Climate-Smart Agriculture in Peru

Climate-smart agriculture (CSA) considerations

A P Investing in irrigation infrastructure, conservation of water recharge areas, water-efficient crop varieties, and site-specific land-use planning can improve **water-use efficiency** and resilience of agriculture systems.

M **Efficient use of chemical fertilizers,** especially in rice and sugarcane systems, can facilitate reductions in agricultural emissions.

A M P **Livestock systems offer the potential for dual adaptation and mitigation benefits** through the adoption of natural pasture recovery methods, silvopastoral systems, and improved fodders and livestock breeds.

A M **Agroforestry** in coffee, cocoa, and fruit crops can increase carbon sequestration while also providing adaptation benefits, such as diversified farmer livelihoods, increased biodiversity, and regulation of microclimates that offer resilience towards climate variability.

A P Peru is a megadiverse country, with richness in life zones (84), climates, and genetic diversity of wild and agricultural species. Development and scaling out of CSA practices that focus on research and recovery of this richness and dissemination of **traditional crops** would build resilience of agricultural systems, improve productivity, and contribute to nutrition and food security.

A The preservation and transference of **ancestral adaptation practices** for soil conservation (e.g., platforms, terraces) and water retention (e.g., canals, ponds) are important for mainstreaming CSA.

M $ Peru's vast forest cover (roughly 60%) and relationships with the low-carbon and forestry-related international finance community (UN-REDD+, CDM, NAMAS, LEDS) provide promising opportunities to scale out CSA practices that address **carbon sequestration and ecosystem service provisioning.**[1]

$ Investment in climatic insurance, research and development (R&D), agricultural extension services, domestic markets and value chains, and infrastructure can increase competitiveness of small-scale farmers in the face of climate change.

A M The identification of suitable adaptation and mitigation options can be enhanced by development and access to **Integrated Decision Support Systems** that compile and analyze weather, agronomic, and market information, and deliver results to a range of stakeholders and decision makers.

Institutions: Public institutions require **capacity building** in forging cross-sector synergies, institutional management, and policy development to ensure long-term continuity of strategies and plans in spite of changes in political actors.

A Adaptation — M Mitigation — P Productivity — 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.

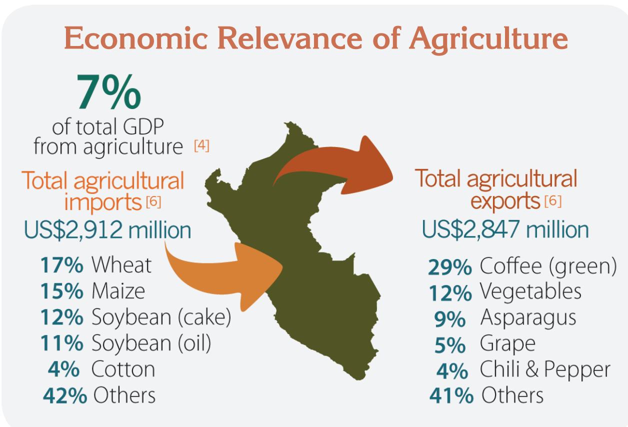
1 UN-REDD+: United Nations Programme for Reducing Emissions from Deforestation and Forest Degradation, plus conservation and sustainable management of forests and enhancement of forest carbon stocks; CDM: Clean Development Mechanism; NAMAs: Nationally Appropriate Mitigation Actions; LEDS: Low-Emissions Development Strategies.

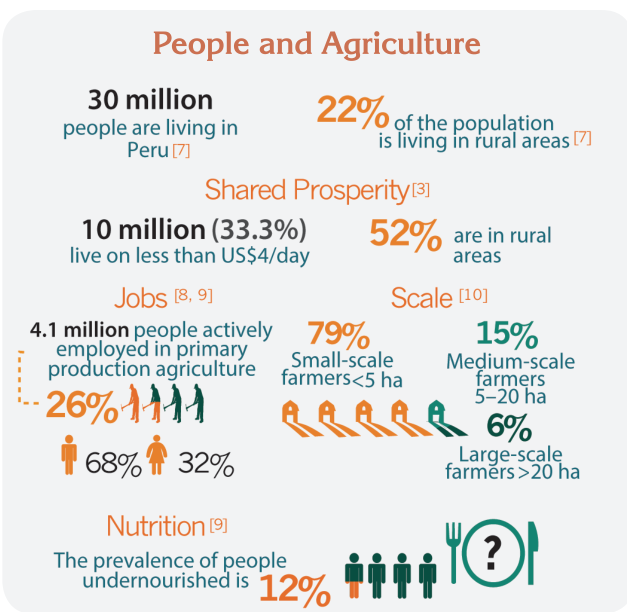
WORLD BANK GROUP — CGIAR — Research Program on Climate Change, Agriculture and Food Security CCAFS — CIAT — CATIE Solutions for environment and development / Soluciones para el ambiente y desarrollo

