



Photo by Carlo Dacumos

Making Agricultural Drones Accessible to Philippine Rice Farmers

Drones have clear potential to reduce labor costs and drudgery and improve speed and efficiency in key rice operations, but scaling in rice is constrained by regulatory bottlenecks, limited licensed operators and allowable chemicals, weak financing/support mechanisms, and uneven awareness.

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Background

As the Philippines moves to ensure greater competitiveness in the rice sector, deploying appropriate, cost-reducing, yield-enhancing technologies is vitally important. Drones are among these technologies. They address perennial issues relating to drudgery and expensive labor costs. Over the years, drones have been employed to perform various tasks such as fertilizer and pesticide application in bananas and pineapples. The Philippine Rice Research Institute (PhilRice) is among the few agencies that have demonstrated the use of drones in rice in the Philippines (PhilRice 2018).

While drones are helpful and have created excitement in agriculture, many issues impede their success in the Philippines. Among these impediments are legal and institutional bottlenecks, such as the absence of clear rules that govern the use of drones (Opengovasia 2019), and the limited number of pesticides that can be used with drones (Tallada, personal communication). These challenges paint an entirely different picture relative to the success of drone use in neighboring rice-producing countries of Thailand and Vietnam.



This study looked into the various aspects that could influence the uptake of agricultural drones in rice in the Philippines with the aim of identifying courses of action to assist in the massive deployment of drones in Philippine rice fields—a move expected to enhance profitability among rice farmers.

Approach

This study was predominantly qualitative. Data were collected through focus group discussions (FGDs) with Nueva Ecija and Pangasinan farmers, complemented by a windshield survey, key informant interviews (KIIs) among experts from public and private organizations, and documentary reviews.

This analysis used the Scaling Ingredients framework developed by the International Maize and Wheat Improvement Center (CIMMYT) (Jacobs et al. 2018), which views “scaling” not just as proving that a technology works, but as ensuring that the full set of enabling conditions is in place—from technology and practice and awareness and demand, to the business case, supply chain, finance, and knowledge and skills, as well as strategic collaboration, leadership and management, public sector governance, and evidence and learning.

Key Findings

The main factors that will enable or constrain the scaling of drone use in rice in the Philippines are outlined in the subsequent analysis, organized according to the Scaling Ingredients framework.

Technology and Practice

The basis for scaling is clear: drones offer speed and overall efficiency, reduce costs (especially of labor), and can improve perceptions of rice farming by easing drudgery. Farmers and key informants also valued the multifunctionality of drones (seeding, fertilizer application, and pesticide spraying). However, operational limitations remain as drones may not seed corner areas effectively and generally perform best in larger, contiguous fields.

Awareness and Demand

The demand for drones in rice cultivation is, expectedly, low to non-existent, as drones are not commonly used in rice and are usually used in large banana or pineapple plantations in Southern Philippines.

An unfavorable notion also exists among farmers, i.e., labor displacement—similar to the experience in introducing other farm machines, such as the combine harvesters, which were then referred to as “halimaw” (monster) because they were taking jobs away from farm laborers.

A case of “innovations fatigue” was likewise noted, referring to farmers not interested anymore about drone use because they already know what will give them handsome income and have their formula for success.

Awareness also needs to be hammered down to local government units (LGUs). From this research, a case was noted in Pangasinan where an LGU bought a unit, hoping that they could use drones thereafter, but they were not aware that they needed to have licensed pilots before they could fly a drone.



Photo by José Emmanuel Hernandez



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Business Case

The business case, as linked with the technology and practice aspect, is clear. Regulatory and cost issues, however, prove limiting, especially for small-time players such as rural entrepreneurs and cooperatives. Drone providers interviewed lamented the gargantuan challenges in the bureaucracy, such as the limited number of pesticides that could be used and expensive licensing requirements for pilots, among others. They also mentioned the need to move fast with the technology as developments in drone technology are quite difficult to match; players who want to have a good share of the market need to be abreast with these developments, which are oftentimes costly to have.

Supply Chain

Owing largely to regulatory issues, there are only three Fertilizer and Pesticide Authority (FPA)-licensed drone operators and 13 chemicals allowed for drone use, and only 154 Civil Aviation Authority of the Philippines (CAAP)-licensed large Remotely Piloted

Aircrafts (RPAs) and four small ones for agriculture. Farmers noted that it would be ideal if there would be more players to ensure affordability of the service. These limitations pose challenges that impact on the business case for drones.

