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Investing in rural people



UNITED NATIONS
DEVELOPMENT PROGRAMME

EMPOWERING RURAL SMALLHOLDERS IN TURKEY THROUGH DIGITAL MARKETING AND BUSINESS SOLUTIONS IN POST COVID-19 PERIOD



January 21th, 2022

About the Study

The COVID-19 Socio-Economic Impact and Response Task Team (SEIRTT) in UN Turkey, co-led by the Resident Coordinator's Office and UNDP, was established at the request of the UN Country Team (UNCT) with a view to informing the readjustment and expansion of the portfolio of programmes of the UN and its partners in Turkey, including 3RP, in response to the socio-economic dimensions of the COVID-19 crisis. In this context, COVID-19 Socio Economic Assessment Report and Response Plan was prepared by SEIRTT in 2020. In order to provide evidence based support for the UN level Assessment Report, a joint study on "Rapid Impact Assessment of COVID-19 Pandemic on the Agri-Food Sector and Rural Areas in Turkey" by the Food and Agriculture Organisation (FAO), the International Fund for Agricultural Development (IFAD), the UN Development Programme (UNDP) in collaboration with the Ministry of Agriculture and Forestry (MOAF) was conducted and the evidence based policy recommendations were laid down for mitigation of the impact of the Pandemic as well as agricultural livelihood in 2021.

Further, another joint study was jointly initiated by FAO, IFAD and UNDP with the technical support of MOAF with a title of Empowering Rural Smallholders in Turkey Through Digital Marketing and Business Solutions in post Covid-19 Period.

The current study as a joint effort was conducted in the implementation area of IFAD Project areas. This third joint study will also follow up and support the other previous 2 joint studies and aim to promote the digital solutions to enhance the marketing and business skills of rural smallholders in Turkey to mitigate the impact of COVID-19. It is funded by IFAD.

The study was implemented by the following team in terms of data collection, analysis and reporting:

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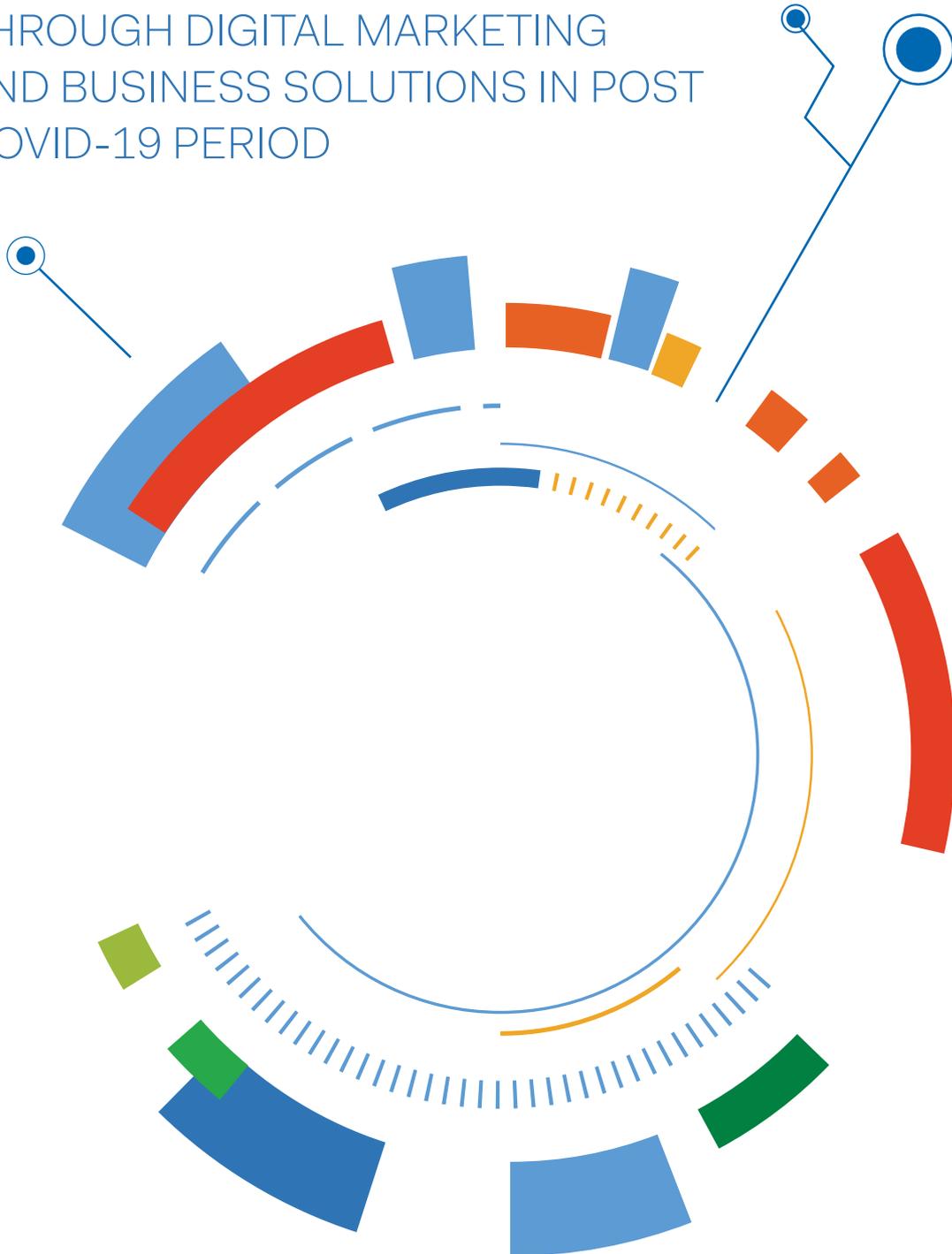


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EXECUTIVE SUMMARY

The world has been facing a global health crisis with a great number of infected people and deaths due to COVID-19. The pandemic has had an unprecedented impact on health in many countries. Measures adopted by governments to contain the spread of the outbreak, including travel restrictions, partial or total lockdowns, quarantine measures and school shutdowns, are having tremendous economic and social consequences. The measures necessary to contain the spread of the disease have resulted in simultaneous demand and supply shocks to the world's economies.

In 2020, at the beginning of the pandemic, a Rapid COVID-19 Impact Assessment of Agri-Food Sector and Food Security in Rural Areas was conducted jointly by IFAD, FAO and UNDP. This report showed how the COVID-19 crisis, with its tremendously negative effect on the economy and inequalities, had once again underlined the importance of agriculture and food supply. Ensuring food security through a strong food supply chain remains one of Turkey's priorities.

Digital literacy is a factor that helps small-sized farms at times of crisis. Sustainable food systems necessitate strong market links which enable small-scale rural producers to reach more market information and to access the finance, knowledge and decent inputs they need to sustain agricultural production, contributing in turn to rural development and the reduction of poverty and inequalities in rural areas. Digital applications may soon become one of the most widespread ways of improving market efficiency and so boosting productivity, increasing incomes and consequently strengthening food security.

This report has been prepared jointly by IFAD, FAO and UNDP with the technical support of Ministry

of Agriculture and Forestry (MoAF) to help mitigate the impacts of COVID-19 on the agriculture sector further. It may be regarded as a second phase study that refers to the results of the Rapid Impact Assessment report of 2020.

Specifically, the current report assesses the availability of digital business solutions in the agriculture sector and the demand for these services from rural smallholders in Turkey. The specific focus was on digital platforms for food and agricultural marketing, agricultural extension services, agricultural input purchases and rural finance. Digital services offered by government organisations, private companies and non-profit organisations were classified based on their availability. Depending on their needs and priorities, producers can choose from among these platforms. Although producers have to pay a commission if they choose the private digital marketing platforms with high user volumes, such platforms may allow them to reach larger numbers of consumers. Additionally, producers selling higher volumes of agricultural products may prefer to use digital marketing platforms, such as the Digital Agriculture Market (DITAP) system of the Ministry of Agriculture and Forestry (MoAF).

To evaluate the demand for digital technologies and assess the needs of farmers, an online survey was conducted with smallholder farmers. Primary surveys of pre-identified target groups included smallholder farmers working in the agriculture ecosystem, especially women, young farmers, and farmers affiliated with farmers' organisations. The demand analysis was performed in selected IFAD project areas in the provinces of Konya, Karaman (Göksu Taşeli Watershed Development Project), Adana and Mersin (Uplands Rural Development Programme)¹ in coordination with the provincial directorates of the MoAF.

Among the farmers belonging to farmers' cooperatives or producers' unions in the provinces of Konya, Karaman, Adana, and Mersin, a total of 56 completed responses to the survey were received. The survey results show that farmers who are aware of the DİTAP system have a 68 percent probability of using it, which clearly indicates the importance of DİTAP for farmers. Efforts should therefore continue to be made to diffuse information about DİTAP among farmers by increasing their knowledge of the system through various awareness raising activities and informational outputs. Although a website and informative documents for DİTAP already exist, information could be provided to the farmers registered with the Farmers Register System of the MoAF in order to increase awareness of these resources.