National context:
Key facts on agriculture and climate change

Economic relevance of agriculture

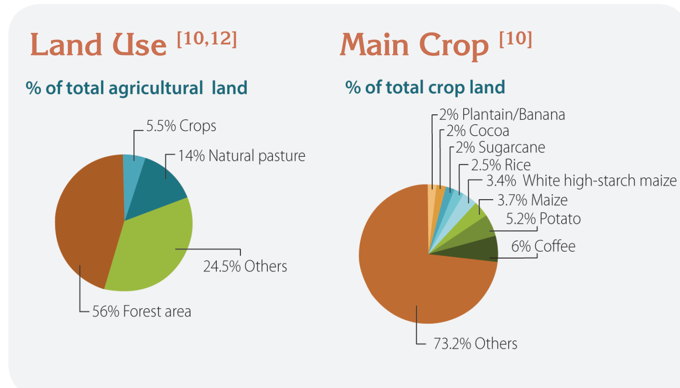
Peru is a country with a growing economy, which is reflected in the 6.4% average annual increase in gross domestic product (GDP) (2004–2013) [3] and an annual population growth rate of 1.3% [4]. Agriculture is a very important sector of the economy, society, and culture. The sector produces most of the staple foods consumed by the population, maintaining a positive trade balance [5] and consistently contributing 7% to the GDP (2008–2012) [4].[2]





Land use

Some of the challenges facing sustainable agriculture in Peru include the conversion of forests to pastures or fields and the unequal distribution of land ownership. In Peru, around 87% of land is owned by 5.5% of the population, mostly large-scale farmers owning more than 20 hectares [10]. Peru's highly inequitable land distribution – recording a Gini coefficient of 0.86 in 1994 [11] – is a factor in its equally high rural poverty rates (52% of the rural population) [7].[3]



Agricultural production systems

Seventy-nine percent (79%) of producers own less than 5 hectares of land, principally concentrated in mountainous areas, and 15% own between 5–20 hectares [10]. These small- and medium-size producers practice traditional agriculture (extensive or subsistence) and make up 91% of the national Gross Value of Production (GVP) [11]. They grow mainly potato, rice, maize, cotton, onion, sugarcane, tomato, banana, and cassava for the domestic market, and coffee and cocoa for export.

Producers who own large tracts of land are located mainly on the coast and have modern intensive systems with pressurized irrigation. Some of the non-traditional export-oriented crops grown are mango, paprika, pepper, olive, asparagus, grape, and citrus fruits [5].

Agriculture exerts considerable pressure on water supplies, especially on coastal irrigated lands. Sugarcane and rice are the most demanding crops in terms of water requirements [13]. Irrigated cropland makes up 36% of agricultural land; approximately 52% of the coast is irrigated [10] with irrigation efficiency (based on application, storage, and uniformity) averaging 35–40%. Water consumption totals roughly 20,000 Mm^3/year and 80% corresponds to agriculture [13].[4]

2 See Annex II.

3 See Annex III.

4 See Annex IV.

Agricultural greenhouse gas emissions

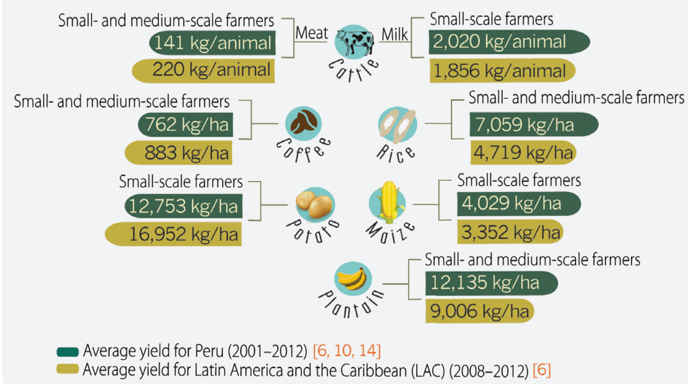
The main sectors that contributed to GHG emissions in 2009 were land use, land-use change, and forestry (47%), energy (21%), and agriculture (19%) [12].

The main sources of agricultural emissions are methane from enteric fermentation (46%) and nitrous oxide from the use of nitrogen fertilizers in agricultural soils (43%). Minor sources include rice (4%), manure management (4%), burning of agricultural residues (1%), and burning of savannas (2%).

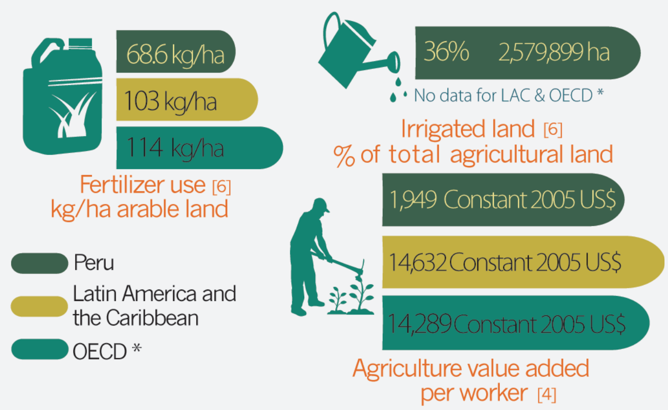
Challenges for the agricultural sector

- Given that 52% of the nation's poor live in rural areas, and 26% of national employment comes from agriculture [7], current levels of government support to agriculture (agricultural insurance, loans, subsidies, and tax protection) are not sufficient to significantly improve shared prosperity and agricultural productivity.
- Most farmers have limited access to extension services, especially those not associated with farmers organizations. Peru lacks a critical agent for transforming subsistence farming into a modern and competitive agriculture system that promotes food security, improves incomes, and reduces poverty.
- Peru is in need of a comprehensive and concerted climate change strategy that involves different stakeholders – including public and private institutions – and further develops site-specific actions and risk management plans.

