

REPUBLIC OF NIGER



Fraternity – Labor - Progress

«Intended Nationally Determined Contribution (INDC) » of Niger

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SUMMARY OF THE NIGER INDC

National circumstances	<ul style="list-style-type: none"> - Population: 17.7 millions (80% rural, 20% urban) inhabitants. - Population growth rate: 3,9% (General Census of Population and Dwellings (RGPH), 2011). - Low GDP, US \$6,303.5 million in 2015 (National Institute of Statistics) (INS), or US \$413 per inhabitant, with an agriculture sector that contributes 80% to the income of the populations and is very dependent on climatic risks.
Losses and damage	<ul style="list-style-type: none"> - Average losses due to drought: more than US \$70 million. - Damage to the economy from floods for the 2000's: US \$18 million.
National objectives	<ul style="list-style-type: none"> - Assure food security; combat poverty; contribute to the reduction of world greenhouse gas (GHG) emissions (objective 2°C at the 2050 horizon); promote rational management of natural resources, a low-carbon and green-growth development strategy; enhance the resilience of populations and agricultural, forest and pastoral ecosystems. - Adaptation is essential for the country. In order to participate in the mitigation efforts of the international community, Niger favours adaptation actions with strong co-benefits. - Mitigation in the energy sector requires large investments to facilitate access to cheap, sustainable and clean energy. - While mobilising its own national resources, the country hopes to use climate financing and benefit from the support of international cooperation.
Emissions for the reference year	<ul style="list-style-type: none"> - 30,801 GgCO₂e. (Second National Communication (SCN), 2000), - Breakdown: Land use, land-use change and forestry (LULUCF), 55.6%; agriculture, 34.6%; energy, 8.5%; waste, 1.2%; industrial processes, 0.06%.
Coverage and scope of the contribution	<ul style="list-style-type: none"> - 100% of the national territory covered by the intended contributions. - Gases covered: CO₂, CH₄, N₂O (88.7% of the gases emitted). - Agriculture, forestry and other land uses (AFOLU) sector: 89% of the total GHG emissions. - Energy sector: 9% of the total GHG emissions.
Contribution	<ul style="list-style-type: none"> - Contribution based on a mixed results-and-action approach, unconditional and conditional according to the reference Business as Usual (BaU) scenario. - Results approach: % reduction of emissions, 2020-30. - Action approach: Strategic Framework for Sustainable Land Management (SF-SLM) actions, 2015-29 (Nigerans Feed Nigerans Initiative (I3N) focus).
Periods	<ul style="list-style-type: none"> - BaU : 2000 and 2030, based on the emissions from the three national communications: Initial National Communication (CNI), 1990, 9,000 GgCO₂e; Second National Communication (SCN),

	<p>2000, 30,801 GgCO₂e; Third National Communication (TCN), 2008, 35,900 GgCO₂éq.; 2020, 66,821 GgCO₂éq.; 2030, 96,468 GgCO₂éq.</p> <ul style="list-style-type: none"> - Implementation period: 2015-2030 (National Durable Land Management Strategy) (SF-SLM).
Reduction of GHG emissions from now to 2030	<ul style="list-style-type: none"> - Unconditional reduction of 2.5% (BaU 2020) and 3.5% (2030). - Conditional reduction of 25% (BaU 2020) and 34.6% (2030, or a reduction of 33,400 GgCO₂e).
GHG emissions mitigation measures at the 2030 horizon	<p><u>AFOLU (Agriculture, Forestry and Other Land Uses) :</u></p> <ul style="list-style-type: none"> - Upscaling of good sustainable land management practices over all agroecological areas in order to increase the resilience of ecosystems and households and sequester carbon. - Sustainable management of forests in order to reduce GHG emissions due to deforestation. <p><u>Energy:</u></p> <ul style="list-style-type: none"> - Electricity: Improvement of the rate of access to electricity (overall, exceed 10% in 2010, 60% in 2030, of which 47% to 100% is in the urban zone and 0.4% to 30% in 2030 is in the rural zone. - Cooking energy: reduction in the demand for wood energy per inhabitant by the mass spread of improved cook stoves, with a rate of penetration of 100% in urban areas and 30% in rural areas; promotion as domestic gas of biogas and biofuels at both the industrial and family level. - Spread of multifunctional platforms. <p><u>Renewable energy:</u></p> <ul style="list-style-type: none"> - Exceed a capacity of 4 MW in 2010, 250 MW in 2030, 130 MW of which comes from the Kandadji hydroelectric plant and 20°MW comes from wind energy (currently 0.035 MW). - Double the rate of energy mix to reach 30% energy mix in the primary and final energy balance. <p><u>Energy efficiency:</u></p> <ul style="list-style-type: none"> - Decrease of 25% in the GDP energy intensity (modern and traditional energy). - Improving energy efficiency in industries and households, transportation and electricity distribution (reduction of losses from 12% to less than 10% in the 2020 horizon). - Low-carbon home construction (without framing).
Implementation process	<ul style="list-style-type: none"> - Enhancement of institutional, technical, financial and telecommunications capabilities and technology transfer. - Development of standard files, Strategic Environmental and Social Assessments (SESA) and Environmental and Social Impact Assessments (ESIA), Measurement, Notification and Verification (MVN) procedures, project registration. - Inclusive participation (private sector, NGO's, civil society).

