



PHILIPPINES



NDC Private Sector Engagement Project

# Engaging private sector in NDC implementation - Assessment of private sector investment potential in the agriculture sector

EXECUTIVE SUMMARY



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UNDP's work on climate change spans more than 140 countries and USD \$3.7 billion in investments in climate change adaptation and mitigation measures since 2008. With the goal to foster ambitious progress towards resilient, zero-carbon development, UNDP has also supported the implementation of the Paris Agreement on Climate Change by working with countries on achieving their climate commitments or Nationally Determined Contributions (NDCs).

## THE UNDP NDC SUPPORT PROGRAMME

The NDC Support Programme provides technical support for countries to pursue a “whole-of-society”, integrated approach that strengthens national systems, facilitates climate action and increases access to finance for transformative sustainable development. The programme helps countries address these financial barriers by deploying a structured approach for scaling up sectoral investments and putting in place a transparent, enabling investment environment. Beyond direct country support, UNDP facilitates exchanges and learning opportunities on NDC implementation at the global and regional level by capitalizing on our close collaboration with the UNFCCC and other strategic partners. The Programme, which works in contribution to the NDC Partnership, is generously supported by the German Federal Minister for the Environment, Nature Conservation, and Nuclear Safety (BMU), the German Federal Ministry of Economic Cooperation and Development (BMZ), the European Union and the Government of Spain.

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# EXECUTIVE SUMMARY

Transforming Nationally Determined Contributions (NDCs) into tangible actions that lead to long-term zero-carbon and climate-resilient development requires financing. Access to finance is fundamental to realize the objectives set by the NDCs. However, countries continue to face challenges in securing the resources needed to achieve their NDC targets. A significant share of the financing required is expected to be provided by the private sector.

To increase private investment in NDC targets, it is important that the private sector stakeholders engaged in markets and industries understand the business environment, current market and investment potential in specific sectors.

This report estimates the private sector investment potential for delivering NDC sectoral targets for the agriculture sector in the Philippines through assessments of the sectoral mitigation targets, the enabling environment, current market and the Philippines' investment potential.

## GREENHOUSE GAS EMISSIONS AND CLIMATE TARGETS

The Philippines is a relatively low GHG emitter, accounting for only 0.3 percent of global GHG emissions. However, the country is highly vulnerable to the impacts of climate change due to its location on the tropical rim of the Pacific Ocean and its archipelagic grouping of water-bound islands. These impacts include sea level rise, increased frequency of extreme weather events, rising temperatures and extreme rainfall. The Philippines was ranked as the second-most affected country by extreme weather events in 2018. It is also one of the countries most affected by recurring catastrophes over a 20-year period, ranking as the fourth-most affected country globally from 1999 to 2018.

As the country's economy develops and its population continues to grow rapidly, its GHG emissions will also likely increase at a higher rate in coming decades. Data from 2010 show that the Philippines emitted 114.5 million metric tons of carbon dioxide equivalent (MtCO<sub>2</sub>e), including the amount of carbon sequestered by land use change and forestry. The energy sector was the largest contributor to the country's GHG emissions, followed by the agriculture, transport, waste and industrial processes sectors.

The Philippines' gross domestic product (GDP) has been growing annually, on average, by 6.5 percent over the last five years and is expected to strengthen further in the medium term to about 7 to 8 percent. At the same time, its population is expected to increase from around 100 million in 2014 to around 140 million in 2050. This increase in economic activity will increase GHG emissions. Projections reveal that under a business-as-usual (BAU) scenario, GHG emissions will grow by over 800 percent by 2050.

The agriculture sector is a key driver of the country's economy, with a large percentage of the population relying heavily on agriculture for food security. The adverse impact of climate change on the agriculture sector increases the vulnerability of the entire population, particularly of the sector's stakeholders. For example, in 2012, the agriculture sector declined with decreased production of major crops, such as rice and sugarcane, due to floods that severely affected rice farms in Davao, changes in harvest schedules in Western Visayas and Cagayan Valley, and frequent rains negatively affecting crop yield in Bukidnon, Davao del Sur and Lanao del Sur.

