Food and Agriculture Organization of the United Nations

Climate-Smart Agriculture in Cabo Verde

Climate-smart agriculture (CSA) considerations

P Agriculture in Cabo Verde contributes about 8 percent of the country's gross domestic product with 18 percent of the population engaged in primary production agriculture. The agricultural sector however, remains vulnerable to climate change and variability and suffers many challenges such as limited land availability, soil erosion, soil fertility loss, insufficient financial investments etc.

M As a small island development state (SIDS), Cabo Verde has one of the lowest (0.48 MtCO2eq) greenhouse gas (GHG) emissions per capita. Most GHGs emissions come from the energy sector followed by GHG emissions from agriculture (22.9 percent). Regarding emissions from agriculture, the livestock sub-sector contributes 99.6 percent mainly from enteric fermentation (40.5 percent) and emissions from manure left on pastures (35.8 percent).

A P CSA practices and technologies including drip irrigation, improved seeds/breeds, soil and water conservation techniques (e.g. mulching, application of organic fertilizer etc.), anti-erosion practices (e.g. terraces, vegetative barriers involving Cajanus cajan, contour ridges etc.), integrated pest management practices adopted for improved productivity and adaptation to climate change and variability.

I A M P Several policies, strategies, plans and programs are being implemented to fight climate change and promote activities underpinning CSA. Of relevance to CSA are the National Communication on Climate Change (NCCC), Intended nationally Determined Contribution (INDC), National Adaptation Programme of Action on Climate Change (NAPA), National Strategy for Food and Nutrition Security - 2020 (ENSAN- 2020), Strategic Plan of the National Agricultural Research System (PE-SNIA-2017-2024), Strategy for Agro-silvopastoral and Environmental Development in the Maio Island etc.

I Broadly, institutions enabling CSA and related activities in Cabo Verde include the Ministry of Environment, Agriculture and Fisheries, the Food and Agriculture Organization of the United Nations (FAO), the United Nations Development Programme (UNDP), National Agricultural Research and Development Institute (INIDA) and the University of Cabo Verde.

$ At present, Cabo Verde does not have any specific funding allocated for CSA per se. However, various projects funded within the purview of agriculture, environmental sustainability and climate change have contributed to delivering CSA goals. These funding have come from national sources, FAO, World Bank and GEF with support of UNDP. Greater effort needs to be placed on accessing international climate finance instruments while at the same time, ensuring availability of local level public and private financing instruments for investments in the agriculture sector.

A Adaptation M Mitigation P Productivity I Institutions $ Finance

The climate-smart agriculture (CSA) concept reflects an ambition to improve the integration of agriculture development and climate responsiveness. It aims to achieve food security and broader development goals under a changing climate and increasing food demand. CSA initiatives sustainably increase productivity, enhance resilience, and reduce/remove greenhouse gases (GHGs), and require planning to address tradeoffs and synergies between these three pillars: productivity, adaptation, and mitigation [1]. The priorities of different countries and stakeholders are reflected to achieve more efficient, effective, and equitable food systems that address challenges in environmental, social, and economic dimensions across productive landscapes. While the concept is new, and still evolving, many of the practices that make up CSA already exist worldwide and are used by farmers to cope with various production risks [2]. Mainstreaming CSA requires critical stocktaking of ongoing and promising practices for the future, and of institutional and financial enablers for CSA adoption. This country profile provides a snapshot of a developing baseline created to initiate discussion, both within countries and globally, about entry points for investing in CSA at scale.

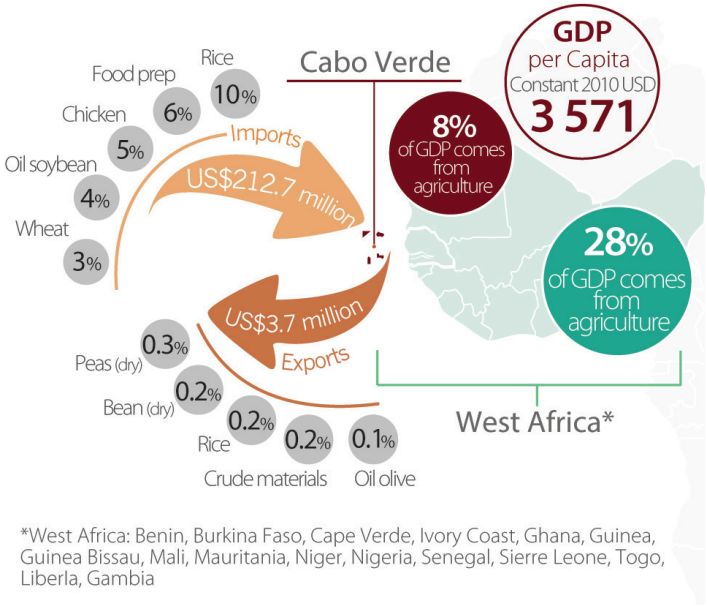
ICRISAT International Crops Research Institute for the Semi-Arid Tropics
CGIAR Research Program on Climate Change, Agriculture and Food Security
CCAFS
CIAT 1967-2017

National context

Economic relevance of agriculture

Cabo Verde, an archipelago country of volcanic origin, presents an ecological and landscape diversity associated to the geomorphological characteristics of the islands and to the influences of the actions of climate elements and the anthropic pressure on the existing resources. It is a developing country in West Africa with a per capita gross domestic product (GDP) of USD 3 571.41 [3]. Agriculture contributes about 8 percent to the country's GDP. The average value of total agricultural export from 2012 to 2016 is about USD 3.7 million with the top five agriculture export products being: peas, dry (0.33 percent), beans, dry (0.22 percent), Rice (0.20 percent), crude materials (0.2 percent), oil, olive, virgin (0.15 percent). As a country with limited agricultural land and natural resources, Cabo Verde imports agricultural products worth about USD 212 million to meet its food security needs. Top five agricultural products imported between 2012 and 2016 include: rice (rice milled equivalent) (10.36 percent), food prep nes (6.13 percent), chicken meat (5.36 percent), soybean oil (4.08 percent); wheat (2.98 percent) [3].

Economic relevance of agriculture in Cabo Verde



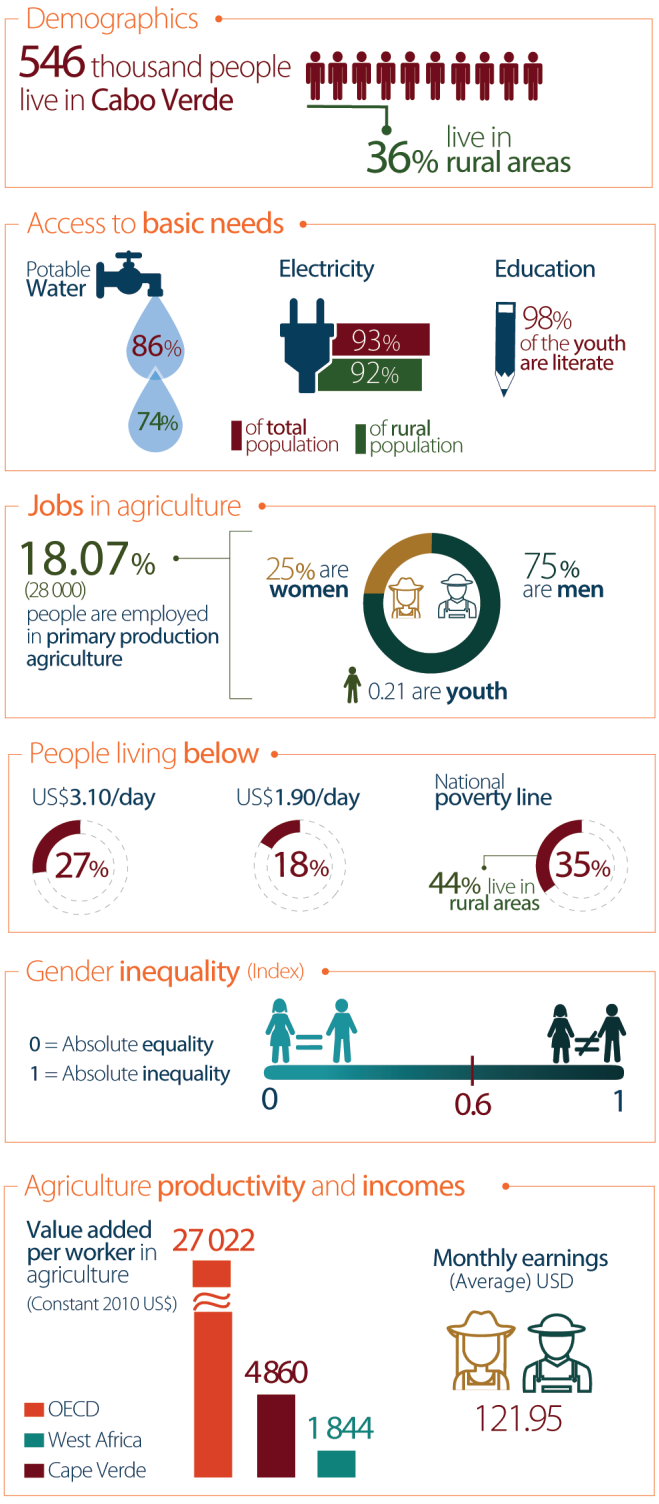
*West Africa: Benin, Burkina Faso, Cape Verde, Ivory Coast, Ghana, Guinea, Guinea Bissau, Mali, Mauritania, Niger, Nigeria, Senegal, Sierre Leone, Togo, Liberia, Gambia

Source: [3, 4]

As at 2017, the total human population of Cabo Verde was about 546 388 [4] out of which about 35.7 percent live in rural areas [3]. According to the World Bank Development Indicators, 26.5 percent of Cabo Verdeans live below the poverty line (USD 3.10 per day, at 2007), 16 percent of which are in rural areas. Agriculture employs about 28 000 people representing 18.07 percent of the total labour force. Out of the total population employed in primary production agriculture, 25 percent are women.

In terms of access to basic needs, 86 percent of the population have access to improved water resources while 92.6 percent have access to electricity. Rural populations have comparable access to basic needs like those in urban areas.

