



PIDS DP 2023-29

Transforming Philippine Agri-Food Systems with Digital Technology:

Extent, Prospects, and Inclusiveness

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PDP Chapter 5: “Modernizing Agriculture and Agribusiness” identifies digital technology in several strategies for agriculture and agribusiness modernization.

Digital agriculture boosts economic gains by enhancing productivity, efficiency, market access, and environmental sustainability.

OUTLINE OF PRESENTATION

01 Research Questions

02 Method

03 Background

04 Main Findings

05 Recommendations

RESEARCH QUESTIONS

1. What are existing applications of digital technologies in the agricultural value chain in the Philippines?

2. What are the prospects of further adoption?

3. How much are smallholders benefiting from these trends?

Rapid Appraisal

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Desk Review

Focus Group Discussions

- Government
- Private companies/
Social enterprises
- Farmer organizations



Areas

.....

- Region III
- Region IV-A
- CAR
- Region V
- Region XI

Rapid Appraisal

.....
Desk Review

Focus Group Discussions

- Government
- Private companies/
Social enterprises
- Farmer organizations



PHILIPPINE AGRICULTURE

7 million
farmers and
fisherfolks

remains quite a sizable
contributor to GDP

(10%)



74% male

60% aged 50 & above

27% were HS graduate

70% cultivated less than 2 hectares



DIGITAL USAGE: PH

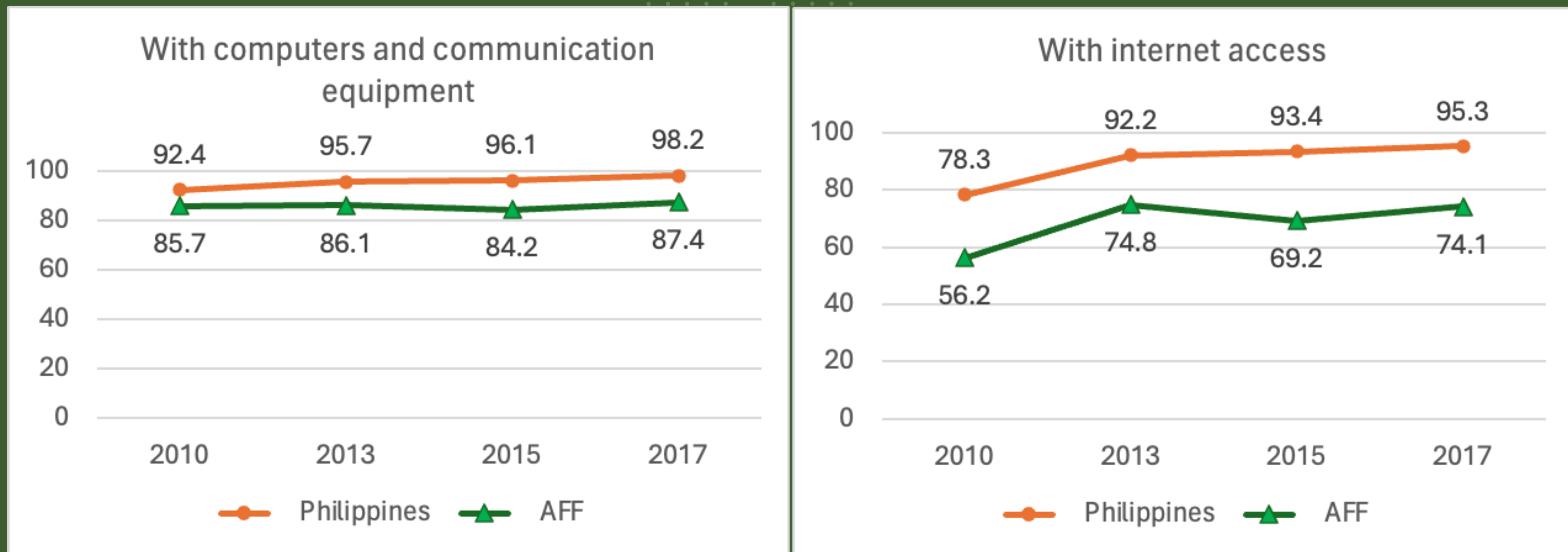
Most Filipino households have ICT access, but rural households* face disadvantages

Digital economy accounts for about a tenth (1/10) of the economy although its GDP share has remained stagnant.