GHG emissions in the sector totalled 49.2 MtCO<sub>2</sub>e in 2010. Methane (CH<sub>4</sub>) emissions from anaerobic conditions in continuously flooded rice fields during rice cultivation represent the largest source of GHG emissions in the agriculture sector. These emissions totalled 19.2 MtCO<sub>2</sub>e in 2010, or 39.1 percent of the sector's total emissions. The second-largest source of GHG emissions come from N<sub>2</sub>O emissions from the use of synthetic fertilizers in agricultural soils, amounting to 10.4 MtCO<sub>2</sub>e (21.2 percent). The livestock subsector also represents a significant source of GHG emissions, generating methane emissions from enteric fermentation (mainly from cattle and carabaos) and both methane and N<sub>2</sub>O emissions from the decomposition of livestock manure. By 2050, GHG emissions from the agriculture sector are projected to increase by 30 percent over 2010 figures, to about 68 MtCO<sub>2</sub>e. Rice cultivation is project to remain the largest source of GHG emissions, even with land area planted assumed to be constant in the baseline.

The Philippines' INDC notes that the country intends to reduce GHG emissions by about 70 percent relative to its BAU scenario by 2030. This is conditional on financial resources, technology development and transfer, and capacity building, that will be made available to the Philippines. Emission reductions will come from the energy, transport, waste, forestry and industry sectors. However, the INDC does not include information on how the mitigation target of 70 percent will be achieved in each.

The government's general approach to meeting its committed mitigation targets in the INDC is to achieve climate resilience and improve adaptive capacity as prerequisites for low-emission development. The government prioritizes adaptation and adopts it as the anchor strategy for carrying out the mitigation actions.

Adaptation measures identified for the agriculture sector include enhancing climate and disaster resilience. The INDC does not include contributions from agriculture sector mitigation efforts, so no specific mitigation actions are identified for the sector. It does note, however, that mitigation actions in the agriculture sector were included in the cost-benefit analysis study conducted by the United States Agency for International Development for the Climate Change Commission (CCC) of the Philippines. This indicates that inclusion of the agriculture sector is being considered during development of the NDC to be submitted by 2020.

Mitigation options identified for the agriculture sector are as follows:

- Improved management of fertilizer to increase the use of organic fertilizer, resulting in decreased use of synthetic fertilizer;
- Alternate wetting and drying (AWD) in rice production, which allows rice fields to periodically dry out, reducing CH<sub>4</sub> emissions;
- Crop diversification to include leguminous crops, resulting in decreased synthetic fertilizer use; and,
- Use of biodigesters in livestock production, which capture and destroy CH<sub>4</sub> and N<sub>2</sub>O emissions from the decomposition of animal manure and produce renewable energy that replaces traditional fuels.

The Department of Agriculture (DA) emphasized that the overall priority for the agriculture sector is to enhance its resilience and reduce/remove emissions whenever possible. The mitigation options above are cross-cutting actions, offering both adaptation and mitigation benefits. As such, these options could be prioritized for the agriculture sector, as the DA notes. The DA is also in the process of identifying potential adaptation and mitigation measures in the agriculture sector that could be part of the Philippines' NDC. In September 2020, it transmitted a list, to the CCC, of 12 adaptation measures for the sector; 11 of them have mitigation co-benefits. The mitigation options prioritized above are included, along with additional adaptation measures that offer mitigation co-benefits, such as the use of microbial inoculants that fix atmospheric nitrogen and improve plants' ability to absorb minerals efficiently, use of herbicide-tolerant crops, use of genetically engineered pest-tolerant crops, use of solar-powered pumps, use of lactobacillus as feed supplement, conversion of chicken manure to organic fertilizer, biomass-based power plants, and bamboo plantation. With support from its development partners, the DA is studying the potential impacts of these additional measures.

