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Innovating Technology Solutions to Enable Market and Credit Access in Agriculture

Digital Pilipinas

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Introduction

The Philippines is known primarily as an agricultural country, especially considering the impact agriculture has on the nation's economy. An estimated 23% of all Filipinos are employed in the sector, according to data from the World Bank.¹ Crops like rice, sugar, and coconut are vital parts of the nation's food supply and overall economic output.

The importance of the agricultural sector to the nation is especially worth noting given that the Philippines is one of the top countries most vulnerable to climate change. Every year, the monsoon season brings torrential rains and floods that destroy millions of dollars worth of crops. These extreme weather events likewise hamper the efficiency of local supply chains, impeding the movement of food from farm to table and increasing commodity prices.

Concern over the resiliency of the Philippines' agricultural sector has reinvigorated discussions on the nation's food security. On top of concerns over extreme weather events, the Philippine agriculture industry is also hampered by the African Swine Fever epidemic (which affects hogs) and Highly Pathogenic Avian Influenza (bird flu), higher cost of inputs, lingering effects of the COVID-19 pandemic on supply chains, issues over low wages for workers and decreasing employment rate in the agricultural sector, and other pertinent concerns.

The multiple issues plaguing the agriculture sector resulted in a situation where Filipino farmers have become the most impoverished in the country, despite agriculture's importance. It is estimated that among the 11 basic sectors in the Philippines, farmers and fisherfolk residing in rural areas have remained the poorest since 2006.²

One key challenge of the sector is getting agricultural goods from farm to market. Farm-to-market initiatives by organizations like the World Food Programme note that sometimes the problem is as basic as slippery and muddy roads hampering travel to the market.³ The challenge of traversing difficult roads and hard-to-reach areas delays crop delivery and also drives up prices.

¹ World Bank/International Labor Organization. (2021, January). *Employment in agriculture (% of total employment) (modeled ILO estimate) - Philippines | Data*. World Bank Data. Retrieved November 9, 2022, from <https://data.worldbank.org/indicator/SL.AGR.EMPL.ZS?locations=PH>

² Canlas, J. (2021, January 14). *DA-SAAD's contribution to Philippine's poverty reduction: An Analysis*. Special Area for Agricultural Development. Retrieved February 8, 2023, from <https://saad.da.gov.ph/2021/01/da-saads-contribution-to-philippines-poverty-reduction-an-analysis>

³ World Food Programme. (2016, May 3). *Philippines: Farm-to-Market Road Provides Better Access for Rural Community - Philippines*. ReliefWeb. Retrieved February 8, 2023, from <https://reliefweb.int/report/philippines/philippines-farm-market-road-provides-better-access-rural-community>



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Several other factors hinder farmers' access to the market and lack of profit, including limited access to financial resources such as loans, insufficient technical expertise (important especially when adhering to food safety standards), and even a lack of information on technologies that could improve their productivity.

Amidst increasing climate emergencies, health concerns, and challenges to the supply chain, it has become even more critical to improve farm-to-market access. The nation's food security could very well depend on it.

Bringing farmers closer to tech

Rapidly evolving agricultural technology, or agritech, is designed to maximize farmer productivity as easily and efficiently as possible. Examples of agritech include automated irrigation and use of sensors and satellites to create precise predictions on crop yield. Even something like improved weather forecasting through satellites and radar is considered agritech.

Modernizing Philippine agriculture will not be possible without embracing agritech. However, the average age of farmers in the Philippines is about 59 years old.⁴ This brings up concerns not only about where the next generation of farmers will come from but also about how receptive the sector will be when it comes to adopting new technology. There must be a concentrated effort to convince farmers and other agricultural stakeholders to invest in agritech and make them understand how it can boost productivity and make farming more efficient.

Past initiatives can provide a blueprint of how to push for agritech education. For example, the AgriKapihan 2022 conference at the FutureRice Farm, DA-PhilRice Central Experiment Station included a demonstration of how drone technology can enable direct seeding.⁵ The specific features and advantages of using agricultural drones were discussed such as the ability to finish crop establishment in just 30 minutes per hectare as well as even and consistent seed spreading that can attain the 40kg recommended seeding rate. It is also

⁴ USAID. (2022, July 22). *Producing Opportunity: USAID Upskills the Next Generation of Filipino Farmers* | News | Philippines. U.S. Agency for International Development. Retrieved November 10, 2022, from <https://www.usaid.gov/philippines/our-stories/jul-2022-producing-opportunity-usaid-upskills-next-generation-filipino-farmers>

⁵ Philippine Rice Research Institute. (2022, June 23). *Agri drone for direct seeding demonstrated* | DA-PhilRice. Philippine Rice Research Institute. Retrieved February 8, 2023, from <https://www.philrice.gov.ph/agri-drone-for-direct-seeding-demonstrated/>



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estimated that using drone technology can lower the cost of seeding from P5,460 per hectare (including manual labor costs and seeds) to just P2,370 per hectare.

Abroad, farmers have already long been taught how to integrate drones into their operations. Researchers from the University of California that have worked with a California farm showed how data collected by drones can supplement data collected by agronomists, who will then anticipate potential crop issues like herbicide injury.⁶ A co-op in Michigan gives its farmers the option to rent drones to conduct activities such as applying pesticides to crops.⁷

Ideally, there will be similar educational initiatives done in partnership with cooperatives and farmers' federations to disseminate information on the various technologies that can help farmers scale, access markets, and grow. The example above can provide a blueprint for how these cooperatives would work. For example, the collective bargaining power of a co-op can lower the cost of renting a drone for a day's work—which is what happened with the co-op in Michigan cited above.