*36% of rural HHs used the internet in the past 3 months (Albert et al 2021)

DIGITAL USAGE: PH FIRMS

Digital economy indicators, Philippine and *AFF establishments, shares in total (%)



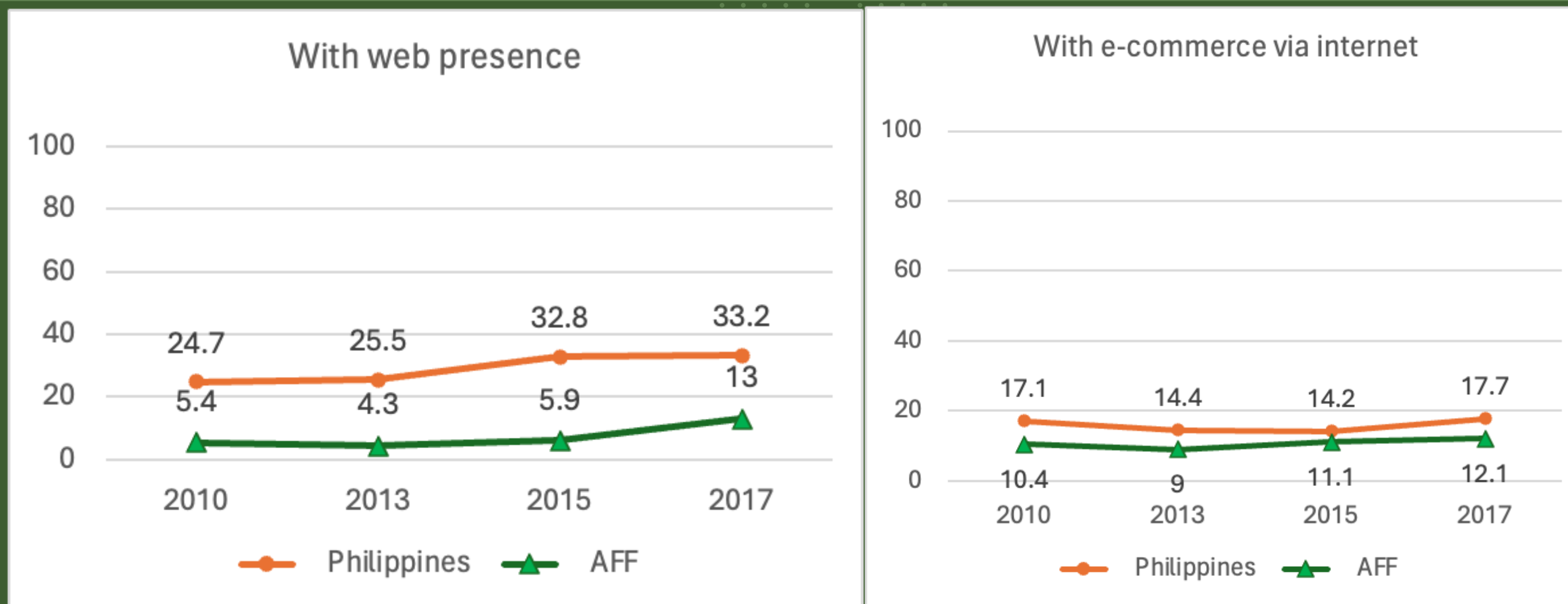
Source of basic data: PSA 2023

*Agriculture, Fisheries, and Forestry

Digital technologies are increasingly being adopted by all establishments, including AFF establishments, though the latter tend to lag behind average trends.

