



# THE WORLD BANK GROUP'S PERU PORTFOLIO AND CLIMATE CHANGE

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## Executive Summary

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Peru is one of the most vulnerable countries in the world to climate change impacts, but one of the smallest contributors to greenhouse gas emissions (GHG). Peru's water resources lie at the center of climate change risks faced by the country. Peru is already facing large and ever increasing water shortages, which are exacerbated by the impacts of climate change. Peru's glaciers are retreating at a rapid and escalating rate. Diminished glacial water and decreased precipitation will result in reduced stocks of drinking water, water for irrigation, and water pressure to power hydroelectric facilities.

Although climate change impacts pose increasing water scarcity risks for Peru, the current water shortages facing Peru are largely a result of the rapid expansion of the water intensive industries of export agriculture and mining. Experts warn that increased demand from agriculture, mining and population growth together with climate change will cause severe water scarcity in Lima already by 2025.<sup>1</sup>

The largest source of GHG emissions in Peru comes from land use change accounting for more than 53 percent of emissions.<sup>2</sup> Deforestation is at the forefront of land use change concerns as the Peruvian Amazon is facing growing pressure. The forests are key to both Peru's climate change resilience and mitigation serving to protect against floods and soil erosion, to control climate, and to absorb carbon dioxide.

In recent years, the World Bank Group (WBG) has become increasingly concerned with the risks posed by climate change and on the disproportionate impact it has on the poorest and most vulnerable communities.<sup>3</sup> One of the WBG's core climate change objectives is to support global action to avoid exceeding a 2°C warmer world. One of the most promising climate change pledges of the World Bank is to end fossil fuel subsidies.<sup>4</sup> By phasing out harmful fossil fuel subsidies, countries can reallocate their spending to where it is most needed and most effective, including targeted support for the poor.

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<sup>1</sup> According to the World Bank's Water and Sanitation Program for Peru: <https://www.wsp.org/featureevents/features/lima-running-dry-%E2%80%93-promoting-water-culture-second-driest-capital-world>

<sup>2</sup> <http://pe.seeg.global/emisiones-totales/>

<sup>3</sup> See <http://www.worldbank.org/en/topic/climatechange/publication/turn-down-the-heat-climate-extremes-regional-impacts-resilience>

<sup>4</sup> See <http://www.worldbank.org/en/news/feature/2015/03/18/5-ways-reduce-drivers-climate-change>

Given world leaders are set to make a global agreement on climate change this December and the WBG's Annual Meetings take place in Peru, it is timely to assess the WBG's (including World Bank, International Finance Corporation (IFC) and Multilateral Investment Guarantee Agency (MIGA)) Peru portfolio and its implications for climate change.

Like climate change, the negative impacts of water scarcity and deforestation are being felt disproportionately by the poorest communities in Peru. Even more sobering is the fact that both of these problems further increase the vulnerability of Peru's poor to climate change. The following assessment focuses on three sectors: agriculture, mining and energy. These sectors were chosen because the WBG has had and continues to have significant involvement in them in Peru and because they are of high climate change significance. These sectors are further viewed in the specific context of water scarcity and land use change/deforestation.

## **Main Findings**

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The WBG is constantly challenged by the delicate balance of deciding where to draw the line between commercially beneficial investments and the environmental and social costs – more specifically, the climate change risks of those investments. In the case of Peru, unfortunately the WBG got the balance wrong.

The model of growth supported by the WBG for Peru was overly dependent on climate vulnerable and climate destructive sectors, without adequately improving the country's regulations and capacity to manage the climate risks. This has exacerbated Peru's vulnerability to climate change risks.

## Water Scarcity Conclusions

WBG policy reforms and investments supporting the export agriculture sector have attracted billions of investment and have created the lowest unemployment rates in Peru for the coastal regions of Ica and La Libertad.<sup>5</sup> However, the WBG's portfolio has on balance contributed to the serious water scarcity problems facing Peru that will only be made worse by climate change.



The WBG has invested in some of the largest projects in both the export-agriculture sector and the mining sector and in some of the most water intensive operations within those sectors, e.g., asparagus (e.g., Agrokasa) and gold mining (e.g., Yanacocha). In addition, expanding well beyond the impacts of project investments, the Bank has supported policy reforms through development policy loans and technical assistance aimed at accelerating the expansion of these water intensive sectors.

Even though the WBG put substantial efforts into improving water management in an attempt to help Peru mitigate the water risks, the growth in the export-agriculture and mining sectors outpaced the WBG's initiatives. For example, the improvements to irrigation efficiency were unable to compensate for the ever expanding agriculture. In general, WBG initiatives were not accompanied by an adequate understanding of the water depletion rates of aquifers or surface water flows fed by glaciers. Thus, efficiency measures were not coupled with limitations to farming or mining expansion, including the exceptionally large-scale operations financed by the IFC. The World Bank itself determined that the aquifer supplying the Ica region, where much of the WBG-supported export-agriculture growth has occurred, is now over-exploited and unsustainable.

Since 2000, there have been 16 complaints in Peru concerning water depletion and/or contamination filed with the Compliance Advisory Ombudsman (CAO) of the IFC and MIGA. These complaints were filed by local farmers, fishermen, communities, and water-users associations surrounding five different IFC and MIGA projects in Peru – three mining projects (Yanacocha, Antamina, and Quellaveco), one agriculture project (Agrokasa), and one oil & gas project (Maple Energy). These

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<sup>5</sup> Rios, Luz Díaz, 2007. Agro-industries characterization and appraisal: Asparagus in Peru. Food and Agriculture Organization of the United Nations (FAO), Rome, 2007. Available at: <http://www.fao.org/docrep/016/ap297e/ap297e.pdf>

complaints are highly suggestive of the WBG's contribution to water scarcity in Peru. Several findings of the CAO are important to highlight:

1. **Lack of IFC management support for concerns of environmental staff** - In the absence of effective IFC management support, the professional advice of IFC's environmental and social specialists was effectively overruled by commercial pressures (Agrokasa case, Ica).
2. **Misguided assumptions on adequacy of measures to address risk** - Without an underlying baseline assessment and understanding of the scale of aquifer depletion, the project's commitment to reduce water usage was without context and essentially meaningless as regards the impact on aquifer depletion (Agrokasa case, Ica).
3. **Ineffective Equity framework** - A more robust framework for considering environmental & social issues when decisions were made in relation to equity stakes and divestment may have put IFC in a better position to respond to the water issues raised by the complaint (Quellaveco case).
4. **Inappropriate handling of future risks** – The IFC categorized environmental and social risks incorrectly of investments in exploration operations and feasibility projects, i.e., B instead of A. Thus, the IFC has not addressed the actual risks involved (Quellaveco case).
5. **Weak framework for addressing problems** – None of the water concerns in the 16 CAO complaints have been resolved. The WBG needs to strengthen IFC management's accountability to the CAO to ensure adequate resolution of problems.

**Inappropriate sequencing of policy reforms and investments** The Bank's approach to improve the investment climate for these water intensive sectors without first having adequate water management regulations and government capacity in place has made the water scarcity issue significantly more difficult to resolve. Some of the necessary reforms to strengthen water management are opposed by the now well-established powerful private agriculture and mining operations. For example, in the formulation of the 2009 Water Law, the mining sector's influence won out over the pleas of poor communities and farmers, including even large agro-exporters, to allow development in the fragile Andean headwaters, which will further exacerbate the impacts of melting glaciers.

To be fair, the World Bank reform programs supported by DPLs are limited and cannot be expected to address all failures in a given country. However, the WBG must recognize that in order to strengthen a country's resilience to climate risks, the Bank must start by correctly prioritizing reforms. In the case of Peru, the WBG supported policies to promote the expansion of export agriculture and mining, and made direct investments in the biggest and most water intensive projects, prior to correcting water rights issues, water

metering and pricing, and lacking data on aquifer depletion rates. All of which still remain major problems to this day.

**Inequitable access to water** Although unintended, the Bank's policies aimed at increasing agriculture and mining investments have also led to privileged water access and increased consolidation of water rights in the hands of large-scale agriculture and mining operations. The continued inequitable distribution of water rights harms the poorest communities' access to water most in Peru. For example, Indigenous groups in the Andes fight with mining companies over access to clean water.<sup>6</sup> The Andean highland populations are very poor, and their ability to influence water use politics and strategies is much lower than that of large-scale agro-exporters or high-value mining projects. In the end, the Bank has exacerbated rather than abated inequalities in access to resources vital to climate change adaptation for the poor.

**Water management does not target mining** The WBG did not comprehensively address the World Bank's specific contributions to climate risks. For example, in Peru none of the WBG's water efficiency measures or government metering was directed at the mining sector. In fact, the Yanacocha gold mine does not dispute that its activities have likely contributed to drying up some of the local wells, but the operation also maintains that it is not in violation as the government has set no limits on its water usage. Even though the IFC has 5 percent equity ownership in Yanacocha, it remains silent on the water rights issues surrounding this mega mining operation.

Given the gaps in the WBG's approach, water shortages continue to plague Peru and promise to get worse with climate change. The World Bank itself notes that the rising lack of water is becoming a restriction to the country's economic development and an increased source of conflict.<sup>7</sup>

## Energy Sector Conclusions

For the last two decades, the WBG has focused on the development of natural gas and to a lesser extent oil in the energy sector of Peru. Since the 1990s, development policy loans and technical assistance has centered on expanding oil and gas investments and

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<sup>6</sup> Lubovich, Kelley. 2007. The Coming Crisis: Water Insecurity in Peru. FESS Issues Brief. Foundation for Environmental Security and Sustainability (FESS), September 2007. Available at: [http://www.fess-global.org/publications/issuebriefs/the\\_coming\\_crisis\\_water\\_insecurity\\_in\\_peru.pdf](http://www.fess-global.org/publications/issuebriefs/the_coming_crisis_water_insecurity_in_peru.pdf)

<sup>7</sup> World Bank. 2012. *Peru - Country partnership strategy for the period FY12-FY16*. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/2012/02/15822676/peru-country-partnership-strategy-period-fy12-fy16>

more recently on hydropower expansion. In addition to policy reforms, WBG investments in the energy sector were 81 percent to oil and gas; 16 percent to large hydropower; and 3 percent to small hydropower<sup>8</sup> and solar PV systems (see Table 1).

**Table 1. WBG Investments by Primary Energy Source 2000-2014 (million US\$)\***

<b>Oil &amp; Gas</b>	<b>440</b>	<b>Oil &amp; Gas breakout</b>	<b>440</b>
<b>Large Hydropower</b>	<b>85</b>	Gas Export	300
<b>Renewables**</b>	<b>16.5</b>	Gas Domestic	50
<b>Total</b>	<b>541.5</b>	Exploration & Production	90

\* Does not include Development Policy Loans, Technical Assistance or transmission & distribution.

\*\*Includes small hydropower and solar PV systems.

This assessment of the WBG's energy sector portfolio in Peru found that it contributed to the vulnerability of Peru to climate change through:

**Focus on Gas Exports** Due to IFC's Peru LNG project, over half (55 percent) of the WBG's primary energy source investments go towards exporting natural gas. By supporting the export of gas, the WBG is promoting an accelerated rate of burning natural gas, which threatens the 2 degree global limit and makes Peru more vulnerable to climate risks. Furthermore, it also contradicts Peru's priority of ensuring a long-term domestic gas supply.

**Increase in Fossil Fuel Subsidies** In Peru, the WB supported policies that extended subsidies to fossil fuels. World Bank Development Policy Loans and Technical Assistance supported policy frameworks in Peru that included: VAT exemption for exploration, accelerated depreciation, and subsidies for natural gas infrastructure. The Bank-supported subsidies were aimed at producers, including for exploration, and infrastructure investors.

**Lack of support for Climate-Smart Alternatives** When it comes to renewable energy sources, there is a significant hole in the WBG's Peru portfolio. The WBG has provided very little support, only \$16.5 million, for renewable energy projects that are not threatened by depleting water resources. Since 2008, the WBG has put emphasis on policy reforms in support of large hydropower development in Peru and invested \$85 million in a 168 MW hydropower plant. However, experts predict that Peru will become

<sup>8</sup>The World Bank states that small hydropower is defined country by country (<http://wbi.worldbank.org/energy/small-hydropower-technology/chapter-1-introduction>). However, the International Center on Small Hydro Power and UNIDO, defines small hydropower as having a capacity of up to 10 MW per plant (World Small Hydropower Development Report 2013, UNIDO & ICSHP).

water scarce possibly as early as 2030. Without consistent water flow from glacial melt and rainfall, hydropower facilities may lack the water pressure necessary for consistent electricity generation.<sup>9</sup>

## Land Use Change Conclusions

The largest source of GHG emissions in Peru comes from land use change accounting for more than 53 percent of emissions.<sup>10</sup> The WBG's Peru portfolio includes significant support for sectors widely considered to be drivers of land use change, including: agriculture, mining, and energy.

Especially worrisome is growing forest loss in the Peruvian Amazon. Forests are key to climate change mitigation since cutting trees emits CO<sub>2</sub> and standing forests absorb CO<sub>2</sub>. Peru has the fourth largest tropical forest in the world. According to the Intergovernmental Panel on Climate Change (IPCC), as much as 24-30 percent of total climate mitigation potential can be provided by halting and reversing tropical deforestation.<sup>11</sup>

Unfortunately, a recent analysis by InfoAmazonia of non-Brazilian Amazon countries, found that Peru had the largest extent of forest loss in 2012, losing 162,000 hectares, an increase of 67 percent over 2011.<sup>12</sup> In the coming years, Peru's forest loss will likely continue to increase largely due to the expansion of agriculture and roads, including those associated with mining and hydrocarbon development.<sup>13</sup>

**Lack of support for forest management/protection** As in the case for climate-smart renewables, it is also important to note a complete lack of WBG funding for sustainable forest management/protection and land use planning in Peru.<sup>14</sup> In addition, Bank data does not allow for a clear and quantifiable understanding of land use change or

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<sup>9</sup> *Economist*. 2007. When ice turns to water: Climate change in the Andes. July 14, 2007 and Economist Intelligence Unit, 2007. Peru: Energy provision. May 23, 2007.

<sup>10</sup> <http://pe.seeg.global/emisiones-totales/>

<sup>11</sup> That is, the amount of carbon dioxide emissions that would be avoided by halting tropical deforestation, plus the carbon dioxide that would be removed from the atmosphere by continuing to regrow tropical forests at the current pace. IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland. <http://www.ipcc.ch/report/ar5/syr/>

<sup>12</sup> <http://news.mongabay.com/2013/06/deforestation-rates-for-amazon-countries-outside-brazil/>

<sup>13</sup> Dourojeanni, Marc, Alberto Barandiaran, and Diego Dourojeanni, 2009. Amazonia Peruana en 2021: Explotación de recursos naturales e infraestructura: Que esta pasando? Que es lo que significa para el future? ProNaturaleza, DAR, SPDA e ICAA, Peru, 2009.

[http://www.actualidadambiental.pe/documentos/amazonia\\_peruana\\_dourojeanni.pdf](http://www.actualidadambiental.pe/documentos/amazonia_peruana_dourojeanni.pdf)

<sup>14</sup> The only forest management projects found received funding from the Global Environment Facility not the World Bank. For example, 2001-2007, the GEF funded the Indigenous Management of Protected Areas in the Peruvian Amazon Project.

deforestation at the project level. The Bank also does not assess land use change or deforestation risks of its development policy loans and technical assistance.

**Significant risks associated with Development Policy Loans** Expansion of palm oil land holdings and oil and gas concessions in the Amazon link back to land tenure reforms supported by the WB's development policy loans of the early 1990s, including increases to size limits without requiring the necessary protections to forests and indigenous people.

On the hydrocarbon front, oil and gas concessions now cover 75 percent of Peru's Amazon territory.<sup>15</sup> Almost all of these concessions overlap with areas of extreme ecological and cultural sensitivity, including areas occupied by indigenous peoples living in voluntary isolation. As much as one half overlap with nature and indigenous reserves - lands the Peruvian government has preserved only on paper.<sup>16</sup> The vast coverage of hydrocarbon blocks in the Amazon is largely a result of reforms supported by Bank DPLs and technical assistance. According to a Bank assessment "it is only since 1994 as a result of the huge private investment effort that the large majority of hydrocarbon contracts have been signed and exploration has arrived at frontier areas... especially in the central and southern Amazonian areas."<sup>17</sup>

## Recommendations

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The WBG needs to ensure that its model of growth for countries fundamentally does not depend on a growth in climate vulnerable and climate destructive sectors. To this end, the WBG should adopt:

1. **Robust Climate Change Assessment Safeguard** As evident from the critical gaps in the WBG's approach to Peru, the Bank has not yet formally integrated climate issues into its operational policies. Most notably, the current Safeguard Policy framework does not adequately address the challenges a changing climate presents to client governments, donor governments, affected communities, local ecosystems and the global commons.