Assumptions and methodology	<ul style="list-style-type: none"> - Second National Communication (SNC), 2000. - IPCC 2006 directives for national GHG inventories. - Energy sector: LEAP, MAED, MESSAGE software. - AFOLU sector: EX-ACT, TARAM software.
Climate change adaptation measures	<ul style="list-style-type: none"> - Application of all Strategic Framework for Sustainable Land Management (SF-SLM) techniques: <ul style="list-style-type: none"> - Restoration of agricultural/forestry/pastoral lands: 1,030 000 ha. - Assisted natural regeneration: 1,100,000 ha. - Fixation of dunes : 550,000 ha. - Management of natural forests: 2,220,000 ha. - Hedgerows: 145,000 km. - Planting of multiuse species: 750,000 ha. - Planting of <i>Moringa oleifera</i> : 125 000 ha. - Seeding of roadways: 304,500 ha. - Private forestry: 75,000 ha.
Financial needs over ten years, for the period 2020-2030	<ul style="list-style-type: none"> - Total cost of the INDC over 10 years: US \$8.667 billion (US \$866.7 per year), or 48% of the GDP and US \$490 per inhabitant, of which: <ul style="list-style-type: none"> - Adaptation: US \$1.607 billion, of which US \$0.337 billion (21%) is unconditional and US \$ 1.270 (79%) is conditional. - Mitigation: US \$7.060 billion, of which \$0.830 billion unconditional (12%) and \$6.230 US conditional (88%).
Ambitious and fair character	<ul style="list-style-type: none"> - Since Niger is a non- Annex I Party to the UNFCCC, it has no quantitative obligations with respect to mitigation. - However, Niger is contributing to the reduction of worldwide climate change impacts through a double results/actions approach. - Emissions of 30,801 GgCO₂e in 2000 (the Second National Communication reference year) represent 2.8 tons per inhabitant and 0.07% of the worldwide emissions of CO₂. Despite its important need to develop its economy and combat poverty, Niger's ambition is to limit its emissions to 2,1 tCO₂e/inhabitant in the 2030 horizon (within the framework of the conditional objective). - Since 2015, Niger has been implementing its INDC, through the Strategic Framework for Sustainable Land Management and the Kandadji hydroelectric plant, among other things. - Niger supports the mechanisms of the international CO₂ market, such as the Clean Development Mechanisms (CDM), but revised to facilitate the access of National Development Programmes (NDP) to this financing. For this purpose, it hopes to see a high price for CO₂ (US \$50 /t) that will permit it to reach the global objective of 2°C.

2 NATIONAL CONDITIONS

Niger is a Sahelian country, three-fourths of the area of which (1,267,000 km²) is situated in the desert zone, which makes it highly exposed to climate risks, with rainfall that is highly variable during the year, in terms of both space and time.

Its population of 17.7 million has a high rate of demographic growth (3.9% per year) (RGPH, 2011). A completely landlocked country, its GDP was US \$6.3 billion in 2015, or US \$413 per inhabitant, with a human development index of 0.374, placing it in the lowest rank of countries (UNDP). The production of the primary sector, dominated by the agropastoral sector with 37% of the GNP and 80% of employment (INS), varies greatly from year to year.

The objectives of Niger's INDC are to assure food security, combat poverty and contribute to the reduction of world greenhouse gas (GHG) emissions so that they will not increase in excess of 2°C in the 2050 horizon thanks to green growth and a low-carbon development strategy, the purpose of which is to assure resilience of the population and ecosystems.

It should be recalled that in June 1992 Niger signed the United Nations Framework Convention on Climate Change (UNFCCC) and ratified it on 25 July 1995. It also signed the Kyoto Protocol in December 1996 and ratified it on 17 March 2004. In the context of implementing this agreement, Niger prepared and presented to various Conferences of the Parties (COP's) the Initial National Communication and the Second National Communication on climate change. The Third National Communication is now being prepared. In these communications, GHG inventories were performed in five sectors: land use and land use change and forestry; agriculture/animal husbandry; energy; industrial process and use of solvents; and waste management. For more than three decades Niger has made important investments related to reducing vulnerability to climate change, particularly with projects implementing the Maradi commitment (1984) to combat desertification. Although the results of these inventories showed that Niger is first of all a carbon sink because of GHG sequestration, the first three sectors, which are the greatest emission sources in the country, have been the subject of specific mitigation studies.

Like other non-Annex I countries of the list of the UNFCCC, Niger has no obligation to present GHG emissions mitigation measures. At the same time, the fact remains that, since it is a Party to the Convention and in conformity with the commitments made by the states Party to the UNFCCC at the time of COP20 in Lima, Peru, Niger is committed to contributing to the world effort to reduce GHG emissions so that the increase in the global temperature will not exceed 2°C in the 2050 horizon.

With this in view, Niger participates in the global effort to stabilise GHG emissions by presenting its ambitions and its capacity to mitigate these emissions. This capacity depends largely on the application of sectoral priorities and the national strategic frameworks for sustainable development. Thus, Niger's priority is to focus first of all on strategies for adaptation and resilience to climate change.

For Niger's INDC, the adaptation options considered as top priority are those that will permit the higher co-benefits with respect to climate change mitigation, particularly those good adaptation practices and techniques which, at the level of the country's eight regions, will permit carbon sequestration and reduction of GHG emissions at the same time. These adaptation options have already been well defined in the existing strategic frameworks, such as the Economic and Social Development Plan (PDES 2012-2015 and 2016-2020), which flows from the Sustainable Development and Inclusive Growth Strategy - Niger 2035 (SDDCI), the 3N Initiative (Nigerans Feed Nigerans), the National Policy on Climate Change (PNCC), the Strategic Framework for Sustainable Land Management (SF-SLM), and the National Strategy and Plan of Action for Climate Change and Variability (SNPA-CVC).

The preparation of the INDC has included the following steps: designation of an INDC focal point; establishment of the Technical Steering Committee (TSC) made up of the stakeholders; the scoping mission and kick-off workshop; the collection of data and documentary research; the workshop on capacity development and validation of options and analytical results; the national validation workshop on the draft INDC; the adoption of the INDC by the government of Niger; and the submission of the INDC to COP21 in Paris on December 15.

3 PRIORITY SECTORS

The National Communications indicate that the AFOLU and energy sectors represent on average 89% and 9% of Niger's total GHG emissions. Given the potential offered by the country's resources, the national concerns are focussed on issues related to adaptation, particularly in the AFOLU (agriculture/animal husbandry and land use) sector, and on issues related to mitigation, principally in the AFOLU sector and the energy sector (transportation and residential and industrial energy).

The strategy is based on the vision of climatically intelligent agriculture and on access to modern energy services for everyone in 2030. The search for solid co-benefits that combine mitigation and adaptation is the basis for Niger's INDC. However, while the AFOLU and energy sectors are the priority action areas of the INDC on climate change in Niger, the implementation of the INDC actual represents cross-sectoral support for all sectors of the economy.

4 MITIGATION COMPONENT

4.1 General objectives

Niger's strategy is based on the vision of climate-smart agriculture and on access to modern energy services for everyone in 2030. Concerning the latter point, Niger has adopted the Regional White Book of the Economic Community of West African States (ECOWAS), which recognizes that access to modern energy services makes a major contribution to improved access to basic social services (health, education, potable water); to increased productivity of households in cooking, lighting and transportation; to giving impetus to the creation of income-producing economic activities; to freeing women from chores such as gathering wood and water and shelling peas and beans; to preserving the environment and improving the quality of life of rural populations; and to promoting local jobs and stabilising populations in order to contain the rural exodus and check uncontrolled urbanisation.