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DIGITAL USAGE: PH FIRMS

Proportion of establishments that are innovation-active by industry and by size of establishment (%)

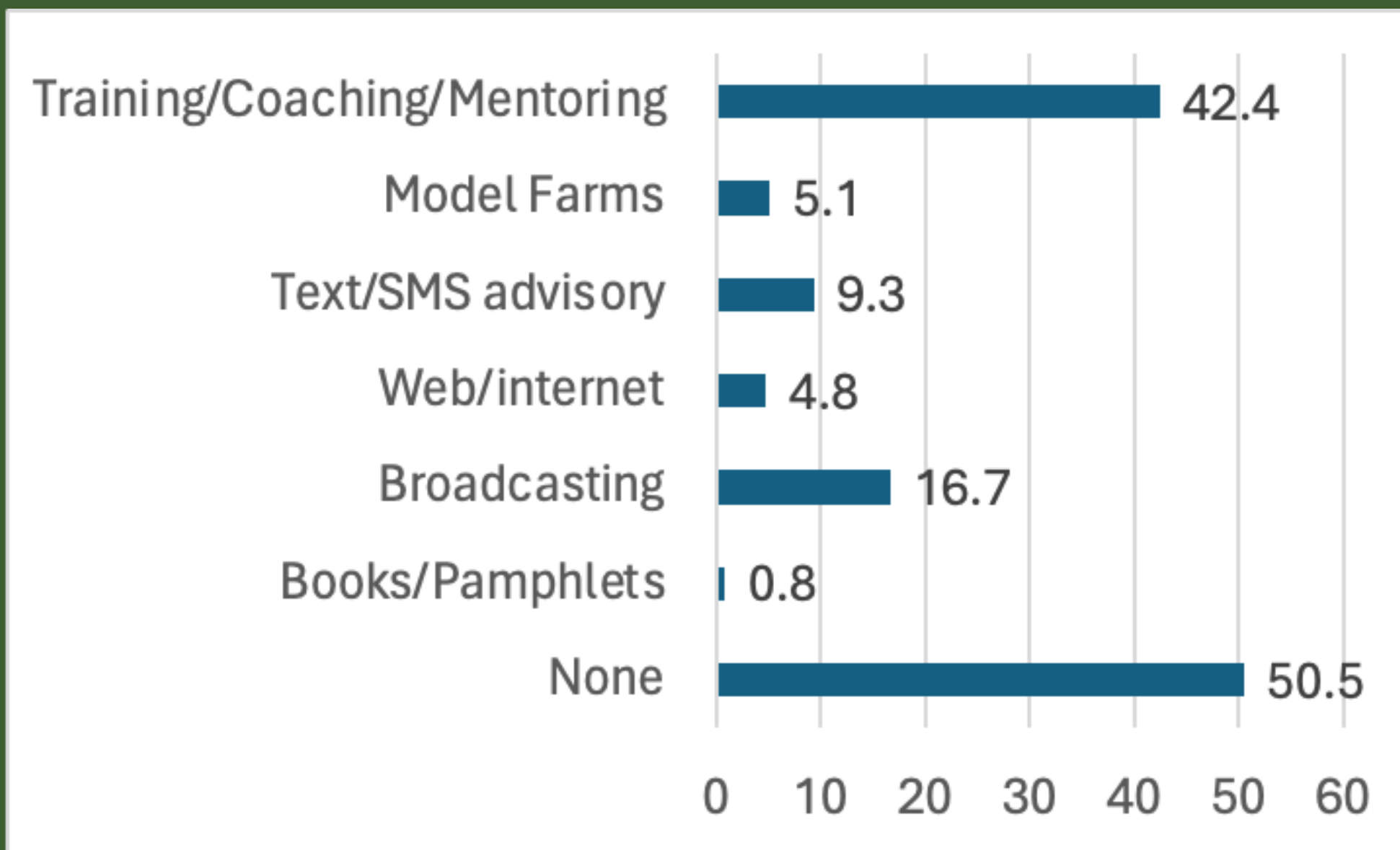
Large enterprises in the agriculture sector exhibit higher innovation activity compared to their counterparts in the service sector when considering the percentage of innovation-active establishments by industry and enterprise size

Source of basic data: Albert et al 2023



DIGITAL USAGE: FARMERS AND FISHERFOLKS

Shares in total farmers and fisherfolk, by source of information needed for farm/aquafarm activities (%)



Only half of farmers and fisherfolk get information needed for their farm/aquafarm activities —primarily through training, coaching, or mentoring, representing 42.4% of the total.