Important Agricultural Production Systems



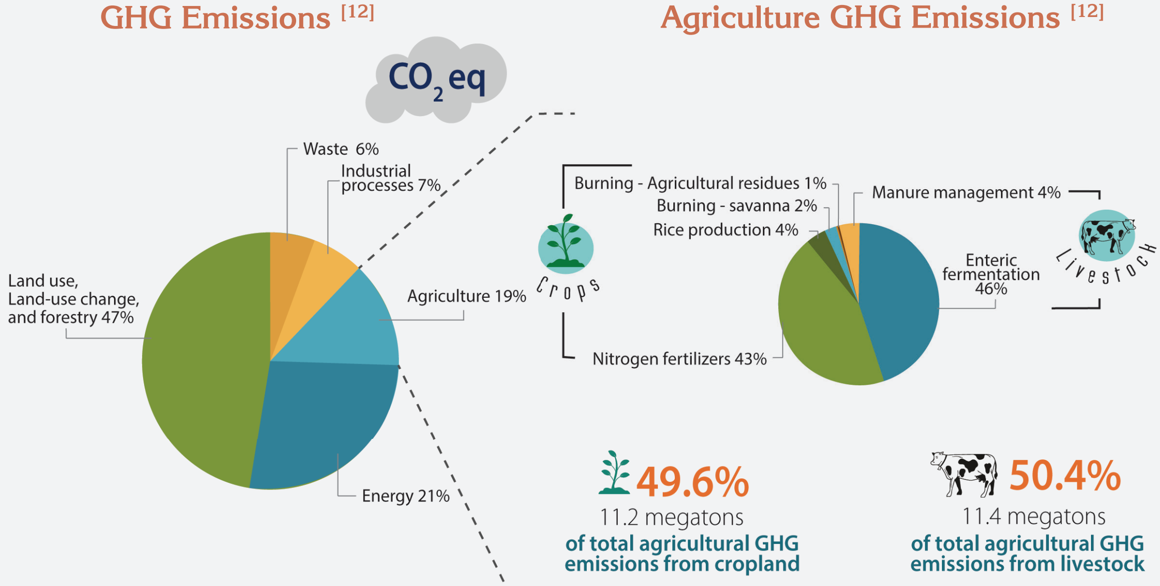
Productivity Indicators



* Organization for Economic Co-operation and Development

GHG Emissions [12]

Agriculture GHG Emissions [12]



Agriculture and climate change

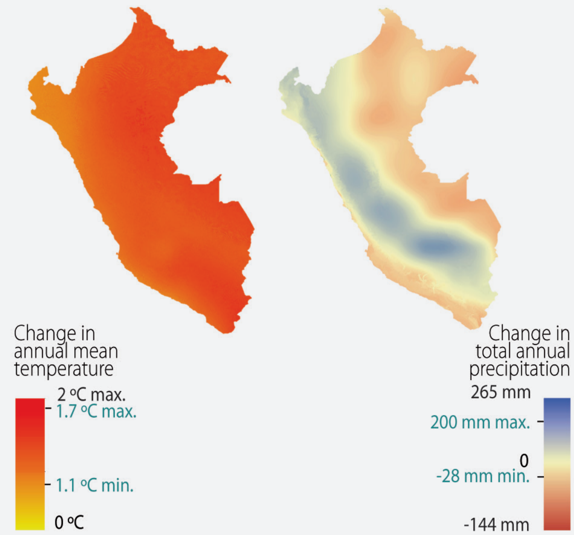
Peru is one of the Latin American countries most impacted by hydro-meteorological phenomena associated with El Niño and ocean atmospheric disturbances generated in the equatorial Pacific Ocean [11]. Climate projections for 2030 indicate that changes in temperature and precipitation, as well as stronger and more frequent El Niño events, can be expected (CCSM-NCAR/RAMS Model). Climate change has already been evidenced by species migration (e.g., native potato now being produced in higher areas) and shifts in pest and disease distribution. Seventy-two percent (72%) of national emergencies are related to drought, heavy rains, floods, frost, and hail, and these have already became six times more frequent between 1997 and 2006 [12]. The biggest crop losses were reported during the 2006–2007 growing year, totaling US$78 million or 1.3% of the nation's agricultural GDP in 2007 [15, 16]. The increased variability of weather and intensity of adverse weather patterns (e.g., extreme temperatures, distribution of precipitation) will continue to result in heavy crop losses.

According to the climate projections, temperatures are generally expected to rise 1–2 °C, and shifts in rainfall vary depending on the region. Temperature increases are projected everywhere except the southern coast (no change), with largest increases in the northern coast (+2 °C). Increases in precipitation are generally projected in the northern coast (20%; +10–40mm), highlands (10–20%; +5–200mm), and rainforest (10%; +100–300mm) regions. Decreases in precipitation are projected in the central coast (20%; -10mm), affecting water availability to yellow maize and potato, in the southern coast (20%; -10mm, possibly as much as -26mm), affecting rice yields, and in the departments of San Martín and Huánuco (-10%), where reductions could affect coffee production [17, 18, 19].