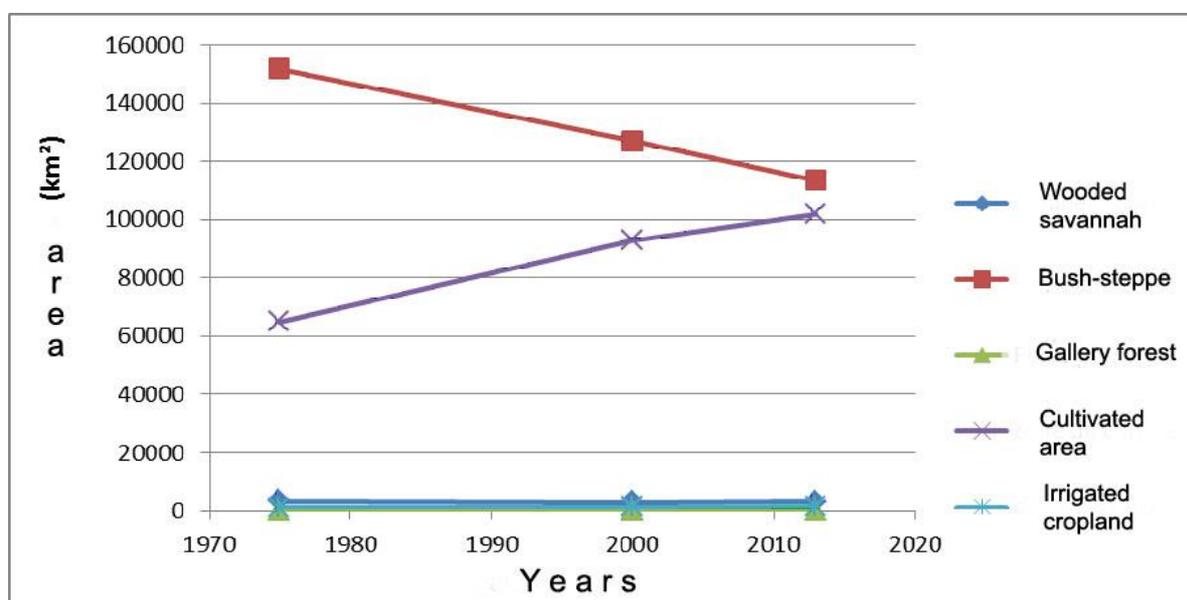
4.2 Reference scenario

4.2.1 AFOLU sector

The AFOLU sector is characterised by the significant growth of cultivated areas at the expense of forests (the shrub-steppe habitat and grazing lands). This leads to the need to decouple the trends in these types of land occupation by upscaling the good practices of sustainable land management (SLM). The AFOLU sector consists of the following sub-sectors.

- Land use, land-use change and forestry sub-sector (LULUCF):

The loss of 100,000 ha per year to deforestation is due to the clearing of land for agriculture and the exploitation of timber, used principally as household firewood. The shrub-steppe habitat (grazing areas) is giving way to agriculture, with around 4 million ha of grazing land disappearing between 1975 and 2013. This makes it necessary to have an approach based on climate-smart agriculture (CSA). The figure below shows the changes in km² of agricultural land and shrub-steppes in Niger from 1975 to 2013 (CILSS/USGS, 2015).



- Agriculture-livestock sub-sector:

The agriculture sub-sector consists of agricultural and grazing activities and its GHG emissions come from enteric fermentation (60%), manure management (39%), on-site burning of residues, agricultural soils and rice growing (1%).

The potential agricultural land represents 13% of the country, of which 40% is cultivated. Low fertilisation, reduced summer fallow and expansion of cultivated land leads to soil degradation through the growth of water and wind erosion and makes it impossible to assure that the biomass of the soil will be maintained.

Only 30% of the irrigable potential of 330,000 ha (I3N 2012-15), located essentially in the Niger river valley and some adjacent valleys, is utilised. Given the country's need for rice, which in the long term will increase because of population growth, it is necessary to implement a policy of increasing the rice-growing area.

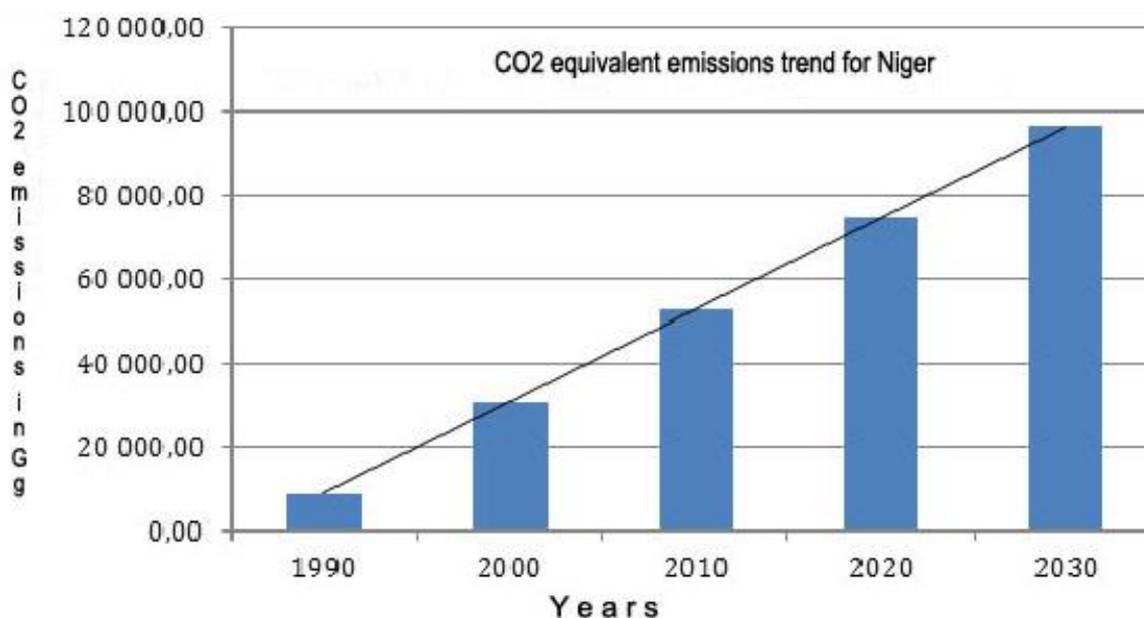
The potential for animal husbandry is significant (37 million head in 2008, SDE, 2013-35) thanks to vast grazing areas that can be exploited through transhumance and the development of large above-ground water resources. The population's attachment to the practice of grazing is encouraged by the presence of a market of almost 160 million consumers in Nigeria, which shares a 1,500 kilometre border with Niger.

