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INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROGRAM DOCUMENT FOR A PROPOSED
LOAN

IN THE AMOUNT OF

EUR 637,700,000

(at an exchange rate of 0.911, USD700 million)

TO

THE REPUBLIC OF COLOMBIA

FOR THE

FIRST SUSTAINABLE DEVELOPMENT AND GREEN GROWTH DEVELOPMENT POLICY LOAN

August 31, 2015

Environment and Natural Resources Global Practice
Colombia and Mexico Country Management Unit
Latin America and the Caribbean Region

COLOMBIA GOVERNMENT

CURRENCY EQUIVALENTS
(Exchange Rate Effective as of August 11, 2015)

Currency Unit = Colombian Pesos
COP 2,942.30 = US$1.00

ABBREVIATIONS AND ACRONYMS

ASA	Advisory Services and Analytics
AFD	French Agency for Development
AMVA	Aburrá Valley Metropolitan Area (*Área Metropolitana del Valle de Aburrá*)
BID	Inter-American Development Bank (*Banco Interamericano de Desarrollo*)
CAD	Current Account Deficit
CCE	Colombia Efficient Purchase (*Colombia Compra Eficiente)*
CEA	Country Environmental Analysis
CPS	Country Partnership Strategy
CONASA	National Inter-sectoral Technical Commission for Environmental Health (*Comisión Nacional de Salud Ambiental*)
CONPES	National Council of Economic and Social Policy (Consejo Nacional de Politica Economica y Social)
COP	Colombian Peso
COTSA	Territorial Environmental Health Council (*Consejos Territoriales de la Salud Ambiental*)
DAGMA	Administrative Department of Environmental Management (*Departamento Administrativo de Gestión del Medio Ambiente)*
DNP	National Planning Department
DPL	Development Policy Loan
DRM	Disaster Risk Management
FARC	Revolutionary Armed Forces of Colombia *(Fuerzas Armadas Revolucionarias de Colombia)*
EPA	Environmental Protection Agency
FCL	Flexible Credit Line
FDI	Foreign Direct Investment
FENOGE	Non-Conventional Energies and Energy Efficiency Fund *(Fondo de Energías No Convencionales y Eficiencia Energética)*
FNGRD	National Fund for Disaster Risk Management *(Fondo Nacional de Gestión de Riesgo de Desastres)*
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GoC	Government of Colombia
GRS	Grievance Redress Service
IFRS	International Financial Reporting Standards
ISA	International Standards on Auditing
IMF	International Monetary Fund

KfW	KfW Development Bank
LAC	Latin America and the Caribbean Region
MADS	Ministry of Environment and Sustainable Development (*Ministerio de Ambiente y Desarrollo Sostenible*)
MDG	Millennium Development Goals
MFPC	Ministry of Finance and Public Credit
MPI	Multidimensional Poverty Index
MSPS	Ministry of Health and Social Protection *(Ministerio de Salud y Protección Social)*
MT	Ministry of Transport (*Ministerio de Transporte*)
MME	Ministry of Mines and Energy (*Ministerio de Minas y Energía*)
MVCT	Ministry of Housing, Cities and Territories (*Ministerio de Vivienda, Ciudades y Territorios*)
NDP	National Development Plan
NPL	Non-Performing Loan
OECD	Organisation for Economic Co-operation and Development
PM	Particulate Matter
PFM	Public Financial Management
PGIRS	Solid Waste Integrated Management Plan (*Plan de Gestión Integral de Residuos Sólidos*)
PISA	Policy on Integrated Environmental Health (*Política Integral de Salud Ambiental*)
PNGRD	National Plan for Disasters Risk Management (*Plan Nacional de Gestión del Riesgo de Desastres*)
POT	Land-use plans (*Planes de Ordenamiento Territorial)*
PPP	Public-private Partnership
PSIA	Poverty and Social Impact Analysis
REDI	Recent Economic Developments in Infrastructure
RER	Real Exchange Rate
ROA	Return on Assets
ROE	Return on Equity
SDA	District Environmental Secretariat (*Secretaria Distrital de Ambiente)*
SDR	Special Drawing Rights
SEA	Strategic Environmental Analysis
SIIF	Financial Information Integrated System (*Sistema Integrado de Información Financiera)*
SINERGIA	National System on Management and Evaluation of Results (*Sistema Nacional de Gestión y Evaluación de Resultados)*
SETP	Public Transportation Strategic System *(Sistema Estratégico de Transporte Público)*
SITM	Integrated Mass Transport System *(Sistema Integrado de Transporte Masivo)*
SITP	Integrated Public Transport System *(Sistema Integrado de Transporte Público)*
SITR	Integrated Regional Transport System *(Sistema Integrado de Transporte Regional)*
SNGRD	National System for Disaster Risk Management *(Sistema Nacional de Gestión del Riesgo y Desastres)*

SUISA	Unified Information System for Environmental Health (*Sistema Unificado de Información de Salud Ambiental*)
UNGRD	National Disaster Risk Management Unit (*Unidad Nacional para la Gestión del Riesgo de Desastres*)
WHO	World Health Organization

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COLOMBIA

FIRST SUSTAINABLE DEVELOPMENT AND GREEN GROWTH DEVELOPMENT POLICY LOAN

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SUMMARY OF PROPOSED LOAN AND PROGRAM, COLOMBIA DEVELOPMENT POLICY OPERATION FOR THE FIRST SUSTAINABLE DEVELOPMENT AND GREEN GROWTH DEVELOPMENT POLICY LOAN

Borrower	Republic of Colombia
Implementing Agencies	Ministry of Finance and Public Credit (MFPC) and National Planning Department (DNP)
Financing Data	IBRD variable spread loan of EUR 637.7 million
Operation Type	First in a series of three single tranche programmatic Development Policy Loans (DPLs).
Pillars of the Operation And Program Development Objective(s)	In line with priorities set by the government in the National Development Plan (NDP), this First Programmatic Sustainable Development and Green Growth DPL would support the overarching green growth strategy through (i) establishing a set of policy and institutional measures for green growth in transport, energy, environmental health, and disaster risk management; and, (ii) improving environmental quality by reducing particulate matter ($PM_{2.5}$) in the air; strengthening regulatory and economic instruments for reducing water pollution; and increasing capacity for solid waste disposal and enhancing waste recycling.
Results Indicators	**Pillar 1: Establish a set of policy and institutional measures for green growth in transport, energy, environmental health, and disaster risk management. .** • Percentage of passenger journeys done in public and non-motorized transport in eight cities (Barranquilla, Bucaramanga, Medellín, Bogotá-Soacha, Cali, Cartagena, Pasto, and Montería). *[Baseline 2015: 27 percent. Target 2018: 33 percent]*. • Non-conventional Energies and Energy Efficiency Fund (FENOGE) provisioned with a minimum funding of 20 billion Colombian pesos *[Baseline 2015: 0. Target 2018: 20 billion Colombian pesos]* • *Consejos Territoriales de la Salud Ambiental* (Territorial Environmental Health Councils [COTSAs]) adopted environmental health action plans validated by National Inter-sectoral Technical Commission for Environmental Health (CONASA) [*Baseline 2015: 0. Target 2018: 32*]. • Disaster risk management measures mainstreamed in agriculture, housing, and transport programs and under implementation. *[Baseline 2015: 0. Target 2018: 3 Strategic Sectoral Agendas]* • At least three National Fund for Disaster Risk Management (FNGRD) accounts operationalized according to Art. 51, Law 1523 of 2012. *[Baseline 2015: No. Target 2018: Yes]*.

	Pillar 2: Improve environmental quality by reducing $PM_{2.5}$ in air; strengthening regulatory and economic instruments for reducing water pollution; and increasing capacity for solid waste disposal and enhancing waste recycling. • Percentage reduction in the mean annual concentration of $PM_{2.5}$ in at least seven prioritized monitoring stations in the cities of Medellín, Itagui, and Bogotá. *[Baseline 2014: See footnote for details. Target 2018: 5 percent reduction at each station]*. • Characterization, reporting, and disclosure of quality and quantity of physical/chemical and microbiological parameters in the main water bodies of priority basins (*Bogotá, Cali and Medellín*) to allow future quality monitoring. *[Baseline 2015: National Report of Water 2010 and Technical Minutes of Resolution 0631 of 2015. Target 2018: Report on Water Quality: discharges and receiving systems]*. • Increase to 20 percent the reuse of treated wastewater from the hydrocarbon sector in agricultural activities. *[Baseline 2014^{+++}. Target 2018: 20 percent or 118.56Mm3/yr.]*. • Share of municipalities and/or districts adopting Solid Waste Integrated Management Plans (PGIRS). *[Baseline 2015: 0 percent of municipalities and/or districts. Target 2018: 60 percent]*. • Number of municipalities disposing solid waste in sanitary landfills according to the legal framework *[Baseline 2015: 874. Target 2018: 916]*. • Share of recycled solid waste not disposed in sanitary landfills. *[Baseline 2015: 17 percent. Target 2018: 20 percent]*.
Overall Risk Rating	Moderate
Operation ID	P150475

1. INTRODUCTION AND COUNTRY CONTEXT

1. **The proposed Development Policy Loan (DPL 1) in the amount of EUR 637,700,000 (US$700 million) to the Republic of Colombia is the first in a series of three single-tranche programmatic DPLs**. It supports the overarching green growth strategy of the Government set forth in the recently approved National Development Plan (NDP) 2014–2018[1] through establishing a set of policy and institutional measures for green growth in transport, energy, environmental health, and disaster risk management; and improving environmental quality by reducing $PM_{2.5}$ in air; strengthening regulatory and economic instruments for reducing water pollution; and increasing capacity for solid waste disposal and enhancing waste recycling.[2] Colombia's approach to green growth is to advance growth compatible with climate change considerations; to protect and ensure the sustainable use of natural capital and improve environmental quality; and to strengthen resilience by reducing vulnerability to natural disasters and climate change.

2. **Colombia's strong economic performance has contributed to poverty reduction and shared prosperity**. From 2002 to 2012, Colombia's real Gross Domestic Product (GDP) per capita averaged 3.2 percent. In addition, poverty has declined significantly; from 2002–13, the number of poor people declined from 19.96 million to 13.99 million. Moreover, the Multidimensional Poverty Index (MPI)[3] declined from 49 percent in 2003 to 27 percent in 2012. Prosperity was widely shared. Colombia's less well-off benefited more from growth than the average person; the income growth of the bottom 40 percent of the population reached 6.6 percent over the period 2008–13, compared to 4.1 percent for the total population.[4]

3. **Colombia's dependence on its unique endowment of natural wealth underscores the importance of ensuring green growth**. The country faces critical environmental challenges from air and water pollution in urban areas, forest and land degradation in rural areas, and a growing vulnerability to natural disasters and the effects of climate change. Indicators suggest that Colombia's economic growth, increasingly dependent on using natural resources, may not be sustainable because of the country's low adjusted net savings, a key measure of growth sustainability.[5] [6] Colombia's adjusted net saving rate fluctuates around zero, well below the Organization for Economic Co-operation and Development (OECD) and regional averages, which implies that Colombia's current growth model is unsustainable. By greening growth, Colombia would reduce negative impacts of pollution on human and man-made capital on the one hand, and reduce natural resource depletion and environmental degradation on the other. From a poverty-reduction perspective, increasing adjusted net savings is also a high priority.

4. **Key economic sectors - notably transport, energy, industry, and agriculture - contribute to environmental degradation in Colombia, pointing to the need for a greener growth path**. Pressures on natural resources exerted by industry - notably extractives, extensive livestock farming, urbanization, and motorization[7] - have created levels of environmental degradation that impose significant and rising economic costs. Deforestation, land degradation, and soil erosion result in annual economic losses estimated to be around 0.7 percent of GDP, and occur primarily in areas of agricultural expansion, illegal mining, and drug-related activities.[8] Extensive agricultural production occupies 35 million hectares of land, of which only 15 million are suited for such purposes. Deforestation is poised to worsen in the absence of controls in many post-conflict areas and important watershed ecosystems. Environmental problems such as urban air pollution, indoor air

pollution from burning of solid fuels for household purposes, and inadequate access to improved water sources and sanitation impose high costs in terms of human illness and death. It is estimated that in 2013, more than 15,000 deaths in Colombia were attributable to these pollution factors.[9] These pollution issues jointly account for an economic cost of Colombian Peso (COP) 14.1 trillion, equivalent to 2 percent of GDP in 2013.[10] The combined natural resources losses and pollution damages were estimated to be about 3.7 percent of GDP in 2007. Recent data suggest that total costs have increased.[11]

5. **Colombia's high vulnerability to the effects of climate change - notably the devastating impacts of natural disasters - highlights the need for a strengthened institutional approach to disaster risk management and prevention**.[12] Floods and landslides are the most frequent disasters that afflict Colombian cities and rural areas; their frequency is expected to rise due to the effects of climate change and greater climate variability. On average, more than 600 natural disaster events are reported each year, making Colombia the country with the tenth highest economic risk from two or more hazards in Latin America. Some 64.7 percent of the population and 86.6 percent of assets are located in areas exposed to two or more natural hazards.[13] The effects of La Niña in 2010–11 caused damages equivalent to 2 percent of GDP in 2010 and 0.38 percent in 2011.

6. **Colombia has made green growth a fundamental theme in its National Development Plan 2014 - 2018 (NPD) and signed the Green Growth Declaration as part of the OECD accession process**. The Government of Colombia (GoC) has designed a set of policy and institutional measures that makes green growth a central element of the NDP 2014–2018. The Green Growth Declaration adopts the OECD approach to green growth - that is, moving toward a growth trajectory that reduces pollution and carbon emissions, uses natural capital sustainably, and is resilient to natural disasters and climate change.[14]

7. **The proposed DPL series adopts the approach to green growth endorsed by both the GoC and OECD, and will include policy and institutional actions to support various dimensions of green growth, including renewable energy and energy efficiency, environmental health improvements, disaster risk management, sustainable transport, improved air and water quality, and solid waste management**. These dimensions are consistent with the NDP, analytical work undertaken by GoC and the Bank, and comprehensive consultations conducted by GoC - led by the National Department of Planning (*Departamento Nacional de Planeación*, DNP) - as part of the NDP process.

2. MACROECONOMIC POLICY FRAMEWORK

A. Recent Economic Developments

8. **In recent years, Colombia has implemented critical structural reforms to promote macroeconomic stability and social progress.** The Government has been able to build a solid macroeconomic framework through a number of reforms, including the Fiscal Responsibility Law, the Fiscal Rule, and Comprehensive Tax Reforms to address loopholes, reduce distortions, and encourage formal job creation. Reforms have strengthened the country's policy management tools, promoted sustainability and resilience but increased buffers against shocks. In parallel to macro and social reforms, the Government has proceeded with peace negotiations with the *Fuerzas Armadas Revolucionarias de Colombia* (FARC) guerrilla group, reaching agreements on three out of five negotiation topics for ending the conflict:[15] illegal drugs (May 2014), rural development (June 2013), and political

participation (December 2013).[16] Over more than five decades, the conflict has imposed severe economic and social costs, and the dividends from reaching peace are expected to be significant.

9. **Colombia's sound economic performance, backed by solid macro reforms and a favorable external context, helped consolidate the country's position among Latin America and the Caribbean Region's (LAC) strongest performers**. As a result of an enhanced macroeconomic policy framework, a commodity price boom, and better security conditions, Colombia's economy has grown strongly since the early 2000s. The country weathered the financial crisis robustly, sustaining high average growth rates (close to 5 percent) before and after the crisis. This performance helped Colombia close the country's per capita income gap with top LAC economies and OECD countries. Government actions to support economic activity helped sustain high growth rates in 2013 (4.9 percent) and 2014 (4.6 percent), despite unfavorable changes in the external environment. Growth slowed down to 2.8 percent in the first quarter of 2015, drive by low international oil prices, but was still among the highest in LAC. In recognition of these important achievements, Colombia was invited to start its accession process to OECD membership (October 2013); the country's risk rating was also upgraded above investment grade by all major rating agencies.[17]

10. **In the past two years, growth has been led by domestic demand, fueled by mildly supportive macroeconomic policies that helped compensate for a severe oil price shock in the second half of 2014.** From a sectorial point of view, growth has been led by the construction sector (mainly due to infrastructure projects and a rebound in housing construction driven by mortgage subsidy program), social services (mostly public administration and defense), and the financial sector. In contrast, extractive activities remain stagnant following a sharp drop in international prices[18] and interruptions in production. From the demand point of view, gross capital formation, household and Government consumption were the main drivers of growth, and compensated for the widening trade deficit. Growth has been accompanied by improvements in labor market outcomes. During the last four years unemployment has dropped consistently, reaching a record low of 9.1 percent in 2014[19], the lowest annual figure in this century.

11. **Unfavorable terms[20] of trade contributed to a larger current account deficit, which remains comfortably financed by Foreign Direct Investment (FDI) and portfolio inflows.** The current account deficit widened to 5.2 percent of GDP in December 2014 (from 3.3 percent in 2013), led by a combination of growth in imports (8 percent) from strong economic activity, and a contraction in exports (5.5 percent) from low oil prices and a temporary shutdown in the Cartagena refinery. The deficit was financed by large portfolio inflows (net 3.1 percent of GDP),[21] particularly in the first half of the year, and FDI (net 3.2 percent of GDP), which also contributed to a comfortable level of international reserves (US$ 46 billion, 8.7 months of G&S imports). Colombia's external debt remains relatively low (31.8 percent of GDP), balanced between public (18.8 percent of GDP) and private (13 percent of GDP) sectors, and mostly long term[22] (27.3 percent of GDP). Finally, Colombia has recently renewed its precautionary Flexible Credit Line (FCL) arrangement with the International Monetary Fund (IMF) (US$5.45 billion).

12. **Monetary policy management has been consistent with the country's stability objectives.** The Central Bank has appropriately managed monetary policy tools, in response to fluctuations in economic activity, while maintaining inflation within the target range.

Inflation recovered ground after reaching a 50-year record low in 2013 (prices increased 1.94 percent year on year). It reached 3.7 percent[23] at the end of 2014, above the Central Bank's target range (2 percent to 4 percent).[24]

13. **Colombia's flexible exchange regime has provided a first line of defense to external shocks.** During the last decade, Colombia experienced a long currency appreciation cycle, which raised concerns about potential Dutch disease effects.[25] This cycle was reversed in mid-2013, following changes in the external environment. The US dollar continued to lose ground in 2014, averaging COP $2,000 per US dollar above 2013 and 2012's COP $1,869 and COP $1797 respective rates. As of mid- 2015, the US dollar averaged COP $2,800.[26]

14. **Colombia's financial sector remains stable, with low exposure to macroeconomic risks generated by the external environment.** Credit growth to the private sector increased at an annualized rate of around 14 percent in 2014. Financial soundness indicators are robust. The banking system is profitable and well provisioned. Banks' Return on Equity (ROE) and Return on Assets (ROA) stood at 19.8 percent and 2.9 percent respectively, in December 2014, compared with 19.5 percent and 2.8 percent a year earlier. In terms of asset quality, the ratio of Non-Performing Loans (NPLs) to total loans in the banking system was relatively stable in 2014, ending the year at 2.9 percent[27]. Capitalization (17 percent) is well above the regulatory limits.[28]

15. **Colombia has enjoyed a sound fiscal position, but fiscal space is now limited.** The Government remains strongly committed to its medium-term consolidation goals. The country's fiscal rule and medium-term fiscal framework, adopted in 2011, targets a gradual consolidation of the central Government's structural deficit to reach 1.0 percent in 2022. Colombia has met the fiscal targets during the first three years of its new fiscal rule. Central Government results in 2014 remained broadly unchanged with respect to 2013, and in line with the structural balanced target embedded in the country's fiscal rule (2.3 percent of GDP in 2014). However, subnational Governments posted strong expenditure growth following the elections, which contributed to an increase in the consolidated public sector deficit (1.6 percent of GDP in 2014). This, combined with the effects of the exchange depreciation, contributed to an increase in the overall public debt (38.7 percent of GDP)[29]. While the impacts of lower oil prices on revenues have been small in 2014, larger impacts are expected for 2015 and 2016. For this reason, the Government introduced a tax reform that covers a 1.5 percent of GDP expenditure gap in the 2015 budget. The reform expects to raise $12.5 billion in 2015 and further increase revenue in 2016–18, partially compensating for falling oil prices and increasing expenditure requirements (related to investments and political commitments such as those made to the rural sector).

B. Macroeconomic Outlook and Debt Sustainability

16. **Colombia is expected to continue outperforming the regional average with slightly slower growth in the near term, and sound macroeconomic indicators despite the strong headwinds.** A strong oil price shock has materialized, affecting most extractive commodity exporters in LAC (regional growth is expected to fall below 0.5 percent in 2015). While there is significant uncertainty about future oil prices, they are likely to remain low in the near term (following weaker demand in China and supply expansion in the United States). In addition, expectations about a monetary policy reversal in the United States have increased volatility. An actual increase in the US interest rate could trigger capital outflows and increase the cost of financing for Governments in the region.

17. **Colombia has a robust macroeconomic framework that can help withstand the main risks.** The macroeconomic policy framework rests on three mutually reinforcing pillars: (1) a responsible fiscal policy based on a credible medium-term fiscal framework, supported by a Fiscal Rule; (2) a monetary policy based on an inflation-targeting regime complemented by a floating exchange rate with moderate interventions; and (3) sound macro and micro prudential policies combined with a robust financial system. This framework provides a solid basis for the country's economic prospects. In the short to medium term, aggregate demand is likely to be boosted by consumer and investor confidence and new infrastructure investments, which will attenuate the impact of external shocks.

18. **Owing to strong fundamentals, a sound policy framework, and some degree of policy space, Colombia's economic prospects in the baseline scenario are expected to be solid.** Lower oil prices are likely to produce negative effects in the short term, but Colombia will continue to outperform its regional peers. While the economic outlook is subject to the above downside risks, the most likely scenario for Colombia is described as follows:

- **Growth and inflation:** Lower oil prices and production will negatively impact earnings from exports and private investment, particularly in the oil sector. These impacts should be partially offset large investments under the fourth generation of road infrastructure program (4G program) starting in 2016 and by Government efforts to stimulate the economy. Growth is expected to decelerate to 3.4 percent in 2015, and recover to 3.7 percent in 2016, still below its 4.5 percent long-term potential. Private consumption (4.4 percent) and investment (3.6 percent) are expected to sustain domestic demand growth, led by supportive policies. Inflation will stay slightly above target at 3.6 percent in 2015.[30]
- **Fiscal accounts:** Despite the recent oil shock, Colombia still enjoys a relatively strong fiscal position. By targeting the structural deficit, fiscal rule accommodates a gradual adjustment in expenditures/taxes in response to lower oil revenues and a smooth transition to a lower equilibrium price. The nominal deficit is expected to reach 3.4 percent of GDP in 2015, while the public debt is expected to reach 39.7 percent of GDP. Both figures are expected to decrease thereafter as the Government implements the structural fiscal consolidation path set by the medium-term fiscal framework. While the path assumes a mild annual adjustment on the fiscal balance, under unchanged tax policy and declining structural oil revenues, the path would imply expenditure cuts[31] and leave limited room to accommodate social and infrastructure expenditure requirements. Keeping its solid track record of fiscal management, authorities are expected to take the necessary corrective policy measures needed to meet the fiscal deficit target and have announced plans to increase gross tax revenues with more efficient collection in the short term and a structural reform in the medium term.[32]
- **External accounts:** The current account deficit is projected to deteriorate in the medium term as earnings from traditional extractive exports decrease, particularly oil and carbon. In 2014 the Current Account Deficit (CAD) reached 5.2 percent of GDP. It is expected to widen to almost 6 percent of GDP in 2015, and return to approximately 5 percent in 2016, as the country's export composition adjusts with lower participation of extractive intensive industries and larger participation of manufacturing and agriculture, which benefit from a weaker peso. Imports should moderate as the floating exchange rate acts like a shock absorber. The external deficit is expected to continue to be primarily financed by inflows of net foreign direct investment and remittances. In addition, Colombia has

an adequate reserve buffer. The reserve adequacy metric in 2014 was considered adequate for precautionary purposes, covering 7.6 months of imports and 3.3 times the external short-term debt.

19. **The debt sustainability analysis indicates that the public debt burden is expected to decline in both the baseline case and alternative scenarios.** This analysis is consistent with the macroeconomic assumptions outlined in Table 1 below. In the baseline scenario, the combined public debt-to-GDP ratio is projected to increase initially to accommodate the oil price shock, then decline continuously, from 38.7 percent of the gross combined public sector debt in 2014 to 37.3 percent in 2020 (Annex 4). This scenario is largely based on the Government's consolidation plans supported by the medium-term fiscal framework.[33] Contingent fiscal liabilities represent a potential risk to fiscal accounts, but after a simulated increase of 10 percent in debt-creating flows, the public debt continues to follow a declining path. Even when historical figures are taken into account, the debt path is still declining. These results suggest that public debt sustainability is not a major concern in the medium term.

20. **On the whole, and notwithstanding the economic risks to the near-term outlook, Colombia's macroeconomic policy framework is sustainable and hence deemed adequate for development policy lending.** Medium-term fiscal policy remains prudent, with proposed fiscal adjustments already well under way. Monetary and exchange rate policies are also supportive of macroeconomic and financial stability, though downside risks remain significant. Primarily, a sharper-than-expected decline in commodity prices would tighten the fiscal position. A large income shock could reverse social gains and erode efforts to reduce poverty. However, Colombia's economy is well-positioned to weather these shocks. In addition, the country could benefit from positive shocks that are not accounted for in the baseline scenario. These include a faster-than-expected implementation of the peace agreement or an acceleration of the infrastructure investment program.

21. **Furthermore, the green growth actions proposed under this DPL series is integral to the country's macroeconomic program.** The recent World Bank Systematic Country Diagnostic (SCD) for Colombia concluded that "Colombia's economic performance will be closely linked with its ability to successfully transition to a lower oil-price equilibrium, and promote productivity and competitiveness in non-extractive activities. The second set of challenges relates to promoting productivity and competitiveness beyond extractives, by addressing critical horizontal barriers to economic development."[34] Green growth not only reduces large welfare costs and environmental externalities, it can contribute directly to economic growth in five ways: (1) by promoting efficiency gains that are cost-effective, reduce energy and materials use, and increase profits; (2) by improving the health of the work force; (3) by promoting the expansion of new industries and technologies offsetting losses in sunset industries; (4) by responding to changes in consumer preferences through expansion of less polluting and energy intensive service industries; and (5) by proactively adapting to disaster risks in ways that reduce the impact of those risks, reduce costs, and improve knowledge. This DPL series - through the actions spelled out for the transport, energy, environmental health, and disaster risk management sectors - can help contribute to medium- and long-term economic growth in the Colombian economy.

