GEODATA FOR INCLUSIVE FINANCE AND FOOD

Summary of NpM Seminar

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NpM and G4IFF

NpM, Platform for Inclusive Finance is a member platform for Dutch investors in the inclusive finance sector. Together with the Dutch Ministry of Foreign Affairs and its members, NpM is committed to expand accessible financial services worldwide. We believe that access to financial services offers people the possibility to improve their living conditions, which in turn reduces poverty and inequality.

In 2018, NpM established the Geodata for Inclusive Finance and Food (G4IFF) work stream together with Rabobank Foundation, Bill and Melinda Gates Foundation, FMO, the Netherlands Space Office, and ICCO. The goal of this work stream is to improve risk management and to lower transaction costs for financial institutions (FIs) as well as to increase the access to financial services for smallholder farmers by using geodata-based information. As part of the G4IFF work stream, NpM initiated the Innovator's Challenge, challenging tech companies to propose geodata solutions to increase smallholder farmers' access to finance. The three winners of the challenge are Agri-wallet, Apollo and VanderSat who pilot their solutions in Kenya.

NpM's seminar on Geodata for Inclusive Finance and Food was held as a pre-day event to the SPTF and Smart Campaign's Summit on "Inclusive Digital Future" in Nairobi. This summary will provide insights on the objectives and processes that the three winning companies face, as well as highlight data privacy issues that may arise with the use of geodata-based information in financial services.
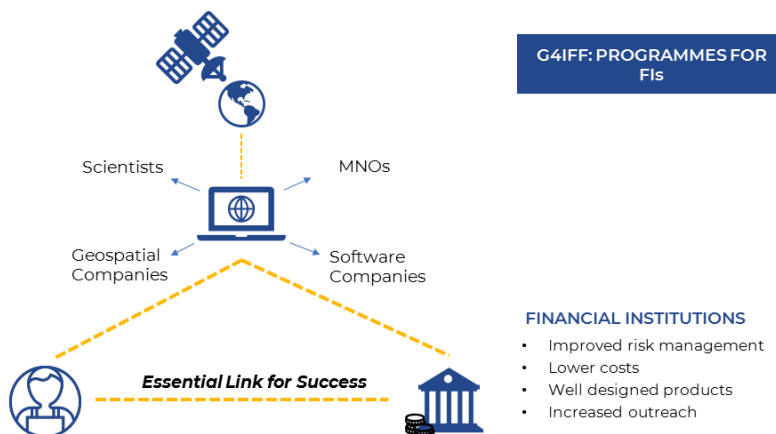

Figure 1: G4IFF work stream

Agri-wallet: Geodata and Value Chain Finance

Agri-wallet is a blockchain-enabled finance platform that facilitates transactions between farmers, suppliers and buyers. The mobile wallet identified that smallholder farmers do not receive sufficient funding due to the following reasons: Firstly, most smallholder farmers do not have sufficient financial track records and little knowledge of climate risks and opportunities, whereas FIs lack tailored services that fit the needs of smallholder farmers. Secondly, according to Agri-wallet, 68% of all agricultural loans given to smallholder farmers are diverted to other uses.

Agri-wallet aims to solve these problems by using geodata-based information to tailor digital loans sent as unique earmarked tokens to the farmer's mobile Agri-wallet account. This system is built on the M-Pesa payment method, which uses digital payments instead of traditional cash payments. As the tokens are earmarked, they can only be used at buyers and merchants registered with Agri-wallet, thus staying in the agriculture supply chain.

In addition, Agri-wallet collects geodata-based information regarding climate risks that are added in the company's climate profiling model. This model can be used to determine farmers' climate and repayment risk levels as well as their growth potentials. This helps FIs provide tailored services and advice to farmers and other value chain actors.