In response to the survey query on the purposes for which the farmers use the internet, 29 percent said that their main motivation is the option to sell farm products online. This shows that selling products online is not common among the participating farmers. A linear probability model was used to analyse the factors that influence farmers to use the internet for selling their farm products. Three statistically significant variables were identified – namely, agricultural income, education, and off-farm income. The main conclusion reached as a result of the survey is that the greater the farmer's total agricultural income, the more likely the farmer is to sell farm products online. This points to the importance of availability of capital for accessing online markets, and hence to the need to provide professional support to small farms to enable them to gain access to online markets. Education has a similar positive effect on internet utilisation, as there is a strong positive correlation between the education level of the farmer, and the farmer's likelihood of selling farm products online. Given that education provides farmers with skills to work with new technologies, training programmes would improve farmers' use of digital tools where such skills are lacking. Farmers who have off-farm income are less likely to sell their farm products online as off-farm income provides them with additional resources but reduces the amount of time they have available for farm-related activities. In other words, farmers who have off-farm income might face time constraints in selling their products online. This indicates the importance of coordinating marketing activities through cooperatives or producer

organisations so as to make them more systematic and automatic.

The impact of gender on farmers' use of the internet to market their products was assessed using a Treatment Effects model. If all the farmers in the survey had been female, the probability of them selling products online would have been 0.18 percentage points less than the mean for male farmers (0.33), meaning that female farmers are far less likely to sell products online. Thus the survey results show that female farmers are disadvantaged compared to male farmers when it comes to online marketing. This could be due to a lack of access to digital applications, which is common among women in the project regions. Hence, professional support could be provided to female farmers to make their access to digital technologies faster and easier.

The survey results indicate that the internet is commonly used by the target group to communicate with family members and friends. Of the farmers surveyed, 55 percent used the internet for this purpose. The second most common purpose of using the internet was to find solutions for problems encountered in agricultural production. The fact that 54 percent of the farmers used the internet to this end shows that the internet is the most effective way of reaching farmers when disseminating agricultural information. Among the purposes suggested in the survey, the farmers were least likely to use the internet to buy farm inputs, such as seeds. This could be because when farmers buy input from input providers they tend to pay at harvest-time or in instalments. In order to increase the percentage of digital input sales, online service providers might therefore consider providing similar options and advertising their channels.

With respect to financial products, around 70 percent of the farmers indicated that they are aware of the Agricultural Insurance Pool (TARSİM). However, only 45 percent of the farmers actually have insurance coverage from TARSİM. The probability of farmers who are aware of the programme actually using TARSİM is 59 percent. This suggests that the coverage and insurance premiums could be the main reasons why farmers do not have insurance coverage.

Only 16 percent of the farmers indicated that they use online training and extension services, even though 54 percent use the internet to look for

solutions to problems in agricultural production. In other words, while online information sources are widely used by farmers, the use of online formal training and extension services is much lower. This illustrates the importance of disseminating information about the existence of online formal training and extension services and the need to use reliable sources of information, such as the Agriculture and Forestry Academy of the MoAF.

In the survey, 70 percent of the farmers indicated that they are aware the possibility of applying online for credit from banks, but only 16 percent said that they had applied for credit online. Most online credit services are for consumer credit, so this could be the reason for the low number of online applications among farmers. It could be suggested that an online credit application option would ease the application process for farmers seeking credit.

As many as 85 percent of the farmers indicated that they believe climate change is a problem for agriculture. However, no correlation could be found between the promotion of digital marketing services and the farmers' opinions on climate change. In other words, it cannot be claimed that promoting online marketing will mitigate the impacts of climate change by influencing farmers' opinions.

Of female farmers in the survey, 88 percent agreed that there is gender inequality in agricultural marketing. This underlines the need to support female farmers and facilitate their access to digital marketing platforms. Such support could take the form of providing them with the necessary equipment and tools for internet access. One way of providing such support would be through cooperatives. Interviews with women's cooperatives show that some of their members do not have mobile phones and usually use their husbands' phones when necessary. Limited internet access can be considered a major barrier to female farmers' access to markets.

In line with a request from the farmers' organisations, a training module was designed on the basis of the survey findings. The training programme was implemented at the very end of 2021 with participants from the selected target provinces of the IFAD-funded projects..

List of Digital Business Solutions Available to Farmers in Turkey by Type and Provider

▶ Digital Platforms for Food and Agricultural Marketing	▶ Digital Platforms for Agricultural Extension Services
▷ Digital Platforms Provided by Government Organisations	▷ Digital Platforms Provided by Government Organisations
• Digital Agriculture Market (DİTAP)	• Agriculture and Forestry Academy
• PttAVM	• Farmer Academy
▷ Digital Platforms Provided by Private Companies	▷ Digital Platforms Provided by Producer Organisations
• General Shopping Platforms	• Agricultural Library
• Trendyol	▷ Digital Platforms Provided by Private Companies
• Hepsiburada	• Toros Library
• Amazon	• Büyükaksoy Agricultural Consulting
• n11	▶ Digital Platforms for Agricultural Input Purchases
▷ Shopping Platforms Specialising in Food and Agricultural Products	▷ Digital Platforms Provided by Private Companies
• TazeDirekt	• Sahibinden
▷ Digital Platforms Provided by Producer Organisations	• TarımGaraj
• Nahil	• Tarfin
▷ Self-Marketing through Own Website	▶ Digital Platforms for Rural Financial Services
• Antalya Bahcesi	▷ Digital Platforms Provided by Government Organisations
• Bir Manav	• Agricultural Insurance Pool (TARSiM)
▷ Self-Marketing through Networking Websites	• Ziraat Bank Online Credit
• Facebook	▷ Digital Platforms Provided by Private Banks
• Twitter	• İş Bank Agricultural Credit
• Instagram	• Şeker Bank Agricultural Services
• Sahibinden	



2. DIGITAL PLATFORMS FOR FOOD AND AGRICULTURAL MARKETING

2.1. Digital Platforms Provided by Government Organisations

2.1.1. Digital Agriculture Market (DİTAP)

The Digital Agriculture Market (DİTAP)² was initiated by the MoAF and was launched in 2020 in conjunction with the Ministry of Treasury and Finance, the Ministry of Trade, and the Union of Chambers and Commodity Exchanges of Turkey (TOBB). DİTAP enables producers to meet potential buyers upon login and reach multiple buyers at the sales stage, and therefore provides market price information. DİTAP provides two main options for producers: contract farming and direct sales. The detailed information on DİTAP was also provided with relevant future actions in the recently released “National E-Agriculture Strategy Document”, a joint work of the Ministry of Agriculture and Forestry and FAO under FAO’s Technical Cooperation Programme³.

Contract Farming

This module allows farmers to engage in contract farming with a buyer. The farmers can place a request for a contract specifying the land on which they will carry out the contracted production. The land which the farmer specifies must be registered with the Farmer Register System of the MoAF. The farmer indicates the product and the amount that s/he proposes to grow on the contractual farming request form, together with the requested price. Using this module, farmers can also receive payments in advance amounting to a certain percentage of the value of the contract value or the

inputs for production. Once the form is submitted and approved by the site administrator, it is posted on the online platform for a match with potential buyers. Buyers who are interested in entering into contracts with the farmer can then make a bid in response to the price requested by the farmer. Once the farmer and buyer reach agreement on the price, the system generates a contract that includes the specifications, information about the buyer and the farmer, the name of the product to be grown, the amount and price of the product, the timeline for delivery and other details. The contract becomes effective once it has been accepted by both parties. Through this system, the farmer is protected from price risks and uncertainties about payment. Overall, this system provides a safety net for farmers against unstable farm income.

Direct Sales

This module allows farmers to sell the products they have in stock. The farmer posts the necessary information, the product specifications, the quantity and the total price requested, along with the conditions for delivery. Once the post is approved by the site administrator, it can be seen by multiple potential buyers. The buyers can then contact the farmers and the trade is conducted once an agreement is reached. In this module, no formal contract is established between the farmer and the buyer. However, since their posts are seen by potential buyers who are also registered with the site, the farmers can expect to receive a fair market price for their products.

² Dijital Tarım Pazarı (ditap.gov.tr)
³ FAO (2022)

2.1.2. PttAVM⁴

The PttAVM is a digital retail shopping platform established by the Post and Telegraph Directorate of Turkey (PTT). This platform allows for various categories of goods to be traded online. Food items and fresh fruit and vegetables are among the goods that can be sold through this platform. Farmers can apply to become sellers. The seller needs to identify a storage address for orders to be picked up by the transport/delivery service. The frequency of shipments can also be determined and indicated in advance. Farmers can advertise their products in different package sizes, such as 1 kg and 5 kg packs. Once the payment is made by the buyer using the digital platform, the PTT takes care of the transport/delivery service, collecting the shipment from the storage address provided by the seller and delivering it to the buyer. Under this arrangement, the sellers have the advantage of meeting multiple potential buyers and receiving their payment through the digital platform.