4.2.2 Energy sector

The National GHG Inventory Report of 2000 divides the GHG emissions of the energy sector among transportation (41%), residential (37%), power production units (15%) and manufacturing industries (5%). The other sub-sectors (business and institutional, agriculture-fishing-fish farming, mines) total less than 3%. National energy consumption is going to triple between now and 2030, principally because of strong growth in the residential, transportation, industrial and mining sub-sectors.

4.2.3 Overall GHG emissions trends under BAU

Taking 2000 as the base year (SNC) and an INDC implementation period extending from 2015 to 2030 (SF-SLM), the figure below shows the GHG emissions trend for Niger between 1990 and 2030.



The base year emissions are 30,801 GgCO₂e, distributed between LULUCF: 55.6%; Agriculture: 34.6%; Energy: 8.5%; Waste: 1.2%; and Industrial processes: 0.06%.

The 2000 and 2030 BaU are based on the emissions levels in the three National Communications: Initial National Communication, 1990: 9,000 GgCO₂e; Second National Communication, 2000: 30,801 GgCO₂e; Third National Communication, 2008: 35,900 GgCO₂e; BAU, 2020: 66,821 GgCO₂e; BAU, 2030: 96,468 GgCO₂e.

4.3 Conditional and unconditional mitigation measures

4.3.1 AFOLU sector

The upscaling of good SLM practices are, at the same time, measures of adaptation to climate change and measures to mitigate GHG emissions. Their implementation is the object of ongoing and planned projects and is accompanied by research into the improvement of agro-silvo pastoral productivity. These have been selected for the INDC: restoration of agricultural, forest and grazing land: 1,030,000 ha; assisted natural regeneration: 1,100,000 ha; dune fixation: 550,000 ha; management of natural forests: 2,220,000 ha; hedgerows: 145,000 km; planting of multi-use species: 750,000 ha; planting of *Moringa oleifera*: 125,000 ha; seeding of roadways: 304,500 ha; and private forestry: 75,000 ha. A total cost model for upscaling good SLM practices comes to US \$1.27 billion. The strategic framework for sustainable land management (SF-SLM 2015-2029) indicates mobilisation of financing at the level of 10% of the costs of upscaling, i.e. US \$107.6 in 2009, through the unconditional budget of the government and the financial partner. The conditional SLM comes to US \$968.06 million.

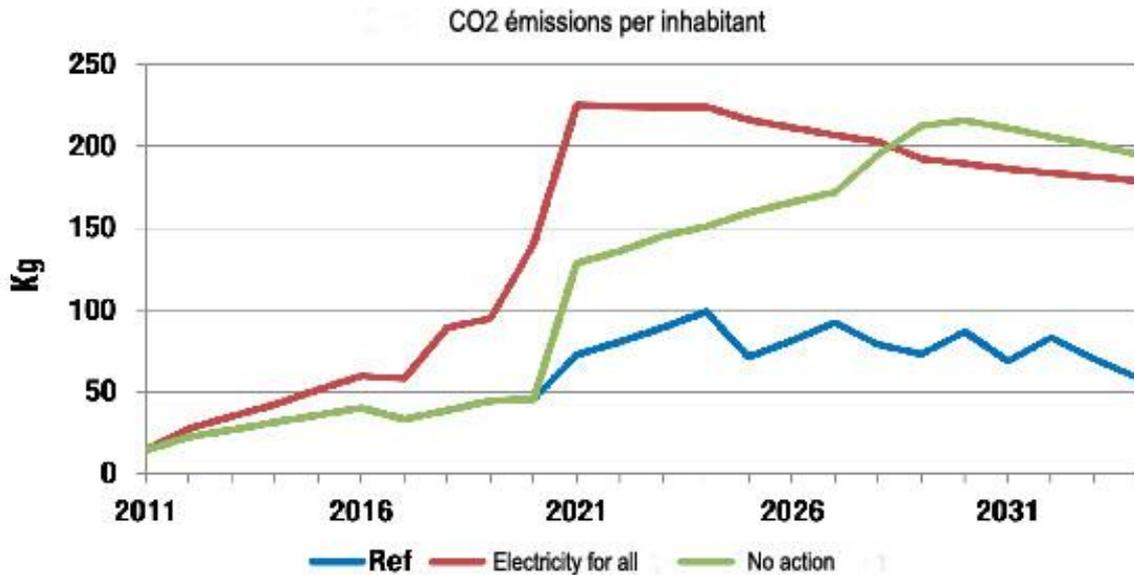
4.3.2 Energy sector

The unconditional mitigation options in the energy sector concern the management of the residential sub-sector through rural electrification and the conservation and replacement of wood energy; the management of the transportation and residential sub-sectors; rural electrification; economising of wood energy and reduction of specific consumption in transportation; management of the sector concerned with the demand for and transformation and dissemination of renewable energies; improving the energy efficiency of the sectors; and promoting solar photovoltaic for pumping and electrification.

The conditional technologies for the energy sector in the medium and long terms relate to: exploitation of photovoltaic and thermal solar energy; exploitation of wind energy; construction of a nuclear power plant and a gas power plant; hydroelectricity; economising the use of wood for cooking; energy efficiency; use of biogas; and construction of frame-free buildings. The impact of the electricity scenarios on the reduction of GHG has been evaluated in an IAEA report.¹ CO₂ emissions per inhabitant will increase more significantly in the Electricity for All scenarios and the no action scenario (without reduction of GHG). This is explained by the greater utilisation of coal in electricity production under these two scenarios. The National Action Plan for Sustainable Energy for All (SE4ALL) is calculated to cost US \$6 billion in the 2030 horizon. The unconditional financing that has been mobilised and the conditional financing total US \$5.28 billion.

The mitigation potential of the energy sector is 700 GgCO_{2e}, i.e. 0.7% of the total national emissions. A reduction in this emission is noted in the Electricity for All scenario beginning in 2025, which is explained by the growth of production from gas and by the entry of nuclear power production into the system, as shown in the figure below (CO₂ emissions per inhabitant under three scenarios).