Table 1: Key economic indicators

	2012	2013	2014	2015	2016	2017	2018	2019
Real GDP growth (percent)	4	4.9	4.6	3.4	3.7	4.0	4.2	4.3
GDP Deflator (avg. percent)	2.9	1.9	2.8	3.3	3.1	3.0	2.9	3.0
Oil price, Colombian mix (US$/bl)	104.2	104.1	91.9	55.5	62.7	66.6	68.5	69.8
Gross national savings	20.8	20.9	20.8	18.1	18.5	19.0	19.2	19.3
Gross dom. Investment	24.0	24.6	26.0	24.0	23.5	23.4	23.4	23.3
Export growth (FOB+, percent)	6.1	-1.5	-10.1	-13.3	11.0	9.3	5.1	4.5
- Oil exports growth (percent)	10.8	2.9	-11	-15.2	6.7	6.6	4.5	4
Import growth (FOB, percent)	9.6	3.1	1.8	-6.0	12.6	9.4	5.2	5.1
Current account balance	-3.0	-3.3	-5.2	-5.9	-5.0	-4.4	-4.2	-4.0
Foreign direct investment (net)	4.2	2.2	3.2	2.5	2.8	3	2.9	2.8
Gross reserves (months of G&S++)	6.5	7.5	7.6	7.5	7.4	7.2	7	7
Total external debt +++	21.3	24.2	26.8	27.5	26.5	24.7	23.3	22.8
Central Government (percent of GDP):								
Total Revenue	16.1	16.9	17.1	16.3	16.1	16.3	16.3	16.2
Tax Revenue	14.3	14.3	14.5	14.3	14.3	14.4	14.3	14.3
Non-tax	1.8	2.7	2.6	2	1.8	1.9	2	2
Total expenditures	18.4	19.3	19.5	19.1	18.6	18.4	18.3	17.8
Current expenditures	14.2	14.6	15.6	15.5	15.6	15.7	15.7	15.7
- Wages and salaries	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1
- Goods and services	0.8	0.9	1	0.8	0.9	0.9	0.9	0.9
- Interest	2.6	2.3	2.3	2.4	2.4	2.4	2.3	2.3
-Transfers	8.7	9.3	10.1	10	10.2	10.3	10.4	10.4
Capital Expenditures	4.2	4.6	3.9	3.6	2.9	2.7	2.6	2.1
Overall Balance	-2.3	-2.4	-2.4	-2.8	-2.5	-2.1	-2	-1.6
Primary balance	0.2	0	0	-0.2	-0.1	0	0.3	0.7
Combined Public Sector (percent of GDP):								
Total Revenues	28.3	28.3	28.2	26.5	26.3	26.4	26.4	26.3
Total Expenditures	28.3	29.2	29.6	29.5	28.8	28.5	28.1	27.8
NFPS, Overall Balance	0.1	-0.9	-1.5	-3.1	-2.5	-2.1	-1.7	-1.5
CPS Overall balance	0.1	-0.9	-1.4	-3.0	-2.5	-2.1	-1.6	-1.5
Public debt	32	35.6	38.7	39.7	39.3	39.1	38.6	37.9
o/w foreign currency	11.3	12.8	14.8	15.1	14.4	13.9	13.3	12.7
GDP (US$ billions)	369.8	378.4	384.9	332.4	360.3	390.2	418.7	449.3

Note: [+]FOB = Free-on-board; [++]G&S = Goods and services; [+++]Public and private external debt.
Source: DANE (official statistics agency), Banco de la *República*, Ministry of Finance and Public Credit, the IMF, and World Bank Staff projections.

C. IMF Relations

22. **In line with Colombia's robust fundamentals but with significant exposure to tail risk events, the Executive Board approved a two-year FCL arrangement for Special Drawing Rights) SDR 3.87 billion (about US$5.45 billion, 500 percent of quota) on June 17, 2015.** The Colombian authorities stated their intention to treat the new arrangement as precautionary and do not intend to draw on it. Colombia had four previous FCL arrangements with the Fund: the first was approved in May 2009 for SDR7 billion (about US$10.5 billion, 900 percent of quota), the second in May 2010 for SDR2.3 billion (about US$3.5 billion, 300 percent of quota), and the third and fourth in May 2011 and June 2013, respectively, for SDR3.87 billion. The FCL arrangement provides protection against external tail risks.

3. THE GOVERNMENT'S PROGRAM

23. **With the goal of conserving natural resources, improving environmental health, and enhancing resilience to natural disasters and climate change, the GoC has designed a set of policy and institutional measures that make green growth a central element of the NDP 2014–2018 plan.** This policy approach requires integrating environmental considerations in key sector policies and enhancing the efficiency of production activities. In this sense, achieving green growth requires changes in both public and private sector investment strategies, incentivized as needed by public policy reform. GoC has estimated the total investments - in areas such as infrastructure and human resources - required to implement the green growth strategy at US$3.5 billion, and to reduce vulnerability to natural disasters and climate change at US$2 billion.

24. ***Sustainable growth compatible with climate change***. GoC's green growth strategy aims at transforming sectors such as energy, transport, housing, water and sanitation, agriculture, and industry. The focus is on low carbon growth and climate resilience, including, for example, the development of renewable energy; promotion of multimodal transport systems, including non-motorized vehicles; promotion of sustainable construction and urban development; and more efficient use of water resources in agriculture and livestock farming.

25. ***Sustainable use of natural capital and improving environmental quality***. The Government is focused on using natural capital sustainably which requires protecting natural resources and environmental services for the use of current and future generations. The Government is also focused on improving the environmental performance of productive sectors through improving their efficiency in using resources and reducing waste and pollution emissions. This will reduce the cost of environmental degradation and generate benefits to vulnerable population groups. While this DPL series primarily focus on the "environmental quality" aspects of green growth, the KfW Development Bank (KfW) will finance their own budget support operation to protect and ensure the sustainable use of natural capital in the context of the NDP 2014–2018.

26. ***Strengthening resilience by reducing vulnerability to natural disasters and climate change***. GoC's strategy consists in strengthening resilience through better knowledge and reduction and management of disaster risks. To improve knowledge, GoC seeks to strengthen its institutional capacity for monitoring seismic, volcanic and marine threats, as well as strengthen its monitoring and early warning systems.

27. **GoC is making efforts to strengthen institutions and mechanisms for inter-sectoral collaboration for green growth**. The cross-sectoral nature of green growth inherently calls for collaboration across multiple sectors to ensure that green growth objectives and actions of individual sectors are synergistic. GoC's efforts to strengthen institutions and policy frameworks for inter-sectoral collaboration include improving environmental health and reducing vulnerability to natural disasters and climate change.

4. THE PROPOSED OPERATION

A. Link to Government Program and Operation Description

28. The proposed DPL series seeks to support Colombia's overarching green growth strategy through establishing a set of policy and institutional measures for green growth in transport, energy, environmental health and disaster risk management; and improving environmental quality by reducing $PM_{2.5}$ in the air; strengthening regulatory and economic instruments for reducing water pollution; and increasing capacity for solid waste disposal and enhancing waste recycling. In parallel, KfW supports their own budget support operation to protect and ensure the sustainable use of natural capital in the context of the NDP 2014–2018.

Lessons Learned

29. **The design of this proposed operation builds on lessons learned and good practices from previous Bank-supported DPLs**. Key lessons include: (a) be mindful of country ownership by being supportive and responsive to GoC-driven policy reform processes and avoid the role of an agenda setter or being seen as a driver of policy formulation; (b) agree upfront with the Government and other financial partners on a coordinated accountability framework by developing a focused results framework and assuming leadership of the subset of policy areas that the operation is focused on; and (c) choose only a limited number of policy goals and related actions critical for achieving results as conditions for disbursement by carefully reviewing the GoC's green growth strategy and identifying those actions as triggers, which are essential for overall impact of the programmatic DPL series on the green growth agenda.

30. **The proposed DPL series also builds on lessons learned from past DPL engagements in Colombia.** The previous programmatic engagements in Colombia were essential to expanding the dialogue in the area of environmental sustainability and green growth. The GoC implemented a series of regulatory reforms, accompanied by the adoption of policies, strategies, and the creation of inter-sectoral coordination mechanisms, which have brought valuable lessons to the design of this DPL:

- **Extensive analytical work should be the basis of building a reform program.** This operation is based on a broad range of analytical products (Annex 6). The analytical work conducted as part of the Country Environmental Analysis (CEA) and its updates provided a thorough examination of environmental priorities and an understanding of the country's institutional framework for environmental management.
- **Inter-institutional coordination is essential for strengthening the reform program.** DNP's leadership in the implementation of the DPL program is instrumental in enhancing coordination among key actors, other line ministries, as well as national and regional authorities.

- **Having proactive leaders is imperative to the achievement of reforms**. The DNP took a leading role in the identification and preparation of this operation, and director-level staff members have demonstrated firm commitment to the program. In addition, ministerial-level commitment facilitated the approval of prior actions as part of the DPL preparation dialogue. Having the NDP established and enacted as a law that sets green growth in a comprehensive development planning framework significantly strengthens the potential for implementing the GoC's overarching green growth strategy.
- **Having flexibility in project design under a cohesive policy framework is essential.** The proposed DPL design is flexible enough to support actions that are implementable and are key to achieving the objectives of the reform. The design of the DPL series embodies a progressive approach to deepen the policy and institutional measures.

B. Prior Actions, Results, and Analytical Underpinnings

31. **The proposed DPL focus on green growth areas that have been identified as critical under the NDP. All of the prior actions of the first DPL have been completed by the Government.** The policy and institutional measures are grouped into two pillars: (a) Pillar 1 seeks to establish a set of policy and institutional measures for green growth in transport, energy, environmental health and disaster risk management; and (b) Pillar 2 seeks to improve environmental quality by reducing $PM_{2.5}$ in air; strengthening regulatory and economic instruments for reducing water pollution; and increasing capacity for solid waste disposal and enhancing waste recycling. The Policy and Results Matrix is included in Annex 1.

32. **The selection of prior actions included in the policy matrix of the DPL reflects a combination of factors, notably GoC's momentum in advancing its green growth agenda, harmonization of donor support, and GoC's commitment to deliver sustainable reform and results through a cohesive program of policy and institutional actions.** The inclusion of the green growth strategy in the 2014-2018 NDP, and its approval by law, provided additional momentum for action by GoC. The GoC has provided political leadership and demonstrated institutional capacity in moving the green growth agenda forward in such areas as energy, transport, environment, and disaster risk management.

33. **The operation builds on a solid and diverse body of analytical and technical work conducted by the Bank, Government, and other financial and technical partners over the past years**. The Bank has conducted an in-depth analysis of the broad range of existing research, reviews, and other recent information generated by the GoC and other sources. More importantly, the design of this DPL has benefited from a growing knowledge base on environmental sustainability and green growth. Annex 6 lists the key analytical underpinnings by prior action. The Policy Note[35] on Environmental Sustainability/Green Growth in Colombia (P147717) has been a key Advisory Services and Analytics (ASA) work that supports the analytical basis for this DPL.[36]

Pillar 1: Establish a set of policy and institutional measures for green growth in transport, energy, environmental health, and disaster risk management

34. Prior action 1 of the programmatic DPL supports the GoC's overarching green growth strategy by establishing policy and institutional measures to (a) advance sustainable growth compatible with climate change considerations; (b) protect and ensure the sustainable use of natural capital and improve environmental quality; and (c) strengthen resilience by

reducing vulnerability to natural disasters and climate change. The DPL series covers transport, energy, environmental health, and disaster risk management. These sectors are critical to ensure long-term improvements in environmental degradation and the reduction of vulnerability to climate change and natural disasters.[37] Specifically, DPL 1 will include prior actions associated with transport and energy, while subsequent DPLs will include additional indicative triggers associated with environmental health and disaster. Since DPL 1 does not encompass all the elements of the green growth program, the next paragraphs will describe the overall DPL series, including indicative triggers and expected results. Box 1 describes the specific prior action in DPL 1 for Pillar One.

DPL 1 - Prior Action 1 for Pillar One

As a prior action for DPL 1 and, as a part of the National Development Plan, the Government set forth a green growth strategy which, *inter alia*: (a) defines guidelines for developing and improving public transportation systems; (b) entitles territorial entities (including districts and municipalities) to establish new funding resources for public transportation systems and infrastructure for non-motorized transportation; and (c) provides financial resources to the FENOGE. This prior action was completed when articles 32, 33, 34, and 190 of Law No. 1753 were published in the Official Gazette on June 9, 2015.

Transport

35. **The transport sector accounts for 12 percent of Colombia's CO2 emissions and the use of private cars and especially motorcycles is the main contributor to local air pollutants.** Because of urbanization and the accelerated growth of motorization, Colombia's vehicle fleet has nearly tripled in the last 22 years (1990–2013) - increasing from 3 million to 9.7 million vehicles.[38] The use of private vehicles has increased from 18 percent to 29 percent during the 2002-12 period. The share of motorcycles in Colombia's vehicle fleet has grown dramatically—exceeding that of private cars[39] - to more than 45 percent of the total vehicle fleet.[40] While the motorization rate[41] in Colombia is low compared to similar middle-income countries in the region, if current trends continue it will see a threefold increase by 2030, leading to higher levels of congestion and unsustainable pollution. A Bank study on Low Carbon (2014) estimated that as a result of projected fuel consumption, CO_2 emissions from transport could increase from 24.2 million tons in 2012 to 46 million tons in 2040. The growth is driven mainly by diesel, whose consumption and emissions would increase by 127 percent. Prior action 2 in the next DPL pillar addresses this issue.

36. **Increased motorization and vehicle-use intensity make the negative externalities such as congestion, road safety, and pollution more prevalent**. In Colombia, road fatalities and respiratory diseases associated with increased pollution disproportionately affect the poor and most vulnerable. In 2014, pedestrians accounted for 26.7 percent of those killed in road accidents. This is the leading cause of death among young children (5–14-year-old cohort).[42] Respiratory diseases are also one of the leading causes of child mortality. The health costs associated with urban air pollution represent an estimated 1 percent of GDP.[43] Policy actions aimed at sustainable transport solutions can thus bring many benefits, including those in health (from improved air quality), fewer accidents, and greater access to transport for low-income groups. GoC's green growth strategy has prioritized curbing emissions from transport and energy sources.

37. **In an effort to foster low carbon development and improve traditional public transport, the NDP law requires that the Government support public transport solutions and undertake actions targeted to increase and regulate the use of non-motorized means of transport**. Under Article 32 (Law 1753), the Government can adopt

measures to improve the efficiency of urban transport in urban, metropolitan, and regional areas that are integrated in the cities' systems. The Government also can discourage motorization and private car use while promoting public transit systems and non-motorized modes (walking and cycling). Consolidating the reforms of the Integrated Mass Transport System (SITM), the criteria for the Integrated Public Transport System (SITP) co-financing is updated by establishing parameters of operation and environmental quality.[44,45]

38. **Recognizing the central role of local authorities for the development of low carbon and clean transportation, the NDP law entitles territorial entities (including districts and municipalities) to establish new funding resources for public transportation systems and infrastructure for non-motorized transportation (Article 33, Law 1753)**. Different modalities of public and mass transport (SITP, Public Transportation Strategic System [SETP],[46] SITM and Integrated Regional Transport System [SITR]) can be funded through several mechanisms. The law sets guidelines to establish (a) stabilization funds and demand subsidies to cover the difference between the technical and user transportation tariffs; (b) parking fees in public areas of cities and communities with public transportation; and (c) tolls in highly congested areas; revenues can be used to fund road infrastructure, public transportation, and pollution mitigation projects and programs in municipalities or districts with a population larger than 300,000 inhabitants. However, for these funding mechanisms to materialize, regional governments and municipalities should be willing to use them. There is some evidence that local interest groups may constrain the use of these mechanisms. During the supervision phase of the DPL 1 and preparation phase of DPL 2, the Bank would support the GoC in developing policies to encourage local governments to use these funding transport instruments. The results of this policy dialogue, which would include a review of good international practices, are expected to inform the design of related policy actions in DPL 2.

39. **Considering the results of the policy measures established in the NDP law - for promoting mass public transportation, fuel substitution (see also Prior Action 2), and non-motorized transportation - in DPL 3 the Government would establish a regulatory framework to increase and regulate the use of non-motorized and clean energy transport**. This regulation would set norms, rules, and establish institutional arrangements to increase the supply of infrastructure and logistics for clean and non-motorized transport to enable, for example, public service transportation through non-motorized tricycles. The regulation may also include measures to promote multimodal transportation, including promotion of greater participation of clean fluvial transportation.

40. **Expected Program Results.** While the policy measures and trigger discussed are expected to have nationwide effects on the use of mass transport systems and non-motorized and clean energy transportation, their effects would be greater in the major cities of Colombia. Sustainable transport mode usage (measured as the percentage of passenger journeys done in public and non- motorized transport) in the cities of Barranquilla, Bucaramanga, Medellín, Bogotá-Soacha, Cali, Cartagena, Pasto, and Montería is expected to increase from 27 percent in 2015 to 33 percent in 2018 [Baseline 2015: 27 percent. Target 2018: 33 percent]. Achieving this target would be supported by enhanced funding facilities; strengthened transport planning, management, and control; and education programs.

Alternative Renewable Energy and Energy Efficiency

41. **Colombia has a relatively low per capita level of carbon emissions.** Of these emissions, 38 percent come from agriculture, 14 percent from deforestation (land-use change), 37 percent from energy (the largest share is from transport), and 11 percent from waste and industrial processes. The large share of hydropower, 70 percent of installed capacity, makes the power sector one of the least carbon-intensive in the world. However, Colombia's high dependence on hydropower and this source's vulnerability to the effects of climate change has made the development of alternative renewable energy such as geothermal, wind, and solar a preferred option for expanding low carbon sources in the power sector. Colombia's wind regime, for example, has been rated among the best in South America.[47]

42. **A key constraint for the development of alternative renewable energy and energy efficiency projects is the lack of funding.** In response to this situation, article 10 of Law 1715 established the Non-Conventional Energies and Energy Efficient Fund (FENOGE) to support programs, projects, and studies on alternative energy and energy efficiency. FENOGE can receive and manage funds from the GoC, public and private institutions, and international and multilateral organizations. However, the law uses other policy instruments to set specific mechanisms that can bring a permanent source of funding to FENOGE, as well as to define its institutional architecture.

43. **The permanent funding source from the GoC, which is critical for the FENOGE to fulfill its promotion role, is established by the NDP law**. Article 197 on electric funds earmarks US$0.40 of the US$1.90 charge per kilowatt-hour dispatched to the Energy Wholesaler Bourse to FENOGE. In addition to funding projects and programs, these funds can serve to leverage additional resources from other sources to support the alternative energy and energy efficiency policy of the GoC. This key constraint of FENOGE is addressed through prior action 1. The indicative triggers for DPL 2 and DPL 3 seek to have FENOGE fully operational.

44. **Establishing the institutional structure of FENOGE is the indicative trigger 1 of DPL 2.** This structure to be established through a Supreme Decree would, *inter alia*, set up FENOGE's organizational structure and the project requirements for accessing the Fund's resources. The institutional structure is a necessary but not a sufficient condition for FENOGE to operate. By establishing its policy and operational framework, indicative trigger 2 of DPL 3 will create the sufficient conditions for FENOGE to operate.[48]

45. **Expected Program Results.** As a result of the policy measure adopted by the NDP law and the indicative triggers discussed, by 2018 FENOGE will be provisioned with a minimum funding of 20 billion Colombian pesos [Baseline 2015:0. Target 2018: COP 20 billion].

Environmental Health

46. **Colombia has made progress in addressing environmental health problems.** However, further progress - including the preparation of the Inter-sectoral Policy on Environmental Health (PISA)[49] - has been constrained by shortcomings in inter-sectoral coordination and limited clarity regarding the roles of the national and local governments. Intersectoral coordination is important because environmental health issues related to air, water, and soil pollution involve activities of multiple sectors. Potential environmental health

benefits from pollution abatement in one sector can be lost by greater pollution from other sectors. Moreover, the achievement of national objectives to improve environmental health outcomes could be undermined by unresponsive local governments. Of particular concern is that the National Inter-sectoral Technical Commission for Environmental Health (CONASA) and the Territorial Environmental Health Councils (COTSAs) face challenges in (a) harmonizing and implementing environmental health policies, and (b) undertaking joint actions to address the determinants of environmental health problems.[50] The NDP 2014–2018 identifies the need to address these environmental health governance challenges to reduce the cost of morbidity and mortality related to environmental degradation. Indicative triggers for DPL 1 and 2 aim to address these challenges.

47. **Indicative Trigger DPL 2: The GoC would establish a national inter-sectoral framework for environmental health on (a) knowledge management, (b) governance, and (c) management of social determinants of environmental health.** This framework would aim to address gaps that are constraining the implementation of the PISA. On knowledge management, it is expected to establish research priorities, implement an environmental health survey, and set indicators on environmental health. On governance, the focus it is likely to be on capacity building and institutional strengthening for inter-sectoral coordination. On the management of social determinants of environmental health, the framework for the implementation of the PISA is expected to include differentiated approaches to vulnerable groups. Complementing these national efforts at the subnational level, the indicative trigger of DPL 3 is the establishment of subnational inter-sectoral coordination mechanisms for improving environmental health within the framework of the Territorial Councils for Environmental Health (COTSAs). These mechanisms would be supported by measures to facilitate consensus building and institutional strengthening measures, including a methodology to prioritize environmental health problems at the local level.

48. **Expected Program Results.** DPL 2 and DPL 3 are expected to enable inter-sectoral and inter-jurisdictional coordination for the implementation of the PISA. As a result, it is expected that by 2018 environmental health action plans validated by CONASA will be adopted by thirty-two COTSAs [Baseline 2015: 0. Target 2018: 32]. These plans would set measures and actions to be undertaken by the COTSAs, which would include the requirements in investments to achieve local targets on improving environmental health conditions.

Disaster Risk Management

49. **In the last few years the GoC has been developing elements of a legal, policy, and institutional framework for disaster risk management in response to the imperative of reducing vulnerability and promoting adaptation to climate change**. Law 1523 (April 24, 2012) established the National System for Disaster Risk Management (SNGRD), which comprises an organizational structure, planning instruments, information systems and funding mechanisms. This national system is formed by public and nonprofit private entities and the community. It reaches the national, regional, and local levels. The law also created the National Disaster Risk Management Unit (UNGRD) to provide the national system with strategic and policy direction. The National Plan for Disaster Risk Management (PNGRD) will define the priorities, actions, responsibilities, and budgets for disaster risk management. DPL 2 includes a trigger related to the preparation of this plan (as discussed below). The law

also reformed the National Fund for Calamities, which became the new National Fund for Disaster Risk Management (FNGRD).[51]

50. **Indicative Trigger DPL 2.** The Government has established a framework with priorities, responsibilities, and an action plan for the knowledge, reduction, and management of disaster risk. This will lead to the alignment of public and private investments with Colombia's disaster risk management priorities. This policy will be implemented through the PNGRD, which will (a) provide institutional articulation of goals, actions, and resources of SNGRD; and (b) enable the preparation of disaster risk management plans at the departmental level. Resources for implementation of these plans would be leveraged through the FNGRD. An indicative trigger of DPL 3 is the establishment of the regulatory and operational framework for the FNGRD to support project implementation by national and regional entities.

51. **Expected Program Results.** The policy measures related to disaster risk management included in this programmatic series would contribute to the mainstreaming of disaster risk management measures in the agriculture, housing, and transport sectors. [Baseline 2015: 0. Target 2018: 3 Strategic Sectoral Agendas[52]]. The operationalization of the FNGRD will be instrumental for the UNGRD to put a program in place to support the implementation of Disaster Risk Management (DRM) measures in these sectors. At least three FNGRD accounts will be operationalized according to Art. 51 of Law 1523 of 2012. [Baseline 2015: 0. Target 2018: 3].

Pillar 2: Improve environmental quality by reducing $PM_{2.5}$ in air; strengthening regulatory and economic instruments for reducing water pollution; and increasing capacity for solid waste disposal and enhancing waste recycling.

52. **Pillar 2 supports the GoC green growth objective to improve environmental quality by reducing air and water pollution and increasing the safe disposal and recycling of solid wastes**. Specifically, the pillar will support policy actions that seek to improve pollution management by (a) strengthening standards and regulatory instruments related to air pollution; (b) strengthening standards and regulatory and economic instruments related to water pollution; (c) promoting policies in wastewater treatment to keep up with the demand of growing urban areas; and (d) developing technical requirements and economic instruments to improve solid waste management.

53. **Policy actions supported under Pillar 2 complement the institutional and policy measures under Pillar 1 and strengthen the effectiveness and applicability of policies for achieving improved environmental outcomes.** In the area of environmental health, for example, while Pillar 1 actions aim at fostering an institutional setting that is conducive to addressing environmental health, Pillar 2 will complement these actions by focusing on measures to improve the environmental factors that affect health. Furthermore, the actions supported in Pillar 2 address institutional and policy shortcomings that undermine policy effectiveness.[53]

54. **Furthermore, Pillar 2 provides policy responses to pollution problems that are important contributors to the cost of environmental degradation and health damage but have not previously been addressed by pollution policies.** The main water pollution problems in Colombia are associated with pathogens, toxic substances, and other hazardous substances, which have the most significant impacts on human health. However, no policies address these problems, notwithstanding the significant associated health damage costs

estimated at COP 1,759 billion or 0.25 percent of GDP in 2013. Under Pillar 2, GoC will put in place, for the first time, water pollution charges (*tasas retributivas*) for pathogenic and toxic substances in domestic and industrial wastewaters. With respect to air pollution, particulate matter pollution ($PM_{2.5}$) is most important in terms of its deleterious effects on human health. Although Colombia is making considerable efforts to improve air quality management, the national air quality ambient standard of 25μg/m^3 more than doubles the World Health Organization (WHO) air quality guideline value (10 μg/m^3), and the majority of air quality monitoring stations in the country measure the less harmful PM_{10}. Under Pillar 2, Colombia will set new progressive norms for air pollutants that affect health, notably $PM_{2.5}$. Box 2 summarizes the Prior Actions for Pillar two, which correspond to the four main topics of air pollution, water pollution, treated wastewater reuse, and solid waste management.

Box 2: DPL 1—Prior Actions 2-6 for Pillar Two

- Prior Action 2: The Government adopted a regulation to update the quality parameters for diesel fuel at the national level, with the objective of reducing toxic emission in the air contamination.
- Prior Action 3: The Government established parameters, limits, and procedures for the discharge of treated wastewater originating from selected agricultural, industrial, commercial, and service activities.
- Prior Action 4: The Government established a set of rules, including quality parameters, regulating the reuse of treated wastewater for selected industrial and agricultural activities.
- Prior Action 5: The Government established a methodology for the formulation, implementation, evaluation, management, control, and update of Solid Waste Integrated Management Plans (PGIRS) by municipalities, districts, and other selected local entities within its territory.
- Prior Action 6: The Government established a set of incentives to promote the recycling of solid waste, including an additional fee to be charged per ton of solid waste finally disposed in sanitary landfills.

Air Pollution

DPL 1 Prior Action 2. The Government adopted a regulation to update the quality parameters for diesel fuel at the national level, with the objective of reducing toxic emission in air contamination, as evidenced by Resolution No. 90963, dated September 10, 2014, issued jointly by the Government's Ministry of Mines and Energy (MME) and the Ministry of Environment and Sustainable Development (MADS), published in the Official Gazette on September 11, 2014.

