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Opportunities for investments in agricultural water to contribute to a green and resilient recovery and mobilise commercial finance

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BACKGROUND PAPER

Background

Water is an essential driver of agricultural productivity, which supports rural livelihoods, food security and sustainable land use. The agriculture sector accounts for approximately 70% of the world's water withdrawals and 85% of global freshwater consumption (OECD, 2017^[1]). These water needs will rise in the future. In Asia for instance, the area under irrigation is expected to expand by 22% by mid-century, compared to 2010 levels (Rosegrant et al., 2017^[2]).

Sustainable water use in agriculture has a key role to play in achieving the Sustainable Development Goals (SDGs), the Paris Agreement and other policy objectives. This will require a substantial increase in finance and better targeting of existing financing flows. In particular, significant additional capital is needed to support the transition towards sustainable agriculture, including investment in innovation, infrastructure, water use efficiency improvements and capacity building. Select estimates highlight the magnitude of the challenge. For example, globally, at least USD 300 billion are estimated to be required annually to meet the SDGs related to food security (UNCTAD and Convergence, 2020^[3]). An estimated total of USD 3.1 billion per year are required to meet the projected irrigation expansions across developing countries in the sub-regions of East Asia and Pacific, and South Asia between 2015-30 (Rosegrant et al., 2017^[2]). Agriculture is mostly funded by the public sector but expenditure levels often remain insufficient. Out of 13 countries in the Arab region, 10 have public spending levels for agriculture of only 60% or less from the levels considered "optimal" to achieve policy goals (FAO IWMI, 2019^[4]).

The COVID-19 crisis and its negative impacts on public budgets is exacerbating the financing challenge, while recovery programmes may provide opportunities. On the one hand, the pandemic has entailed a decrease in supply and demand of agricultural products, disrupted supply chains, reduced income of SMEs, including small-scale farmers, and has increased uncertainty on agricultural markets (OECD/FAO, 2020^[5]; FAO, 2020^[6]). The redirection of public finance towards public health and social measures is likely to affect availability of public finance for agricultural water expenditures in the short and medium term, potentially delaying needed maintenance and investment.

On the other hand, a large number of countries have launched recovery packages which directly and indirectly affect the agriculture sector. It is essential that these investments are used to build resilience for agriculture, especially in light of a growing population and climate change. Further, recovery funds could be used strategically to leverage additional commercial investment through blended finance solutions.

This paper discusses key drivers of water risks for agriculture and the need for a green and

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resilient transformation as well as the impacts and responses of the COVID-19 crisis. Further, it highlights the challenges and opportunities to mobilise commercial finance for agricultural water and the role of blended finance, followed by practical examples.

Questions for discussion

1. How can COVID-19 related recovery measures be used to support the transition towards more sustainable and resilient agriculture? How can recovery funds support investments in agricultural water? Which opportunities or barriers could emerge?
2. What are the distinctive features of an enabling environment that are conducive to adequate water-related investments in the agriculture sector in a developed country and emerging country context?
3. Which experiences can be shared on mechanisms to mobilise commercial finance for agricultural water? Where are there opportunities for replication and scaling up?

Water risks for agriculture: Challenges and opportunities for enhancing the resilience and sustainability of the sector

Water risks for agriculture

Agricultural production in many regions will be subject to increasing water risks, arising from climate variability, extreme weather events, depletion of groundwater resources, and growing resource competition from other sectors in the coming decades (Gruère, Ashley and Cadilhon, 2018^[7]). Population growth combined with changing consumer preferences are key drivers for scarce freshwater resources. In sub-Saharan Africa and Northern and Western Africa, annual total renewable water resources per capita declined by 41 percent and 32 percent, respectively between 1997 and 2017 (FAO, 2020^[8]). About 1.2 billion people live in extremely water scarce irrigated or rainfed areas affected by water shortages, of which 520 million live in rural areas (FAO, 2020^[8]). Increasing water scarcity and other water related hazards, such as flooding, are sharp constraints for agricultural productivity. Agriculture accounts for 84% of the economic impact of droughts (OECD, 2017^[11]) and by 2017, droughts, cyclones, floods and cold waves have led to agriculture crop and livestock production losses worth USD 80 billion (OECD, 2017^[11]). Further, agricultural water use undermines ecosystem services, as an estimated 41 percent of current irrigation water use occurs at the expense of environmental flow requirements (FAO, 2020^[8]).