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<sup>15</sup> <http://www.alianzaarkana.org/the-amazon-rainforest/oil-exploitation-in-the-peruvian-amazon>

<sup>16</sup> <http://www.alianzaarkana.org/the-amazon-rainforest/oil-exploitation-in-the-peruvian-amazon>

<sup>17</sup> ESMAP, 1999. Peru Reform and Privatization in the Hydrocarbon Sector. Joint World Bank/UNDP Energy Sector Management Assistance Programme (ESMAP), ESM216, July 1999.

The Peru case demonstrates how critical it is to fully assess and adequately address the climate risks associated with reforms contained in Development Policy Loans and Technical Assistance. Such operations reach far beyond the impacts of project investments and yet they are not adequately assessed by any Bank operational policy and specifically not covered by the Safeguards.

For instance, the Bank Information Center worked with many Civil Society Organizations to develop a Safeguard submission for a Climate Change Assessment policy to deal with many of the identified shortcomings and covers all Bank instruments, including inter alia: **Development Policy Loans, Technical Assistance, Country Partnership Frameworks, and Financial Intermediaries.**<sup>18</sup>

The Safeguard reforms will additionally need to strengthen guidelines for **Environmental Categorization** to ensure appropriate handling of future environmental and social risks associated with early operations, such as exploration (see CAO finding 4 above).

- 2. Appropriate Sequencing** When there are gaps in the regulations and government capacity to manage a sector(s), the necessary reforms to adequately address climate risks need to be in place prior to policy reforms aimed at expanding investments in sectors with potential climate risks. The World Bank often plans to address risks through future additional operations. But, as demonstrated in Peru, this approach often fails and the necessary reforms often become more difficult to adopt due to a lack of leverage. Thus, it is critical that reforms to address climate risks must be triggers directly within the Development Policy Loans or Technical Assistance aimed at promoting the sector containing climate risks.

Special attention must be given to protect the poor's access to resources vital to their climate change adaptation, such as forests, land, and water. Specifically, both policy and project assessments should do an explicit, robust analysis of the direct and indirect impacts that policies and projects will have on forests, land use, and water coupled with appropriately robust mitigation mechanisms. Measures that adequately improve land use planning and/or water and forest management should be included within the development policy loans and projects containing risks.

In Peru, the WB did not understand how its supported land tenure reforms would ultimately exacerbate inequitable access to water and land for the poor. In addition, on deforestation in Peru, DPLs and technical

<sup>18</sup> For more details, please see the submission at: <http://www.bankinformationcenter.org/wp-content/uploads/2014/05/Climate-Change-Safeguard-Model-Policy-for-the-World-Bank.pdf>

assistance supporting increased investments in hydrocarbons and agriculture should have been, at the very least, conditioned upon a government ban on awarding concessions in indigenous and nature reserves.

Regarding deforestation in Peru, DPLs and technical assistance supporting increased investments in hydrocarbons and agriculture should have been, at the very least, conditioned upon secured titling of indigenous lands, strengthened legislation for the protection of community land and the closing of loopholes for granting concessions in nature reserves including overlapping land administration regimes among various government agencies.

- 3. Comprehensive End to Fossil Fuel Subsidies** One of the WBG's most promising climate pledges is to end fossil fuel subsidies. However, so far the World Bank has taken a very limited approach by targeting mainly only consumer subsidies. The Bank often does not recognize its own promotion of fossil fuel subsidies largely to producers through support for government guarantees, infrastructure investment incentives, Public-Private Partnerships, and WBG finance itself. Producer subsidies are the drivers of investment and a significant barrier to low-carbon development.

Scientists have determined that at least two-thirds of the world's current, proven reserves of oil, gas, and coal must not be burned if we are to avoid raising global temperatures above 2 degrees Celsius – the globally agreed limit. Thus, any subsidies for fossil fuel exploration are directly incompatible with preventing the worst impacts of climate change. **Given WBG assistance is a subsidy,<sup>19</sup> the World Bank Group should immediately eliminate any assistance linked to fossil fuel exploration and support all countries to do the same.**

In Peru, the WB should support the government to eliminate any subsidies supporting fossil fuel exploration (e.g., VAT exemption and accelerated depreciation of machinery and equipment), fossil fuel price supports, and gas infrastructure investment subsidies. The WB should help the government of Peru to reallocate their spending on targeted support for the poor.

- 4. Proactive Equity Stakes** In FY13, equity investments accounted for nearly \$2.7 billion of the IFC's annual commitment of \$11 billion. Shareholders of significant equity stakes in a company may exercise some level of control, influence or participation in the activities of the company. For equity investments, the IFC generally holds between 5 and 20

<sup>19</sup> According to the World Bank, because of their longer-term loans, International Financial Institutions (IFIs) bring down the costs of financing long-term capital intensive projects, by around 25 percent, even when blended with shorter-term commercial loans. World Bank, 2010. Peru: Overcoming the Barriers to Hydropower. Energy Sector Management Assistance Programme (ESMAP), May 2010.

percent of a project's equity and usually maintains it for 8 to 15 years. The IFC currently does not use its equity stakes to influence a company's activities even when it could improve social or environmental outcomes. **The IFC should proactively use its equity stakes to correct unforeseen contributions to climate risks and more broadly negative environmental and social impacts.**

For Peru, the IFC should use its 5 percent equity stake in the Yanacocha/Conga gold mine to help resolve complaints regarding water access and water quality. Start by requiring Yanacocha to provide the local community with promised water quantity and quality reports.

5. **Climate-Smart Renewables for Every Country** In some countries, the WBG has turned to large-scale hydropower as a “climate friendly” approach without fully understanding the climate risks and without adequately investing in truly climate-smart renewables, like solar and wind. Among other environmental and social concerns, in the face of climate change, large hydropower will often not be a long-term solution and in some countries may increasingly compete with drinking supplies and irrigation needs.

For Peru, the WBG should ramp up funding for renewable energy projects and policies to incentivize investment in renewables, which are not at risk from depleting water resources, like wind and solar.

## Introduction

Peru is one of the most vulnerable countries in the world to climate change impacts, with seven of the nine climate vulnerability characteristics recognized in the 1992 United Nations Framework Convention on Climate Change (UNFCCC), including: low coastal zones; arid and semi-arid areas; exposure to floods, droughts, and desertification; zones prone to natural disasters; areas of high urban pollution; fragile mountain ecosystems; and significant economic dependence on the production and export of fossil fuels.<sup>20</sup>

In 2009, as part of the Copenhagen Accord, world leaders agreed to limit the rise in global temperatures to no more than 2°C above pre-industrial levels. More vulnerable countries such as Peru wanted deeper emissions cuts to hold temperature rise to 1.5°C but this was not achieved.<sup>21</sup>

In recent years, the World Bank Group (WBG) has become increasingly concerned with the risks posed by climate change and on the disproportionate impact it has on the poorest and most vulnerable communities.<sup>22</sup> One of the WBG's core climate change objectives is to support global action to avoid exceeding a 2°C warmer world. Overall, the WBG hopes to eventually achieve carbon neutrality in the global economy to enable achievement of its twin goals of ending extreme poverty and increasing shared prosperity.<sup>23</sup>

One of the most promising climate change pledges of the World Bank is to end fossil fuel subsidies. By phasing out harmful fossil fuel subsidies, countries can reallocate their spending to where it is most needed and most effective, including targeted support for the poor.

Given world leaders are set to make a global agreement on climate change this December and that the WBG's Annual Meeting takes place in Peru shortly before the UNFCCC negotiations, it is timely to assess the WBG's portfolio in Peru and its implications for climate change to determine what lessons can be learned to strengthen the WBG's climate change approach to development. This assessment includes the WBG's World Bank (or International Bank for Reconstruction and Development (IBRD) which lends to middle-income countries), International Finance Corporation (IFC) and Multilateral Investment Guarantee Agency (MIGA). Both IFC and MIGA cover the private sector.

It is important to note that in contrast to Peru's high climate change vulnerability, the country is one of the smallest climate change contributors – responsible for only an estimated 0.1% of global CO<sub>2</sub> emissions.<sup>24</sup> As such, this assessment emphasizes contributions to Peru's vulnerability to the risks of climate change.

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<sup>20</sup> USAID, 2012. Follow the Water: Emerging Issues of Climate Change and Conflict in Peru. Office of Conflict Management and Mitigation, United States Agency for International Development (USAID), June 2012.

<sup>21</sup> <http://www.perusupportgroup.org.uk/peru-climate-change.html>

<sup>22</sup> See <http://www.worldbank.org/en/topic/climatechange/publication/turn-down-the-heat-climate-extremes-regional-impacts-resilience>

<sup>23</sup> See <http://www.worldbank.org/en/news/feature/2015/03/18/5-ways-reduce-drivers-climate-change>

<sup>24</sup> <http://www.perusupportgroup.org.uk/peru-climate-change.html>

There was not enough time or resources to assess the entire World Bank Group's Peru portfolio and the full range of climate change risks and vulnerabilities facing the country. As such, this assessment focuses on only three sectors: agriculture, mining and energy. These sectors were chosen because the WBG has had and continues to have significant involvement in them and because they are of high climate change significance. These sectors are further viewed in the specific context of water scarcity and land use change/deforestation.

## **Water Scarcity**

Peru's water resources lie at the center of climate change risks faced by the country, both because water scarcity is a risk common to three of Peru's climate vulnerability characteristics<sup>25</sup> and because of the current water risk level. In fact, Peru is already experiencing large and ever increasing water shortages that are damaging agricultural production, drinking supplies, and availability of hydroelectricity. In addition, violent conflicts over water access have been taking place between communities and mining operations.

These water shortages are further exacerbated by the impacts of climate change, including rapid warming of mountain ecosystems, with the consequent changes in glaciers and mountain wetlands, and changes in rainfall patterns.

More than 99% of the world's tropical glaciers are in South America and 71% of those are found in Peru. Already, Peruvian glaciers have diminished in size by 22 percent since 1980.<sup>26</sup> Experts warn if current trends continue, Coropuna in Arequipa is projected to lose all of its glacier cover in less than 20 years.<sup>27</sup>

Moreover, most of Peru's population lives on the arid Pacific coast, including approximately one third in Lima. The Peruvian coast is one of the driest deserts in the world with little rainfall and therefore heavily reliant on water from glacial melt. Melting glaciers coupled with decreases in precipitation threaten to severely reduce water supplies in a country that is already water poor. According to a 2010 World Bank study<sup>28</sup>:

"Peru's highly populated arid Pacific coast depends on water from glacial melt to compensate for the region's lack of rainfall, but Peru's glaciers are retreating at a rapid—and increasing—rate.

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<sup>25</sup> Arid and semi-arid areas; exposure to floods, droughts, and desertification; and fragile mountain ecosystems.

<sup>26</sup> USAID, 2012. Follow the Water: Emerging Issues of Climate Change and Conflict in Peru. Office of Conflict Management and Mitigation, United States Agency for International Development (USAID), June 2012.

<sup>27</sup> USAID, 2012. Follow the Water: Emerging Issues of Climate Change and Conflict in Peru. Office of Conflict Management and Mitigation, United States Agency for International Development (USAID), June 2012.

<sup>28</sup> ESMAP, 2010. Assessment of the Impacts of Climate Change on Mountain Hydrology: *Development of a Methodology through a Case Study in Peru. Energy Sector Management Assistance Program (ESMAP), World Bank. September 28, 2010. Available at: [http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2013/03/28/000333037\\_20130328121426/Rendered/PDF/762960ESWOP11000Box374367B00PUBLIC0.pdf](http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2013/03/28/000333037_20130328121426/Rendered/PDF/762960ESWOP11000Box374367B00PUBLIC0.pdf)*

Diminished glacial water will result in decreased stocks of drinking water, water for irrigation, and water pressure to power hydroelectric facilities.”

Although climate change impacts pose increasing water scarcity risks for Peru, the severe water shortages currently facing the country are largely a result of the rapid expansion of export agriculture and mining operations – contributing to water scarcity through excessive demand and contamination.

Water availability is intimately linked with water quality, as water pollution can limit the amount of water available for drinking, agriculture, and other uses. Peru’s water supply is vulnerable to a variety of pollution sources—agricultural runoff, urban runoff, mining, and the waste streams of many different industries.

In Peru, the agricultural sector is by far the largest water consumer, using by some estimates around 80 percent of water.<sup>29</sup> In second place is the mining sector. However, there are no available data on the water consumption of the mining sector. An estimate made in 1997 placed it at 5 percent. With the tens of billions of dollars in mining over the last decade, this amount is now substantially more. Neither the government of Peru nor the World Bank knows how much water the mining sector consumes in Peru.

Experts warn that increased demand from agriculture, mining and population growth together with climate change will cause severe water scarcity in Lima already by 2025.<sup>30</sup> Water scarcity is negatively affecting the poorest communities in Peru the most and thus further enhancing their vulnerability to climate change. Large agro-export and mining companies have far more influence and have a highly inequitable share of water rights, which is fueling social conflict across Peru.

### **WBG and Expansion of Export Agriculture**

Over the last decade and half, a rapid expansion of export-oriented agriculture has taken place in the desert coastal zone of Peru, including the Ica Valley. Over this period, water demand has increased significantly because of the extension of land under cultivation—particularly with crops that are highly water intensive such as asparagus—as well as increases in population, which is also partially connected to the agriculture sector’s expansion.

By 2007, this dry desert region already accounted for 50 percent of the country’s agricultural products.<sup>31</sup> With regards to Ica, in 2000, only 400 hectares (ha) of land in total were cultivated. In 2014, asparagus alone

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<sup>29</sup> FAO. 2000. FAO statistical yearbook—Peru. [http://www.fao.org/es/ess/yearbook/vol\\_1\\_2/pdf/Peru.pdf](http://www.fao.org/es/ess/yearbook/vol_1_2/pdf/Peru.pdf).

<sup>30</sup>According to the World Bank’s Water and Sanitation Program for Peru: <https://www.wsp.org/featuresevents/features/lima-running-dry-%E2%80%93-promoting-water-culture-second-driest-capital-world>

<sup>31</sup> Lubovich, Kelley. 2007. The Coming Crisis: Water Insecurity in Peru. FESS Issues Brief. Foundation for Environmental Security and Sustainability (FESS), September 2007. Available at: [http://www.fess-global.org/publications/issuebriefs/the\\_coming\\_crisis\\_water\\_insecurity\\_in\\_peru.pdf](http://www.fess-global.org/publications/issuebriefs/the_coming_crisis_water_insecurity_in_peru.pdf)

accounted for 6,000 ha, which represents a reduction from its peak of 10,000 ha.<sup>32</sup> The main reason for recent reductions in hectares of asparagus is water scarcity. It is reported that large agricultural companies in Ica are now leaving some of their fields empty due to water risks.<sup>33</sup>

With the expansion of cultivated land in the coastal plains, the practice of drilling wells to extract groundwater for agriculture also expanded, from a total of 800 wells in the early 1990s, to 2,193 in 2007. In 2011, the World Bank reported that the increasing water scarcity has led Peru's National Water Authority to declare a ban on any water extraction projects, i.e., well drilling, in about half of Peru's arid coastal areas.<sup>34</sup> However, this restriction is largely unenforced.<sup>35</sup>

Huge increases in water demand to support this agricultural expansion are linked to negative economic impacts on small and medium-scale farmers and contribute to water scarcity and inequity for some of the poorest communities in Peru, fueling social conflict and enhanced vulnerability to climate change across the Ica Valley and beyond.

Although the rapid expansion of export agriculture has been driven by several factors, including preferential trade agreements with the US<sup>36</sup>, the WBG has played an important role through policy lending and direct project investments.

**Development Policy Loans** – The World Bank has played an important role in expanding the export agriculture sector in Peru through policy lending that supports export-led growth and reforms in support of Free Trade Agreements. World Bank operations that support policy reforms and capacity building within government institutions are Development Policy Loans or DPLs and Technical Assistance Loans or TALs. In the 1990's, DPLs were termed Structural Adjustment Loans.

In the early 1990s, such Bank operations supported the government of Peru's 1991 Agricultural Sector Investment Promotion Law. Among enhancing trade and credit terms for the agriculture sector, the 1991 Law also granted labor and tax advantages to agro-exporters. For example, agro-export activities outside Lima pay 50 percent less income tax.<sup>37</sup> This legislation also reformed land tenure rights. It allowed individuals and

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<sup>32</sup> Ortiz, M., 2014. Water shortages threaten agriculture in southern Peru. El Comercio, August 4, 2014. Available at: <http://www.peruthisweek.com/news-water-shortages-threaten-agriculture-in-southern-peru-103584>

<sup>33</sup> *Ibid.*

<sup>34</sup> Independent Evaluation Group, 2011. Promoting Environmental Sustainability in Peru: A Review of the World Bank Group's Experience (2003-2009). Independent Evaluation Group (IEG), World Bank, IFC, MIGA. IEG Working Paper 2011/1

<sup>35</sup> de Grenade, Rafael Routson, 2014. The Ica Valley: A place of little rain. The International Water Security Network, November 18, 2014. Available at: <http://www.watersecuritynetwork.org/the-ica-valley-a-place-of-little-rain/>

<sup>36</sup> Starting in October 2002 with the Andean Trade Promotion and Drug Eradication Act (ATPDEA). ATPDEA gives preferential trade status in the U.S. market to 6,000 exports from Peru, Bolivia, Colombia, and Ecuador. Subsequently, the US-Peru Trade Promotion Agreement came into force in February 2009.