55. **Ambient air pollution continues to be a significant contributor to environmental degradation and health damage in Colombia**. The use of diesel in cargo transport in Colombia represents a significant source of air emissions, including toxic substances, with adverse impacts on human health. The CEA for Colombia estimated that health damage costs from air pollution were equivalent to 0.79 percent of the country's GDP in 2002.[54] Subsequent analytical work conducted by the Bank in 2012 underscored the continued challenge associated with air pollution, which resulted in health damage costs equivalent to 1.12 percent of GDP in 2010. More recent analysis corroborates earlier findings and further underscores the marked role of air pollution in health and environmental damage - ambient air pollution was the single largest environmental health risk, accounting for 8,000 deaths or 52 percent of environment-related deaths in 2013 and 0.95 percent of GDP in 2013.[55]

56. **The Government has taken several steps over the years to reduce the concentration levels of air pollutants that have adverse impacts on health and are associated with the use of fossil fuels in economic sectors**. A large proportion of the fuels

used in Colombia comprise a mixture of fossil fuels and biofuels. Fossil fuels contain sulfur, polyaromatic compounds, and fine particulate matter, which affect health. Law 1205 (2008) prohibited the distribution, sale, consumption, and transport of diesel with sulfur content in excess of 50 ppm.[56] The Government has also updated and consolidated regulations for reducing polluting air emissions from mobile sources. The 2007 revision of Decree 948 (1995) was an important step to reduce the transport sector's contribution to air pollution through its provisions related to Euro IV and Environmental Protection Agency (EPA) 10 standards for vehicles.[57]

57. **The prior action will support fuel quality and ignition improvements to reduce toxic air pollutants in economic sectors associated with freight transport**. In September 2014, the GoC through Resolution 90963 updated diesel quality parameters as part of these efforts. The resolution included the requirement, as from July 2016, to permanently reduce the content of aromatic substances in diesel and in mixtures of diesel and biofuel from 35 to 32 percent, increase the cetane rating of diesel from 43 to 45, and establish maximum limits for the content of polyaromatic substances.

58. **Indicative Triggers.** The Government has committed to make additional policy interventions that address mobile and stationary pollution sources. Through a new resolution that updates Resolutions 910/08, 2604/09, and 111/13, the MADS will consolidate the norms associated with pollutant emissions from mobile sources to set new vehicle emission standards that promote the renewal of the car fleet, and to strengthen follow-up and control mechanisms (DPL 2). As part of the second operation of the program, the MADS will update outdoor air quality norms - through an approved resolution that updates resolution 610 of 2010 - to set new progressive maximum permissible limits for "criteria pollutants," including $PM_{2.5}$ (DPL 2). Complementing the reform process, the Government envisions an approved resolution to strengthen monitoring and control of pollutant emissions from stationary sources (DPL 3).

59. **Expected Program Results**. The expected outcome of the program is the percentage reduction in the mean annual concentration of particulate matter ($PM_{2.5}$) in at least seven prioritized monitoring stations in the cities of Medellín, Itagui, La Estrella, and Bogotá.[58] [Baseline 2014: See footnote for details.[59] Target 2018: 5 percent reduction at each station]. Given the health damage associated with high levels of fine particulate matter pollution, the outcomes of this reform are expected to contribute significantly to strengthening air quality management in Colombia and reducing air pollution-related health impacts.[60]

Water Pollution

DPL 1 Prior Action 3. The Government established parameters, limits, and procedures for the discharge of treated wastewater originating from selected agricultural, industrial, commercial, and service activities, with the objective of reducing the overall pollution of water bodies, as evidenced by Resolution No. 631, dated March 17, 2015, issued by the Government's Ministry of Environment and Sustainable Development, published in the Official Gazette on April 18, 2015.

60. **Despite improvements in coverage of wastewater treatment, inadequate water supply, sanitation, and hygiene impose a high economic burden and are an important cause of death and disease in Colombia**. Between 1993 and 2003, coverage of water supply and sewerage services increased significantly from 79.7 percent to 86.1 percent and from

73.2 percent to 82 percent, respectively. The number of municipalities with wastewater treatment increased from 218 in 2002 to 355 in 2006. Notwithstanding this increase, total coverage is low - estimated at 32.3 percent of all the municipalities in the country. As a result, the economic cost associated with morbidity and mortality related to inadequate water supply, sanitation, and hygiene has been significant in Colombia.[61]

61. **Untreated wastewater discharges generated by industrial sources and urban centers are a major and growing cause of deterioration in the quality of water resources in Colombia**. From 1979 to 2008, a GoC analysis found an increasing trend in the total volume of wastewater discharged from various industrial activities (MADS 2015). Bogota, Antioquia, and Valle del Cauca were the largest contributors, accounting for 15.3 percent, 13 percent, and 9.87 percent, respectively, of the total volume generated. A majority of municipalities directly discharged untreated wastewater into water bodies within urban limits. In addition, over 50 percent of wastewater treatment systems do not operate properly or regularly. Low coverage of municipal wastewater treatment has caused a significant impact on the quality of receiving water bodies, particularly the Bogotá River and in the basin of the Magdalena and Cauca rivers. Forty percent of the principal water basins in the country are vulnerable to deterioration - with areas of major economic activity being most affected - as a result of receiving highly polluted wastewater discharges from point and diffuse sources. The growing specter of climate change impacts, notably low and variable flows, will further exacerbate the quality of water resources.

62. **The prior action represents an important step in the GoC's efforts to reduce pollution of water bodies by strengthening rules and regulations related to the quality of wastewater discharges**. Decree 3930 of 2010 regulated the levels of treatment required for domestic and industrial wastewaters for discharge to surface waters. In March 2015, the GoC through Resolution 631 updated the parameters and maximum permissible limit values for point discharges to surface water bodies and public sewerage systems. The updated norms were expanded to the control of 49 productive, agricultural, industrial, commercial, and service activities - in addition to the 24 activities that were being regulated for eight economic sectors - bringing the total number of activities to which the norms are applicable to 73. An important and new aspect of the updated norms is their focus on the measurement of concentrations of polluting substances in milligrams per liter of water instead of kilograms per day, indicating a shift in focus from the effectiveness of the treatment process to actual water quality. Overall, the new resolution will contribute to significant improvement in the quality of surface water bodies, covering a broader spectrum of polluting substances through the control of discharge limits and the requirement of absolute concentration values in the management of wastewaters.

63. **Indicative Triggers.** The Government plans to undertake further actions to restore the quality of water bodies in Colombia. As part of the reform process, the Government has committed to regulate (approved resolution regulating decree 1076 of 2015 – *decreto único sectorial del sector ambiente*) the levels of treated wastewater for discharge into the marine environment (DPL 2) and in soils (DPL 3). Similar to the above-mentioned prior action, the Government supports the definition of quality parameters and limits, including for pathogens and toxics, for the discharge of treated wastewater in marine waters and in soils to protect the quality of aquifers. To further reduce pollution of water bodies, the Government will establish pollution charges (*tasas retributivas*) for pathogenic and toxic substances in

domestic and industrial wastewaters (approved resolution regulating decree 1076 of 2015) (DPL 3).

64. **Expected Program Results.** An expected outcome of the reform process is an improvement in the characterization, reporting, and disclosure of the quality and quantity of physical, chemical, and microbiological parameters in the main water bodies of priority basins (Bogotá, Cali, and Medellín) that would allow for future quality monitoring. The target for 2018 is the preparation of the Report on Water Quality - Discharges and Receiving Systems. The new system of pollution charges would strengthen incentives for behavioral change by polluters in favor of compliance, as well as strengthen enforcement. The combination of improved disclosure and monitoring, coupled with a well-designed and adequately enforced system of pollution charges, provide important indices for assessing the restoration of the quality of Colombia's water bodies, and their role in environmental health in the country, particularly with respect to waterborne and water-related diseases. GoC recognizes the need for more comprehensive knowledge on sources of polluting wastewater, and is complementing these regulatory efforts with intensive promotion and public awareness activities.

Wastewater

DPL 1 Prior Action 4. The Government established a set of rules, including quality parameters, regulating the reuse of treated wastewater for selected industrial and agricultural activities, as evidenced by Resolution No. 1207, dated July 25, 2014, issued by the Government's Ministry of Environment and Sustainable Development, published in the Official Gazette on August 13, 2014.

65. **Colombia has limited availability of water to satisfy demand.** The lack of available water resources in urban areas is exacerbated by its poor quality, leading to significant pressure and conflicts among users. Wastewaters are an important additional source to meet demand. Water reuse offers an opportunity to significantly expand supplies of freshwater in areas facing water shortages.

66. **Colombia is taking various measures, including promoting wastewater reuse in productive sectors, to achieve the dual goals of improving efficiency of water use and reducing environmental risks to health**. Recognizing the increasing vulnerability of water resources to climate change, the GoC is taking policy measures that promote the reuse of treated wastewater in productive sectors with a view to reduce wasteful and inefficient use of water resources in those sectors. In this context, Law 373 of 1997 addressed water use efficiency and savings and established obligatory reuse of treated wastewater for any activity that generates liquid effluents. This law also stipulated that wastewater be used when there is technical, environmental, and economic viability. The 2010 National Policy for Integrated Management of Water Resources established a strategy for strengthening the implementation of processes and technologies for the efficient and sustainable use of water by key users.

67. **Recognizing that wastewater reuse has implications for pollution control, the MADS issued Resolution 1207 of July 2014**. The resolution defines the permissible quality criteria for utilization of treated wastewater as well as procedural aspects for development of, and environmental authorizations for, wastewater reuse. Treated wastewater in agriculture can be reused for irrigation of parks and gardens in non-residential areas, pasture and forage crops for animal consumption, non-food crops for humans and animals, crops for biofuels, forest harvesting timber, fiber, and other non-food crops, and food crops for non-

direct human and animal consumption.[62] In addition to cost savings, the use of wastewater brings numerous potential benefits to agricultural and industrial activities, including the supply of treated wastewater during dry periods, nutrient recovery in water, and a reduction in water user conflicts. Potential benefits in industry include reduced use of water, reagents, and raw material, and heat recovery.

68. **Indicative Trigger.** As part of the reform process, the Government is committed to establishing complementary rules to promote the reuse of treated wastewater in additional sectors. More specifically, a set of rules will be established that target the reuse of treated wastewater in the service, trade, and manufacturing sectors (approved regulation) (DPL 3). This reform process will reduce polluting discharges to water bodies, thereby improving the quality of water resources and aquatic ecosystems. Moreover, there will be a reduction in water treatment costs and improvement in public health for intermediary users.

69. **Expected Program Results.** An expected outcome of this reform agenda is the increased reuse of treated wastewater from the hydrocarbon sector in agricultural activities [Baseline 2014: forthcoming.[63] Target 2018: 20 percent, or 118.56 million m^3/yr*)*]. This result will contribute to the integrated management of water resources in Colombia by enabling reductions in freshwater demand in the country, generating clear rules for the development of new activities during periods of water shortage, and controlling contaminating discharges from wastewater treatment plants to water bodies.

Solid Waste Treatment

DPL 1 Prior Action 5. The Government established a methodology for the formulation, implementation, evaluation, management, control and update of Integrated Management of Solid Waste Plans (PGIRS) by municipalities, districts and other selected local entities within its territory, as evidenced by Resolution No. 754, dated November 25, 2014, issued jointly by the Government's Ministry of Housing, City and Territory and the Ministry of Environment and Sustainable Development, published in the Official Gazette on December 1, 2014.

70. **While Colombia has made important strides in the collection and final disposal of solid waste, a significant amount of waste continues to be disposed in a manner that is harmful to the environment and human health**. As of 2011, the national per capita average generation of solid waste was 0.6 kg per day, amounting to a total of 6,357 metric tons per day. Approximately 96 percent of solid waste generated is collected by a formal collection service. With respect to final disposal, approximately 93 percent of waste generated is disposed of in sanitary landfills or sent to a treatment plant. Approximately 76 percent of municipalities have adequate options for final disposal of solid waste, while the remaining 24 percent dispose to dumps and other inadequate disposal options. Decree 1713 of 2002, replaced by Decree 2918 of 2013, established that all municipalities must have a PGIRS prepared by the respective municipality and approved by the competent environmental authorities for their information, control, and monitoring. It also set out criteria that all solid waste service providers must meet for provision of services for treatment and final disposal of solid waste.

71. **The prior action will provide a robust tool for supporting the GoC's efforts to achieve the goal set out in the NDP to increase the number of municipalities with adequate final waste disposal options**. The NDP seeks to increase the number of municipalities with adequate final disposal options from the current 79 percent to 83 percent

by 2018. The Government, through Resolution 754 of November 2014, establishes the methodology that municipalities are required to adopt for the formulation, implementation, evaluation, monitoring, control, and update of the PGIRS and determines the responsible entities and the criteria under which the PGIRS must be adopted by the departmental or municipal authorities. Provisions of the resolution - such as (a) the incorporation of the PGIRS in municipal or district development plans; (b) the requirement for articulation of the PGIRS with the provision of public sanitation services and with land use plans (*Planes de Ordenamiento Territorial*, [POTs]); and (c) the requirement that municipalities support coordination among actors involved in activities related to the use of solid waste (for example, service providers, official recyclers, environmental and sanitation authorities, vendors of recyclable materials, and productive and service sectors) - all make for a robust tool supporting the GoC's efforts to reach the goal set out in the NDP.

72. **Indicative Triggers.** As part of this policy reform, the Government is committed to further strengthening solid waste management in the country through additional policy actions. More specifically, by updating Decree 838 of 2005, the Ministry of Housing, Cities and Territories (MVCT) will define the technical guidelines for final disposal activities and regulate standard operation of landfills in the second operation of this program (DPL 2). Under the third operation, MVCT will establish requirements for the use of alternative technologies in sanitary landfills (DPL 3) by updating the technical regulation *(Título F)* of the water and sanitation sector.

73. **Expected Program Results**. The Government's actions supported by the proposed program are essential to continue improving solid waste management and increase the number of municipalities disposing solid waste in sanitary landfills according to the legal framework [Baseline 2015: 874. Target 2018: 916]. Another measurable outcome in this reform is the percentage of municipalities and/or districts adopting PGIRS [Baseline 2015: 0 of municipalities and/or districts. Target 2018: 60 percent].

Solid Waste Recycling

Prior Action 6: The Government established a set of incentives to promote the recycling of solid waste, including an additional fee to be charged per ton of solid waste finally disposed in sanitary landfills, as evidenced by Article 88 of Law No. 1753, dated June 9, 2015, published in the Official Gazette on June 9, 2015.

74. **Efforts to encourage waste minimization, source separation, and recycling have had limited traction in Colombia mainly due to limited understanding and information for assessing the viability of such activities.** A small percentage of all municipalities currently incorporate some form of formal recycling in their solid waste management activities. Efforts to encourage recycling have been driven largely by the public sector - either directly by municipalities or by departmental environmental authorities - and have led to the construction and failure of a number of recycling plants. Some recycling facilities in the country are run by private sector operators but are not necessarily profitable due to the absence of waste separation at source. The *Consejo Nacional de Política Económica y Social* (CONPES) SWM Policy document (3530), however, represents a change in favor of recycling. Furthermore, the NDP 2014-2018 calls for better coordination with municipalities, and for incorporating the private sector and waste pickers in recycling activities. In recent years, the focus has been on municipalities with more than 1 million inhabitants, where the

scale of the business and the likelihood of closer proximity of supply and demand will decrease transportation costs, and thus increase the viability of recycling.

75. **Colombia has made important progress in solid waste disposal but recycling is still very low and most recycling workers face social exclusion**. While 91 percent of municipal solid waste is disposed of in landfills or treatment plants, only 13 percent of total solid waste is recovered and reused. Of the 13 percent, only 7 percent - which is less than 1 percent of the total solid waste generated - is recovered and sold by self-employed recycling workers.[64] There are around 50,000 self-employed recycling workers, and the livelihoods of approximately 300,000 people depend on this informal activity. Self-employed recycling workers are not only poor but excluded. They are affected by uncertainty in accessing recyclables, price variability, police harassment, social discrimination, complex regulations, and lack of transparency in public bidding.[65]

76. **Use of economic incentives and increasing access to landfills and transfer stations will encourage solid waste reuse and alleviate a major constraint affecting self-employed recycling workers**. The GoC has promoted increased reuse of waste through the PGIRSs, which are planning instruments for municipal and regional Governments. However, lack of economic incentives has been a major constraint to increasing recycling. NDP Law 1753 establishes an incentive for the use of solid waste by territorial entities that develop feasible reuse projects in their PGIRSs. The incentive is a surcharge paid in addition to the cost per metric ton disposed. The GoC will regulate this legal norm and apply it gradually. In addition, the GoC will strengthen processes and promote alliances between different public and private actors, including self-employed recycling workers, in order to develop inclusive systems for recycling, production chains, and a monitoring observatory for waste recycling and reuse (*Bases del NDP*).

77. **Indicative Triggers.** The Government is committed to continue policy reforms in the area of recycling, reuse of solid waste, and activities of self-employed recycling workers. For DPL 2, MVCT will establish the operational framework for the reuse of solid waste and the timeline for compliance of waste pickers as formal suppliers in the reuse activity. By means of an administrative action, MVCT will define criteria, requirements, and procedures for reuse of solid waste and the requirement to be met by waste pickers in order to participate in reuse activities under a formal framework.[66] As Trigger for DPL 3, MVCT will issue regulations for the surcharge on the final disposal of non-recyclable solid waste to minimize the amount of solid waste disposed of in sanitary landfills. A decree will be instrumental in determining the resources that under the tariff scheme of the waste collecting system, municipalities will assign following effective PGRIS in order to provide with the necessary infrastructure for reuse of waste.

78. **Expected Program Results.** These policy actions will create an enabling framework for reuse with emphasis on social inclusion of waste pickers. This will be a key aspect of the national solid waste management strategy, which will be critical to increase the percentage of recycled solid waste not disposed in sanitary landfills. [Baseline 2015: 17 percent. Target 2018: 20 percent]. This result, in combination with other actions, will improve the performance of existing sanitary landfills in the long term.

C. Link to CPF, Other Bank Operations, and the WBG Strategy

79. **The proposed DPL series is aligned with the Bank Group Country Partnership Strategy (CPS) 2012–2016 for Colombia (Report 60620-CO) discussed by the Executive Directors on July 21, 2011.** The CPS supports the NDP through a portfolio of financial, knowledge, and convening services. This DPL contributes directly to the pillars in the 2012–2016 CPS; in particular, Pillar 2: Sustainable Growth with Enhanced Climate Change Resilience.

80. **The DPL is directly related to (or complements) a series of Bank policy and investment lending operations in Colombia.** The Bank has been actively assisting the GoC with policy-based reform programs (First, Second, and Third Programmatic Development Policy Loan for Sustainable Development - P081397, P095877, and P101310). These have been accompanied by a program of technical assistance under the Sustainable Development Investment Project (P082520). These activities have helped strengthen air pollution management, addressed key issues on the urban environmental agenda, made the initial key steps toward more effective integrated water resources management, strengthened the air and water quality networks, and improved the mechanisms for inter-sectoral coordination and the coordination between the environmental management institutions at the national and local levels. The solid waste management policy actions to be supported by the proposed DPL program continue a long-standing Bank-GoC dialogue complemented by policy support, technical assistance, and investment lending. On the disaster risk management side, the proposed policy actions capture GoC's progress towards improved risk management, notably through legislation that complements an ambitious reform initiated in 2012 with the support of a Bank-financed CAT DDO (Colombia Disaster Risk Management Cat DDO II - P126583).

D. Consultations, Collaboration with Development Partners

81. **The policy and institutional program supported by the operation has undergone extensive consultations and has benefited from a participatory process associated with the NDP 2014–2018**. In addition, prior actions more specifically were subject to additional consultation following the GoC's criteria and procedures. The preparation process of the NDP provided a strong platform for collaboration and consultation with other donors and relevant stakeholders throughout 2014–15. Technical inputs were provided from renowned experts, Government institutions, and civil society. At least 34 seminars and workshops were carried out to discuss the NDP at the subnational level (*Dialogos Regionales para la Construcción del Plan Nacional de Desarrollo 2014–2018*). The dissemination process related to the NDP has been documented by the DNP on their website.[67] The policy actions included under this operation were drafted and agreed to by several of the DNP's units and resulted from a process of consultation and agreement between different GoC entities involved in the implementation of the policy actions, including MFPC, Ministry of Transport (MT), MADS, MME, Ministry of Health (MSPS), MVCT, and the Ministry of Agriculture and Rural Development.

82. **The KfW Development Bank and the French Agency for Development (AFD) are key development players in Colombia, also supporting the green growth strategy**. The World Bank and KfW have been collaborating closely to discuss and promote development coordination to improve the management of national protected areas and biodiversity. Joint team meetings have been held throughout preparation to ensure that

activities under the DPL program and the sectoral program to be financed by the KfW (€75 million) are complementary. The proposed operation has been designed to complement efforts led by the KfW's policy-based operations on natural resources management. This partnership is important to ensure synergy and coordination between the operations while pursuing alignment and harmonization with the NDP's overarching green growth strategy. In the AFD operation - through the Programmatic Loan on Climate Change under preparation - the policy actions and means of verification are complementary to this proposed DPL. Specifically, under climate adaptation, the AFD operation will improve the characterization, vulnerability assessment, and risk reduction associated with climate change in productive sectors and territories. On climate mitigation, the aim is to reduce greenhouse gas (GHG) emissions by adopting a multisectoral approach with specific actions for the sectors of waste, transport, energy, and agriculture.

83. **Collaboration with the IMF has ensured the DPL's consistency with the IMF's policy advice**. The Bank has collaborated closely with the IMF in the review and assessment of macroeconomic developments. The macroeconomic framework for the operation is fully consistent with the IMF.

5. OTHER DESIGN AND APPRAISAL ISSUES

A. Poverty and Social Impact

84. **To assess the distributional impact of the policy reforms supported by this DPL series on the well-being of the poor and vulnerable, the World Bank carried out a Poverty and Social Impact Analysis (PSIA, Annex 4).** Overall, the specific policy reforms supported by this DPL are expected to have significant and positive poverty alleviation and social development impacts in Colombia. In general, improvements in environmental sustainability are expected to benefit the poor who are most impacted by common environmental problems. Experience from other countries shows that the more costly problems associated with environmental degradation are urban air pollution, inadequate water supply and sanitation, and natural disasters (such as flooding and landslides) - all of which are addressed by this DPL. As a whole, the measures supported by the DPL will enhance the environmental and health conditions that allow for more productive workdays and a better life for the poor.

85. **Minor, regressive effects found by the PSIA related to the application of fixed fees across income groups may be addressed through the introduction of standard compensation mechanisms.** The PSIA provides recommendations to incorporate social and distributional considerations into the proposed DPL that will be considered by the GoC during the implementation of DPL 1. The PSIA will help the GoC to ensure that the policies supported by DPL 2 and DPL 3 will benefit the most vulnerable groups by providing policy advice and suggesting areas of further research for medium-term engagement.

B. Environmental Aspects

86. **As part of the preparation of the DPL, the Bank has conducted a policy Strategic Environmental Analysis (policy SEA).** The analysis acknowledges the Government's efforts and commitments to improved environmental management - evidenced by the 2014–2018 NDP - that includes a strategy for green growth (pillar 1), as well as by the policy actions included under pillar 2. Annex 5 summarizes the policy SEA. The policy SEA considered whether specific country policies supported by the DPL were likely to cause significant effects

on Colombia's environment, forests, and other natural resources. For those policies with likely significant effects, the policy SEA assessed Colombia's systems for reducing such adverse effects and enhancing positive effects. It also assessed if there were significant gaps or shortcomings in these systems.

87. **Based on the policy SEA findings, there are no significant negative effects on the environment, forests, and other natural resources. The overall net effect of the policy actions supported by this DPL is expected to be positive.** Related indicative triggers reinforce this positive effect. The significance of effectively implementing these policy actions would translate into a reduction in the health costs associated with air, water, and soil pollution, as well as with natural disasters - Colombia's environmental priorities. Moreover, the programmatic DPL would play an important role in continuing to help mainstreaming of environmental considerations into key sectors such as water, transport, energy, and disaster risk management in Colombia and in the country's overall approach to sustainable development. Although a few potential negative environmental effects associated with some of the policy actions were found, none of these are significant. The GoC is aware of the results and recommendations of the assessment The PSEA provides recommendations to incorporate environmental considerations into the proposed DPL that will be considered by the Government of Colombia during the implementation of this DPL. These recommendations aim at strengthening the systems and policies in place to deal with such effects if they materialize.[68]

C. PFM, Disbursement, and Auditing Aspects

88. **The national-level Public Financial Management (PFM) systems show advanced levels of performance that are moving toward good international practices, according to the most recent reports from the IMF and World Bank.** There remain some areas for further strengthening of public financial management systems, such as budget management and the integration with administrative management systems. In 2012, a new financial and administration system (*Sistema Integrado de Información Financiera* [SIIF II]) was put into operation, and an effort is under way to adopt a Unified System of Investment and Public Finance. The Government has increased the coverage of SIIF II, and is working in its integration with the different PFM tools. Colombia has an effective track record of implementing PFM reforms, which the Bank has supported. Salient features of the PFM systems are summarized below:

89. **The budget is comprehensive, well documented, and implemented as planned, with actual expenditures deviating only slightly from planned levels.** Budget planning is based on a multiyear perspective, and annual formulation reflects a mostly well-functioning policy-based system. Execution of budgeted expenditures suggests a largely credible budget. The Government has published its annual budget in a timely fashion.

90. **Revenue and expenditure controls are comprehensive, and there is a continuous effort to improve them.** Of significant relevance are strong measures to safeguard the overall integrity and accuracy of revenue data by integrating or reconciling the different accounting systems used by the tax administrator, ensuring consistency between the information from accounting and statistical records, and guaranteeing timely recording of transactions. Records and controls on cash flows, balances, and public debt support sound fiscal management and provide public institutions with the tools for predicting funding to execute their budgets in an orderly manner.

91. **The consolidated public accounts are prepared within six months after the end of the fiscal year.** They include full information on revenues, expenditures, and financial assets and liabilities. Year-end accrual-based financial statements are issued by the Accountant General and presented by May 15 of the following year to the Controller General for audit purposes. The Controller General's auditing policies and procedures provide for the application of financial, compliance, and performance procedures consistent with the national Government's auditing standards. Audit reports are submitted before July 1 of the following fiscal year to the Congress and the President.

92. **The GoC is implementing an accounting and auditing reform agenda to adopt and implement International Financial Reporting Standards (IFRS) and International Standards of Auditing (ISA).** In the last three years, there have been significant developments toward implementing this reform, including new legislation, and an inter-institutional commission involving key Government authorities to implement transitional arrangements toward completing implementation. A few challenges remain for the GoC to overcome in the reform process.

93. **Disbursement arrangements.** Once the DPL becomes effective and the Borrower complies with any withdrawal tranche release conditions, and following the Borrower's request, the Bank would deposit the funds into an account denominated in US dollars of the Central Bank *(Banco de la República*) for subsequent credit into the Treasury Single Account of the MFPC, thus becoming available to finance budgeted expenditures. The MFPC will provide the Bank with a written confirmation of the transaction within 30 days after the funds are disbursed by the Bank. If the Bank determines at any time that an amount of the loan was used to make a payment for an excluded expenditure, the Borrower shall promptly, upon notice from the Bank, refund an amount equal to the amount of such payment to the Bank; and amounts refunded to the Bank upon such notice shall be canceled from the loan.

94. **There is no evidence that the banking control environment into which the DPL proceeds would flow is other than adequate.** This assessment is based on a review of the 2014 and 2013 external audit report of the *Banco de la República*, the latest IMF Central Bank safeguards assessment (2012), and the 2015 IMF Article IV Consultation. Because the Borrower's PFM systems and the fiduciary arrangements for this financing are assessed as strong, and fiduciary risk is low, the Bank will not require an audit of the designated account, and no additional fiduciary arrangements are considered necessary at this time.