2.2. Digital Platforms Provided by Private Companies

2.2.1. General Shopping Platforms

Trendyol

Trendyol⁵ is a private digital shopping platform that brings together sellers and buyers of numerous categories of goods, among them food products including fresh fruits and vegetables. Trendyol is for retail marketing and the sellers are themselves responsible for shipping orders. Sellers must therefore have the advertised product in stock. Farmers can apply to become sellers on Trendyol by providing the legal information requested by the platform administrators. Once approved, they can start to sell their food products. Trendyol levies a percentage-based commission on every sales transaction and sellers are informed about this fee. Since Trendyol is a digital retail market platform, farmers' cooperatives or producers' associations might be more inclined than individual farmers to use it to sell food products directly from stock. For

sellers, the platform has the advantage of providing them with a fair price for the products which they advertise, since there are multiple buyers. Another advantage is that there is no risk of the seller not being paid, since the payment is made online; the seller is only responsible for dispatching the product.

Other private digital platforms that facilitate retail marketing include:

- Hepsiburada www.hepsiburada.com.tr
- Amazon Turkey www.amazon.com.tr
- n11 www.n11.com.

These private digital marketing platforms provide services similar to Trendyol's, with some variations. Amazon Turkey, for example, provides sellers with storage space, for a fee, from which the Amazon delivery service delivers the order to the buyer. In the case of Hepsiburada, sellers can apply to become Hepsiburada suppliers and to sell their product under this brand, instead of branding their own products. These platforms also provide sales management information and feedback from buyers, which enables sellers to become more professional.

2.2.2. Shopping Platforms Specialising in Food and Agricultural Products

TazeDirekt

TazeDirekt⁶ is a digital shopping platform for food items only, including fresh fruits and vegetables. It is managed by the retailing company Migros. The objective of TazeDirekt is to work with local and organic farmers to provide fresh, safe food to consumers. Farmers who satisfy the safety and quality standards of TazeDirekt can apply to become suppliers. TazeDirekt collects the product from the seller on certain days of the week and delivers it to the customer based on orders, which means that the seller is not responsible for shipping the product to the buyer.

4 <https://www.pttavm.com/>
5 <https://www.trendyol.com/>; <https://partner.trendyol.com/>
6 www.tazedirekt.com

2.3. Digital Platforms Provided by Producers' Organisations

The non-profit Foundation for the Support of Women's Work (KEDV) operates the digital shopping platform NAHIL⁷. The main objective of this platform is to sell the products of women's cooperatives and use the returns to support the well-being of women. Various household items, including food items, are sold on this digital platform. Would-be sellers must apply to NAHIL in advance. Their applications are then evaluated by the site administration. Once approved, the seller's products are advertised on the website. Upon receiving an order, the seller is responsible for having the product delivered, and payment is received online.

Another option that is widely used by farmers and farmers' cooperatives is networking websites, such as Facebook and Twitter. With this option, farmers or cooperatives may open a suitable account and display their products and information to multiple consumers online. Farmers or cooperatives can use these digital platforms to sell their products on a retail or wholesale basis. These platforms are free of charge and with the right advertising strategy, product and sales information could reach millions of consumers. However, the farmers or cooperatives need to make their own logistics and shipping arrangements and follow up the monetary transactions. In the case of wholesale deals, the farmer may negotiate with the buyer about the logistics. Sahibinden.com charges commissions from businesses and individual users.

2.4. Self-Marketing through Own Website

Another option for selling online is for the seller to establish an individual website. In this case, the seller – or possibly a farmers' cooperative or producers' organisation – could establish a website and use it to sell products. Some examples are:

- AntalyaBahcesi⁸
- BirManav⁹.

With this option, the seller is responsible for reaching potential buyers, advertising, online payments and shipping. No fees are paid to a third party for the sales, but all processes have to be managed by the seller. Given the challenges involved in building up the trust of buyers who have to make online payments in advance, this option is more suitable for larger cooperatives or producers' unions.

2.5. Self-Marketing through Networking Websites

- Facebook
- Twitter
- Instagram
- Sahibinden.com

7 <https://www.nahil.com.tr/>
8 www.antalyabahcesi.com
9 www.birmanav.com



3. DIGITAL PLATFORMS FOR AGRICULTURAL EXTENSION SERVICES

Agricultural extension services in Turkey are managed by the government through the MoAF. The MoAF provides agricultural extension services directly through its provincial and district directorates. It is also responsible for assessing and certifying prospective agricultural extension experts. These certified agricultural extension experts can then work as individuals or for companies or farmers' organisations. In summary, agricultural extension services are provided by the MoAF, private companies and farmers' organisations.

3.1. Digital Platforms Provided by Government Organisations

3.1.1. The Agriculture and Forestry Academy

The MoAF has established a digital agricultural extension platform called the Agriculture and Forestry Academy.¹⁰ This platform provides three major services free of charge - namely, agricultural classes, Agriculture TV, and a library. Farmers can attend online classes on a wide variety of topics ranging from plant production to agricultural technologies. All the major issues of agriculture and forestry are covered by these online classes. The classes are provided in the form of recorded videos and the instructors are academics or topic experts from various agencies. Agriculture TV broadcasts current news related to agriculture and forestry. The digital library enables farmers to access electronic resources on the topics that interest them.

3.1.2. The Farmers' Academy

The Farmers' Academy¹¹ is a digital agricultural information platform provided by Muş Alparslan University, a public university. The platform is linked to the Agriculture and Forestry Academy of the MoAF. This digital platform provides information on various issues in livestock and crop production, and access is free of charge.

3.2. Digital Platforms Provided by Producers' Organisations

3.2.1. Agricultural Library

The Sugar Beet Growers' Cooperative of Konya has established a digital information platform¹² through which farmers can access information on various crops free of charge.

3.3. Digital Platforms Provided by Private Companies

3.3.1. Toros Library

A digital library website¹³ has been established by Toros Agriculture, a major fertiliser producer in Turkey, to provide information on how to apply various fertilisers to different crops. Farmers can access the website free of charge.

3.3.2. Büyükaksoy Agricultural Consulting

The Büyükaksoy Agricultural Consulting company operates a website¹⁴ featuring relevant information about fertiliser application and related topics. Farmers can access the website free of charge.

10 <https://akademi.tarimorman.gov.tr/>

11 <http://hayvancilik.alparslan.edu.tr/ciftci-akademisi/>

12 <https://konyaseker.com.tr/icerik/liste/2118/bilgi-bankasi>

13 <https://www.toros.com.tr/tr/gubre-faaliyetleri/toros-kutuphanesi>

14 <http://www.buyukaksoy.com/>



4. DIGITAL PLATFORMS FOR AGRICULTURAL INPUT PURCHASE

4.1. Digital Platforms Provided by Private Companies

4.1.1. Sahibinden.com

Sahibinden.com¹⁵ is a private digital sales advertising platform that matches buyers with sellers. Various categories of goods are sold and rented including agricultural machinery and equipment, seeds, fertilisers and other inputs. Buyers have to contact the seller and make the arrangements for transport and delivery. They make the payment directly to the seller in line with the agreed price and method of payment. This website makes it possible for buyers to view various goods and price information, enabling them to make informed choices.

4.1.2. TarımGaraj

TarımGaraj¹⁶ is a private digital shopping platform focusing primarily on agriculture. The platform provider is the Aydemirler Agricultural Machinery and Livestock Company. Farmers can purchase various goods related to agriculture including agricultural equipment, seeds, fertilisers and spare parts for their machinery. They pay for their purchases online by credit card or money orders. This suggests that the website offers farmers flexibility with respect to the means of payment.

4.1.3. Tarfin

Using an agricultural risk scoring model, the private firm Tarfin¹⁷ offers farmers' various agricultural inputs such as fertiliser, seeds and feed, with the opportunity to pay at harvest. The company offers

a mobile application on which users can compare updated fertiliser, feed and other agricultural input prices in their locations. The company operates in around 40 provinces. Farmers can determine when they will pay depending on the harvest season, and users of the service do not need to pay collateral or additional fees to the company.

15 www.sahibinden.com

16 www.tarimgaraj.com

17 <https://tarfin.com/>



5. DIGITAL PLATFORMS FOR RURAL FINANCIAL SERVICES

5.1. Digital Platforms Provided by Government Organisations

5.1.1. TARSİM

The Agricultural Insurance Pool (TARSİM)¹⁸ is a government-supported digital agricultural insurance system. Information on the various agricultural insurance options and the corresponding premiums are provided on its website. The government pays a certain percentage of the premiums, depending on the type of the insurance. Farmers can apply for insurance coverage through the MoAF's Registry System.

5.1.2. Ziraat Bank Online Credit Services

Türkiye Ziraat Bankası (Ziraat Bank)¹⁹ is a public bank that provides loans primarily to the agriculture sector. Through its digital platform, farmers can apply for a cash loan of up to TRY 50,000 with a maximum term of 36 months. For loans above TRY 50,000, the maximum loan term is 24 months. Once assessed, the result of the loan application is communicated through the digital platform. If the application is approved, the funds are deposited into the farmer's account. This loan is not an agriculture-specific loan, but rather consumer credit.

5.2. Digital Platforms Provided by Private Banks

5.2.1. İş Bank Online Agricultural Credit

Türkiye İş Bankası²⁰ is a private commercial bank that lends to various sectors, including agriculture. Through the bank's digital platform, farmers can apply for a cash loan of up to TRY 50,000 with a maximum term of 36 months. Once assessed, the result of the loan application is communicated through the digital platform. If the application is approved, the funds are deposited into the farmer's account. This loan is not an agriculture-specific loan, but rather consumer credit.

