

**COMBINED PROJECT INFORMATION DOCUMENTS / INTEGRATED
SAFEGUARDS DATA SHEET (PID/ISDS)
CONCEPT STAGE**

Report No.: PIDISDSC15992

Date Prepared/Updated: 23-Jun-2016

I. BASIC INFORMATION

A. Basic Project Data

Country:	Peru	Project ID:	P156250
		Parent Project ID (if any):	
Project Name:	Strengthening the Science, Technology and Innovation System in Peru (P156250)		
Region:	LATIN AMERICA AND CARIBBEAN		
Estimated Appraisal Date:	26-Sep-2016	Estimated Board Date:	15-Dec-2016
Practice Area (Lead):	Trade & Competitiveness	Lending Instrument:	Investment Project Financing
Borrower(s):	Ministry of Economy and Finance		
Implementing Agency:	CONCYTEC		
Financing (in USD Million)			
Financing Source			Amount
Borrower			55.00
International Bank for Reconstruction and Development			45.00
Total Project Cost			100.00
Environmental Category:	B - Partial Assessment		
Concept Review Decision:	Track II - The review did authorize the preparation to continue		
Is this a Repeater project?	No		
Other Decision (as needed):			

B. Introduction and Context

Country Context

Peru has emerged as a new growth star in Latin America and the Caribbean (LAC). Peru's economy surged at an average of 6.4% per year during the last decade, the second-fastest growth in the region. Over the same period, Peru doubled its per capita income, well ahead of the region as a whole (which increased per capita income by only half). Moreover, Peru has been consistently among the top regional poverty and inequality reducers. Growth helped Peru to reduce poverty from 54.8% to 25.8% of the population between 2001 and 2012, faster than other countries with similar incomes. Across the country, lower-income households (those in the bottom 40% of the income distribution) gained more from growth than the national average. Between 2004 and 2013, the real income per capita of the lowest-paid 40% of Peru's population grew at an average 6.8%, above the 4.4% national average.

Strong macroeconomic and structural reforms over the last 20 years have driven these successes. Beginning in the early 1990s, Peru adopted an ambitious mandate for reform. Macroeconomic stabilization included a more flexible exchange rate regime, inflation-targeting, fiscal discipline, and continued debt reduction. Structural reforms covered areas such as financial liberalization, trade, and product and factor market regulations. Highly favorable external conditions over the last decade have also contributed to Peru's successes. As a commodity exporter, Peru benefited significantly from the commodity boom, particularly between 2004 and 2013. In recent years, high labor and capital accumulation have helped provide Peru with enough inputs to fuel growth. The country achieved substantial labor accumulation, supported by a strong demographic dividend and high labor force participation (78% by 2013). At the same time, domestic savings increased (from just above 10% of GDP in the early 1990s to 24% in 2014).

Peru continues to have a sound macroeconomic policy framework to face the headwinds of the new global context. Growth slowed to 2.4% in 2014, but the ample macroeconomic buffers allowed the country to undertake moderate, prudent, and temporary counter-cyclical fiscal policy. The country reached upper-middle-income status in 2008 and is now seeking to join the Organization for Economic Co-operation and Development (OECD). The next step in development (high-income status) will require Peru to further deepen reforms to accelerate and sustain productivity growth and export competitiveness.

Moving from middle- to high-income status is achievable for Peru, but growth will have to rely much more on productivity. Peru still has much lower income and productivity than high-income countries. Its output per worker is only 25% of that of the United States, lower than in Mexico (35%) and Chile (36%). While potential gains from increasing the capital stock, human capital, and labor are significant, a total factor productivity (TFP) increase would have the greatest impact. In fact, while LAC as a whole would only double its GDP per worker if it had US levels of efficiency (same TFP as the US), Peru would almost triple it.