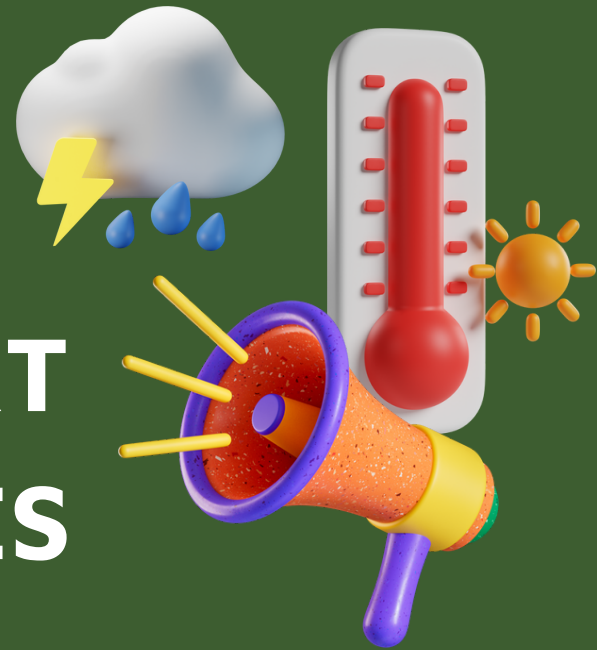
BACKGROUND: DIGITAL AGRICULTURE



Digital agriculture refers to “ICT and data ecosystems to support the development and delivery of timely, targeted information and services to make farming profitable and sustainable while delivering safe nutritious and affordable food for ALL” (ICRISAT n.d.).