Education initiatives can also delve into pre-existing solutions created by the government. It is possible that many farmers have yet to hear of Deliver-E, which is a missed opportunity because it is a platform created by the Department of Agriculture and the Department of Trade and Industry where farmers can attend to direct orders from buyers, sell their produce online, and ship out goods at lower costs.⁸

Improving credit access

It is worth noting that technology and digitalization can also extend access to funding. In many parts of the world farmers still remain unbanked.⁹ Leveraging tech to push for access to agricultural credit and loans can start with helping farmers overcome the hurdles in traditional financial institutions and open their own bank accounts, especially considering the more efficient

⁶ Warnert, J. E. (2018, June 29). *UCCE helps farmers see the potential in agricultural use of drones*. UC ANR. Retrieved February 8, 2023, from <https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=27576>

⁷ Veenstra, C. (2022, June 16). *New Pigeon Co-Op drones keep farmers up to date with technology*. Huron Daily Tribune. Retrieved February 8, 2023, from <https://www.michiganstumb.com/agriculture/article/New-Pigeon-co-op-drones-keep-farmers-up-to-date-17243251.php>

⁸ Department of Agriculture Communications Group. (2020, December 14). *Farmers, consumers to enjoy hassle-free shopping and trading via Deliver-E | Official Portal of the Department of Agriculture*. Department of Agriculture. Retrieved February 8, 2023, from <https://www.da.gov.ph/farmers-consumers-to-enjoy-hassle-free-shopping-and-trading-via-deliver-e/>

⁹ World Bank. (2016, January 7). *Of Maize and Money: How to Bring Farmers into the Financial System*. World Bank. Retrieved February 8, 2023, from <https://www.worldbank.org/en/news/feature/2016/01/07/of-maize-and-money-how-to-bring-all-farmers-into-the-financial-system>



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platforms made available by new players. Bank accounts offer a secure way to store money while making it easier to receive any government disbursements. This will be especially crucial as more loans and cash aid become available to farmers as the government tries to grow the nation's agricultural sector.

Adopting agritech solutions can also be a basis for releasing loans to farmers. For instance, nascent telematics technology makes it possible to track the temperature of a specific piece of cargo, thereby preventing spoilage. Leveraging data from telematics devices can allow insurance agencies to save money instead of sending teams of surveyors just to assess what happened to a farmer's crops. In the US, a senate bill was already pushed to provide loans to farmers seeking agritech equipment.¹⁰

In Myanmar, an app provided by the agritech startup Impact Terra grants farmers information on agronomic advice, market prices, weather patterns, and more. The app then collects data such as a farmer's assets, historical performance like yields and income and available financial history.¹¹ The app then uses this data as the basis for an alternative credit score. This alternative credit score makes it easier for lenders to accurately assess a farmer's credentials, while also making it easier for farmers to avail of a loan.

Without access to credit, farmers are often unable to take advantage of market opportunities, which can limit their income potential and stunt their contribution to the sector as a whole. Also, with very scarce funds and subsistence-level harvest, they cannot support their families and hover at the poverty line. It has been well-established that access to loans can play a critical role in the development of rural communities and the broader agricultural sector. By helping farmers become more productive and sustainable, access to credit can drive economic growth, reduce poverty in rural areas, and strengthen the Philippine agricultural sector.

Legislation and policy

Both initiatives to educate farmers about agritech and help them use agritech tools will require the consistent and concrete support of agricultural regulators and governing bodies. Of particular relevance are the National Irrigation Administration, Bureau of Plant Industry, Bureau of Animal Industry, and other attached Department of Agriculture agencies; Presidential

¹⁰ Farm Equipment. (2021, September 16). *New Senate Bill Would Provide Loans for Precision Agriculture Equipment*. Farm Equipment. Retrieved February 8, 2023, from <https://www.farm-equipment.com/articles/19658-new-senate-bill-would-provide-loans-for-precision-agriculture-equipment>

¹¹ Loukos, P. (2020, March 3). *Agritechs enabling farmer credit scoring: A view from Impact Terra | Mobile for Development*. GSMA. Retrieved February 8, 2023, from https://www.gsma.com/mobilefordevelopment/accelerating_universal_financial_access/agritech-companies-enabling-farmer-credit-scoring-a-view-from-impact-terra/



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Agrarian Reform Committee; Provincial/ Municipal Agrarian Officers; Cooperative Development Authority; and concerned units of the Department of Environment & Natural Resources.

The above-cited administrative agencies and subunits have annual budget allocations and have the mandate and authority to look into providing further subsidies to local farmers' groups, associations, and cooperatives relevant to access to credit, organizational development, reskilling, risk mitigation, and enterprise sustainability in the context of frequent calamities, contingencies, and losses. These agencies will also lend credibility and may assist in establishing organizational profiles and credentials when exploring the sourcing of funds and partnerships with financial institutions such as the Development Bank of the Philippines and the Land Bank of the Philippines for digitalization projects and the use of technology in farming.

Conclusion

Pain points such as difficult farmer-to-market access and insufficient funding have always been present in the Philippine agriculture sector. Agritech presents a unique opportunity to mitigate and even eliminate these challenges. The key here is for stakeholders to ask themselves: how can we leverage technology and optimize government programs and regulations to give agricultural players easier access to the market and encourage business growth in the sector?

Agriculture's central position in the Philippine economy drives home just how important it is to solve its multiple pain points. Whether it is an old or new problem, key industry leaders need to leverage technology to solve these as soon as possible—or else risk crippling the entire agricultural sector.