<sup>37</sup> The 1991 Agricultural Sector Investment Promotion Law was initially to be in force until only 2010, but has been extended until 2021. Hepworth N D, Postigo J C, Guemes Delgado B and Kjell P., 2010. Drop by Drop: Understanding the Impacts of the UK's Water Footprint

corporations to own land and relaxed the size-limit for individual agricultural estates. Property rights were also defined on water usage for agricultural purposes, by modifying the legal framework to allow the transfer of irrigation networks to private producers' associations.<sup>38</sup> Maintaining these export-agriculture reforms, including land tenure and water rights, was a specific Bank condition for the signing of the World Bank's Peru 1992 Structural Adjustment Loan of \$300 million.<sup>39</sup>

The changes in land tenure, especially increased size of estates, led to a significant expansion of cultivated land and substantial consolidation of land in the hands of large-scale export agriculture operators. According to the US Department of Agriculture, this process occurred almost exclusively on the coast, and asparagus producers have been the largest beneficiaries of the land consolidation.<sup>40</sup> As a result, the current Peruvian asparagus industry is dominated by large firms. As of 2011, in Ica, 9,715 hectares had been purchased from small farmers by seven large agro-industrial companies. The IFC client, Agrokasa, purchased 2,906 hectares (see project investments below).<sup>41</sup>

Like land, water rights for irrigation are also disproportionately concentrated among a handful of large-scale farms.<sup>42</sup> As a consequence, small farmers have not received water rights in sufficient quantity to meet their irrigation needs. According to David Bayer, a former USAID administrative officer in Lima, Ica's six largest growers consume 78 percent of Ica's groundwater.<sup>43</sup>

**Direct Project Investments** – Between 1997 and 2007, IFC invested \$191.25 million in 12 agricultural projects, including some of the largest asparagus (e.g., Agrokasa) and sugar cane (e.g., Gloria) companies located in the water scarce coastal zone of Peru. For a list of IFC agricultural investments in Peru please see Annex 1.

Between 1999 and 2007, three of these investments totaling \$31.25 million went to Sociedad Agricola Viru / Corporacion Drokasa, the largest exporter of canned produce in Peru and its wholly owned subsidiary Agrokasa, the largest fresh asparagus exporter in Peru. All three investments supported the expansion of export crops, including asparagus, grapes, and avocados.<sup>44</sup> The initial 1999 investment increased Agrokasa's cultivation in Ica

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through a case study of Peruvian Asparagus. Progressio in association with Centro Peruano de Estudios Sociales and Water Witness International, September 2010. Available at: [http://www.progressio.org.uk/sites/default/files/Drop-by-drop\\_Progressio\\_Sept-2010.pdf](http://www.progressio.org.uk/sites/default/files/Drop-by-drop_Progressio_Sept-2010.pdf)

<sup>38</sup> World Bank, 1995. Project Completion Report: Peru Trade Policy Reform Loan (Loan 3437-PE) and Structural Adjustment Loan (Loan 3452-PE). World Bank, March 29, 1995.

<sup>39</sup> World Bank, 1995. Project Completion Report: Peru Trade Policy Reform Loan (Loan 3437-PE) and Structural Adjustment Loan (Loan 3452-PE). World Bank, March 29, 1995.

<sup>40</sup> USDA, 2013. Peru: Annual Asparagus Report. US Department of Agriculture, August 2, 2013. Available at: [http://www.chilealimentos.com/2013/phocadownload/Alimentos\\_Procesados/annual%20asparagus%20report\\_lima\\_peru\\_8-2-2013.pdf](http://www.chilealimentos.com/2013/phocadownload/Alimentos_Procesados/annual%20asparagus%20report_lima_peru_8-2-2013.pdf)

<sup>41</sup> Burneo, Zulema, 2011. The Process of Land Concentration in Peru. International Land Coalition, CIRAD, and Centro Peruano de Estudios Sociales (CEPES), January 2011. Available at:

[http://www.landcoalition.org/sites/default/files/documents/resources/PERU\\_ENG\\_web\\_21.06.11%202.pdf](http://www.landcoalition.org/sites/default/files/documents/resources/PERU_ENG_web_21.06.11%202.pdf)

<sup>42</sup> USAID, 2012. Follow the Water: Emerging Issues of Climate Change and Conflict in Peru. Office of Conflict Management and Mitigation, United States Agency for International Development (USAID), June 2012.

<sup>43</sup> Schmall, Emily, 2010. Peru water wars threaten agricultural export boom. *Reuters*, September 9, 2010. Available at: <http://www.reuters.com/article/2010/09/09/us-peru-water-feature-idUSTRE6885QF20100909>

<sup>44</sup> The initial investment of \$6 million, in 1999, directly financed Agrokasa's expansion of its agricultural operations in the Ica Valley. Planned expansion included cultivation from 73 ha of asparagus to 730 ha and from 65 ha of grapes to 360 ha. The second investment, in 2004, involved refinancing of Corporacion Drokasa. The third investment of \$17 million (the second in Agrokasa), in 2006, expanded

from 73 hectares (ha) of asparagus to 730 ha and from 65 ha of grapes to 360 for total of 1,090 ha or an increase of more than 7 times the original size.<sup>45</sup> Subsequent IFC investments supported further asparagus expansion as well as other export crops. By 2005, Agrokasa had 1,814 ha of asparagus. This makes Agrokasa responsible for a substantial amount of the asparagus grown in Ica accounting for 15 percent of total fresh asparagus exports by value in Peru in 2005.<sup>46</sup> Ninety-nine percent of Peru's asparagus is exported with the Ica region producing 40 percent of total asparagus.<sup>47</sup>

Two other IFC investments were made in Empresa Agroindustrial Laredo, the fourth largest sugar producer in Peru (9,100 ha), in 1999 and 2006 for a total of \$33 million. Both investments were used for the cultivation of sugar cane. For the 2006 investment, the IFC's Summary of Proposed Investment states that the project involves "the cultivation and planting of sugar cane on sand dunes " and that "the company will introduce innovative irrigation methods to convert unused desert land into agricultural land, which, if successful, could be utilized by other local companies to turn arid land into productive use."

### **World Bank Group Measures to Improve Irrigation Efficiency**

The current water scarcity in the arid coastal zone resulted from excessive expansion of highly water intensive export crops coupled with a lack of government capacity to manage water resources and inequitable assignment of water rights. Regarding water rights, small farmers who benefited from the land reforms of the 1970s did not receive water rights in sufficient quantity to meet their irrigation needs. As a consequence, the rights to use water for irrigation are still disproportionately concentrated in a few hands, i.e., large-scale farms.<sup>48</sup>

The WBG was aware of the lacking water management capacity and inequity of water rights at the time of their initial investments in the agricultural sector. As such, the World Bank prioritized water management in its portfolio to assist Peru in mitigating risks and has taken steps in the right direction to improve water management. Initiatives that specifically target the agriculture sector are discussed here and other water management initiatives that apply more broadly are discussed towards the end of the water scarcity section.

Specifically targeting the agriculture sector, the Bank supported several initiatives to improve the efficiency of irrigation, including the Agriculture Research and Extension II project, the Irrigation Sub-sector Investment

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asparagus growing operations and developed an avocado business. In September 2004, IFC provided an \$8.25 guarantee to Drokasa PCG to cover a \$25 million bond issue. The purpose was to finance maintenance capital expenditure as well as to refinance Corporación and its subsidiaries's outstanding short-term and long-term debt. The existing debt is the result of a restructuring underwent in 2000 and currently imposes high interest rates and administration costs as well as covenants that inhibit long-term growth.

<sup>45</sup> Calculated using information contained in the IFC's Summary of Proposed Investment.

<sup>46</sup> For total asparagus, which includes fresh asparagus as well as processed/canned produce, the largest export company in 2005 was Composol with 15% of total export value and Agrokasa is second with 9 % of export value. Rios, Luz Díaz, 2007. Agro-industries characterization and appraisal: Asparagus in Peru. Food and Agriculture Organization of the United Nations (FAO), Rome, 2007.

Available at: <http://www.fao.org/docrep/016/ap297e/ap297e.pdf>

<sup>47</sup> USDA, Peru: Annual Asparagus Report. United States Department of Agriculture, August 2, 2013. Available at:

[http://www.chilealimentos.com/2013/phocadownload/Alimentos\\_Procesados/annual%20asparagus%20report\\_lima\\_peru\\_8-2-2013.pdf](http://www.chilealimentos.com/2013/phocadownload/Alimentos_Procesados/annual%20asparagus%20report_lima_peru_8-2-2013.pdf)

<sup>48</sup> USAID, 2012. Follow the Water: Emerging Issues of Climate Change and Conflict in Peru. Office of Conflict Management and Mitigation, United States Agency for International Development (USAID), June 2012.

Program (\$85 million), the Sierra Irrigation Project (\$20 million, FY11-FY16), Agricultural Innovation (\$40 million, FY14-FY19), and the Agricultural Research and Extension Adaptable Program Loan Phase 2 (US\$69 million). All of the projects involve efficiency improvements to irrigation with the last project specifically promoting the adoption of sustainable agricultural practices in glacier-dependent watersheds.

In addition, the IFC's agribusiness projects addressed water scarcity through promotion of improved irrigation technologies, including sprinkler and drip irrigation. According to a 2011 report by the Independent Evaluations Group of the WBG<sup>49</sup>:

IFC finances agribusiness projects that produce and process water intensive crops, such as sugar, asparagus, artichokes, and pepper for export and domestic markets. Such extensive support for expansion of irrigated crops may seem counterintuitive, since these projects are located in the arid coastal plains where water is scarce and water use conflicts are growing. IFC's response is that by promoting the use of improved irrigation techniques, its projects are actually reducing the pressure on the resource, rather than increasing it. The [IEG] mission was able to visit two such projects [Agrokasa and Empresa Agroindustrial Laredo] and verify that they had implemented state of the art irrigation efficiency practices and have an active outreach program to their neighboring suppliers.<sup>50</sup>

While it is true that the WBG made significant improvements to the water use efficiency of the irrigation systems in its own export agriculture projects and to a degree across the sector – these measures largely appear to have resulted in higher agriculture production rates per liter of water not an overall decrease in water demand.

According to Javier Chiong of the Ministry of Agriculture in Ica, **it is true that large-scale farmers on the coast have more efficient irrigation systems, but the profusion of wells is pumping water out of the aquifer nearly twice as fast as it can recharge.**<sup>51</sup> A World Bank study confirms that extraction from the Ica aquifer system doubled between 2002 and 2007 and that the **Ica aquifer is now overexploited.**<sup>52</sup>

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<sup>49</sup> Independent Evaluation Group, 2011. Promoting Environmental Sustainability in Peru: A Review of the World Bank Group's Experience (2003-2009). Independent Evaluation Group (IEG), World Bank, IFC, MIGA. IEG Working Paper 2011/1

<sup>50</sup> With IFC's financial support, a major asparagus grower established new fields using the latest drip irrigation technology, which currently consume about 286–357 tons of water per ton of produce, with a target of reducing it to 250 tons. This compares favorably with a range of 615–769 tons for other local producers that supply the project's canning plant. In a neighboring project, IFC supported the renewal and replanting of 2,900 ha of irrigated sugar fields. As a result of the conversion from flood irrigation to modern computer-managed gravity and drip irrigation, water consumption per ton of sugar was reduced by more than three quarters, from over 4,000 tons to about 1,000 tons of water per ton of sugar, with a target of reducing it to 875 tons. With IFC encouragement, both clients have an active outreach program to disseminate their efficient water management practices to their suppliers, so the pressure on the resource can be expected to reduce over time.

<sup>51</sup> Fraser, Barbara. Water Wars come to the Andes. Scientific American, May 19, 2009. Available at: <http://www.scientificamerican.com/article/water-wars-in-the-andes/>

<sup>52</sup> CAO, Agrokasa Audit Report 2011. Available at: [http://www.cao-ombudsman.org/cases/case\\_detail.aspx?id=139](http://www.cao-ombudsman.org/cases/case_detail.aspx?id=139)

It is interesting to note that in the 1970's the government of Peru prohibited drilling new wells to preserve aquifer levels.<sup>53</sup> However, in the 1990s with reforms to encourage the export agriculture economy, drilling was resumed at unprecedented levels, which resulted in the overexploitation of the Ica aquifer. From the early 1990s to 2007, the drilling of wells in the coastal plains expanded from 800 wells to 2,193 wells.<sup>54</sup> It is worth pointing out that the IFC's Agrokasa project used as an example of the WBG's water management improvements is one of the largest agriculture operations, second in terms of hectares under cultivation in Ica.

Thus, no matter how efficient the irrigation systems supported by the WBG are, it unfortunately does not mean that the improved efficiency compensates for the overall increase in water usage associated with the significant expansion of some of the most water intensive crops in one of the driest deserts. In other words, **if improvements to water use efficiency are not coupled with limitations on agricultural expansion then overall water demand is not reduced and water scarcity continues or even intensifies.**

The IFC's assumption that improving the irrigation techniques of its projects would adequately address the unsustainable exploitation of water resources was misguided. The CAO came to a similar conclusion in its review of an IFC proposed new investment into Agrokasa in 2009 causing the IFC to ultimately withdraw the proposed additional investment (see Box 1. CAO Case – Agrokasa III below).

Furthermore, according to the Vice Minister for Agricultural and Irrigation Infrastructure Development, Jorge Montenegro, the water level in the coastal wells is descending at a rate of one to one and half meters every year as the river water brought in to replenish the wells is not enough.<sup>55</sup> This means that the export agricultural sector is also at risk from glacial retreat because it relies on glacier-fed rivers to replenish its wells.

### **WBG and Expansion of the Mining Sector**

Between 1990 and 1997, mining investment in Peru increased twenty fold.<sup>56</sup> In recent years, mining investment continues to grow. Between 2003 and 2012, it grew by more than 2,700 percent. The enormous growth has been largely a result of high international mineral prices aided by a long list of economic incentives, e.g., generous tax provisions and minimal royalty requirements.<sup>57</sup> However, although Peru made it a priority to put policies in place to incentivize foreign investment into mining, there was a marked institutional lag in environmental protection and oversight. As such, with the exceptional growth in mining operations, the environmental costs of the poorly

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<sup>53</sup> de Grenade, Rafael Routsen, 2014. The Ica Valley: A place of little rain. The International Water Security Network, November 18, 2014. Available at: <http://www.watersecuritynetwork.org/the-ica-valley-a-place-of-little-rain/>

<sup>54</sup> Rios, Luz Díaz, 2007. Agro-industries characterization and appraisal: Asparagus in Peru. Food and Agriculture Organization of the United Nations (FAO), Rome, 2007. Available at: <http://www.fao.org/docrep/016/ap297e/ap297e.pdf>

<sup>55</sup> Ortiz, M., 2014. Water shortages threaten agriculture in southern Peru. El Comercio, August 4, 2014. Available at: <http://www.peruthisweek.com/news-water-shortages-threaten-agriculture-in-southern-peru-103584>

<sup>56</sup> USAID, 2012. Follow the Water: Emerging Issues of Climate Change and Conflict in Peru. Office of Conflict Management and Mitigation, United States Agency for International Development (USAID), June 2012.

<sup>57</sup> Starting under Fujimori's rule (start year – 2005) and continued under President Alan Garcia (2006-2011).

regulated sector proliferated. Adding to that, there was very little evidence that mining brought lasting benefits to affected communities.<sup>58</sup>

In fact, affected communities have instead largely suffered damages, including to the supply of their water resources both in terms of quantity and quality. Mining operations' inefficient water management and pollution<sup>59</sup>, coupled with the effects of climate change result in limited water access and availability in the highlands of Peru.

In addition, public concerns about mining companies' privileged water access and water pollution have led to increasing social unrest. The unrest includes Indigenous groups in the Andes fighting with mining companies over access to clean water.<sup>60</sup> The Andean highland populations are much poorer than their coastal compatriots, and their ability to influence national or regional water use politics and strategies is generally much lower than that of large-scale agro-exporters or investors in high-value mining projects.<sup>61</sup>

Although unintended, the policies to increase mining investments have also led to privileged water access and increased consolidation of water rights for large mining operations. The expansion in mining has exacerbated inequalities in access to resources vital to climate change adaptation for the poor.