BACKGROUND: DIGITAL AGRICULTURE

GOV'T
SUPPORT
SERVICES



PROCESSING

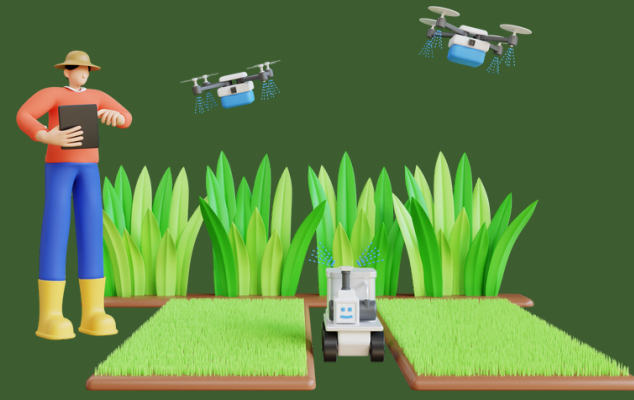


DISTRIBUTION



B2B

PRODUCTION



B2C

BACKGROUND: DIGITAL AGRICULTURE

Decision support and protection of ecosystem services

GOV'T SUPPORT SERVICES

Fin tech

PRODUCTION

PROCESSING

agricultural automation/ smart farming

information and advisory service apps

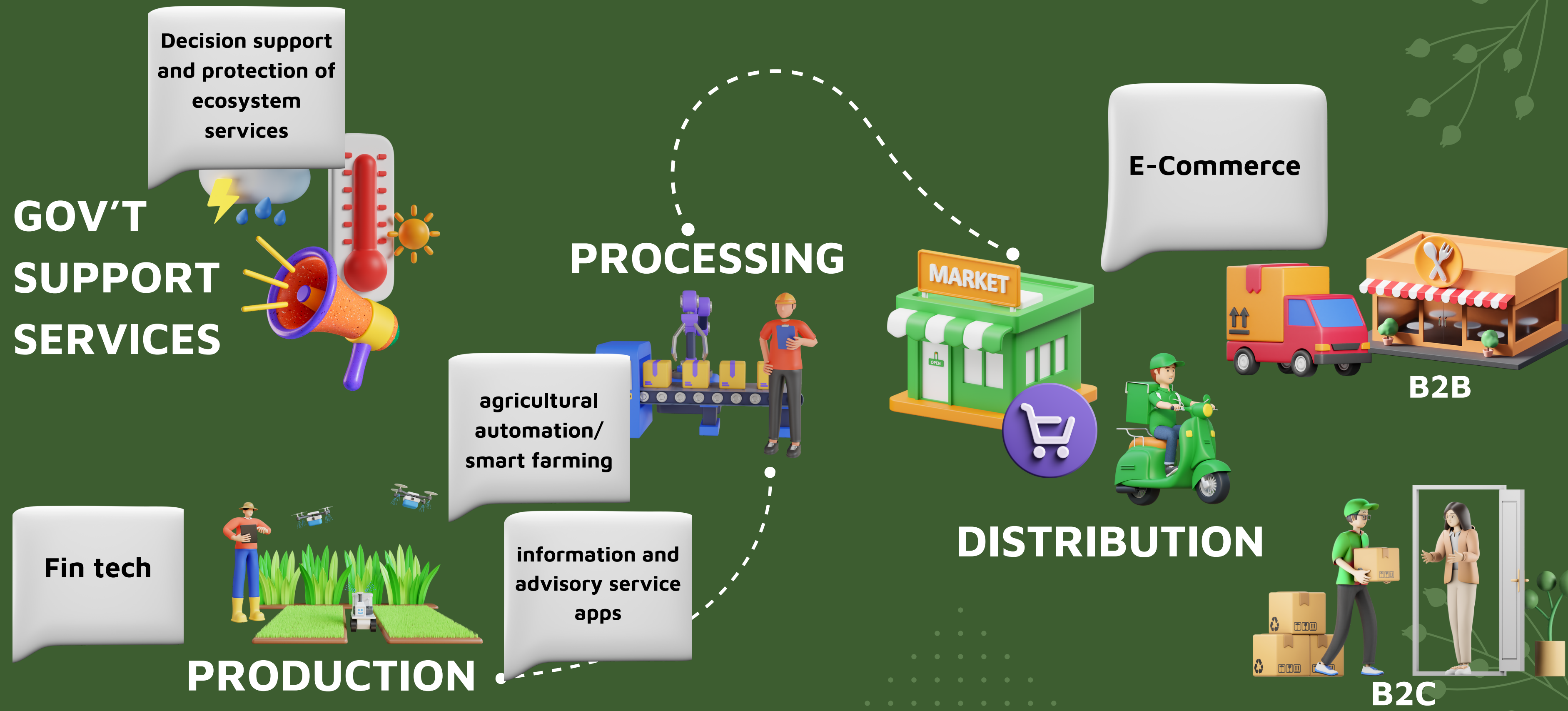
E-Commerce

MARKET

DISTRIBUTION

B2B

B2C



ADOPTION OF DIGITAL AGRI TECH

Developed countries widely adopt digital agri, but limited uptake for developing countries

Concerns have been raised regarding the “digital divide”

Internet use in agriculture and marketing has shown a significant positive impact on farmer income, market access, and finance in some countries.