The agriculture sector is important to the Philippines' economy. It is a significant contributor to the country's GDP, provides employment in most rural areas and is key to achieving food security. However, it is one of the sectors most vulnerable to climate change and its impacts, including extreme weather events, such as the strong typhoons that have hit the Philippines in recent years, severe dry spells caused by the El Niño phenomenon, and flooding due to increased amounts of precipitation. The Government of the Philippines has emphasized the importance of prioritizing the implementation of adaptation measures to address the challenges of climate change, particularly in the agriculture sector. The government has also highlighted that public financing will prioritize adaptation and that private sector participation will be encouraged to optimize mitigation opportunities. Cross-cutting measures were identified that could be included as mitigation actions in the country's NDC, which is being developed. As such, these mitigation actions represent opportunities for private sector investment in the agriculture sector.

## ENABLING ENVIRONMENT

The existence of an enabling environment, including related legislation, laws, programmes and plans, is crucial to achieve the sustainable development targets in any country. The Philippines has developed a wide range of policies related to climate change and the agriculture sector that emphasize the need to involve the private sector.

### CLIMATE-CHANGE RELATED POLICIES

The Government of the Philippines recognizes the importance of integrating climate change considerations into its policies, strategies and plans, as reflected in the creation in 1991 of the Inter-Agency Committee on Climate Change to formulate domestic policy responses and strategies to address climate change challenges. This paved the way for the Philippine Congress to enact special laws and implement national measures on environmental preservation, including taking into account the effects of climate change on the different sectors. Since the late 2000s, climate policymaking and climate diplomacy have intensified. Policies enacted include the Biofuels Act of 2006, aimed at pursuing energy self-sufficiency through the production and use of biofuels, and the Renewable Energy Act of 2008, which promotes the development, use and commercialization of renewable energy resources. The Presidential Task Force on Climate Change was created in 2007 to address and mitigate the impact of climate change in the Philippines, focusing particularly on adaptation, mitigation and technological solutions.

The Climate Change Act of 2009 mainstreams climate change in government policy formulations, establishing the climate change framework strategy and programme. The National Framework Strategy on Climate Change (NFSCC) was developed and adopted in 2010 under the mandate of the Climate Change Act of 2009. The NFSCC aims to build a roadmap that will serve as the basis for a national climate change programme. It also seeks to establish an agenda through which the Philippines could pursue a dynamic process of determining actions through the National Climate Change Action Plan (NCCAP). The NCCAP outlines the country's 2011-2028 adaptation and mitigation agenda. It emphasizes that public financing will prioritize adaptation to reduce vulnerability and risks to communities, particularly the marginalized poor. At the same time, it will provide a policy environment that will encourage private sector participation to optimize mitigation opportunities towards sustainable development.

### AGRICULTURE-RELATED POLICIES

The Philippines has developed several policies that guide development of the country's agriculture sector. The Agriculture and Fisheries Modernization Act of 1997 (AFMA) is the primary policy on the development of the agriculture and fisheries sector. It is considered a landmark law and the basis for the major programmes and policies to develop the sector. To achieve the AFMA's goals, the DA is developing the Agriculture and Fisheries Modernization Plan (AFMP) for the period 2018-2023. It constitutes one aspect of the long-term effort and focuses on food security; poverty alleviation and social equity; income enhancement and profitability; global competitiveness; and sustainability. It also incorporates climate change, disaster risk reduction and climate resilience considerations for the agriculture sector. The AFMP aligns with and provides details on the agriculture chapters of both the NCCAP and Philippine Development Plan 2017-2022.

The Philippine Development Plan 2017-2022 is the first medium-term plan anchored on Ambisyon Natin 2040 (Vision 2040). The Plan aims to lay a stronger foundation for inclusive growth, a high-trust society and a globally-competitive economy toward realizing the vision by 2040. Specific to the agriculture sector, the main target is to substantially increase gross value added in the sector (including forestry) from the baseline value of 0.1 percent to between 2.5 and 3.5 percent in 2017, and maintain that growth over the next five years.