The WBG has played a highly significant role in the rapid growth of Peru's mining sector through development policy loans, technical assistance, and direct project investments in the sector.

**Development Policy Loans and Technical Assistance** – In the early 1990s, the World Bank provided development policy loans and technical assistance in support of expanding Peru's mining sector, including an Energy and Mining Technical Assistance Loan (EMTAL, 1993 – 1998 for \$11.8 million), Privatization Adjustment Loan directed at mineral resources (a form of DPL, 1993 – 1998 for \$250 million), and Trade Policy Reform Loan Project (a form of DPL, 1992 – 1993 for \$300 million).

Under the reform program supported by the Bank, mining investments of \$10 million and greater were offered legal stability or "stabilization agreements" guaranteeing specified project taxes, labor, and environmental

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<sup>58</sup> USAID, 2012. Follow the Water: Emerging Issues of Climate Change and Conflict in Peru. Office of Conflict Management and Mitigation, United States Agency for International Development (USAID), June 2012.

<sup>59</sup> Fraser, Barbara. Water Wars come to the Andes. Scientific American, May 19, 2009. Available at: <http://www.scientificamerican.com/article/water-wars-in-the-andes/>

<sup>60</sup> Lubovich, Kelley. 2007. The Coming Crisis: Water Insecurity in Peru. FESS Issues Brief. Foundation for Environmental Security and Sustainability (FESS), September 2007. Available at: [http://www.fess-global.org/publications/issuebriefs/the\\_coming\\_crisis\\_water\\_insecurity\\_in\\_peru.pdf](http://www.fess-global.org/publications/issuebriefs/the_coming_crisis_water_insecurity_in_peru.pdf)

<sup>61</sup> USAID, 2012. Follow the Water: Emerging Issues of Climate Change and Conflict in Peru. Office of Conflict Management and Mitigation, United States Agency for International Development (USAID), June 2012.

regulations for ten to fifteen years.<sup>62</sup> Overall, mining investments were offered the following incentives or subsidies:<sup>63</sup>

- Immediate deductible for exploration expense during production
- Elimination of royalties on mineral production
- Corporate tax only on distributed profits
- VAT exemption
- Tax exemption on income from infrastructure of public utility
- Accelerated depreciation of 20% p.a. for machinery, equipment and other fixed assets, and 5% for buildings (only for investments of \$20 million or greater)

VAT exemptions and stabilization agreements were all heralded as characteristics for a successful mining investment regime in the World Bank's Mining Strategy for Latin America and the Caribbean (1996). In addition, the Bank's technical assistance provided other assistance to the mining sector investment promotion such as dissemination of investment opportunities, database design for a mining information system; and modernization of the cadastral system.

**Incentives for expansion, but not for environmental protection** – Goods and services used by companies in exploring for oil/gas and minerals and in developing new projects qualify for a VAT exemption. **This VAT exemption does not apply to pollution control equipment, which would be needed to mitigate these new mining and hydrocarbon activities.** As a result, the tax system provides incentives for extractives expansion, but not to control the pollution created by this expansion. In addition, the reform program left the approval of Environmental Impact Assessments and associated action plans (or PAMAs) under the responsibility of the Ministry of Energy and Mines – the same agency responsible for expanding the mining sector.

At the very least, the World Bank's DPLs and technical assistance supporting the expansion of this highly polluting sector should have also included support to strengthen the institutional capacity for social and environmental risk management as well as incentives to protect the environment. Instead the Bank waited years to try and clean up mining operations through a series of Environmental DPLs. In 2009, Peru's Health Ministry has identified dozens of rivers polluted with lead, cadmium, arsenic, mercury and other metals from mining operations.<sup>64</sup> By not ensuring adequate measures to ensure high standards for risk management and pollution control within the Bank's promotion of mining and hydrocarbons, the Bank's approach to an extent contributed to water scarcity in Peru.

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<sup>62</sup> UNCTAD, 2000. Investment Policy Review of Peru. Figure 4.1 "Protection and Incentives for Larger Scale Mining in Peru." United Nations Conference on Trade and Development (UNCTAD), New York, Geneva. 2000.

<sup>63</sup> *Ibid.*

<sup>64</sup> Fraser, Barbara. Water Wars come to the Andes. *Scientific American*, May 19, 2009. Available at: <http://www.scientificamerican.com/article/water-wars-in-the-andes/>

**Direct Project Investments** – The enormity of the mining operations the WBG has directly funded in Peru cannot be understated as they include Yanacocha and Antamina – two of the largest mining projects in Peru and the world. Between 1993 and 2015, the IFC and MIGA made at least 5 investments and provided 12 guarantees to the mining sector totaling at least \$374 million.<sup>65</sup> These investments and guarantees supported 8 different operations in the mining sector (please see Annex 2). IFC also made at least two investments totaling \$83 million to expand infrastructure (Callao Port and Peru Rail) that in large part serve mineral exports.

Beginning in 1993, IFC provided \$23 million and MIGA provided \$31.8 million in guarantees to build the Yanacocha gold mine. The Yanacocha project was the first foreign investment in Peru in 20 years and truly paved the way for the ensuing explosion of mining investments in the years that followed. In 1999, IFC also financed Yanacocha's expansion for \$60 million.<sup>66</sup> Furthermore, IFC currently holds a 5 percent equity stake in the mega mine. Unfortunately, the IFC has not used this equity position to resolve water quantity and quality complaints surrounding this project (see CAO Complaints section below).

Yanacocha alone accounts for almost half of Peru's annual gold production. Yanacocha is by far the largest gold mine in Latin America and the second largest in the world producing approximately 2% of global gold production. However, despite the development of these immense gold reserves, the province of Cajamarca, where Yanacocha is based, remains the poorest province in Peru.<sup>67</sup>

In addition, between 1999 and 2000, MIGA issued six guarantees totaling \$107.5 million to the \$2 billion Antamina investment. It is one of the largest copper-zinc mines in the world. At the time, it was MIGA's largest project ever.<sup>68</sup> It is scheduled to cease production by 2019.

Mining in general is water intensive, and gold mining is probably the most water intensive. Cyanide leaching, the method of separating gold from other minerals, uses massive amounts of water to dilute the cyanide. A hydrological study completed in 1992, just prior to the opening by Newmont Mines of the Yanacocha gold mining site, estimated that the operation would entail water requirements of 11.6 liters per second, or 1,000 cubic meters per day.<sup>69</sup> An average person in the US consumes 50 cubic meters per year.<sup>70</sup> Thus, Yanacocha uses a year

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<sup>65</sup> The IFC's website did not include investments before 1995 so some investments prior to that year might be omitted.

<sup>66</sup> Hallman, Ben and Roxana Olivera, 2015. Gold Rush: How the World Bank is financing environmental destruction. *Huffington Post*. April 16, 2015. Available at: <http://projects.huffingtonpost.com/worldbank-evicted-abandoned/how-worldbank-finances-environmental-destruction-peru>

<sup>67</sup> Fifty-three percent of the population live under the national poverty line of about \$100 a month, according to the most recent government figures. Hallman, Ben and Roxana Olivera, 2015. Gold Rush: How the World Bank is financing environmental destruction. *Huffington Post*. April 16, 2015. Available at: <http://projects.huffingtonpost.com/worldbank-evicted-abandoned/how-worldbank-finances-environmental-destruction-peru>

<sup>68</sup> CAO, 2008. Appraisal Report: Minera Antamina, Peru. Compliance Advisor Ombudsman (CAO), September 2008. Available at: [http://www.cao-ombudsman.org/cases/document-links/documents/CAO\\_Appraisal\\_Report\\_C-M-R9-Y08-F106\\_ENGLISH.pdf](http://www.cao-ombudsman.org/cases/document-links/documents/CAO_Appraisal_Report_C-M-R9-Y08-F106_ENGLISH.pdf)

<sup>69</sup> Lubovich, Kelley. 2007. The Coming Crisis: Water Insecurity in Peru. FESS Issues Brief. Foundation for Environmental Security and Sustainability (FESS), September 2007. Available at: [http://www.fess-global.org/publications/issuebriefs/the\\_coming\\_crisis\\_water\\_insecurity\\_in\\_peru.pdf](http://www.fess-global.org/publications/issuebriefs/the_coming_crisis_water_insecurity_in_peru.pdf)

supply of water for 20 people in just one day's operation of the mine. However, Yanacocha's water consumption is likely much larger given the operation has expanded since the original estimate.

It is reported that wells have gone dry in Combayo as a result of Yanacocha's water use. News further reports that Newmont Mines does not dispute this fact, but claims that the government has not set limits on the amount of water the operation is allowed to draw.<sup>71</sup>

Both Yanacocha and Antamina have had multiple complaints filed with the Compliance Advisor Ombudsman of the IFC and MIGA regarding concerns of water depletion and contamination, which remain unresolved (See CAO section below).

### **CAO Complaints Involving Water Concerns**

Since 2000, there have been 16 complaints from communities in Peru concerning water issues filed with the Compliance Advisory Ombudsman (CAO) of the IFC and MIGA. The complaints were filed by local farmers, fishermen, communities, NGOs and water-users associations surrounding five different IFC and MIGA projects – three mining projects (Yanacocha, Antamina, and Quellaveco) one agriculture project (Agrokasa, Sociedad Agrícola Drokasa) and one oil & gas project (Maple Energy). These local communities all had concerns with water depletion and/or water contamination linked to the projects. Please see Annex 3 for a summary of the CAO complaints.

In every case, the water concerns remain unresolved. In some cases, this was due to the fact that the IFC or MIGA no longer had involvement in the project (Antamina and Quellaveco) or decided to drop the pending additional investment (Agrokasa). In other cases, even though the CAO process initiated preliminary studies or convened stakeholder groups to discuss the issues, these processes ended before adequate information was obtained or correctional measures were implemented (Yanacocha and Maple Energy).

In the case of Yanacocha, the CAO closed the complaint without providing an adequate answer to the local communities' pivotal question of whether their water was contaminated by the project. It was subsequently learned, according to documents obtained as part of a 2005 Frontline and New York Times investigation that a Newmont vice president warned fellow senior Newmont officials that the company had violated environmental regulations on a "huge scale", and that the abuses he discovered were significant enough that senior management was at risk of "criminal prosecution or imprisonment."<sup>72</sup>

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<sup>70</sup> [http://southwestwater.custhelp.com/app/answers/detail/a\\_id/208/~/what-is-the-average-use-per-household-on-a-meter%3F](http://southwestwater.custhelp.com/app/answers/detail/a_id/208/~/what-is-the-average-use-per-household-on-a-meter%3F)

<sup>71</sup> Salazar, Milagros. 2006. Residents fight back as gold mining pollutes their water. Inter Press Service, September 21, 2006.

<sup>72</sup> Hallman, Ben and Roxana Olivera, 2015. Gold Rush: How the World Bank is financing environmental destruction. *Huffington Post*. April 16, 2015. Available at: <http://projects.huffingtonpost.com/worldbank-evicted-abandoned/how-worldbank-finances-environmental-destruction-peru>

Since then, Yanacocha reported spending hundreds of millions of dollars updating a water treatment plant and devising a new method to capture and filter runoff from the mine. However, the communities' questions regarding water contamination still remained largely unanswered.

In 2014, two separate studies, including one by Peru's environmental ministry, found water and food in communities near Yanacocha contained unsafe levels of contaminants associated with the mining operation.<sup>73</sup> Yanacocha disputes these findings. However, even though the IFC remains a 5% owner, it has not revisited the issues of water pollution or quantity that are still in question with the project.

These 16 CAO complaints involving five projects are certainly suggestive of the WBG's contribution to water scarcity in Peru. Several findings of the CAO are important to highlight:

1. **Lack of IFC management support for concerns of environmental staff** - In the absence of effective IFC management support, the professional advice of IFC's environmental and social specialists was effectively overruled by commercial pressure (Agrokasa case, Ica).
2. **Misguided assumptions on adequacy of measures to address risk** - without an underlying baseline assessment and understanding of the scale of aquifer depletion, the project's commitment to reduce water usage was without context and essentially meaningless as regards the impact on aquifer depletion (Agrokasa case, Ica).
3. **Ineffective Equity framework** - a more robust framework for considering environmental & social issues when decisions were made in relation to equity stakes and divestment may have put IFC in a better position to respond to the water issues raised by the complaint (Quellaveco case; although the CAO did not suggest it, true of the Yanacocha case too).
4. **Inappropriate handling of future risks** – The IFC categorized environmental and social risks incorrectly of investments in exploration operations and feasibility projects, i.e., B instead of A. Thus the IFC has not addressed the actual risks involved (Quellaveco case).
5. **Weak framework for addressing problems** – None of the water concerns in the 16 CAO complaints have been resolved. The WBG needs to strengthen IFC management's accountability to the CAO to ensure adequate resolution of problems.

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<sup>73</sup> Food safety experts from the University of Barcelona found elevated levels of lead, cadmium and other heavy metals in the food and water in communities near Yanacocha. The metals are associated with higher rates of cancer and kidney failure, as well as cardiovascular diseases. "It is reasonable to advise the people of La Pajuela not to drink from their water sources," the report concluded. In December 2014, officials from Peru's environmental ministry issued a report indicating that tainted water had seeped out of the mine into the community of San Jose, near La Pajuela. Yanacocha disputes the findings of both studies. Source: Hallman, Ben and Roxana Olivera, 2015. Gold Rush: How the World Bank is financing environmental destruction. *Huffington Post*. April 16, 2015. Available at: <http://projects.huffingtonpost.com/worldbank-evicted-abandoned/how-worldbank-finances-environmental-destruction-peru>

### Box 1. CAO Case – Agrokasa III

In 2009, Agrokasa III, a fourth investment for Corporacion Drokasa, was circulated for approval by the IFC Board under IFC's streamlined procedures. The project objective was to further develop Agrokasa's agricultural operations in the Ica Valley. Between June 1 and July 16, 2009, several complaints were filed with the CAO regarding the impact of Agrokasa's operations on the Ica aquifer. Complainants maintained that Agrokasa's operation, among others, was contributing to over-exploitation of the Ica aquifer through a high concentration of wells, drilling of new wells, and/or deepening of existing wells—without appropriate permits and required licenses. A further concern was Agrokasa's construction project to convey water from one farm—where water is more plentiful—to another farm where the wells are no longer viable, without appropriate consultation with potentially impacted villagers and farmers.

The CAO reported that: Overexploitation of the Ica aquifer and the extent of local concern were well known to IFC throughout its due diligence process. Substantive concerns were raised internally and in IFC environmental and social documentation over potential non-compliances with multiple Performance Standards. Nonetheless, IFC proposed to seek Board approval in this sensitive situation without an appropriate environmental assessment (EA). **Even though the client has committed to year-on-year reductions in water usage, without an underlying baseline assessment and understanding of the scale of aquifer depletion that would be provided by an EA, this commitment is without context and essentially meaningless as regards the impact on aquifer depletion.**

The CAO also drew conclusions relating to IFC's underlying management processing of the investment. The scope and quality of environmental and social due diligence undertaken by IFC was appropriate to the level of risk identified. However, **against a backdrop of community objection, commercial pressure to expedite the project, and an absence of effective IFC management support, the professional advice of IFC's environmental and social specialists was effectively overruled. Thus significant project risks remained outstanding beyond the Investment Review Meeting, with no clear procedures in place for their resolution before circulation to the Board.** This resulted in the removal of the investment from Board circulation by senior management at a very late stage. The cancellation of the proposed new investment rendered the CAO case closed while the questions surrounding water depletion remained unresolved.

Source: CAO, Agrokasa III Case Reports available at: [http://www.cao-ombudsman.org/cases/case\\_detail.aspx?id=139](http://www.cao-ombudsman.org/cases/case_detail.aspx?id=139)

### WBG Water Management Improvement Measures

The current water scarcity facing Peru was driven by excessive expansion of highly water intensive export crops and mining operations coupled with a lack of government capacity to manage water resources and inequitable assignment of water rights.

The WBG has prioritized water management in its portfolio over many years to assist Peru in mitigating risks and has taken steps in the right direction to improve water management and reduce conflict. WBG-supported initiatives to improve irrigation systems were covered in the agriculture section above.

In addition to irrigation improvements, the World Bank also provided wider water management initiatives, including the Water Resources Management Project (FY10-FY15).<sup>74</sup> This project aims at strengthening the

<sup>74</sup> In June 2007, the Global Environment Facility (GEF) approved the Regional Adaptation to the Impacts of Rapid Glacier Retreat in the Tropical Andes (Bolivia, Ecuador and Peru) Project. This project provided preliminary methodologies for anticipating the consequences of glacier retreat induced by climate change. GEF project funding is not part of the World Bank budget and thus is not considered a Bank-funded initiative.

institutional capacity for integrated water resources management at the national level and in three river basins namely, Chancay-Lambayeque, Ica-Alto Pampas and Chili. From 2012-2014 progress achieved included the creation of three river basin councils and approval of river basin plans. A national water quality strategy was also planned for completion by 2016.