Sectoral and Institutional Context

To continue growing, Peru needs to increase and diversify its exports. Peru has one of the world's most liberal trade policy regimes but exports less than other countries with similar incomes (24.2% of GDP in 2013). Moreover, Peru's exports are increasingly concentrated in a few low-margin commodities (from 54% of total exports in 1994 to 72% in 2013) and export markets (95% of Peru's export growth between 2007 and 2013 came from selling existing products to existing export markets). Overall, five sectors (minerals, metals, vegetables, foods, and textiles & apparel) accounted for 91% of merchandise exports in 2013, virtually unchanged since 1994, with minerals taking a significant share. Peru is also low in services trade and is poorly integrated into global value chains (GVCs). A more diversified export basket with a

variety of value added can make an economy more competitive and resilient to external shocks.

To achieve greater export diversification, Peru needs to spur productivity. Greater productivity, unleashed by a suite of structural reforms and firm productivity increases, could unleash export-driven growth in Peru. The past decade's performance has laid the groundwork. Success requires Peru to further improve conditions for firms' growth through lowering costs of entry and operation, increasing competition, and improving management skills and tools. Doing so would allocate factors of production to more productive sectors and more productive firms within sectors. Most importantly, Peru needs a reformed and improved science, technology, and innovation framework to provide the critical technology, human capital, and know how needed to boost firms' productivity.

Productivity growth depends on firms' ability to effectively innovate, which in turn depends on the technologies, processes, human capital, and managerial skills available to them, their own growth aspirations and internal capabilities, and the expected profitability of the new markets they are trying to serve. Unfortunately, shortcomings in Peru's innovation system limit reliable access to the technologies, human capital, and know how that firms need to innovate. Firms invest too little in innovation, indicating that the innovation system might not be functioning properly. (On average, Peruvian firms invest only 2.5% of sales on innovation, compared to 3.5% in Chile and 5.6% in the EU.)

Firms that invest in innovation are more likely to introduce new products, but low returns deter further investment. Peruvian firms that spend on innovation are more likely to introduce new products or processes than firms in other LAC countries except Chile. However, Peruvian firms that introduce new products or processes see only about 38% higher sales per employee, compared to about 100% higher sales per employee in Colombia, Panama, Uruguay, Costa Rica, and Chile.

The low capacity of Peru's science, technology, and innovation (STI) system is a critical reason for the low returns firms see on innovation. The low returns on innovation are due to three main factors:

- 1) Due to its supply-driven orientation, Peru's STI system fails to transfer innovative technologies to firms. It also does not coordinate the relevant agents sufficiently and lacks a long-term common strategic vision.
- 2) Productive networks in Peru have poor strategic focus, often competing in low-margin segments. Firms need to move into high-margin strategic segments to increase returns to innovation.
- 3) Peru's insufficient supply of scientific researchers and university graduates in science and technology restricts the creation and adoption of knowledge and technology. Peru's national STI system does not provide enough of the right kind of human capital and research and innovation products to respond to the demands for innovation coming from the productive system.

The institutional framework and governance of the national STI system is still embryonic. The system is uncoordinated, fragmented, and lacks a common strategic vision. Mechanisms for policy coordination and collaboration are insufficient. Confusion between policy design and program funding and management overlap in several agencies, creating conflicts of interest regarding the use of resources. Executing agencies and funds have excessively broad missions.

Prevailing institutional rigidities and overwhelming legalistic frameworks hinder the development and effectiveness of policy instruments. Peru also has one of the weakest sets of STI data in the region, hindering monitoring of policies and international benchmarking. The absence of a proper M&E framework for innovation policies constrains policy learning and recalibration.

Absence of a proper institutional framework and governance contributes to low public investment in innovation. Peru's public expenditure on STI as a share of GDP is low and ineffective compared with other LAC countries. STI budgets in Mexico, Chile, and Colombia are 20, 10, and 6 times larger than the STI budget in Peru. Public support also reaches very few firms (less than 1%, while for example in Brazil and Chile innovation policy instruments are being used by 6% and 8% of firms, respectively).