Credit for Buyers earmarked to pay Farmers   **Credit for Farmers earmarked** to pay Merchants   **Credit for Merchants earmarked** to pay Distributor

Figure 2: Agri-wallet's value chain financing process

Apollo Agriculture: Commercial Farming for Everyone

Apollo Agriculture aims to help smallholder farmers maximize their productions and profits. The FinTech company recognizes that smallholder farmers are highly dispersed in Kenya and that they operate in loose value chains. Therefore, these farmers are extremely difficult to profile and to reach for FIs. In addition, they lack capital to make yield-increasing farm investments due to minimal financial track records, low purchasing power and the lack of access to credit.

Apollo aims to solve these problems by using agronomic machine learning, remote sensing technology, and mobile phones in order to deliver credit, farm inputs and advice needed by farmers to increase their yields. In addition, Apollo uses geodata and machine learning to improve credit decisions for farmers who do not

have sufficient credit histories. This technology is also used to automatize operations that allow for high scalability and low-cost production.

Apollo also aims to reduce lending risks for FIs by using geodata. Firstly, geodata can accurately detect fraud. The software automatically flags loan applications where the GPS coordinates of the farm overlap with a previously defaulted farm loan; or if the spouse of the applicant is a default farmer, based on national ID and GPS coordinates of farmland. This allows FIs to consistently catch fraudulent loan applications before approval. Secondly, geodata can be used to detect harvest dates for each farmer. This allows FIs to customize repayment deadlines according to harvest dates.
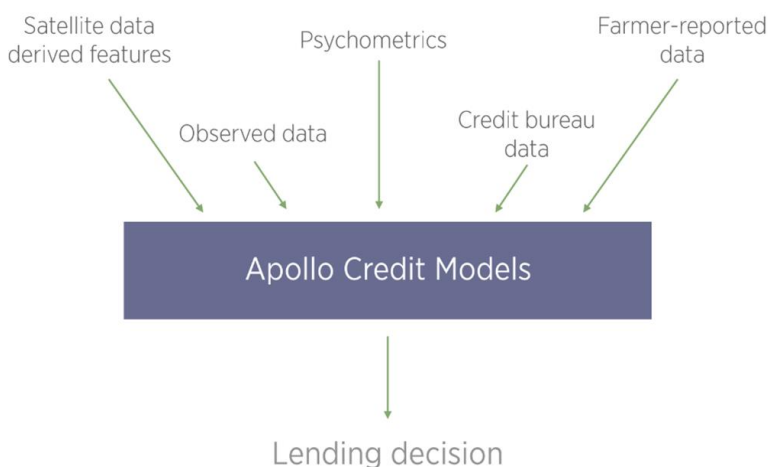

Figure 3: Apollo's Credit Models

Various sources of data are collected and inserted into Apollo's Credit Model, which then determines lending decisions of FIs.

VanderSat:
Credit Scoring and Financial Inclusion

Mendy van der Vliet of VanderSat explained how geodata can contribute to improving financial inclusion and solving the world's water and food crisis by integrating climate risk information on agriculture, food & commodities, insurance & banking as well as water management.

VanderSat and its partners ACRE Africa and Tulaa aim to give solutions by providing scalable, low-cost climate risk information and agricultural track records to insurance providers and FIs, as well as agricultural advice to farmers. This information can help insurance providers and FIs to efficiently assess risk and determine farmers' credit scores before disbursement. VanderSat also uses geodata to cost-efficiently monitor climate risks, which helps predict the farmer's potential yields and can provide early warnings of crop losses.