Climate change also affects tropical glaciers, with deglaciation resulting in water scarcity in coastal areas. Over the next 10 years, glaciers below 5,000 meters may disappear altogether [12]. In the rainforest, climate change has brought about unseasonable cold fronts and fluctuations in rainfall patterns [13].[5]

5 See Annex V.

Projected Changes in Temperature and Precipitation in Peru by 2030[6]



CSA technologies and practices

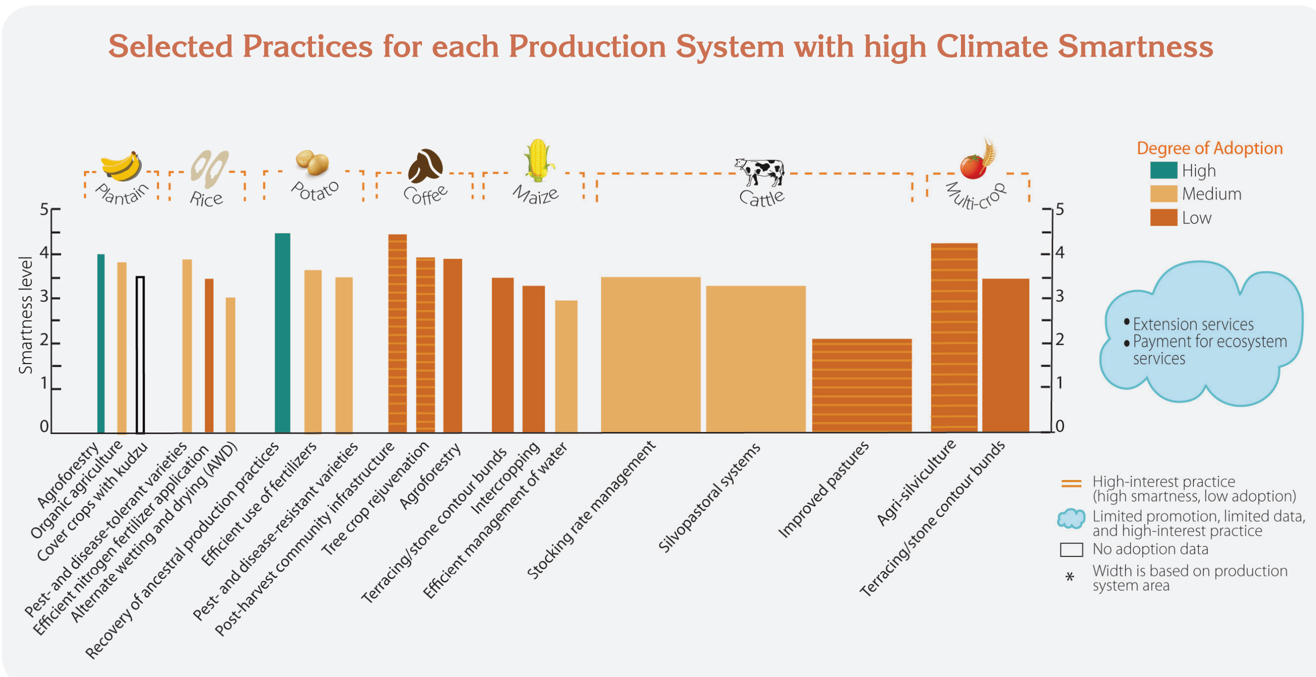
CSA technologies and practices present opportunities for addressing climate change challenges, as well as for economic growth and development of agriculture sectors. For this profile, practices are considered CSA if they maintain or achieve increases in productivity as well as at least one of the other objectives of CSA (adaptation and/or mitigation). Hundreds of technologies and approaches around the world fall under the heading of CSA [2].

Peruvian farmers are already using many CSA practices derived from ancient Andean agriculture. These practices include the management of native crops (mainly potato and maize) and livestock (llamas and vicuñas) in traditional systems, efficient water management (canals, lakes, and ponds), soil conservation (terraces, platforms), and crop associations, among others. Increasingly common practices include pressurized irrigation systems, use of chemical and organic fertilizers, genetic improvement, use of certified seed, and agroforestry (coffee, cocoa, and fruits). The demand of specialized markets has prompted producers to use Good Agricultural Practices, Sustainable Agriculture, and Organic Farming standards (currently 27,000 hectares of organic farms alone), contributing to more sustainable management of agro-ecosystems, environmental awareness, and conservation [20].

6 Projections based on RCP 4.5 emissions scenario [18] and downscaled using the Delta Method [19].

Although CSA practices are used in many areas, in general these practices have low-to-medium adoption rates. These practices have a high potential for productivity, adaptation, and mitigation co-benefits if barriers to adoption can be overcome. For example, efficient water management in rice production can increase productivity, reduce methane emissions, and reduce the risk of soil salinization. Improved pastures (planted with legumes) increase food security and improve the quality of livestock feed and soil. The recovery of ancestral practices in crops, such as potato landraces, maintains genetic diversity and contributes to soil and water conservation. Intercropping also helps reduce climate risks, uses water and soil nutrients efficiently, and diversifies livelihoods (Table 1).

