official lists of agents, either from providers or a central registry. However, this needs to be weighed against the value. For example, it is likely impossible to capture all SACCOs in some countries, nor would it be particularly meaningful, since many are not really open to the public.

- **Cost per point identified.** Dividing the project cost by the number of points may not produce such a meaningful metric at this stage. Different types of providers price their services differently. For example, initiatives supported by the Bill & Melinda Gates Foundation would likely have a different cost than those driven by a government, a small non-profit, or a private sector firm. Further, costs might change across different types of access points. For example, there is no need to use a detailed questionnaire to identify the location of an ATM.
- **Fit with government procurement and other legal requirements.** Even though our overview of data collection mechanisms is not exhaustive, it is clear that identifying geolocations is not technically difficult, and there is a wide range of solutions for stakeholders in most markets. However, some aspects of data collection imply certain challenges, depending on the market. For example, third-party firms may collect sensitive commercial or personal information, which would need public-private agreements to clarify rules for data protection and sharing, and maybe even registration for the firms involved.
- **Ability to scale domestically.** The BrandWorx model has been the only one to date tested at a national scale. Whilst small-scale collection efforts could be valuable for particular use cases, only national efforts could replicate and extend the value of the FSPmaps.com resources.
- **Ability to scale to other markets.** Some data collection models may have quite onerous prerequisites which make it difficult to scale to other markets. For example, a national census by a third-party firm can only be conducted if international firms have local resources or if there are adequate local suppliers. Similarly, crowdsourcing models depend on either pre-established networks of contributors or the ability to develop those networks quickly. Meeting these prerequisites could add significant time to a data collection effort.

5. Innovations in data collection

This section describes three pilot projects testing innovations in geospatial data collection. The first two pilots rely on local residents to identify the geolocations of financial access points. The third, ongoing project, employs a model of self-collection by an individual financial services provider (FSP). The locations for all the pilots were chosen because FSPmaps.com data already existed for those countries, allowing us to make comparisons with previous data collection exercises.

Please note that the following pilots are built on the assumption that the BrandWorx-style methodology would be valuable for certain stakeholders in certain situations, but that if stakeholders understood their broader range of options, they would be more likely to find one that worked in their market and their current stage of ecosystem development.

Model 1: Crowdsourced data collection, with volunteer enumerators



Background: The Bill & Melinda Gates Foundation partnered with the Humanitarian OpenStreetMap (OSM) Team to test a purely volunteer-based geospatial data collection model. OSM staff train local residents to identify financial access points using a smartphone application. These residents then remain in the OSM network and can be called upon for future projects in their area.

Data collected	Collection tool	Primary data collectors
Access point locations.	Open-source smartphone app.	Volunteers, mostly university students, trained by program staff.
Frequency of collection	Integration with provider data	Public good outcome
One-time during a coordinated call for data collection.	None; though providers can download data from public platform.	Public platform for viewing location data; validation of new codes (e.g. mobile money agent) for future mapping efforts elsewhere.

Table 1: Pilot overview for Model 1

Motivation: This pilot project tested the hypothesis that this particular model of crowdsourcing could perform just as well as a national census conducted by a private firm's enumerators, in terms of data coverage, quality and cost. Specifically, how the costs of this model change over time, with repeated data collection efforts. Both OSM and Premise, described below, make the point that each successive engagement, including these pilot projects, builds the community of trained enumerators, which should reduce training costs and, in Premise's case, reduce the assignments to weaker enumerators in the future. Both also offer longer-term cost estimates, but unfortunately the evidence is not available to validate those estimates in regard to the application of financial services points with their models.

Implementation: The OSM volunteers, all university students, mapped 22 districts in Uganda over three months in early 2016. The students used OpenMapKit on their personal smartphones. The Bill & Melinda Gates Foundation had just funded a full data collection exercise in Uganda for FSPmaps.com in 2015, making for a meaningful comparison. In urban areas, the data was comparable. For example, in one region, volunteers found eight fewer mobile money agents⁴, two more bank branches and eight more ATMs than found in the region by FSPmaps.com. In rural areas, volunteers found more mobile money agents, but they also identified points that had ceased operations.

Data from the app flowed into the OpenStreetMap portal, where it can be viewed or accessed using an API.

Model 2: App-directed data collection, with paid enumerators

Background: In 2015, the Bill & Melinda Gates Foundation funded a pilot with the firm Premise to test its data collection model with financial access points in Abuja and Lagos, Nigeria. Premise trained over 100 enumerators, and assigned tasks to those enumerators via its smartphone application. The app specified either a geographic area within which to identify financial access points, or a list of pre-identified points to validate. The company pays contributors for each completed task.⁵

Data collected	Collection tool	Primary data collectors
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⁴ Without unique identification for the agents, it cannot be confirmed if some agents ceased operations or the OSM team missed some access points.