Opportunities in agriculture under the Plan will be expanded by fostering linkages with the industry and service sectors for more efficient value-adding processes and more effective commercialization. This will require increasing agricultural productivity by, first, developing an integrated agricultural map to identify the comparative advantage of particular areas. The next step will involve strengthening collaboration between and among the science, technology and extension systems in agriculture. Greater farm mechanization and technology adoption will be promoted, organized farm management will be encouraged to achieve economies of scale and climate-resilient small-scale irrigation systems will be constructed or retrofitted, as necessary.

## **PRIVATE SECTOR ENGAGEMENT AND INVESTMENT-RELATED POLICIES**

Policies supporting private sector development in the agriculture sector are limited in the Philippines. In general, the country recognizes the indispensable role of the private sector in sustainable development and has enacted a law that would allow for public-private partnerships.

The Sustainability Reporting Guidelines for Publicly Listed Companies of the Securities and Exchange Commission aims to promote sustainability reporting that is relevant and value adding for publicly-listed companies (PLCs). Specific to climate-related issues, the guidelines incorporate recommendations from the Task Force on Climate-related Financial Disclosure, focused on climate-related risks, opportunities and financial impacts, and scenario analysis. The guidelines provide classifications and materiality assessments to determine what constitutes a sustainable investment, providing a more favourable investment environment for PLCs.

The Sustainable Finance Framework of the Bangko Sentral ng Pilipinas (BSP) could further encourage private sector investment toward NDC actions. It is the policy framework that sets out the BSP's expectations regarding the integration of sustainability principles, including those covering environmental and social risk areas, in corporate governance and risk management frameworks, strategic objectives and bank operations. It recognizes the financial industry's critical role in pursuing sustainable and resilient growth by enabling environmentally and socially responsible businesses to make decisions in line with the country's development plans and goals.

## **OVERALL BUSINESS ENVIRONMENT**

The overall enabling environment for private investment in the agriculture sector in the Philippines is relatively strong. The government has emphasized the need to involve the private sector in the agriculture sector's sustainable development while addressing climate change. The Philippines is one of the faster-growing economies in Southeast Asia and although its economic growth is expected to be severely affected by the COVID-19 pandemic, it is likely to recover gradually as global conditions improve.

Despite the decline in the country's economic outlook due to the pandemic, the government has developed policies and strategies supporting the development of private investment towards low-carbon development, including in the agriculture sector. Policies such as the AFMA and the BOT Law provide incentives to encourage private sector participation. The regulatory framework also supports investment in the agriculture sector, providing conditions and incentives that encourage foreign direct investment and cross-border investment.

## **CHALLENGES, RECOMMENDATIONS AND POTENTIAL FOR PRIVATE SECTOR INVESTMENTS IN THE AGRICULTURE SECTOR**

The country's existing policy, strategies and plans encourage private sector investment in the Philippines' agriculture sector. However, the sector is constrained by barriers and challenges that prevent private sector investment from scaling up. These barriers and gaps need to be addressed to support private sector participation in the sector.

### **CROP PRODUCTION**

Mitigation actions related to crop production identified in the Philippine agriculture sector include improved management of organic and inorganic fertilizers, AWD in rice production, and crop diversification.

Crop production in the Philippines is structured around producers, who are the main drivers for the adoption of low-carbon technologies in the agriculture sector. Crop production in the country is defined by the area of land available to farmers and is dominated by smallholder farmers. The crop production value chain includes larger stakeholders, such as large-scale agricultural companies. They include both locally-owned and predominantly foreign-owned companies that provide agricultural inputs and services, integrated cooperatives under private profit-making management, bulk buyers and dealers, and food processing firms. Agricultural innovation is spearheaded by research institutes and DA agencies, such as the Agricultural Training Institute and Philippine Rice Research Institute. Technology providers in crop production include providers of support services and farm equipment. Capital providers in the value chain range from large commercial banks to community-based organizations.