A programmatic Environmental Development Policy Loan series comprising of three loans in each of FY08, FY09 and FY11 was aimed at the identification and prioritization of all mining environmental legacies, which would have addressed water pollution too. In addition, water quality would be improved by the establishment, in 2008, of the Office of Evaluation and Environmental Enforcement (OEFA) with responsibility for regularly monitoring the implementation of environmental commitments of licensed businesses. OEFA has developed technical and legal criteria for undertaking post-licensing monitoring and is now fully operational.

Unfortunately, in 2014 within the latest reforms of the environmental legislation (Paquetazo Ambientla), the government has stripped OEFA's jurisdiction over air, soil and water quality standards, as well as its ability to set limits for harmful substances. It also eliminates the ministry's power to establish nature reserves exempt from mining and oil-drilling.<sup>75</sup>

**Improving Access to/Availability of Water:** In addition to overall water management, the WBG also supported initiatives aimed at improving water access and availability in such projects as the National Rural Water Supply and Sanitation (2010=\$30 million FY03-FY14) and the First and Second Optimization Lima Water (FY94 Lima Water Rehabilitation and Management \$150 million, \$54.5 million in 2011; \$55 million in FY15). According to the World Bank, the percentage of the total population in Peru with an improved source of drinking water increased from around 81 percent in 2000, to 88 percent, in 2012. In rural areas, access increased from approximately 64 percent to 77 percent over the same period.

Even though the World Bank has put considerable effort and attention on the water scarcity issue, very little progress has been made regarding reducing the overall demand on the resource. The rights to use water for irrigation are generally inefficient, inequitable, and disproportionately concentrated in the large export agriculture estates. Small farmers have not received water rights in sufficient quantity to meet their irrigation needs.<sup>76</sup>

With regards to Peru's progress on strengthening environmental management of resources like water, still in 2015 the World Bank notes<sup>77</sup>:

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<sup>75</sup> See <http://cnsnews.com/news/article/new-peru-law-weakens-environmental-safeguards>

<sup>76</sup> USAID, 2012. Follow the Water: Emerging Issues of Climate Change and Conflict in Peru. Office of Conflict Management and Mitigation, United States Agency for International Development (USAID), June 2012.

<sup>77</sup> Sanchez-Triana, Ernesto. 2014. *Project Information Document (Concept Stage) - Peru: Investments for Environmentally Sustainable Development - P147342*. Washington, D.C.: World Bank Group.  
<http://documents.worldbank.org/curated/en/2014/09/20255950/project-information-document-concept-stage-peru-investments-environmentally-sustainable-development-p147342>

Overall, there is a disconnect between decision making and the data required to inform decision making. Data on environmental quality to establish baselines in vulnerable areas and areas of high potential for investments is insufficient. Most of the environmental monitoring is undertaken by third parties who are not rigorously supervised by the sectoral authority in both sampling and analytical capability. The information required to certify and supervise investment projects is not standardized. For example, baselines and trends in water quality [and quantity] are not available.

Although in principle water quality standards/regulations are now higher, widespread contamination still occurs due to a lack of state monitoring and enforcement (as noted above by the WB). In addition, further necessary reforms to strengthen water management are often opposed by powerful agriculture and mining operations. For example, in the formulation of the 2009 Water Law, the mining sector's influence won out over the pleas of poor communities and farmers, including even large agro-exporters, to allow development in the fragile Andean headwaters, which will further exacerbate the impacts of melting glaciers.

### **Water Scarcity Conclusions**

WBG policy reforms and investments supporting the export agriculture sector have attracted billions of investment and have created the lowest unemployment rates in Peru for the coastal regions of Ica and La Libertad.<sup>78</sup> However, the WBG's portfolio has on balance contributed to the serious water scarcity problems facing Peru that will only be made worse by climate change. The WBG has invested in some of the largest projects in both the export-agriculture sector and the mining sector and in some of the most water intensive operations within those sectors, e.g., asparagus and gold mining. In addition, expanding well beyond the impacts of project investments, the Bank has supported policy reforms through development policy loans and technical assistance aimed at accelerating the expansion of these water intensive sectors.

Even though the WBG put substantial efforts into improving water management in an attempt to help Peru mitigate the water risks, the growth in the export-agriculture and mining sectors outpaced the WBG's initiatives. For example, the improvements to irrigation efficiency were unable to compensate for the ever expanding agriculture. In general, WBG initiatives were not accompanied by an adequate understanding of the water depletion rates of aquifers or surface water flows fed by glaciers. Thus, efficiency measures were not coupled with limitations to farming or mining expansion, including the exceptionally large-scale operations financed by the IFC. The World Bank itself determined that the aquifer supplying the Ica region, where much of the WBG-supported export-agriculture growth has occurred, is now over-exploited and unsustainable.

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<sup>78</sup> Rios, Luz Díaz, 2007. Agro-industries characterization and appraisal: Asparagus in Peru. Food and Agriculture Organization of the United Nations (FAO), Rome, 2007. Available at: <http://www.fao.org/docrep/016/ap297e/ap297e.pdf>

**Inappropriate sequencing of policy reforms and investments** – The Bank’s approach to improve the investment climate for these water intensive sectors without first having adequate water management regulations and government capacity in place has made the water scarcity issue significantly more difficult to resolve. Some of the necessary reforms to strengthen water management are opposed by the now well-established powerful private agriculture and mining operations.

To be fair, the World Bank reform programs supported by DPLs are limited and cannot be expected to address all failures in a given country. However, the WBG must recognize that in order to strengthen a country’s resilience to climate risks, the Bank must start by correctly prioritizing reforms. In the case of Peru, the WBG supported policies to promote the expansion of export agriculture and mining, and made direct investments in the biggest and most water intensive projects, prior to correcting water rights issues, water metering and pricing, and lacking data on aquifer depletion rates. All of which still remain major problems to this day.

**Inequitable access to water** - Although unintended, the Bank’s policies aimed at increasing agriculture and mining investments have also led to privileged water access and increased consolidation of water rights for large-scale agriculture and mining operations. The continued inequitable distribution of water rights harms the poorest communities’ access to water most in Peru. For example, Indigenous groups in the Andes fight with mining companies over access to clean water.<sup>79</sup> The Andean highland populations are very poor, and their ability to influence water use politics and strategies is much lower than that of large-scale agro-exporters or high-value mining projects. In the end, the Bank has exacerbated rather than abated inequalities in access to resources vital to climate change adaptation for the poor.

**Water management does not target mining** - The WBG did not comprehensively address the World Bank’s specific contributions to climate risks. For example, in Peru none of the WBG’s water efficiency measures or government metering was directed at the mining sector. In fact, the Yanacocha gold mine does not dispute that its activities have likely contributed to drying up some of the local wells, but the operation also maintains that it is not in violation as the government has set no limits on its water usage. Even though the IFC has 5 percent equity ownership in Yanacocha, it remains silent on the water rights issues surrounding this mega mining operation.

Given the substantial gaps in the WBG’s approach, water shortages continue to plague Peru and promise to get worse with climate change. The World Bank itself notes that the rising lack of water is becoming a restriction to the country’s economic development and an increased source of conflict.<sup>80</sup>

## **WBG and Peru’s Energy Sector**

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<sup>79</sup> Lubovich, Kelley. 2007. The Coming Crisis: Water Insecurity in Peru. FESS Issues Brief. Foundation for Environmental Security and Sustainability (FESS), September 2007. Available at: [http://www.fess-global.org/publications/issuebriefs/the\\_coming\\_crisis\\_water\\_insecurity\\_in\\_peru.pdf](http://www.fess-global.org/publications/issuebriefs/the_coming_crisis_water_insecurity_in_peru.pdf)

<sup>80</sup> World Bank. 2012. *Peru - Country partnership strategy for the period FY12-FY16*. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/2012/02/15822676/peru-country-partnership-strategy-period-fy12-fy16>

For the last two decades, the WBG has almost exclusively focused on the development of natural gas and to a lesser extent oil in the energy sector of Peru and more recently has put an emphasis on hydropower. The WBG has played a significant role in the growth of Peru's hydrocarbon sector through development policy loans, technical assistance, and direct project investments in the sector.

**Development Policy Loans and Technical Assistance** – In the early 1990s, many of the same development policy loans and technical assistance the Bank used to support the mining sector reforms also applied to expanding Peru's hydrocarbon sector, including the Energy and Mining Technical Assistance Loan (EMTAL, 1993 – 1998 for \$12 million) and the Privatization Adjustment Loan (1993 – 1998 for \$250 million).

In 1993, Bank programs supported the creation of a new institution, Perupetro, charged with promoting the “acreage” of the hydrocarbons sector, negotiating new contracts with the private sector, and administering new exploration and production contracts.<sup>81</sup> An investor friendly exploration and production contract model was instituted that provided longer contract terms and no size limits.

**Fossil Fuel Subsidies** – The WB's Privatization Adjustment Loan required that a new Hydrocarbons Law be drafted and enacted. Furthermore, the legislation and accompanying regulations needed to be “acceptable to the Bank.”<sup>82</sup> Accordingly, the 1993 Hydrocarbons Law was passed that enhanced the investment framework for hydrocarbons. The new law provided several investment incentives or subsidies, including:<sup>83</sup>

- VAT exemption – The import of goods for hydrocarbon exploration are exempt from VAT (usually 18%).
- Temporary importation - Goods required for the execution of hydrocarbon contracts may be brought into Peru on a temporary basis for a period of 2 years without the payment of duty or taxes and re-exported afterwards.
- Relief for losses (consolidation of losses on hydrocarbon activities) - Tax losses can be carried forward and offset against net income derived in future fiscal years.
- Accelerated depreciation – The rate of depreciation for machinery and equipment for mining and oil activities is 20% (for other sectors of the economy it is typically only 10%).

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<sup>81</sup> ESMAP, 1999. Peru Reform and Privatization in the Hydrocarbon Sector. Joint World Bank/UNDP Energy Sector Management Assistance Programme (ESMAP), ESM216, July 1999.

<sup>82</sup> World Bank. 1998. Implementation Completion Report: Peru - Privatization Adjustment Loan and Privatization Technical Assistance Loan. Washington, DC: World Bank.

<sup>83</sup> For a description of tax incentives see Ernst and Young, 2015. Peru's Oil and Gas Investment Guide. Available at: [http://www.ey.com/Publication/vwLUAssets/EY-Peru-oil-gas-investment-guide-2014-2015/\\$FILE/EY-Peru-oil-gas-investment-guide-2014-2015.pdf](http://www.ey.com/Publication/vwLUAssets/EY-Peru-oil-gas-investment-guide-2014-2015/$FILE/EY-Peru-oil-gas-investment-guide-2014-2015.pdf)

In addition, the World Bank's Energy and Mining Technical Assistance Loan provided support to draft regulations to compliment the 1993 Hydrocarbons Law and set up a Perupetro database of geological information for oil and gas exploration investors.<sup>84</sup>

Following up on the DPLs and technical assistance, the World Bank's 1998-00 Country Assistance Strategy for Peru required that the Bank drop its second Poverty Reduction Support Loan (PRSL) if Peru failed to comply with the IMF's Stand-by-Arrangement. The IMF Arrangement had several structural benchmarks linked to major mining and hydrocarbon assets (please see table in Annex 4). Most notable of these benchmarks was the Camisea natural gas project – Latin America's largest natural gas deposit.

In 1999, largely aimed at setting the rules for the massive Camisea natural gas project, Peru passed its Law for the Promotion and Development of the Natural Gas Industry.<sup>85</sup> The 1999 Law subsidized the construction of the pipeline from Camisea to Lima through a financial guarantee mechanism. Under the *Garantía de la Red Principal* (Principal Network Guarantee or GRP) a surcharge for the pipeline has been included in the bills of electricity consumers in Peru to compensate for a portion of the investment cost of the gas pipeline.<sup>86</sup> According to the 1999 Law, the government will guarantee pipeline investors a minimum capacity usage/payment during the first years of operation when demand is lower than pipeline capacity. Thus, the GRP was designed as a profitability guarantee.

The GRP mechanism, in practice, makes electricity consumers bear the risk of the gas transport system, help finance its expansion, and at the same time pay for power plants to have a lower transport tariff.<sup>87</sup> Once the pipeline is operating at capacity, a GRP surcharge will not be charged to consumers.

It is important to note that an IFC project is one of two direct beneficiaries of the GRP gas subsidy. The Camisea gas distribution companies are Transportadora de Gas del Perú S.A (TGP) and Gas Natural de Lima y Callao S.A (Calidda), the IFC project. From 2002 to 2008, Calidda received \$31 million from the GRP and TGP received \$397 million. The total amount paid by consumers to the GRP equaled US\$ 430 million as of 2008.<sup>88</sup>

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<sup>84</sup> World Bank, 1999. Implementation Completion Report. Peru Energy and Mining Technical Assistance Project (EMTAL). Finance, Private Sector and Infrastructure Sector Unit, Bolivia, Paraguay, and Peru Country Management Unit, Latin America and the Caribbean Region, World Bank. Appendix C. March 11, 1999.

<sup>85</sup> Oil & Gas Journal, 1999. Natural gas rules for Camisea project set. September 27, 1999. Available at: <http://www.ogj.com/articles/print/volume-97/issue-39/in-this-issue/general-interest/natural-gas-rules-for-camisea-project-set.html>

<sup>86</sup> World Bank, 2010. Peru's Downstream Natural Gas Sector: A Preliminary Assessment. Energy Sector Management Assistance Program (ESMAP), September 2010.

<sup>87</sup> Without the GRP profitability guarantee, when the pipeline is below maximum capacity, gas transfer fees would be much higher in order for the pipeline investors to obtain the desired profit. Portocarrero, Geannine Gisset Chabaneix, 2010. The Camisea gas Project in the Peruvian Amazon: The promises and perils of hydrocarbon exploitation. Lund University, May 2010.

<sup>88</sup> Osinergmin. Gerencia Adjunta de Regulación Tarifaria - GART, 2008. Regulación del Gas Natural en el Perú: Estado del Arte al 2008. Available at: [http://www2.osinerg.gob.pe/Infotec/GasNatural/pdf/Regulacion\\_Gas\\_Natural\\_Peru.pdf](http://www2.osinerg.gob.pe/Infotec/GasNatural/pdf/Regulacion_Gas_Natural_Peru.pdf)

In 2006, WB technical assistance produced the report “Peru: Extending the Use of Natural Gas to Inland Provinces”. This report provided prefeasibility studies on the extension of trunk lines from the main Camisea pipeline to other areas outside of Lima.<sup>89</sup> The WB report recommended a continuation of the GRP-type guarantee and/or “direct subsidies for the creation of [gas distribution] infrastructure.” The WB report also recommended the use of promotional gas price discounts in initial contracts for large consumers in line with those provided for the Camisea Concession.

More recently, WB assistance took a step in the right direction on natural gas subsidies with its 2010 report – Peru’s Downstream Natural Gas Sector.<sup>90</sup> The report indicates that Peru’s price stabilization policy<sup>91</sup>, which keeps the domestic price of natural gas relatively cheap, hinders the government’s objective of promoting the development of hydroelectricity and other renewable energy.

However, at the same time, the WB report still stands by the use of a GRP-type subsidy for new gas pipelines in Peru and does not recommend the elimination of subsidies for oil and gas exploration and production that the WB previously helped initiate, which also hinder investment in renewables.

**Direct Project Investments** – From 2006 to 2014, WBG investments by primary energy source included: \$440 million or 81 percent to oil and gas; \$85 million or 16 percent to large hydropower; and \$16.5 million or 3 percent to small hydropower<sup>92</sup> and solar PV systems (see Table 1 and Chart 1). In addition, the WBG provided \$182 million for power transmission and distribution. Please see Annex 5 for details on WBG energy sector projects.

By far the largest sum of funding, \$300 million, went to the Peru LNG gas export project in 2008. The project cost \$4 billion in total, making it Peru’s largest-ever foreign direct investment.<sup>93</sup> It opened in 2010 as Latin America’s first liquefied natural gas project. The IFC project consists of the construction and operation of a liquefied natural gas plant, including a marine loading terminal from which LNG is exported, and a 408-km gas pipeline that runs through the Ayacucho Mountains and Ica to reach the LNG plant. Natural gas is purchased from the Camisea gas fields, liquefied and sold to Repsol CG for export to Mexico, Asia and North America.

**Table 1. WBG Investments by Primary Energy Source 2000-2014 (million US\$)\***

<b>Oil &amp; Gas</b>	<b>440</b>	<b>Oil &amp; Gas breakout</b>	<b>440</b>
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<sup>89</sup> The study provides the terms to be used for the natural gas transportation and distribution concession bids within four regions: Ayacucho, Junín, Ica, and Cusco.