5.2.2. Şekerbank Agricultural Services

Şekerbank²¹, is another private bank that offers financial services to farmers. Şekerbank provides the Harvest Card, for which farmers may apply online. With this card, farmers can purchase agricultural inputs and repay the balance later. Using the Harvest Card, farmers can make purchases from approved suppliers at 0 percent interest for up to 6 months. The Harvest Card may also be used to defer TARSİM insurance premium payments.

18 <https://www.tarsim.gov.tr/>

19 <https://www.ziraatbank.com.tr/tr/bireysel/krediler/genel- ihtiyaclar/tuketici-kredisi>

20 <https://www.isbank.com.tr/is-ticari/aninda-tarim-kredisi>

21 <https://www.sekerbank.com.tr/tarim>

6. EVALUATION OF DIGITAL MARKETING PLATFORMS

Digital platforms for agricultural marketing can be evaluated in terms of their various features. In this section they are evaluated by the number of users, pricing/commissions, secure online payment options, logistic and shipping services, and advertising support. Table 1 presents an indicative comparison of digital marketing platforms based on these features which could slightly be varied. The pros and cons of these digital platforms are shown in Table 2.

The numbers of users and of potential buyers are important features for distinguishing marketing platforms, as different platforms have different levels of customer potential. DiTAP, which is one of the two government-supported platforms, has a medium level of users because it has been established recently. The other government-supported digital marketing platform, PttAVM, has a medium-to-high number of customers. The private sector platforms, such as Trendyol, and Hepsiburada, have higher numbers of users, probably due to their advertising spending. Amazon Turkey started operating in 2018, and it is a relatively new platform in Turkey. However, Amazon Turkey has seen an increase in users due to its global brand value. The numbers of users of TazeDirekt and NAHIL are relatively low. Facebook, Twitter and Instagram have a very high customer potential due to their high numbers of users globally.

Turning to the pricing and commission rates of the digital platforms, DiTAP does not collect commissions from sales, but PttAVM charges a 10 percent commission. The commission rates of Trendyol, Hepsiburada, Amazon, and n11 vary between 10 percent and 15 percent. Amazon charges an additional monthly subscription fee and n11 charges a marketing service commission fee. TazeDirekt and NAHIL charge no commission on sales. Facebook, Twitter, and Instagram do not charge commission on sales. Sahibinden.com charges a 10 percent commission to business users and a 12 percent commission to individuals.

Table 1. Indicative Comparison of Digital Marketing Platforms

Platform	User Volume	Pricing/ Commission	Online Secure Payment	Logistics Service	Advertising Support
Digital Agriculture Market (DiTAP)	Medium	Free	None	None	None
PttAVM	Medium-high	10%	Available (credit card, debit card, etc.)	Available (Ptt Cargo)	Free product promotion and advertising support
Trendyol	High	12-15%	Available (credit card, debit card, etc.)	Available (8 contracted cargo companies)	COVID-19 Marketing Support
Hepsiburada	High	12.5%	Available (credit card, debit card, etc.)	Available (11 contracted cargo companies)	“Digital Transformation of Local Products” Support
Amazon	High	10% (+ monthly subscription fee of TRY 99 + VAT)	Available (credit card, debit card, etc.)	Available (3 local + 3 foreign contracted cargo companies)	COVID-19 advertising support
n11	High	10% (+ 0.8% marketing service)	Available (credit card, debit card, etc.)	Available (7 contracted cargo companies)	Pre-paid
TazeDirekt	Medium	Free	Available (credit card, debit card, etc.)	Delivery is by private vehicle	None
NAHIL	Low	Free	Available (credit card, debit card, etc.)	Available (1 contracted cargo company + free pick-up from the store)	None
Facebook	High	Free	None	Non	Free advertisements
Twitter	High	Free	None	None	Pre-paid
Instagram	High	Free	None	None	Pre-paid
Sahibinden	High	10% (corporate user) 12% (individual user)	Available (credit card, debit card, etc.)	Available (2 contracted cargo companies)	Pre-paid

While DiTAP, Facebook, Twitter, and Instagram do not offer secure payment systems, the other digital marketing platforms provide for the use of secure payment methods such as debit cards or credit cards. Since the option of online secure payment is an important feature for customers, digital marketing platforms that offer this feature can attract more consumers. The provision of logistics and delivery services is another important feature, since sellers are responsible for sending products to consumers and it is important to ensure that the products reach the consumers on time. DiTAP, Facebook, Instagram and Twitter do not offer logistics and delivery services while all the other digital marketing platforms offer these services through contracted cargo companies. Amazon Turkey also offers international logistics and shipping. In addition to logistics and delivery services, some digital

marketing platforms have been providing support for advertising and promotion during the pandemic. These include Trendyol and Amazon which announced marketing and advertisement support for both existing and new users.

Overall, producers are able to selected from a range of digital marketing platforms depending on their needs and priorities. The choice of digital marketing platforms with high numbers of users comes at the cost of a commission on the sale of the products. The advantage such platforms offer is reaching high numbers of consumers. However, agricultural producers who sell in high volumes can also opt for other digital marketing platforms, such as DiTAP.

Table 2. Pros and Cons of Digital Marketing Platforms

	PROS	CONS
	Government operated No commission	Lack of secure payment, logistics & ad services
	User volume Payment options Free promotion & ad support	Commission Lack of logistics alternatives
	High user volume Logistics alternatives COVID-19 marketing support	Commission Lack of payment options
	High user volume Logistics & payment alternatives Support for local products	Commission
	High user volume International logistics COVID-19 ad support	Monthly fee Lack of payment options
	High user volume Logistics alternatives Payment options	Marketing services fee Pre-paid ads
	No commission Private logistics Payment options	Lack of user volume Lack of ad support
	No commission Free pick-up from the store	Lack of ad support Lack of user volume
	High user volume No commission Free ads	Lack of payment & logistics services
	High user volume No commission	Lack of payment & logistics services Pre-paid ads
	High user volume Logistics alternatives	Commission Pre-paid ads



7. DEMAND ANALYSIS AND SURVEY RESULTS

An online survey was conducted with farmers living in IFAD project regions in order to assess the farmer's needs and their demand for digital technologies. The target group for the survey consisted of members of farmers' cooperatives or producers' unions from the provinces of Konya, Karaman, Adana, and Mersin. In all, 56 completed responses were received to the survey. Information about the survey participants is provided in the tables below. Some respondents opted not to answer specific questions and the total number of observations is therefore less than 56 in some of the tables.

Demographic Information

Table 3 below shows the gender distribution of the survey respondents. In total, 18 female and 33 male participants took part in the survey, with female respondents making up 35 percent of the participants.

Table 3. Gender of the Respondents

Variable	Freq.	Percent	Cum.
Male	33	65	65
Female	18	35	100
Total	51	100	

Table 4 gives information on the ages of the respondents. Considering that the mean age is 41 and the range is between 24 and 76, it can be seen that relatively younger farmers responded to the survey, given that the average age of farmers in Turkey is estimated to be 50.

Table 4. Age of the Respondents

Variable	Obs	Mean	Std. Dev.	Min	Max
Age	51	41	10	24	76

Table 5 shows the levels of education of the survey respondents. About two thirds of the respondents had completed at least a high school education. Of the respondents who held higher qualifications, nine farmers had an associate degree, six farmers a bachelor's degree, and three farmers a master's degree. This indicates a higher average level of education among survey respondents than the average for farmers in Turkey (MoAF, 2021).

Table 5. Level of Education of the Respondents

	Freq.	Percent	Cum.
Literate But Not a Graduate	1	1.92	1.92
Primary School	10	19.23	21.15
Middle School	7	13.46	34.62
High School	16	30.77	65.38
Associate Degree	9	17.31	82.69
Bachelor's Degree	6	11.54	94.23
Master's Degree	3	5.77	100.00
Total	52	100.00	

Table 6 shows the distribution of the total annual agricultural income of the survey respondents. The most frequent agricultural income category is TRY 5,001TL- TRY 10,000. Among all the survey respondents, 73 percent had annual agricultural incomes of less than lower than TRY 30,001.

Table 6. Total Annual Agricultural Income

	Freq.	Per cent	Cum.
1TL - 5.000TL	7	13.73	13.73
5.001TL- 10.000TL	11	21.57	35.29
10.001TL- 15.000TL	5	9.80	45.10
15.001TL- 20.000TL	8	15.69	60.78
20.001TL- 25.000TL	2	3.92	64.71
25.001TL- 30.000TL	4	7.84	72.55
30.001TL- 40.000TL	0	0	72.55
40.001TL- 45.000TL	2	3.92	76.47
45.001TL- 50.000TL	3	5.88	82.35
50.001TL- 55.000TL	2	3.92	86.27
55.001TL- 65.000TL	0	0	86.27
65.001 TL or more	7	13.73	100.00
Total	51	100.00	

Table 7 shows the distribution of the survey respondents by location. It indicates that 38 percent of the respondents were from Konya, 32 percent

from Karaman, 21 percent from Mersin and 9 percent from Adana. Thus Konya and Karaman are relatively better represented in the survey data. Since the study does not aim to draw conclusions at the level of provinces, the relatively few observations from Mersin are not considered to pose a specific problem for the analysis of the findings.