Productive networks in Peru have poor strategic focus, often competing in low-margin segments. Firms need to move into high-margin strategic segments to increase the returns to innovation. Unfortunately, Peruvian firms have not been able to enter high-margin strategic segments and produce nontraditional or upgraded products and services, with only 0.4% of Peru's exports considered high tech, against 2.2% in Argentina, 3.3% in Brazil, 0.9% in Colombia, and 6.0% in Chile. This is because Peruvian firms are poorly integrated into regional and global productive networks (GVCs), primarily through the supply of primary inputs via downstream linkages.

In Peru, most firms innovate in isolation, failing to benefit from the knowledge flows and technology transfers typically associated with dynamic GVCs. Opportunities for knowledge transfer from multinational companies through FDI are limited. In Peru, 52.5% of inputs used by foreign companies are locally sourced, whereas in Chile and Colombia, local sourcing by foreign firms reaches 58.6% and 61%, respectively. Similarly, university and industry collaboration in R&D is the weakest in Peru among peer countries. (Peru ranks 109 out of 144 countries in the corresponding WEF indicator). This suggests that Peru needs to exploit spillovers, increasing interactions with research institutions and public programs.

The creation and adoption of knowledge and technology are restricted by having too few scientific researchers or university graduates in science and technology. The lack of qualified human capital is one of the main constraints on productivity and innovation in Peru (National Innovation Survey, 2012; World Bank Enterprise Survey, 2010). The supply of skills is insufficient, and the quality of education remains poor. Distorted institutional incentives are biased against R&D, and Peru underinvests in technology, research, and innovation. As a result, Peru performs worse than its peers across all indicators of science, technology, innovation and creativity. For, example, Peru produces 2.4 scientific articles per billion GDP (ranking 122 of 142 on the GII Index 2015) and files 0.03 international patents per billion GDP (ranking 84 of 142 on the GII Index 2015).

The Government of Peru is determined to foster productivity growth through strengthening its national innovation system (SYNACIT). To that end, the government has mandated that the National Council for Science, Technology, and Innovation (CONCYTEC) design the national STI strategy (Crear para Crecer) and to implement it through a public investment project with the support of the World Bank.

Relationship to CAS/CPS/CPF

The proposed project is a core element of the latest CPS (FY2012-16) and contributes to the CPS goal of (Sustainable Growth and Productivity), specifically results area 3.1: (Promoting

productivity through enhanced labor skills and SMEs' competitiveness by supporting the Government's capacity to generate productive innovation, strengthen human capital formation and foster collaboration with the private sector.

At the same time the proposed project is fully aligned with the World Bank Group's (WBG) twin goals of ending extreme poverty and boosting shared prosperity. By fostering innovation and entrepreneurship, the WBG is contributing to improving the earnings of the less well-off by creating more, better-paying jobs and achieving productivity gains. In line with the CPS's objective of increasing opportunities for women, the project will also support the participation of women in the calls for grants, especially those for young researchers and postdoctoral grants in component 3.

This project contributes directly to efforts to boost productivity through innovation, by improving the performance of the National System of Science, Technology and Innovation (SYNACIT), supporting the country's productive diversification agenda by strengthening R&D investment and human capital on strategic sectors; and increasing research and innovation capacity.

C. Proposed Development Objective(s)

Proposed Development Objective(s) (From PCN)

The project's development objective (PDO) is to strengthen the capacity of the STI system to generate high-quality relevant research to contribute to productive innovation.

Key Results (From PCN)

The key indicators to measure progress towards the achievement of the Project Development Objective are proposed below and will be finalized during project preparation:

- Firm-level innovation, as measured by the number of firms participating in the Productive Innovation (PI) Fund and Competitiveness Reinforcement for Innovation (CRI) for PIs adopting innovative/upgraded products and processes
- Innovation results, as measured by the number of new and improved products and processes offered, and number of patents submitted by beneficiary firms, universities and research centers
- Number of active researchers in Peruvian universities, research centers, or companies;
- High quality research products aligned with the demand for innovation by the productive system, as measured by the number of publications submitted to peer reviewed, indexed scientific journals

D. Concept Description

The operation will have the following four main components: 1) Institutional Framework and Governance of the National STI System, 2) Strategic Programs: Productivity & Innovation Fund and Competitiveness Reinforcement Initiatives for Productive Innovation, 3) Research and Innovation Capacity, and 4) Project Management and M&E. Each of the three main components will contribute in synergy to strengthen the national STI system of Peru by redesigning its institutional set up and governance (component 1), and addressing both demand-side (component 2) and supply-side (component 3) constraints to the proper functioning of the national innovation system.