People, agriculture and livelihoods in Cabo Verde

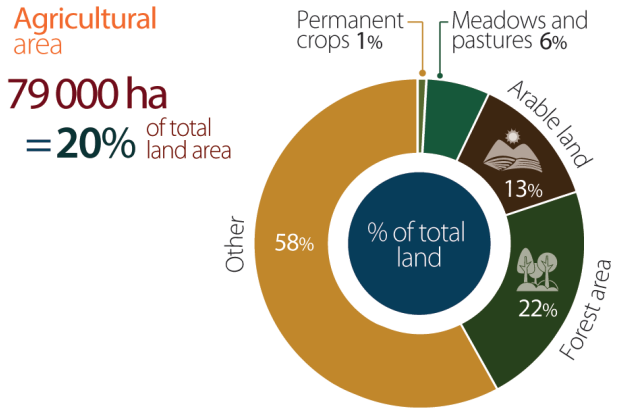


Source: [3, 4]

Land use

Agricultural land in Cabo Verde is about 79 000 hectares representing 19.6 percent of total land area. The percentage distribution of land use systems is as follows: arable land (12.90 percent), permanent crop (0.99 percent), permanent meadows and pastures (6.20 percent); forest area (22.07 percent) and other land uses (57.84 percent). Santiago (991 square kilometer), the largest of the ten islands of Cabo Verde is the most important region for agriculture. Three agroecological zones can be distinguished in Cabo Verde: arid, semi-arid and sub-humid (annex 1). In Santiago where agricultural activities are predominant, the climate is predominantly arid tropical with two seasons: a moderate season (december–june, with an average seawater temperature of 22 °C-23 °C) and a warm season (26 °C-27 °C). Precipitation is meagre and erratic – indeed Cabo Verde can be seen as an island extension of the arid, sahel zone. The mean precipitation is around 225 mm/year and has been decreasing since the 1960s, with negative impacts on agriculture and water supplies. Soils in Cabo Verde are mainly of volcanic origin, medium to coarse textured, steep, low in organic matter and generally shallow. The vegetation of the Cabo Verde Islands is sparse and consists of various shrubs, aloes, and other drought-resistant species. About 84 000 hectares of Cabo Verde is forested. Between 1990 and 2000, Cabo Verde gained an average of 2 400 hectares of forest per year. The amounts to an average annual reforestation rate of 4.14 percent. Between 2000 and 2005, the rate of forest change decreased by 88.2 percent to 0.49 percent per annum. In total, between 1990 and 2005, Cabo Verde gained 44.8 percent of its forest cover, or around 26 000 hectares.

Land use in Cabo Verde



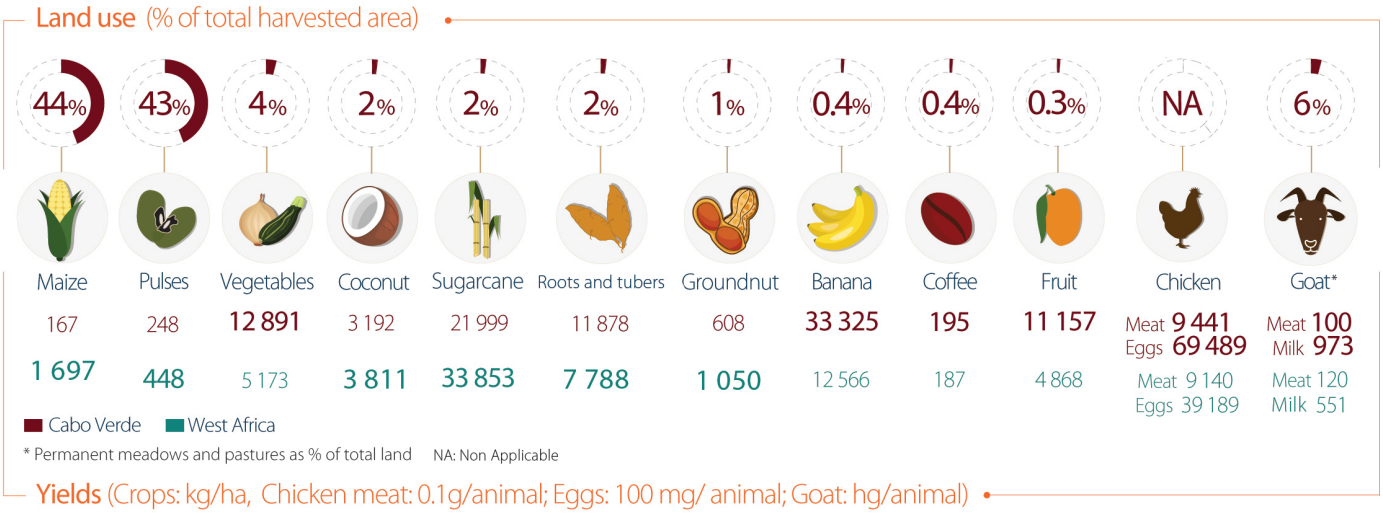
Source: [3]

Agricultural production systems

Agriculture in Cabo Verde is predominantly based on subsistence family production. Agricultural production systems can be categorized into rainfed and irrigated systems. Major crops produced in Cabo Verde include maize, pulses (e.g. beans, groundnut), vegetables (e.g. carrot, cabbage, lettuce, tomatoes etc.), coconut, sugar cane, coffee and fruits (e.g. banana, citrus, apple etc.). Sugar cane, pineapple, coffee and banana are the main cash crops. Maize is the only cereal presently grown in Cabo Verde normally in association with beans. Maize covers about 44.2 percent of the total crop harvested area with average yield between 2013 and 2017 estimated as 1 677 kg/ha which varies among the different agroecologies. The main livestock produced in Cabo Verde are ruminants (cattle, goat sheep), pig and poultry (chicken, turkey and ducks). Fisheries represent a significant source of foreign exchange. Fishery products (fish and crustaceans) are also the population's main source of animal protein. Some 50 000 - 60 000 tonnes of fish are exported every year.
The infographic shows a selection of agriculture production systems key for Cabo Verde's food security. The importance is based on the system's contribution to economic, productivity and nutrition quality indicators. For more information on the methodology for the production system selection, consult annex 2.

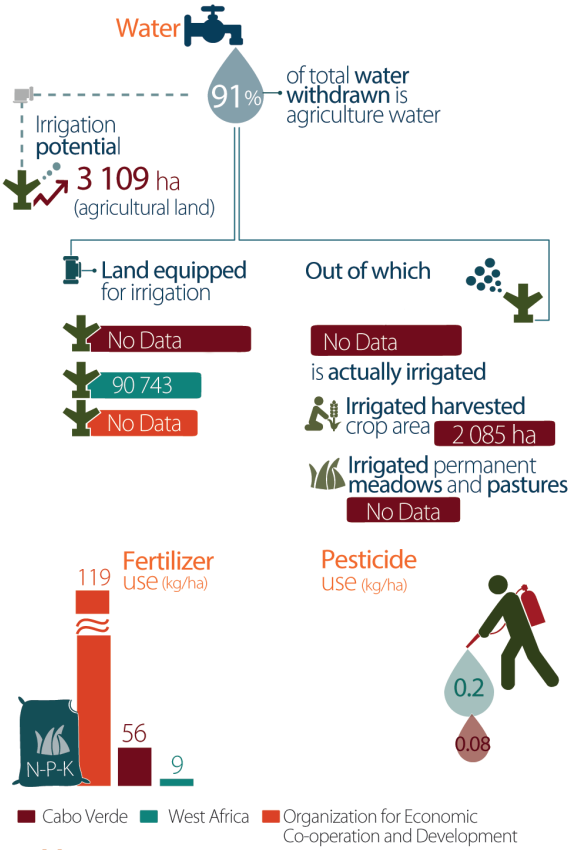
In terms of agricultural inputs, Cabo Verde has an irrigation potential of 3 109 hectares. Drip irrigation has expanded fast, with investments made in water mobilization and gravity irrigation schemes. Between 2004 and 2015, the number of farms that use irrigation increased from 7 023 to 8 580. In 2015, 19 percent of the farms used irrigation and 14 percent of all plots were irrigated, up from 11 percent in 2004 [5]. Meanwhile, pesticide use is very minimal (0.08 kg/ha) while on average, aggregated fertilizer application rate is about 55.63 kg/ha.

Production systems key for food security in Cabo Verde



Source: [3]

Agriculture input use in Cabo Verde

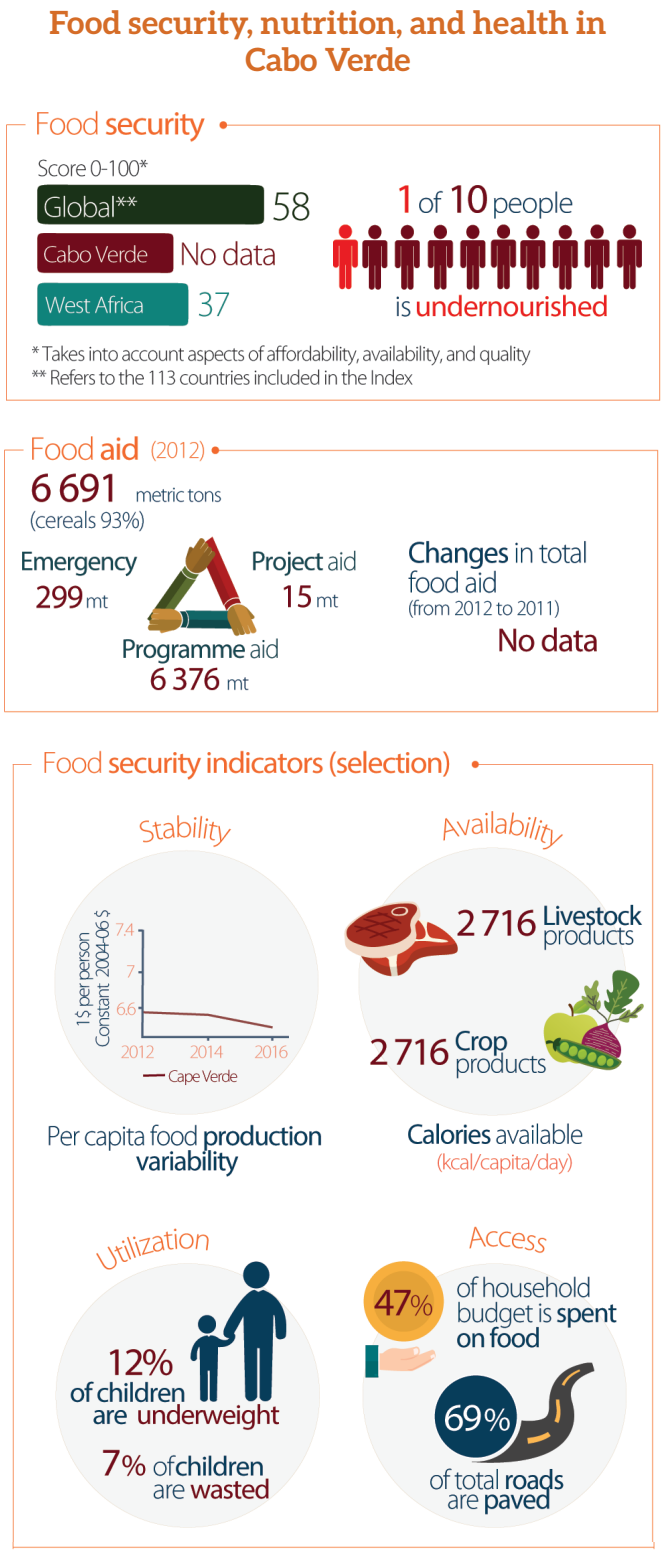


Source: [3]