<sup>90</sup> World Bank, 2010. Peru’s Downstream Natural Gas Sector: A Preliminary Assessment. Energy Sector Management Assistance Program (ESMAP), September 2010.

<sup>91</sup> This price support chiefly benefits the largest consumers and is not directed at assisting the poor to gain access to electricity.

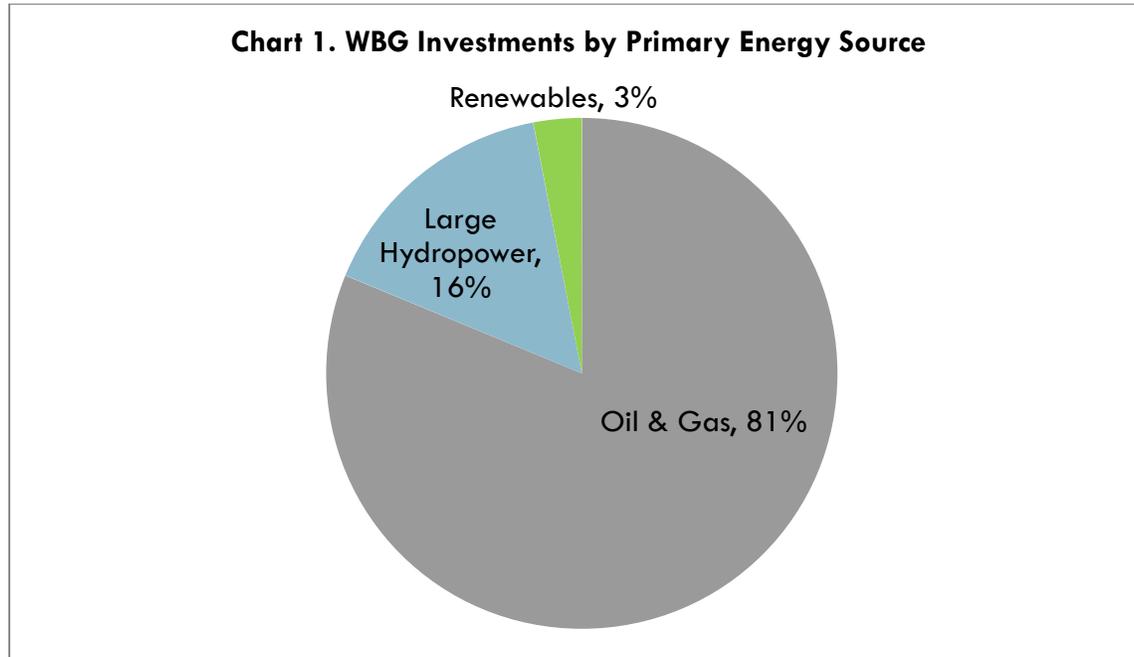
<sup>92</sup> The World Bank states that small hydropower is defined country by country (<http://wbi.worldbank.org/energy/small-hydropower-technology/chapter-1-introduction>). However, the International Center on Small Hydro Power and UNIDO, defines small hydropower as having a capacity of up to 10 MW per plant (World Small Hydropower Development Report 2013, UNIDO & ICSHP).

<sup>93</sup> Sponsored by Hunt Oil Co. of the U.S. with partners from Spain (Repsol), South Korea, and Japan.

Large Hydropower	85	Gas Export	300
Renewables**	16.5	Gas Domestic	50
<b>Total</b>	<b>541.5</b>	Exploration & Production	90

\* Does not include Development Policy Loans, Technical Assistance or transmission & distribution.

\*\*Includes small hydropower and solar PV systems.



The Peru LNG project has been criticized because Peru’s domestic demand for natural gas still goes unsatisfied, which the 1999 Natural Gas Law stipulated had to be protected before exports could take place. As such, the project required modification of contracts surrounding Camisea and the 1999 legislation.

**Gas-to-power project turns into oil development** – On December 15, 2006, IFC approved \$50 million to finance the Block Z-1 project. The project was approved by the Board based on IFC’s original Summary of Proposed Investment which stated that the project will directly increase electricity supplies for the growing demand in Peru through refurbishment of an existing offshore platform in Block Z-1; development of a pipeline; and construction of a gas processing plant and a 160 MW gas power plant.

However, four years later, on November 19, 2010, the IFC disclosed that the company, BPZ, had changed “its priorities for development”, and, thus, how the IFC funding would be used. Instead of gas-to-power, the IFC states the company’s key priority is to develop newly discovered oil reserves as well as exploration of two onshore blocks (Block XXII, XXIII) which were acquired by BPZ in 2007. It is unclear whether the oil will be sold to the domestic market or exported. It is also unclear why the project is not held to its original development

objective of gas-to-power for Peru. The change to the development of oil reserves is a more climate destructive objective than gas-to-power.

## **Revival of Hydropower**

According to the World Bank, hydropower has been and continues to be the major source of electricity in Peru, traditionally supplying more than 80 percent of electricity requirements, and serving as a source of independent generation for major mining operations.<sup>94</sup> However, its development was put on hold starting in the early 1990s due to the focus on natural gas – most importantly with the development of Camisea.<sup>95</sup>

**Hydropower subsidies to counter natural gas subsidies** – The creation of export markets for Peruvian gas, supported by the WBG, meant less gas was available for domestic consumption. As such, by 2008, the Government turned its attention and, hence, government-provided incentives back to hydropower. By 2009 government hydropower incentives included: (a) introduction of accelerated depreciation for hydropower investments, [which were already given to hydrocarbon investments]; (b) introduction of a “discount” to permit hydropower to compete with gas-fired plants in auctions [in other words, a discount was given to correct the distortion created by the subsidized price of gas]; and (c) announcement of a special hydropower auction to be held in 2009.<sup>96</sup>

In 2008, the World Bank started an emphasis on hydropower development as well. That year, the Bank began work on its study “Peru: Overcoming the Barriers to Hydropower.” This study was aimed at large-scale hydropower in Peru and was being conducted at the same time the government was drafting its new package of incentives for hydropower (listed above), which the Bank’s study backed up. In 2010, the study published its findings, including *inter alia*<sup>97</sup>:

- The economic analysis concludes that hydropower is an economically viable option for power expansion in Peru, when gas is valued at its economic cost.<sup>98</sup>
- The Camisea natural gas price for power generation, one of the cheapest in the region, introduces a price distortion that is a serious barrier to hydroelectricity and other renewable technologies.

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<sup>94</sup> World Bank, 2010. Peru: Overcoming the Barriers to Hydropower. Energy Sector Management Assistance Programme (ESMAP), May 2010.

<sup>95</sup> *Ibid.*

<sup>96</sup> World Bank, 2010. Peru: Overcoming the Barriers to Hydropower. Energy Sector Management Assistance Programme (ESMAP), May 2010.

<sup>97</sup> *Ibid.*

<sup>98</sup> “In the sample of projects with definitive concessions, about 1,000 MW are economically viable if gas is to be valued at an economic cost of around US\$4.4 per million British Thermal Units (mmBTUs) at the power plant (for a long term scenario characterized by an average crude oil price of US\$75 per barrel).” Source: World Bank, 2010. Peru: Overcoming the Barriers to Hydropower. Energy Sector Management Assistance Programme (ESMAP), May 2010.

- For long-lived, capital-intensive investments such as hydropower, longer loan tenors are vital to bring down electricity prices. Because of their longer-term loans, International Financial Institutions (IFIs) could have an important role in bringing down the costs of financing hydro projects (by around 25 percent), even when blended with shorter-term commercial loans.
- Explore the need and possibilities for the Government to act as a financial intermediary in mobilizing more attractive (IFI) financing and/or, in selected cases, participate in public private partnerships (or PPPs).
- The legal framework regulating water rights has major voids and constitutes a barrier for the development of hydropower projects.

The 2010 Bank study also warns “since there is great uncertainty on the impact of climate change, the Government needs to monitor closely this area, in particular regional rainfall patterns, in order to incorporate this knowledge into the design of hydropower plants and the formulation of a power supply strategy for the country.”<sup>99</sup>

Regarding the development of the Amazon basin with exports to Brazil, the Bank report adds “the potential for development of hydropower in eastern basins surpasses the country’s power requirements and offers an opportunity for export to neighboring countries. However, the knowledge of this potential is less advanced and the social and environmental consequences are greater.”

**IFC’s Cheves Hydro Project** - Following the release of its first hydropower study, in December 2010, the IFC invested \$85 million in Cheves Hydro to develop a run-of-river 168 MW hydroelectric power plant along the Churin and Checras rivers in the Andes. The project also involved constructing three dams and 18 km of tunnels for water conveyance.

In 2011, the World Bank followed up its study on large-scale hydropower with one on small-scale hydropower.<sup>100</sup> This study came to many of the same conclusions, including the need to remove the Camisea natural gas subsidy and the significant barrier that water rights issues still posed. However, even though the study was supposed to focus on small hydropower it made the following conclusion:

In the particular case of Peru, it could be argued that small hydropower below 20 MW has no particular economic or environmental advantage over medium-sized hydro in the 20 to 200 MW range. There is an argument to expand the coverage of the Renewable Energy Decree to such

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<sup>99</sup> The World Bank goes on to say “Current, though limited, information on the impact of climate change suggest that future hydropower development in Peru should consider the following: (a) the need for continuous monitoring on the progress made in this area; and most likely (b) the need for a continuous increase in storage capacity to compensate for the loss of glaciers, more frequent Nino’s climate phenomena, and a possible dryer hydrology in the south of the country. World Bank, 2010. Peru: Overcoming the Barriers to Hydropower. Energy Sector Management Assistance Programme (ESMAP), May 2010.

<sup>100</sup> World Bank, 2011. Peru Opportunities and Challenges of Small Hydropower Development, March 2011.

medium scale hydropower projects, or to find an alternative mechanism to permit their development as economically viable clean energy projects.<sup>101</sup>

Even though the World Bank acknowledges the limited understanding of climate change risks to hydropower, it largely focuses on suggesting policies to expand the sector and invests in a 168 MW plant itself.

Analysts question hydropower as a viable strategy in Peru noting importantly that:<sup>102</sup>

[Hydropower expansion] may be feasible in the coming 10 to 20 years as increased glacial melt from the last of the country's glaciers flow at a rapid rate, increasing the water supply and potentially making more water available for power generation. However, this is not a viable long-term strategy. Experts predict that Peru will become water scarce by 2050, and possibly as early as 2030. Once this happens, hydropower operations that rely on glacier melt will be increasingly unreliable. Additionally, hydropower facilities also are vulnerable to fluctuations in rainfall. Without consistent water flow from glacial melt and rainfall, hydropower facilities may lack the water pressure necessary for consistent electricity generation.

**Support for Climate-Smart Alternatives** – In 2006 and 2011, the Bank's Rural Electrification Project I and II provided \$6.5 million and \$10 million respectively for renewable energy subprojects. These subprojects have included prefeasibility studies for small hydropower and electricity to 8,000 households using solar PV systems. The two projects also provided \$83 million to support transmission via extension of the electricity grid. In total, the project has supported directly over 105,000 connections to households, schools, clinics and community centers, thereby increasing rural electricity coverage by 5.9 percent.<sup>103</sup> While the support for small hydropower and solar PV systems is a step in the right direction, the WBG should be providing much more assistance in Peru for renewable energy sources that are not threatened by climate change, including depleting water resources.

## **Energy Sector Conclusions**

For the last two decades, the WBG has focused on the development of natural gas and to a lesser extent oil in the energy sector of Peru. Since the 1990s, development policy loans and technical assistance has centered on expanding oil and gas investments and more recently on hydropower expansion. This assessment of the WBG's

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<sup>101</sup> "The latter projects are also generally run-of-river projects (with minimal storage sufficient for daily peaking operation in the dry season) and with minimal numbers of project-affected households and little impact on forests and agriculture. Projects in this size category have the potential to make a more significant aggregate contribution to meeting the fast-growing power demands." Source: World Bank, 2011. *Peru Opportunities and Challenges of Small Hydropower Development*, March 2011.

<sup>102</sup> *Economist*. 2007. When ice turns to water: Climate change in the Andes. July 14, 2007 and Economist Intelligence Unit, 2007. *Peru: Energy provision*. May 23, 2007.

<sup>103</sup> World Bank. 2015. *Peru - Performance and learning review of the country partnership strategy for the period FY12-FY16*. World Bank Group. Washington, D.C. <http://documents.worldbank.org/curated/en/2015/05/24424311/peru-performance-learning-review-country-partnership-strategy-period-fy12-fy16>

portfolio in the energy sector of Peru found that it contributed to the vulnerability of Peru to climate change risks through:

**Focus on Gas Exports** – Due to IFC’s Peru LNG project, over half (55 percent) of the WBG’s primary energy source investments go towards exporting gas. By supporting the export of gas, the WBG is promoting an accelerated rate of burning natural gas, which threatens the 2 degree limit and makes Peru more vulnerable to climate risks. Furthermore, it also contradicts Peru’s priority of ensuring long-term domestic gas needs.

**Increase in Fossil Fuel Subsidies** – In Peru, the WB supported policies that extended subsidies to fossil fuels. World Bank Development Policy Loans and Technical Assistance supported policy frameworks in Peru that included: VAT exemption for exploration, accelerated depreciation, and subsidies for natural gas infrastructure. The Bank-supported subsidies were aimed at producers, including for exploration, and natural gas infrastructure investors.

**Lack of Support for Climate-Smart Alternatives** – When it comes to renewable energy sources, there is a significant hole in the WBG’s Peru portfolio. The WBG has provided very little support, only \$16.5 million, for renewable energy projects that are not threatened by depleting water resources. Since 2008, the WBG has put emphasis on policy reforms in support of large hydropower development in Peru. Recommending further subsidies to compensate for the subsidies the Bank previously supported for natural gas. The IFC also invested \$85 million in a 168 MW hydropower plant. However, experts predict that Peru will become water scarce possibly as early as 2030. Without consistent water flow from glacial melt and rainfall, hydropower facilities may lack the water pressure necessary for consistent electricity generation.

## **WBG and Land-Use Change**

The largest source of GHG emissions in Peru comes from land use change accounting for more than 53 percent of emissions.<sup>104</sup> While this work did not cover a full assessment of land use change in Peru, it does note that the WBG’s Peru portfolio includes significant support for sectors widely considered to be drivers of land use change, including: agriculture, mining, and energy. Special emphasis is given to the Development Policy Loans and Technical Assistance supporting the overall expansion of these specific sectors, which reach far beyond the impacts of direct project investments.

As in the case for climate-smart renewable energy, it is also important to note the lack of World Bank Group funding for sustainable forest management/protection in Peru. The only forest management projects found received funding from the Global Environment Facility not the World Bank budget.<sup>105</sup> In addition, Bank data does not allow for a clear and quantifiable understanding of land use change or deforestation at the project level. The

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<sup>104</sup> <http://pe.seeg.global/emisiones-totales/>

<sup>105</sup> For example, 2001-2007, the GEF funded the Indigenous Management of Protected Areas in the Peruvian Amazon Project.

Bank also does not assess land use change or deforestation risks of its development policy loans and technical assistance.

Deforestation is at the forefront of land use change concerns as the Peruvian Amazon is facing growing pressure. The forests are key to both Peru's climate change resilience and mitigation serving to protect against floods and soil erosion, to control climate, and to absorb carbon dioxide.

According to the Intergovernmental Panel on Climate Change (IPCC), as much as 24-30 percent of total climate mitigation potential can be provided by halting and reversing tropical deforestation.<sup>106</sup> Peru has the fourth largest tropical forest in the world, including about 13 percent of the carbon-absorbing Amazon.

Deforestation in Peru accounts for about 71 million tons of CO<sub>2</sub> emissions every year.<sup>107</sup> Plus deforestation in Peru is increasing. A recent analysis by InfoAmazonia of non-Brazilian Amazon countries, found that Peru had the largest extent of forest loss in 2012, losing 162,000 hectares, an increase of 67 percent over 2011.<sup>108</sup> Unfortunately, in the coming years, Peru's forest loss will likely continue to increase largely due to the expansion of agriculture and roads, including those associated with mining and hydrocarbon development.<sup>109</sup>

On the agriculture front, the growth in palm oil plantations in the Amazon is especially worrisome. In 2011, there were 52,829 hectares already established in the Amazon with an additional 307,329 ha in the pipeline.<sup>110</sup> The land holdings acquired by large scale palm oil operations can be linked back to land tenure reforms supported by World Bank development policy loans in the early 1990s.