¹ Evaluation study of electricity supply and demand in Niger from 2010 2035, 2014.

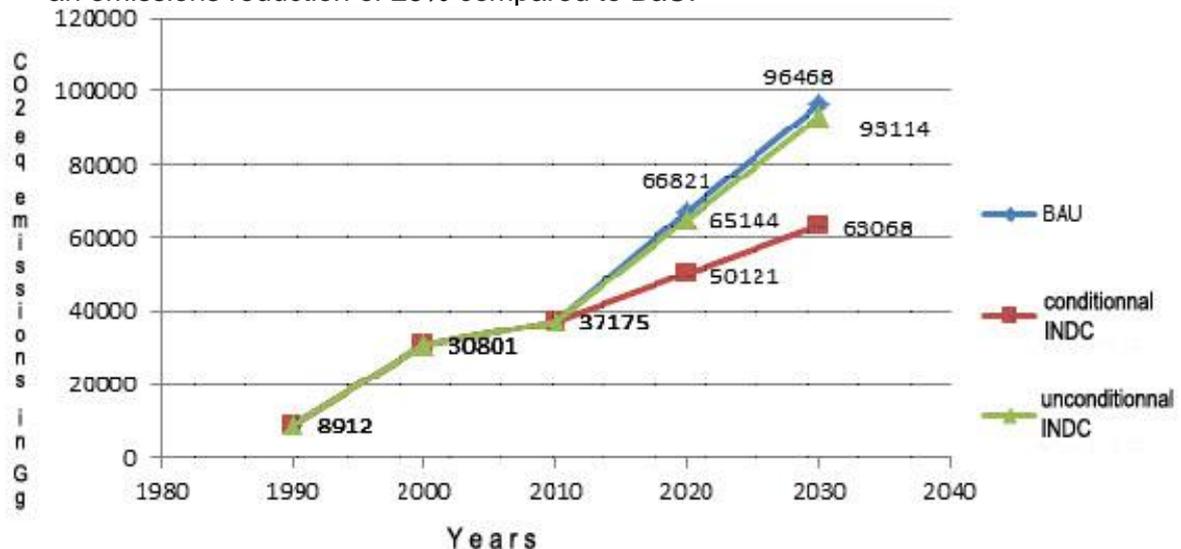


Source: PANEDT/IAEA, 2014

4.3.3 Mitigation of the two sectors put together

Niger's contribution is based on a results-action mix. The emissions reduction of the two priority sectors, AFOLU, and energy is estimated at 33,400 GgCO₂e, 34,7% compared to BaU in 2030. According to figure 3 below:

- For 2030, the INDC with unconditional financing permits a GHG emissions reduction of 3.5% compared to BAU, while the INDC with conditional financing permits an emissions reduction of 34.6 % compared to BaU.
- For 2020, the INDC under unconditional financing permits a 2.5% reduction of GHG emissions compared to BaU (2030), while the INDC with conditional financing permits an emissions reduction of 25% compared to BaU.



The overall cost of the conditional INDC is US \$6.25 billion, or 87%, and the overall cost of the unconditional INDC is US \$827 million, or 13%, as shown in the table below (summary of GHG emissions reductions and costs for 2020-2030).

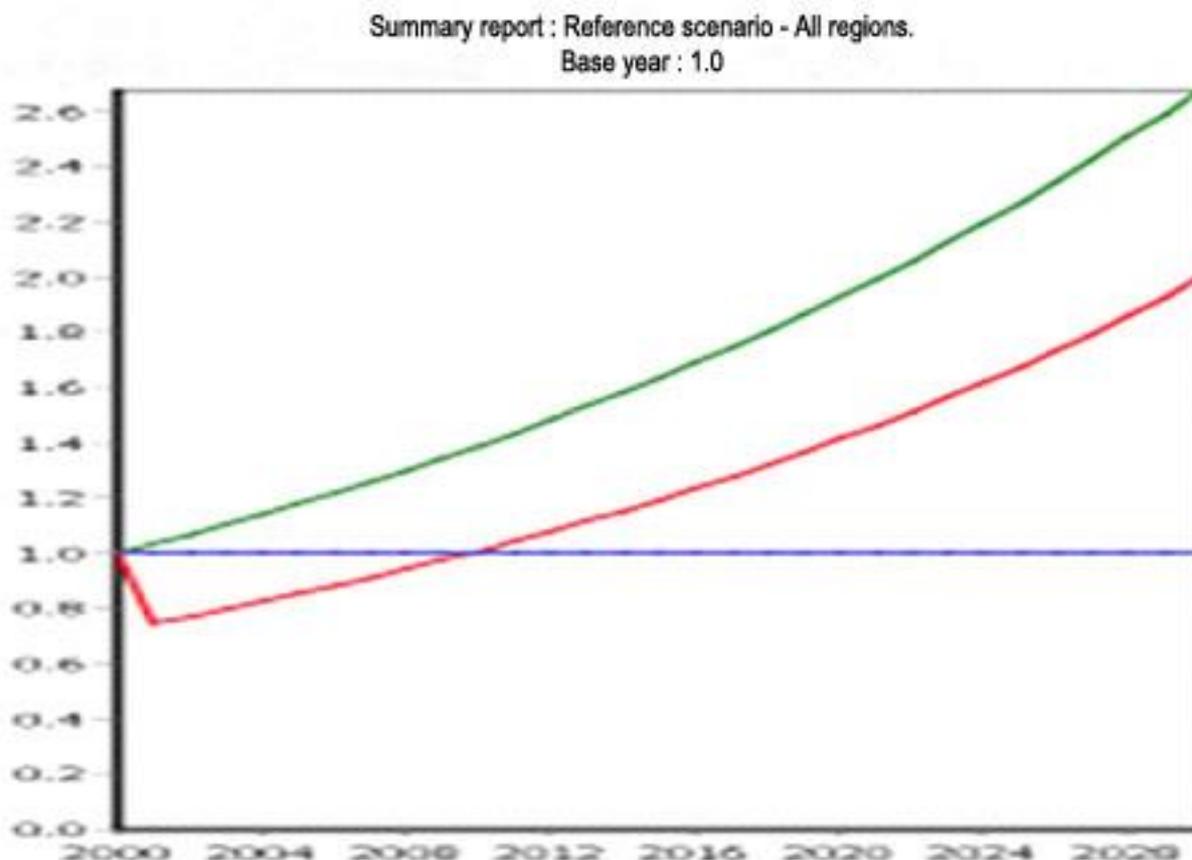
	GHG reduction in comparison to BaU 2020	GHG reduction in comparison to BaU 2030	Costs compared to BaU 2030 in billions of USD
Conditional INDC	25%	34.6%	6.25
Unconditional INDC	2.5%	3.5%	0.83