The country's existing policy, strategies and plans encourage private sector investment in the Philippines agriculture sector and the crop production value chain. However, several challenges limit the sector's development. These include low agricultural productivity, high production costs, high vulnerability to climate change, lack of investment in technology and innovation, limited access to financing, and land ownership uncertainties.

#### RECOMMENDATION AND POINT OF ENTRY 1

##### **Incentivizing private sector investments in crop production mitigation actions**

The government's focus on crop production and the agriculture sector in general is to achieve self-sufficiency and food security. The priority in terms of climate change actions is adaptation actions that consider mitigation actions if the latter are cross-cutting and/or offer co-benefits with associated adaptation actions. As such, the current enabling environment is not tailored to private sector investment in advanced low-carbon technologies, measures and practices in crop production.

Incentives are needed to encourage the private sector to invest in sustainable low-emission technologies in order to scale up. This could be achieved through financing instruments to support mitigation actions, such as climate finance or carbon finance from international organizations and/or donors. Such instruments include the Green Climate Fund, Nationally Appropriate Mitigation Action Facility and future mechanisms expected to be operational under Article 6 of the Paris Agreement, including CORSIA, under which demand for carbon offsets could be sourced from existing crediting mechanisms.

#### RECOMMENDATION AND POINT OF ENTRY 2

##### **Making precision agriculture accessible to smallholder farmers**

Precision agriculture, which involves the proper and efficient use of fertilizers, relies on high-level technology, machinery and equipment. Crop production in the Philippines is dominated by smallholder farmers, who generally have no access to such technologies. However, solutions targeting smallholders could be provided to improve the management of fertilizer application. For example, very small landowners could apply micro-doses of fertilizer manually. More advanced farmers, or larger groups of smallholders such as cooperatives and irrigator associations, may have access to more advanced technologies and may consider remote services offered by third-party providers.

#### POTENTIAL FOR PRIVATE SECTOR INVESTMENT IN CROP PRODUCTION

Improving fertilizer management for crop production, specifically through the use of organic fertilizer, as well as introducing climate-smart agriculture practices, such as precision agriculture for the proper and efficient use of fertilizers, offer strong good potential for private sector participation. The private sector investment potential in managing the use of organic and inorganic fertilizers is estimated at between \$103 million and \$207 million to achieve mitigation targets by 2030 and 2050, respectively.

Private sector investment potential in disseminating the practice of AWD in rice cultivation is estimated at between \$2.13 million and \$6.40 million to achieve mitigation targets by 2030 and 2050, respectively. However, direct investment in this mitigation action is not expected to generate returns. Hence, innovative financing mechanisms such as carbon financing could be leveraged to enable private sector participation.

In terms of crop diversification through intercropping of leguminous plants, the private sector investment potential is estimated at between \$135 million and \$270 million to achieve mitigation targets by 2030 and 2050, respectively.

#### LIVESTOCK PRODUCTION

Mitigation actions identified for the livestock subsector involve using biodigesters to treat and manage swine waste.

The value chain for livestock production is structured around the producers raising livestock, which is the source of most of the subsector's GHG emissions. Livestock producers will be the main drivers for implementing mitigation actions in the subsector. Medium and large producers dominate in areas around major cities. In terms of livestock inventories, smallholder producers have larger market share, but are located farther from major cities.



The country's existing policy, strategies and plans encourage private sector investment in the Philippine livestock subsector. However, the development of the sector is limited by several challenges. These include the lack of government support, lack of technical capacity, high cost of technology, availability of low-cost alternatives and limited access to financing.

#### RECOMMENDATION AND POINT OF ENTRY

##### **Establish enabling environment for quality biodigester technologies and solutions**

Policies and regulations – Previous experience implementing biodigester projects in the Philippines has been primarily private sector-led, with minimal government intervention in terms of regulation. The Bureau of Animal Industry launched the National Animal Waste Resource Management Program in 2015 to promote biogas production in treating livestock waste. However, regulations have not yet been developed to ensure that biogas systems are high quality and meet certain standards.