Table 7. Location of the Survey Respondents

	Freq.	Percent	Cum.
Adana	11	20.75	20.75
Karaman	17	32.08	52.83
Konya	20	37.74	90.57
Mersin	5	9.43	100.00
Total	53	100.00	

Table 8 gives information about the cooperatives of which the farmers were members. About 34 percent of the respondents were members of the Bozkır Agricultural Development Cooperative in Konya. The farmers in Adana and Mersin were members of cooperatives that fall under the 'Other' category, which represents 32 percent of the total respondents. The Başyayla Kışla Village Development Cooperative and the Elmayurdu Tepebaşı Boyalık Villages Agricultural Development Cooperative are in Karaman.

Table 8. Membership of Cooperatives

Variable	Obs	Mean	Std. Dev.	Min	Max
Bozkır Agricultural Development Cooperative (Konya)	56	.339	.478	0	1
Konya Akören Development & Business Cooperative (Konya)	56	.018	.134	0	1
Başyayla Kışla Village Development Cooperative (Karaman)	56	.054	.227	0	1
Elmayurdu Tepebaşı Boyalık Villages Agricultural Development Cooperative (Karaman)	56	.125	.334	0	1
Other (Adana & Mersin)	56	.321	.471	0	1

Awareness and Utilisation of Digital Marketing Platforms

This section analyses the data related to farmers' awareness and use of the various digital marketing

platforms that were described in the previous section. Table 9 displays information on farmers' awareness of digital marketing platforms.

Table 9. Farmers' Awareness of Digital Marketing Platforms

Variable*	Obs	Mean	Std. Dev.	Min	Max
Digital Agriculture Market	56	.500	.505	0	1
PttAVM	56	.464	.503	0	1
Trendyol	56	.750	.437	0	1
Hepsiburada	56	.768	.426	0	1
Amazon	56	.375	.489	0	1
n11	56	.518	.504	0	1
TazeDirekt	56	.196	.401	0	1
NAHIL	56	.232	.426	0	1
Facebook	56	.857	.353	0	1
Twitter	56	.714	.456	0	1
Instagram	56	.696	.464	0	1
Sahibinden	56	.661	.478	0	1
Other	56	.411	.496	0	1

* 1= The farmer is aware of the digital platform, 0= The farmer is not aware of the digital platform

According to Table 9, 50 percent of survey respondents were aware of the Digital Agriculture Market (DITAP) provided by the MoAF. Given that the platform was only established in 2020, this is a relatively high value. The other government supported digital marketing platform PttAVM was known to 46 percent of the survey respondents. The digital marketing platforms provided by the private sector are relatively well known. Hepsiburada was the most widely known private digital marketing platform, with 77 percent of survey respondents aware of it. Trendyol was the second most widely known digital marketing platform: 75 percent of the survey respondents indicated that they were aware of Trendyol. These platforms were probably well known among the survey respondents because of their frequent advertising in national media. Amazon and n11 were relatively less known to the survey respondents at scores of 38 percent and 52 percent respectively. Only 20 percent of the survey respondents indicated that they were aware of TazeDirekt, which was the least known private digital marketing platform among the survey respondents.

NAHIL, which is provided by a non-profit organisation, was known to 23 percent of the survey respondents. Social networking platforms were well-known among farmers. Facebook was known to 86 percent of the survey respondents, making it the most widely known of all the digital platforms included in the survey. Facebook was followed by Twitter, Instagram, and Sahibinden, in that order. Sahibinden had the lowest awareness rating among the social networking platforms, but was still relatively well known among the survey respondents, with a score of 66 percent.

The farmers' actual use of digital marketing platforms is shown in Table 10. As many as 34 percent of the survey respondents indicated that they use DITAP. This is a relatively high percentage for such a recently established digital platform. According to conditional probability, the likelihood of farmers who are aware of DITAP actually using it is 68 percent, which means that if a farmer is aware of DITAP, he or she is very likely to use it. This indicates the importance of DITAP for farmers and the need to

continue to diffuse information about DITAP among farmers.

PttAVM is used by 32 percent of the survey respondents. Among the private sector marketing platforms, Trendyol was the most popular digital platform, used by 46 percent of the survey respondents. Trendyol was followed by Hepsiburada with 43percent, n11 with 36 percent and Amazon with 21 percent . TazeDirekt is the platform least used by farmers, at 13 percent.

NAHIL is used by 18 percent of farmers. However, the conditional probability of using NAHIL once a farmer becomes aware of the platform is 54 percent, which indicates high potential use. Of the social networking platforms, Facebook was the most popular, with 70 percent of respondents using it. Instagram follows with 52 percent. Sahibinden is used by 45 percent of farmers and Twitter is the least used social networking digital platform at 32 percent.

Table 10. Farmers' Use of Digital Marketing Platforms

Variable*	Obs	Mean	Std. Dev.	Min	Max
Digital Agriculture Market	56	.339	.478	0	1
PttAVM	56	.321	.471	0	1
Trendyol	56	.464	.503	0	1
Hepsiburada	56	.429	.499	0	1
Amazon	56	.214	.414	0	1
n11	56	.357	.483	0	1
TazeDirekt	56	.125	.334	0	1
NAHIL	56	.179	.386	0	1
Facebook	56	.696	.464	0	1
Twitter	56	.321	.471	0	1
Instagram	56	.518	.504	0	1
Sahibinden	56	.446	.502	0	1
Other	56	.339	.478	0	1

* If the farmer uses the digital platform = 1, If the farmer does not use the digital platform = 0

Access to Internet and Purpose of Use

This section provides information on the frequency of the survey respondents' use of the internet and the purposes for which they use it. Table 11 below shows how the respondents access the internet. As many as 84 percent of the survey respondents

indicate that there is internet infrastructure in the village where they reside. In addition, 70 percent of the farmers have internet access at home and 89 percent have internet access through their mobile phones. In other words, a large majority of the farmers surveyed have access to the internet.

Table 11. Access to the Internet

Variable	Obs	Mean	Std. Dev.	Min	Max
Has Internet Infrastructure in the Village	56	.839	.371	0	1
Has Internet Access at Home	56	.696	.464	0	1
Has Internet Access through Cell Phone	56	.893	.312	0	1

Table 12 shows the frequency of farmers' internet use. 42 percent of respondents use the internet every day for between one and two hours, which makes this the most common frequency of use. Almost all the farmers use the internet daily, according to the survey data.

Table 12. Frequency of Internet Use

	Freq.	Percent	Cum.
None	2	3.64	3.64
Few Times a Week	3	5.45	9.09
Daily Half an Hour	6	10.91	20.00
Daily 1-2 Hours	23	41.82	61.82
Daily 3-4 Hours	9	16.36	78.18
Daily 5 Hours or More	12	21.82	100.00
Total	55	100.00	

In the survey, the farmers were also asked about the purposes for which they use the internet. This was a question for which they could select multiple answers. The results are shown in Table 13. The most frequently-selected response was that they used the internet to communicate with family members and friends, with 55percent. The use of the internet to find solutions to challenges

encountered in agricultural production came second with 54 percent. This indicates that the internet is an effective way of reaching farmers to disseminate agricultural information. Furthermore, 46 percent of the farmers stated that they used the internet for the weather forecast, which indicates that digital messaging systems are an effective means of informing farmers of extreme weather alerts. Meanwhile, 41 percent of the respondents indicated that they use the internet to communicate with other farmers. These farmers can therefore be said to be part of a farmer network, which could be an effective way of disseminating information among farmers. The percentage of farmers who stated that they used the internet to sell their farm products was 29 percent, making this option the sixth most popular among the ten responses including in the questionnaire. This shows that selling products online is not very common among the farmers in the survey. Using the internet to buy farm inputs, such as seeds, was the response that was selected least. This could be because when farmers buy input from input providers through other means, they probably pay at harvest time or in instalments. Online service providers might consider adding such payment options to their services in order to increase their sales of agricultural inputs.