Climate change exacerbates water risks for the agricultural systems. Frequency of droughts might rise by more than 20 to 60 percent by 2100 (FAO IWMI, 2019^[4]) and climate change induced flooding is predicted to increase over more than half of the global surface (FAO, 2020^[8]). In India, for example, productivity of most of the crops is projected to decline by 10 to 40 percent by the end of the century due to higher temperatures, rainfall variability and decreasing access to freshwater for irrigation (Shrivastava, 2016^[9]).

Changing precipitation patterns and temperatures particularly affect rainfed agriculture, which is completely reliant on rainfall and thus more vulnerable to a changing climate. Similarly, small-scale farmers are more susceptible to water constraints because of limited access to irrigation technology and rainwater harvesting options (FAO, 2020^[8]).

Opportunities for a resilient and sustainable transformation

Ensuring that agriculture and food systems meet the needs of a rising population and are able to withstand, recover from and anticipate the impacts of climate change, will require major transformations. Increasing agricultural water efficiency, equity and productivity is vital to achieve and maintain food security, sustainable land use and rural livelihoods. More sustainable management of irrigated areas, as well as water management in rainfed cropland and pastureland areas are critical. Irrigated agriculture is at least twice as productive per unit of land as rainfed agriculture, on average, and could improve resource efficiency and intensify production (World Bank, 2020^[10]). Expanding small-scale irrigation can be profitable and benefit between 113 million and 369 million rural people (Xie et al., 2014^[11]). In Africa, for example, and at least 5.4 million hectares would be viable for small-scale irrigation (Lynch et al., 2019^[12]). On-farm conservation to increase infiltration and water storage in the soil as well as water harvesting and storage systems are solutions for rainfed systems to increase water availability and resilience to droughts (FAO, 2020^[8]). Exploring options for non-conventional sources of water, such as desalination or waste water and measures to reduce water pollution can help reduce water stress further.

Despite significant improvements in water productivity by agriculture over the last decades, continuing investments in innovation, infrastructure, including transportation and the provision of information and communication technologies, and in biosecurity, are needed to strengthen the productivity and resilience of the sector. Farmers, and particularly female farmers, face challenges accessing irrigation equipment or improved inputs, and/or they lack the skills or technology for water retention or other improved water management practices. Barriers constitute of tenures, lacking access to finance and credit and limited market access (FAO, 2020^[8]). In Africa and Asia, for instance, farmers could improve crop yields in semi-arid regions through water harvesting but are reluctant to invest due to low returns and an average payback period of 4-5 years (Bouma, Hegde and Lasage, 2016^[13]). Public investments in water accounting and disseminating of results together with awareness-raising campaigns and capacity building for farmers can support farmers in engaging in sustainable water use. Removing barriers and facilitating access to finance for small and medium scale farmers also plays an essential role in paving the way for a sustainable transformation of the sector.

The COVID-19 pandemic: Challenges and opportunities

The COVID-19 crisis has created additional pressures on the agriculture system, but simultaneously creates opportunities to support a green and resilient recovery.

Impacts

The pandemic induced a decline in disposable income, especially in low-income countries. Rural areas and SMEs, including small-scale farmers, are expected to be disproportionately hit by the crisis. Preliminary evidence suggests that half of the SMEs in OECD countries are already facing severe lost revenue (FAO, 2020^[6]) and 48 million to 135 million people will be pushed into poverty worldwide (Loayza, 2020^[14]). In developing countries, income shocks have severely affected farmers and informal workers in rural areas, with 65% of poor working adults making a living through agriculture (Castañeda et al., 2016^[15]).

COVID-19 and policy response measures have caused transportation problems, labour and input shortages and an overall contraction in both supply and demand of agricultural products. (OECD/FAO, 2020^[5]). The latter increased the likelihood of agri-food companies to underperform

or to default on loans, increasing overall market uncertainty. Further, the current crisis downgraded the risk profile of many existing borrowers and fund managers may not be authorized to provide them with additional liquidity. There is early evidence showing that commercial investors are unlikely to provide a needed levels of financing due to risk concerns (FAO, 2020_[6]).

Responses

In order to address the economic impacts of the COVID-19 crisis, governments introduced a wide set of policies and fiscal support with direct and indirect implications for the food and agriculture sector.

Agriculture and food related measures include general financial support schemes for affected farmers and other actors in the sector, including credit lines, loan guarantees, loan repayment deference and lower interest rate loans. An example of support measures directly affecting water management for agriculture is Israel's response, preparing to release a water quota to manage an increase in agricultural production to secure the internal demand. China prioritised water, electricity and gas supply to animal feed and poultry producers, slaughterhouses and processors. (OECD, 2020_[16])

Further, many countries instituted temporary administrative and regulatory flexibilities to agriculture and agro-food companies, including temporarily halted or delayed on-farm compliance inspections or temporarily relaxed conditionality, cross-compliance or green measures, such as in several EU member states. For example, Germany delayed the application of its amended fertiliser ordinance (OECD, 2020_[16]). Such actions could have negative impacts on water quality and quantity and sustainable water management.