95. **In the area of public procurement, Colombia has made significant progress over the past six years in strengthening the performance of its procurement systems**. Procurement is based on the legal framework - Law 1150/2007 - and ruling decrees, the most recent 1510/2013. One of the most relevant steps forward is the creation (November 2011) of a Procurement Directorate (*Agencia Nacional de Contratación Pública, Colombia Compra Eficiente (CCE*)) to oversee and lead the procurement reforms. The agency has undertaken important steps to further improve the system, consolidate gains, and ensure sustainability. To this end, the newly created agency is working to implement an ambitious program, including (a) adopting a more strategic approach to procurement as an essential component of public sector expenditure management; (b) establishing a transactional electronic procurement system, expected to become operational in 2015; and (c) professionalizing the procurement staff, while providing increased exposure to new, more efficient ways of doing business in Colombia and around the world. The Bank has been

cooperating through direct dialogue with CCE and through a RAS in some of the initiatives to achieve these objectives.[69]

D. Monitoring, Evaluation, and Accountability

96. **MFPC will be the main coordinating agency. The DNP will be responsible for coordinating actions among the concerned agencies (MADS, MT, MVCT, UNGRD, MME and Ministry of Health and Social Protection [MSPS]).** Article 145 of Law 1753 (2014-2018 NDP) establishes that DNP will be the technical coordinator of budget support loans in Colombia. DNP will collect and report to the Bank the information related to the implementation progress of the program.

97. **The program outcomes will be monitored through the results indicators included in the policy and results matrix (Annex 1)**. This monitoring seeks to assess progress toward the implementation of the policy and institutional measures supported by the proposed DPL series and will be evaluated following the disbursement of the loan. The timing of the disbursement of DPL 2 and DPL 3 will depend on the Government's ability to provide the Bank with satisfactory evidence that the prior actions have been met. The DNP will have the responsibility of presenting the information related to the implementation of the policy actions in a timely manner and in a format satisfactory to the Bank.[70]

98. **Grievance redress**. Communities and individuals who believe they are adversely affected by specific country policies supported as prior actions or tranche release conditions under a Bank supported DPL may submit complaints to the responsible country authorities, appropriate local/national grievance redress mechanisms, or to the Bank's Grievance Redress Service (GRS). Complaints to GRS are promptly reviewed.

99. **Affected communities and individuals may submit their complaint to the Bank's independent Inspection Panel, which determines whether harm occurred or could occur as a result of Bank noncompliance with its policies and procedures**. Complaints may be submitted at any time after concerns have been brought directly to the Bank's attention and the Bank management has been given an opportunity to respond. Information on how to submit complaints to the Bank's corporate GRS is available at http://www.worldbank.org/GRS. Information on how to submit complaints to the Bank's Inspection Panel is available at www.inspectionpanel.org.

6. SUMMARY OF RISKS

100. **The overall risk of the operation is assessed as *Moderate*. The main risks are related to the political and governance situation and institutional capacity for implementation. The macroeconomic risks are moderate but they will be closely followed up during the implementation of the DPL given the current situation in the commodities market**:

- **Political and governance**. The transition process to a new administration, expected to take place in 2018, could pose political risks to the continuity of the policy and institutional measures supported by this DPL series, as the champions of these reforms are likely to change. Mitigating these risks would require a comprehensive dialogue on environmental issues with various stakeholders and the new administration as soon as they are in place. In addition, decentralization in Colombia includes evolving power relationships between the different levels of Government and their stakeholders, and urban authorities may be hesitant to implement national policies. This DPL will promote

policy dialogue and coordination between DNP sector ministries and regional and local governments to develop the relevant regulations.

- **Institutional capacity for implementation and sustainability**. Given the multi-sectoral nature of the program's reforms, effective coordination among the several ministries and other entities is a potential risk for this DPL. The Government, through DNP, is committed to ensure broad discussions of the issues among the national ministries, subnational entities, and the stakeholders, enhancing the credibility and effectiveness of policy actions, which will help to mitigate this risk. In addition, and as part of the NDP 2014-2018 implementation, the technical assistance and investment gaps that need to be addressed in order to ensure a successful implementation of the program of reforms will be identified.
- **Macroeconomic**. The adverse external environment poses risks of a larger than expected deceleration in growth and adds fiscal pressures. The oil and mining sectors, which remain susceptible to external shocks, represent an important part of Government revenues. At the same time, Colombia development goal requires sustaining or even stepping up expenditures on areas such as security, infrastructure, and agriculture. These risks are mitigated by Colombia solid initial macroeconomic conditions, sound policy management, and comfortable buffers.

Table 2: Risk Categories

Risk Categories	Rating (H, S, M, or L)
Political and governance	S
Macroeconomic	M
Sector strategies and policies	M
Technical design of project or program	M
Institutional capacity for implementation and sustainability	S
Fiduciary	L
Environment and social	L
Stakeholders	M
Other	–
Overall	M

ANNEX 1: POLICY AND RESULTS MATRIX

Prior Action- DPL 1	(Indicative) Triggers – DPL 2	(Indicative) Triggers – DPL 3	Result Indicators[1]
Pillar 1 – Establish a set of policy and institutional measures for green growth in transport, energy, environmental health and disaster risk management			
		Indicative Trigger 1: The Government has established a regulatory framework to increase and regulate the use of non-motorized and clean energy transport Responsible Agency: MT	Percentage of passenger journeys done in public and non- motorized transport in 8 cities" (*Barranquilla, Bucaramanga, Medellín, Bogotá-Soacha, Cali, Cartagena, Pasto, and Montería*). *[Baseline 2015: 27 percent. Target 2018: 33 percent]*
Prior Action 1: As a part of the National Development Plan, the Government set forth a green growth strategy which, inter alia: (a) defines guidelines for developing and improving public transportation systems; (b) entitles territorial entities (including districts and municipalities) to establish new funding resources for public transportation systems and infrastructure for non-motorized transportation; and (c) provides financial resources to the FENOGE, as evidenced, respectively, by articles 32, 33, 34 and 190 of Law No. 1753, dated June 9, 2015, published in the Official Gazette on June 9, 2015. Responsible Agency: DNP	**Indicative Trigger 1:** The Government has established the institutional structure of the FENOGE on governance, fundraising, and eligibility criteria to allocate public funds in investment projects on alternative energy and energy efficiency. Responsible Agency: MME	**Indicative Trigger 2:** The Government has established the policy and operational framework for the implementation of the FENOGE. Responsible Agency: MME	(a) FENOGE provisioned with a minimum funding of 20 bn pesos. *[Baseline 2015: 0. Target 2018: COP 20 billion]*
	Indicative Trigger 2: The Government has established a national inter-sectoral framework for environmental health on (a) knowledge management, (b) governance, and (c) management of social determinants influencing environmental health. Responsible Agencies: MSPS, DNP, MADS	**Indicative Trigger 3**: Subnational inter-sectoral coordination mechanisms for improving environmental health have been established in the framework of the *Consejos Territoriales de la Salud Ambiental* (COTSAs). Responsible Agencies: MSPS, DNP and MADS	COTSAs adopted environmental health action plans validated by CONASA. *[Baseline 2015: 0. Target 2018: 32]*
	Indicative Trigger 3: The Government has established a framework with priorities, responsibilities, and action plan for the knowledge, reduction, and management of disaster risk. Responsible Agency: UNGRD	**Indicative Trigger 4:** The Government has established the regulatory and operational framework for the Disaster Risk Management National Fund (FNGRD) to support project implementation by national and regional entities. Responsible Agency: UNGRD	DRM measures mainstreamed in agriculture, housing, and transport programs and under implementation. *[Baseline 2015: 0. Target 2018: 3 Strategic Sectoral Agendas]*[2]

[1] Results indicators for Pillar 1 has been proposed by the GoC based on the DNP 2014-2018 targets.

[2] Wording of this target is in accordance with the NDP 2014-2018. Strategic Sectoral Agendas are defined in the NDP as the official instruments for ensuring follow-up and consensus building between relevant sectors to define key actions and achieve structural changes (e.g. technical, investment and others, as appropriate) in disaster risk management at a national level.

Prior Action- DPL 1	(Indicative) Triggers – DPL 2	(Indicative) Triggers – DPL 3	Result Indicators[1]
			At least 3 FNGRD accounts operationalized according to Art.51, Law 1523 of 2012 *[Baseline 2015: 0. Target 2018: 3]*
Pillar 2 - Improvement of environmental quality by reducing $PM_{2.5}$ in air; strengthening regulatory and economic instruments for reducing water pollution; and increasing capacity for solid waste disposal and enhancing waste recycling.			
Prior Action 2: The Government adopted a regulation to update the quality parameters for diesel fuel at the national level, with the objective of reducing toxic emissions in air contamination, as evidenced by Resolution No. 90963, dated September 10, 2014, issued jointly by the Government's Ministry of Mines and Energy and the Ministry of Environment and Sustainable Development, published in the Official Gazette on September 11, 2014. Responsible Agency: MADS	**Indicative Trigger 6:** The Government has updated and consolidated the norms associated with pollutant emissions to allow the renewal of the car fleet and to strengthen follow-up and control mechanisms. Responsible Agency: MADS **Indicative Trigger 7:** The Government has updated the outdoor air quality norms to set new progressive maximum permissible limits for "criteria pollutants" (including $PM_{2.5}$) to strengthen air quality management. Responsible Agency: MADS	**Indicative Trigger 5:** The Government has strengthened the regulation on monitoring and control of pollutant emissions from stationary sources. Responsible Agency: MADS	*Percentage reduction in the mean annual concentration of $PM_{2.5}$ in at least 7 prioritized monitoring stations in the cities of Medellín, Itagui, and Bogotá.* *[Baseline 2014: See footnote for details[3].* *Target 2018: 5 percent reduction at each station]*
Prior Action 3: The Government established parameters, limits, and procedures for the discharge of treated wastewater originating from selected agricultural, industrial, commercial, and service activities, with the objective of reducing the overall pollution of water bodies, as evidenced by Resolution No. 631, dated March 17, 2015, issued by the Government's Ministry of Environment and Sustainable Development, published in the Official Gazette on April 18, 2015.	**Indicative Trigger 8:** The Government has defined quality parameters and limits (including for pathogens and toxics) for the discharge of treated wastewater in the marine environment to protect water quality. Responsible Agency: MADS	**Indicative Trigger 6:** The Government has established pollution charges (*Tasas Retributivas)* for pathogenic and toxic substances in domestic and industrial waste waters. Responsible Agency: MADS **Indicative Trigger 7:** The Government has defined quality parameters and limits (including for pathogens and toxics) for the discharge of	Characterization, reporting, and disclosure of quality and quantity of physical/chemical and microbiological parameters in the main water bodies of priority basins (*Bogotá, Cali and Medellín*) to allow future quality monitoring. *[Baseline 2015: National Report of Water 2010 and Technical Minutes of Resolution 0631 of 2015. Target 2018: Report on Water Quality: Discharges and Receiving Systems]*

[3] 2014 Baseline values are: Medellin – 29.9µg/m^3 (UNNV), 37.9µg/m^3 (MANT), 28.6µg/m^3 (UNFM); Bogota – 35.1µg/m^3 (Carvajal), 31.5µg/m^3 (Kennedy); Itagui – 32.0µg/m^3 (CJUS), 25.1µg/m^3 (CONC). Additional information is provided in Annex 7.

Prior Action- DPL 1	(Indicative) Triggers – DPL 2	(Indicative) Triggers – DPL 3	Result Indicators[1]
Responsible Agency: MADS		treated wastewater in soils to protect water quality of aquifers. Responsible Agency: MADS	
Prior Action 4: The Government established a set of rules, including quality parameters, regulating the reuse of treated wastewater for selected industrial and agricultural activities, as evidenced by Resolution No. 1207, dated July 25, 2014, issued by the Government's Ministry of Environment and Sustainable Development, published in the Official Gazette on August 13, 2014 . Responsible Agency: MADS		**Indicative Trigger 8:** The Government has established complementary rules for reuse of treated wastewater in the service sector, trade and manufacturing to reduce pollution of water bodies. Responsible Agency: MADS.	-Increase to 20 percent the reuse of treated wastewater from the hydrocarbon sector in agricultural activities. *[Baseline 2014[4], Target 2018: 20 percent or 118.56 million m3/yr)]*
Prior Action 5: The Government established a methodology for the formulation, implementation, evaluation, management, control, and update of Solid Waste Integrated Management Plans (PGIRS) by municipalities, districts, and other selected local entities within its territory, as evidenced by Resolution No. 754, dated November 25, 2014, issued jointly by the Government's Ministry of Housing, City and Territory and the Ministry of Environment and Sustainable Development, published in the Official Gazette on December 1, 2014.	**Indicative Trigger 9:** The Government has defined technical guidelines for final disposal activities and has regulated standard operation of landfills. Responsible Agency: MVCT	**Indicative Trigger 9:** The Government has established requirements for the use of alternative technologies in sanitary landfills. Responsible Agency: MVCT	-Share of municipalities and/or districts adopting PGIRS. *[Baseline 2015: 0 percent of municipalities and-or districts. Target 2018: 60 percent]*. -Number of municipalities disposing solid waste in sanitary landfills according to the legal framework. *[Baseline 2015: 874. Target 2018: 916]*

[4] GoC will establish a baseline for this indicator, which will be delivered to the Bank prior to the preparation of DPL2. The Bank will revise the 2018 target if need be when the baseline is established.

Prior Action- DPL 1	(Indicative) Triggers – DPL 2	(Indicative) Triggers – DPL 3	Result Indicators[1]
Responsible Agency: MVCT and MADS			
Prior Action 6: The Government established a set of incentives to promote the recycling of solid waste, including an additional fee to be charged per ton of solid waste finally disposed in sanitary landfills, as evidenced by Article 88 of Law No. 1753, dated June 9, 2015, published in the Official Gazette on June 9, 2015. Responsible Agencies: DNP, MVCT and MADS.	**Indicative Trigger 10**: The Government has established the operational framework for the reuse of solid waste and the timeline for the compliance of waste pickers as formal suppliers in the reuse activity. Responsible Agency: MVCT and MADS	**Indicative Trigger 10:** The Government has issued regulations for the extra charge of the final disposal of non-recyclable solid waste to minimize the amount of solid waste disposed in sanitary landfills. Responsible Agencies: MVCT y MADS	- Share of recyclable solid waste not disposed in sanitary landfills. *[Baseline 2015: 17 percent. Target 2018: 20 percent]*

ANNEX 2: LETTER OF DEVELOPMENT POLICY

DNP Departamento Nacional de Planeación | MINHACIENDA | TODOS POR UN NUEVO PAÍS PAZ EQUIDAD EDUCACIÓN

Bogotá D.C., 20 de agosto de 2015

Señor
JIM YONG KIM
Presidente
Grupo Banco Mundial
Washington, D.C.

Asunto: Carta de Política, DPO Desarrollo Sostenible y Crecimiento Verde

Apreciado Sr Yong

El Gobierno de Colombia está comprometido con el propósito de alcanzar un mayor desarrollo preservando la estabilidad macroeconómica y fortaleciendo la inserción del país en la economía mundial, lo cual ha implicado entre otras, adoptar una serie de reformas que permitan mantener niveles contralables de inflación, el cumplimiento de la regla fiscal, tipos de cambio flexibles y mecanismos para una efectiva supervisión y regulación financiera.

La economía colombiana cuenta con una estabilidad macroeconómica y fiscal reconocida a nivel mundial. Mantuvo un crecimiento económico de 4,3% anual entre 2000 y 2014, y registró en 2014 (4,6%), el crecimiento más alto de la región y el séptimo más alto a nivel global dentro del conjunto de países monitoreados por The Economist. Para el primer trimestre de 2015, el crecimiento anual fue de 2,8%, el mayor entre los países que conforman el grupo LAC6. Gracias a la tendencia del crecimiento económico, el ingreso promedio de los colombianos ha aumentado significativamente desde el año 2000; hoy, según el Fondo Monetario Internacional, este ingreso se ubica en US$8,394 dentro del rango de los países considerados de ingreso medio.

La estabilidad macroeconómica y las políticas contracíclicas implementadas le han permitido a la economía colombiana financiar tasas de inversión históricamente altas. En 2014, la inversión como porcentaje del PIB alcanzó el 29,5%, casi 2 p.p. por encima del valor observado en 2013 (27,6%), y para el primer trimestre de 2015 se observó nuevamente un máximo histórico de 30,7%, 1,2 pp más que el registro del primer trimestre de 2014.

Sin embargo, el Gobierno Nacional es consciente de que aún persisten importantes retos en materia de política pública que debe asumir con el fin de que el país logre consolidar una senda de crecimiento y desarrollo económico sostenido en el largo plazo. Es por esto que, específicamente en materia de desarrollo ambiental sostenible, el Plan Nacional de Desarrollo 2014-2018: "Todos por un

nuevo país", incorpora la estrategia envolvente de 'Crecimiento Verde' a través de la cual se promueve un modelo de desarrollo que busca el bienestar económico y social de las generaciones actuales y futuras, asegurando la provisión de los bienes y servicios ambientales en el largo plazo. Este modelo de desarrollo está orientado a la protección y recuperación de la biodiversidad y sus servicios ecosistémicos, el aumento de la competitividad y la eficiencia de los procesos productivos y la adaptación y mitigación al cambio climático, generando menores impactos sobre el ambiente y mayor resiliencia ante eventos naturales adversos.

Para asegurar un desarrollo que cumpla con parámetros de sostenibilidad, minimice los impactos generados por el cambio climático y modifique la tendencia del deterioro ambiental, se han planteado los siguientes objetivos: (i) avanzar hacia un crecimiento sostenible y bajo en carbono; (ii) proteger y asegurar el uso sostenible del capital natural y mejorar la calidad y la gobernanza ambiental; y (iii) lograr un crecimiento resiliente y reducir la vulnerabilidad frente a los riesgos de desastres y al cambio climático.

Con el fin de seguir avanzando en la implementación de esta estrategia, el Gobierno de Colombia solicitó al Banco Mundial un préstamo de política, bajo la modalidad Development Policy Operation (DPO), en virtud del cual busca lograr apoyo y acompañamiento técnico para: (i) establecer un conjunto de medidas políticas e institucionales para el crecimiento verde en transporte, energía, salud ambiental y manejo de riesgo y desastres, y (ii) mejorar la calidad ambiental a través de la reducción de material particulado (PM 2.5) en el aire, fortalecer los instrumentos de tipo regulatorio y económico para la reducción de la contaminación del agua, e incrementar la capacidad para la disposición de residuos sólidos y el mejoramiento del reciclado de residuos. Los pilares y acciones de política asociadas a esta operación reflejan estos propósitos.

En lo que concierne al primer pilar, relacionado con la definición de un conjunto de medidas políticas e institucionales para el crecimiento verde en transporte, energía, salud ambiental y manejo de riesgo y desastres, la acción de política consistió, como se mencionó anteriormente, en la inclusión de la estrategia transversal y envolvente de 'Crecimiento Verde' en el décimo capítulo del Plan Nacional de Desarrollo 2014-2018, aprobado mediante la Ley 1753 del 9 de junio de 2015. Con lo anterior se legitimó la prioridad del Gobierno Nacional de alcanzar un crecimiento económico sostenible ambiental y socialmente, resaltando la importancia del trabajo intersectorial como elemento fundamental para incidir en la transformación de las tendencias de crecimiento que se traduzcan en mejor competitividad de la economía. El país es consciente del reto que enfrenta en el mediano y largo plazo para fortalecer su institucionalidad en esta materia.

Con respecto al segundo pilar, enfocado mejorar la calidad ambiental a través de la reducción de material particulado (PM 2.5) en el aire, el fortalecimiento de instrumentos de tipo regulatorio y económico para la reducción de la contaminación del agua, el incremento de la capacidad para la disposición de residuos sólidos, y el mejoramiento del reciclado de residuos, el programa reconoce las siguientes cinco acciones de política que ha emprendido Colombia, específicamente en materia ambiental:

1) *Se regularon los parámetros de calidad del combustible diesel con el objetivo de mejorar la calidad del aire.* La resolución 90963 de 2014 modificó los criterios de calidad de los biocombustibles para su uso en motores diesel como componente de la mezcla con este combustible de origen fósil en procesos de combustión. De esta manera, se busca alinear los estándares del país con aquellos internacionales en materia de disminución de los efectos de la contaminación del aire.

2) *Se establecieron parámetros de calidad y límites máximos permisibles para la descarga de aguas residuales tratadas a cuerpos de aguas superficiales y sistemas de alcantarillado.* Se expidió la resolución 631 de 2015, a partir de la cual se resalta no solo la regulación discriminada por el tipo de vertimientos, sino por el sector que la genera, con miras a tener un impacto preciso en la reducción de la contaminación del agua. Adicionalmente, establece estrategias puntuales para controlar la contaminación al mar y el fortalecimiento de la tasa retributiva, todos con el propósito de fortalecer la reglamentación ambiental vigente.

3) *Se fortaleció la regulación para los los sectores que generan las aguas residuales.* Se expidió la resolución No. 1207 de 2014 que busca fomentar el uso eficiente del agua –y reuso- con miras a la conservación del recurso hídrico, y establece a su vez las disposiciones relacionadas con el uso del agua residual tratada para riego y algunos usos industriales.

4) *Se precisó el establecimiento de una metodología que permite formular, implementar, evaluar, gestionar, controlar y actualizar los Planes Integrales de Residuos Sólidos Urbanos por parte de las municipalidades y los distritos.* Lo anterior se logró a partir de la resolución 754 de 2014, la cual explica detalladamente el marco conceptual para desarrollar los mencionados Planes, y solicita a los municipios y distritos el diligente ejercicio de los mismos.

5) *Se definió y determinó un pago adicional al costo de disposición final por tonelada de residuos no aprovechables.* Lo anterior fue incluido en artículo 88 del Plan Nacional de Desarrollo 2014-2018, lo que le permitirá al país avanzar en la minimización de la cantidad de residuos dispuestos en rellenos sanitarios.

Finalmente, consideramos relevante destacar como la estrategia de 'Crecimiento Verde' también busca reducir los costos asociados a la contaminación ambiental a través de procesos productivos que sean más eficientes y el fortalecimiento de la regulación y el control ambiental. El cumplimiento de este segundo pilar nos permitirá incidir de forma precisa y detallada en toda la cadena de valor asociada a la generación y control de contaminantes ambientales.

En conclusión, los pilares de política bajo los cuales se estructuró la operación de crédito buscan promover el desarrollo social, económico y ambiental de nuestro país, considerados como los

componentes centrales del Plan Nacional de Desarrollo 2014-2018, para así dar cumplimiento a los objetivos del Gobierno nacional para alcanzar la paz y la equidad.

Agradeciendo su atención, reciba un cordial saludo.

Mauricio Cárdenas Santa María
Ministro
Ministerio de Hacienda y Crédito Público

Simón Gaviria Muñoz
Director General
Departamento Nacional de Planeación

Revisó: Lina Mondragón – Subdirectora de Financiamiento con Organismos Multilaterales y Gobiernos, MHCP
Alexandra González – Subdirectora de Crédito, DNP

Bogota, D.C. 20 August 2015

Dr. **JIM YONG KIM**
President
The World Bank Group
Washington, D.C.

Subject: Letter of Development Policy – Sustainable Development and Green Growth DPL

Dear Dr. Kim,

The Government of Colombia is cognizant of its ongoing commitment to achieve higher levels of development while preserving macroeconomic stability and ensuring that the country remains integrated into the global economy. This entails the continued implementation of a series of institutional reforms focused on curbing inflation and the fiscal deficit, maintaining a flexible exchange rate, and ensuring effective financial supervision and regulation.

The macroeconomic and fiscal stability of the Colombian economy has been globally recognized. Between 2000 and 2014, the country's economic growth rate stood at 4.3 percent annually, and in 2014, its 4.6 percent growth rate was the highest in the region and, among the group of countries monitored by The Economist, the seventh highest globally. In the first quarter of 2015, annual growth stood at 2.8 percent, the highest among the LAC-6 countries. Owing to stable economic growth, the average income of Colombians has increased significantly since 2000. At present, according to the International Monetary Fund, this income stands at US$8,394 in current terms, a figure that now places Colombia in the middle-income country category.

Macroeconomic stability and countercyclical polices have made it possible for the Colombian economy to finance the highest investment rates in its recent history. In 2014, investment as a percentage of GDP climbed to 29.5 percent, almost two percentage points above the 2013 rate (27.6 percent) and, in the first quarter of 2015, this rate again soared to a historic high of 30.7 percent, 1.2 percentage points above the rate recorded in the first quarter of 2014.

The Government is, however, aware of the significant public policy challenges that remain and which it must tackle in order to ensure that the country manages to maintain its strong growth performance and sustained economic development over the long term. Consequently, the 2014-2018 National Development Plan, "All for a New Country," includes the overarching green growth strategy, which is being used to promote a development model that strives for the economic and social well-being of current and future generations by ensuring the provision of environmental goods and services over the long term. This development model is oriented toward the protection and restoration of

biodiversity and its ecosystem services, heightened competition and the efficiency of productive processes, and climate change adaptation and mitigation, thus reducing the environmental footprint and boosting resilience to adverse natural events.

To ensure a development approach that is consistent with sustainability parameters, minimizes the effects of climate change, and curbs the trend toward environmental degradation, the following objectives have been identified: (i) making progress toward sustainable, low-carbon growth; (ii) protecting and ensuring the sustainable use of natural capital and improving environmental quality and governance; and (iii) achieving resilient growth and reducing vulnerability to disaster and climate change risks.

In order to forge ahead with the implementation of this strategy, the Colombian Government requested a Programmatic Development Policy loan from the World Bank, with the aim of establishing technical assistance and monitoring, to (i) establish a set of policy and institutional measures for green growth in transport, energy, environmental health and disaster risk management; and (ii) improve environmental quality by reducing PM 2.5 in air; strengthen regulatory and economic instruments for reducing water pollution; and increase capacity for solid waste disposal and enhancing waste recycling. The pillars and policy actions associated with this operation reflect these objectives.

With respect to the first pillar, which is associated with the establishment of a set of policy and institutional actions for green growth in transport, energy, environmental health and disaster risk management, the policy action entailed, as mentioned earlier, the establishment of the overarching green growth strategy in Chapter 10 of the 2014-2018 National Development Plan, which was approved by means of Law 1753 of June 9, 2015. The foregoing affirms the Government's priority of achieving environmentally and socially sustainable economic growth and underscores the importance of inter-sectoral work as a key element in influencing change in economic growth trends, with the aim of carrying out actions that boost competitiveness in the economy. In this regard, the country is cognizant of the medium- and long-term challenges to strengthen its institutional capacity.

With regard to the second pillar—aiming to improve environmental quality by reducing PM 2.5 in air, strengthening regulatory and economic instruments for reducing water pollution, and increasing capacity for solid waste disposal and enhancing waste recycling—the program recognizes the following five policy actions adopted by Colombia, specifically related to the environment:

1) Regulation of the quality parameters for diesel fuel, with the objective of improving air quality. The resolution No. 90963, of 2014, amends the quality criteria related to biofuel, which is used in engines and is mixed with fossil fuels in combustion processes. The aim is to create international standards, one of the priorities of which is to reduce the effects of air pollution.

2) Establishment of parameters, limits, and procedures for the discharge of treated wastewater to surface water bodies and sewage systems. Resolution No. 631, of 2015, emphasizes not only differing regulations in this area depending on the type of discharge but also the sector of origin, with a view to achieving a specific impact on the reduction of water pollution. In the same regard, specific triggers have been established to control marine pollution and to increase pollution charges (*tasa retributiva*), all with the aim of regulating the current environmental legal framework.

3) Strengthened regulation for the sectors that generate wastewater. Resolution 1207 of 2014 was issued for the purpose of promoting efficient water use, and reuse, in order to conserve

water resources. It sets forth provisions related to the use of treated wastewater for irrigation and selected industrial uses.