Table 13. Purpose of Internet Use

Variable*	Obs	Mean	Std. Dev.	Min	Max
Shop for Myself or Family Members	56	.268	.447	0	1
Communicate with Family Members or Friends	56	.554	.502	0	1
Learn the Weather Forecast	56	.464	.503	0	1
Watch TV or Movies / Series	56	.161	.371	0	1
Find Solutions for Problems in Agricultural Production	56	.536	.503	0	1
Communicate with Other Farmers	56	.411	.496	0	1
Learn About Issues Related to Agriculture	56	.446	.502	0	1
Sell Farm Products	56	.286	.456	0	1
Buy Seed, Fertiliser or Agricultural Chemicals	56	.107	.312	0	1
Other	56	.232	.426	0	1
Does Not Use the Internet	56	.036	.187	0	1

* If the farmer chose this option = 1, If the farmer did not choose this option = 0

Determinants of Farmers' Use of the Internet to Sell Farm Products

To analyse the factors that influence farmers' use of the internet to sell farm products, a linear probability model was applied using Stata 14. A multiple linear regression model with a binary dependent variable is called the linear probability model. In a linear probability model the probability of an event occurring is modelled as a linear function of the coefficients to be estimated. An estimated regression coefficient can be interpreted as the change in the probability of an event occurring when the corresponding independent variables change. For example, the estimated coefficient of -0.23 for the off-farm income variable in Table 14 below shows that the farmers with off-farm income are 23 percent less likely to sell their farm products online (Wooldridge, 2013). The linear probability model was chosen in preference to other modelling methods due to the low percentage of farmers using the internet to sell farm products and the small dataset. Table 14 shows the results of the regression analysis. The regression is statistically significant at 1 percent significance level and the R-squared value is 0.33 for this model. In other words, the independent variables used in the current regression model jointly explain 33 percent of the factors that influence farmers' decisions to sell farm products online and the influence of these independent variables

are jointly statistically significant. Therefore, there is a satisfactory regression estimation. The three statistically significant variables are total agricultural income, education, and off-farm income. The results of the analysis show that the greater the total agricultural income of the farmer, the more likely the farmer is to sell farm products online. This indicates the importance of capital and/or higher production levels for accessing online markets. Hence there may be a need for small farmers to join forces to increase their selling opportunities through access to digital markets. Farmers' organisations are the major option in this respect and need to be used effectively to this end. Education also has a positive effect on online sales: the higher the level of education of the farmer, the more likely he or she is to sell farm products online. Given that education provides farmers with the skills to work with new technologies, there is a need to offer training to farmers on the use of digital marketing tools. Farmers who have off-farm income are less likely to sell their farm products online as off-farm income creates additional resources for the farmer, but reduces the time available for farm-related activities. In summary, farmers who have off-farm income might face time constraints in selling their products online. This in turn points to the importance of marketing activities being coordinated through cooperatives or producers' organisations.

Table 14: Linear Regression Results for Determinants of Selling Farm Products Online

Variables	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Total Agricultural Income	.045	.021	2.18	.035	.003	.087	**
Gender (=1 if female, 0 otherwise)	.097	.158	0.62	.541	-.222	.417	
Education	.140	.056	2.47	.018	.025	.254	**
Age	-.013	.009	-1.39	.171	-.031	.006	
Off-farm Income (=1 if has, 0 otherwise)	-.230	.113	-2.03	.049	-.459	-.001	**
Constant	.142	.651	0.22	.828	-1.173	1.457	
Mean dependent var	0.326		SD dependent var		0.474		
R-squared	0.328		Number of obs		46		
F-test	9.621		Prob > F		0.000		
Akaike crit. (AIC)	54.523		Bayesian crit. (BIC)		65.495		
*** p<.01, ** p<.05, * p<.1							
¹ Dependent Variable: If the farmer sells farm products online= 1, otherwise = 0.							

Effect of Gender on Online Marketing

Further analysis was conducted of the influence of gender on farmers’ use of the internet to market their products through the use of a Treatment Effects model with gender as the treatment. Unlike in physical sciences, controlled experiments with treatments randomly assigned to subjects are rare in social sciences. The Treatment Effects model is used to measure the effect of a treatment or an intervention on an outcome of interest for observational data (Cameron and Trivedi, 2005). The Regression Adjustment method for Treatment Effects model was applied using Stata 14. The Regression Adjustment method was chosen because it makes it possible to build a regression model of the outcome, which is the probability of farmers selling farm products online. The Regression Adjustment fits separate regressions of the outcome for each treatment category (i.e. gender) and applies the averages of predicted outcomes to the whole data

set (StataCorp, 2015). Table 15 shows the results, which demonstrate that the predicted mean of selling products online is 15 percent for female farmers and 33 percent for male farmers, which are both statistically significant results. If all the farmers in the survey were female, the probability of selling products online would be 18 percentage points less, and this would be lower than the mean for male farmers, which is 33 percent. In other words, the farmer being female reduces the probability of the farmer selling products online. The result is statistically significant at a level of 10percent. Overall, female farmers are disadvantaged compared to male farmers when it comes to online marketing. This could be due to not having access to digital technologies – a situation which is common among women in the project regions. Specific training sessions and family support may work better for getting more women to use online sales opportunities.

Table 15. Treatment Effects Estimation Results

	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Predicted Mean ¹							
Male	.330	.089	3.70	.000	.155	.504	***
Female	.154	.066	2.32	.021	.024	.284	**
Average Treatment Effect² (Female vs. Male)	-.176	.104	-1.69	.092	-.38	.029	*

*** p<.01, ** p<.05, * p<.1
 1 Outcome Variable: Used internet to sell my farm products.
 2 Treatment Variable: Gender = 1 if female, 0 otherwise.

Farmers’ Marketing Channels

Table 16 gives information on the marketing channels used by the farmers. The most frequently-selected option, with 48 percent, was the sale of through a cooperative. This relatively high proportion may well reflect the way the participants were selected, as the survey was conducted mainly among cooperative members. Selling at a farmer’s market and selling to an intermediary were both checked by 32 percent of the farmers, while 27 percent said they sold to consumers online. The option selected least was selling to a supermarket chain, with just 4 percent. Calculations show

that selling to an intermediary was chosen by 26 percent of the respondents who also sell their products through a cooperative and 38 percent of the farmers who do not. Marketing farm products through a cooperative could make farmers less reliant on intermediaries. This shows the importance of supporting cooperatives’ marketing activities and of farmers’ marketing farm products through cooperatives, as selling to an intermediary could result in a significant divergence between farm gate and consumer prices.

Table 16. Farmers' Marketing Channels

Variable	Obs	Mean	Std. Dev.	Min	Max
Online Selling to Consumers	56	.268	.447	0	1
Selling to an Intermediary	56	.321	.471	0	1
Selling to a Supermarket Chain	56	.036	.187	0	1
Selling through a Producers' Union	56	.214	.414	0	1
Selling through a Cooperative	56	.482	.504	0	1
Selling at a Farmers Market	56	.321	.471	0	1
** If indicated = 1, If not indicated = 0					

Digital Finance, Training, and Input Services

Table 17 provides information on the levels of farmers' awareness and use of digital finance, training, and input services. As many as 70 percent of the farmers indicated that they were aware of the government-supported Agricultural Insurance Pool (TARSİM) and around 45 percent of the farmers have insurance coverage through TARSİM. The conditional probability of farmers who aware of TARSİM actually using it is 59 percent. The coverage of the insurance and the amounts of the premiums could explain why some farmers do not have insurance. Meanwhile, 16

percent of the farmers, a relatively low proportion, indicated that they use online training and extension services. Table 13 above indicated that 54 percent of the farmers use the internet to find solutions for problems in agricultural production. It could therefore be inferred that farmers use general online information sources, but not formal training and extension services. This points to the importance of disseminating information about the existence of online training and extension services and of using reliable sources of information, such as the Agriculture and Forestry Academy of the MoAF.

Table 17. Digital Finance, Training and Input Services

Variable	Obs	Mean	Std. Dev.	Min	Max
Aware of Agricultural Insurance Pool	56	.696	.464	0	1
Has Insurance through Agricultural Insurance Pool	56	.446	.502	0	1
Uses Online Training and Extension Services	56	.161	.371	0	1
Aware of Online Credit Application Services	56	.696	.464	0	1
Applied Online for Credit Services	56	.161	.371	0	1
Aware of Online Agricultural Input Purchase	56	.643	.483	0	1
Purchased Agricultural Inputs Online	56	.107	.312	0	1

While 70 percent of the farmers indicated that they were aware of the option of applying online for credit, only 16 percent of the farmers said that they had actually done so. The reason for the low application rate could be that most online credit services are for consumer loans. If agricultural credit application processes could be completed over the internet, more farmers might use that service. The percentage of farmers who said they were aware of online agricultural input purchase platforms was 64 percent. However, the use of digital platforms to buy inputs is not very common among respondents: only 11 percent reported doing so.

Climate Change and Gender Equality

As sustainable agriculture relies on economic, environmental, and social sustainability, the survey respondents were asked about climate change and gender equality in agriculture. Table 18 shows the responses given by the farmers when were they asked whether they agreed or disagreed with the statement “I believe climate change is a problem for agriculture”, or whether they were unsure.

Table 18. Farmers’ Opinions on Climate Change

Variable: “I believe climate change is a problem for agriculture”	Freq.	Percent	Cum.
Not Sure	6	11.11	11.11
Disagree	2	3.70	14.81
Agree	46	85.19	100.00
Total	54	100.00	

As seen in the table, 85 percent of the farmers indicated that they believe climate change is a problem for agriculture. To see how promoting the use of digital marketing platforms influences farmers’ opinion about climate change, a pairwise comparison of means was carried out with a t-test between farmers who sell their products online and who do not, with respect to their opinion about climate change. The results are presented in table 19.