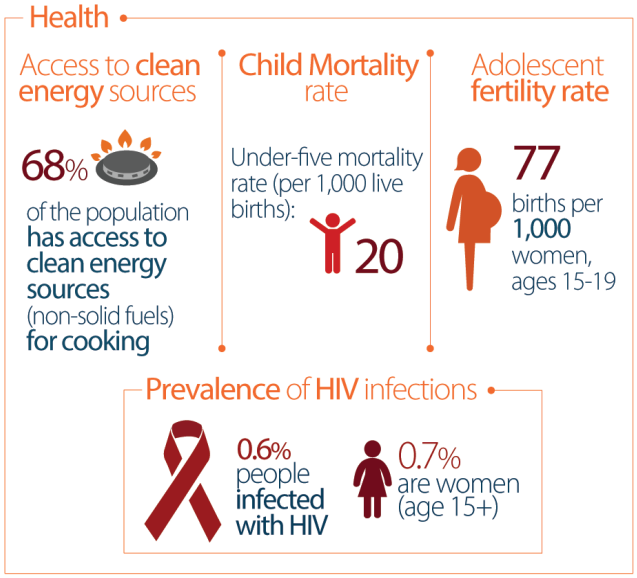
Food security and nutrition

Cereals (maize, rice and wheat) continue to constitute the major parts of Cabo Verdean diet although diets are now more diversified with more protein- and micronutrient-rich foods (meat, fish, dairy products, fruit and vegetables). As a feature of the nutrition transition, fat- and sugar-rich foods have also become more common in the diet, which may cause significant public health problems rapidly. With limited arable land and increased rainfall variability, the country is highly dependent on imports, especially for basic food products. Around 85 percent of the domestic cereal demand (mostly rice and wheat for human consumption) is covered by imports, averaging 80 000 tonnes per year. However, the cereal import requirements for 2018 are forecast at 92 600 tonnes, 24 percent higher than 2017 and about 15 percent above the average of the previous five years, to offset the decline in domestic maize production [6].

The country's progress in the areas of health and living conditions, efforts in nutritional education and improvement in young child feeding practices have entailed a significant decline in chronic and acute malnutrition, which are currently at low levels. On average, the prevalence of people undernourished between 2012 and 2017 stands at 13.1 percent of the total population. Adolescent fertility rate is about 76.7 percent. Cabo Verde also has some of the lowest prevalence of HIV. Adult HIV prevalence is about 0.7 percent for women and 0.5 percent for men [6].



Source: [3, 4, 7]



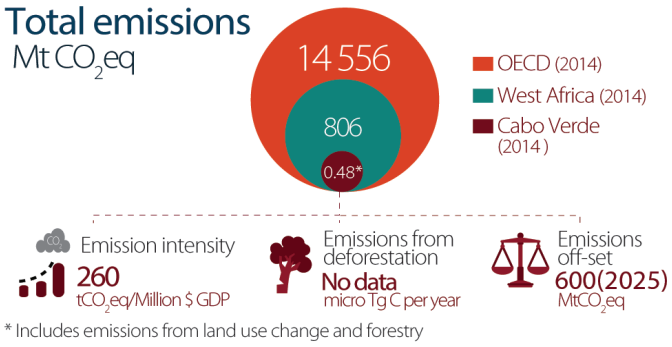
Source: [3, 4, 7]

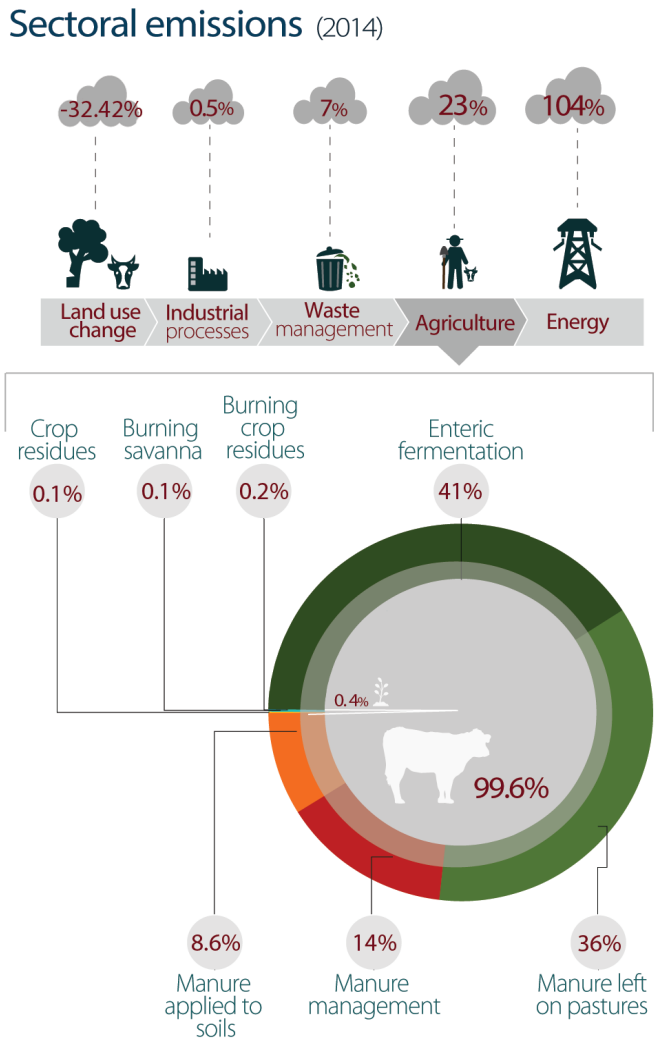
Agricultural greenhouse gas emissions

As a small island development state (SIDS), Cabo Verde has one of the lowest GHG emissions per capita. Total annual greenhouse gas (GHG) emission in Cabo Verde is estimated at about 0.48 Mt CO_2 equivalent (CO_2e) with an emission intensity of 260 tCO_2eq/ million $ GDP [8]. Most GHGs emissions come from the energy sector followed by GHG emissions from agriculture (22.9 percent). Emissions from land use change was least (-0.17 Mt CO2). As result, total GHG emissions (0.48 Mt CO_2) is lower than GHG emissions from energy (0.5 Mt CO_2) in 2014. Regarding emissions from agriculture, the livestock sub-sector contributes 99.6 percent mainly from enteric fermentation (40.5 percent) and emissions from manure left on pastures (35.8 percent) [3].

In the Intended Nationally Determined Contribution (INDC) submitted to the UNFCCC, Cabo Verde outlined an unconditional commitment to reduce emissions particularly from the energy sector. With international support, Cabo Verde seeks to increase the renewable energy uptake in electricity to 100 percent by 2025, with best efforts to achieve this goal already by 2020, in accordance with the following indicative trajectory: 35 percent renewable penetration rate in 2016-2018; 50 percent renewable energy penetration rate in 2018-2020; and 100 percent renewable energy penetration rate in 2020-2025.

Greenhouse gas emissions in Cabo Verde





Source: [3, 8]

Challenges for the agricultural sector

Agriculture in Cabo Verde is confronted with several challenges. Some of these include:

- Growth in population and food demand - human population in Cabo Verde is projected to increase by 129 percent by 2050. This will have serious implications on food security. At present, food consumption per capita is about 2 716 kcal/day each for crop and livestock products. Rising populations will call for increased production to meet the demand for food in sustainable way. Failure to meet food security needs will increase malnutrition and the presently unacceptable levels of poverty and child mortality. As a country devoid of large arable land and natural resources, Cabo Verde rising food demands will influence rising imports of cereals such as rice, maize and wheat which constitute the bulk of Cabo Verdean diets.
- Limited marketing opportunities of agricultural commodities has long been a challenge in Cabo Verde. The agriculture sector is mainly subsistence- based except for sugar cane, pineapple, coffee and banana with a larger majority of smallholder farmers lacking knowledge and skills on aligning agricultural value chains to marketing and commercialisation. Thinking of a value chain as a business and understanding how to minimize costs, improve efficiencies, differentiate products, and overcome challenges to achieve profitability is critical to achieving sustainable livelihoods.
- Climate change and variability – Cabo Verde is an insular country, located in the sahel zone, and has an arid climate. The mean precipitation is around 225 mm/year and has been decreasing since the 1960s, with negative impacts on agriculture and water supplies. Around 20 percent of precipitation is lost to the sea, 13 percent infiltrates in the soil and 67 percent evaporates. The characteristics of Cabo Verde as a small island developing state (SIDS), with its dry and unpredictable climate, limitation and access to water and geomorphology of the islands represent significant risks for the primary sector, especially for agriculture. Agriculture in Cabo Verde is highly dependent on rainfall to recharge of groundwater, rainfed production, and irrigation systems making it extremely vulnerable to the impact of climatic changes that could present significant risks to food security. Existing systems of production and livestock exploitation tend to be fragile and use inadequate or inappropriate techniques that have deleterious impacts on the environment and result in low production and productivity, and soil degradation.