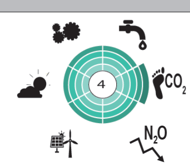
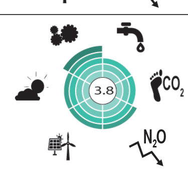
Low and medium adoption rates for these practices are linked with institutional and financial challenges facing farmers and producers associations. Sporadic and unsystematic promotion of policies, regulatory frameworks, and institutions that deliver services, such as climate information systems, R&D, extension services, and financial incentives, contributes to low adoption. Moreover, programmatic risk management instruments, such as agricultural insurance, are of limited availability to Peruvian farmers.



This graph displays the smartest CSA practices for each of the key production systems in Peru. Both ongoing and potentially applicable practices are displayed, and practices of high interest for further investigation or scaling out are visualized. Climate smartness is ranked from 1 (very low positive impact in category) to 5 (very high positive impact in category).

Table 1. Detailed smartness assessment for top ongoing CSA practices by production system as implemented in Peru.[7]

The assessment of a practice's climate smartness uses the average of the rankings for each of six smartness categories: weather; water; carbon; nitrogen; energy; and knowledge. Categories emphasize the integrated components related to achieving increased adaptation, mitigation, and productivity.

	CSA Practice	Climate Smartness	Adaptation	Mitigation	Productivity
Plantain Agricultural area 2%	Agroforestry ■ High adoption (>60%)		Generated microclimates, water regulation, soil conservation.	Increased carbon reserves and sequestration.	Livelihood diversification, high potential for income generation.
	Organic agriculture ■ Medium adoption (>30;<60%)		Greater yield, stability despite climate variability.	Improved efficiency in fertilizer use reduces nitrogen emissions.	Enhanced yields reported.

7 See Annex VI.

	CSA Practice	Climate Smartness	Adaptation	Mitigation	Productivity
Rice Agricultural area 2.5%	Pest- and disease-tolerant varieties ■ Medium adoption (>30;<60%)	3.9	Resistant to pests and diseases, earlier maturation, less water consumption.	Reduction of methane emissions.	Improved yield and grain quality.
	Efficient nitrogen fertilizer application ■ Low adoption (<30%)	3.5	Soil conservation, reduced soil salinity.	Reduced methane emissions, increased soil carbon content.	Increased productivity.
Potato Agricultural area 5.2%	Recovery of ancestral production practices ■ High adoption (>60%)	4.5	Soil conservation, genetic diversity, efficient water use.	No significant benefits.	Maintained productivity.
	Efficient use of fertilizers ■ Medium adoption (30–60%)	3.7	Soil conservation, reduced soil salinity, improved water retention.	Reduced methane emissions, increased soil carbon content.	Increased productivity.
Coffee Agricultural area 6%	Post-harvest community infrastructure ■ Low adoption (<30%)	4.5	Efficient water use, reduced contamination of water and soil.	Unidentified.	Maintained grain quality for higher market value.
	Tree crop rejuvenation ■ Low adoption (<30%)	4.0	Avoided high humidity and fungus development, reduced competition for nutrients.	Unidentified.	Maintained yield.
Maize Agricultural area 7.1%	Terracing/stone contour bunds ■ Low adoption (<30%)	3.5	Soil conservation.	Maintained CO_2 deposits in the soil.	Maintained productivity.
	Intercropping (maize with others crops, bean, quinoa, soybean, fruit, etc.) ■ Low adoption (<30%)	3.3	Reduced climate risks, greater efficiency in water and soil use.	Improved foliar biomass, increased carbon sequestration.	Increased crop diversification.
Cattle Natural pastures 14%	Stocking rate management ■ Medium adoption (30–60%)	3.5	Water conservation, soil availability.	Reduced contamination by nitrates and phosphates.	Maintained productivity.
	Silvopastoral systems ■ Medium adoption (30–60%)	3.3	Improved soil quality, regulates microclimate.	Increased carbon sequestration.	Livelihood diversification.

	CSA Practice	Climate Smartness	Adaptation	Mitigation	Productivity
Multiple crops	Agroforestry (quinoa, avocado, golden berry, etc.) ■ Low adoption (<30%)		Wind protection and soil conservation.	High potential for mixed income generation.	Increased agricultural diversification, high potential for mixed income generation.
	Terracing/stone contour bunds (quinoa, avocado, golden berry, etc.) ■ Low adoption (<30%)		Soil conservation.	Maintained CO_2 deposits in the soil.	Maintained productivity.

CO_2 Carbon smart   Water smart   Weather smart N_2O Nitrogen smart   Energy smart   Knowledge smart

Case Study:

Water harvesting for aquifer recharge and agricultural productivity in Peru

Climate projections entail reductions in rainfall patterns in some areas of the country. The Peruvian government is collaborating with countries that share water networks (Peru-Ecuador, Peru-Bolivia) to improve water-use efficiency and watershed management.