4.4 Ambition and fairness

Niger's GHG emissions of 30,801 GgCO₂e represent 2.8 t per inhabitant and only 0.061% of world CO₂ emissions. Since it is non-Annex I Party to the UNFCCC, Niger does not have a quantitative obligation in terms of mitigation. However, despite its great need to develop its economy and the need to lift a large part of its population out of poverty, Niger's ambition is to limit its emissions to 2.1 t CO₂e per inhabitant in the 2030 horizon, within the framework of a conditional objective. To do this, Niger hopes to see a carbon price commensurate with international concerns (US \$50/t), which would facilitate the double results/actions approach and optimise its contribution on a worldwide scale.

4.5 Method used to estimate emissions

The reported GHG emissions contained in the three National Communications have been used to establish the greenhouse gas trends in Niger from 1990 to 2030. In the AFOLU sector, the EX ACT programme has been used to simulate the carbon stored in the projects between the two dates. In the energy sector, the LEAP model has been used, as shown in the figure below (projection of total energy demand in the 2029 horizon).



For the study on “the evaluation of Niger’s energy demand and supply for the period 2010-2035” (Ministry of Energy and Petroleum/Bureau of Energy, December 2013), the IAEA models MAED and MESSAGE were used.

5 ADAPTATION COMPONENT

5.1 Justification of the component

Niger is not a country that represents a source of GHG emissions, but rather a net absorption sink. Moreover, since Niger is situated along the edge of the dry areas of the Sahara, it is directly impacted by the consequences of climate change. Taking into consideration the potential offered by the country’s resources, the national concerns are centred first of all on issues related to adaptation (with its mitigation co-benefits) in the priority AFOLU sector, and then in the priority energy sector (transportation and residential and industrial energy). The other areas important to the country are those related to transfer of technology and capacity building.

5.2 Impacts of climate change and Niger’s vulnerability

Various studies carried out in connection with the National Communications on climate change in Niger mention the increasing variability of precipitation in terms of both space and time; a trend of increased temperatures, particularly since 1996; increased frequency and intensity of extreme climate risks (droughts, floods, violent winds and sand and dust storms, the enemies of crops); the silting of water courses (Niger River valley and Lake Chad) and oases; drought losses in Niger estimated at more than US \$70 million (World Bank, Climate Risk Assessment, Niger, 2012); the damage, including costs, caused to key sectors of the economy by the floods in the 2000’s, estimated at US \$18 million (DPCS, OCHA 2009).

5.3 National Priorities for Adaptation to Climate Change

The national priorities for the AFOLU sector relate to improving the resilience of the agriculture, animal husbandry and forestry sub-sectors. The other priorities concern water resources, fishing, fauna, health and capacity building of the actors at all levels. Adapting to climate change is a challenge for the country. In order to achieve it, the adaptation techniques appropriate for Niger relate in particular to sustainable land management (SF-SLM 2014), renewable energy and energy efficiency. Because of its relevance and its conclusions, the SF-SLM is the chosen reference document for the INDC.

5.4 Niger’s initiatives supporting adaptation

Of the projects focussed on adaptation to climate change in Niger, the following are already under way:

- Projects financed by the French Development Agency (AFD), including extension of the NIGELEC electrical network (US \$46.33 million); the socioeconomic development of Kandadji (US \$15.8 million); support for the food security of households (US \$1.36 million); development and management of the Badaguichiri watershed (US \$12.4 million); and management of the natural forests for the sustainable supply of wood energy to Sahelian cities (Bamako, Ouagadougou and Niamey) (US \$1.7 million).
- The PANA Resilience/FEM/ACDI project (US \$7.0 million), which has been going on since 2010 at the commune level in seven regions and allows the good practices to be put to use in the use of improve varieties, market gardening, use of meteorological data, seeding of degraded grazing areas and income-producing activities.
- The African Climate Change Adaptation Programme (P2AA) (US \$610,000), which is setting up an index-based insurance prototype to prevent episodes of drought.

- The PNUD/FED Community Based Adaptation project (CBA) costing US \$4.26 million over four years beginning in 2015, which is operating in the departments of Dakoro and Bermo.
- The Climate-Smart Agriculture Support Project of HC-13N, financed by the World Bank in the amount of US \$111 million beginning in 2016 and lasting five years in 20 departments.
- The PRASE-FEM project, the objective of which is to facilitate access to power services, for a cost of US \$5.47 million.
- The Strategic Programme for Climate Resilience (PSRC), consisting of three projects (PAC-RC, PROMOVARE and PDIPC) and financed at the level of US \$100 million.
- The Food Security Support Project in the Maradi region (PASADEM) for a cost of \$ US 31.7 million, which is dealing with aspects of resilience in the rural environment.
- And a number of other projects financed through bilateral and multilateral cooperation.

5.5 Adaptation measures

The consultations with stakeholders have stressed the need for the INDC to seek complementarities with existing processes by preventing its contents from replacing, duplicating or weakening the national climate change response processes that are already under way, such as the National Adaptation Programme (NAP) and Nationally Appropriate Mitigation Actions (NAMA), which are the reference national processes for adaptation and mitigation. Thus, in order to be complementary with the existing processes, the INDC aims at specific measures and is committed to applying them. In the priority AFOLU priority sector, the implementation of the proposed INDC relates to the application of a set of techniques coming from the SF-SLM over the period 2015-2030. The table in Annex 2 lists the techniques from the SF-SLM and the objectives in terms of areas covered that have to be achieved to implement them in the INDC. Thus, the cost of upscaling the SF-SLM is estimated at US \$1.27 billion (conditional), knowing that US \$0.337 billion (unconditional) has already been mobilised, for an overall adaptation cost of US \$1.607 billion. Mitigation in the energy sector requires much larger investments in order to permit access to clean, sustainable and affordable energy. However, in the National Adaptation Plan and the INDC's vision for 2050, Niger would have to include all or part of a wide range of infrastructures (highways, bridges, dikes, construction projects to mobilise and enhance water resources, projects and networks to clean up used water and solid waste).