In addition to agricultural-related measures, countries' **general economic relief measures** also apply to firms and actors in the agriculture sector, such as direct support to business and the self-employed. Fiscal support across countries worldwide amounts to almost USD 8 trillion (IMF, 2020_[17]). However, liquidity enhancing measures may remain out of reach for SMEs in the agri-food sector, especially in countries where commercial banks already struggled to reach this segment before the crisis (FAO, 2020_[6]).

It is essential that the COVID-related policies support a green recovery and focus on the provision of public goods and services that underpin the competitiveness and resilience of the sector. Pre-COVID, only 17% of the total support to the sector was allocated to general services, supporting innovation, information technologies and services that create enabling conditions for the sector on 2017-19 average². COVID recovery funds need to be used strategically to create a robust environment for future investments, strengthen farmers' resilience and improve their access to finance. For the latter, intermediaries can play a crucial role.

There is an opportunity to step up blended finance solutions to mitigate the COVID-19 crisis, such as governmental loan guarantee schemes to push financial institutions to provide affordable loans to micro, small and medium enterprises (FAO, 2020_[6]). These opportunities as well as other options to mobilise commercial finance are discussed below.

² The other two components are consumer support and producer support, the latter accounting for 74% of the 2019 total net support to agriculture in OECD countries (OECD, 2020_[16]). Background paper 1 gives detailed insights on estimates and trends of government water-related agricultural support in OECD and emerging countries.

Mobilising commercial finance to scale up investment

A robust enabling environment is key to attract commercial investment

Given the substantial investment needs to transition towards sustainable and resilient agricultural water management, it is essential to mobilise additional sources of finance to complement public funds. Commercial finance can help bridging the financing gap. Commercial finance includes public finance (sovereign wealth funds or public pension funds) as well as private finance, (including SME and small-scale farmers), which is seeking market rate returns (OECD, 2019^[18]). SMEs in particular are expected to play a critical role in supporting the transition to sustainable agriculture, but face challenges in accessing appropriate financial services (AGRA, 2019^[19]).

The engagement of private investors and commercial lenders is determined by the attractiveness of the risk-return profile of investments which depends on three factors: i) a stable revenue stream; ii) how the range of risks related to water security investments are shared between public and private actors and iii) transaction costs (OECD, 2018^[20]). Revenues are the main driver of financial sustainability and hence the potential return for commercial financiers and investors. It is hence vital that revenue streams are clearly defined, improving the borrower's creditworthiness or the bankability of water-related projects. Creating revenue streams requires regulated decision-making processes related to pricing and to the collection of charges, contributing to cost-recovery and the improvement of the financial case for water-related investments. Economic instruments can help to convert benefits from water-related investments into revenue streams, e.g. approaches applying the Polluter Pays Principle and Beneficiary Pays Principle, for instance, via through multi-stakeholder engagement (e.g. Water funds, see below).

In certain contexts where the enabling environment is especially weak, investors consider the agriculture sector as too risky, especially at the primary production level, and therefore as unattractive. Some of the main causes of the risks typically associated with agricultural investment are inconsistent and unpredictable agricultural and/or subsector policies, or legislative, regulatory and institutional bottlenecks (FAO, 2019^[21]). Additionally, there is a need for appropriate analytical tools and data to assess complex water-related investments and borrowers' creditworthiness as well as climate-related water risks (OECD, 2018^[20]).

The mobilisation of commercial finance requires a robust enabling environment with institutional arrangements, clearly defined roles and capacities and available data and information. Strong inclusive water governance across sectors, mutually supportive policies and a comprehensive legal framework with coherent incentives and regulatory measures are elements of a supportive environment and improve predictability and the sector's attractiveness for investors. A strong enabling environment also provides incentives for the sustainable management of water resources, minimise overall investment needs and reduce the risk of investments failing to deliver expected benefits. (OECD, 2020^[22]) [Background paper 1](#) discusses characteristics of a conducive policy environment in more detail.