Establishing an enabling environment for the implementation of biodigester systems is essential for disseminating the technology and scaling up private sector investment. Policies and regulations to be established could include implementation standards, certification for equipment and systems, and incentives.

Awareness campaigns – The Philippines lacks general lack of awareness of biodigester technologies. Awareness is usually created by technology providers who approach individual farms to propose installing their systems. Awareness-raising is needed to highlight the benefits of biodigester systems in terms of cost savings, environmental benefits and social benefits so that farmers can make informed investment decisions.

#### RECOMMENDATION AND POINT OF ENTRY 4

##### **Developing innovative business models focused on sustainability and replicability**

Biogas technology and solution providers have been operating in the Philippines, offering farm owners several business models for operating biodigester systems. These include the BOT model, through which the system is provided to the farmer at no cost. In exchange, the farmer gives the provider the right to build, install and operate the biogas system on the farm premises. The farmer provides the amount of animal waste required to feed the system and then purchases the electricity that the system generates at a discount compared to the cost of electricity from the grid. The biogas system thus meets part of the farm's electricity demand. At the same time, a circular model could be considered for the slurry and residual by-products of the biodigester system, as biogas slurry is a good source of organic fertilizer for crop production.

Establishing an enabling environment to ensure the quality of the biogas systems provided to end-user farmers and developing innovative business models favourable to both technology providers and farmers would encourage the private sector to invest in biodigester systems.

#### RECOMMENDATION AND POINT OF ENTRY 5

##### **Carbon finance to mitigate the high cost of technologies and solutions**

Carbon finance, particularly results-based financing through the generation of emission reduction credits, could be leveraged to reduce the incremental cost of implementing biodigester technologies and solutions. The Philippines has experience in leveraging carbon finance under the Clean Development Mechanism, with most of the country's registered projects related to biogas production through the treatment of animal waste. Although the current status of the carbon market is uncertain, it is expected improve when negotiations over the new mechanisms under Article 6 of the Paris Agreement conclude and become operational.

#### POTENTIAL FOR PRIVATE SECTOR INVESTMENT IN LIVESTOCK PRODUCTION

Private sector investment potential in the use of biodigesters to treat livestock waste is estimated at between \$82.8 million and \$90.4 million to achieve mitigation targets by 2030 and 2050. It is important to establish the enabling environment that would regulate the quality of biodigester technologies and solutions being provided to farmers to



ensure sustainability and allow their dissemination to be scaled up. In addition, technology and solution providers should lead the development of innovative business models that would benefit both farmer end users and the providers' businesses.

## ACCESS TO FINANCE

Access to finance is critical to the Philippines agriculture sector. Short-term financing allows smallholder stakeholders to purchase the inputs required to sustain production, while medium- and long-term financing provides larger stakeholders the capacity to increase their investment in equipment, infrastructure and technology. Investing in additional assets to implement improved crop production practices and livestock waste management by using biogas is essential to reduce GHG emissions from the agricultural sector.

Several financial institutions provide financing to the Philippines agriculture sector; some provide specifically green financing.

Commercial banks in the Philippines provide credit to the agriculture sector. The products and services offered by commercial banks can generally support investments in low-carbon and resilient development in the agriculture sector. However, green products specific to the agriculture sector are not available. This is due primarily to the perceived high risk of both the technologies involved in implementing low-carbon and resilient agriculture-related projects and agriculture sector stakeholders overall, particularly smallholder farmers, who may not meet the requirements of commercial banking.

### RECOMMENDATION AND POINT OF ENTRY 6

#### Encouraging green investments in the agriculture sector

Investments in mitigating the impacts of climate change in agriculture are similar to traditional investments, as they are related to financing equipment, machinery and inputs. However, green investments are considered to be more sustainable in the long term. They increase the resilience of producers and industry to climate change and reduce their contribution to it, which reduces the investment risk. Some investors have integrated these environmental criteria into their investment framework. They are encouraged to do so because these investments present fewer risks than traditional ones. Several environmental, social and governance (ESG) rating agencies rate portfolios and companies based on their ESG performance, which increasingly drives ESG investing.