4) Establishment of a methodology for the formulation, implementation, evaluation, monitoring, control, and updating of the urban Integrated Solid Waste Plans (*Planes Integrales de Residuos Sólidos*) by municipalities and districts, implemented through Resolution 754 of 2014, which explains in detail the conceptual framework for the development of the plans and calls on municipalities and districts to diligently carry out these plans.

5) Establishment of a payment of an extra charge for final disposal, per ton, of non-recyclable waste. This measure was included in Article 88 of the 2014-2018 National Development Plan, thus paving the way for progress in minimizing the amount of solid waste in sanitary landfills.

Finally, it is important to highlight that the Green Growth Strategy also seeks to reduce the costs associated with environmental pollution through more efficient productive processes and to strengthen environmental regulation and control. The achievement of the second pillar will seek, in a precise and detailed manner, to influence the entire value chain associated with the generation and control of environmental pollutants.

In conclusion, the policy pillars seek to promote social, economic, and environmental development, considered to be the key components of the green growth strategy, thus making a significant contribution to achievement of the strategies set forth in the 2014-2018 National Development Plan and the objectives of the Colombian Government to achieve peace and equity.

We thank you for your attention to this matter.

Sincerely,

Mauricio Cárdenas Santamaría
Minister
Ministry of Finance and Public Credit

Simón Gaviria Muñoz
Director General
National Planning Department

ANNEX 3: FUND RELATIONS ANNEX

IMF Executive Board Concludes 2015 Article IV Consultation with Colombia
Press Release No. 15/236
May 29, 2015
On May 18, 2015, the Executive Board of the International Monetary Fund (IMF) concluded the Article IV consultation with Colombia[5]

Colombia has enjoyed strong growth over the past several years, among the highest in Latin America. Credible fiscal and inflation targeting frameworks have supported sound macroeconomic policy management, which underpinned robust economic performance during the last decade. Social indicators have improved steadily over this period. Public debt remained low, Colombia's foreign exchange reserve position strengthened, and the Flexible Credit Line arrangement provided a buffer against elevated external tail risks. The authorities continued to improve the fiscal policy framework and strengthen the social safety net.

Real GDP grew by 4.6 percent in 2014. Unemployment declined to an average of about 9 percent during the year. In the second half of 2014, global oil prices fell sharply by about 40 percent and the peso depreciated, especially in the fourth quarter. As inflation began rising to the mid-point of the target band, and given the slightly positive output gap, the central bank raised the policy rate by 125 basis points to 4.5 percent between May and August. The central Government fiscal balance remained broadly unchanged from 2013, meeting the structural balance target, although the headline fiscal deficit increased slightly. The consolidated public sector deficit rose to 1.6 percent of GDP, pushing public debt to about 39 percent of GDP.

The current account deficit widened to 5.2 percent in 2014, but capital inflows were buoyant. Strong inflows of foreign direct investment and portfolio flows more than offset the current account deficit, and gross international reserves rose to 47 billion at year end. This level appears adequate for precautionary purposes but may be insufficient for tail risks. The current account deficit is projected to widen in 2015 due to the oil price decline, but would gradually narrow over the medium term with the slight recovery in oil prices and growth in Colombia's trading partners, especially the U.S. Moreover, the sharp peso depreciation should help contain imports and spur non-traditional exports.

The banking system and corporate sector have remained in good financial health. Financial soundness indicators have been strong and financial system exposure to the oil sector is very low. Growth in credit to the private sector was buoyant, at 14.7 percent in 2014 (nominal year-over-year) and house price growth has slowed. Corporate profitability was strong, and liquidity remained adequate. Corporate and household debt has increased in 2014, but remains modest by international standards and leverage is within historical norms.

[5] Under Article IV of the IMF's Articles of Agreement, the IMF holds bilateral discussions with members, usually every year. A staff team visits the country, collects economic and financial information, and discusses with officials the country's economic developments and policies. On return to headquarters, the staff prepares a report, which forms the basis for discussion by the Executive Board.

Growth is expected to slow to 3.4 percent in 2015 given a subdued outlook for investment, especially oil-related, and private consumption. Inflation rose to 4.6 percent in March, due to a weather-related agricultural output supply shock and some pass-through from exchange rate depreciation, but is expected to diminish to 3.6 percent year-over-year by end-December with inflation expectations remaining anchored within the target band of 2−4 percent. In response to lower corporate profits and a partial postponement of dividends from the state oil company, the central Government announced an expenditure reduction of 0.7 percent of GDP in 2015, which will also act as a drag on growth. However, the impact of oil shock on the budget and economic growth will be mitigated by the sharp depreciation of the peso (20 percent vis-à-vis the U.S. dollar since mid-2014), and the operation of the fiscal rule, which allows a smoother adjustment to the permanent decline in wealth.

Growth is expected to gradually rise toward its potential (around 4.25 percent) over the medium term, supported by the Government's Public-Private Partnership-based infrastructure program and a gradual recovery in oil prices and external demand. However, risks threaten on the downside, including higher interest rates and financial volatility, a protracted period of slower growth in advanced and emerging economies, economic or political stress in neighboring countries, and a delayed implementation of the infrastructure program.

Executive Board Assessment [6]

Executive Directors welcomed Colombia's continued robust economic performance and financial stability, underpinned by prudent management and strong policy frameworks including a fiscal rule, an inflation targeting regime, and a flexible exchange rate. Substantial progress has also been made in reducing unemployment and poverty in recent years. Directors noted, however, that Colombia is facing headwinds from the sharp fall in the price of oil, a key export. Given elevated external risks, Directors stressed the need for stepped-up efforts to further enhance the resilience of the economy. They supported an eventual exit from the Flexible Credit Line arrangement with the Fund once external risks have receded.

Directors commended the authorities for their commitment to the structural fiscal rule. They highlighted the importance of mobilizing non-oil revenues to meet the authorities' medium term fiscal targets while protecting social and infrastructure spending. This requires a comprehensive tax reform, with the objectives of simplifying the tax structure, increasing progressivity, broadening the tax base, and improving tax administration. Directors looked forward to the recommendations of the recently established expert commission on these matters.

Directors supported the broadly neutral stance of monetary policy, but encouraged the authorities to stand ready to take appropriate action if growth falters. They noted that the current level of official international reserves provides adequate insurance in normal times, and that the exchange rate has adjusted flexibly in line with fundamentals. Directors

[6] At the conclusion of the discussion, the Managing Director, as Chairman of the Board, summarizes the views of Executive Directors, and this summary is transmitted to the country's authorities. An explanation of any qualifiers used in summings up can be found here: http://www.imf.org/external/np/sec/misc/qualifiers.htm.

considered that the widening current account deficit, largely financed through foreign direct investment, is likely to narrow over time on the back of the exchange rate depreciation and ongoing fiscal consolidation.

Directors noted that the financial system is sound, profitable, and well-provisioned, with low exposure to the oil sector. They commended the authorities for the progress in addressing cross-border risks and strengthening the regulatory and supervisory frameworks. Continued efforts are nonetheless crucial to boost the resilience of financial institutions, and to strengthen supervision of complex financial conglomerates. Directors also underscored the importance of further improving risk-based supervision, enhancing regional cooperation primarily in Central America, deepening the capital market, and promoting financial inclusion.

Directors welcomed the authorities' inclusive growth agenda. They agreed that key priorities are to reduce informality in the economy, improve competitiveness and infrastructure, and foster social mobility, especially through better education and health care. Directors recognized the benefits of the authorities' fourth generation road investment program—implemented with appropriate funding and safeguards—in reducing infrastructure gaps and helping diversify sources of growth. More broadly, they supported initiatives to promote private participation in the economy, including through divestiture of a public utility company.

Colombia: Selected Economic Indicators 1/

	2013	Est. 2014	Proj. 2015
	(Annual percentage changes, unless otherwise indicated)		
National Income and Prices			
Real GDP	4.9	4.6	3.4
Consumer price index (period average)	2.0	2.9	3.9
Consumer price index (end of period)	1.9	3.7	3.6
GDP deflator	1.9	1.8	1.0
Terms of trade (deterioration -)	-4.1	-3.2	-18.0
Real effective exchange rate (depreciation -)	-3.3	-5.3	-14.3
	(In percent of GDP, unless otherwise indicated)		
Public finances			
Central government balance	-2.3	-2.6	-2.6
Combined public sector	-1.1	-1.6	-3.4
Public debt 2/	35.6	38.7	39.7
External Sector			
Current account (deficit -)	-3.3	-5.2	-5.9
External debt	24.2	29.3	30.9
of which: Public sector	12.8	14.8	15.1
GIR in percent of short-term debt	181.9	187.0	198.8
Savings and Investment			
Gross domestic investment	24.2	26.0	24.0
Gross national saving	20.9	20.8	18.1
	(12-month percentage changes, unless otherwise indicated)		
Money and credit			
Broad money (M2)	13.4	10.0	13.0
Credit to the private sector	12.1	14.7	11.9
Interest rate (90-day time deposits; percent per year)			
Nominal	4.1	4.3	n.a.

Sources: Colombian authorities; and IMF staff estimates and projections.

1/ Based on information available on May 1, 2015.
2/ Includes Ecopetrol and Banco de la Republica's outstanding external debt.

ANNEX 4: POVERTY AND SOCIAL IMPACT ANALYSIS

1. **This PSIA has determined whether specific policies supported by the operation are likely to have significant poverty and social consequences, especially on poor people and vulnerable groups.** For policies with likely significant effects, the PSIA summarizes the relevant analytic knowledge of these effects and of Colombia's systems for reducing adverse effects and enhancing positive effects associated with the specific policies being supported. The significant gaps in the analysis or shortcomings in these systems have been identified, and the document describes how such gaps or shortcomings would be addressed during program implementation, as appropriate.

2. **This PSIA is developed according to Bank guidelines and follows practices adopted by the recently approved DPLs in Colombia and in the rest of Latin America and the Caribbean.** The PSIA is designed to provide an analysis of the potential effects of the policies supported by this operation on poverty reduction, inequality, and welfare of the Colombian population. It documents the expected impacts of each of the policy actions with regard to the key objective of supporting the green growth policy of the GoC. Specifically, the PSIA analyzes how these outcomes could have potential effects on poverty and inequality.

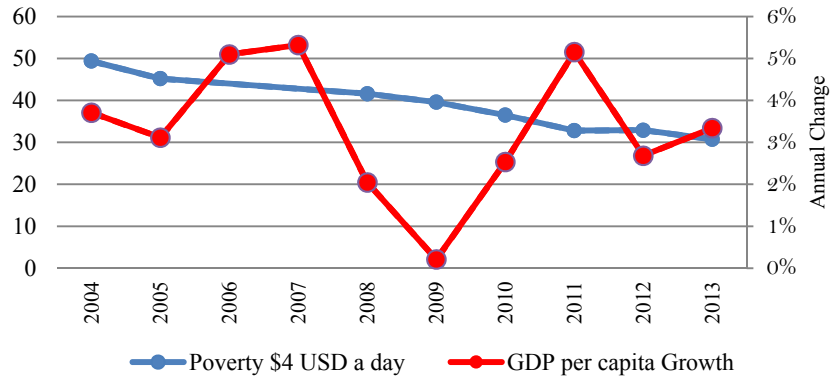
3. **Quantitative analyses specific to the policies supported by this operation were performed along with literature reviews of previous studies relevant to the prior actions.** Useful information to define parameters and assumptions to perform the quantitative analysis and to organize the literature review was gathered from policy reports of the DNP, MT, MME, MSPS, MVCT, and MADS; previous evaluations by the Bank and other multilateral organizations; and from academic research papers. Several Bank Group Global Practices also provided valuable inputs for this assessment.

Colombia's Poverty and Inequality Priorities

4. **Over recent years Colombia has experienced considerable economic growth and strong poverty reduction; however, poverty rates are still above the mean for the region.** The average GDP per capita growth rate of 3.32 percent experienced by the Colombian economy in the last decade has been translated into a strong poverty reduction path. The poverty rate fell sharply, from 49.4 percent living on less than US$4 a day in 2004 to 30.8 percent in 2013 (Figure 4.1). Despite this large reduction in poverty, poverty rates remain significantly higher than the rate of 24.3 for Latin America. Furthermore, as highlighted by the Systematic Country Diagnostic,[7] Colombia is one of the countries with the most inequality in the world. Income inequality measured by the Gini coefficient remained stable at around 0.533 in 2013, slightly above the Latin American inequality rate of 0.516. In this context, the NDP[8] supported by this DPL incorporates among its objectives the elimination of extreme poverty by 2024 and the reduction of moderate poverty and inequality.

[7] World Bank. 2015. *Colombia - Systematic Country Diagnostic*. Washington, DC: World Bank Group.
[8] Bases del Plan de Desarrollo. 2014–2018. "Todos por un nuevo país." Departamento Nacional De Planeación.

Figure 4.1. Poverty Rate (US $4 a day) and GDP Per Capita Growth



Source: Author's calculation based on Socio-Economic Database for Latin America and the Caribbean (SEDLAC) data (CEDLAS and the World Bank). Note: poverty rates are calculated using $4 a day poverty lines (all in 2005 US$ Purchasing Parity Power per day). GDP per capita growth was based on the estimates of the macroeconomic and final management staff (World Bank).

5. **Given that inequality in Colombia is still above the average for Latin American countries, it is critical to understand the potential socioeconomic effects of the prior actions included in this DPL.** The policies that support this multisector framework will likely improve the environmental health of Colombians by reducing air, water, and soil pollution. Moreover, even though the policy action for the DRM will indirectly affect poverty reduction and inequality, its implementation is valuable in its role of minimizing the vulnerability of populations living in high-risk areas. In addition, the establishment of a policy framework conducive to green growth will generate a better-managed environment and the adaptation of the economy to a low carbon path that will reduce emissions of GHGs.[9] However, as suggested by the literature, it cannot be assumed that green growth is inherently inclusive. Green growth policies must be carefully designed to maximize benefits for, and minimize costs to, the poor and most vulnerable, and policies and actions with irreversible negative impacts must be avoided.[10]

6. **Most prior actions included in this DPL will improve outcomes for the poor.** The benefits with regard to public health and a better-managed environment exceed any potential negative distributive effect found in this PSIA. However, the project may have larger social gains if compensatory systems are implemented. Revenues obtained from this new set of regulations could be used to benefit those harmed disproportionately by the new policies. Beneficiaries could include small agricultural producers affected by the new treated water incentive scheme or the additional rate per ton for final disposal of no recyclable solid waste that would increase costs for poor households.[11] In this context, standard mechanisms to compensate the small potential regressive nature of pollution control policies may be evaluated when the revenue is being generated.

[9] Sánchez Abril, M. A. 2013. "Bases conceptuales sobre economía verde e identificación de sectores potenciales para su implementación de acuerdo a la experiencia internacional." Departamento Nacional De Planeación. Subdirección De Desarrollo Ambiental Sostenible.
[10] Fay, M. 2012. "Inclusive Green Growth: The Pathway to Sustainable Development." Washington, DC: World Bank.
[11] Gonzalez, F. 2012. "Distributional Effects of Carbon Taxes: The Case of Mexico." *Energy Economics* 34 (6): 2102–2115.

7. **The PSIA provides recommendations to incorporate social and distributional considerations into the proposed DPL that will be considered by the GoC during implementation of DPL 1.** The PSIA will also help the GoC to ensure that the policies supported by DPL 2 and DPL 3 will benefit the most vulnerable groups by providing policy advice and suggesting areas of further research for medium-term engagement.

Pillar 1 - Establish a set of policy and institutional measures for Green Growth in transport, energy, environmental health and disaster risk management

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Prior Action 1: As a part of the National Development Plan, the Government set forth a green growth strategy which, inter alia: (a) defines guidelines for developing and improving public transportation systems; (b) entitles territorial entities (including districts and municipalities) to establish new funding resources for public transportation systems and infrastructure for non-motorized transportation; and (c) provides financial resources to the FENOGE, as evidenced, respectively, by articles 32, 33, 34 and 190 of Law No. 1753, dated June 9, 2015, published in the Official Gazette on June 9, 2015.

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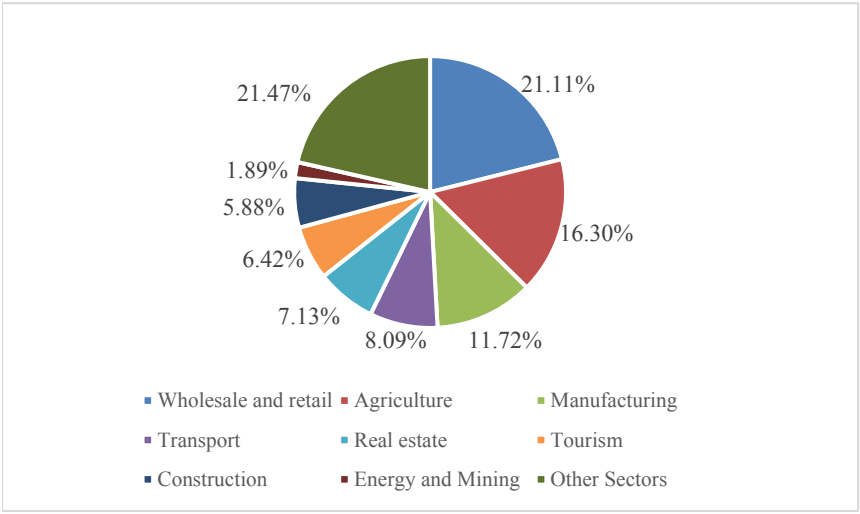
8. **The analysis of the previous green growth experiences found mixed evidence for the distributional effects of such policies depending on how those policies were implemented.** Typical green growth regulatory policies implemented include incentives to reduce carbon emissions and achieve energy efficiency.[12] The evidence is not conclusive for the distributive impacts of these regulations; some were found to be progressive[13] while others were regressive.[14] In response, the literature found that distributional effects crucially depend on how the revenue obtained by these regulations is expended. In particular, these policies were found to be more progressive when the revenue raised by the economic incentives was transferred to the poor in monetary terms or as the provision of public goods.[15]

9. **In the Colombian context, regulations related to a low carbon path may increase the cost of inputs and may reduce employment, but will affect the rich disproportionately.** Air quality regulations as well as energy and transport regulations will probably mainly affect the manufacturing, energy, and transport sectors. In particular, the manufacturing, energy, and transport sectors represent more than 21 percent of the employment creation of the Colombian economy (Figure 4.2). While regulations may affect the employment of workers in the affected sectors, these industries mainly employ workers of the top quintiles (Table 4.1). Thus, regulations affecting the manufacturing, energy, and transport sectors will not disproportionately affect the Colombian poor.

[12] Barker, T., and J. Köhler. 1998. "Equity and Ecotax Reform in the EU: Achieving a 10 Percent Reduction in CO_2 Emissions Using Excise Duties." *Fiscal Studies* 19 (4): 375–402.
[13] Oladosu, G., and A. Rose. 2007. "Income Distribution Impacts of Climate Change Mitigation Policy in the Susquehanna River Basin Economy." *Energy Economics* 29 (3): 520–544.
[14] Feng, K., K. Hubacek, D. Guan, M. Contestabile, J. Minx, and J. Barrett. 2010. "Distributional Effects of Climate Change Taxation: The Case of the UK." *Environmental Science & Technology* 44 (10): 3670–3676.
[15] Yusuf, A. A., and B. Resosudarmo. 2007. "On the Distributional Effect of Carbon Tax in Developing Countries: The Case of Indonesia." Paper EEN0706, Economics and Environment Network, the Australian National University.

Figure 4.2. Labor Creation by Sector in the Colombian Economy



Source: Authors' calculation based on the Colombian Household Survey 2013.

Table 4.1. Workers Distribution among the Potential Affected Sectors

	Percentage of workers per quintile				
Sector	**1st quintile**	**2nd quintile**	**3rd quintile**	**4th quintile**	**5th quintile**
Manufacturing	8.24	13.88	21.67	28.53	27.68
Energy and Mining	14.42	14.85	18.77	21.49	30.47
Transport	9.81	17.11	22.60	25.92	24.56

Source: Authors' calculation based on the Colombian Household Survey 2013.

10. **The Green Growth Strategy set by the GoC also establishes a framework for future regulations in energy efficiency and clean-energy-based transport that may be more inclusive if progressive incentives are included.** The expected introduction of the FENOGE is slated to be financed by fixed fees that will be paid equally by the poor and the rich.[16] This negative distributional burden may be avoided by the introduction of a differential tax for the most-deprived population. Following the same approach, the absence of social fares for the introduction of clean-energy-based transport leaves room for the introduction of a differential fare in favor of the poor that will contribute to the distributional dimension of these policies.[17]

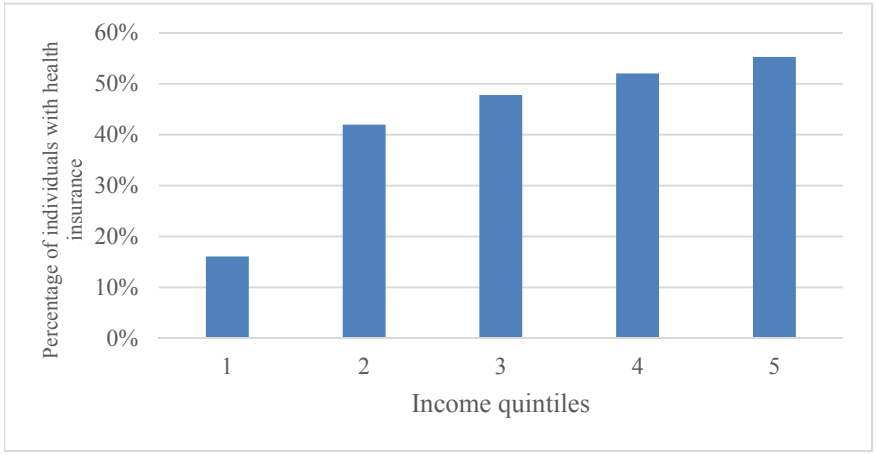
11. **The development of a Green Growth Strategy will enhance welfare in Colombia.** The resulting improvements in environmental conditions are expected to improve citizens' health in the future. In particular, the improvement of air quality through the reduction of

[16] Colombian Act 1715 of 2014 on tax matters.
[17] Speck, S. 1999. "Energy and Carbon Taxes and Their Distributional Implications." *Energy Policy* 27 (11): 659–667.

toxic emissions from industries, motorized vehicles, and nonrenewable energy production will reduce the pollution impact on respiratory illnesses. These health improvements will reduce expenditures on public health that are currently estimated at 2 percent of the Colombian GDP.[18]

12. **Reducing potential health threats will particularly benefit Colombia's poor.** Access to health insurance is below 17 percent for the bottom 20 percent of the Colombian income distribution (Figure 4.3). Moreover, since low-income households rarely have assets that can rapidly be converted to cash to cover food expenses when an income-earner is off work or to pay for treatment to hasten recovery, the incidence of negative externalities are regressive across the income distribution. Thus, improvement of environmental conditions that will reduce the probability of the usage of health services is likely to benefit the poor disproportionately.

Figure 4.3. Access to Health Insurance by Quintile



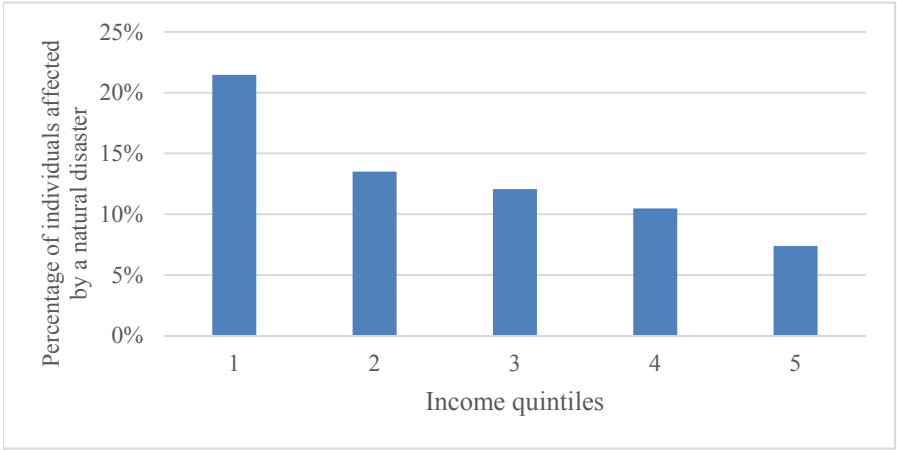
Source: Authors' own calculation based on the Colombian Household Survey 2013

13. **Since exposure to natural disasters is positively correlated with poverty levels, the reduction of extremely high levels of vulnerability in Colombia that was supported by this prior action will improve the well-being of the most-deprived population in Colombia.** A recent study for Latin America and the Caribbean shows evidence of positive correlation between natural disasters and higher incidence of poverty and other welfare indicators.[19] In the case of Colombia, the poor are disproportionally more affected by natural disasters than the rest of the population (Figure 4.4). Moreover, the literature shows that disasters increase the percentage of the population that suffers privations associated with education, income loss, and the probability of being poor.[20] Overall losses generated by disasters in the most vulnerable municipalities affect education and health and deepen poverty factors due to the low recovery capacity of local governments and the affected

[18] MSPS, 2014.
[19] Caruso 2015; Caruso and Miller 2015.
[20] Sanchez and Calderon 2012.

population. These results highlight the vulnerability of poor populations to natural disasters and weather-related shocks and the importance of stronger risk management in Colombia.

Figure 4.4. Vulnerability to Natural Disasters by Income Quintile



Source: Authors' calculation based on the Colombian Household Survey 2013

14. **As a result of this prior action, the Colombian Government will trigger the elaboration of an action plan for the knowledge, reduction, and management of disaster risk that is essential to mitigate potential negative impacts on the population, especially for the lower end of the income distribution.** Poorer socioeconomic conditions make households more sensitive to the impact of hazards and less able to respond, cope, and adapt to disasters. Moreover, the poor have a lower threshold for enduring external shocks and barely have financial resources or capital, if any, to rely on.[21] Therefore, in case of a hazard, the emergency plan will prioritize the most-affected and vulnerable populations, taking into account their multidimensional poverty status.[22] This priority framework will contribute to protect vulnerable groups from unforeseen events. Since the literature on shocks affecting the poor emphasizes the vulnerability of children and woman to natural disasters, with a target more oriented to children and gender, this ex post risk management plan will more efficiently alleviate the long-term welfare consequences of natural disasters.

Pillar 2 - Improvement of environmental quality by reducing $PM_{2.5}$ in air; strengthening regulatory and economic instruments for reducing water pollution; and increasing capacity for solid waste disposal and enhancing waste recycling.

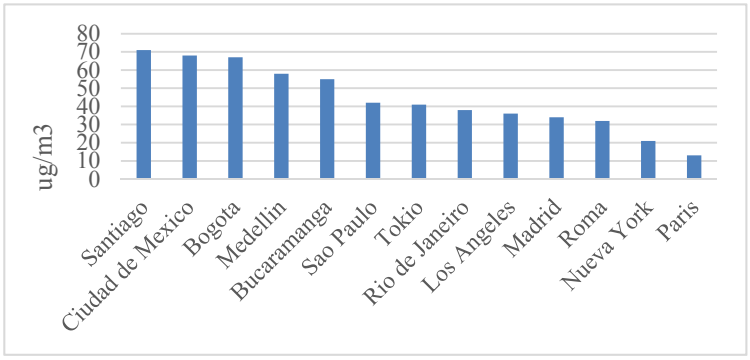
Prior Action 2: The Government adopted a regulation to update the quality parameters for diesel fuel at the national level, with the objective of reducing toxic emission in air contamination, as evidenced by Resolution No. 90963, dated September 10, 2014, issued

[21] Lal, P. N., R. Singh, P. Holland. 2009.
[22] Sistema Nacional de Gestión del Riesgo de Desastres 2014.

jointly by the Government's Ministry of Mines and Energy and the Ministry of Environment and Sustainable Development, published in the Official Gazette on September 11, 2014.