Blended finance can play a major role to scale up commercial investment

Public investments can be deployed strategically to strengthen the enabling environment and to improve the risk-return profile of water-related agricultural projects, using blended finance solutions. Blended finance is defined as the strategic use of development finance (such as ODA and funds provided by philanthropic foundations) for the mobilisation of additional commercial finance towards sustainable development in developing countries (OECD, 2018^[23]). Blended approaches have a dual aim: i) mobilise additional capital for investments, and ii) serve a market building role, to help strengthen the financing systems upon which investments rely

through greater accountability (OECD, 2018^[20]). Mechanisms can range from grants, guarantees, loans, credit enhancements to technical assistance. The latter has played a strategic role in the agri-food sector (FAO, 2020^[6]), supporting the dissemination of information, knowledge, innovation and capacity building among borrowers. Further, it can enhance the entrepreneurial capacity and innovation of SMEs, which could be especially relevant in the aftermath of the COVID-crisis and supporting a resilient recovery.

In 2017-18, a small share (3.3%) of the amounts mobilised from the private sector by official development finance interventions were dedicated to agriculture, forestry and fishing (compared to 28% to the energy sector) (OECD, 2020^[24]). The number of blended finance vehicles targeting the agricultural sector in developing countries has been rising over the last decades (Schrevel, 2020^[25]) and according to a Convergence report (2019^[26]), the sector is “ripe for more blending”. At present, transactions have mostly focused on Sub-Saharan Africa with relatively small deal sizes (ca. USD 55 million) and primarily in the form of concessional debt or equity, followed by technical assistance funds (Havemann, Negra and Werneck, 2020^[27]).

The following section highlights several examples of approaches to mobilise commercial finance for agricultural water investments, including blended finance. The selected mechanisms range from grants for technical assistance and training along the supply chain, public-private partnerships for irrigation investments to risk financing instruments.

FAO's Investment Centre helps to strengthen the enabling environment

FAO's Investment Centre facilitates public-private policy dialogues to improve the enabling environment for private investors. It supports the improvement of the efficiency and sustainability of food value chains to open new market opportunities and provides private investors with training, market research and innovation. Most of the Investment Centre's work on private sector investment is with the European Bank for Reconstruction and Development (EBRD). In 2018, the EBRD and the Investment Centre jointly signed 16 new technical assistance assignments in nine countries for a total amount of USD 5.8 million. FAO-EBRD projects have been located in countries such as Ukraine and Serbia, Kazakhstan and Kyrgyz Republic or Morocco. Overall, most of the Investment Centre's projects are located in Asia and the Pacific region (16 projects with USD 4 526 million investment, accounting for 63% of the value of all investment projects), followed by Sub-Saharan Africa (18 projects, 20% of all investments). (FAO, 2019^[21])

Cost-share irrigation investments in Chile

The Chilean government has set up a **public private partnership** (PPP) arrangement to mobilise private investment for dam constructions. Between 2014 and 2018, the Chilean government launched the construction of five large dams, allowing for irrigation of around 8 000 farms covering 40 000 ha in the central and northern regions, for a total investment of USD 1.3 billion. Three of the five dams were developed under a cost-share mechanism: the state financed a part of the total cost, private investors built, exploit and maintain the dam, and the end users pay the license holder for water stored. Initially, the approach had faced opposition from farmers fearing higher costs of water. Eventually, the project led farmers to shift their production to high-value agriculture (e.g. fruit trees) or to sell their land to other farmers.

A second initiative to support private investment in irrigation in Chile is the **cost-share grant programme for small-scale initiatives**. Under this programme, small and medium sized owners can complement their investments in irrigation and drainage projects for community or individual works with public grants. Since the according law entered into force in 1986, about 23 000

farmers have benefitted from the program, which contributed to develop irrigation on 200 000 ha, including a growing number of small farmers over time. The programme also enabled 500 000 beneficiaries to shift to pressurised irrigation, representing a total area of 325 000 ha. (Gruère, Ashley and Cadilhon, 2018^[7])

Water funds and payments for ecosystem services

Corporates with water-intensive activities and utilities, such as breweries or beverage companies or other stakeholder have an interest in improving or conserving water quality and quantity, which reduces their costs of water treatment or improve the quality of their products. Water funds are collective investment vehicles which allow stakeholders to provide and pool capital to fund improved water management or to pay for ecosystem services ('Beneficiary Pays'). Farmers can thus be compensated for decreased fertiliser use and improved water management practices. The investments do not need to be repaid and investors do not get any return on investment. The profitability of such capital provision emerges from the positive impact on actors in the spatial area reliant on water resources.