Table 19. Pairwise Comparison of Means: Climate Change and Digital Applications

Variable: “I believe climate change is a problem for agriculture”						
Sell My Farm Products Online	Mean	Std.Err.	Groups*			
No	1.789	0.078	A			
Yes	1.875	0.120	A			
*Mean values labelled with the same letter under Groups are not significantly different at the 5 percent level.						
“I believe climate change is a problem for agriculture”	Contrast	Std.Err.	T	P>t	[95%_Conf	Interval]
Sell My Farm Products Online Yes vs No	0.086	0.144	0.60	0.554	-0.203	0.374

The mean for agreeing with statement “I believe climate change is a problem for agriculture” is 1.88 for farmers who sell their products online and 1.79 for farmers who do not. Hence, respondents who use online marketing are more likely to believe that climate change is a problem for agriculture. However, the t-test for the difference between the two means is not statistically significant. Therefore, there is not enough evidence to claim

that promoting the use of digital services influences farmers’ opinions about climate change.

Table 20 gives information about the farmers’ responses to the statement “As farmers we should take action to mitigate the impact of climate change”. The farmers were asked if they agreed or disagreed with this statement, or whether they were unsure. As many as 83 percent of the farmers agreed with the statement, meaning that the great majority

of the farmers believe that they need to take action against climate change. This information could be used to promote farmers' adoption of conservation practices to mitigate the impact of climate change through cooperatives.

Table 20. Farmers' Opinions about Actions to Mitigate the Impact of Climate Change

Variable: "As farmers we should take action to mitigate the impact of climate change."	Freq.	Percent	Cum.
Not Sure	2	3.77	3.77
Disagree	7	13.21	16.98
Agree	44	83.02	100.00
Total	53	100.00	

A pairwise comparison of means was conducted between farmers who sell their products online and those who do not, for their responses to the above statement. There was no statistically significant difference between the means of the two groups.

In order to determine the farmers' opinions about gender inequality in agriculture, they were asked whether they agreed or disagreed with the statement "I believe women and men are treated equally in agriculture", or whether they were unsure.

Table 21. Farmers' Opinions about Gender Inequality in Agriculture

Variable: "I believe women and men are treated equally in agriculture"	Freq.	Percent	Cum.
Not Sure	10	19.61	19.61
Disagree	15	29.41	49.02
Agree	26	50.98	100.00
Total	51	100.00	

Table 21 shows that 51 percent of the farmers agreed with the statement. However, there is wage inequality between women and men in agriculture in Turkey (TURKSTAT, 2018). Sverage monthly wages in agricultural businesses in 2019 were TRY 2,041 for women and TRY 2,486 for men, which signifies that wages for men are 22 percent higher than for women. This shows the importance of supporting women and increasing awareness and communication on gender issues through gender mainstreaming in agriculture and agro-based sectors.

As the second question about gender inequality in agricultural marketing, respondents were asked for their opinions on the statement "Female farmers face more problems than male farmers when marketing their farm products."

Table 22. Farmers' Opinion about Gender Inequality in Agricultural Marketing

Variable: "Female farmers face more problems than male farmers when marketing their farm products"	Freq.	Percent	Cum.
Not Sure	5	10.20	10.20
Disagree	15	30.61	40.82
Agree	29	59.18	100.00
Total	49	100.00	

Most (59 percent) of the farmers agreed with the statement. This shows that a significant number of survey respondents believe there is gender inequality in agricultural marketing. In order to analyse further the way in which gender influences farmers' opinions on gender inequality in agricultural marketing, a pairwise comparison of means was carried out with a t-test between female and male farmers, with respect to their opinions about the statement.

Table 23. Pairwise Comparison of Means Problems in Agricultural Marketing and Gender

Variable: “Female farmers face more problems than male farmers when they market their farm products.”						
Gender	Mean	Std.Err.				
Male	1.036	0.163				
Female	1.813	0.216				
Variable: “Female farmers face more problems than male farmers when they market their farm products.”						
Gender	Contrast	Std.Err.	T	P>t	[95%_Conf	Interval]
Female vs Male	0.777	0.271	2.87	0.006	0.230	1.324

Fourteen of the 16 female farmers in the survey agreed with this statement. As expected, the mean for female farmers is higher than the mean for male farmers and the difference is statistically highly significant. This points to the need to support female farmers by providing them with access to digital marketing platforms. This could be achieved by providing them with the necessary equipment for internet access through cooperatives. However, interviews with women’s cooperatives reveal that some of their members do not even have a mobile phone: they use their husbands’ phones when they need to. It may be concluded that lack of access, or limited access, to the internet could constitute a major barrier to female farmers’ access to markets.

Farmers’ Participation in the Activities of Cooperatives

Besides becoming members of cooperatives, it is important for farmers to participate actively in the activities which cooperatives organise if they are to benefit fully from these organisations. Table 24 provides information about whether farmers agreed or disagreed with the statement, “I regularly attend the meetings organised by the cooperative/ producers’ organisation that I am a member of”.

Table 24. Farmers’ Participation in Meetings Organised by Cooperatives

Variable: “I regularly attend the meetings organised by the cooperative / producers’ organisation that I am a member of.”	Freq.	Percent	Cum.
Not Sure	2	4.08	4.08
Disagree	3	6.12	10.20
Agree	44	89.80	100.00
Total	49	100.00	

Around 90 percent of the farmers indicated that they agree with the statement “I regularly attend the meetings organised by the cooperative/producers’ organisation that I am a member of.”

Table 25 gives information on farmers’ responses to the statement “Members’ opinions are taken into consideration by the management of the cooperative”. Once again, 90 percent of farmers agreed with the statement, which demonstrates that the majority of the farmers believe that their opinions are considered carefully by the cooperative management. This could increase farmers’ involvement in cooperatives and encourage new members to join.

Table 25. Farmers’ Opinions on the Management of the Cooperative

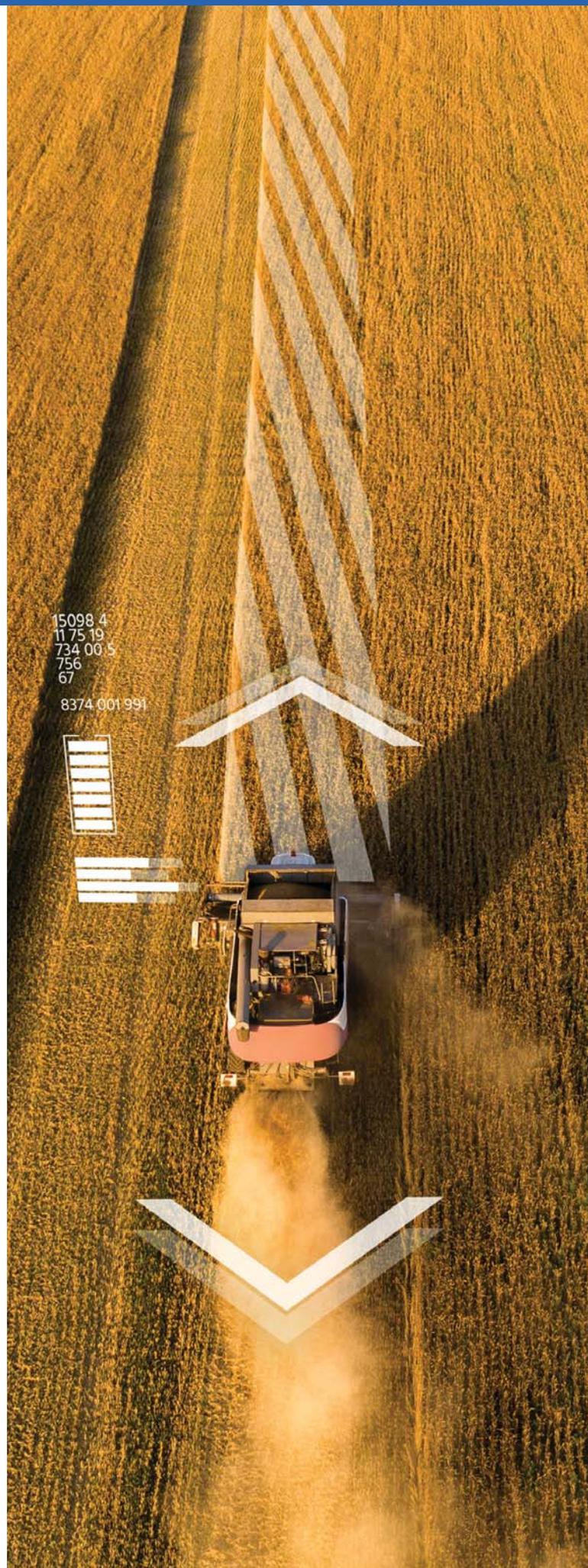
Variable: “Members’ opinions are taken into consideration by the management of the cooperative.”	Freq.	Percent	Cum.
Not Sure	2	3.85	3.85
Disagree	3	5.77	9.62
Agree	47	90.38	100.00
Total	5	100.00	

Farmers’ Demand for Agricultural Extension Services

Table 26 presents information about the demand from the farmers for agricultural extension services on various topics. The area most frequently identified by farmers as one in which they would like to receive training was “Marketing Channels”. About 57 percent of the farmers wanted agricultural training on marketing channels to be prioritised. In second place came “Production Techniques” – a priority for some 20 percent of the farmers. Training on irrigation was the least-chosen response. Overall, the survey results indicate a strong need for agricultural training and extension work in the area of marketing, especially as the farmers had also named marketing as their most important problem during pre-survey telephone interviews.