Together with ACRE Africa and Tulaa, VanderSat developed the Tool for Agricultural Risk Advice (TARA), which is a global risk assessment platform for credit scoring and agricultural advice tailored to the needs of FIs. TARA combines climate conditions and agricultural track records to determine the farmer's credit score as well as their agricultural abilities and repayment capacities. TARA is highly scalable and can be easily upscaled to other countries and organizations.
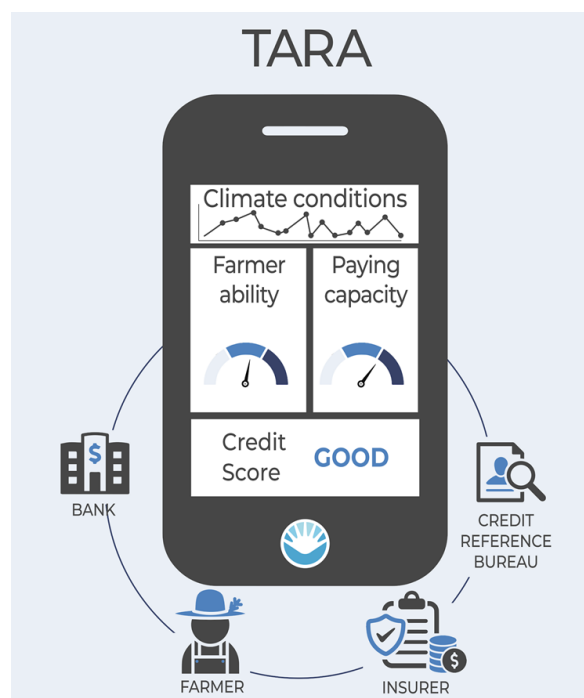

Figure 4: VanderSat's TARA platform

The Smart Campaign

The Smart Campaign, founded in 2009, works globally to create an environment in which financial services are delivered safely and responsibly to low-income clients. The campaign shares tools and resources that help FIs and FinTechs deliver transparent financial services to their clients. The Smart Campaign therefore unites the inclusive finance sector around a common goal: to put the interests of the clients first by integrating client protection principles and providing transparent financial services.

Isabelle Barrès made the case for why the sector needs to focus on client-centricity. As low-income customers around the world have increasing access to digital financial services, providers must position themselves as responsible actors to establish confidence in their services and products.

Focusing on digital credit, the Smart Campaign has identified seven risks for clients:

1. Inappropriate product design and delivery
2. Over-indebtedness
3. Non-transparency of terms and conditions
4. Irresponsible pricing
5. Unfair and unrespectful treatment of clients
6. Data privacy issues
7. Lack of mechanisms for complaint resolution

In order to engage practitioners, the Smart Campaign is developing data protection standards through the [FinTech Protects Community of Practice](#). This CoP seeks to conduct research on financial risks for clients, to establish good practices and mitigation tools, to facilitate consensus-building, and to roll-out assessment and certification programs.

When making use of geodata to collect information about smallholder farmers, one must think of the data privacy risks this entails. The main issues encountered are:

• data ownership and control by the clients;
• clients' consent over who captures/uses/shares their data;
• collected data must only be used and stored for specific purposes;
• data transparency and grievance mechanisms must be in place for clients to know what data is used, for what purpose and how they can challenge these methods, if needed.

MicroFinanza Rating

The mission of MicroFinanza Rating (MFR), founded in 2000, is to provide the inclusive finance sector with independent ratings, certifications and high-quality information services, aiming at enhancing transparency, facilitating investments and promoting responsible practices.

In cooperation with NpM and the Smart Campaign, MFR is conducting research on good practices when using geodata in digital financial services. This research is crucial because FIs have a responsibility to ensure that smallholder farmers understand what information is collected and the ensuing privacy risks. Certain types of geodata are arguably intrusive and the industry must find solutions to this.

Ben Wellington of MFR explained privacy challenges when using geodata, such as the fact that field markings of farmer's land are stored together with the farmer's name and other personal information, exposing the farmer's identity and sensitive data.

Good practices have emerged, for example, an FI must ensure privacy risks are explained to farmers during the data collection process. Only personal data that is needed for operational purposes should be collected, and systems that protect against data misuse and security breaches should be put into place. Sensitive geodata of a specific farmer, such as GPS coordinates, should be anonymized for staff who do not need this information. The farmer should also have the right to opt-out of providing a particular type of data. Data ownership and control should therefore have the highest priority; farmers requests to inquire or permanently delete any data maintained by FIs must be fulfilled.

Nevertheless, several open questions remain: How can we improve client consent? How can we learn from consumers to improve our processes and products? And how can we limit data privacy risks? These questions led to a lively debate between the participants of the event and provided input for practitioners to take into account. The collaboration between NpM, the Smart Campaign, and MFR will result in a study to be published in October 2019, available via NpM's website.