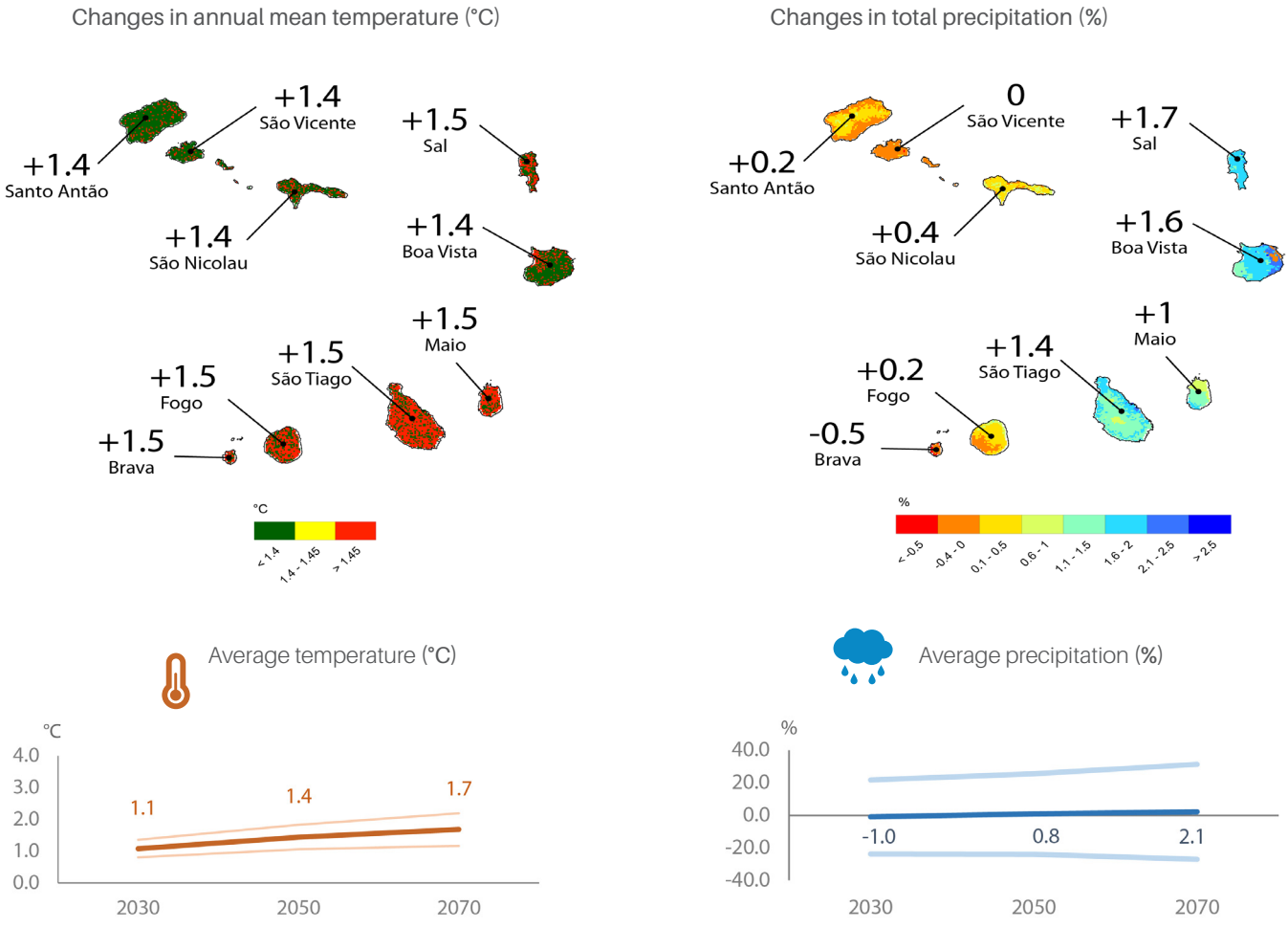
- Food waste - the low level of conservation and processing of the main agricultural products generally results in relatively high post-harvest losses. The major problems identified in this area are inadequate technology for the processing and conservation of perishable foodstuffs and the high cost of existing technologies and energy uses.

Agriculture and climate change

Climatic models ran during 2008-2012 have shown that the country´s natural vulnerabilities, along with their social and economic implications, are very likely to be exacerbated by climate-related disruptions in the next decades. These include more frequent extreme events like storms, floods and droughts, as well as shorter rainy seasons, with immediate impacts on livelihoods, infrastructure, sanitary conditions, recharge of reservoirs, and crop productivity.

In addition, the country´s coastal lines are particularly vulnerable to sea level rise and erosion. Around 80 percent of its population is currently living in these coastal areas. Cabo Verde is affected by acute water scarcity (both surface and underground). Mean annual precipitation levels are erratic and have decreased considerably since 1970. Rainfall projections to 2020 reveal values below the historical pattern. As result, the country has implemented and regularly maintains around 20 highly costly and energy intensive water desalination units. Daily water needs of population centers, tourism and agriculture is predicted to increase fourfold, from around 50 000 m^3 to 160 000 m^3 by 2030 and thus the potential of various sustainable water supply and mobilization solutions will need to be better explored going forward.

Projected changes in temperature and precipitation in Cabo Verde by 2050



Source: [9, 10, 11]

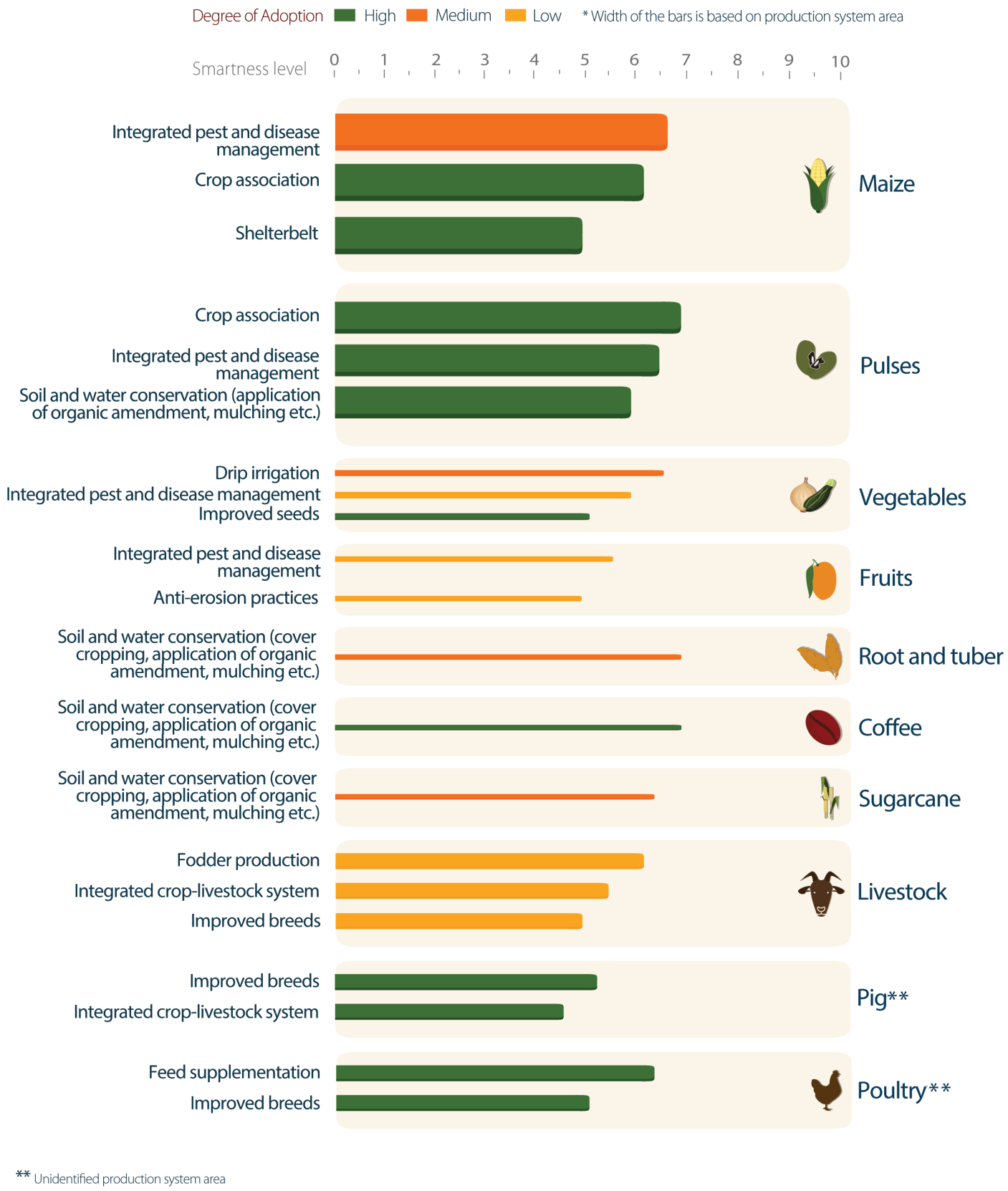
CSA technologies and practices

CSA technologies and practices present opportunities for addressing climate change challenges, as well as for economic growth and development of the agriculture sector. For this profile, practices are considered CSA if they enhance food security as well as at least one of the other objectives of CSA (adaptation and/or mitigation). Hundreds of technologies and approaches around the world fall under the heading of CSA. In Cabo Verde several CSA practices are adopted for improved food production, adaptation, and mitigation to climate change and variability. Some of these include:

- Integrated pest and disease management (IPM) – this is a strategy that promotes a safer and more sustainable management of pesticides. IPM strategies are evolving because of new emerging pests and climate change. With climate change, the distribution and aggressiveness of some pests and diseases have changed considerably. In Cabo Verde integrated pest management systems (IPM) involves the use of natural enemies of plants and approved pesticides. IPM has been successfully used to reduce seasonal infestations of fall army worms and reducing crop yield losses.
- Drip irrigation – it is widely used in the country. At present, one can estimate that 45 percent of the total irrigated land has drip irrigation system installed. Drip irrigation is used in the production of high-value vegetables (cabbage, sweet pepper, onion etc.) and sweet potatoes. Farmers report about 70-105 percent benefits in income generation when drip irrigation is used in vegetable production. Drip irrigation compared with traditional irrigation systems improves water availability and utilization efficiency.
- Anti-erosion practices – common practices include terraces, contour ridges and vegetation barriers (using pigeon pea). These practices have shown tremendous impact on reducing soil loss and improving soil productivity. For instance agronomic trials of pigeon-pea runoff barriers resulted in positive ecological impact such as 28 percent reduction in area with annual rates of erosion >10 tonnes/ha and >20 percent increase in both water availability and ground water recharge [12].
- Soil and water conservation (SWC) techniques – SWC measures implemented in Cabo Verde promote the sustainable land management aimed at reversing and preventing land degradation. Some of the SWC practices include mulching, planting of cover crops and application of organic amendments. These practices markedly improve soil organic matter and fertility, soil water retention and soil structure. By encouraging soil fertility enhancement with organic amendments, the use of synthetic fertilizers will decline thereby reducing GHGs emissions.
- Shelterbelts - the association of trees to minimize effect of wind and heavy rains on seedlings, where they benefit from the shade of trees to grow at the early stages of development. The technology has also shown to be productive during periods of long dry spells.
- Improved seeds/breeds - with increased temperatures and higher intensity of rain, many farmers have adopted the use of varieties of crops and improved breeds of animals (livestock and poultry) that are resistant to extreme weather conditions. Some of these are locally saved but many are imported and tested at the National Agricultural Research and Development Institute.