Finance

There are no clear support mechanisms yet for drone investors and potential users, and drones remain expensive for farmers, especially smallholder ones.

Knowledge and Skills

Drones are heavily regulated in the Philippines, and use of drones in rice cultivation is not as simple as buying a unit and starting its deployment. Use of drones requires licensed pilots, yet there is an overall inadequacy of licensed drone operators. There are proposals for the Department of Agriculture (DA) to equip agricultural extension workers to serve as operators, but these have to be discussed with the CAAP.

Strategic Collaboration

While there are some collaborations in place, they are rather small, and there is a need for more public–private partnerships, especially in the areas of marketing and acquisition. It is also not clear who is the orchestrator at the national level.

Leadership and Management

The private sector is leading efforts to promote drones at the national level; there are pros and cons to this, especially since drones are heavily regulated. If this will continue, private providers ask for tangible support from the government to ensure massive scaling of drones in rice in the near future.

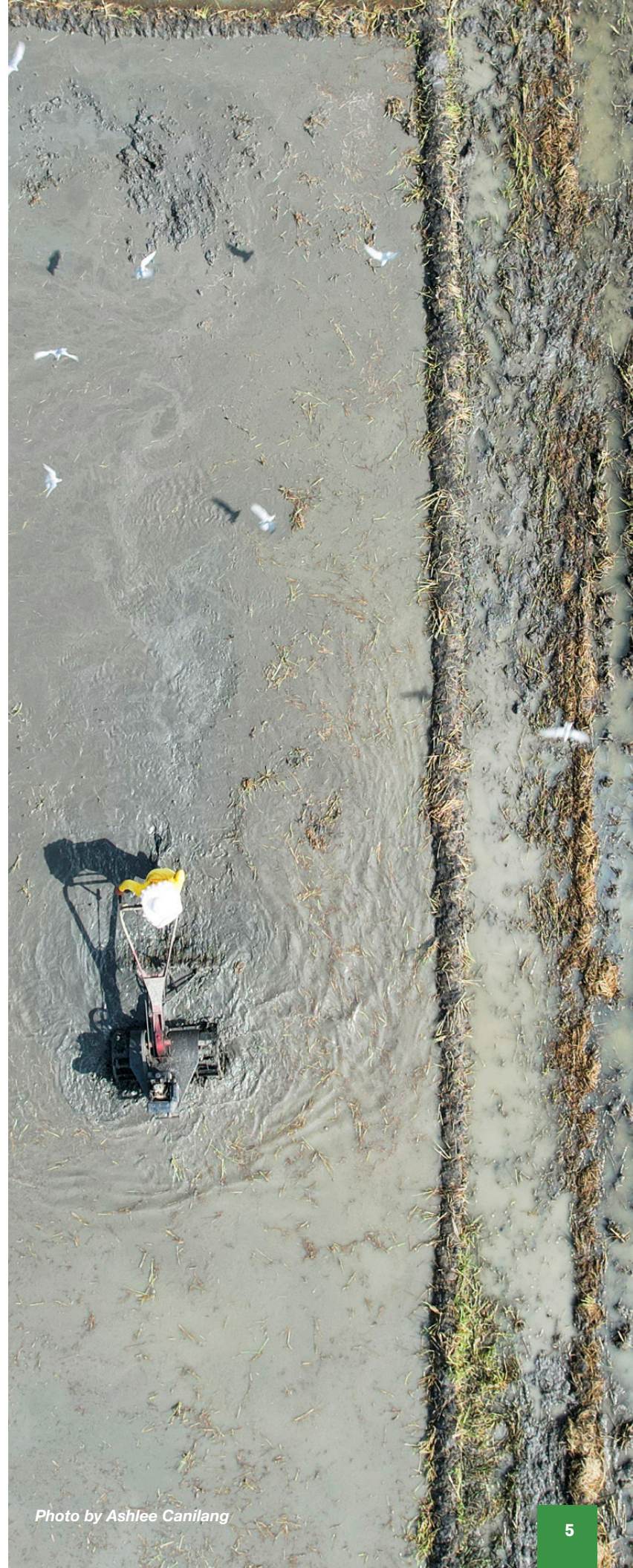
Public Sector Governance

There are issuances by the DA in support of drone use, and the Masagana Rice Industry Development Program is supportive of drone use under its digital transformation pillar—an indication of support by the State that can be used as basis for wider scaling of the technology.

