

# SCPP Knowledge Brief

## Farmer Network Analytics/ FarmNetX: Data Decision Tools to Improve Farmer Engagement for Cocoa Sustainability



### SUMMARY

Farmer Network Analytics (FarmNetX) was created to strengthen knowledge sharing in smallholder supply chains through network data analysis. FarmNetX goes beyond satisfying the basic certification requirements for sustainable supply chains. It enables private sector partners to facilitate their farmer networks to become innovation networks.

### CONTEXT

Major consumer food brands have committed to sustainably sourcing their commodity ingredients. They are investing large sums into upgrading their smallholder-based supply chains. Despite these efforts, serious issues threaten the very viability of these sustainability investments.

Farmers' yields remain below potential because their adoption rates of technology and best practices remain low. At the same time, certification standards are increasing pressure on growers to improve performance or risk losing certification eligibility. Improving farmer adoption of innovations is a priority.

Research shows that informal social networks play a significant role in the diffusion and adoption of innovations. Also, informal networks are key to building trust amongst farmers for sustainability efforts and the companies that lead them.

This latter point is a major issue because farmers sell only 30-40% of their production into sustainable supply chains to which they belong. If insights can be gained into these informal information networks, then both levels of innovation and producer trust and loyalty can be raised.

### INNOVATION

FarmNetX provides data-driven insights to assist managers of sustainable supply chains to improve farmer adoption levels and systematically build trust. Swisscontact saw the opportunity to combine existing data collected for private and voluntary sustainability standards, with social network analysis to gain insights into farmers' informal knowledge sharing networks.

This helps sustainability managers to improve their smallholder network performance through:

- Identifying the best network structures for diffusing knowledge and innovations to farmers
- Targeting priority farmers for

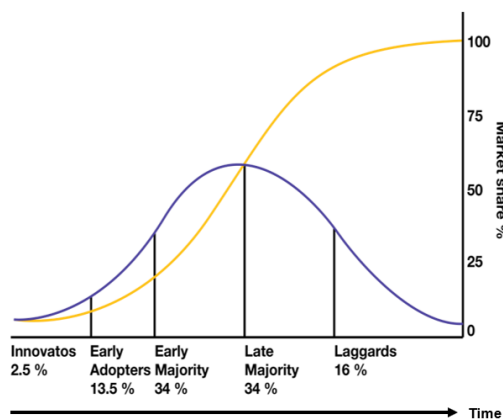
Since its inception in 2019, Swisscontact has successfully applied the FarmNetX tools to cocoa, coffee, and dairy supply chains involving over 25,000 smallholder producers. Participating companies have included Cargill Cocoa, Mondelez, Mars Inc., Olam Cocoa, LDC Coffee, and Nestle.

FarmNetX looks first at how commodity companies recognize and measure innovation amongst their farmers. This is usually related to the application of Good Agricultural Practices leading to increases in productivity. Also of interest is the extent that farmers adopt new norms of production in line with sustainability standards, especially those related to the elimination of deforestation of the worst labor practices in the supply chains. Despite these concerns on behalf of companies, their efforts to accurately assess these practices do translate into useful measurements that provide insights into farmers' rates of adoption.

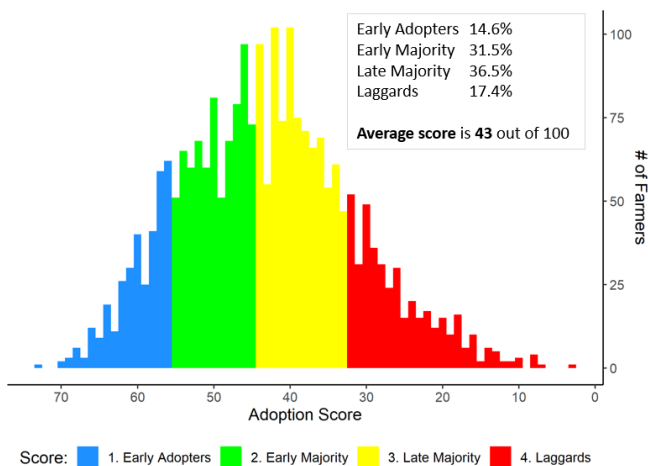
Therefore, as part of FarmNetX, Swisscontact advises companies on data collection and analysis so they can better monitor the spread of innovation across their supplier networks. A key statistic that FarmNetX generates is the *Adoption Index Score* that functions as the speedometer for understanding farmers' differing rates of adoption.

The farmers that take on innovations the fastest, i.e, early adopters, are differentiated from the more traditional, slower adopting farmers, or laggards. It also categorizes the majority of farmers in between these extremes as innovating either earlier or later than the average.