The following graphics present a selection of CSA practices with high climate smartness scores according to expert evaluations. The average climate smartness score is calculated based on the practice's individual scores on eight climate smartness dimensions that relate to the CSA pillars: yield (productivity); income, water, soil, risks (adaptation); energy, carbon and nitrogen (mitigation). A practice can have a negative/ positive/ zero impact on a selected CSA indicator, with 10 (+/-) indicating a 100 percent change (positive/ negative) and 0 indicating no change. Practices in the graphics have been selected for each production system key for food security identified in the study. A detailed explanation of the methodology and a more comprehensive list of practices analyzed for Cabo Verde can be found in annexes 3 and 4, respectively.

Selected CSA practices and technologies for production systems key for food security in Cabo Verde



** Unidentified production system area

Case study: Building adaptive capacity and resilience to climate change in the water sector in Cabo Verde

Since 2007, Cabo Verde has graduated from the list of least developed countries and is now on track to achieve most of the Millennium Development Goals. Yet, climate change can potentially reverse these development gains. In fact, rising temperatures and persistent rainfall deficit are severely affecting the country's water sector. The National Adaptation Programme of Action (NAPA) considers climate risks to freshwater resources as the most significant constraint on Cabo Verde's development. Climate change modelling suggests that rainfall could further decrease by up to 20 percent by the end of this century. Even in the more immediate planning horizon, climatic changes over the next 10-20 years are expected to bring seasonal water shortages at a number of economically important sites and year-round shortages elsewhere. Overall, these changes are expected to have a significant negative impact on water resource availability and agricultural productivity on the islands, especially for vulnerable farmers.

In response to concerns about water security, the Government of Cabo Verde, with financial support (USD 3 million) from the Global Environmental Facility's Least Developed Countries Fund (LDCF), partnered with UNDP to address the three adaptation priorities outlined in the NAPA related to these conditions – integrated water resources management, modernization and diversification of agricultural production for food security, and integrated protection and management of coastal zones. From 2009 to 2013, the LDCF project achieved tangible results; however, additional efforts were needed to address the challenge of food security, as one of the major manifestations of changing water availability. In 2013, the Government of Canada agreed to provide additional funding under the new Canada-UNDP Climate Change Adaptation Facility (CCAF) to build on and scale up the results of the LDCF project with a co-financing total of USD 13.57 million. The new phase focuses on the most vulnerable populations, identified through a comprehensive baseline study undertaken in 2013. The CCAF project aims to reduce the negative impacts of climate change on food security in these communities, and ensure that water availability, supply and quality is maintained in the face of changing climatic conditions.

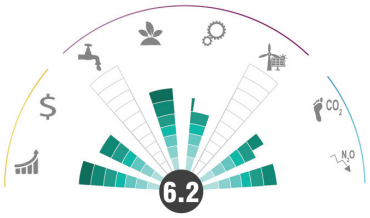
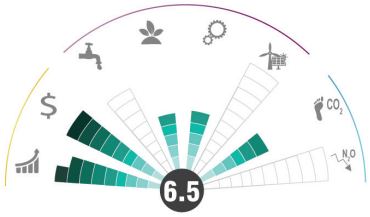
Key achievements under the LDCF project have been scaled up under the CCAF project as demonstrated below:

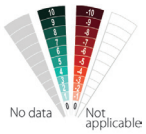
- a site-level food security, climate change vulnerability, and gender assessment and mapping exercise has been completed, to both build capacity of technical staff on food security and agricultural statistics related to climate change, and establish a database of information on climate change vulnerability and food security;
- a series of community-led demonstration projects have been identified in the most vulnerable communities and designed through a participatory rural assessment and planning process;
- technical sessions have been held for community and rural extension workers on issues, such as public health in the reuse of treated waste water for agriculture, and an exchange visit to the Canary Islands organized to learn best practices on this issue;
- extensive research and testing have been conducted on the adaptation and productivity of different varieties of crops under different conditions, as well as corn and forage production with recycled treated waste water. Drawing on the research findings, training and technical assistance is now being provided to farmers to implement demonstration plots; and
- fifteen transmissions of the radiophonic programme "climate change and food security in focus" were conducted to raise awareness on the importance of climate change for food security.

The integrated development of the Alto Mira and Ribeira da Torre basins in Santo Antão, Ribeira da Prata in S.Nicolau and Ribeiras de Flamengos and Principal on the island of Santiago.

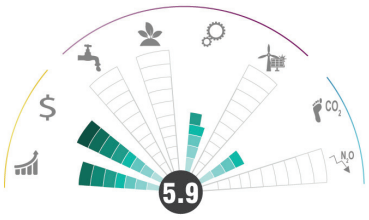
Source: UNDP (2018). Building adaptive capacity and resilience to climate change in the water sector in Cabo Verde. United Nations Development Programme, Bureau for Policy and Programme Support, NY, USA. Read here for more information

Table 1. Detailed smartness assessment for top ongoing CSA practices by production system as implemented in Cabo Verde

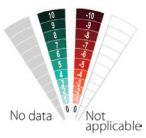
CSA practice	Region and adoption rate (%) <30 30-60 60>	Predominant farm scale S: small scale M: medium scale L: large scale	Climate smartness	Impact on CSA Pillars
Maize (44 percent of total harvested area)				
Integrated pest and disease management	30-60%	M		**Productivity** Improves crop production and quality, hence potential increases in income. **Adaptation** Prevents crop losses caused by diseases. Increases the potential to overcome climate shocks. **Mitigation** Increases carbon storage in soils. Has no use of synthetic fertilizers and related GHG emissions/carbon footprint. Reduces GHG emissions attributed to ploughing. Reduces soil disturbance.
Crop association	60%	L		**Productivity** Enhances production per unit area. Diversifies income and food sources. **Adaptation** Improves and conserve soil fertility; minimizes erosion; and contributes to reducing the risks of crop failure. **Mitigation** Allows long-term reduction in nitrogen-based fertilizers when leguminous crops are rotated with cereals. Maintains or improves above and below-ground carbon stocks and soil organic matter content.
Pulses (beans and groundnuts) (43 percent of total harvested area)				
Crop association	60%	L		**Productivity** Enhances production per unit area. Diversifies income and food sources **Adaptation** Improves and conserve soil fertility; minimizes erosion; and contributes to reducing the risks of crop failure. **Mitigation** Allows long-term reduction in nitrogen-based fertilizers when leguminous crops are rotated with cereals. Maintains or improves above and below-ground carbon stocks and soil organic matter content.
Integrated pest and disease management	60%	L		**Productivity** Improves crop production and quality, hence potential increases in income. **Adaptation** Prevents crop losses caused by diseases. Increases the potential to overcome climate shocks. **Mitigation** Increases carbon storage in soils. Has no use of synthetic fertilizers and related GHG emissions/carbon footprint. Reduces GHG emissions attributed to ploughing. Reduces soil disturbance.



Yield Income Water Soil Risk/Information Energy CO_2 Carbon N_2O Nutrient

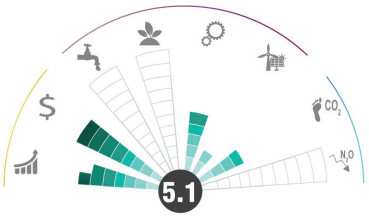
CSA practice	Region and adoption rate (%) <30 30-60 60>	Predominant farm scale S: small scale M: medium scale L: large scale	Climate smartness	Impact on CSA Pillars
Vegetables (cabbage, carott, onion, lettuce, tomatoes etc.) (4 percent of total harvested area)				
Drip irrigation	30-60%	S M		**Productivity** Improves crop yield and overall productivity **Adaptation** Improves water availability and utilization efficiency for increased resilience to drought. **Mitigation** Some impact on nitrogen emissions byefficient fertilizer aplication. A reduction in energy required for irrigation can reduce emissions intensity per unit of output).
Integrated pest and disease management	<30%	S M		**Productivity** Improves crop production and quality, hence potential increases in income. **Adaptation** Prevents crop losses caused by diseases. Increases the potential to overcome climate shocks. **Mitigation** Increases carbon storage in soils. Has no use of synthetic fertilizers and related GHG emissions/carbon footprint. Reduces GHG emissions attributed to ploughing. Reduces soil disturbance.
Fruits (banana, mangoes, papaya, citrius, apple, peach) (1 percent of total harvested area)				
Integrated pest and disease management	30-60%	S M L		**Productivity** Improves crop production and quality, hence potential increases in income. **Adaptation** Prevents crop losses caused by diseases. Increases the potential to overcome climate shocks. **Mitigation** Increases carbon storage in soils. Has no use of synthetic fertilizers and related GHG emissions/carbon footprint. Reduces GHG emissions attributed to ploughing. Reduces soil disturbance.
Anti-erosion practices	30-60%	S M L		**Productivity** Increased productivity per unit of land. **Adaptation** Medium- to long-term increases in soil fertility by improving physical and biochemical soil characteristics. Conserves soil moisture. **Mitigation** Increases in above- and below-ground biomass. Reduction in loss of biomass from soil.