5.6 Co-benefits

The co-benefits in the AFOLU sector consist of the results of implementing and upscaling the Climate-Smart Agriculture activities: strengthening of the good practices of assisted natural regeneration and recovery of degraded land; improvement of the balance sheet of cereals and fodder, along with food and nutritional security; development of local agro-climate information; job creation and reduction of the rural exodus; and strengthening of social cohesion. The projected annual benefits and costs of implementing and upscaling the techniques recommended in the SF-SLM and selected for the AFOLU sector in Niger's INDC are presented in the table in Annex 3, and the cost of implementing the SF-SLM over the first ten years (2016-2030) is estimated at US \$127,393,000. The co-benefits in the energy sector relate to improvement in the people's living conditions as a result of increased income through social welfare, access to potable water, education and health, as well as access to new information and communication technologies (NICT) and energy equipment, development of local entrepreneurship, alleviation of women's domestic duties and reduction of the rural exodus through job creation.

5.7 Accent on Climate-Smart Agriculture

The techniques of climate-smart agriculture (CSA) are consistent with the objectives of the INDC (adaptation, mitigation and food security) by strengthening grassroots development. Climate-smart agriculture takes into account weather information, early warning, the management of risks and disasters and index-based agricultural weather insurance. The inclusion of climate change in local (PDC programme), regional and national planning (in the health and animal husbandry sectors) are tested and approved good practices in Niger and are therefore taken into consideration in the INDC. The advantages brought by the measures of climate-smart agriculture should satisfy from the outset all of the actors involved in the responses to climate change: on the one hand the people of Niger and their government, who thus set adaptation to climate change and food security as a priority and, on the other hand, the international community, which sees that the mitigation of climate change is effectively taken into account in the adaptation measures. In addition, these measures can be put in place immediately and thus make it possible to give priority to this action since the technical experimentation phase is being carried out in the various agroecological regions of the country (it remains only to upscale them) and because their impacts and their costs and benefits have been evaluated and their socioeconomic relevance and economic return have been demonstrated. Emphasising these objectives and results, which are clearly defined in Niger's INDC, should allow the technical and financial partners to support this integrated vision of adaptation and mitigation. This will make it possible to galvanise their technical and financial support for the implementation of these responses, which are both workable and well suited to linking good climate change options to national development.

6 IMPLEMENTATION OF THE INDC

6.1 Institutional structure

The process of implementing the INDC is an opportunity to build institutional and technical capacities, stimulate policy integration and promote inclusive development. The national institutions necessary to implement the INDC programmes exist. They are the Ministry of the Environment, Urban Hygiene and Sustainable Development (MESUDD), the agency currently responsible for the preparation of the INDC, in cooperation with the Executive Secretariat of the National Council of the Environment for Sustainable Development (CNEDD), the focal point for the UNFCCC. However, alternatives can be envisaged: institutional anchoring of the INDC to MESUDD, with focal points in the concerned institutions; establishment of an operationally independent executive agency; a supreme authority for the INDC, etc. An institutional analysis will have to be considered to evaluate these options.

6.2 Obstacles and gaps

To obtain the necessary financing, one option would be to request international aid from the donors (the conditional option). Another option would be to attract financing from the private sector to implement the SF-SLM. For this purpose, the communities have the possibility of selling mitigation services on the carbon market. The possible problems with this option are the difficulty of accessing this market and the low level of current prices for carbon credits. Whether the financing is acquired conditionally or unconditionally, follow-up actions will be essential to assure efficient use of the funding that is granted.

Another major obstacle to implementing the INDC is the country's high rate of population growth. At present, this rate is 3.9% per year, although the government is committed to reducing the rate to 2.5% in the 2035 horizon (Sustainable Development and Inclusive Growth Strategy (SDDCI) 2012-2035).

The illiteracy of the rural population represents a real impediment to the dissemination of the technologies of climate-smart agriculture and sustainable land management so that these techniques can be upscaled. Effective schooling and the spread of literacy among the rural population, accompanied by a rural extension system, are in any case necessary to allow understanding and implementation of the techniques recommended in the INDC.

The low qualification level of human resources, the insufficiency of logistical means and the institutional conflicts related to supporting the upscaling of good practices require strengthening of rural leadership, particularly in the AFOLU sector. It is also necessary to secure agricultural and pastoral land tenure and to have competent field operators to improve the absorption capacity.

The implementation of these measures requires improved coordination between institutions, synergy between policies and strategies, and appropriate allocation of expertise in the case of cross-sector projects.

7 THE COUNTRY'S NEEDS

The sustainable development objectives to which the INDC contributes cannot be realised without the transfer of appropriate technologies and the financing and building of competencies, while taking into account the national economic and social development priorities defined for the various strategic frameworks.

7.1 Financial support

Attaining the objectives of Niger's INDC requires a total investment estimated at US \$8.667 billion, US \$7.5 billion of which (87% of the total) is dependent on access to new sources of financing (the Green Climate Fund and other climate financing mechanisms). The unconditional financing coming from the government's own resources and public development aid is estimated at US \$1.167 billion, or 13% of the total cost.

7.2 Technology transfer

In order to implement the INDC, Niger will emphasise the need for the transfer of knowledge and technology in the priority sectors of AFOLU and energy. This needs relate essentially to the upscaling of the good practices of climate-smart agriculture, to renewable energy technologies, to energy efficiency and to other action areas such as integrated water resources management (IWRM), urban waste management, fauna, fishing, social and health protection etc.

7.3 Capacity building

Capacity building relates to the design of bankable projects and the understanding of the donors' rules and procedures; the evaluation of adaptation projects in terms of economic and financial analysis; the establishment of the measurement, notification and verification system (MNV); knowledge and understanding of the INDC implementation process; strategic environmental and social assessments (SESA) and environmental and social impact statements (ESIA); land use planning; good practices for carbon management and sequestration; the carbonisation chain of charcoal for domestic use; the mapping of soils; the development of a national forestry plan; and the rational management of liquid and solid wastes etc. These activities should concern, first of all, the stakeholders in the INDC implementation process in Niger: the actors concerned with implementation of the INDC; the economic actors, primarily rural smallholders, the Producer Organisations (PO: agriculture, animal husbandry etc.) and any INDC investor that already has in place advanced planning for his project; and representatives of the civil society and NGO's. If INDC investments represent around 83% of the total amount, the operating cost can be estimated at 17% (particularly follow-up and evaluation), 10% of which is to be allocated to technology transfer and capacity building.