Roger's adoption curve:



Adoption Index Score Distribution of 2,155 Sulawesi farmers:

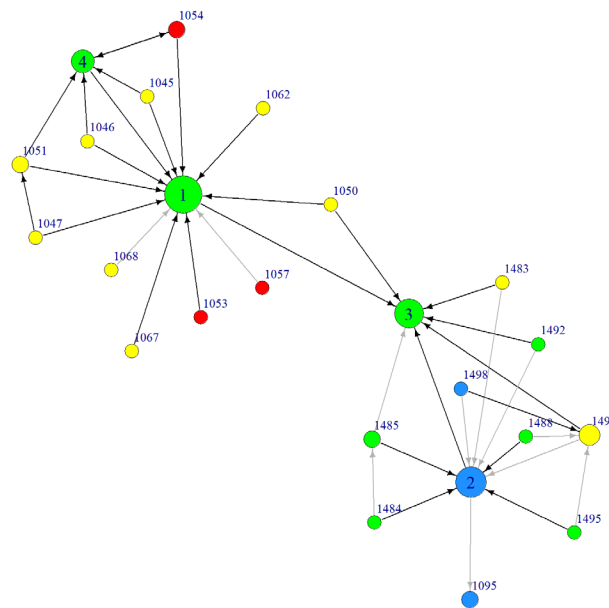


This segmentation of farmers based on levels of innovation influenced supply chain companies to be more nuanced in how they engage farmers. They now have a framework to tailor their interventions to the farmers' level of innovation, and the farmers' predilection to adopt new innovations. This is one part of the picture.

Another part is that farmers already learn and adopt innovations from others in their network. Understanding these knowledge sharing networks is fundamental to making a network more innovative. Therefore, FarmNetX introduced sociometric surveys that gathers quantitative data about the relationships within a group of people. There are several types of relationship that FarmNetX helps discover, such as:

**Informal knowledge sharing relationships, relationships that lead directly to adopting a new technique, and/or the relationships farmers have with institutions** specific to the commodity of interest.

Using Social Network Analysis (SNA) statistical methods, FarmNetX is able to visualize these relationships together with the farmer's level of innovation. This provides intuitive insights into how supply chains are performing and how to accelerate the diffusion of innovations in the supplying network at lower costs.



FarmNetX provides an easy-to-follow intervention rationale based on data that can guide each and every farmer engagement. The 4x4 matrix is an example of such a network wide strategy. It segments all farmers in network into 16 possible categories based on the combination of their level of innovation and position in the information network.

Within this matrix, strategies can be developed that cater to the needs of each farmer, and leverages opportunities for increasing innovation and loyalty through existing network channels.

Farmers' Position in the Network	Level of Innovation Adoption			
	Early Adopters (16%)	Early Majority (34%)	Late Majority (34%)	Laggards (16%)
<b>Influencers (8%)</b> ≥ 4 indegrees Central to the network, popular	2% of Network: Positive Norm Setters. Place to seed Innovations. <b>Incentivize them with demoplots, fertilizer, etc.</b>	6% of network: Key for improving adoption in the network. Intensive coaching here linked to FFD for their followers. <b>Transformational.</b>		2% of network. Negative Norm Setters. Link their followers to other influencers. Prune from network over time.
<b>Minor Influencers (13%)</b> 3 or fewer indegrees		40% of the network. <b>Invite them to FFD with their respective influencer.</b> Organize CoC/GAP training around their influencer to strengthen network.		
<b>Followers/Receivers (78%)</b> Can be targeted through Influencers	14%: Good to know who they are; low investment needed, <b>monitor their loyalty.</b>	22% of network: <b>Seek to improve their network ties.</b> Focused Training invitees. Low investment.		14% Seek to improve their network ties. Focused Training invitees. Low investment.
<b>Isolates (1%)</b> Either quickly incorporate them into the network or cut out				

## KEY LESSONS

- **When dealing with thousands of smallholder suppliers, there is a tendency for companies see smallholders as a homogeneus, undifferentiated population.** This is a fallacy. It is important to segment farmers based on key indicators that enable management to take in the big picture of the issues in the network, while also allowing them to drill down to specifics, village by village, farmer by farmer tailored made opportunities. That is the purpose of FarmNetX
- **One of the key lessons is to help our clients and their supply chain partners to better define what innovations are important, and then to establish observable, concrete indicators to measure the innovation.** Out of that comes a Adoption Scoring Index that allows all the farmers to be accurately assessed and segmented according to their specific state.
- **Supply chain companies are now using a plethora of database platforms to collect and manage their sustainable, supply chain data.** FarmNetX can be used with any relational data base platform in use by partners or corporate clients.

## WAY FORWARD

Indonesia, a major global producer of tropical commodities, has been the test market for FarmNetX to date. FarmNetX tools are able to use with any relational database platform. FarmNetX is relevant to all smallholder based, sustainable commodity networks across the globe.

Swisscontact is now in discussions with several companies to mainstream the FarmNetX tool to help manage the supplier network. This will provide the companies with annual or even seasonal updates on the performance of their network in the following key dimensions: (1) level of adoption and innovation at the individual level as well as network level, (2) loyalty of farmers to sell to the network as it relates to their position in the network, and (3) changes over time of their network performance as it relates to specific interventions.

Swisscontact Indonesia for the remainder of 2021 will be piloting the FarmNetX tool with several companies and supply chains in Indonesia, Sri Lanka, and Morocco. We expect to be offering this service of FarmNetX to other companies and Swisscontact country offices that are working with agricultural commodity supply chains.