Rainwater harvesting is an important climate-smart practice aimed at strengthening and protecting the regenerative dynamics of habitats and agrobiodiversity. Natural hollows are adapted to store runoff, and native grasses are planted to rehabilitate wetlands and recharge aquifers in highland areas. The ponds that are eventually formed store water for use in dry periods. In Peru, this is an especially useful practice to address impacts from climate change in the upper Cachi-Mataro basin and in the Pampas.

The Bartolomé Aripaylla Association of Ayacucho (ABA-Ayacucho) of Peru began developing the technique in 1994. The ABA water harvesting project has been implemented in 60 communities and localities by more than 6,000 farming families across areas with diverse soil and climatic conditions, many with steep slopes. ABA's initiative has seen numerous achievements and benefits since its launch 22 years ago:

- Recharged aquifers and increased water quality and quantity with over 71 rainwater-generated ponds.
- Increased water-use efficiency when combined with modern techniques, such as spray irrigation.

Rainwater-generated ponds (Asociación Bartolomé Aripaylla/ABA)

- Reduced overgrazing through regeneration of native grasses.
- Provision of habitat for new populations of flora and fauna (biodiversity enhancement).
- Increased vegetation cover, expanded pastures, and orchards.
- Strengthening of organizations, and social cohesion structures.
- Improved livestock production, household income, and family nutrition.

Given that water availability is a challenge many countries face due to climate change, lessons from this project, both regarding technical aspects and methods for achieving successful adoption at scale, could be useful in other areas around the globe. Furthermore, this practice can support the Andean NAMA.

Institutions and policies for CSA

Peru has been part of the United Nations Framework Convention on Climate Change (UNFCCC) since 1992 and the Kyoto Protocol since 2002. It has submitted two UNFCCC national communications and has ongoing integrated policies, strategies, and national and regional plans for climate change. These include:

- National Climate Change Strategy (ENCC), 2003
- National Forest Strategy of Peru (ENFP), 2002–2021
- Regional Strategies on Climate Change (ERCC)
- Bicentennial Plan 2021 (BP 2021), 2012–2021
- National Environmental Action Plan (PLANAA), 2010–2021
- Climate Change Planning (PLANCC), 2012–2020
- Plan of Action for Adaptation and Mitigation to Climate Change (PAAMCC), 2010
- Risk Management and Adaptation to Climate Change in the Agricultural Sector Plan (PLANGRACC-A), 2012–2021

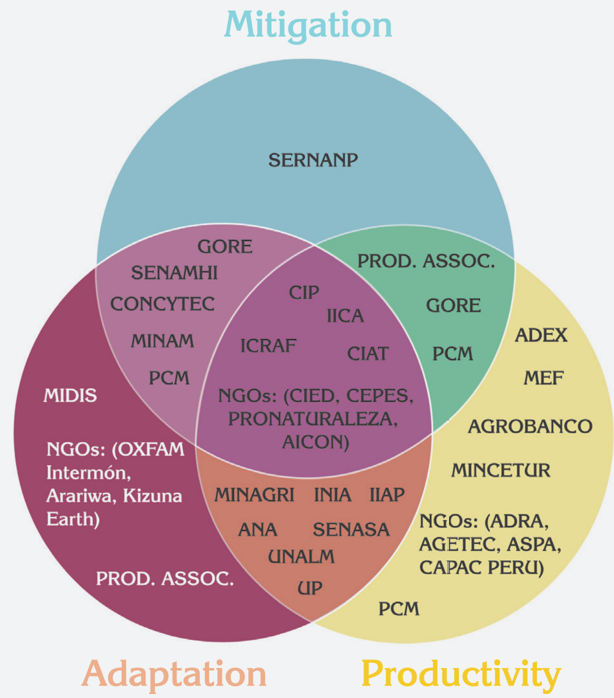
In addition, Peru has signed the Convention on Biological Diversity (CBD) and the Cartagena Protocol on Biosafety as well as the Convention to Combat Desertification and Drought.

A few groups operating in Peru have activities that link the three pillars of CSA. These include CGIAR Centers (CIAT, CIP, ICRAF), IICA, and some NGOs (e.g., CIED, CEPES, PRONATURALEZA, AICON). The groups provide international cooperation opportunities that involve research, agricultural innovation, emissions reduction, conservation, education, gender, and adaptation systems, among others.

Peruvian institutions show a high degree of integration between combinations of two pillars of CSA. Synergies between national institutions in the adaptation and productivity pillars are embodied by institutions that support technological innovation, research, trade, capacity building, and technology transfer in the agricultural sector, which can be seen in the diagram.[8]

Policies for adaptation to climate change in agriculture are spearheaded by the Ministry of Agriculture and Irrigation (MINAGRI) in coordination with the Ministry of Environment (MINAM) and with the support of

Primary Focus of Institutions Engaged in CSA



the Regional Governments (GOREs). MINAGRI has implemented the Agricultural Multiannual Sectoral Strategic Plan (2012–2016) and national programs (Agroideas, Mi Riego, Agrorural) to connect directly to producers. The Chair of the Council of Ministers (PCM) has implemented Sierra Exportadora to diversify production chains. Furthermore, in 2012 the Law for Promotion of Organic Agriculture and Ecology was passed, chaired by MINAGRI and executed through the National Institution of Agricultural Innovation (INIA) and National Agrarian Health Service (SENASA). Adaptation and productivity initiatives are supported further by international entities and local NGOs (e.g., OXFAM Intermón, Arariwa, Kizuna Earth).