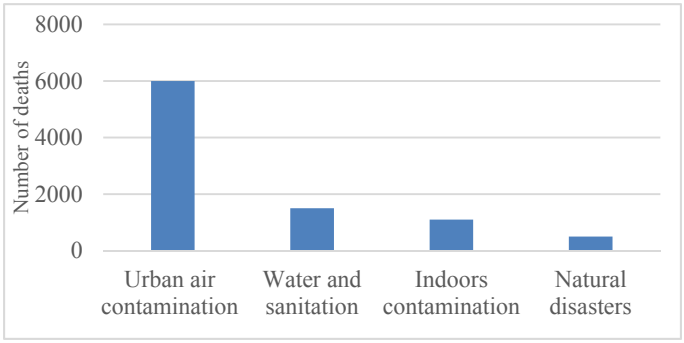
15. **Given the high level of air pollution in Colombia, the implementation of this policy will impact public health.** Colombian cities have some of the highest concentrations of Particulate Matter in their air. In particular, Bogotá has concentrations of PM comparable with Santiago and Mexico City (Figure 4.5). Among others, the health effects of inhaling PM that have been widely reported by the literature include terminal health problems such as cancer, cardiovascular diseases, and premature death, as well as respiratory diseases and birth defects.[23, 24] An evaluation of the number of deaths due to pollution sets air pollution as the most lethal cause among all the other sources of pollution, leading to 6,000 deaths per year in Colombia (Figure 4.6). As a consequence, this reduction of air pollution will contribute positively to the well-being of all Colombians.

Figure 4.5. Annual PM Concentration in Select Cities



Source: Sánchez-Triana, E., K. Ahmed, and Y. Awe, eds. 2007. Environmental Priorities and Poverty Reduction. A Country Environmental Analysis for Colombia. Washington, DC: World Bank.

Figure 4.6. Mortality Estimation by Pollution Source



Source: Sánchez-Triana, E., K. Ahmed, and Y. Awe, eds. 2007. Environmental Priorities and Poverty Reduction. A Country Environmental Analysis for Colombia. Washington, DC: World Bank.

[23] Raaschou-Nielsen, O., Z. J. Andersen , R. Beelen, E. Samoli, M. Stafoggia, G. Weinmayr, and G. Cesaroni. 2013. "Air Pollution and Lung Cancer Incidence in 17 European Cohorts: Prospective Analyses from the European Study of Cohorts for Air Pollution Effects (ESCAPE)." *The Lancet Oncology* 14 (9): 813–822.

[24] Cohen, A. J., H. Ross Anderson, B. Ostro, K. D. Pandey, M. Krzyzanowski, N. Künzli, and K. Smith. 2005. "The Global Burden of Disease due to Outdoor Air Pollution." *Journal of Toxicology and Environmental Health Part A* 68 (13–14): 1301–1307.

16. **The adoption of better quality parameters for diesel will reduce toxic emissions and then reduce the vulnerability of Colombia's poor.** The regulation update of quality parameters proposes to introduce diesel exhaust emission caps equivalent to European Emission Standards, Euro IV. This will reduce the PM originating from motorized vehicles that has been linked to a myriad of adverse health outcomes ranging from cancer to cardiopulmonary diseases.[25, 26] Since many poor groups are located in squatter colonies in insecure tenures and tend to work outdoors due to the selection of the low skills job market, the poor are likely to be more exposed to outdoor air pollution. Thus, the regulation of diesel exhaust will improve the quality of life of the poor.[27]

17. **The new regulation may increase the cost of transportation.**[28] However, this potential adverse impact can be expected to affect only a small percentage of poor households. The majority of the households in the bottom 40 percent of the income distribution use public transport, which is price regulated and usually not elastic to the diesel price, and non-motorized or low-fuel vehicles such as bikes or motorbikes (Table 4.2)

Table 4.2. Transportation Means and Expenditures Per Quintile

Quintile	Means of transportation				Household that owns a car (percent)	Transportation expenditures as percentage of the household income
	Public transport (%)	Private transport (%)	Motorcycle or bike (%)	Other means (%)		
1	30.53	3.24	41.99	24.24	2.09	9.60
2	43.63	3.88	40.04	12.45	3.27	8.30
3	46.71	4.00	39.34	9.96	6.55	7.73
4	54.73	5.46	31.21	8.60	11.85	7.92
5	45.38	24.74	21.66	8.22	41.83	6.18

Source: Authors' calculation based on the quality of life survey 2011.

Prior Action 3: The Government established parameters, limits, and procedures for the discharge of treated wastewater originating from selected agricultural, industrial, commercial and service activities, with the objective of reducing the overall pollution of water bodies, as evidenced by Resolution No. 631, dated March 17, 2015, issued by the Government's Ministry of Environment and Sustainable Development, published in the Official Gazette on April 18, 2015.

18. **Since more than 40 percent of the households of the top quintile own cars, the regulation will be disproportionately funded by the rich.** Finally, since the poor pay almost 10 percent of their income for transportation, previous experiences showed that the introduction of a social fare for public transportation with lower prices for the poor may avoid negative impacts of a future increase of the fare due to diesel quality regulations.

[25] Geller, M. D., L. Ntziachristos, A. Mamakos, Z. Samaras, D. A. Schmitz, J. R. Froines, and C. Sioutas. 2006. "Physicochemical and Redox Characteristics of Particulate Matter (PM) Emitted from Gasoline and Diesel Passenger Cars." *Atmospheric Environment* 40 (36): 6988–7004.

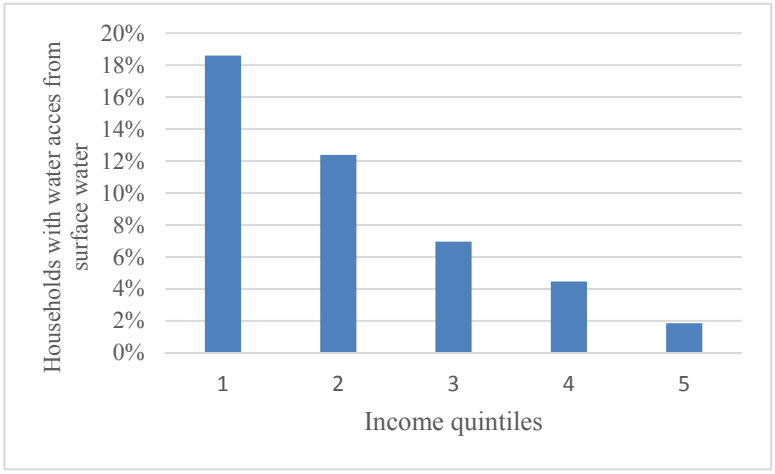
[26] Ristovski, Z. D., B. Miljevic, N. C. Surawski, L. Morawska, K. M. Fong, F. Goh, and I. A. Yang. 2012. "Respiratory Health Effects of Diesel Particulate Matter." *Respirology* 17 (2): 201–212.

[27] Houston, D., J. Wu, P. Ong, and A. Winer. 2004. "Structural Disparities of Urban Traffic in Southern California: Implications for Vehicle-related Air Pollution Exposure in Minority and High-poverty Neighborhoods." *Journal of Urban Affairs* 26 (5): 565–592.

[28] Markovich, J., and K. Lucas. 2011. "The Social and Distributional Impacts of Transport: A Literature Review." School of Geography and the Environment Working Paper 1055, Transport Studies Unit.

19. **Even though most Colombians currently have access to water, a considerable proportion of the society still consumes water from surface water sources.** Around 89 percent of the Colombian population currently has access to water. However, the majority of the individuals who consume surface water belong to the bottom quintiles of the income distribution (Figure 4.7). Thus, wastewater disposal plays a key role in the quality of water consumed by the poor. Moreover, water pollution is the costliest form of pollution with regard to the Colombian GDP, representing 1.1 percent of GDP (Figure 4.8) and mainly affecting children younger than five years of age.[29]

Figure 4.7. Access to Surface Water by Quintile

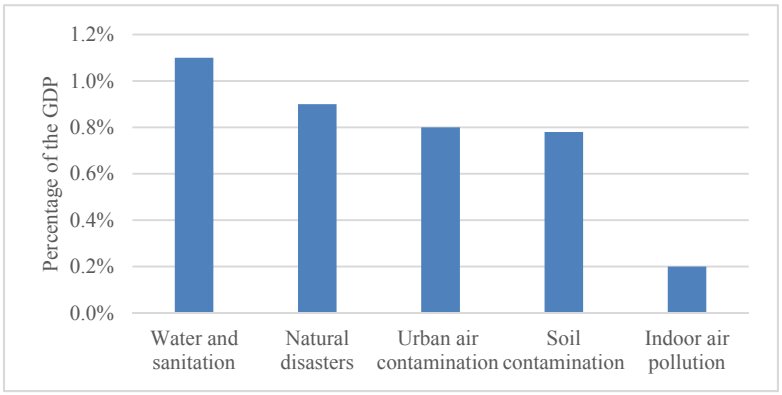


Source: Authors' calculation based on the Colombian Household Survey 2013.

20. **By reducing the overall pollution in surface water, this policy will improve welfare in Colombia.** Because wastewater consumption generates gastrointestinal diseases as well as infectious hepatitis A and E, the reduction of wastewater discharge will have a positive impact on consumers of surface water.[30] In Colombia, surface water consumers are concentrated in the bottom 40 percent of the income distribution (Figure 4.8). Therefore, the benefits of reducing the pollution level of surface water will probably accrue in a greater proportion to the most deprived of the population. Furthermore, due to the greater vulnerability of women and children to illnesses related to water quality, this policy may reduce gender disparities and benefit child development.

[29] Sánchez, E., K. Ahmed, and Y. Awe. 2007. "Prioridades ambientales para la reducción de la pobreza en Colombia. Un análisis ambiental del país para Colombia." Banco Mundial, Washington, DC.
[30] Shuval, H. 2003. "Estimating the Global Burden of Thalassogenic Diseases: Human Infectious Diseases Caused by Wastewater Pollution of the Marine Environment". *J Water Health* 1: 53–64.

Figure 4.8. Economic Cost Estimation by Pollution and Risk Source



Source: Sánchez-Triana, E., K. Ahmed, and Y. Awe, eds. 2007. Environmental Priorities and Poverty Reduction. A Country Environmental Analysis for Colombia. Washington, DC: World Bank.

Prior Action 4: The government established a set of rules, including quality parameters, regulating the reuse of treated wastewater for selected industrial and agricultural activities, as evidenced by Resolution No. 1207, dated July 25, 2014, issued by the Government's Ministry of Environment and Sustainable Development, published in the Official Gazette on August 13, 2014 .

21. **As highlighted in the previous analysis, the improvement in the quality of the water will benefit the poor**. The regulation imposed by the Government will reduce the pollution of the water consumed by the lower quintiles of the income distribution. Therefore, a reduction in gastrointestinal illnesses produced by the consumption of polluted water is expected.[31]

22. **The new regulation for the reuse of treated wastewater might generate slightly negative distributional impacts.** To align the incentives of the industrial and agricultural producers, the Colombian Government will introduce a quality regulation for the reuse of treated wastewater. Since this policy will reduce the income of small agricultural and industrial self-employed workers, a simulation of the potential impact of this policy was performed assuming different reductions in the income of these workers. Different scenarios were tested and none of them had a significant effect on poverty and inequality (Table 4.3). As a result, standard compensatory mechanisms may alleviate potential negative distributional effects of this policy.

Table 4.3. Scenarios of Income Reduction of Agricultural and Industrial Self-employed

Reduction of the income of self-employed workers (%)	Poverty Rate	Gini
0	30.81	0.5333
1	30.83	0.5334
5	30.95	0.5338
10	31.10	0.5343

Source: Authors' calculation based on the Colombian Household Survey 2013.

[31] Egorov, A., E. Naumova, A. Tereschenko, V. Kislitsin, and T. Ford. 2003. "Daily variations in effluent water turbidity and diarrhoeal illness in a Russian city". *International journal of environmental health research*, 13(1): 81-94.

Prior Action 5: The Government established a methodology for the formulation, implementation, evaluation, management, control and update of Solid Waste Integrated Management Plans (PGIRS) by municipalities, districts and other selected local entities within its territory, as evidenced by Resolution No. 754, dated November 25, 2014, issued jointly by the Government's Ministry of Housing, City and Territory and the Ministry of Environment and Sustainable Development, published in the Official Gazette on December 1, 2014.

23. **The new methodology of the PGIRSs will increase favorable health conditions by reducing the pollution due to disposal of solid waste, mainly for those living close to the landfills.** Households in Colombia are not typically close to sanitary landfills, and almost 90 percent of households do not consider themselves as living close to a landfill. However, those living close to landfills are more likely to be poor. Those living close to landfills are among the bottom 20 percent of the population, almost double the number of the top 20 percent of the population living close to sanitary landfills. Thus, this policy will mainly favor the most disadvantaged population in Colombia.

24. **In addition to the health benefits, solid waste management programs might generate economic profits and avoid the depletion of natural resources**. Previous experiences showed that, if efficiently managed, waste management plans may be profitable, saving public funds that can be destined to social programs.[32] Moreover, these plans might generate energy savings, thus avoiding the depletion of natural resources used to produce energy in Colombia.[33]

Prior Action 6: The Government established a set of incentives to promote the recycling of solid waste, including an additional fee to be charged per ton of solid waste finally disposed in sanitary landfills, as evidenced by Article 88 of Law No. 1753, dated June 9, 2015, published in the Official Gazette on June 9, 2015

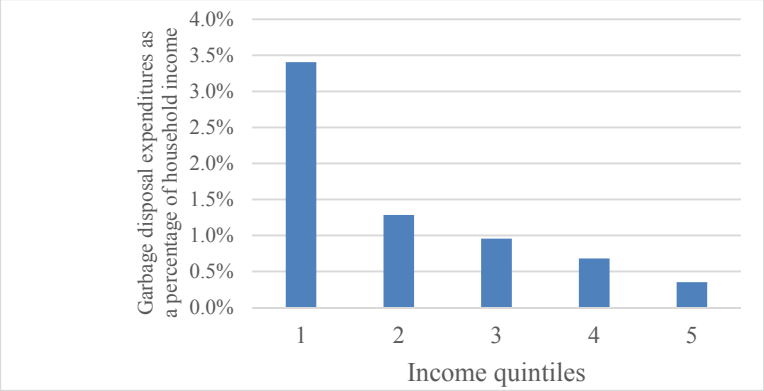
25. **The objective of the new waste disposal price scheme is to internalize the negative externalities generated by the disposal of non-recyclable solid waste.** Companies do not usually incorporate the social cost of pollution in their production function due to the disposal of solid waste. Externalities to society include a rise in waste processing costs, loss of productivity of individuals due to deterioration of public health, and increased levels of GHG and other local pollutants.[34] In line with economic theory, the proposed scheme seeks to internalize these externalities by taxing production technologies that contribute the most to waste generation, in particular those production approaches that generate non-recyclable waste. Moreover, the collected proceeds from the scheme are earmarked for investments to improve infrastructure. This guarantees that the funds would be designated for the expansion of public goods, which will potentially benefit the whole population but mainly the poor, who most depend on such externalities.

26. **Although the waste management program will have positive health and socioeconomic effects, the additional cost of the final disposal would be equally distributed among rich and poor households.** The current fee scheme for garbage disposal

[32] White, P., Dranke, M., & Hindle, P. 2012. Integrated solid waste management: a lifecycle inventory. Springer Science & Business Media.
[33] Thormark, C. 2001. "Conservation of energy and natural resources by recycling building waste". *Resources, Conservation and Recycling*, 33(2): 113–130.
[34] Weitz, K. A., S. A. Thorneloe, S. R. Nishtala, S. Yarkosky and M. Zannes. 2002. "The impact of municipal solid waste management on greenhouse gas emissions in the United States". *Journal of the Air & Waste Management Association*, 52(9): 1000–1011.

service represents a greater proportion of the income of the bottom of the income distribution (Figure 4.9). Adding a fee independent of household income will make the garbage disposal fee regressive. The incorporation of compensation mechanisms is relevant in this context to avoid taxing the poor disproportionally for the new incentives program.

Figure 4.9. Garbage Disposal Expenditures by Income Quintile



Source: Authors' calculation based on the quality of life survey 2011

27. **In addition, the new waste management plan incorporates the future formalization of waste pickers, guaranteeing better work conditions for this deprived group.** The socioeconomic study of waste pickers shows that 12 percent are minors or older than 65 years of age, 50 percent of them work more than 8 hours per day, 62 percent did not finish primary school, and 25 percent have no health insurance. Given the deprived condition of this group, this formalization will improve their socioeconomic status in a substantial way.

ANNEX 5: ENVIRONMENTAL ASPECTS

1. **As part of the preparation of the DPL, the Bank has conducted a policy strategic environmental analysis (policy SEA).** The purpose of the policy SEA is to determine whether specific country policies supported by the DPL are likely to cause significant effects on Colombia's environment, forests, and other natural resources. For those policies with likely significant effects, the policy SEA assessed Colombia's systems for reducing such adverse effects and enhancing positive effects, drawing on relevant country-level or sectoral environmental analysis. The policy SEA also assessed if there were significant gaps or shortcomings in these systems. This assessment has been framed in the context of the environmental priorities of Colombia, which have informed the dialogue between the Bank and the GoC since the last decade.

Environmental Priorities of Colombia

2. **Despite major improvements in environmental management, environmental degradation has increasingly affected public health and welfare, constraining Colombia's potential for sustainable economic growth.** Since the mid-1970s, the country developed an ample gamut of environmental and natural resource management policies and an institutional framework that served to address environmental challenges. Sustainable economic growth, nonetheless, has been constrained by increasing levels of land degradation; higher frequency of natural disasters (intensified by climate change); urban air pollution; indoor air pollution; water pollution; and sanitation and hygiene. Urban air pollution is the most critical problem. Despite substantial advances in the prevention of health costs related to water, sanitation, and hygiene, these costs are still significant. Sanitation and clean water supply are still affecting children under age five, mainly from lower-income households.

3. **Natural disasters—such as floods, landslides, droughts, and earthquakes—have become more frequent in Colombia, accounting for annual costs of about 0.95 percent of GDP**. Coupled with climate change, they may pose an even more serious problem to growth and development, in a country where close to three disaster events are registered every year. Around 190,000 dwellings were destroyed during the period 1970–2011. Floods were the principal disaster events, followed by seismic activity, landslides, volcanic eruptions, gale storms, and fires (World Bank 2011). Most of the damages, deaths, injuries, and loss of assets affect the poor sectors of the population. Erosion, salinization, and the effects of deforestation are the main problems associated with land degradation, at an annual cost of approximately 0.80 percent of GDP.

Environmental Assessment of the Government's set of policies and measures

4. **The GoC has set an overarching environmental green growth strategy to address these environmental challenges and follow a green growth path.** In this context, the DPL will support the Green Growth Strategy of the GoC, focusing on two pillars. Pillar 1 involves policy actions that (a) strengthen sustainable economic growth that is low in carbon; (b) enhance environmental quality; and (c) reduce the vulnerability to natural disasters and climate change. In an articulated way, Pillar 2 focuses on selected prior actions targeted to improve environmental quality in air, water, and soils by (a) reducing water and air pollution; (b) increasing the reuse of wastewater; and (c) improving solid waste management. In line with OP 8.6, the policy SEA assessed the programmatic DPL, focusing on the prior actions of these pillars (DPL 1), but it also considers the potential environmental implications of the policy

triggers of the ensuing planned operations (DPL 2 and DPL 3). A summary of findings is outlined in the following paragraph.

Main Findings

5. **There are no significant negative effects on the environment, forests, and other natural resources.** The overall net effect of the policy actions supported by this DPL is expected to be positive. Related indicative triggers reinforce this positive effect in the medium and long term. The significance of effectively implementing these policy actions would translate into a reduction in the health costs associated with air, water, and soil pollution, as well as with natural disasters, Colombia's environmental priorities. Moreover, the programmatic DPL would play an important role in continuing to help mainstreaming of environmental considerations in key sectors - such as water, transport, energy, and disaster risk management - in Colombia and in the country's overall approach to sustainable development. Although a few potential negative environmental effects associated with some of the policy actions were found, none of these are significant. Where appropriate, specific supplementary actions, including undertaking strategic environmental assessments and institutional capacity building, are suggested to enhance positive effects and to increase sustainability of the policy actions.

Assessment of Pillar 1

6. **Establishing a policy and institutional measures for the Green Growth Strategy to direct growth toward a low carbon trajectory, enhanced environmental health, and climate change resilience will reinforce growth in Colombia toward environmental and natural resource sustainability**. Accordingly, its main effect on the environment, natural resources, and forests would be significant and positive as it addresses Colombia's environmental priorities. Potential undesired or negative environmental effects that might result from the implementation of these measures are difficult to grasp as they are formulated at the policy and institutional levels. They can only be analyzed in the more specific policy measures in the areas supported by this pillar: transport, energy efficiency and alternative energy, environmental health, and disaster risk management.

Transport

7. **Policy actions and trigger 1 of DPL 3 to increase public transport and non-motorized modes (walking and cycling) will contribute significantly to the reduction of GHG emissions**. The accelerated pace at which urban areas, in Colombia, have been growing during the last couple of decades triggered a substantial upsurge in motorization, particularly in private vehicles and motorcycles. The unfavorable results of this process include an increase in urban air pollution. While Integrated Public Transport Systems (SITP) in Bogotá, Cali, Pereira, and Barranquilla have been successful at promoting the use of the system, especially by individuals from the lowest socioeconomic strata, growing discontent with the service, coupled with a deficit of proper conditions to promote non-motorized alternatives (walking and cycling), have increased the use of more polluting means of transport, such as motorcycle taxis; old, inefficient, and illegal buses; and old and cheap private cars.

8. **Article 32 of the NDP Law stipulates that the national Government can implement actions to enhance the SITP and to increase and regulate non-motorized means of transport**. The Government can co-finance projects in cities or regions that establish a change in the business scheme and adjust for more efficient, accessible, and sustainable SITP. Co-

financing also gives the Government control over the type of fuel that the systems will use. If these policy measures are satisfactorily implemented, there will be significant positive effects, including (a) substantial reductions in CO_2; (b) lower levels of urban air pollution due to a decrease in private cars, motorcycles, and illegal buses; (c) lower rates of traffic fatalities; and (d) less costs because of mortality and morbidity. Estimates for improved SITP under different vehicle-technology scenarios range from 44 percent to 66 percent reductions in CO_2 emissions.

9. **Territorial entities are entitled to establish new financial resources, public or private, to support the sustainability of the transport systems**. Article 33 of the NDP Law gives territorial entities the faculty of finding financial resources for public transport systems through several mechanisms, including tolls for congested traffic areas in municipalities or districts with more than 300,000 inhabitants. As evidenced in some European cities where congestions charges were adopted, CO_2 emissions were reduced by 19.5 percent in London, and by 18 percent in Stockholm. Furthermore, if this measure is combined with an increase in electric vehicles, the combined reduction in CO_2, in the period 2012–2040, could reach 41 million tons.[35]

10. **In the policy SEA, however, a risk was found that the positive effects of these policy actions may not be widely disseminated across Colombia if the regional and municipal governments lack the motivation to implement the reform**. Decentralization in Colombia involves nuances of evolving power relationships between the different levels of Government and their stakeholders, and urban authorities may be hesitant to implement national policies that do not adapt to their local contexts or are opposed by interest groups. It is recommended that incentives to address institutional and political economy constraints be established, in order to encourage subnational governments to widely use the mechanisms established by the national Government to curb pollution and promote public transportation at the local level. Similarly, policy dialogue and coordination between the Government and regional and local governments to develop regulations for the use of non-motorized means of public transport - such as tricycles - should be encouraged.

Energy Efficiency and Alternative Energy

11. **The Government's objective is to build up the participation of low-carbon energy technologies in its current energy system to offset the potential climate change effects in hydrological sources**. At present, only 4.5 percent of the electrical power capacity in Colombia derives from alternative energy (NDP 2015). Solar, eolic, biomass, and geothermal sources are viable options for the diversification of the energy portfolio in the country, contributing to a decrease in GHG emissions. Article 190 of the NDP law establishes the mechanism by which the FENOGE will secure its financial resources. This is a key component of the Government's green growth strategy by which FENOGE will provide the required funding for the energy efficiency and alternative energy programs.

12. **The assessment found that policy actions that promote the development of alternative energy and the efficient management of energy will have a significant positive effect on the environment, forests, and natural resources**. The Colombian Strategy for Low Carbon Development estimates that annual reductions can reach 9 million metric tons of CO_2; that is a 51percent reduction in GHG by 2030, using a "business as usual" scenario (NDP

[35] The World Bank (2014) *Hacia la paz sostenible, la erradicación de la pobreza y la prosperidad compartida.* Notas de política: Colombia. Bogotá D. C.

2015). The Government has also planned for programs in energy efficiency and in alternative energy sources in the rural areas. Substituting solid fuels for cleaner fuel sources will lessen the health risks associated with indoor air pollution.

13. **Nonetheless, as the institutional reforms of FENOGE are under preparation, it is suggested to develop a deeper understanding of the potential environmental implications of the alternative energy program.** An SEA is suggested to inform the eligibility criteria and best alternatives to the development of non-conventional renewable energy (e.g., biomass, eolic, geothermal, solar, and marine), as well as the energy efficiency program (e.g., architectural remodeling, adaptation of internal installations).

Environmental Health

14. **Horizontal and vertical coordination for implementing environmental health policies, including the strengthening of the subnational level, will enhance the effectiveness of environmental health (Prior Action 1 and Triggers 2 of DPL 2 and trigger 3 of DPL 3).** The creation of the National Inter-sectoral Technical Commission for Environmental Health (CONASA) in 2010 was instrumental in the Government's objective to articulate the different entities involved in environmental health. In support of the environmental policies, CONASA's action plan contemplates the formulation and implementation of the Unified Information System for Environmental Health (SUISA) and the development of inter-sectoral and inter-institutional platforms at the departmental level with the aim of creating Territorial Environmental Health Councils (COTSAs) in all 32 departments. It is expected that, by 2018, all 32 COTSAs will have their action plans approved, which include local environmental health targets. Ongoing COTSA activities in Santander and Barranquilla show that the participation of local authorities and communities is key to effectively develop local action plans, in order to disseminate information on the prevention of health risks, including those that improve sanitation, clean water supply, and food safety. The net benefits include (a) reductions in the incidence of waterborne diseases that affect mainly children under age five; and (b) reductions in respiratory and cardiovascular diseases associated with indoor air pollution that affect mostly children under age five and women above age 30. Many of the already constituted COTSAs, however, have not identified key territorial environmental priorities for their action plans. These shortcomings are associated with incomplete data, weak coordination, and the required tools for inter-sectoral planning and priority setting. It is suggested that the institutional framework of the Unified Environmental Health Information System (SUISA) be consolidated, by supporting the Hydrology, Meteorology, and Environmental Studies Institute (IDEAM) and the National Health Institute (*Instituto Nacional de Salud*-INS). Both organizations have been working on the identification of variables and indicators of environmental health for SUISA, but the system has not been consolidated. Along with the consolidation of SUISA, a program to provide technical assistance to COTSAs for priority setting and the formulation of action plans is suggested.