7.4 Monitoring, evaluation and management

The INDC's institutional implementation structure includes the following: a "Country monitoring and evaluation system" which takes into account gender, measurement, notification and verification (MNV) procedures, and a register of INDC projects.

The monitoring and evaluation system and INDC capitalisation will be implemented based on: monitoring and evaluation of the implementation process which will examine aspects of inter-sector coordination, of the decision-making process, etc., follow-up and evaluation of the effects and impacts of the INDC based on relevant criteria and indicators and the definition of corrective measures for climate, environmental, economic and social protection, monitoring of risk and of the evolution of vulnerability to climate change at the national level, and capitalisation of experiences and the lessons learned.

8 ANNEXES

8.1 Annexe 1 : Abbreviations and acronyms

AFD	Agence Française de Développement (French Development Agency)
AFOLU	Agriculture, Forestry and Other Land Uses
ANR	Assisted Natural Regeneration
BaU	Business as Usual (normal course of affairs without the INDC)
CBA	Community Based Adaptation
CC	Climate Change
CDM	Clean Development Mechanism
CILSS	Comité Inter-Etats de Lutte contre la Sécheresse au Sahel (Inter-State Committee to Combat Drought in the Sahel)
CSA	Climate-Smart Agriculture
CNEDD	Conseil National de l'Environnement pour un Développement Durable (National Environmental and Sustainable Development Council)
CNI	Initial National Contribution
CO ₂	Carbon dioxide
COP	Conference of the Parties
CTN-CVC	Commission Technique Nat. sur les Chang. et la Variabilité Clim. (National Technical Commission on Climate Change and Variability)
ECOWAS	Economic Community of the West African States
ESIA	Environmental and Social Impact Assessment
Ex-ACT	Ex-Ante Carbon-Balance Tool (software)
FED	European Development Fund
FEM	Global Environment Facility
GCF	Green Climate Fund
GDP	Gross Domestic Product
Gg CO ₂ e	Gigagrammes equivalent carbon dioxide
GHG	Greenhouse gas
I3N	Initiative « Les Nigériens Nourrissent les Nigériens » (Nigerans Feed Nigerans Initiative)
IAEA	International Atomic Energy Agency
INDC	Intended Nationally Determined Contribution
INS	Institut National des Statistiques (National Institute of Statistics)
LDC	Less Developed Countries
LEAP	Long-range Energy Alternatives Planning system (software)
LULUCF	Land Utilisation, Land Use Change and Forestry
MAED	Energy Demand Analysis Model
MESSAGE	Model for Energy Supply Strategy Alternatives and their General Environmental Impacts
MESUDD	Ministry of the Environment, Urban Hygiene and Sustainable Development
MNV	Measurement, Notification, Verification (MDP, REDD etc.)
NAMA	Nationally Appropriate Mitigation Actions
NAP	National Adaptation Programme
OCHA	Office for the Coordination of Humanitarian Affairs
P2AA	African Climate Change Adaptation Programme
PANA	National Action Plan for Adaptation
PASADEM	Maradi Project to Support Food Security for Development

PDC	Plan de Développement Communal (Commune Development Plan)
PDES	Programme de Développement Economique et Social (Economic and Social Development Plan)
PNCC	Politique Nationale sur les Changements Climatiques (National Climate Change Policy)
RGPH	Recensement Général de la Population et de l'Habitat (General Census of Population and Housing)
SCN	Seconde Communication Nationale (Second National Communication)
SDDCI	Stratégie de Développement Durable et de Croissance Inclusive (Sustainable Development and Inclusive Growth Strategy)
SDE	Schéma de Développement de l'Elevage (Animal Husbandry Development Scheme)
SESA	Strategic Environmental and Social Assessment
SLM	Sustainable Land Management
SF-SLM	Strategic Framework for Sustainable Land Management
SNPA/CVC	Strat. Nat. et le Plan d'Action en matière de Chang. et Variabilité Clim. (National Strategy and Action Plan for Climate Change and Variability)
TARAM	Tool for Afforestation and Reforestation Approved Methodologies
TCN	Troisième Communication Nationale (Third National Communication)
TFP	Technical and Financial Partner
TMC	Technical Monitoring Committee
UNDP	United National Development Programme (PNUD)
UNFCCC	United Nations Framework Convention on Climate Change

8.2 Annex 2: Projected annual benefits and costs of adaptation measures

Techniques	Surface area (in thousands of ha)	First quantified benefit	Second quantified benefit	Costs (in thousands of \$)
Restoration of agricultural land	1,030	Increased yields	Increased earnings	309,000
Assisted natural regeneration	1,100	Increased yields	Increased earnings	33,000
Dune fixation	550	Increased yields	Increased earnings	220,000
Management of natural forests	2,220	Timber.	-	222,000
Planting of hedgerows (145,000 km) :	29	Increased yields	Increased timber	46,980
Planting of gum trees and doum	750	Gum and leaves	Increased timber	300,000

palms				
Planting of Moringa oleifera	125	Leaves	-	37,500
Herbaceous seeding	304.5	Straw and fodder	-	30,450
Private forestry	750	Timber	-	75,000
TOTAL	6,858			1,273,930

Source: Workshop on capacity building of actors, CPDN 2015.

8.3 Annex 3 : Projected areas in sustainable land management (SLM) for the INDC

The annual cost of implementing the Strategic Framework for Sustainable Land Management (SF-SLM) over the first ten years (2016-2030) is estimated at US \$127,393,000, as indicated in the table below (proposed schedule and budget for Niger's INDC adaptation measures, in areas and costs per year for the first ten years).

SF-SLM technologies	Projected annual areas for the period 2016-30 (in ha/year)	Annual budget for the period 2016-30 (in US\$)
1. Restoration of agricultural land	68,667	30,900,000
2. Assisted natural regeneration	73,333	3,300,000
3. Dune fixation	36,666	22,000,000
4. Management of natural forests	148,000	22,200,000
5. Hedgerows	9,667	4,698,000
6. Planting of gum trees and douma palms	50,000	30,000,000
7. Planting of <i>Moringa oleifera</i>	8,333	3,750,000
8. Herbaceous seeding	20,300	3,045,000
9. Private forestry	50,000	7,500,000
TOTAL		127,393,000

Source: Workshop on capacity building of actors, INDC, 2015.