Component 1. Institutional Framework and Governance of the National STI System ➤ USD 6

million

The proposed component will work to: i) strengthen the institutional design and governance capacity of the Science Technology and Innovation (STI) System, for it to become more integrated, coordinated and effective, ii) identify and improve the efficiency, effectiveness, operation and governance of STI programs, and iii) Improve information and monitoring systems for STI expenditure indicators.

Proposed subcomponents, activities, and instruments

Subcomponent 1.1: Improving the institutional and governance framework of the national innovation system: Assessment of the institutional framework of SYNACIT and recommendations for improvement.

- (€ Conduct an assessment on the formulation of STI policy, service delivery and sustainable funding of STI activities.
- (€ Elaborate a proposal for a new institutional design and an action plan for the implementation of the proposed design.

Subcomponent 1.2. Strengthening the National Innovation System management capacity.

Subcomponent 1.2 will be key for achieving the project's development objective, since it will lay the foundation for reform of the National Science Technology and Innovation system by providing concrete recommendations on how to improve the system's institutional design and by informing the analysis of the other two components.

1. Implementation of the Public Expenditure Review Analysis methodology: This activity aims to improve the design process of the various STI programs and instruments, in order to ensure their proper functioning, efficiency, effectiveness and good governance.
2. Implementation of a monitoring and evaluation system: Monitoring will include, among other things, regular measurement of the effectiveness of tax incentives and other specific instruments, and the establishment of baselines and outputs for the projects implemented within SINACYT.
3. Strengthening of CONCYTEC's management capacity: Training for CONCYTEC's staff and staff from other entities of the STI system.

Subcomponent 1.3: Improvement of national information and STI expenditure monitoring systems:

1. Activities related to internal information needs:
 - (€ Finance the development of a budget application that improves the monitoring of STI expenditure of the various public entities of the system by providing a better disaggregation and classification of STI activities.
 - (€ Finance the development of an integrated information system and implementation of the equipment and infrastructure needed to monitor programs and instruments of the entities involved in STI activities.

2. Activities related to external information needs:

➤(¢ Conduct an assessment of the system ➤(s information needs. The main product of this activity will be the preparation of a report on the strategy for the development of STI indicators in Peru

➤(¢ Increase access to virtual libraries and other information sources by financing the necessary infrastructure and the necessary licenses and subscriptions.

Component 2 ➤(Strategic Programs: Productivity & Innovation Fund and Competitiveness Reinforcement Initiatives for Productive Innovation ➤(USD 11 million

The main objective of this component is to design, plan, and oversee the operationalization of the strategic programs on science, technology and productive innovation of CONCYTEC, in line with the national research priorities and demands for innovation of the private sector. It will establish a Productivity and Innovation Fund (PI for I Fund) to encourage research-industry technology transfer, and it will finance the implementation of selected Competitiveness Reinforcement Initiatives for Productive Innovation (CRI for PI) at industry and cluster levels.

Proposed subcomponents, activities, and instruments

2.1 Sub-component- Planning and Capacity Building for the Strategic Programs on Productive Innovation. This subcomponent will finance the establishment and implementation of a structured decision-making mechanism and consultative process led by CONCYTEC to assess the demand for productive innovation by the private sector in Peru, with a focus on cluster and industry SME networks. The core activity of this subcomponent is the implementation of a Capacity Building Program for the Strategic Programs on Productive Innovation that will train a cadre of CONCYTEC ➤(s staff, private sector representatives, and relevant stakeholders of the SYNACIT to implement a set of CRI for PI pilots at industry and local cluster levels in line with the national priorities on innovation.