Disaster Risk Management

15. **The Government reform to strengthen the planning and financing framework for natural disaster risk management, as stipulated in the NDP law, will contribute to enhance resilience of infrastructure and production sectors (Prior Action 1, Trigger 3 of DPL 2 and Trigger 4 of DPL 3)**. This policy action will improve the performance of the National System for Disaster Risk Management (SNGRD) and the National Disaster Risk Management Unit (UNGRD). The DPL will support the regulatory and operational framework

for the FNGRD to fund projects by national and regional entities, focusing initially on key sectors such as agriculture, transport, and housing. In addition, the DPL will support (a) further development of the policy, institutional, and regulatory framework for disaster risk management through defining objectives, programs, institutions, and budget to implement knowledge management, disaster risk mitigation, and institutional strengthening; and (b) the formulation of the regulatory and operational framework for the FNGRD to fund projects by national and regional entities, focusing initially, on key sectors such as agriculture, transport, and housing.

16. **These policy actions translate into significant positive effects on the environment, forests, and natural resources**. By strengthening the capacity of the state to (a) better understand the risks; (b) reduce the risks by a better management of the factors that contribute to those risks; and (c) respond adequately to disaster events, both at the national and subnational levels, several benefits ensue, including (a) a reduction in deaths, injuries, damages, and loss of assets, particularly in poorer sectors of society; (b) improvements in the safety and sustainability of water basins, as a result of better land use planning; (c) a decrease in CO_2 emissions due to reductions in wild forest fires and the loss of biodiversity; (d) a reduction in the potential damages to water supply, wastewater management, and power generation; and (e) a decline in the costs associated with infrastructure and agricultural damages.

17. **The World Bank is currently evaluating the second phase of the National Disaster Vulnerability Reduction Project to strengthen the technical capacity for disaster risk management in Colombia.** The project is expected to start operation in November 2015. The project aims at continuing the Bank's support to the GoC in its efforts to further strengthen its disaster risk management framework through (a) the application of disaster risk analysis and management in policy making at the sectoral and territorial levels; and (b) strengthening of risk reduction at subnational levels. The expected results include: (a) the consolidation of technical capacities across key national agencies and ministries (e.g., MVCT and MADS) for disaster risk management; (b) strengthening the institutional capacity of the National Unit for Disaster Risk Management (UNGDR) to coordinate, monitor, and evaluate an integrated disaster risk reduction program; and (c) supporting the streamlining of disaster risk reduction at sector and subnational levels. This project will address the most significant policy and institutional shortcomings identified in the policy SEA.

Assessment of Pillar 2

18. **Through Resolution No. 90963 (Prior Action 2), the Government has adopted a regulation to update the diesel quality parameters with the objective of reducing toxic emissions in air contamination.** The assessment found that the measure translates into significant environmental benefits, especially in reducing costs associated with premature mortality, lower respiratory illnesses in children, chronic bronchitis, restricted activity days, hospital admissions, as well as in emergency room and outpatient hospital visits. However, once the Government updates and consolidates the norms associated with pollutant emissions to allow for the renewal of the car fleet and to strengthen follow-up and control mechanisms (Trigger 7 of DPL 2), there is a risk that old vehicles will be sold in smaller cities and towns where the control is likely to be weak, thus spreading the pollution to smaller urban areas. It is recommended that complementary measures be established to prevent further air pollution from major polluter vehicles. Alternative measures, among others, include (a) a non-

operating registration; (b) an obligation that old diesel vehicles (of specified age) convert to natural gas; (c) retrofitting engines with more recent technology, especially for buses and large trucks; and (d) scrappage incentives (e.g., free family public transport pass for a certain period of time).

19. **To reduce the overall pollution of water bodies (Prior Action 3), the MADS has established quality parameters and maximum permissible limits for discharge of treated wastewater from industrial, commercial, and service activities to surface water bodies and sewage systems.** The aggregated costs associated with water pollution on health, the treatment of water for domestic and industrial consumption and for production and tourism are in the order of 0.3 percent of national GDP (3.7 percent agricultural GDP and 2.6 percent industrial GDP).[36] Large pollution concentrations are found in some of the most important river basins in the country, increasing the risk of diseases associated with contaminated water sources. The MADS' Resolution No. 631 updates the previous standards and extends to 41 new production activities. The policy action also implements new indicators to measure physiochemical pollutants, enabling more effective monitoring and control. If adequately implemented, the measure will translate into significant improvements in the quality of wastewater, with direct benefits to surface water bodies. Indirect benefits include (a) reduction in mortality and morbidity rates due to waterborne diseases; (b) the repopulation and increase in the diversity of hydro-biological species; (c) an increase in the scenic value of landscapes associated with water bodies; and (d) the restoration of aquatic and terrestrial ecosystems. Key challenges for the materialization of the positive effects, nonetheless, include resolving the limited technical capacity of some CARs and Sustainable Development Corporations (CDS) to monitor and control the new quality parameters of water. The assessment found that monitoring and processing equipment is one of the shortcomings among these corporations. Many of them either do not have environmental laboratories or if they have them, the data collection equipment and analysis infrastructure do not work. These shortcomings prevent the collection of reliable data, affecting the information that is needed to monitor the quality of wastewater. Support to these regional corporations that do not have the capacity to monitor and control the quality of wastewater is suggested, focusing on the technical aspects as well as on human resource development and institutional and organizational development.

20. **By establishing a set of rules for the reuse of treated wastewater in the industrial and agricultural sectors (Prior Action 4), the Government has moved forward in reducing the pollution load that is discharged into rivers and in decreasing the problems of water scarcity.** Through Resolution No. 1207, the MADS aims at regulating the use of treated wastewater for purposes other than as a fertilizer or as a soil conditioning agent. The norm has positive effects in the agricultural sector by making water available during drought periods and by providing nutrients to the soil. In the industrial sector, the wastewater can be recycled and used in cooling systems. It also contributes to the reduction of transaction costs associated with water treatment processes before their discharge. If effectively implemented, the norm will contribute to a reduction in water pollution, including the pathogenic load. Thus the measure will reduce the incidence of waterborne diseases. The measure states that in case of a contingency, the competent environmental authority must be notified and treated wastewater use must be stopped. It also stipulates that the analysis and

[36] *Larsen (2004), cited in Ministerio de Ambiente y Desarrollo Sostenible 2015, 10.*

implementation of the prevention, control, mitigation, and compensation of the impacts must be formulated and implemented by the generator user and the recipient user, according to "what the competent environmental authority establishes." This leaves a gap, in terms of the criteria that environmental authorities will use for establishing the contingency plans for the treated wastewater subsector. It is recommended that regulations be established for contingency plans in the event of foreseeable emergencies that involve the risk of serious environmental harm, as a result of accidental spillages of wastewater, or equipment or plant failure. Regulations should, at least, include: (a) criteria to determine in which cases an environmental audit must be performed, in order to determine risks; (b) when a contingency plan needs to be reviewed and updated; and (c) an incident notification and emergency communication protocol.

21. **MADS and the MVCT established a methodology for the formulation, implementation, evaluation, management, control, and update of the PGIRSs by municipalities and districts (Prior Action 5).** Resolution No. 754 provides a detailed methodology for developing a PGIRS to improve solid waste management and the service coverage of municipal cleaning by minimizing solid waste—at the source—and its final disposal. The assessment found that the measure contributes to developing land use criteria for landfills, enabling the closing of the pollution gap associated with open garbage dumps that have adverse effects on public health. Implementation of the methodology will also be instrumental in enhancing the quality of water, soil, and air, contributing to a reduction in GHG, infectious diseases, and disaster risks. These actions translate into significant environmental benefits. The resolution charges the environmental authorities with monitoring and control of the environmental goals of the PGIRS. Monitoring the progress of the policy action, in terms of its environmental achievements, is fundamental to evaluate the efficacy and relevance of the norm. Yet, environmental evaluation criteria have not been formulated. It is recommended that guidelines to monitor, control, and evaluate the environmental achievements of the PGIRS be established. The guidelines recommended for Prior Action 5 may include environmental achievements of this measure.

22. **By establishing an extra charge for the final disposal of non-recyclable solid waste (Prior Action 6), the Government aims at optimizing sanitary landfills' performance, thus reducing environmental degradation costs.** Article 88 of Law 1753 modifies previous regulations by adding an incentive in territorial units that complete sustainable PGIRS. The norm promotes recycling and thus, reduces environmental degradation costs. The environmental effects are positive. Since baseline data and indicators will feed into the monitoring and evaluation process, it is important that information on supply and demand as well as on the number of waste recyclers is carefully incorporated in the baseline study.

ANNEX 6: ANALYTICAL UNDERPINNINGS

Prior Actions under DPL 1	Analytical Underpinnings
Pillar 1 - Establish a set of policy and institutional measures for green growth in transport, energy, environmental health, and disaster risk management	
Prior Action 1: As a part of the National Development Plan, the Government set forth a green growth strategy which, inter alia: (a) defines guidelines for developing and improving public transportation systems; (b) entitles territorial entities (including districts and municipalities) to establish new funding resources for public transportation systems and infrastructure for non-motorized transportation; and (c) provides financial resources to the FENOGE, as evidenced, respectively, by articles 32, 33, 34 and 190 of Law No. 1753, dated June 9, 2015, published in the Official Gazette on June 9, 2015.	• The overarching Green Growth reform builds on the *Bases del Plan Nacional de Desarrollo 2014–2018, Todos por un Nuevo País. Versión para el Congreso. Departamento Nacional de Planeación. Febrero de 2015*. This document, prepared by the DNP, is the analytical basis for the NDP and provides the strategic guidelines for public policy in Colombia. Green growth has been defined by this document as one of its six structural strategies for the achievement of development based on peace, education, and equity. The NDP has been supported, among others, by key analytical documents entrusted by the DNP to different experts such as the *Bases Conceptuales sobre Economía Verde e Identificación de Sectores Potenciales para su Implementación de acuerdo a la experiencia internacional*, Mariet Alejandra Sánchez Abril, 2013. • In addition, this prior action is informed by *Evaluaciones del desempeño ambiental. Colombia. 2014. OCDE*. This OECD report provides a wide-ranging assessment of environmental conditions and policies that have helped in the preparation of the 2014–18 NDP. With regard to this prior action, this study examines how environment is being mainstreamed into Colombia's economic and sectoral policies. It examines the use of tax policy to pursue environmental objectives and progress in removing fiscal incentives that can encourage environmentally harmful activities. It also looks at other economic instruments to implement the polluter-pays and user-pays principles and to recover the cost of providing environmental services such as water and waste management. Moreover, it includes a discussion on public and private investment in environment-related services and infrastructure. Colombia's innovation performance, including on environment, is also assessed. • The Bank prepared the policy note *Hacia la paz sostenible, la erradicación de la pobreza y la prosperidad compartida. Notas de política: Colombia. Bogotá D. C.: Banco Mundial* (2014) which identifies priority issues on the environmental agenda through the lens of sustainable growth. Considering that natural resources are the backbone of the Colombian economy, the note presents the technical justification to (a) address pollution management as the main priority on Colombia's environmental agenda, with a focus on shared prosperity and (b) invest in wastewater treatment and solid waste management to keep up with growing urban areas. • The Bank has conducted solid analytical work to help client countries advance sustainable growth and create enabling conditions for green and inclusive growth. Bank studies (such as: *The World Bank (2012) Inclusive Green Growth. The Pathway to Sustainable Development. and the World Bank (2011) Policy Research Working Paper 5872. From Growth to Green Growth. A Framework, by Stéphane Hallegatte, Geoffrey Heal, Marianne Fay and David Treguer)* have contributed to clarify the concepts in analytical framework and to propose foundations for green growth based on (a) what needs to happen over the next 5–10 years before the world gets locked into patterns that would be prohibitively expensive and complex to modify, and (b) reconciliation of the short- and long-term goals by offsetting short-term costs and maximizing synergies and economic co-benefits. The detailed country- and context-specific analyses presented in the last set of Bank policy notes (mentioned before) for Colombia identify priority issues on the environmental agenda through the lens of green growth. As natural resources are critical to the Colombian economy, the note presents the technical justification to (a) address pollution management as the main priority on Colombia's environmental agenda, with a focus on shared prosperity and (b) invest in addressing wastewater treatment and solid waste management to keep up with growing urban areas. • **Energy.** The triggers related to energy are supported by the report Low-Carbon Development for Colombia (2014) prepared by the Bank with the GoC, which is described below. In particular, these triggers are supported by the report *Integración de las energías renovables no convencionales en Colombia* prepared by MINMINAS y UMPE (2015) with the support

Prior Actions under DPL 1	Analytical Underpinnings
	of the Global Environment Facility and the Inter-American Development Bank. This report has served to develop activities, analyses, and proposals to promote enabling conditions for penetration of nonconventional renewable energy sources through the identification of major barriers at the national level and the determination of potential regulatory measures and policy recommendations as well as the necessary actions to develop a strategy targeted to these sources in Colombia. In addition, ISAGEN developed specific technical work in the field of geothermal energy which is under this same technical cooperation. • **Transport.** The trigger related to transport is supported by the analytical underpinnings that the Bank was leading between 2007 and 2014, which were described for Prior Action 2. In addition, the Bank prepared the report Low-Carbon Development for Colombia (2014) jointly with the DNP. This report was intended to contribute to Colombia's climate change strategy and action plan. It represents a two-year effort by a team of Colombian and international experts to identify and evaluate policies and actions to reduce GHG emissions. The study used two important tools for undertaking low carbon assessments: an economic methodology for estimating the costs of low carbon measures across sectors and a macroeconomic model developed by the DNP to assess the integrated impacts of specific low carbon measures on the rest of the economy, including economic growth and employment. The recommendations provided by this report support the proposed prior action and are consistent with the *Plan de acción sectorial de mitigación. Sector Transporte,* which was prepared by the Minister of Transport as part of the Low Carbon Strategy for Colombia. For the transport sector in particular, the DNP has requested the preparation of the report *Crecimiento Verde e Inclusivo para el Sector Transporte en Colombia* by Darío Hidalgo (2014). This report discusses the principles for green and inclusive growth in the transport sector, including a diagnosis and proposals to be included in the NDP 2014–2018. • **Environmental Health.** The Government has made progress in measuring the impact of this environmental health policy implementation advancing the design of the Information System on Environmental Health through the study *Propuesta de estructura técnica y conceptual, diseño del Sistema Unificado de Información de Salud Ambiental (SUISA). Documento realizado por el Ministerio de Ambiente y Desarrollo Sostenible, a través del contrato de consultoría 326 de 2014, IDS Loan.* This prior action is being supported by a technical concept: *Proyecto Resolución. "Por la cual se modifica el artículo 4 de la Resolución 898 de 1995, modificado por la Resolución 182087 del 17 de diciembre de 2007." MADS. 2014.* • **Disaster Risk Management.** The Bank has led a study—*Analysis of Disaster Risk Management in Colombia: A Contribution to the Creation of Public Policies*. Coordinators and Editors: Ana Campos G., Niels Holm-Nielsen, Carolina Díaz G., Diana M. Rubiano V., Carlos R. Costa P., Fernando Ramírez C., and Eric Dickson. The World Bank Group, GFDRR. 2011. As a result of the immense losses caused by the La Niña phenomenon in 2010–2011 and within the scope of the agenda on DRM that the Bank has maintained since 1999 with the Colombian Government, the DNP requested the support of this institution to conduct a comprehensive assessment of the risk management policies and make short- and long-term strategic recommendations to help reduce the disaster's impact on the population and the economy. This study, which is not limited to analyzing the risk causes or measuring their growth, is the result of a joint effort with multiple public and private agents. It goes in depth into the institutional advances in risk management at different Government levels and explains how this issue has been incorporated in the territorial and sectoral public administration. Additionally, it indicates the opportunities to articulate DRM in current planning, investment, monitoring and control instruments and makes evident the need to define public and private responsibility as part of the strategy in reducing the state's fiscal vulnerability. The study shows that if the country does not want stagnation in its economic growth due to more frequent losses and at a greater scale, a radical change is essential in the development policies and in territorial and sectoral management practices. Therefore, this study defines a set of recommendations so that DRM becomes a state policy, emphasizing that improving land use and land occupation conditions is a priority in reducing the impact of disasters.

Prior Actions under DPL 1	Analytical Underpinnings
	• The basis of these triggers has also been informed by the following study conducted by the GoC and the IADB: *DNP y Banco Interamericano de Desarrollo (BID). 2014. Estudio de impactos económicos del cambio climático en Colombia. Bogotá D. C.: DNP y BID.* This study concerns the assessment of the economic impacts of climate change on a number of important productive sectors and seeks to identify the major vulnerabilities and opportunities for Colombia toward climate change, generating the relevant knowledge for decision makers to identify cost-effective adaptation measures and to identify gaps in information to improve in a continuous process knowledge of the relationship between climate change and the economy.
Pillar 2 - Improvement improving environmental quality by reducing $PM_{2.5}$ in air; strengthening regulatory and economic instruments for reducing water pollution; and increasing capacity for solid waste disposal and enhancing waste recycling.	
Prior Action 2: The Government adopted a regulation to update the quality parameters for diesel fuel at the national level, with the objective of reducing toxic emission in air contamination, as evidenced by Resolution No. 90963, dated September 10, 2014, issued jointly by the Government's Ministry of Mines and Energy and the Ministry of Environment and Sustainable Development, published in the Official Gazette on September 11, 2014.	• The Government and the Bank maintained a long-lasting dialogue on pollution management that started in 2007 and was finalized by the report entitled *Environmental Priorities and Poverty Reduction: A Country Environmental Analysis in Colombia*. This study was carried out in parallel with the preparation of the first Sustainable Development DPL to provide the Colombian Government with an analytical framework to support its efforts toward achieving the Millennium Development Goals (MDGs), with its findings expected to support the design and implementation of policies focused on protecting the most vulnerable groups, especially children under five years of age in poor households. By achieving this objective, the CEA provided a basis for the structure of that loan and for the future development of related operations. This study was followed by more recent analytical efforts which have updated some of the variables originally considered in 2007: (a) *Overcoming Institutional and Governance Challenges in Environmental Management Case Studies from Latin America and the Caribbean Region*. Environment and Water Resources LCSEN, Occasional Paper Series; (b) *Environmental Health Costs in Colombia: The Changes from 2002 to 2010*. The World Bank, Latin America and Caribbean Region. June 2014; (c) *Environmental Health in Colombia: An Economic Assessment of Health Effects and their Costs*. Prepared for the World Bank by Bjorn Larsen and John Magne Skjelvik, December 2014; and (d) *Benefits and Costs of Household Air Pollution Control in Colombia*. Prepared for the World Bank by Bjorn Larsen, December 30, 2014. These subsequent updates confirm the trends and the priorities identified in 2007. • The Government has made progress in measuring the impact of this environmental health policy implementation advancing the design of the Information System on Environmental Health through the study *Propuesta de estructura técnica y conceptual, diseño del Sistema Unificado de Información de Salud Ambiental (SUISA). Documento realizado por el Ministerio de Ambiente y Desarrollo Sostenible, a través del contrato de consultoría 326 de 2014, IDS Loan.* This prior action is being supported by a technical concept: *Proyecto Resolución. "Por la cual se modifica el artículo 4 de la Resolución 898 de 1995, modificado por la Resolución 182087 del 17 de diciembre de 2007." MADS. 2014.*
Prior Action 3: The Government established parameters, limits, and procedures for the discharge of treated wastewater originating from selected agricultural, industrial, commercial and service activities, with the objective of reducing the overall pollution of water bodies, as evidenced by	• This prior action is also supported by the analytical underpinnings that the Bank has been leading between 2007 and 2014, which have been described for Prior Action 2, presented above. • The GoC, through the technical teams in the MADS, has made analytical efforts to inform the design of this prior action through the following documentation: (a) *Memoria Justificativa de la Resolución por medio de la cual se adoptan disposiciones relacionadas con el uso de las aguas residuales tratadas. MADS. 2013.;* (b) *Soporte Técnico para la resolución: Por la cual se establecen los Parámetros y Valores Límites Máximos Permisibles en Vertimientos Puntuales a Cuerpos de Aguas Superficiales y a Sistemas de Alcantarillado Público, y se Dictan otras disposiciones. MADS. Marzo de 2015;* and (c) *Memoria Justificativa la resolución: Por el cual se establecen los Parámetros y Valores Límites Máximos Permisibles en Vertimientos Puntuales a Cuerpos de Aguas Superficiales y a Sistemas de Alcantarillado Público, y se Dictan otras disposiciones. MADS. Setiembre de 2013.* In addition, the GoC has

Prior Actions under DPL 1	Analytical Underpinnings
Resolution No. 631, dated March 17, 2015, issued by the Government's Ministry of Environment and Sustainable Development, published in the Official Gazette on April 18, 2015. .	advanced a strategy to ensure the sustainability of the changes related to the management of polluted water by means of the following study: *"Diseñar una estrategia de sostenibilidad financiera para la implementación de la Política Nacional de Gestión Integral del Recurso Hídrico - PNGIRH" Producto 2: Estimación de recursos y fuentes de financiación existentes y su proyección al 2022. Periodo del informe: 3 de septiembre de 2014 a 20 de octubre de 2014. DNP, Economía Urbana Soluciones Públicas y Privadas. 2014.*
Prior Action 4: The Government established a set of rules, including quality parameters, regulating the reuse of treated wastewater for selected industrial and agricultural activities, as evidenced by Resolution No. 1207, dated July 25, 2014, issued by the Government's Ministry of Environment and Sustainable Development, published in the Official Gazette on August 13, 2014 .	• This prior action is also supported by the analytical underpinnings that the Bank was leading between 2007 and 2014, which were described for Prior Action 2, presented above.
Prior Action 5: The Government established a methodology for the formulation, implementation, evaluation, management, control, and update of Solid Waste Integrated Management Plans (PGIRS) by municipalities, districts, and other selected local entities within its territory, as evidenced by Resolution No. 754, dated November 25, 2014, issued jointly by the Government's Ministry of Housing, City and Territory and the Ministry of Environment and Sustainable Development, published in the Official	• This prior action is also supported by the analytical underpinnings that the Bank was leading between 2007 and 2014, which were described for Prior Action 2, presented above. • In the context of the Recent Economic Developments in Infrastructure (REDI) Preparation of National Strategy for Infrastructure Development (P151249), the Bank has conducted the study *COLOMBIA: Desarrollo Económico Reciente en Infraestructura. Preparación de la Estrategia Nacional para el Desarrollo de la Infraestructura Sector Aseo. Magda Carolina Correal S. Informe Final Versión Final. Diciembre 12 de 2014.* The objective of the REDI was to support the preparation of a national strategy for infrastructure development. In doing so, special emphasis was placed on increasing capabilities within the DNP in undertaking this task. An implementation team was created within the DNP. Its main responsibility has been to lead the process aimed at building consensus regarding the future of the infrastructure sector in the country. The strategy will serve as a basis for the implementation of new infrastructure policies in the country (policies related not only to sectoral issues but also to infrastructure financing and public-private partnership [PPP] schemes). Additionally, it will serve as a tool for sectoral planning and investment prioritization.

Prior Actions under DPL 1	Analytical Underpinnings
Gazette on December 1, 2014.	
Prior Action 6: The Government established a set of incentives to promote the recycling of solid waste, including an additional fee to be charged per ton of solid waste finally disposed in sanitary landfills, as evidenced by Article 88 of Law No. 1753, dated June 9, 2015, published in the Official Gazette on June 9, 2015.	• This prior action is also supported by the instruments presented for Prior Action 5. In addition, the GoC has requested the preparation of the report *Recicladoras y recicladores de Bogotá, Colombia* by Angélica Acosta Táutiva y Rovitzon Ortiz Olaya (2013) as part of a study to monitor the informal economy. The study combines quantitative and qualitative methods of research and seeks to provide a thorough understanding of how three groups of home informal workers, street vendors, and waste pickers are affected by (and respond to) economic, political trends and urban practices, the dynamics of the value chain, and other economic and social drivers. • The GoC has also requested the preparation of the report *Informe sobre la política pública de inclusión de recicladores de oficio en la cadena De reciclaje Barranquilla, Bogotá, Bucaramanga, Manizales, Medellín* by Oscar Andrés Jiménez (2014). This document contains an analysis of the model of public policy for inclusion of the recyclers in five cities in Colombia.

ANNEX 7: ESTABLISHMENT OF BASELINE - MEAN[37] ANNUAL CONCENTRATION OF PARTICULATE MATTER ($PM_{2.5}$)[38]

Background

1. Air pollution, notably $PM_{2.5}$ (fine particulate matter less than 2.5 microns in aerodynamic diameter), has been identified as a significant environmental risk to health in several Colombian cities and urban centers. Colombia's standards for mean ambient $PM_{2.5}$ concentrations are 25 $\mu g/m^3$ annually and 50 $\mu g/m^3$ for a 24-hour period. In comparison, the World Health Organization air quality guideline values[39] for $PM_{2.5}$ are 10 $\mu g/m^3$ annual mean, and 25 $\mu g/m^3$ 24-hour mean. The proposed DPL includes policy actions to reduce ambient air pollution, specifically $PM_{2.5}$ concentrations.

Objectives

2. The purpose of this annex is to present the methodological approach taken to establish an appropriate baseline of mean annual concentration of ambient $PM_{2.5}$, in the cities of Medellin, Bogota, and Cali prior to the approval of the DPL program. Upon completion of the DPL program (currently envisaged to take place in 2018), measurements of mean annual $PM_{2.5}$ ambient concentrations will be compared to the baseline in order to assess whether the DPL target for improved air quality has been met.

Study Area

3. Three cities were initially examined as part of this exercise, namely Medellin, Bogota and Cali, given the high levels of air pollution and populations in these cities. Each of these cities forms part of a metropolitan area, so that in establishing a baseline, it is important to specify the limits to be considered. For the city of Bogotá, the limits of the Federal District were considered; while for Cali, those of the Municipality of Santiago de Cali were considered. Medellín shares the Aburrá Valley air shed and metropolitan area with a number of municipalities, which jointly comprise the *Área Metropolitana del Valle de Aburrá* (AMVA). For Medellin, the entire AMVA was considered to be the limit.

Publicly Available Data Sources[40]

4. Air quality monitoring and measurement in Colombia are conducted by local and regional environmental authorities (*Autoridades Ambientales*). Data from these activities are publicly available on the internet at the websites of the respective environmental authorities. For the cities of Bogotá and Cali, the environmental authorities are the *Secretaria Distrital de Ambiente* (SDA), Bogotá; and *Departamento Administrativo de Gestión del Medio Ambiente* (DAGMA), Cali. For the metropolitan area including Medellín, the environmental

[37] The terms "mean" and "average", are used interchangeably in this annex.
[38] This annex was prepared based on the findings of a draft Consultant report prepared for the World Bank by C. Weaver (2015), and discussions between the Bank and GoC.
[39] World Health Organization, Air Quality Guidelines: Global Update 2005. http://www.euro.who.int/en/health-topics/environment-and-health/Housing-and-health/publications/pre-2009/air-quality-guidelines.-global-update-2005.-particulate-matter,-ozone,-nitrogen-dioxide-and-sulfur-dioxide
[40] Publicly available data sources as of August 11, 2015

authority is the *Área Metropolitana del Valle de Aburrá* (AMVA). Published data on the mean annual $PM_{2.5}$ concentrations taken for the latest available calendar year - 2014 - are presented and discussed below.