TECHNOLOGY TYPOLOGY



DECISION
SUPPORT AND
PROTECTION OF
ECOSYSTEM
SERVICES



AGRICULTURAL
PRODUCTION
APPLICATIONS



FINTECH

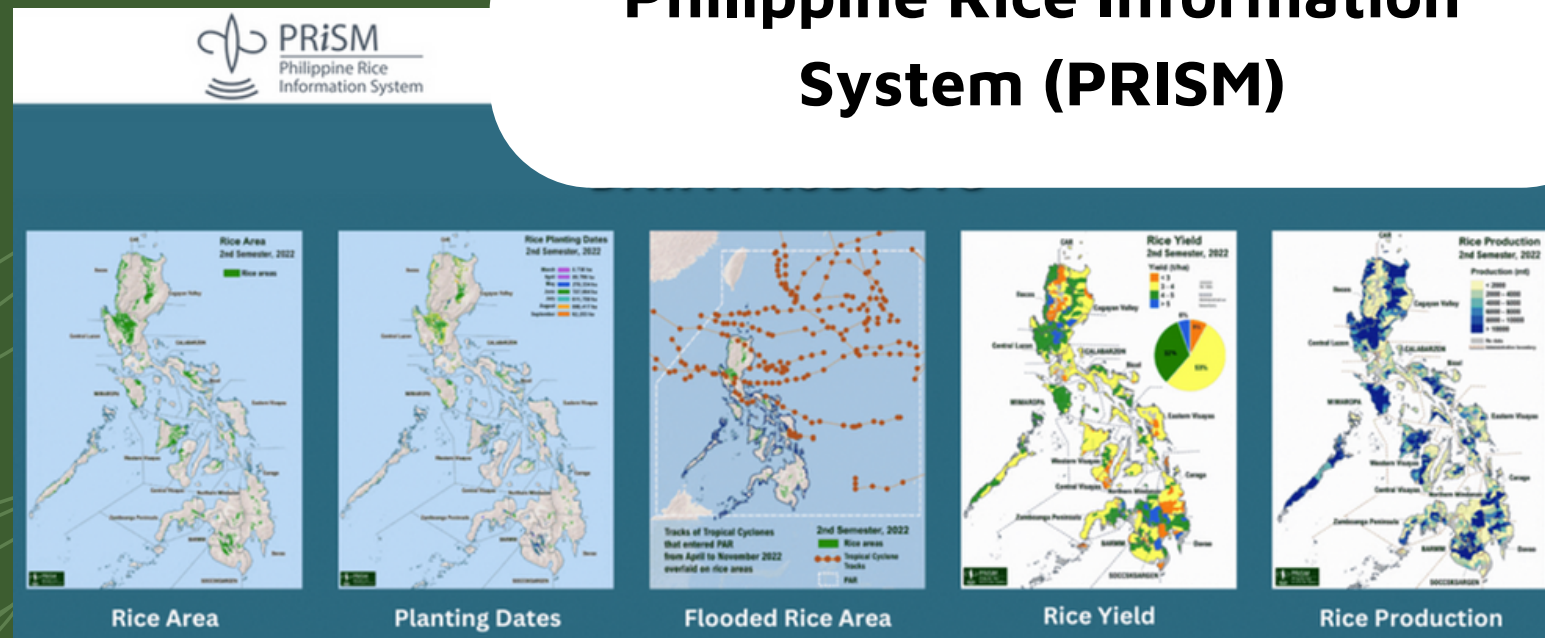


E-COMMERCE



DECISION SUPPORT AND PROTECTION OF ECOSYSTEM SERVICES

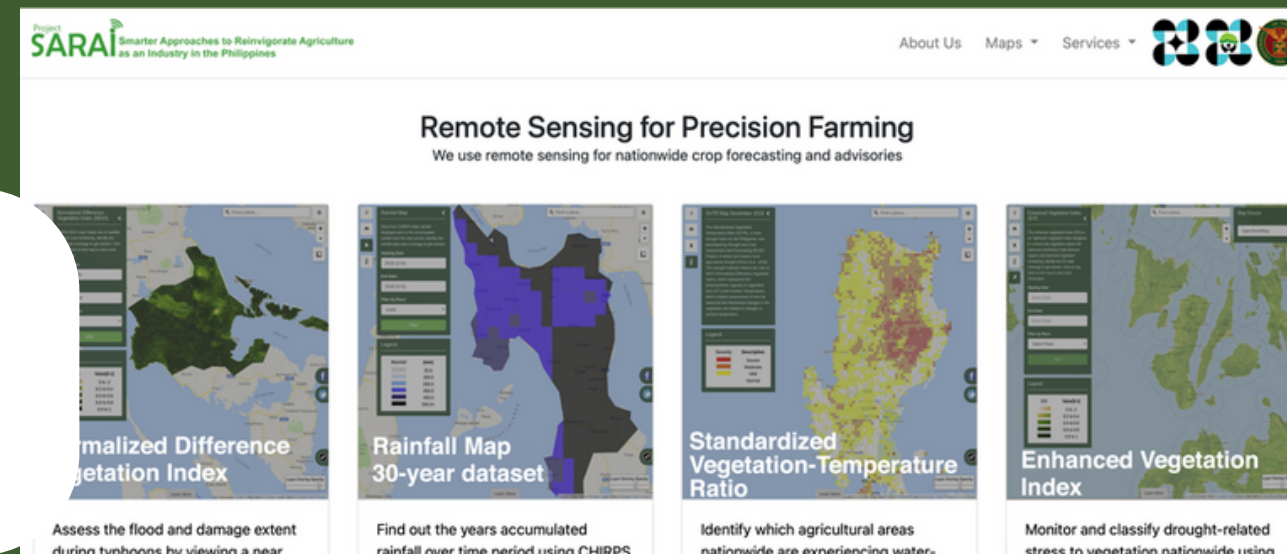
Philippine Rice Information System (PRISM)



Adaptation and Mitigation Initiative in Agriculture (AMIA)



Smarter Approaches to Reinvigorate Agriculture as an Industry in the Philippines (SARAI)