⁵ For an analysis of Premise's data quality in another application, real-time economic statistics, see (Dubey & Gennari, 2014)



<ul style="list-style-type: none"> • Access point locations. • Services provided. • Transaction information. 	Proprietary smartphone app.	Smartphone users, many who were previous users of the app, who are paid to visit points and rewarded with more assignments if their data is consistently validated and if they travel to remote areas.
Frequency of collection	Integration with provider data	Public good outcome
One-time during a coordinated call for data collection.	None; data accessed via proprietary platform.	None; data accessed via proprietary platform.

Table 2: Pilot overview for Model 2

Motivation: This model tested the same hypothesis as the OSM model. The key difference is that whilst OSM recruits volunteers, Premise pays its data collectors, typically with mobile money but occasionally with airtime credit. Premise claims that its model is replicable since its ongoing projects develop data collectors with reputations for quality. However, this particular project on financial access points did not include additional rounds of data collection.

Implementation: In Abuja, enumerators were given a total of 1,154 access point locations, drawn from the FSPmaps.com data, to verify using the Premise app. According to the firm’s report to the Bill & Melinda Gates Foundation, enumerators found all of the assigned points, as well as some additional points⁶. Of the original points, 38 were no longer operational. Enumerators made a total of 4,379 visits; in other words, it took enumerators just under four visits to validate each access point.

In Lagos, enumerators worked from a bounded geographical area and collectively identified and verified 11,199 access points in total, of which about a quarter were unique. Premise’s system allocated more tasks to strong contributors, and it also rewarded contributors who visited less accessible areas. As the system adapted to users’ behaviour, the cost of collection per access point decreased from USD 4.75 to 2.55.

The data from both cities was uploaded onto a proprietary platform, where it can be overlaid with additional data on market prices and purchasing power, a core component of Premise’s work in Nigeria and elsewhere.

Model 3: Self-collection by financial providers

Background: The third model is currently underway and relies on FSPs to collect the geolocations of their own access points. The particular mechanism for data collection is a customised smartphone app, to be used by agent supervisors.

Data collected	Collection tool	Primary data collectors
<ul style="list-style-type: none"> • Access point locations. • Other information to be decided. 	Smartphone app.	Provider employees, specifically agent supervisors.
Frequency of collection	Integration with provider data	Public good outcome
One time during pilot, with possible re-visits for agents.	Facilitated by project-funded technical assistance.	Location data to be exported to Google Maps and FSPmaps.com.

Table 3: Pilot overview for Model 3

⁶ It may be that Premise enumerators included types of points that were not meant to be included in the initial FSPmaps.com data collection.



Motivation: It is likely that in Tanzania and Ghana, the central banks will require providers to report some geolocation data directly to the central bank – potentially in conjunction with another model the central bank could employ to validate and supplement the providers' data. It is important to understand the compliance costs this would impose, as well as the perceived burden. The perceived burden is likely to be low if providers see value in collecting their own data and in potentially having access to some basic level of data from their competitors.

But even in markets where regulators do not issue this kind of requirement, if this self-collection model proves valuable, more providers will take it up and become active geospatial data users. However, until we have evidence of the success of these examples, we cannot fully test the market-wide impact.

The implication is that providers see geospatial data as an investment, requiring a high-level decision that weighs the costs against the likely benefits. This, in turn, suggests an internal process of “selling” geospatial data to high-level decision-makers, as well as a whole host of internal stakeholders, each with its own incentives to support, oppose, or shape the use of geospatial data.

For example, the process of data collection may impose new responsibilities on some staff members, and those staff may or may not be rewarded for performing this new task. Further, if the provider needs to hire new staff to meet the technical demands of data analysis that may shift the internal political balance toward one department or another. Finally, if data visualisation removes the need to have staff direct clients to their nearest access point, people's jobs could be at risk. However, these intersecting and possibly competing interests could simply be overruled by a top-down decision and mandate from senior leadership if they deem it valuable.

The long-term goal of this pilot project is thus to provide evidence for selling geospatial data collection and analysis to FSPs as a way to identify additional needs in low-income communities and serve existing clients better. At a minimum, this evidence will entail:

- A data collection mechanism that is inexpensive and easy to implement; and
- One or two specific use cases with proven benefits for FSPs within a constrained geographical area or market segment.

Implementation: To date, one bank in Kenya has signed on as a partner for this project, and additional partners may be added as the pilot is refined, the approach improved and evidence obtained that could encourage others to participate.

The pilot will use a smartphone app developed by Akvo, a specialist non-profit with an office in Nairobi. The app records geolocation data and allows the user to complete one or more forms for each point on the map. It will likely be pre-loaded with specific agents using the bank's internal unique identification numbers. The data will be immediately posted to a cloud-based database that can also host additional uploaded data, and be exported for external use. For example, the data could be used by public-facing platforms like Google Maps, or for analysis alongside internal bank data. Importantly, the data collection process will be tailored to fit the bank's current processes. At first, data collection will occur in a geographic area chosen by the bank.

In the future, the bank may see value in new staff or new processes to provide more types of data, such as on merchants with point-of-sale devices, or higher frequency collection, such as weekly instead of monthly. However, we expect this will happen over time and the first task will be to demonstrate what can be accomplished by simply adding a geographic component to the data that currently exists into the institution today.