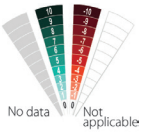
CSA practice	Region and adoption rate (%) <30 30-60 60>	Predominant farm scale S: small scale M: medium scale L: large scale	Climate smartness	Impact on CSA Pillars
Roots and tubers (cassava, sweet potatoes, potatoes) (1.5 percent of total harvested area)				
Soil and water conservation (cover cropping, application of organic amendment, mulching etc.)	30-60%	S M		**Productivity** Increases productivity as a result of enhanced soil health and fertility. **Adaptation** Promotes soil structure conservation. Integrates crop residues and other on-farm waste. Minimizes erosion and enhances insitu moisture conservation. **Mitigation** Allows long-term reduction in nitrogen-based fertilizers and related GHG emissions. Maintains or improves soil carbon stocks and organic matter content.
Coffee (0.4 percent of total harvested area)				
Soil and water conservation (cover cropping, application of organic amendment, mulching etc.)	60%	M		**Productivity** Increases productivity as a result of enhanced soil health and fertility. **Adaptation** Promotes soil structure conservation. Integrates crop residues and other on-farm waste. Minimizes erosion and enhances insitu moisture conservation. **Mitigation** Allows long-term reduction in nitrogen-based fertilizers and related GHG emissions. Maintains or improves soil carbon stocks and organic matter content.
Sugarcane (2 percent of total harvested area)				
Soil and water conservation (cover cropping, application of organic amendment, mulching etc.)	30-60%	L		**Productivity** Increases productivity as a result of enhanced soil health and fertility **Adaptation** Promotes soil structure conservation. Integrates crop residues and other on-farm waste. Minimizes erosion and enhances insitu moisture conservation. **Mitigation** Allows long-term reduction in nitrogen-based fertilizers and related GHG emissions. Maintains or improves soil carbon stocks and organic matter content.



Yield Income Water Soil Risk/Information Energy CO_2 Carbon N_2O Nutrient

CSA practice	Region and adoption rate (%) <30 30-60 60>	Predominant farm scale S: small scale M: medium scale L: large scale	Climate smartness	Impact on CSA Pillars
Livestock (cattle, goat and sheep) (6.2 percent)				
Fodder production	<30%	S M		**Productivity** Reduces costs of production through reduction in external input use. Increases in income through high quality food." **Adaptation** Builds soil fertility by improving physical and bio-chemical soil characteristics. Promotes biodiversity conservation. Provides alternative food source, increasing adaptive capacity to dry season. Reduces soil erosion. **Mitigation** Reduces GHG emissions (carbon footprint) by reducing consumption of energy, synthetic fertilizers and other agricultural inputs. High-quality feed reduces methane emissions from ruminants"
Integrated crop-livestock system	<30%	S M		**Productivity** Enhances production per unit area. Diversifies food sources. **Adaptation** Provides important safety net climate-related risks and prospects for income diversification **Mitigation** Reduces GHG emissions (carbon footprint) by reducing consumption of energy, synthetic fertilizers and other agricultural inputs. High-quality feed reduces methane emissions from ruminants.
Pigs (NA)				
Improved breeds	60%	S M		**Productivity** Using improve breeds improve overall productivity and income. **Adaptation** Improved breeds are resilient to climate shocks **Mitigation** Improved breeds have improved feed conversion minimizing GHG emissions.
Integrated crop-livestock system	60%	S M		**Productivity** Provides important safety net climate-related risks and prospects for income diversification. **Adaptation** Enhances production per unit area. Diversifies food sources. **Mitigation** Reduces GHG emissions (carbon footprint) by reducing consumption of energy, synthetic fertilizers and other agricultural inputs. High-quality feed reduces methane emissions from ruminants.

CSA practice	Region and adoption rate (%) <30 30-60 60>	Predominant farm scale S: small scale M: medium scale L: large scale	Climate smartness	Impact on CSA Pillars
Poultry(chicken, turkey, ducks, etc) (NA)				
Feed supplementation	60%	S M		**Productivity** Improves animal production and quality, hence potential increases in income. **Adaptation** Provides alternative food source increasing adaptive capacity to dry season. **Mitigation** Some effective diet manipulation such as feed supplementation reduce methane emissions. Indeed, dietary manipulation by selecting and utilizing high quality forages, strategic supplementation of forages, changing concentrate proportion with special emphasis on changing carbohydrate composition are considered as an immediate and sustainable methane mitigation approach of enteric CH4 emitted by ruminant livestock.
Improved breeds	60%	S M L		**Productivity** Using improve breeds improve overall productivity and income. **Adaptation** Improved breeds are resilient to climate shocks. **Mitigation** Improved breeds have improved feed conversion minimizing GHG emissions.



Yield Income Water Soil Risk/Information Energy CO_2 Carbon N_2O Nutrient

Institutions and policies for CSA

There are several institutions that aims to foster the development and adoption of technologies that enhance agriculture productivity and advance CSA practices in Cabo Verde. At the government level, the institution responsible for the country's climate change plans and policies is the Ministry of Environment, Agriculture and Fisheries which also serves as the country's UNFCCC focal point and Nationally Designated Authority (NDA) to the Green Climate Fund (GCF), Adaptation Fund (AF), Climate Investment Fund (CIF) and Global Environment Facility (GEF). As the head of the agrarian sector, the Ministry of Agriculture plays a large role in the implementation of actions on the ground linked to climate-smart agriculture.

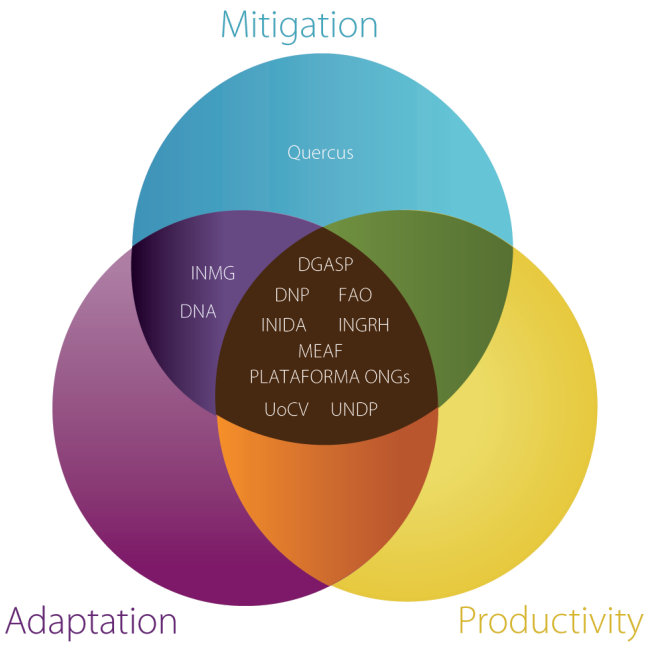
The Food and Agriculture Organization of the United Nations (FAO) and the United Nations Development Programme (UNDP) play instrumental roles in the promotion of sustainable agriculture and environmental sustainability. Specifically, FAO's assistance in Cabo Verde is centered on five medium-term priority areas: improving food availability at the national level, with an emphasis on increased productivity and diversification of agricultural production, strengthened agricultural support services and capacity building in the area of natural resource policy and management; enhancing access to food through the development of agricultural markets, trade and agro-processing; stabilizing food supply through improved disaster risk management; supporting food security programmes to enhance household food and nutritional security; providing regulatory, political and institutional support to the public and private sectors.

In terms of research, the National Agricultural Research and Development Institute (INIDA) is the main research and development agency of the Cabo Verde Government for agriculture and environment. It has as its main obligations research and development in the field of agrarian technologies and natural resources management; the diffusion of scientific and technical knowledge available for the agriculture, forestry, husbandry and environmental sectors; the professional education and higher education in the agriculture, forestry, husbandry and environmental areas [13]. INIDA has special responsibilities in the combat to desertification in Cabo Verde, having produced the existing studies on desertification, erosion and soil and water conservation. INIDA has two departments: (1) Department for Agriculture and Husbandry; (2) Environmental Sciences Department [13].

The University of Cabo Verde, specifically the College of Agricultural and Environmental Sciences also conducts various types of CSA-related agricultural research including research on improved practices for annual crops (rice, maize, roots and tubers, etc.), livestock and fisheries.

The following graphic highlights key institutions whose main activities relate to one, two or three CSA pillars (adaptation, productivity and mitigation). More information on the methodology and results from interviews, surveys and expert consultations is available in annex 5.

Institutions for CSA in Cabo Verde



DGASP National Directorate for Agriculture Forestry and Animal Husbandry **DNA** National Directorate For Environment **DNP** National Directorate for Planning and Finance **FAO** Food and Agriculture Organization of the United Nations **INGRH** National Institute for the Management of Water Resources **INIDA** National Agricultural Research and Development Institute **INMG** National Institute for Meteorology and Geophysics **MEAF** Ministry of Environment, Agriculture and Fishery **PLATAFORMA ONGs** National Association of NGOs **Quercus** Quercus Cabo Verde **UNDP** United Nations Development Programme **UoCV** University of Cape Verde

In terms of policies, there is no specific policy on CSA in Cabo Verde. The approach is rather embedded in the Intended Nationally Determined Contributions (INDCs) and other policy instruments which allude to the three pillars of CSA in the form of increased agricultural productivity, climate change adaptation and mitigation. In many countries including Cabo Verde, climate change policies that are reflective of CSA are expressed through the National Adaptation Programmes of Action (NAPAs). Since the 2000s, climate change adaptation has been developed mainly under the initial impulse of the United Nations Convention on Climate Change (UNFCCC), which mobilized the Ministries of Environment at the country level for implementation. Therefore, the thinking process on climate change has gradually been developed in this frame, leading to the development of the NAPAs. Other national instruments reflecting policy guidance and mandate of CSA are the Cabo Verdean National Agricultural Investment Plan as well as the Comprehensive Africa Agriculture Development Programme (CAADP) Compacts and the Strategic Plan for Agricultural Development. Below are some of the policy instruments been put into place, to cope with the challenges of economic development, poverty, food security and climate change in Cabo Verde:

- National Adaptation Programme of Action on Climate Change (NAPA) - the main goal of the NAPA is the identification of the urgent and immediate needs and concerns of Cabo Verde relating to adaptation to the adverse effects of climate change. As per the guidelines, the formulation of the Cabo Verde NAPA followed a participatory process that involved those most affected by climatic impacts, that is rural people and the poor. Moreover, the NAPA process builds upon existing coping strategies implemented by local communities in order to enhance their adaptation capacity. More specifically, the objectives of the NAPA were: (1) to understand the main characteristics of climate hazards in Cabo Verde (notably floods, droughts and sea level rise); (2) to understand coping mechanisms to climate hazards and climate change at the grassroots level; (3) to understand existing programmes and institutional arrangements for addressing climate hazards and climate change; (4) to identify and prioritize adaptation activities to climate hazards and climate change [14].