Table 26. Farmers’ Demand for Agricultural Extension Areas

Variable: “Please choose the agricultural extension areas that you want prioritised.”	Freq.	Percent
Production Techniques	10	19.61
Marketing Channels	29	56.86
Business	8	15.69
Irrigation	4	7.84
Total	51	



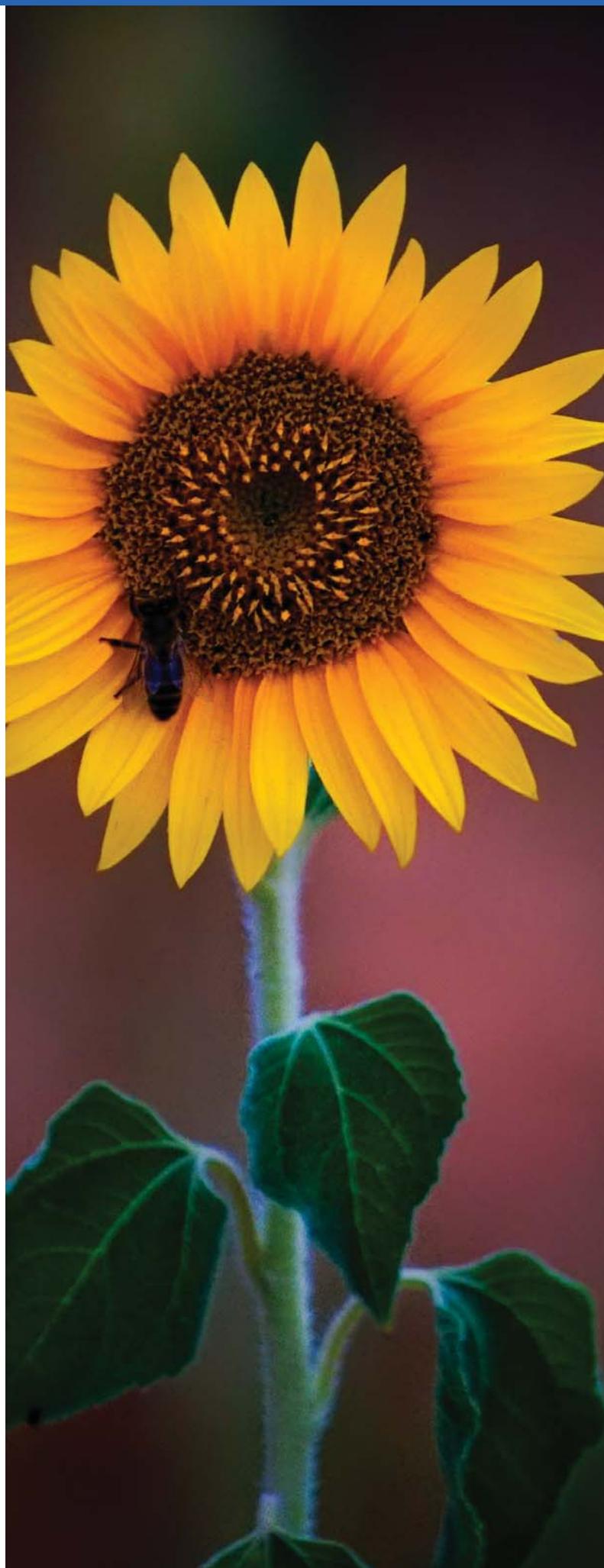
8. POLICY RECOMMENDATIONS

This section discusses a series of policy recommendations to promote the use of digital platforms particularly by smallholder farmers:

- I. Turkey is currently investing in e-commerce applications for virtual marketing, through government-led and privately owned platforms, in order to accelerate digital transformation in agriculture by developing innovative management models and strengthening vertical and horizontal cooperation and R&D infrastructure. We strongly suggest that information about the online marketing tools currently available and about their benefits should be diffused among farmers, particularly given the strong correlation between farmers' level of awareness of DiTAP and their use of it as a major marketing platform.
- II. The use of DiTAP as a major online marketing platform offers many benefits to farmers, such as faster and more reliable access to national markets and increased revenue. Therefore, we suggest making improvements to the technical infrastructure of DiTAP and introducing a system that makes it possible to match unsold products with potential buyers. This would serve to reduce food loss.
- III. End-users benefit from extension services and the dissemination of information on digital applications through cooperatives, international development organisations, universities, and other stakeholders. The MoAF may wish to establish an incentive programme for two to three years in order to provide financial support to smallholder farmers who use DiTAP to market their products. Simple incentives for platform owners might also be considered as a way of increasing the use of digital applications by cooperatives and farmers' organisations.
- IV. Awareness-raising activities should be carried out to disseminate information among farmers about the existing formal agricultural training and extension platforms.. This would enable them to obtain the sectorial knowledge they require from reliable sources.
- V. In the regions covered by this study, agricultural marketing should be prioritised in agricultural extension programmes, as the farmers surveyed identified marketing channels as their top priority for training.
- VI. Poor smallholders should be brought together under farmers' organisations to provide them with better opportunities to sell their products online at decent prices. This is because available capital and current level of production are the most significant predictors of the level of use of digital platforms.
- VII. A training mechanism should be provided towards farmers on use of digital marketing tools. This is because farmers are more likely to sell farm products online with the higher their level of education, awareness of various marketing mechanisms and digital literacy. A training session was held under this study that targeted producer organisations in the four study provinces. This programme is expected to scale up according to priorities of relevant producer groups.
- VIII. There is no evidence that the use of digital services influences farmers' views on climate change. Promoting online marketing alone would not increase farmers' level of awareness. Climate change should therefore be emphasised in all digital applications.
- IX. Female farmers face the problem of not having access to digital technologies. We therefore

strongly suggest that female farmers are supported in gaining access to digital marketing platforms. This support could take the form of providing them with the equipment they need for internet access. This could be done via cooperatives. Similarly, the digital literacy of female farmers and their knowledge of marketing should be improved through various awareness raising activities and the provision of the necessary knowledge products.

- X. Farmers generally buy farm inputs with deferred payments, and pay at the time of the harvest. Buying farm inputs over the internet is not common among farmers. Consequently, there is a need to promote awareness about, and the use of, digital platforms that sell farm inputs to farmers with alternative payment options.
- XI. The efficiency and sustainability of agricultural production and marketing in general should be supported using innovative methods. New models for resilience to climate change should be supported by digitalisation and the importance of vulnerable groups should be emphasised. More efforts and analyses are needed to provide target groups with the necessary means to access digital tools, to improve their knowledge and awareness and to increase their digital literacy.



9. CONCLUSION

This report has evaluated the availability of digital business solutions in the agriculture sector and the demand for these services from the rural smallholders in Turkey. The digital services provided by government organisations, private companies and non-profit organisations were classified taking into account the needs and priorities of producers selecting which of them to use. It was noted that if producers choose digital marketing platforms with high user volume, they have to pay a commission but that these platforms can be used to reach larger numbers of consumers. On the other hand, producers who sell their agricultural products in high volumes may prefer to use the government-provided digital marketing platforms.

The survey conducted in this study referred that the farmers were in need of multiple forms of support, from rural finance to training in how to use digital platforms effectively in their business solutions. Agricultural support programmes could be developed to finance the needs of farmers for the equipment and infrastructure they need to access digital services. Training programmes about the availability of these platforms and how to use them are also essential as a way of increasing digital marketing.

The survey results show that farmers use the internet to obtain information, but they do not use it much to access formal training and extension services. Accordingly, there is a need to disseminate information about the existence of formal agricultural training and extension platforms among farmers. Similarly, online purchases of agricultural inputs were not common among the farmers surveyed. The use of online channels to purchase inputs can be increased by adjusting digital platform services in such a way as to provide farmers with alternative payment options.

It was found that there is an urgent need to support female farmers' access to digital platforms. This support could take the form of providing them with

the equipment they need to access the internet. This could be done through cooperatives as online transactions require investment and knowledge, collective action through cooperatives could be an effective means of increasing their use.

This report constitutes a first step towards a supply-and-demand analysis of digital platforms. It has identified important factors which could increase farmers' use of digital platforms. We suggest that further studies be carried out that cover more regions and farmers. Larger-scale analysis of broader target audiences will made it possible to attain more beneficial and substantial results.

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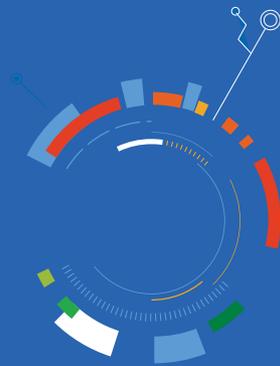
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EMPOWERING RURAL SMALLHOLDERS IN TURKEY
THROUGH DIGITAL MARKETING AND BUSINESS SOLUTIONS
IN POST COVID-19 PERIOD



Food and Agriculture
Organization of the
United Nations



Investing in rural people