5. **Bogota.** Monthly average $PM_{2.5}$ concentrations for a number of air quality monitoring stations were downloaded from the *Observatorio Ambiental de Bogotá*.[41] Until 2013, only very limited $PM_{2.5}$ data were available for Bogotá, but a number of new $PM_{2.5}$ monitors began operation in late 2013 and 2014.

6. Table 7.1 shows the mean of the reported monthly averages for the seven monitoring sites for which at least nine monthly average values were reported during January to December 2014.[42]

Table 7.1: Average 2014 $PM_{2.5}$ concentrations (in µg/m^3) for seven air quality monitoring sites in Bogotá

	Air Quality Monitoring Site						
	Kennedy	**Carvajal**	**CdAR**	**Usaquen**	**Tunal**	**Min Ambiente**	**Suba**
PM $_{2.5}$ concentration	32.0	35.1	20.3	13.6	23.3	15.9	21.8
Months observed	11	9	10	10	12	9	9
Environment	Urban	Urban	Urban	Urban	Urban	Urban	Suburban
Type	Background	Traffic	Background	Background	Background	Background	Back-ground

7. Table 7.1 shows, the annual average $PM_{2.5}$ concentrations for Kennedy and Carvajal - the two monitoring sites in the southwest - exceed the Colombian air quality standard of 25 µg/m^3. Next highest are the concentrations at the Tunal (south central), Suba (northwest), and CdAR (central) locations, while the lowest average $PM_{2.5}$ concentrations are found at the MinAmbiente (east central) and Usaquen (northeast) sites. Nonetheless, all seven sites exceed WHO guidelines for annual average $PM_{2.5}$ concentrations. Except for Carvajal, each of the $PM_{2.5}$ monitoring stations is considered a "background" site - located so as to avoid the influence of nearby pollution sources. Most of these are located in parks and other green areas. The resulting measurements will likely tend to understate the typical citizen's exposure to $PM_{2.5}$ from sources such as vehicle traffic.

8. **Medellín.** Table 7.2 shows the annual average $PM_{2.5}$ concentrations published[43] for the nine air quality monitoring sites that measured $PM_{2.5}$ concentrations during 2014, as well as the number of days of valid measurements obtained at each site. Eight of the sites were equipped with continuous $PM_{2.5}$ monitors, while the Medellín-UNFM site was equipped with a filter-type PM sampler that operated about every three days.

[41] http://oab.ambientebogota.gov.co/es/indicadores?id=753&v=l

[42] The table also shows the number of months for which a monthly average value was reported. The Colombian government has established a threshold for "representativeness" of monitoring data that calls for at least 75% coverage. It appears that months for which data were not reported were those for which the data coverage fell below this 75% criterion. Monitoring sites for which the monthly averages were available for less than 75% of the months in the year were excluded from Table 1.

[43] AMVA, *Red de Calidad Del Aire del Valle de Aburrá: Informe Mes De Diciembre De 2014*, available at: www.metropol.gov.co/CalidadAire/isodocRedAire/Resumen%20anual%20calidad%20del%20aire%202014.pdf

Table 7.2: Average 2014 $PM_{2.5}$ concentrations (in µg/m^3) for nine air quality monitoring sites in the Valle del Aburrá Metropolitan Area (Medellín)

	Air Quality Monitoring Site								
	Medellin					Itagüí		Caldas	La Estrella
	UNNV	MANT	UNFM	PJIC	UNEP	CJUS	CONC	LASA	METR
PM 2.5 concentration	29.9	37.4	21.3	17.9	25.0	32.1	25.1	24.9	41.2
Days observed	349	354	92	281	334	336	341	339	292
Environment	Urban	Urban	Urban	Urban	Surburban	Urban	Urban	Urban	Urban
Type	Background	Traffic	Traffic	Traffic	Back-ground	Industrial	Indus-trial	Back-ground	Indus-trial

9. As Table 7.2 shows, three of the $PM_{2.5}$ monitoring sites in the Medellín metropolitan area are located so as to reflect the influence of traffic, three to reflect that of industry, and three to measure background concentrations. This is in contrast to Bogotá, where six of the seven sites were classed as "background." Surprisingly, two of the "traffic influenced" sites have the lowest average $PM_{2.5}$ concentrations among those measured. The highest $PM_{2.5}$ concentrations were found in the industrial area of La Estrella (at the metro station), and at the traffic-influenced MANT site in central Medellín. Overall, five of the nine sites exceeded the Colombian air quality standard of 25 µg/m^3, with two more barely meeting the limit. All nine sites far exceeded WHO guidelines for $PM_{2.5}$.

10. **Cali**. The $PM_{2.5}$ monitoring network in Cali is less dense than those in Bogotá and Medellín. Table **7.3** shows the annual average values for the three $PM_{2.5}$ monitoring stations for which data were reported by DAGMA.[44] The three stations are located in the suburban periphery of Cali. No annual average data are available for the urban center, or for other areas with heavy traffic. The highest $PM_{2.5}$ concentration is found at the Base Area station in the northeast, which is affected by nearby industries. All three stations are well within the Colombian $PM_{2.5}$ standard of 25 µg/m^3 but exceed WHO guideline values.

Table 7.3: Average 2014 $PM_{2.5}$ concentrations (in µg/m^3) for three air quality monitoring sites in Cali

	Air Quality Monitoring Site		
	Uni Valle	Base Aerea	Compartir
PM 2.5 concentration	15.6	18.7	17.1
Percentage observed	92.6	68.8	70.1
Environment	Suburban	Suburban	Suburban
Type	Background	Industrial	Background

Data Set and Methodology Used to Define Baseline

11. The dataset that was used to establish the baseline was reviewed and jointly agreed upon by the Bank and the Ministry of Environment and Sustainable Development (*Ministerio de Ambiente y Desarrollo Sostenible*, MADS) during the World Bank Appraisal Mission that

[44] Data for the Universidad del Valle and Base Aerea stations were presented in a graphic in DAGMA's annual air quality report for 2014, DAGMA, Informe Annual de Calidad del Aire de Santiago de Cali, 2014. The results for the Compartir station were not included in that report, but were provided separately through personal communication with DAGMA.

took place on August 10–13, 2015 (presented in Table 7.4). It can be noted that at some of the stations- namely Bogotá-Kennedy, Medellin MANT, and Medellin-UNFM - the values presented in Tables 7.4 and 7.5 differ from the values presented for the same stations in Table 7.1 and 7.2. During the August 2015 mission, MADS informed the Bank mission of corrections to the published data (annual average $PM_{2.5}$ concentrations) at the aforementioned stations.[45] The dataset used to establish the baseline incorporates the corrected data as provided by MADS.

12. Given the available data, a number of approaches were considered for defining the baseline, and are discussed in a separate report.[46] The approach proposed by GoC was selected for the definition of the baseline. Under this approach only monitoring stations that complied with the following criteria were selected: (a) deficient $PM_{2.5}$ data are available to be "representative" (i.e. minimum 75 percent valid data coverage) as required in Colombia by the Protocol for monitoring and for air quality; (b) the 2014 annual average $PM_{2.5}$ concentrations exceed the Colombian air quality standard of 25 $\mu g/m^3$ (Resolution 610 of 2010); and (c) the local environmental authority that operates the station has an active air pollution control program.

13. The data from the seven monitoring stations presented in Table 7.4 meet the above criteria, and jointly provide the baseline for annual average $PM_{2.5}$ concentration as required in the policy matrix for the DPL program.

Table 7.4: Dataset Used to Establish Baseline of Mean Annual $PM_{2.5}$ Concentration (in $\mu g/m^3$)[47,48]

	Air Quality Monitoring Site						
	Bogotá		**Medellin**			**Itagüí**	
	Kennedy	**Carvajal**	**UNNV**	**MANT**	**UNFM**	**CJUS**	**CONC**
PM 2.5 concentration	31.5	35.1	29.9	37.9	28.6	32.0	25.1
Environment	Urban	Urban	Urban	Urban	Urban	Urban	Urban
Type	Background	Traffic	Background	Traffic	Traffic	Industrial	Industrial

Advantages and Limitations Related to Selected Data Set

14. This selected methodological approach has the advantage of simplicity, in that it is based on monitoring results for individual sites. At the same time, the possibility of overweighting less-polluted sites is minimal, since only severely polluted sites are included in the baseline. Furthermore, the approach reflects the on-the-ground realities associated with data quality and quantity available on air quality (specifically $PM_{2.5}$), and air quality management in Colombia.

[45] In an email to the Bank, dated August 12, 2015, (sent by Ing. Sergio Hernandez Cruz of MADS' *Dirección de Asuntos Ambientales Sectorial y Urbana* - DAASU), MADS informed the Bank of the corrections to the published data and indicated that GoC would subsequently make the corrections to the published data.

[46] Draft Consultant Report prepared for the World Bank by C. Weaver (2015).

[47] Full names of the air quality monitoring sites are: **Bogotá**, Kennedy and Bogotá, Carvajal; **Medellín**, Universidad Nacional (UNal) Facultad de Minas (MED-UNFM); Medellín, Museo de Antioquia (MED-MANT); Medellín, UNal Núcleo El Volador (MED-UNNV); **Itagüí**, Casa de Justicia (ITA-CJUS); and Itagüí, Liceo Consejo Municipal (ITA-CONC).

[48] La Estrella METR data are not included in table. MADS confirmed that La Estrella METR is temporary - the mobile station was located to monitor the impact of a major construction project, and will be moved in 2016. Thus, comparison data will not be available for this site in 2018.

15. The main limitation to this approach is that it could potentially shift attention from seeking a general reduction in $PM_{2.5}$ concentrations in major urban areas, to reducing $PM_{2.5}$ concentrations in the areas of the Aburrá Valley and in southwestern Bogotá. Furthermore, while the approach would focus strongly on the Aburrá Valley, much of this focus would not necessarily be due to greater air quality needs but to AMVA's more aggressive approach to the siting of its monitoring stations. Six of the nine AMVA $PM_{2.5}$ monitoring sites (Table 7.2) are considered to be affected by traffic or industry, and five of those sites are captured by GoC's prioritization process according to the criteria discussed above. In contrast, only one of seven sites in Bogotá (Table 7.1) is so affected, and none of three sites in Cali (Table 7.3). Had Bogotá and Cali focused more strongly on monitoring of critical points rather than background levels, it is likely that additional priority sites would have been identified in those cities.

16. In discussions with GoC, the Bank was informed that by law, MADS could not require environmental authorities to comply with air quality concentrations that are below the Colombian standard of 25μg/m^3; and that $PM_{2.5}$ reduction efforts going forward will not be limited to the specific monitoring sites listed in Table 7.5, but will continue across major urban areas, including the listed sites.

Summary of Baseline (2014) and Target (2018) Values for Annual Average $PM_{2.5}$ concentration, Proposed Indicator, and Considerations for 2018 Measurements

17. Table 7.5 summarizes the baseline and target values (based on 5% reduction of $PM_{2.5}$ concentrations) for annual average $PM_{2.5}$ concentration at the seven monitoring stations that are incorporated in the policy matrix.

Table 7.5: Summary of Baseline and Target Values of Mean Annual PM2.5 Concentration

Environmental Authority	City	Monitoring Site	2014	2018
			Baseline PM2.5 concentration (μg/m^3)	Target PM2.5 concentration (μg/m^3)
Secretaria Distrital de Ambiente (SDA) Bogotá	Bogotá	Kennedy	31.5	29.9
		Carvajal	35.1	33.3
Área Metropolitana del Valle de Aburrá (AMVA)	Medellin	UNNV	29.9	28.4
		MANT	37.9	36.0
		UNFM	28.6	27.2
	Itagüí	CJUS	32.0	30.4
		CONC	25.1	23.8

Proposed Indicator – Taking into account the available data and the discussion with GoC during the Appraisal Mission, the suggested phrasing of the indicator for the proposed DPL program was agreed as follows: *Percentage reduction in the mean annual concentration of $PM_{2.5}$ in at least seven prioritized monitoring stations in the cities of Medellín, Itagüí, and Bogotá.* The Government will take the steps necessary to ensure that representative annual average $PM_{2.5}$ monitoring results are available for the same seven monitoring stations (listed in Table 7.5) in 2018.

Notes

[1] The NDP is the document that supports and provides strategic guidelines for public policies formulated by the president of Colombia. Its preparation, dissemination, monitoring, and evaluation are the DNP's responsibility. The NDP is the formal and legal instrument by which the government's objectives are plotted, allowing the subsequent evaluation of its results. According to the Constitution of Colombia, 1991, the NDP comprises a general section describing long-term goals and strategies, as well as an investment plan for national public entities, which contains details related to financial resources required to implement the plan and funding sources. The National Development Plan 2014–2018 was approved through article 1 of Law No. 1753, dated June 9, 2015, and published in the Official Gazette on June 9, 2015.

[2] This support builds on and complements past Bank policy actions and supports the long-term partnership between the GoC and the Bank and a broader programmatic engagement that includes policy and investment lending, knowledge, and convening services, all in support of sustainable development and green growth in Colombia. The government also recognizes the role of natural capital accounting as a tool to monitor the implementation of the National Development Plan, and is currently working under the Wealth Accounting and Valuation of Ecosystem Services (WAVES) Partnership to strengthen the development and implementation of its natural capital accounts, so they can provide valuable input in the design of priority public policies.

[3] The global MPI is an international measure of acute poverty, which complements traditional income-based poverty measures by capturing overlapping deprivations suffered by people at the same time.

[4] Banco Mundial. 2014. Notas Políticas de Colombia: hacia la paz sostenible, la erradicación de la pobreza y la prosperidad compartida. Washington, DC: Banco Mundial.

[5] The concept of adjusted net savings rests upon the premise of three forms of capital—natural, human, and physical. Transformation of one form of capital into another is possible. Thus, education expenditures are added to gross natural savings and partly offset the depletion of natural capital (Hamilton 2000; Hamilton and Ruta 2009).

[6] This measure is calculated by subtracting from a country's gross national savings all forms of capital depreciation, including the loss of natural capital (i.e., mineral depletion and natural resources degradation) and pollution damages.

[7] The World Bank. 2014. Hacia la paz sostenible, la erradicación de la pobreza y la prosperidad compartida. Notas de política: Colombia. Bogotá D. C.

[8] Sanchez-Triana, et al, 2007, cited in World Bank, Colombia Policy Notes, 2014.

[9] Consultant Report prepared for the World Bank: Larssen et al., 2014. Environmental Health in Colombia. An Economic Assessment of Health Effects and their Costs.

[10] Consultant Report prepared for the World Bank: Larsen et al., 2014. Environmental Health in Colombia. An Economic Assessment of Health Effects and their Costs.

[11] The overall estimate is from Sanchez-Triana, et al, 2007, cited in World Bank, Colombia Policy Notes, 2014. Since then, more detailed economic cost estimates have been done, although with different methodologies that are not always comparable. Nevertheless, both World Bank Development Indicators and these country-specific studies support the claim that the overall cost of environmental degradation in Colombia is rising.

[12] Colombia's high vulnerability to climate change speaks to its need to adapt to climate change impacts. Steps to adapt to climate change are part of this DPL series. However, actions to reduce Colombia's carbon emissions are not an important part of this DPL series. It is certainly true that many green growth-related policies encourage energy and resource efficiency, and thereby have significant climate mitigation co-benefits as well. Nevertheless, the targets and indicators for this DPL series does not include those co-benefits.

[13] The World Bank. 2014. Hacia la paz sostenible, la erradicación de la pobreza y la prosperidad compartida. Notas de política: Colombia. Bogotá D. C.

[14] Declaration on Green Growth. June 25, 2009 - C/MIN(2009)5/ADD1/FINAL. http://acts.oecd.org/Instruments/ShowInstrumentView.aspx?InstrumentID=70&InstrumentPID=67&Lang=en&Book=False.

[15] The remaining topics are the end of the armed conflict (pending) and the preparation of a strategy for the victims.

[16] The first agreement on rural development aims to transform the living conditions in rural areas, reversing the negative effects of violence. The second agreement reached established the basis of an eventual participation

of the FARC in Colombian politics. It included rights and guarantees for new political parties that may emerge after a final peace deal, mechanisms of citizen participation, and measures to promote engagement in politics. Finally, the FARC agreed through the third point of the agenda to break any relationship with the illegal drugs business, while the GoC compromised to continue fighting illegal drugs and give greater priority to crop substitution and drug treatment programs.

[17] Moody's upgraded Colombia's debt rating on July 2014 (to Baa local currency, Baa2 foreign currency); Fitch upgraded on December 2013 (to BBB+ and BBB, respectively), while S&P upgraded on April 2013 (also to BBB+ and BBB, respectively).

[18] According to the World Bank commodity price data (GEP), energy prices fell 52 percent between June 2014 and January 2015, while the mineral and metals index fell by 15 percent in the same period.

[19] Source: DANE.

[20] Source: Central Bank.

[21] Triggered by an increase in Colombia's weight in the J.P Morgan Emerging Market Bond index.

[22] Term longer than one year.

[23] Source: DANE

[24] As the economy approached the full use of production capacity in 2014 and prices rapidly converged to the midpoint of the target range, the Central Bank initiated a process of monetary tightening that lasted five months, when the policy rate reached 4.5 percent.

[25] Ojeda and Trejos (2012) find that Real Exchange Rate (RER) has fluctuated above its ideal levels because the observed current account has been better than what was predicted by the fundamentals of the economy.

[26] Source: Central Bank. The RER has depreciated approximately 12 percent since 2012, closer to the values predicted by the country's fundamentals. This result was mostly driven by less favorable external conditions—lower oil prices and the tightening of US monetary policy. Overall, Colombia's exchange rate fluctuation has been an effective shock absorber, helping buffer the impacts of changes in the external environment.

[27] Source: Central Bank and Financial Superintendence.

[28] Colombia's financial oversight is strong and recent reforms have further strengthened cross-border risks and supervisory frameworks. Banking and insurance sector intermediation is comparable to countries of similar per capita GDP, size, and demographics—although capital market intermediation to the private sector remains below potential.

[29] Source: IMF Article IV and Ministry of Finance.

[30] The large depreciation of the peso in the first half of the year has temporarily pushed prices slightly above the upper limit of the targeted band, but inflation is expected to converge to 3.6 percent by the end of 2015. Over the rest of the projection period price variation should stay around 3 percent, kept in check by timely Central Bank interventions.

[31] Most of the adjustment would come from capital spending. This reduction is partially compensated by larger private investment through PPP, but in the absence of additional tax revenues, total investment could suffer.

[32] A pragmatic first step discussed by the government is to reform the system for nonprofit organizations, which have been proliferating in recent years. Other options under consideration include strengthening the income tax system and increasing VAT rates and base (IMF, 2015).

[33] Because a large share of central government debt is in local currency and on fixed terms, shocks to the interest (one standard deviation shock) and exchange rates (20 percent devaluation) have only a modest impact on the debt trajectory. At the same time, the debt outlook is not severely affected by shocks to economic growth (one standard deviation shock) or if the primary balance is left unchanged.

[34] Colombia Systematic Country Diagnostic, June 20, 2015, Report R2015-0135, World Bank, p. 10.

[35] Banco Mundial. 2014. Notas Políticas de Colombia: hacia la paz sostenible, la erradicación de la pobreza y la prosperidad compartida. Washington, DC: Banco Mundial.

[36] This policy note complements the Bank's ASA package by analyzing the role that sound environmental and natural resources management play in Colombia with regard to its growth prospects, poverty, and inequality. The policy note helps identify main development challenges and specific policy recommendations to address these challenges. In addition, the priorities addressed by this DPL have also been discussed as part of the Colombia Systematic Country Diagnostic (P151459).

[37] A separate operation to be funded by the KfW Development Bank supports the reforms associated with the natural resources management aspect of part (b) of the green growth agenda, i.e., the sustainable use of natural capital.

[38] 9.7 million vehicles refers to the total number of vehicles, including cars and light trucks (4.2 million), motorcycles (4.9 million), buses and minibuses (0.216 million), trucks (0.350 million), machinery (0.014

million), and others (0.034 million). 2013 data from Ministerio de Transporte, Anuario Transporte en Cifras - Estadísticas. https://www.mintransporte.gov.co/descargar.php?idFile=11527.
[39] "Crecimiento Verde e Inclusivo para el Sector Transporte en Colombia". 2014.
[40] Colombian MT, El Transporte en Cifras, 2013.
[41] 130 cars and light trucks per 1,000 people.
[42] Instituto Nacional de Medicina Legal y Ciencias Forenses.
[43] Consultant Report prepared for the World Bank: Larsen et al., 2014. Environmental Health in Colombia: An Economic Assessment of Health Effects and their Costs.
[44] The SITP improves the efficiency of urban transport by reducing the high number of buses and frequency on a given route and eliminating redundancy. According to the World Bank study on Low Carbon (2014), if the SITPs were introduced, carbon emissions from carbon transport could be reduced by 44 percent in 2040.
[45] Moreover, the law entitles the government to support the financing of transport systems in cities or regions provided that the coverage, efficiency, accessibility, and sustainability of the systems are expanded. In addition to this, when government co-financing for transport systems to territorial entities is provided, the government can choose the fuel to minimize monetary and environmental costs for the operation of the fleet.
[46] SETPs are intended to improve the public transport systems in medium-sized cities (250,000 to 600,000 inhabitants) by optimizing the supply of vehicles and related transport systems. The World Bank (2014) estimated that SETPs could reduce carbon emissions from public transport by 63 percent for the cities of Armenia, Pasto, Popayan, Sincelejo, Santa Marta, and Monteria by 2040.
[47] The World Bank (2014) Hacia la paz sostenible, la erradicación de la pobreza y la prosperidad compartida. Notas de política: Colombia. Bogotá D. C.
[48] The GoC through a Ministerial Resolution plans to set rules and procedures for the operation of FENOGE, which will include the following: (a) mechanisms and procedures to allocate and spend the funds received from FENOGE; (b) timing and conditions for requesting funds; (c) eligibility of beneficiaries; (d) procedures and requirements for preparation of eligible projects and activities; (e) technical, economic, and environmental criteria to prioritize and select projects; and (f) procedures for monitoring, supervision, and evaluation of projects and activities supported by FENOGE.
[49] CONPES document 3550 established the guidelines for the formulation of a comprehensive Environmental Health Policy—PISA.
[50] The CONPES document 3550 from 2008 provides the guidelines for the PISA and proposes the creation of the COTSAs defined as inter-institutional platforms focused on environmental health at the territorial level. COTSAs are expected to prepare Healthy Environment Strategies to implement the PISA at the territorial level. As of 2014, 23 COTSAs had been formed, 19 of which were created through an administrative action.
[51] This fund will receive and manage public funds and donations from national, international and private legal entities, but it is not yet operational. The FNGRD will support the implementation of the PNGRD in agriculture, transport, and housing because of these sectors' importance for the national economy and their vulnerability to natural and climate change disasters.
[52] Wording of this target is in accordance with the NDP 2014–2018. Strategic Sectoral Agendas are defined in the NDP as the official instruments for ensuring follow-up and consensus-building between relevant sectors to define key actions and achieve structural changes (e.g. technical, investment and others, as appropriate) in disaster risk management at a national level.
[53] For example, Colombian municipalities are required by law to develop PGIRS or Integrated Solid Waste Management Plans. However, lack of a tool for translating this legal requirement has precluded the widespread preparation and application of these plans. Pillar 2 will support a resolution that establishes technical and methodological criteria as a tool for the development of Integrated Solid Waste Management Plans (PGIRS) and thereby enhances the effectiveness of solid waste management policy.
[54] Sánchez-Triana, E., K. Ahmed, and Y. Awe, eds. 2007. Environmental Priorities and Poverty Reduction. A Country Environmental Analysis for Colombia. Washington, DC: World Bank.
[55] *Source*: Consultant Report prepared for the World Bank: Larsen et al., 2014. Environmental Health in Colombia: An Economic Assessment of Health Effects and their Costs.
[56] The law, however, established exceptions, including imported diesel or diesel produced exclusively for export as of January 2013 and subsequently diesel used by heavy machinery in hydropower, hydrocarbon, and mining projects.
[57] Norms also were established for Euro IV and EPA 10 standards to be integrated into requirements and certifications of imported and domestically made light and heavy vehicles supported with dynamic testing of engines. The law also created incentives to promote public transportation and use of vehicles that use cleaner

fuels such as natural gas and electricity. Resolution 1111 of 2013 prohibited the entry into the country of vehicles that do not comply with Euro IV.

[58] The specific monitoring stations in each city are listed in Annex X.

[59] 2014 Baseline values are: Medellin – 29.9µg/m3 (UNNV), 37.9µg/m3 (MANT), 28.6µg/m3 (UNFM); Bogota – 35.1µg/m3 (Carvajal), 31.5µg/m3 (Kennedy); Itagui – 32.0µg/m3 (CJUS), 25.1µg/m3 (CONC). Additional information is provided in Annex 7.

[60] The Dirección de Asuntos Ambientales Sectorial y Urbano (DAASU) in MADS is in charge of air quality related issues. DAASU will be in charge of coordinating with subnational entities the collection of data to report air quality improvements.

[61] The CEA estimated the economic cost of health damage related to inadequate water supply, sanitation, and hygiene to be 1 percent of GDP in 2002. A subsequent study reported a value of 0.68 percent of GDP in 2010. Most recently, the cost associated with inadequate water supply, sanitation, and hygiene was estimated at 0.25 percent of Colombia's GDP in 2013.

[62] The application of treated wastewater for industrial purposes includes reuse in boilers of electricity generation, cooling towers, sanitary flushing, mechanical cleaning of roads, and firefighting irrigation systems. The resolution does not apply to the use of treated wastewater as a fertilizer or soil conditioner.

[63] GoC will establish a baseline for this indicator, which will be delivered to the Bank prior to the preparation of DPL2. The Bank will revise the 2018 target if need be when the baseline is established.

[64] Jimenez Oscar 2014 Informe sobre la política pública de inclusión de Recicladores de oficio en la cadena de reciclaje. Marzo 2014.

[65] Angelica and Ortiz Rovitzon 2013. Recicladoras y recicladores de Bogota, Colombia. Mayo 2013.

[66] Based on Law 142 of 1994, which regulates the public utility regime at the household level in Colombia.

[67] https://www.dnp.gov.co/sala-de-prensa/Paginas/Presentaciones-.aspx.

[68] Although no significant gaps or shortcomings in the systems for managing these effects have been found, the GoC will consider the suggestions and recommendations included in Annex 5 during implementation of DPL 1. The GoC and the Bank will also include these issues in the policy dialogue during DPL 2 preparation.

[69] Preliminary results of the measures being implemented by the agency include (a) the use of the first framework contracts for fuel and insurance vehicles at the local and national levels; (b) the publication of standard bidding documents available for public works; and (c) improved mechanisms for complaints and combating corruption. However, important challenges remain to continue adjusting the legal, institutional, and operational frameworks to respond to the challenges in the market for new technologies and international practices.

[70] The proposed DPL will benefit from DNP's already established monitoring and evaluation system *Sistema Nacional de Gestión y Evaluación de Resultados* (SINERGIA) which is geared to provide feedback and strengthen each of the phases of public policies through the systematic use of information about government performance. In addition to allowing the systematic use of quantitative and qualitative information, SINERGIA also offers management tools, twenty-four boards, and eight cross-sectoral monitoring boards, which have strategic information on the progress of the goals of the NDP, helping to generate early warnings and consistency of the sectoral actions to achieve the objectives of the government. Although the DNP is responsible for coordinating actions under the proposed project, implementation of the program's actions is a shared responsibility among the DNP and other line ministries.