On the hydrocarbon front, oil and gas concessions in the Peruvian Amazon have reached alarming levels. Oil and gas concessions now cover 75 percent of Peru's Amazon territory.<sup>111</sup> Almost all of these concessions overlap with areas of extreme ecological and cultural sensitivity, including areas occupied by indigenous peoples living in voluntary isolation. As much as one half overlap with nature and indigenous reserves - lands the Peruvian government has preserved on paper but then also grants concessions for oil and gas exploration and production.<sup>112</sup>

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<sup>106</sup> That is, the amount of carbon dioxide emissions that would be avoided by halting tropical deforestation, *plus* the carbon dioxide that would be removed from the atmosphere by continuing to regrow tropical forests at the current pace. IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland. <http://www.ipcc.ch/report/ar5/syr/>

<sup>107</sup> <http://www.un.org/climatechange/summit/2014/09/peru-germany-norway-launch-climate-forest-partnership/>

<sup>108</sup> <http://news.mongabay.com/2013/06/deforestation-rates-for-amazon-countries-outside-brazil/>

<sup>109</sup> Dourojeanni, Marc, Alberto Barandiaran, and Diego Dourojeanni, 2009. Amazonia Peruana en 2021: Explotación de recursos naturales e infraestructura: Que está pasando? Que es lo que significa para el futuro? ProNaturaleza, DAR, SPDA e ICAA, Peru, 2009.

<sup>110</sup> Burneo, Zulema, 2011. The Process of Land Concentration in Peru. International Land Coalition, CIRAD, and Centro Peruano de Estudios Sociales (CEPES), January 2011. Available at:

[http://www.landcoalition.org/sites/default/files/documents/resources/PERU\\_ENG\\_web\\_21.06.11%202.pdf](http://www.landcoalition.org/sites/default/files/documents/resources/PERU_ENG_web_21.06.11%202.pdf)

<sup>111</sup> <http://www.alianzaarkana.org/the-amazon-rainforest/oil-exploitation-in-the-peruvian-amazon>

<sup>112</sup> <http://www.alianzaarkana.org/the-amazon-rainforest/oil-exploitation-in-the-peruvian-amazon>

The significant expansion of concessions in the Amazon are mainly a result of the World Bank's supported policy reforms in the 1990s to increase investments in the sector, including the elimination of size limits on oil and gas concessions.

According to a World Bank assessment<sup>113</sup> "it is only since 1994 as a result of the huge private investment effort that the large majority of hydrocarbon contracts have been signed and exploration has arrived at frontier areas of the offshore, and especially in the central and southern Amazonian areas, around the Camisea discoveries and towards the border of Bolivia." The Bank goes on to say that in addition to lowering exploration and production costs, technological progress brought in by the new foreign investments has allowed access to more environmentally sensitive frontier areas.

In addition to hydrocarbon links to deforestation in the energy sector, the World Bank has most recently supported policy recommendations with an aim to increase investments in hydropower. Such policy reforms may facilitate the substantial funds (up to \$16.5 billion) needed to build a series of dams in the Peruvian Amazon that were part of a 2010 energy agreement between Peru and Brazil. It is estimated that the deforestation required to build the dams could cause a 6% increase in Peru's greenhouse emissions. Moreover, the flooding caused by the dams could displace more than 4,000 indigenous and non-indigenous people.

Overall, a look into climate change vulnerabilities brought on by land use change once again reveal the significant contribution of WBG development policy loans and technical assistance coupled with serious gaps and lacking regulations and government capacity to sustainably manage forests. Surely the World Bank's DPLs could have required the government to have specific measures in place so that 75 percent of the Peruvian Amazon was not put at risk.

## **Recommendations**

The WBG needs to ensure that its model of growth for countries fundamentally does not depend on a growth in climate vulnerable and climate destructive sectors. To this end, the WBG should adopt:

- 1. Robust Climate Change Assessment Safeguard** – As evident from the critical gaps in the WBG's approach to Peru, the Bank has not yet formally integrated climate issues into its operational policies. Most notably, the current Safeguard Policy framework does not adequately address the challenges a changing climate presents to client governments, donor governments, affected communities, local ecosystems and the global commons.

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<sup>113</sup> ESMAP, 1999. Peru Reform and Privatization in the Hydrocarbon Sector. Joint World Bank/UNDP Energy Sector Management Assistance Programme (ESMAP), ESM216, July 1999.

The Peru case demonstrates how critical it is to fully assess and adequately address the climate risks associated with reforms contained in Development Policy Loans and Technical Assistance. Such operations reach far beyond the impacts of project investments and yet they are not adequately assessed by any Bank operational policy and specifically not covered by the Safeguards.

For instance, the Bank Information Center worked with many Civil Society Organizations to develop a Safeguard submission for a Climate Change Assessment policy to deal with many of the identified shortcomings and covers all Bank instruments, including *inter alia*: **Development Policy Loans, Technical Assistance, Country Partnership Frameworks, and Financial Intermediaries**.<sup>114</sup>

The Safeguard reforms will additionally need to strengthen guidelines for **Environmental Categorization** to ensure appropriate handling of future environmental and social risks associated with early operations, such as exploration (see CAO finding 4 above).

2. **Appropriate Sequencing** – When there are gaps in the regulations and government capacity to manage a sector(s), the necessary reforms to adequately address climate risks need to be in place prior to policy reforms aimed at expanding investments in sectors with potential climate risks. The World Bank often plans to address risks through future additional operations. But, as demonstrated in Peru, this approach often fails and the necessary reforms often become more difficult to adopt due to a lack of leverage. Thus, it is critical that reforms to address climate risks must be triggers directly within the Development Policy Loans or Technical Assistance aimed at promoting the sector containing climate risks.

**Special attention must be given to protect the poor's access to resources vital to their climate change adaptation, such as forests, land, and water.** Specifically, both policy and project assessments should do an explicit, robust analysis of the direct and indirect impacts that policies and projects will have on forests, land use, and water coupled with appropriately robust mitigation mechanisms. Measures that adequately improve land use planning and/or water and forest management should be included within the development policy loans and projects containing risks.

- In Peru, the WB did not understand how its supported land tenure reforms and investment incentives would ultimately exacerbate inequitable access to water and land for the poor.
- Regarding deforestation in Peru, DPLs and technical assistance supporting increased investments in hydrocarbons and agriculture should have been, at the very least, conditioned upon secured titling of

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<sup>114</sup> For more details, please see the submission at: <http://www.bankinformationcenter.org/wp-content/uploads/2014/05/Climate-Change-Safeguard-Model-Policy-for-the-World-Bank.pdf>

indigenous lands, strengthened legislation for the protection of community land and the closing of loopholes for granting concessions in nature reserves including overlapping land administration regimes among various government agencies.

- 3. Comprehensive End to Fossil Fuel Subsidies** – One of the WBG’s most promising climate pledges is to end fossil fuel subsidies. However, so far the World Bank has taken a very limited approach by targeting mainly only consumer subsidies. The Bank often does not recognize its own promotion of fossil fuel subsidies largely to producers through support for government guarantees, infrastructure investment incentives, Public-Private Partnerships, and WBG finance itself. Producer subsidies are the drivers of investment and a significant barrier to low-carbon development.

Scientists have determined that at least two-thirds of the world’s current, proven reserves of oil, gas, and coal must not be burned if we are to avoid raising global temperatures above 2 degrees Celsius – the globally agreed limit. Thus, any subsidies for fossil fuel exploration are directly incompatible with preventing the worst impacts of climate change.

**Given WBG assistance is a subsidy,<sup>115</sup> the World Bank Group should immediately eliminate any assistance linked to fossil fuel exploration and support all countries to do the same.**

- In Peru, the WB should support the government to eliminate any subsidies supporting fossil fuel exploration (e.g., VAT exemption and accelerated depreciation of machinery, and equipment), fossil fuel price support, and gas infrastructure investment subsidies. The WB should help the government of Peru to reallocate their spending on targeted support for the poor.

- 4. Proactive Equity Stakes** – In FY13, equity investments accounted for nearly \$2.7 billion of the IFC’s annual commitment of \$11 billion. Shareholders of significant equity stakes in a company may exercise some level of control, influence or participation in the activities of the company. For equity investments, the IFC generally holds between 5 and 20 percent of a project’s equity and usually maintains it for 8 to 15 years. The IFC currently does not use its equity stakes to influence a company’s activities even when it could improve social or environmental outcomes.

**The IFC should proactively use its equity stakes to correct unforeseen contributions to climate risks and more broadly negative environmental and social impacts.**

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<sup>115</sup> According to the World Bank, because of their longer-term loans, International Financial Institutions (IFIs) bring down the costs of financing long-term capital intensive projects, by around 25 percent, even when blended with shorter-term commercial loans. World Bank, 2010. Peru: Overcoming the Barriers to Hydropower. Energy Sector Management Assistance Programme (ESMAP), May 2010.

- For Peru, the IFC should use its 5 percent equity stake in the Yanacocha gold mine to help resolve complaints regarding water access and water quality. Start by requiring Yanacocha to provide the local community with promised water quantity and quality reports.

**5. Climate-Smart Renewables for Every Country** – In several countries, the WBG has turned to large-scale hydropower as a “climate friendly” approach without fully understanding the climate risks and without adequately investing in climate-smart renewables, like solar and wind. Among other environmental and social concerns, in the face of climate change, large hydropower will often not be a long-term solution and in some countries may increasingly compete with drinking supplies and irrigation needs.

- For Peru, the WBG should ramp up funding for renewable energy projects and policies to incentivize investment in renewables, which are not at risk from depleting water resources, like wind and solar.

## Annex 1. IFC Agriculture Sector Projects in Peru

Project / Company	Environmental Category	Approval Date	Amount (million USD)	Project Activities*
Sociedad Agricola Viru S.A. / Agrokasa	B	8/16/2007	15	Overhaul and automation of the company's canning plant in the south of Peru (Chincha); the acquisition and development of new asparagus plantations with irrigation; the provision of permanent working capital and the refinancing of existing debt. The company currently manages more than 3,500 ha of own and leased plantations in the departments of La Libertad and Ica that produce asparagus, artichoke, and peppers.
Laredo Exp / Empresa Agroindustrial Laredo SAA	B	11/8/2006	18	The project entails providing the fourth largest sugar producer in Peru with a corporate loan to finance its capital expenditure program, which includes: the cultivation and planting of sugar cane on sand dunes, and the expansion of the company's milling and refining capacity.
Agrokasa Expansion / Sociedad Agricola Drokasa S.A.	B	4/17/2006	17	Increase asparagus production and develop business in avocados.
Drokasa PCG (subsidiaries include Agrokasa)	B	9/30/2004	8.25	The purpose of the project is to finance maintenance capital expenditure as well as to refinance the company and its subsidiaries' outstanding short-term and long-term debt. The existing debt is the result of a restructuring underwent in 2000 and currently imposes high interest rates and administration costs as well as covenants that inhibit <u>long-term growth</u> . Drokasa's farms are located in Ica.
Gloria, S.A.	B	2/8/2002	25	In 1998, the company started a strategic investment program (the project) whose main objectives were to (i) consolidate and rationalize its dairy sector operations into a new production facility in Huachipa, near Lima; (ii) build a new UHT plant; (iii) expand domestic milk collection; and (iv) upgrade its paper division with a new plant in Huachipa (pulp based on bagasse from sugar cane. The project will allow Gloria to expand northward from its traditional base in Arequipa.
Empresa Agroindustrial Laredo, S.A.A.	B	11/30/1999	15	The site, Trujillo, consists of 4,265 hectares of sugarcane fields and an existing sugar factory. The project consists of: (i) renewal and replanting of 2,900 ha of sugar cane fields; (ii) rehabilitation/expansion of an existing sugar mill to process up to 3,000 tons/day of sugarcane equivalent to 73,479 tons of refined sugar and; (iii) repayment of overdue retirement obligations and other labor.
Ransa Comercial S.A.	B	6/25/1999	10	The project involves agro storage operations.
Sociedad Agricola Drokasa S.A. / Agrokasa	B	10/19/1999	6	The Project consists of developing a horticulture operation in Ica based on exports of asparagus and grapes to Europe and the United States. The company plans to expand the hectares under asparagus and grape cultivation from 73 has. to 730 has. and from 65 has. to 360 has. respectively. The project also includes: i) the construction of an export packhouse; ii) completion of infrastructure work; iii) working capital for growing crops; iv) an integrated feeding center for 1,500 head of cattle; and v) debt restructuring. <u>There is some uncertainty over the long-term impacts of</u>

				<p><u>water pumping</u>, however, INRENA staff have indicated that levels have been more or less stable over the past 20 years.</p> <p>INRENA has restricted development of new wells in the valley and is confident that it can control demand and sustainability of supply. Agrokasa has acquired 22 of 24 wells that it plans to buy in the Ica valley.</p>
Alicorp S.A.	B	6/30/1999	40	<p>At industrial sites owned and operated by Alicorp in Lima, Arequipa and Piura. Alicorp is Peru's leading food company and the market leader in edible oils, wheat flour, pastas, laundry soaps, packaged rice and cookies and crackers. This project involves: (1) The construction of a new pasta plant at the company's Fideeria site in Callao, Lima; (2) modernization to improve operating efficiencies in Alicorp's edible oil plants (Copsa and Piura) and its wheat flour mill and cracker producing plant at Callao; and (3) the financial restructuring of short term debt. <b><u>Wastewater treatment: The company is operating in compliance with WBG requirements except for wastewater discharge from both of the edible oil plants.</u></b> At the Copsa plant in Lima, the company discharges to a municipal sewer under license to Sedapal the wastewater is then discharged directly to the sea via a marine outfall. The Copsa site has reduced water use by approximately 50% in the past 5 years and continues to try to identify and implement other water saving mechanisms. It also plans to invest US\$370,000 during 1999 to further improve wastewater quality. <b><u>The sponsor will achieve Peruvian standards following the installation of new equipment later this year.</u></b> Nevertheless, both IFC and the sponsor accept that there is a case for continuing improvements to wastewater quality and that this should culminate in compliance with WBG requirements.</p>
Agraria El Escorial S.A. / GLORIA S.A.	B	4/21/1999	7	<p>The project includes the acquisition and refurbishing of a dairy plant in Jequetepe, a northern city.</p>
Agroguayabito S.A.	B	6/30/1998	8	<p>The project site is located approximately 200km north of Lima, in the vicinities of the towns of Chancay, Huacho and Barranca. The site is on never cultivated desert lands contiguous to established coastal river valleys. Specifically, Agro Guayabito is expanding its asparagus and tomato production plantations by 1 200 ha, developing new sugar cane plantations of up to 800 ha, constructing related infrastructure and irrigation canals, and developing on-farm and industrial infrastructure and worker housing including a tomato paste production plant and an asparagus production plant. <b><u>Water use rights:</u></b> Agro Guayabito has authorization from the Ministry of Agriculture to use one liter/sec per hectare for its farms. Agro Guayabito has been developing and applying techniques for drip and microspray irrigation to conserve water. Water supply for the expansion at the Barranca farm will be from the Pativilca River. There is adequate flow in all seasons to meet the project needs. The expected rate of water withdrawal will not have any impact on groundwater supplies.</p>
Agro Industrial Paramonga S.A.	B	11/13/1997	22	<p>IFC was instrumental in bringing new technology to Peru (diffuser technology, co-generation), and in arranging for technical flows between the company and the sugar industry in South Africa. The project insures the survival of a company which was technically bankrupt, thus safeguarding 1,800 jobs in a rural area. This project involves the renovation and expansion of an existing sugar mill to bring its capacity to 4,000 tonnes per day. The project includes the rehabilitation of 5,200 ha of sugarcane and development of an additional 3,500 ha. The factory is situated in the town of Paramonga, coastal plain about 195 km north of Lima. Cane plantings will be extended to presently unused desert land. The plant will utilize a new bagasse and <b><u>oil-fired boiler</u></b>, fitted with wet</p>

				scrubbers to ensure that exhaust gases meet World Bank guidelines. Process water from the scrubbers will be treated to remove particulates and either recycled to the scrubbers or used as irrigation water on the company's cane fields adjacent to the plant.
<b>Total: 12 projects</b>			<b>\$191.25</b>	

\*Based on information from IFC project documents.