The National Service of Meteorology and Hydrology of Peru (SENAMHI) provides climate and environmental data. Adaptation efforts and capacity building in the most vulnerable populations and regions of the country are led by multiple government agencies, such as the Ministry of Development and Social Inclusion (MIDIS) and the PCM, and supported further by international entities, local NGOs, and producers associations.

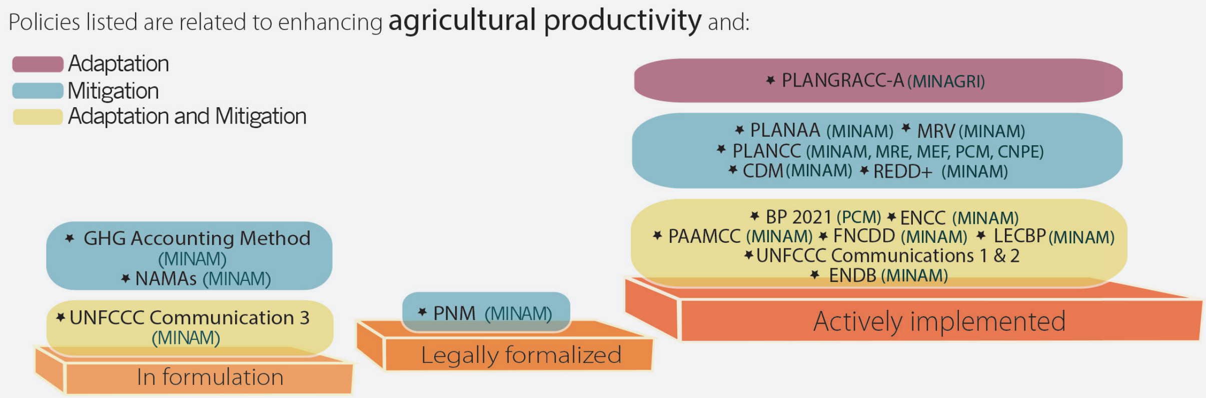
Environmental mitigation policies are guided by MINAM, which created the Climate Change Research Agenda (AIC) for the period 2010–2021 with the support of the National Council of Science and Technology (CONCYTEC). MINAM has identified six sectors for the development of Nationally

8 See Annex VII.

Appropriate Mitigation Actions (NAMAs): energy, transport, industry, waste management, forestry, and land use. Peru is beginning work on NAMAs in this year (formulation stage). The NAMAs combine actions and programs that can be implemented as part of the Clean Development Mechanism (CDM). Peru also has protected areas directed by the National Service of Protected Areas (SERNANP), which contribute to conservation and climate change mitigation.

In recent decades, Peru has transitioned towards more decentralized governance and increased policies benefiting environmental management. These processes require capacity building, senior management of institutional matters, and policies to establish appropriate synergies between different actors in the public sector.

Enabling Policy Environment for CSA



BP 2021 (2012–2021) Bicentennial Plan 2021 **CDM (2014)** Clean Development Mechanism **ENCC (2003)** National Climate Change Strategy **ENDB (2001)** National Strategy on Biological Diversity **ENFP (2002–2021)** National Forest Strategy of Peru **FNCDD (2008–2010)** Fourth National Communication on Desertification and Drought **GHG Accounting (2014)** National Inventories and Accounting **LECBP (2011–2014)** Low-Emissions Capacity Building Program **MRV (2011)** Measuring, Reporting, and Verification **NAMAs (2014)** Nationally Appropriate Mitigation Actions **PNM** National Mitigation Plan **PAAMCC (2010)** Adaptation and Mitigation to Climate Change Plan of Action **PLANAA (2010–2021)** National Environmental Action Plan **PLANCC (2012–2020)** Planning for Climate Change **PLANGRACC (2012–2021)** Risk Management and Adaptation to Climate Change in the Agricultural Sector **REDD+ (2008–2011)** United Nations Programme for Reducing Emissions from Deforestation and Forest Degradation + **UNFCCC (2001–2010)** National Communications to the United Nations Framework Convention on Climate Change

Financing CSA

National finance

National funding for the agricultural sector comes from domestic financial institutions:

- 29% municipal savings (e.g., Caja Arequipa, Caja Huancayo, CMAC CUZCO)
- 13% cooperatives (e.g., CREDICOOP)
- 13% national banks (e.g., commercial banks; Mi Banco, Banco de Crédito del Perú)
- 12% rural savings and credit (e.g., CREDICHAVIN, CREDINKA, INKASUR)
- 12% Small and Micro Business Development Entity (EDPYME) (e.g., ALTERNATIVA, RAIZ, CREDIVISION)
- 9% Agrobanco, and 13% other institutions (4% NGOs, 2% lenders, 5% non-financial companies, 2% other)

Credit is invested in the acquisition of production inputs (74%), product marketing (7%), tool purchases (7%), heavy machinery purchases (2%), and other activities (10%) [10].