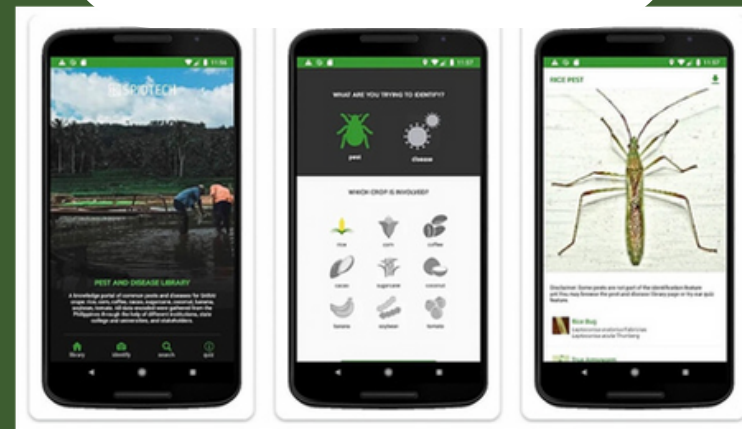


INFO AND ADVISORY APP

Rice Crop Manager Advisory Service



SPidTech



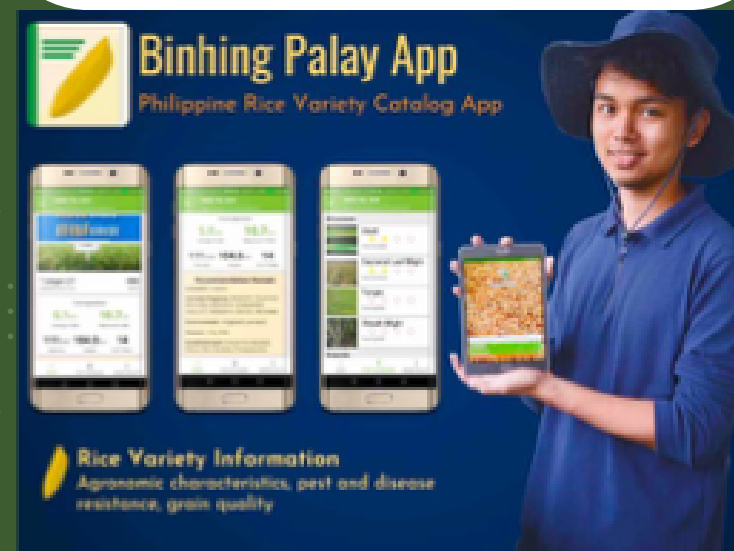
e-Extension



AgriDoc



Binhing Palay App



eDamuhan app





AGRICULTURAL AUTOMATION



Government R&D projects have developed smart farming technologies, most of which are at pre-commercialization stage, e.g., CLSU PreDiCT's auto furrow irrigation system, indoor agriculture with sensors, controllers, monitoring equipment, drones, 3D printers, and mobile solar pump.



FIN.TECH

✓ Cropital

✓ FarmOn

Source: Authors' compilation

✓ **Fintech is a recent addition to the country's financial and regulatory landscape.**

✓ **One crowdfunding platform has aided 1,600 farmers since 2015. Cropital covers 10 provinces raising PHP 100 million.**

CROPITAL



E-COMMERCE



Sources: various company websites



- ✓ Agrabah
- ✓ Agro-Digital Philippines
- ✓ ANI Express
- ✓ Co-opBiz
- ✓ Facebook Marketplace
- ✓ GoLokal
- ✓ Lazada
- ✓ Livegreen International
- ✓ Mayani
- ✓ Onestore.ph
- ✓ Pili NICER Marketplace
- ✓ Rural Rising
- ✓ Session Groceries
- ✓ Shopee.ph
- ✓ ShopSM.com
- ✓ Zagana

Source: Authors' compilation



Various online platforms actively provide market matching for agricultural goods and processed products.

Online Marketplace

Online Retail

Hybrid

Online Market Info

- **Online Marketplace:** Facilitates complete market transactions, from order to payment and delivery (e.g., Shopee.ph and Lazada).
- **Online Retail:** Enables electronic interaction for order, payment, and delivery. Retailer procures goods for sale via traditional or online means (e.g., shopsm.com for SM Supermalls).