The team involved in this project includes a consultant with expertise in linking geospatial data to financial providers' databases of account activity and metrics such as profitability, and network and customer issues. This consultant will lead discussions with the bank about the use cases that could fall within the project's scope – how to balance big, challenging but potentially highly valuable applications with what could be considered “low-hanging fruit”, such as simply identifying access points on a client-facing map.

The pilot aims to produce business models, cost-benefit analyses, case studies or other knowledge products that show the value of incorporating geospatial data collection, analysis and visualisation into current decision-making processes. The project will investigate in which circumstances, and for which use cases, geospatial data is worth an investment. In order to develop these tools, it's important to first understand how the institution calculates internal costs, evaluates potential savings and revenue, and balances risk and opportunity.

6. Longer term implications for regulators

There is no one-size-fits-all solution to developing a shared resource for geospatial data relating to financial inclusion. As the section on data collection mechanisms suggests, reducing the frictions of this process will help make data “usage-ready” for regulators and stakeholders. But although data availability is necessary, it is not a sufficient condition for usage itself.

Countries with existing FSPmaps.com data may already be sensitised to potential use cases and may have a heightened urgency or greater expectations that would not necessarily apply to a market without existing public data. On the other hand, a country like Ghana, which has no existing geospatial data on financial access points, may be the first central bank to impose a sustainable ecosystem.

As the Bank of Ghana (BoG) and other regulators experiment with how to build solutions for the use cases they envision today, they can set themselves up for longer term success by keeping careful records of their efforts and outcomes – good or bad.

Given recent developments, agent registries seem to be the most likely catalyst for geospatial data collection. Of the three pilot projects, two provide direct tests of their compatibility with a registry. Part of the Premise pilot assigned enumerators to verify specific access points that were already identified. These assignments could just as easily have been drawn from a central agent registry. These enumerators could also be tasked with gathering information relevant to compliance requirements or even to conduct mystery shopping exercises – in effect enhancing the central bank's supervision capacity. And in the self-collection pilot, the app will likely be pre-loaded with specific agents' information. This or a similar app could support the creation of a registry.

Although these arrangements are technically possible, further answers should be drawn from regulators on a number of questions: Would regulators allow a third-party to distribute unique agent identifiers? Do central banks want to take on the mandate – and the exposure – of increasing the scale of their in-person supervision efforts?

We look forward to supporting regulators, whether they are already innovating or are at a much earlier stage, and learning alongside them.



Bibliography

- Bank of Ghana, 2015. *Agent Guidelines*. [Online]
Available at: <https://www.bog.gov.gh/privatecontent/Banking/E-MONEY%20GUIDELINES-29-06-2015-UPDATED5.pdf>.
- Bank of Tanzania, 2015. *The Electronic Money Regulations*. [Online]
Available at: <https://www.bot-tz.org/PaymentSystem/GN-THE%20ELECTRONIC%20MONEY%20REGULATIONS%202015.pdf>.
- Broens Nielsen, K. & Slind, T., 2013. *The Power of Mapping Financial Services Data*. [Online]
Available at:
<https://docs.gatesfoundation.org/Documents/The%20Power%20of%20Mapping%20Financial%20Services%20Data.pdf>.
- Central Bank of Myanmar, 2016. *Regulation on Moboile Financial Services*. [Online]
Available at: http://www.cbm.gov.mm/sites/default/files/regulate_launder/_fil-r-01_mobile_financial_services_regulation_eng_final_website_4-4-2016_-5.pdf.
- Cheston, S., Conde, T., Bykere, A. & Rhyne, E., 2016. *The Business of Financial Inclusion: Insights for Banks in Emerging Markets*. [Online]
Available at:
http://www.centerforfinancialinclusion.org/storage/documents/IIF_CFI_Report_FINAL.pdf
- Dubey, S. & Gennari, P., 2014. *Now-casting Food Consumer Price Indexes with Big Data: Public-Private Complementarities*. [Online]
Available at: <https://www.premise.com/files/Now-casting%20Food%20Consumer%20Price%20Indexes%20with%20Big%20Data%20Public-Private%20Complementarities.pdf>.
- Grundling, I., 2016. *Geospatial mapping of service access points in Zambia*. [Online]
Available at: <http://www.fsdzambia.org/zambian-geospatial-mapping-presentation-with-irma-grundling/>.
- Loeb, B., 2014. *The response of large corporates and their value chains to government policies to shift to digital payments: Nigeria's 'Cashless policy'*. [Online]
Available at: <https://www.betterthancash.org/tools-research/case-studies/nigerias-cashless-policy>.
- Mutemi, A. & Loeb, B., 2015. *The next step in geospatial data for financial inclusion: Putting providers front and center*. [Online]
Available at: <http://blogs.afi-global.org/2015/09/09/the-next-step-in-geospatial-data-for-financial-inclusion-putting-providers-front-and-center/>.
- Tanzania National Council for Financial Inclusion, 2014. *National Financial Inclusion Framework*. [Online]
Available at: <http://www.afi-global.org/sites/default/files/publications/tanzania-national-financial-inclusion-framework-2014-2016.pdf>.

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