Peru's Guarantee Fund provides catastrophic agricultural insurance for subsistence agriculture. The Fund has access to US$14.4 million, which is administered by COFIDE Bank. From 2010–2011, 442,210 hectares of crops were insured (10% of the cultivated area) in the eight poorest and most climatically vulnerable regions of the country. While other agriculture insurance schemes exist in Peru, they are not being consistently operationalized.

Under the State Modernization and Decentralization policy of 2000, the Government established the National Public Investment System (SNIP) administered by the Ministry of Economy and Finance (MEF). In this system, regional and local governments can declare their projects viable for competition. There are 45 climate change projects in the SNIP Project Bank, totaling more than US$58 million [12].

In 2004, Peru spent only 0.15% of its GDP on R&D. Recently, however, MEF has implemented the Program of Science and Technology (Fincyt), with US$36 million of funds in the first phase, and the Ministry of Production has created the Fund for Research and Development Competitiveness (Fidecom), which has US$70 million of funds [21].

International finance

Peru has received funding for climate change and agriculture initiatives from international organizations totaling more than US$412 million, provided through loans, grants, and technical assistance, for activities planned for 2007–2015. Funds are mostly from 15 cooperating sources including Japan (JICA, CCIG) (45%), the Inter-American Development Bank (IDB) (20%), Germany (KfW, GIZ) (5%), Switzerland (SECO, COSUDE) (4%), the World Bank (2%), GEF (7%), CIF (12%), and others (5%). Funds were allocated to 58 programs or projects working on adaptation, mitigation, risk management, institutional and human capacity building, REDD+, and monitoring, verification, and reporting (MRV) as part of the ENCC.

Agriculture initiatives made up only a small proportion of the allocated international funds (US$19.5 million or 4.9%) [22]. That said, in 2014 Peru received funds for the National Agricultural Innovation Program implemented by INIA with funding from the World Bank (US$40 million or 31%) and the IDB (US$40 million or 31%), as well as public funds. This project represents a major initiative for innovation within the Peruvian agricultural sector.[9]

Potential finance

Finance for agriculture barely manages to support 10% of producers [6]. Given Peru's relationships with the international financial community, developed through collaborations on low-carbon and forestry-related international development (UN-REDD+, CDM, NAMAs, LEDs), there are promising opportunities to gain support in scaling out CSA. Payments for Ecosystem Services (PES) and Payments for Water Services implemented by MINAM also represent funding opportunities for incentivizing agricultural activities that promote conservation and watershed restoration [23, 24].

Outlook

Peru has experienced transitions in the last decade favorable for sustainable agriculture development and building a resilient agricultural sector. This includes the success of non-traditional crops and native crops in export markets, decentralization, and an increased focus on environmental management. Environmental conservation and climate change mitigation and adaptation have received high levels of funding, but funding has not been sufficiently linked with agricultural initiatives, which remain less integrative across sectors and regions.

Ministries have invested in many agriculture programs, but more work can be done to institutionalize synergies between actors in the public sector. Strengthening the Peruvian national strategy for agriculture would facilitate mainstreaming CSA in agriculture development. This could be done through focusing more on increasing climate change adaptation and resilience of small-scale farmers, incentivizing low-emissions livestock (cattle, sheep) production, and reducing unsustainable land-use change and practices, such as savannas burning. Scaling out CSA will also require increased coordination efforts between public and private agriculture organizations across national and local levels, as well as strengthened cooperation with international climate-related institutions.

Funds for Agriculture and Climate Change

ACP-EC Energy Facility (EU) **AECID** Spanish Agency for International Cooperation for Development **AF** Adaptation Fund **AGROBANCO** Agricultural Bank of Peru **BG** Belgium Government **CAF** Climate Action Fund **CCIG** Climate Change Initiative Grants **CIF** Climate Investment Funds **EDPYME** Small and Micro Business Development Entity **FAO** Food and Agriculture Organization of the United Nations **FCPF** Forest Carbon Partnership Facility **FG** Finnish Government **FONTAGRO** Regional Fund for Agricultural Technology **GCCA** Global Climate Change Alliance **GCF** Green Climate Fund **GEEREF** Global Energy Efficiency and Renewable Energy Fund **GEF** Global Environment Facility **GIZ** German International Cooperation **Gordon and Betty Moore** Foundation **IDB** Inter-American Development Bank **IICA** Inter-American Institute for Cooperation on Agriculture **JICA** Japan International Cooperation Agency **KFW** German Development Bank **KOICA** Korean International Cooperation Agency **NOAK-NEFCO** Nordic Countries **SCCF** The Special Climate Change Fund **SECO and COSUDE** Swiss Cooperation **UN-REDD+** United Nations Programme for Reducing Emissions from Deforestation and Forest Degradation + **UNDP** United Nations Development Programme **UNEP** United Nations Environment Programme **USAID** United States Agency for International Development **WB** The World Bank

9 See Annex VIII.

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For further information and online versions of the Annexes, visit:

http://dapa.ciat.cgiar.org/CSA-profiles/

Annex I: Acronyms

Annex II: Economic relevance of agriculture in Peru

Annex III: Land-use in Peru

Annex IV: Important production systems methodology

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Annex VII: Relevant institutions and organizations related to CSA

Annex VIII: International Climate-Smart Funding

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