#### Annex 4. World Bank Group Mining Sector Project Investments in Peru

Project / Company	Institution / Environmental Category	Approval Date	Amount (million USD)	Project Activities*
Tinka Resources SAC	IFC / B	5/18/2015	10	Exploration and development of Ayawilca-Colquipucro project, located in the department of Pasco in the central Andes of Peru. The Project is comprised of two deposits: Ayawilca (zinc) and Colquipucro (silver), developed under the same mineral concession.
Antares Minerals Inc	IFC / B	6/19/2009	12.26	Prefeasibility for copper mining, exploration drilling in the Andes, greenfield site. Haquira project is located approximately 80 km to the southwest of Cusco. The property is in the Andes at elevations of 3,500 to 4,400 meters.
Yanacocha III	IFC / A	6/16/1999	20	Gold mining. The current project is the development of the La Quinua deposit, containing approximately 7 million reserve oz of gold, which will increase the mine's total production and life.
Yanacocha	IFC / A	1993	23	Gold mining. The project is located in northern Peru approximately 47 km north of the city of Cajamarca at an altitude of 4,000 meters above sea level. Yanacocha is currently the largest gold mine in Latin America. It produced 1.3 million oz of gold in 1998.
Quellaveco	IFC/ B	1993	60	Quellaveco is a large scale copper mining concession located in the Department of Moquegua in southeastern Peru. The IFC Board approved an equity investment in Anglo American Quellaveco for the acquisition and feasibility work of the mining company, comprising a 20 percent equity stake in the company.
Compania Minera Antamina S.A / Mitsubishi Corporation (Japan)	MIGA	2000	39.9	MIGA issued two guarantees totaling \$23.7 million in shareholder loans and \$16.2 million in equity coverage to Mitsubishi Corporation of Japan for its investment in the Antamina copper-zinc mine in the Cordillera Blanca range of the Andes - one of the largest mining projects in Peru.
Compania Minera Antamina / EDC Noranda Inc. Rio Algom Limited Teck Corporation	MIGA	1999	67.5	MIGA insured both equity and debt investments in one of the largest new mining projects in Peru, the Antamina copper-zinc mine in the Cordillera Blanca range of the Andes. MIGA issued \$67.5 million of coverage for equity investments by three Canadian mining companies, and senior loans by Citibank, leading a consortium of commercial banks. The \$2 billion investment will have far-reaching impacts on the local economy. It is expected to significantly increase Peruvian mining exports.
Sociedad Minera Refineria de Zinc de Cajamarquilla / Marubeni Corporation (Japan)	MIGA	1996	9.4	Marubeni Corporation of Japan received \$9.4 million in MIGA coverage for its \$10.4 million equity investment in the privatization of the Cajamarquilla zinc refinery near Lima. The project is a joint venture with Cominco, Ltd., a Canadian natural resources company. The refinery, established in 1981, was owned and operated by a government company.
Sociedad Minera Cerro Verde, S.A. / Cyprus Climax Metals Company	MIGA	1995	50	To facilitate the privatisation of a \$154 million open-pit copper mine in southern Peru.
Magma Tintaya S.A. / Magma Copper Company (US)	MIGA	1995	24	Investment in the privatization of a copper mining and concentrate company, Empresa Minera Especial Tintaya, S.A. (Tintaya), in southeastern Peru.
Minera Yanacocha S.A. /	MIGA	1995	26.5	MIGA increased its coverage to \$47 million The new funds will be used to construct and operate a

Mine Or S.A. Newmont Mining Corporation Union Bank of Switzerland (US company)				new open-pit mine and heap leaching facility at Yanacochas Maqui Maqui ore body, which is projected to produce about five million tons of ore annually.
Minera Yanacocha, S.A. / Compagnie Minière Internationale Or, S.A. Newmont Second Capital Corporation The Union Bank of Switzerland (Switzerland, France, US)	MIGA	1994	31.8	MIGA issued its first guarantees in Peru, a total of \$6.4 million to Compagnie Minière Internationale Or, S.A. of France and \$7.8 million to Newmont Second Capital Corporation of the United States, against the risks of expropriation and war and civil disturbance. MIGA also provided the Union Bank of Switzerland with \$19 million in guarantees for its loan to the project, against the same risks. The \$45 million investment, the first foreign investment in Peru in 20 years, will finance the construction and operation of a gold mine in the highlands of northern Peru. The project enterprise, Minera Yanacocha S.A., will become the second largest gold producer in Peru. The project intends to introduce new heap-leaching technology, and its successful implementation could lead to Other new mining investments by the international mining community. The project is expected to yield about \$34.1 million annually in exports and \$19 million in revenues to the Peruvian government.
<b>Total:</b>			<b>\$374.36</b>	

\*Based on information from World Bank Group project documents.

### Annex 3. Summary of CAO Peru Cases

Project Name	Date of Complaints	Project Activity	Complainants / Water Concerns	CAO Findings/Conclusions
IFC: Agrokasa / Corporacion Drokasa	June 2009  6 complaints	Grow & export asparagus, grapes, and avocados	Ground-water users' associations, NGOs, and confidential groups: - depletion of the Ica aquifer - well drilling throughout the valley - licensing and permitting process for water transfer project - disclosure of information to regional growers & municipalities	IFC required the client to prepare an Environmental Assessment (EA), but it would not be available until after Board approval as this was considered an existing IFC-financed project. Even though the client has committed to year-on-year reductions in water usage, without an underlying baseline assessment and understanding of the scale of aquifer depletion that would be provided by an EA, this commitment is without context and essentially meaningless as regards the impact on aquifer depletion. Thus significant project risks remained outstanding beyond the Investment Review Meeting, with no clear procedures in place for their resolution before circulation to the Board. This resulted in the removal of the investment from Board circulation by senior management at a very late stage, which also rendered the CAO case closed.
MIGA: Antamina	2000 May 2005 June 2008  3 complaints	Open-pit copper & zinc mining & export, pipeline to port	Local fishermen and environmental organizations: - source of significant pollution and loss of fishing resources in Huarmey Bay - degraded ground water quality and water level changes	<u>Huarmey Bay</u> - significant contamination and loss of fishing resources were not substantiated, but monitoring should continue. <u>Ground water</u> – detected rise in ground water levels and degraded ground water quality beneath the areas used for effluent disposal present a potential risk to downstream ground water resources. MIGA planned to swiftly respond to ground water issues, but <u>could not follow-up because guarantees were cancelled in 2007.</u>
IFC: Maple Energy	April 2010  1 complaint	Expansion of existing oil & gas fields, oil & gas exploration, and development of greenfield ethanol project on semi-desert land	Indigenous communities of Nuevo Sucre and Canaán: - access to safe drinking water - 2009, 2010, & 2011 oil spills	In 2011, CAO facilitated 4 dialogues between the community and company aimed at addressing safe drinking water. However, the communities decided to withdraw from the process due to disagreements with Maple. Thus, the process came to an end before water issues were resolved. CAO concluded that although progress had been made, the parties needed to continue to work together. The issues were supposed to be addressed through a government process. CAO did not find fault in IFC's due diligence/monitoring although the company may not have adequately followed through on requested actions.
IFC: Quellaveco	November 2011  1 complaint	Mining – development activities of copper deposit  Note: In 1993, IFC	Local water users association and environmental NGO: - impacts to water quality and quantity in an arid area characterized by rising competition over water	During supervision, IFC demonstrated good practice in identifying potential environmental impacts, including the adequacy of the water resources needed to service the mine, and the potential for water pollution. However, the CAO highlighted errors in the IFC's management of the project's environmental and social (E&S) risks, including that the project "would properly have been categorised A (significant E&S risk)" instead of B "limited risk". The IFC's procedures

		obtained 20 percent equity in Quellaveco. IFC contributed an additional \$54 million to the project through rights issues between 1996 and 2011. In February 2012, IFC divested all of its shares.	resources	<p>for dealing with rights issues were “inconsistent” with its E&amp;S commitments. The CAO also found “no evidence” that an analysis of E&amp;S and future risks was conducted prior to IFC divestment. CAO finds that a more robust framework for considering E&amp;S issues when decisions were made in relation to rights issues and divestment may have put IFC in a better position to respond to the issues raised by the complaint. As such, the water concerns remained unresolved at the time of IFC’s divestment from the project.</p> <p><b>CAO: This compliance investigation raises questions about IFC’s application of the Sustainability Framework and associated procedures to the long-term E&amp;S risk associated with early equity investments in the mining sector.</b></p>
IFC: Yanacocha Note: complaints against IFC but MIGA also provided guarantees	<p>June 2000 March 2001 March 2006 Nov 2012 March 2014</p> <p>7 complaints</p> <p>Note: two complaints based on compensation, not water.</p>	Gold mining and mercury production	<p>People affected by mercury spill; farmers; canal users; and local family</p> <ul style="list-style-type: none"> <li>- contamination from mercury spill</li> <li>- adverse impacts to <u>water</u>, air, and livelihoods of surrounding villages</li> <li>- impacts on quantity of water in canals, rivers, and streams surrounding project</li> <li>- request for an independent water quantity monitoring mechanism</li> </ul>	<p>CAO supported the creation of a multi-stakeholder dialogue roundtable or “MESA” in September 2001. The Mesa sought to establish two processes to underpin its work: a water study and a health study. The water study, organized by the CAO with participation by the Mesa, began in January 2002, and the findings of the study were made public in October 2003. In response to concerns from members of the communities of San Juan, Choropampa and Magdalena, the Mesa also requested that the CAO agree to commission an independent health study to evaluate the health effects of the mercury spill. Though the terms of reference were drafted and agreed to by the Mesa and some local groups in 2002, the study was not completed for various reasons including on-going litigation surrounding the mercury spill in Peruvian and US courts, community divisions and lack of government support for the study.</p> <p>It appears the case was closed prior to the health concerns being resolved. It is unknown to what degree the mercury may have contaminated the water supply.</p> <p>In response to the 2001 complaint, CAO withdrew in March 2006 with the intention that the roundtable would continue.</p> <p><b><u>Request for Independent Water Quantity Monitoring: CAO Exit Report, completed in September 2006, CAO recommended that Yanacocha honor its commitment to distribute relevant documentation to canal users and ensure it is accessible to all interested parties. [Note, this does not meet the request for independent monitoring of water quantity.]</u></b></p>

## Annex 5. IMF Peru Structural Program Benchmarks for the Extractive Sectors: Privatization and Concession Program

<u>1999 Program</u>	<u>2001 Program</u>	<u>2002 Program</u>
<ul style="list-style-type: none"> <li>• Open bidding process for Camisea natural gas project.</li> <li>• Bring one public enterprise in the mining sector to the point of sale.</li> <li>• Award concessions for mining exploration of 3 fields.</li> <li>• Award contract on Camisea natural gas project.</li> <li>• Sale of remaining shares in privatized enterprises in the energy sector.</li> </ul>	<p>Sale of shares in enterprises previously privatized:</p> <p>Hydrocarbons</p> <ul style="list-style-type: none"> <li>• Relapasa Refinery</li> </ul> <p>Mining</p> <ul style="list-style-type: none"> <li>• Iscaycruz (zinc/lead)</li> </ul> <p>Mining Prospects:</p> <ul style="list-style-type: none"> <li>• Toromocho (copper)</li> <li>• Michiquillay (copper)</li> <li>• Alto Chicama (gold)</li> <li>• Yauricocha</li> </ul> <p>Concessions:</p> <ul style="list-style-type: none"> <li>• Bayovar (Phosphate Mining)</li> </ul>	<p>Concessions:</p> <ul style="list-style-type: none"> <li>• Bayovar (Phosphate Mining)</li> </ul>

Sources:

Government of Peru. 2002. IMF Letter of Intent, Technical Memorandum of Understanding: Stand-By-Arrangement (February 2003 – February 2004). Ministry of Economy and Finance & the Central Reserve Bank of Peru. Lima, Peru. November 26, 2002.

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## Annex 6. World Bank Group Energy Sector Project Investments in Peru

Project / Company	Institution / Environmental Category	Approval Date	Amount (million USD)	Project Activities*
Cheves Hydro / Empresa de Generacion Electrica Cheves S.A.	IFC / A	12/7/2010	85	<b>Large Hydropower:</b> Develop a run-of-river 168 MW hydroelectric power generation plant along the Churin and Checras rivers. Construction of a total of 18 km in tunnels (including a water conveyance system), an underground power house, and a 77 km transmission line to connect the project to the National Interconnected System. Involving the construction of three dams in an undeveloped area, this category A project generates some potential adverse impacts. These include: those associated with any large construction project of this type; changes in river hydrology within the Project's footprint; the acquisition of approximately 90.5 ha of land, most of which is owned by Rural Andean Communities; and potential impacts on physical cultural heritage.
Calidda Peru / Gas Natural de Lima y Callao S.A.	IFC / B	3/12/2010	50	<b>Domestic Natural Gas:</b> Expansion of Calidda's distribution network, designed to increase the distribution capacity of natural gas in the concession area from 255 to 420 million standard cubic feet per day. Project includes: (i) the expansion and upgrades to the main grid, (ii) the expansion to the low pressure secondary grid, and (iii) refinancing of existing senior debt.
PERU LNG / Hunt Oil (US), Repsol (Spain), SK Energy Co. (South Korea), and Marubeni Corporation (Japan)	IFC / A	1/31/2008	300	<b>Camisea Natural Gas Export</b> - The development, construction and operation of a liquefied natural gas (LNG) plant comprised of a greenfield 4.45 million tons per annum liquefaction train (the LNG Plant) and related marine facilities at Pampa Melchorita south of Lima, as well as a 408-km, 34-inch natural gas pipeline. The project will liquefy natural gas purchased from Blocks 56 and 88 in the existing Camisea gas fields and sell it to Repsol Comercializadora de Gas S.A. (Repsol CG) for export. The majority of LNG sales are expected to go to Manzanillo, Mexico, where Repsol CG has signed a 15 year gas sales agreement with Mexico's state power company. Remaining volumes will be sold to international markets, including to Asia and North America.
Maple Energy	IFC / B	7/19/2007	40	<b>Oil and Gas Production/Exploration &amp; Ethanol:</b> Finance Maple's capital expenditure program in the short-to-medium term which will include: the drilling and well work-over programs aimed to extend production of its existing hydrocarbon fields; exploration in Maple's hydrocarbon concessions; and the development of a greenfield ethanol project. Maple's hydrocarbon exploration and production Blocks 31 B, C, D and E are located in the three departments of Loreto, Ucayali, and Huanuco. The proposed ethanol project is expected to be developed on 10,672 hectares of unused and uncultivated semi-desert land in northwestern Peru. The ethanol project will also involve the construction of storage and shipping facilities in the port of Paita to accommodate the sale of ethanol from the project.
Block Z-1 / BPZ Resources, Inc.	IFC / B	12/15/2006	50	<b>Oil and Gas Production/Exploration:</b> The original investment was provided to finance a gas-to-power operation and the construction of a 40 mile pipeline from the off shore gas field in Block Z-1 to third party power generators in south east Ecuador. However, during the exploration process an oil reserve was identified which resulted in the company changing its priorities for development. The oil discovery has delayed the gas to power project. The company now intends to develop the oil reserves as its key priority and IFC's new Environmental and Social Review Summary (ESRS) focuses on these new developments as well as the initial exploration of two

				onshore blocks (Block XXII, XXIII), which were acquired by BPZ in 2007.
ISA Peru, S.A.	IFC / B	12/21/2001	18	<b>Power transmission.</b> The project consists of the engineering, construction, ownership and operation of two high-voltage transmission lines in central Peru. Specifically, the project will: link Pucallpa, a town in the Amazon region with a population of about 240,000 people, to the national power grid, thus displacing currently utilized more expensive thermal generation, complete an alternative route for transmitting electricity to Lima and its surrounding areas, reducing technical losses and improving the overall reliability of the national grid system, <b>reinforce power supply to mining centers in central Peru (including Antamina in the Amazon basin), where demand for power is growing as a result of new mining projects being developed,</b> and evacuate power from the 160 MW Yuncan hydroelectric power plant.
Consorcio Transmantaro S.A. / Hydro-Quebec International, Inc.	MIGA /	FY2000	81	<b>Power Transmission:</b> MIGA issued two guarantees totaling \$81 million to construct and operate an electrical transmission line between two departments in Peru. The project involves designing, constructing, and operating a 220 kilovolt electrical transmission line that links Peru's central Mantaro region with the southern Socabaya region. The project will create a large interconnected Peruvian electricity grid that will enhance reliability, reduce end user tariffs, and meet peak power shortages experienced by industrial plants.
Second Rural Electrification	IBRD / B	4/21/ 2011	50	<b>Power Transmission/Distribution (80% or \$40 million) &amp; Renewable Energy (20% or \$10 million):</b> increase access to electricity in the rural areas of Peru. The first component is rural electrification subprojects. This component will support investment in infrastructure by electricity distribution companies to provide electricity services to about 42,500 households, small enterprises and community facilities. The second component is the Technical Assistance (TA) for rural electrification. The third component is the Project Management. According to Implementation Status Report: Technical assistance = 4.4 million for prefeasibility studies for small hydropower. 5 renewable energy subprojects were approved – no further details.
PE Rural Electrification	IBRD / B	3/7/ 2006	50	<b>Power Transmission/Distribution (86% or \$43 million) &amp; Renewable Energy (13% or \$6.5 million)</b> The objective is to increase access to efficient and sustainable electricity services in rural areas of Peru. GEF provides \$10 million for this project with the specific objective to achieve reduction of greenhouse gas emissions through use of renewable energy in rural areas. <b>Subprojects have provided electricity to 8,000 households using solar PV systems.</b>
<b>Total: 9 projects</b>			<b>\$724</b>	

\*Based on information from World Bank Group project documents.