The brewery Heineken, for instance, invests in the Monterrey Metropolitan Water Fund (FAMM) in Mexico, which, to date, has leveraged USD 9.1 million with an implementation area of 1,387ha. Since the establishment of a first Water Fund in 2000, another 35 funds have been set up in South and North America, Kenya and South Africa. Water Funds are an effective tool to tackle governance failures in multi-stakeholder settings and can mobilise multiple types of funding sources. Yet, development finance remains essential to support the set up of these complex structures that bring together the needs of the various commercial actors as well as the different sources and expectations regarding returns. (Trémolet, S. et al., 2019^[28]; OECD, 2019^[18]; Latin American Water Funds Partnership, 2020^[29])

Following the Beneficiary Pays principle, most of the water utilities in England and Wales, Eau de Paris in France, as well as the water companies Vittel-Nestlé and Volvic in France, have made agreements with farmers and compensate them for environmental services and sustainable water resource management. (Trémolet, S. et al., 2019^[28]; OECD, 2020^[30])

Risk financing in agriculture

Risk management strategies will be increasingly necessary to protect the agriculture sector against climate risks. Risk financing instruments, such as insurances, are pre-disaster arrangements coming into play in a post-disaster phase and can provide incentives for farmers to develop risk management strategies and to reduce risk exposure. Costs for agricultural insurances are generally relatively high and premiums are heavily subsidised. Out of 65 developed and developing countries, almost two-thirds subsidized premium costs with an average subsidy rate of 47 percent (Mahul and Stutley, 2010^[31]; FAO, 2018^[32]). For developing countries, it remains difficult to provide subsidized coverage for numerous small scale family farmers. New approaches such as weather-index-based insurances aim to address this challenge. The insurance holds, when rainfall or temperature exceed or fall under a specific threshold, and measurements are taken by weather stations or satellite technology. This reduces assessment and operational costs for insurers, reducing the premium costs. In India, for example, the Weather-based Crop Insurance Scheme covers over 13 million farmers for various climate risks. In sub-Saharan Africa, the Agriculture and Climate Risk Enterprise (ACRE) is the largest index insurance programme among developing countries in which the farmers pay a market premium, and the first agricultural insurance programme globally to reach smallholders using mobile technologies. However, these programmes still require public support through subsidies. (Greatrex et al., 2015^[33])

Technical Advisory Services and concessional loans to improve access to financing for small-scale farmers in the Philippines

The thrift CARD SME Bank in the Philippines partnered with the International Finance Corporation (IFC) to expand access to finance for small-scale farmers. In the Philippines, bank loans are out of reach for many farmers with informally run businesses, since they cannot comply with the documentary procedures and collaterals required by the banks. Due to high exposure to extreme weather events and perceived low creditworthiness of borrowers, investors consider agricultural lending very risky.

During a pilot phase starting in 2013, CARD SME Bank in cooperation with IFC, designed and rolled out an agri-finance strategy, trained loan officers on credit assessment in the sector and developed a credit scoring tool to assess viability of each crop and to understand production cycles. Linking the repayment schedule to the production cycle minimized repayment risks, and overall loan disbursement and the number of client farmers grew substantially.

After the successful pilot phase, IFC provided a seven-year concessional loan package at competitive market rates to CARD SME Bank in 2016. The proceeds of the loan were blended with CARD SME Bank funds and disbursed to client farmers, tailored to their needs. Loans would range from between three months to three years with volumes between about 500 and 85 000 EUR. Repayment is tailored to the production cycle. Financing is accompanied by advisory services enhancing farmers' awareness of new technology, innovations and production and marketing strategies. With this approach, CARD SME Bank's loan disbursement rose by 241% between 2016 and 2017 to reach underserved small-scale farmers and agribusinesses. With this new access to finance, farmers were able to expand production, input supply, and transportation and to improve their income. (SAFIN IDB, n.d.^[34])

A role for intermediaries, to minimise transaction costs and secure access to credit services

The illustrations above provide concrete options to address two intertwined issues: transaction costs for agriculture water projects and access to credit services. Transaction costs can be high when projects are too small in light of the time it takes to review them and finalise contractual arrangements, or when project owners and commercial banks have limited opportunities to meet and discuss business opportunities. This can be the case when small holders living in distant communities fail to engage with commercial banks lacking a local presence, settled in urban areas, or when lack of financial literacy or communication technologies hinder engagement with financial institutions.

Most of the cases referred to above illustrate how intermediaries can provide a bridge between project owners and financing institutions, by bundling projects together (thereby making them big enough to attract the attention of financiers), standardising review processes (aligning project features with standard operating procedures in commercial banks) or otherwise.

More research would help characterise the functions discharged by intermediaries, their mode of operation and business models, and initiatives public authorities could consider (at national or subnational level) to support their development and operation when they contribute to rural livelihoods, food security and sustainable land use.

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