- National Strategy for Food and Nutrition Security - 2020 (ENSAN- 2020) – it aims to improve and sustain the development of the agricultural sector production systems in an integrated and balanced way through contributing to the improvement of access to water, climate change adaptation, sanitation and other components of well-being by households. It also aims at ensuring the integration of food security management in decentralization processes and state reform deals with decentralization and shared responsibilities with local structures and bodies in order to create an enabling environment for the participation of the population in the process of development of its territory and a better governance of food and nutrition security [14].

- Strategic Plan of the National Agricultural Research System (PE-SNIA-2017-2024) – it was designed to consolidate and harmonize national agrarian research priorities with the country's agrarian development objectives, in order to increase the impact of its results on transformation and modernization of the agricultural sector. The objectives allude to the pillars of CSA [14].

- Strategy for agro-silvopastoral and environmental development in the Maio Island - this strategy, consisting of twelve sections, elaborates a planning strategy for the agro-silvopastoral system and the environmental sector on the island of Maio, in a participatory manner, based on its specificity, its endogenous potentialities and comparative advantages, aiming at its economic and social development. Its gneral objective is to establish a short-, medium- and long-term strategy to create the capacity needed to produce inclusive socio-economic data to increase the income and well-being of the population of the island of Maio. The objectives of this strategy are consistent with the adaptation and productivity goals of CSA.

The graphic shows a selection of policies, strategies and programs that relate to agriculture and climate change topics and are considered key enablers of CSA in the counrty.

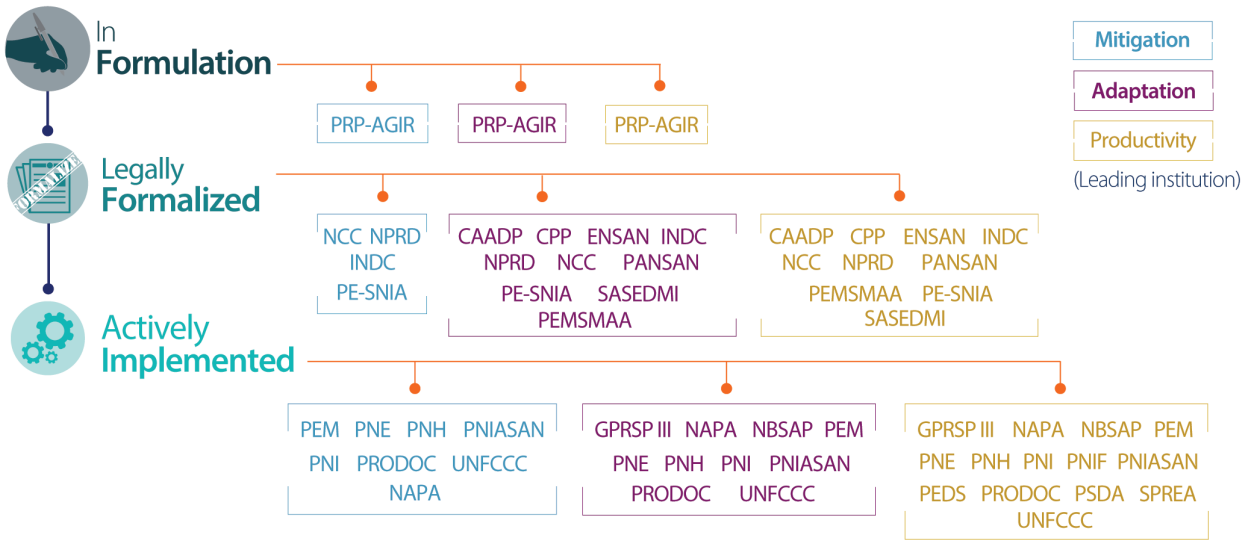
The policy cycle classification aims to show gaps and opportunities in policy-making, referring to the three main stages: policy formulation (referring to a policy that is in an initial formulation stage/consultation process), policy formalization (to indicate the presence of mechanisms for the policy to process at national level) and policy in active implementation (to indicate visible progress/outcomes toward achieving larger policy goals, through concrete strategies and action plans). For more information on the methodology and results from interviews, surveys and expert consultations, see annex 6.

Financing CSA

In Cabo Verde, there is no specific funding allocated for CSA per se. However, various projects funded within the purview of agriculture, environmental sustainability and climate change have contributed to delivering CSA goals. Some of the sources of agriculture, environment and climate finance has been from national sources, FAO, World Bank, GEF with support of UNDP etc. Moreover, most of the support for climate change projects have been funded through the GEF's Least Developed Countries Fund (LDCF) with the support of UNDP. For instance with the support of UNDP, the National Institute for the Management of Water Resources (INGRH) in Cabo Verde received about USD 3 million through the GEF for the project: "Building adaptive capacity and resilience to climate change in the water sector in Cabo Verde". The project was based on the priority adaptation option identified in Cabo Verde's National Adaptation Programme of Action (NAPA). The project was formulated to address the major challenge for Cabo Verde to mainstream climate change adaptation measures into integrated water resource management across different institutional, social and spatial frameworks [15].

From the LDCF, Cabo Verde obtained about USD 200 000 in support of the preparation of its NAPA; and
USD 319 300 to enable the preparation of Cabo Verde's First National Communication in Response to its Commitments to UNFCCC. Again Cabo Verde was one of the countries that received support of about USD 3.3 million from the GEF Trust Fund for the project: Adaptation to Climate Change - Responding to shoreline change and its human dimensions in West Africa through integrated coastal area management". The project which was implemented by UNDP aimed to mainstream adaptation to climate change into Integrated Coastal Area Management (ICAM) planning in the Cabo Verde through the development and implementation of pilot adaptation activities in response to shoreline change. Besides the GEF, Cabo Verde also obtained USD 8 million from the World Bank for the Cabo Verde Disaster Risk Management Development Policy. The development objective of the proposed operation is to support the government of the republic of Cabo Verde in: (a) strengthening the institutional and legal framework to increase disaster and climate resilience; (b) incorporating disaster and climate resilience considerations and technical standards into the management of school infrastructure and territorial planning [16].

Policies for CSA in Cabo Verde



CAADP Comprehensive Africa Agriculture Development Programme (2009) (Ministry Of Environment, Agriculture and Fishery) **CPP** Sectorial Letter for Fishery Policy (2014) (Ministry Of Environment, Agriculture and Fishery) **ENSAN** National Strategy on Food and Nutrition Security - 2020 (2015) (Ministry Of Environment, Agriculture and Fishery) **GPRSP III** Growth and Poverty Reduction Strategy Paper (GPRSP: 2012-2016) (2014) (Ministry Of Environment, Agriculture and Fishery) **INDC** Intended Nationally Determined Contributions (2015) (Ministry Of Environment, Agriculture and Fishery) **NAPA** National Adaptation Programme of Action on Climate Change (2008) (Ministry Of Environment, Agriculture and Fishery) **NBSAP** National Biodiversity Strategy and Action Plan (1999) (Ministry Of Environment, Agriculture and Fishery) **NCC** First, Second and Third National Communication for Climate Change in Cabo Verde (1995) (Ministry Of Environment, Agriculture and Fishery) **NPRD** National Plan for Research and Development (2017) (National Agricultural Research and Development Institute) **PANSAN** National Action Plan for Food and Nutrition Security (2014-2016) (2015) (Ministry Of Environment, Agriculture and Fishery) **PEDS** Strategic Plan for Sustainable Development (2016) (Ministry of Finance and Planning) **PEM** Municipal Environmental Plan (2017) (Ministry Of Environment, Agriculture and Fishery) **PEMSMAA** Emergency Programme for Mitigation of Drought and the Bad Agricultural Year 2017/2018 (2017) (Ministry Of Environment, Agriculture and Fishery) **PE-SNIA** Strategic Plan of the National Agricultural Research System (2017-2024) (2017) (National Agricultural Research and Development Institute) **PNE** National Environment Plan 1 and 2 (2016) (Ministry Of Environment, Agriculture and Fishery) **PNI** National Irrigation Plan (2000) (Ministry Of Environment, Agriculture and Fishery) **PNIASAN** National Agricultural Investment Plan Nutritional Food Security (2017) (Ministry Of Environment, Agriculture and Fishery) **PNIF** Ministry of Environment, Agriculture and Fisheries (2016) (Ministry Of Environment, Agriculture and Fishery) **PNH** National Horticultural Plan (2010) (Ministry Of Environment, Agriculture and Fishery) **PRODOC** Adaptation Resilience to Climate Change Plan (2007) (Ministry Of Environment, Agriculture and Fishery) **PRP-AGIR** Priority for the Resilience of the Country (2016) (Ministry Of Environment, Agriculture and Fishery) **PSDA** Strategic Plan of Agricultural Development (2011) (Ministry Of Environment, Agriculture and Fishery) **SASEDMI** Strategy for Agro-silvopastoral and Environmental Development in the Maio Island (2018) (Ministry Of Environment, Agriculture and Fishery) **SPREA** Strategic Plan for Rural Extension and Agrobusiness (2017) (Ministry Of Environment, Agriculture and Fishery) **UNFCCC** United Nations Framework Convention on Climate Change (2000) (Ministry Of Environment, Agriculture and Fishery)

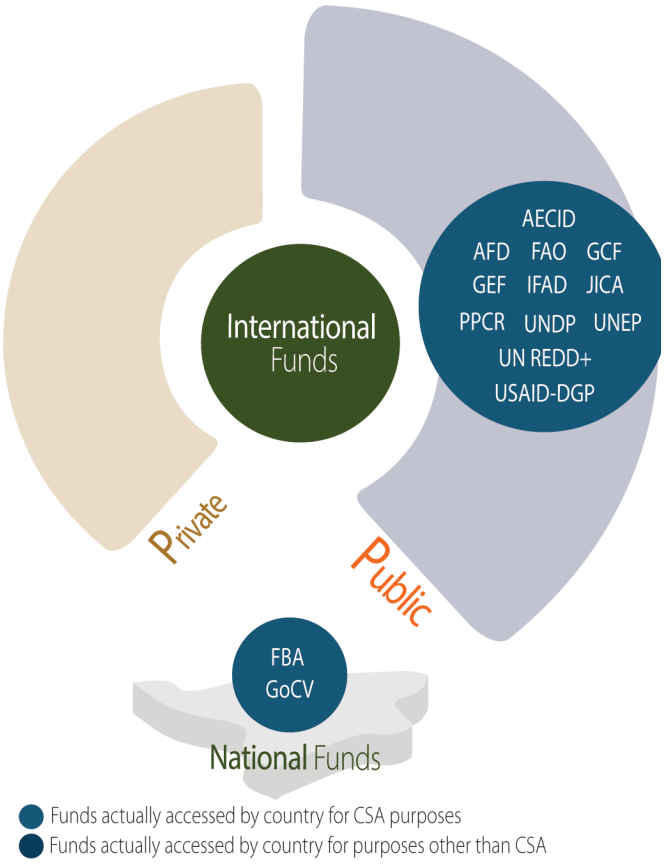
Similar to most developing countries, government support for CSA is weak. Enhancing private sector financing to CSA is needed. This could be done through capacity building and sensitization of microfinance institutes, agro-dealers, outgrowers and multinational companies on the benefits of investing in climate-smart practices.