2.2 Sub-component ➤(Competitiveness Reinforcement Initiatives for Productive Innovation (CRI for PI). Sub-component 2.2 will focus on the implementation of a set of CRI for PI pilots as finalized under the Capacity Building Program. The CRI for PIs will build the capacity of the local private sector to help identify investments and capacity building needs to enhance technological upgrading and firm competitiveness. The CRIs for PI will be structured in three phases: identification of challenges, devising the strategy and launching of the investment plans. At the end, each CRI for PI initiative will have a detailed technology upgrading investment plan to address both firm and cluster innovation and technology gaps.

2.3 Sub-component. Productivity and Innovation Fund for Technology Transfer and Upgrading. The objective of the PI Fund is to finance the implementation of the technology upgrading investment plans prepared under the CRI for PI initiatives. The PI Fund will provide matching grants on an open and competitive basis to technology upgrading investment plans presented by partnerships between SME producers, larger producers/exporters, public or private research institutions (both national and international), and private service providers of innovation and technology services. The PI Fund will provide investment finance both to firms and to shared facilities for firms in a specific value chain, and finite training or other capacity-building as required to establish and begin operation of the facilities.

2.4 Sub-component. Impact Evaluation and Continuous Learning to Recalibrate the National Programs on Innovation. The objective of this sub-component is to establish a continuous learning and feedback mechanism to monitor performance, identify institutional and organizational critical success factors, and distill the lessons learned from the implementation of the CRI for PI pilots and of the PI Fund.

Component 3: Research and Innovation Capacity ➤(USD 26.5 million

The main objective of this component is to strengthen the capacity of the national science, technology and innovation system to generate relevant new knowledge and technology and to contribute to productive innovation. This component concentrates all the activities of the project related to the supply side of the STI system.

Proposed subcomponents, activities, and instruments

3.1 Subcomponent: Strengthening human capital for STI. This sub-component aims at strengthening human capital for science, technology and innovation by incentivizing research work and the number and quality of PhD programs. Specifically, this subcomponent will support the following activities:

3.1.1 Provision of research grants for young, postdoctoral and established researchers as well as visiting scholars (Peruvian researchers to go abroad or international researchers to come to Peru).

3.1.2 Provision of grants to Peruvian higher education institutions to support the creation and consolidation of world class, high quality PhD programs in science and engineering related to or required by the strategic areas of Component 2.

3.2 Subcomponent: Improving research infrastructure. This subcomponent seeks to modernize, update and strengthen research infrastructure in universities and research centers by co-financing the rehabilitation of existing facilities and the acquisition of laboratory equipment with up to date technologies, with emphasis on laboratories and equipment for research in areas related to or required by the strategic areas of Component 2.

3.3 Subcomponent: Competitive and strategically oriented funds for research and innovation to support basic and applied research and technological development, with emphasis on research and innovation projects in areas related to or required by the strategic areas of Component 2.

Component 4: Project Management and Monitoring & Evaluation ➤(USD 1.2 million

This component is designed to build the capacity within CONCYTEC to manage the day-to-day implementation of the project, as well as to monitor and evaluate its impact. It will support the establishment of a minimal Project Management Team (PMT).

II. SAFEGUARDS

A. Project location and salient physical characteristics relevant to the safeguard analysis (if known)

The Project will be implemented in the Republic of Peru.

B. Borrower's Institutional Capacity for Safeguard Policies

The National Council for Science, Technology and Innovation (CONCYTEC) will be the implementing agency for the Project, and it will be responsible for carrying out the environmental assessment process. While CONCYTEC has implemented IADB-financed projects, it does not have experience implementing World Bank-financed projects. CONCYTEC's environmental assessment-related capacity will be strengthened through hiring of an environmental specialist who will supervise that environmental issues are properly addressed along the grants approval process and research infrastructure improvement activities.