Evidence and Learning

There is partial budget analysis, but, in general, there is a need for comprehensive data collection on various aspects of drone use in rice.

Taken together, the findings suggest that drones have clear potential to improve efficiency and reduce drudgery in rice, but wider uptake will hinge on strengthening the enabling environment. Streamlined and coordinated regulation, a broader supply base and more licensed operators, accessible financing and support mechanisms, stronger public–private collaboration with clearer national orchestration, and more comprehensive evidence and learning systems will be essential to translate interest into affordable, compliant, and scalable drone deployment in rice-growing areas.





Policy Recommendations

Prioritize Land Consolidation for Effective Drone Deployment

Discussions on land consolidation have long been on the radar of the DA, especially concerning mechanization, and there have already been several presentations and studies on this subject. The DA should push through with land consolidation if the aim is to optimize benefits from drones and other agricultural machines, as key informants noted that impacts on drone use would only be modest if land is not consolidated—making this a priority move if drones are the future of rice cultivation.

Launch Massive Drone Awareness Campaigns

In this study, there is a consistent clamor among drone suppliers and farmers who have seen how drones work for massive awareness campaigns, with a consensus as regards its usefulness in performing key farm tasks such as seeding, fertilizer application, and spraying of pesticides. Information campaigns will help influence use, appreciation, and investment in drones.

Special sessions should be conducted for policymakers and local executives so they are well-informed of the salient points in drone acquisition and can optimize investments should they be enticed to put money into drone acquisition and promotion. These campaigns must be planned carefully to meet various audiences' information requirements; drones need to be demystified through strategic and creative messaging.

These efforts would also help ensure accurate and complete information on drone use to prevent wasteful use of resources—for example, an LGU case was noted in this study where they bought a drone, hoping that they could use it immediately thereafter, but were unaware they needed licensed pilots before they could fly one.

Streamline and Harmonize Regulations for Investment

The DA should address the impression of overregulation in agricultural drone use by directing the CAAP and the FPA to streamline overly stringent requirements that are pushing potential investors away. As part of this, the enabling ecosystem should be expanded by increasing the number of licensed RPAs, licensed operators, and approved chemicals for drone use, and establish regional access points for drone operation and licensing.

Strengthen Public–Private Partnerships for Drone Scaling

The government, through the DA, should continue and strengthen its role as the rallying point for stakeholders to forge partnerships that address key issues, especially drone acquisition and promotion. Building on the DA’s consultations with drone suppliers—which have already helped identify issues it can address to create an enabling environment for drone use in rice—the government should further explore partnerships with private providers so that farmer-recipients do not have to worry about the technicalities surrounding pilot licensing and other bureaucratic hurdles concerning drone use.

Enhance Drone Acquisition Support

Because drones are expensive and mechanisms to assist farmers in acquiring them are currently absent, scaling will remain limited unless government puts in place targeted support for access and financing. A cluster-based approach—already used in interventions such as seeds and machines—could likewise be employed to make drones available to farmers.

Institutionalize After-Sales Service

The DA should require the provision of after-sales service as part of any drone acquisition or distribution program, ensuring that farmers have access to repair shops and expert support for quick consultation when issues arise.

Standardize Drone Baseline Data

At present, there is no consolidated baseline data on drones used in rice cultivation; the government should collect and maintain a data pool to support investment decisions, regulation, and impact assessments—covering socioeconomic indicators, changes in users’ quality of life, and human–machine interaction data.

Building on the call to establish standardized baseline data to guide investment, regulation, and impact assessments, the pathway to scaling becomes clearer and more manageable. Drones can help reduce drudgery and labor costs and improve efficiency in rice operations, but scaling will remain constrained unless key enabling conditions are put in place. Priority actions include land consolidation, streamlined and harmonized regulations, stronger public–private partnerships, targeted support for acquisition and after-sales service, and sustained evidence generation to support decision-making. Advancing these measures will help translate pilot use into affordable, compliant, and sustainable drone deployment in Philippine rice areas. 🌱

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