Potential finance

Based on funding history and donor interests, Cabo Verde has the potential to continue obtaining funding from climate finance initiatives such as the GEF. There is already high amount of funding received so far with the support of UNDP.

At present a number of FAO projects (with more than USD 30 million in total budget) targeting multiple countries including Cabo Verde have been approved for funding through the GEF. Cabo Verde will benefit from these projects to contribute in meeting its food security, environmental sustainability and climate change adaptation goals. With limited government funding support, enhancing private sector financing to climate-smart agriculture is needed. This could be done through capacity building and sensitization of SME's, microfinance institutes and multinational companies on the incentives/benefits of investing in climate-smart practices. The graphic highlights existing and potential financing opportunities for CSA in Cabo Verde. The methodology and a more detailed list of funds can be found in annex 7.

Financing opportunities for CSA in Cabo Verde



GoCV Government of Cabo Verde
AECID Spanish Agency for International Development **AFD** French Development Agency **FAO** Food and Agriculture Organization of the United Nations **FBA** Farmer-based associations **GCF** Green Climate Fund **GEF** Global Environment Facility **IFAD** International Fund for Agricultural Development **JICA** Japan International Cooperation Agency **PPCR** Pilot Program for Climate Resilience **UNDP** United Nations Development Programme **UNEP** United Nations Environmental Programme **USAID-DGP** United States Agency for International Development – Development Grants Program **UN REDD** United Nations Programme on Reducing Emissions from Deforestation and Forest Degradation

Outlook

Agriculture makes a significant contribution to the national economy of Cabo Verde with 18 percent of the population engaged in primary production agriculture. As in most small island developing states, climate change and variability in weather patterns pose serious challenges in all sectors of the country including agriculture. Without appropriate interventions, the frequent droughts and increased variability of rainfall will dwindle food production and negatively impact natural resources.

While suffering strong impacts of climate change, Cabo Verde has one of the lowest (0.48 MtCO2eq) greenhouse (GHG) emissions per capita. Most GHGs emissions come from the energy sector followed by agriculture (22.9 percent). Regarding emissions from agriculture, the livestock sub-sector contributes 99.6 percent mainly from enteric fermentation (40.5 percent) and emissions from manure left on pastures (35.8 percent).

To reduce climate-related risks, various CSA practices and technologies are adopted in Cabo Verde. Some of these include: drip irrigation, improved seeds/breeds, soil and water conservation techniques (e.g. mulching, application of organic fertilizer etc.), anti-erosion practices (e.g. terraces, vegetative barriers involving cajanus cajan, contour ridges etc.), integrated pest management practices adopted for improved productivity and adaptation to climate change and variability.

Several policies, strategies, plans and programs are being implemented to fight climate change and promote activities underpinning CSA. Of relevance to CSA are the National Communication on Climate Change (NCCC), Intended nationally Determined Contribution (INDC), National Adaptation Programme of Action on Climate Change (NAPA), National Strategy for Food and Nutrition Security - 2020 (ENSAN- 2020), Strategic Plan of the National Agricultural Research System (PE-SNIA-2017-2024), Strategy for Agro-silvopastoral and Environmental Development in the Maio island etc.

Broadly, institutions enabling CSA and related activities in Cabo Verde include the Ministry of Environment, Agriculture and Fisheries, the Food and Agriculture Organization of the United Nations (FAO), the United Nations Development Programme (UNDP), National Agricultural Research and Development Institute (INIDA) and the University of Cabo Verde.

At present, Cabo Verde does not have any specific funding allocated for CSA per se. However, various projects funded within the purview of agriculture, environmental sustainability and climate change have contributed to delivering CSA goals. These funding have come from national sources, FAO, World Bank and GEF with support of UNDP. Greater effort needs to be placed on accessing international climate finance instruments while at the same time, ensuring availability of local level public and private financing instruments for investments in the agriculture sector.

Works cited

[1] FAO. 2010. "Climate-Smart" Agriculture. Policies, practices and financing for food security, adaptation and mitigation. Rome: Food and Agriculture Organization of the United Nations (FAO).

[2] FAO. 2013. Climate-smart agriculture sourcebook. Rome: FAO.

[3] FAO. 2018. FAOSTAT Database. Available at: http://faostat3.fao.org/download/Q/QV/E

[4] World Bank. 2018. World Development Indicators. Washington, D.C: World Bank. Available at: http://data.worldbank.org/

[5] Government of Cabo Verde. 2018.

[6] FAO. 2010. http://www.fao.org/ag/agn/nutrition/ cpv_ en.stm

[7] UNAIDS. 2017. Available at: https://www.unaids.org/en/regionscountries/countries/capeverde

[8] ClimateWatch. 2014. Available at: https://www.climatewatchdata.org/countries/CPV

[9] Collins M; Knutti R; Arblaster J; Dufresne JL;Fichefet T; Friedlingstein P; Gao X; Gutowski WJ; Johns T; Krinner G; Shongwe M; Tebaldi C; Weaver AJ;Wehner M. 2013. Longterm climate Change: Projections, commitments and irreversibility. In: Climate change. The physical science basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. [Stocker TF; Qin D; Plattner GK; Tignor M; Allen SK; Boschung J; Nauels A; Xia Y; Bex V; Midgley PM. (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. pp. 1029–1036. DOI: 10.1017/CBO9781107415324.024

[10] Ramírez J; Jarvis A. 2008. High-resolution statistically downscaled future climate surfaces. International Center for Tropical Agriculture (CIAT); CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Cali, Colombia.

[11] Ramírez-Villegas J; Thornton PK. 2015. Climate change impacts on African crop production. Working Paper No. 119. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), Copenhagen, Denmark. Available at: http://hdl.handle.net/10568/66560

[12] Baptista. 2015. Water management system in Cabo verde

[13] Domgho L. V. M., Fortes A., Flaherty K. 2017. Informative Bulletin of Agricultural R&D Indicators

[14] FAO. 2018. Cabo Verde – Policy. Available at: http:// www.fao.org/faolex/country profiles/general-profile/seemore/en/?iso3=CPV&countryname=Cabo%20

[15] UNDP. 2019. Cape Verde- Second National Communication. Available at: https://www.adaptation-undp.org/projects/trust-cape-verde-second-national-communication

[16] World Bank. 2018. http://documents.worldbank.org/curated/en/125621531480106694/pdf/ConceptProgram-Information-Document-PID-Cabo-VerdeDisaster-Risk-Management-Development-Policy-Creditand-Loan-with-Cat-DDO-P160628.pdf

For further information and online versions of the annexes

Annex 1: Cabo Verde's agro-ecological zones
Annex 2: Selection of agriculture production systems key for food security in Cabo Verde (methodology and results)
Annex 3: Methodology for assessing climate smartness of ongoing practices
Annex 4: Long list of CSA practices adopted in Cabo Verde
Annex 5: Institutions for CSA in Cabo Verde (methodology and results)
Annex 6: Policies for CSA in Cabo Verde (methodology and results)
Annex 7: Assessing CSA finances

This publication is a product of the collaborative effort between the International Center for Tropical Agriculture (CIAT) – lead Center of the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), and the Food and Agriculture Organization of the United Nations (FAO) to identify country-specific baselines on CSA in the Africa Small Island Developing States (Cabo Verde, Guinea-Bissau and Seychelles). The publication is based on data collected by FAO in collaboration with CSA stakeholders and partners in Cabo Verde and on previous work commissioned and led by the World Bank Group to identify country-specific baselines and entry points for scaling out CSA, through data analysis and series of dialogues with national stakeholders. The work complements the CSA Profiles series developed since 2014 by the World Bank, CIAT and CCAFS for countries in Latin America, Asia, Eastern and Central Europe, and Africa (https://ccafs.cgiar.org/publications/csa-country-profiles).

The document was prepared under the co-leadership of Albert Nikiema (FAORAF), Aste Yapi (FAORAF), Samuel Tetteh Partey (ICRISAT/CCAFS), Prosper Houessionon (ICRISAT/CCAFS), Mathieu Ouedraogo (ICRISAT/CCAFS), Robert Zougmoré (ICRISAT/CCAFS), Evan Girvetz (CIAT) and Andrew Jarvis (CIAT/CCAFS). It is based on a methodology prepared by CIAT, the World Bank and the Tropical Agricultural Research and Higher Education Center (CATIE) in 2014 and revisited in 2015 by Andreea Nowak, Caitlin Corner-Dolloff, Miguel Lizarazo, Andy Jarvis, Evan Girvetz, Jennifer Twyman, Julian Ramírez, Carlos Navarro, Jaime Tarapues (CIAT/CCAFS), Charles Spillane, Colm Duffy and Una Murray (National University Ireland Galway).

Main authors: Samuel Tetteh Partey (ICRISAT/CCAFS), Prosper Houessionon (ICRISAT/CCAFS) and João Baptista Monteiro Freire de Andrade (National Consultant)

Editors: Robert Zougmoré (ICRISAT/CCAFS), Albert Nikiema (FAORAF)

Original figures and graphics: Fernanda Rubiano (independent consultant)

Design and layout: CIAT and Fernanda Rubiano (independent consultant)

This document should be cited as:

FAO and ICRISAT. 2019. Climate-Smart Agriculture in Cabo Verde. CSA Country Profiles for Africa Series. International Center for Tropical Agriculture (CIAT); International Crops Research Institute for the Semi-Arid Tropics (ICRISAT); Food and Agriculture Organization of the United Nations (FAO). Rome, Italy. 22p.

Acknowledgement

The fieldwork that supported the preparation of the CSA country profile for Cabo Verde was funded by the African Solidarity Trust Funds. We acknowledge the contribution of the stakeholders as well as experts from Ministries and NGOs in Cabo Verde.

©FAO, 2019
CA5405EN/1/11.19