Various online platforms actively provide market matching for agricultural goods and processed products.

Online Marketplace

Online Retail

Hybrid

Online Market Info

- **Hybrid:** Functions like an online marketplace but may lack features, i.e. onsite payment and delivery arrangement, which are performed offsite.
- **Online Market Information:** Offers information about merchants without transactional features, except through direct interaction with the merchant (e.g., Facebook Marketplace).

PROSPECTS AND INCLUSIVENESS



DECISION
SUPPORT AND
PROTECTION OF
ECOSYSTEM
SERVICES

- **Prospects for expanding decision support systems are promising, but costs may limit features in some applications**, i.e. DCRF and AMIA village projects.
- **Decision support systems across agencies may lack harmonized recommendations**, e.g. inconsistencies between NCCAG's and SARAI's crop suitability maps in specific locations.

PROSPECTS AND INCLUSIVENESS



- **Decision support system's benefits are inclusive**, e.g. CRAO's Climate Risk Vulnerability Assessment

DECISION
SUPPORT AND
PROTECTION OF
ECOSYSTEM
SERVICES



PROSPECTS AND INCLUSIVENESS



AGRICULTURAL
PRODUCTION
APPLICATIONS

- **Impact evaluations are rare, but certain advisory services prove beneficial to adopting farmers**
 - RCM farmers earn PHP 10,000 more per ha per season vs. non-RCM
 - SPIDTECH has 77.3% to 89.5% accuracy
- **Accurate weather information can enhance the efficiency of farming practices and reduce waste from agricultural lands, e.g. AMIA's and SARAI's Automatic Weather Stations (AWS)**

PROSPECTS AND INCLUSIVENESS



- **PhilRice advisory users are mostly male, aged 21-40, college graduates, residing in Luzon**
- Reported numbers may underestimate usage; involving young people in farming is crucial.
- Due to older age and low digital literacy levels of many farmers, app usage depends on agricultural extension service frequency and quality

AGRICULTURAL PRODUCTION APPLICATIONS

	AgriDoc App	e-Damuhan	Binhing Palay
Total number of users	1,061	3,236	8,268
Shares in total users (%)			
Males	58	54	61
College graduates	74	75	69
Farmers	55	40	57
Extension workers	23	19	19
Farmers aged 21-40	62	55	60

PROSPECTS AND INCLUSIVENESS



AGRICULTURAL PRODUCTION APPLICATIONS

- **Limited internet connectivity in remote rural areas** may impede benefits but is already being addressed by government programs, e.g. CDA's satellite-based internet connectivity project covering 58 sites.
- Agricultural Extension Workers/Technicians play important roles as mediators of these advanced technologies.
- Other stakeholders (e.g., Mayani) are also actively engaging farmers and farmers' cooperatives in remote areas to bridge the gap between producers and potential markets.

PROSPECTS AND INCLUSIVENESS



FINTECH AND
E-COMMERCE

- **Assessing growth potential is challenging due to the absence of annual statistics on agricultural credit growth through fintech.**
- **Online market information systems have limited growth potential as they offer minimal additionality vs. other platforms, e.g. CoopBiz vs. Shopee**
- **B2C in online retail is expected to remain a small market segment due to delivery fees, while B2B (i.e., retailers and food service establishments) could become a mainstream procurement mode.**

PROSPECTS AND INCLUSIVENESS



- **Clustering farmers and fisherfolk into organizations, like coops, is crucial for e-commerce entry.** Individual farmers observed were unable to sell directly to e-commerce enterprises.

E-COMMERCE

POLICY RECOMMENDATIONS



- ✓ Unify data set and advisory for government decision support systems.
- ✓ Centralize all govt digital agri sites and apps in one portal
- ✓ Integrate digital solutions for standardized farm management in the DA's clustering program
- ✓ Expand decision support systems and knowledge portals for diversification and climate resiliency.
- ✓ Establish a centralized e-commerce online marketplace for MSMEs, featuring agrifood products
- ✓ Require traceability, food safety compliance, GAP, for participating in e-commerce platform
- ✓ Explore private sector participation in government-supported digital agriculture.
- ✓ Invest in skills enhancement programs targeting landless agricultural workers.

THANK YOU!