C. Environmental and Social Safeguards Specialists on the Team

Alonso Zarzar Casis (GSU04)

Raul Tolmos (GEN04)

D. POLICIES THAT MIGHT APPLY

Safeguard Policies	Triggered?	Explanation (Optional)
Environmental Assessment OP/BP 4.01	Yes	This Project is categorized as environmental risk Category B, given that the proposed activities are not likely to result in significant negative impacts on human populations and/or environmentally important areas. While no direct, physical, environmental impacts are anticipated to result from the proposed project, some of the grant and research financing to be supported may have some environmental impacts, both positive and negative. An Environmental Management Framework (EMF) will be prepared since it appears to be more appropriate to support the screening and development of measures, as needed, to address potential environmental impacts and risks. Moreover, since activities financed under Subcomponent 3.2 (Improving research infrastructure) may also have environmental implications (e.g. disposal of materials/waste, rehabilitation of facilities etc.), they will be addressed through this EMF (assuming that specific activities under these two subcomponents are not known by appraisal).
Natural Habitats OP/BP 4.04	No	This policy is not triggered since the proposed activities will be carried out in existing locations and no conversion of natural or critical habitats is involved.
Forests OP/BP 4.36	No	This policy is not triggered given that the Project activities are to be carried out in existing locations without any involvement on forest activities.
Pest Management OP 4.09	No	This policy is not triggered since the project activities will not involve the purchase or use of

		significant quantities of pesticides.
Physical Cultural Resources OP/BP 4.11	No	This policy is not triggered given that the proposed activities are to be carried out in existing locations without affecting physical cultural or archaeological resources.
Indigenous Peoples OP/BP 4.10	No	The project is aimed at academic institutions and enterprises interested in productive innovation and technology upgrading as well as to individuals holding PhD degrees for human capital strengthening. The Indigenous Peoples of Peru are not among those that could fulfill such a professional profile, and therefore the project does not trigger this policy. No civil works will be financed outside of existing research facilities and therefore there will be no impacts on Indigenous Peoples communities.
Involuntary Resettlement OP/BP 4.12	No	This policy is not triggered since the Productivity and Innovation Fund under subcomponent 2.3 will exclude proposals that would require land acquisition that could entail physical or economic displacement of people. No civil works will be financed outside of existing research facilities and therefore there will be no need for land acquisition.
Safety of Dams OP/BP 4.37	No	This policy is not triggered given that the project will not support the construction or rehabilitation of dams nor will support other investments which rely on the services of existing dams.
Projects on International Waterways OP/BP 7.50	No	This policy is not triggered because the project will not affect international waterways as defined under the policy.
Projects in Disputed Areas OP/BP 7.60	No	This policy is not triggered because the proposed project will not affect disputed areas as defined under the policy.

E. Safeguard Preparation Plan

1. Tentative target date for preparing the PAD Stage ISDS

15-Jul-2016

2. Time frame for launching and completing the safeguard-related studies that may be needed. The specific studies and their timing should be specified in the PAD-stage ISDS.

The Project preparation schedule currently foresees Appraisal taking place in the second half of July 2016. An Environmental Management Framework is under preparation and will be consulted with few key institutions (e.g. Ministry of Environment, etc.) to get feedback. No other safeguard-related studies will be prepared.

III. Contact point

World Bank

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Contact: Javier Botero Alvarez
 Title: Lead Education Specialist

Borrower/Client/Recipient

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V. Approval

Task Team Leader(s):	Name: Alberto Criscuolo, Javier Botero Alvarez	
Approved By		
Safeguards Advisor:	Name: Agnes I. Kiss (SA)	Date: 29-Jun-2016
Practice Manager/ Manager:	Name: Marialisa Motta (PMGR)	Date: 12-Sep-2016
Country Director:	Name: Alberto Rodriguez (CD)	Date: 29-Sep-2016

1 Reminder: The Bank's Disclosure Policy requires that safeguard-related documents be disclosed before appraisal (i) at the InfoShop and (ii) in country, at publicly accessible locations and in a form and language that are accessible to potentially affected persons.