The development of guidelines and guidance formalizing green investments will encourage green investment in the agriculture sector. Supporting the financial sector by formalizing the definition of green investments could also drive sustainable agriculture investments.

The Philippines already has its Sustainability Reporting Guidelines for Publicly-Listed Companies and Sustainable Finance Framework. The former defines a reporting framework for companies in sustainable finance and the latter sets out green financing mandates for banks. These enabling initiatives could be built upon to provide green investment specific to the agriculture sector.

Farmers' organizations, cooperatives and microfinance institutions are important stakeholders in the Philippines for financial inclusion in the agriculture sector. They play a crucial role in providing financing to smallholder farmers. They serve as conduits in accessing financing available specifically from commercial banks for the agriculture sector, with the Land Bank of the Philippines (LBP), in particular, assuming some of the risk of providing financing to smallholder farmers. The financing that farmers' organizations, cooperatives and microfinance institutions offer is usually short term and usually imposes additional interest on top of the commercial banks' interest rates. This could be useful to farmers investing in basic agricultural inputs. However, low-carbon and resilient agricultural investment that can help the country achieve its NDC, such as precision agriculture for proper fertilizer use and installation of biodigester systems, will require longer-term financing.

#### RECOMMENDATION AND POINT OF ENTRY 7

##### Providing equipment and machinery to smallholders at lower costs

Mitigation actions in agriculture, such as using precision agriculture and installing biodigester systems, often require equipment and machinery. Precision agriculture also relies on GPS and automated solutions. Such equipment and machinery remain expensive for smallholders. Access to equipment and machinery is usually facilitated by improving access to agricultural credit, but this can also be achieved by reducing the initial cost.

Leasing may offer a satisfactory financial solution for smallholders. For example, leasing does not require collateral, as the leased asset becomes the collateral. At the end of the lease, the lessor may retain legal ownership of the assets, which reduces the credit risk to the financial service provider.

Lending assets on a short-term basis is another potential solution to overcome obstacles to access to credit. Some startups and companies already lend agricultural equipment and machinery on a short-term basis.

The technology landscape in the Philippines has been improving, paving the way for the establishment of incubators and accelerators. Most incubators are technology focused, supporting tech-based impact business models. Some are dedicated exclusively to impact or social enterprises.

#### RECOMMENDATION AND POINT OF ENTRY 8

##### Fostering innovation specific to low-carbon and resilient development in agriculture

Impact investment in the Philippines has been increasing over the years and the startup ecosystem is favourable. The country's incubators and accelerators can support entrepreneurs willing to invest in climate change-related activities and technologies in the agriculture sector, such as climate-smart agriculture. However, services that focus on agricultural technologies remain very limited. Increasing their presence could further scale up private investment in the agriculture sector. Impact investors, incubators and accelerators could leverage grants and other sources of concessional financing to provide focused services.

## REPORTING FRAMEWORK TO ALIGN BUSINESS OPPORTUNITIES WITH NDC IMPACT TARGETS IN THE PHILIPPINES' AGRICULTURE SECTOR

Governments and international organizations engage the private sector to leverage stakeholder investments in the NDC. The NDC can offer the private sector additional business opportunities, but it is often unaware of those opportunities. It is therefore important to highlight and translate them into clear reporting frameworks, which the private sector can then leverage to enhance its understanding of the added value that climate investments bring.

A clear understanding of this alignment, or the extent to which it can align with NDC actions, offers the private sector potential advantages. First, it enables the sector to identify actionable actions, which can be translated into business opportunities. The NDC and SDGs have been chosen as the main reporting frameworks for this report. Business opportunities in the agriculture sector identified in this report are linked to NDC objectives and SDG targets. A summary of the business opportunities, the corresponding climate and SDG frameworks is provided below (direct benefits in green, co-benefits in orange).

| BUSINESS OPPORTUNITY  | MITIGATION OPTION TARGET   | SDG FRAMEWORK  |
|---|--|--|
| <b>CROP PRODUCTION</b>  |  |  |
| Climate-smart nutrient management (precision agriculture and variable rate application of fertilizer) | Reduce the use of synthetic fertilizers in rice production by 5%, 10% and 20% by 2020, 2030, and 2050, respectively, compared to the 2010 level  | 2 – Zero hunger<br>13 – Climate action<br>1 – No poverty<br>8 – Decent work and economic growth<br>9 – Industry, innovation and infrastructure |
| <b>Illustrative metrics</b>   | Number and value (US\$) of climate-smart equipment and services deployed; productivity of crop producers (tons of crops produced by ha); increased income of crop producers (US\$); decreased cost of fertilizer usage (US\$); volume of nitrogen fertilizer used (tons/output) for crop production; direct carbon reduction achieved through the use of efficient nutrient management (tCO <sub>2</sub> e); number and value of loans (US\$) developed for precision agriculture. |  |

| BUSINESS OPPORTUNITY        | MITIGATION OPTION TARGET   | SDG FRAMEWORK  |
|-----------------------------|--|--|
| <b>LIVESTOCK PRODUCTION</b> |  |  |
| Use of biodigesters         | Increase the amount of swine waste handled in biodigesters from 2% in 2010, to 7% in 2020 and to 12% in 2030 and 2050  | <b>13 – Climate action</b><br><b>1 – No poverty</b><br><b>8 – Decent work and economic growth</b><br><b>9 – Industry, innovation and infrastructure</b><br><b>3 – Good health</b><br><b>6 – Clean water and sanitation</b> |
| <b>Illustrative metrics</b> | Direct carbon reduction achieved through wastewater treatment and methane capture (tCO <sub>2</sub> e); direct carbon reduction achieved through the use of renewable biogas for energy (tCO <sub>2</sub> e); number and value of loans (US\$) developed for low carbon practices in the livestock value chain; number of technology providers in the Philippines providing equipment and technologies to producers related to use of biodigester systems, as well as value (US\$) provided. |  |

\*Additional SDG targets are developed for these opportunities in the main report.

## ASSESSMENT RESULTS AND CONCLUSION

The Government of the Philippines has developed a wide range of policies related to climate change and the agriculture sector that emphasize the need to involve the private sector. It highlights the importance of the agriculture sector to overall contributions to the economy and to achieving food security and self-sufficiency. The country prioritizes implementation of adaptation measures within the sector that will reduce vulnerability and risks to the community and acknowledges that public spending will focus on adaptation actions. Nonetheless, the government also recognizes the key role of the private sector in developing resilience to climate change.

As such, great potential for private sector investment in the agriculture sector exists, especially for cross-cutting measures that address both climate change adaptation and mitigation. Specifically, mitigation actions considered for the agriculture sector include the increased use of organic fertilizers, adoption of AWD in rice cultivation, crop diversification to include leguminous crops, and the use of biodigesters in managing waste from livestock production.

The government has also developed the country's enabling environment for private sector investment in the agriculture sector. The AFMA and the BOT Law provide incentives to encourage private sector participation in the sector's low-carbon development. The existing regulatory framework provides conditions and offers incentives that encourage foreign direct investment and cross-border investment that could support investment in the Philippines' agriculture sector.

Although the Philippines' agriculture sector is private sector-led in terms of investment, it still faces barriers to accessing finance. Government banks, such as LBP and the Development Bank of the Philippines, provide credit specific to the agriculture sector. Agriculture stakeholders also have access to credit from commercial banks. However, green products and services specific to the agriculture sector are not available. Making them available will encourage investment in the sector's low-carbon and sustainable development.

# UNDP NDC SUPPORT PROGRAMME

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