INTENDED NATIONALLY DETERMINED CONTRIBUTION FROM THE PLURINATIONAL STATE OF BOLIVIA

BOLIVIA PRESENTS ITS CONTRIBUTION NOTING:

- The structural cause that has triggered the climate crisis is the failed capitalist system. In this regard, for a lasting solution to the climate crisis we must destroy capitalism.
- The new climate agreement to be approved at the COP 21 should reflect article 4.7 of the United Nations Framework Convention on Climate Change (UNFCCC), which states: "The extent to which developing country Parties will effectively implement their commitments under the Convention will depend on the effective implementation by developed country Parties of their commitments related to financial resources and transfer of technology"
- The new climate agreement must be developed over the basis of the vision of the peoples and social organizations.
- In the context of its vision of holistic development, according to the provisions of the State Constitution, Law No. 071 of The Rights of Mother Earth and Law N° 300 of Mother Earth and Integral Development to Live Well, guided by the 2025 Patriotic Bicentennial Agenda.
- In the context of the 17 Sustainable Development Goals and its 169 goals, which are part of the new development agenda, from a holistic view of the commitments.

Distribution of global emissions under Climate Justice (2015-2050)

- For the increase in environmental temperature not exceeding 1.5 degrees, countries must emit into the atmosphere a maximum of 650 GtCO2.
- In order to not exceed 2 degrees Celsius countries should not emit more than 1,000 GtCO2.

Carbon budget should be distributed in a fair manner

Distribution of global emissions under Climate Justice (2015-2050)

- Bolivia proposed at the United Nations a Climate Justice Index (CJI).
- The CJI distributes carbon budget equitably and with climate justice criteria.
- The CJI considers historical responsibility, ecological footprint, population, technological capability and capacity for development of each country.

CLIMATE JUSTICE INDEX

Ecological Footprint	Ecological Footprint Global Index
Historical Responsibility	Cumulative emissions of CO2 (1750 – 2010)
Development Capability	- GDP - Human Development Index - Percentage of population living with less than US$ 1.25 a day
Technological Capability	- Research and development expenditure as a percentage of GDP - Performance of industrial competition
Population	Total population of each country

CJI Formula

The indicator for **Percent** distribution of carbon budget (i_j) was obtained by multiplying each normalized variable by a weight $\theta \in \mathbb{R}^{0,1}$ and adding the result according to expression,

$$i_j = \left\| \exp\left(-\theta_1 \tilde{h}_j - \theta_2 \tilde{r}_j - \theta_3 \, \tilde{d}_j - \theta_4 \tilde{t}_j + \theta_5 \tilde{p}_j\right) \right\|_{\ell_1}$$

Signs of parameters $\theta \in \mathbb{R}^{0,1}$ reflect the direction of the relationship between the variable and the percentage of budget.

The exp function $(\cdot)$ transform in positive values the outcome of $-\theta_1 \tilde{h}_j - \theta_2 \tilde{r}_j - \theta_3 \, \tilde{d}_j - \theta_4 \tilde{t}_j + \theta_5 \tilde{p}_j$, and $\|\cdot\|_{\ell_1}$ is the norm ℓ_1 (Manhattan norm) which is used to bring the total budget distribution so it will always add 100%.

Ecological Footprint

Definition	Relationship to Indicator
It is calculated on the amount of land, water and forest that people of countries need to satisfy all goods consumed and to assimilate generated waste.	With larger ecological footprint, lower proportion of carbon budget.

Information base of the calculation:
Indicator: Global Ecological Footprint Index 2010
Source: UNEP

Historical Responsibility

Definition	Relationship to Indicator
It includes responsibility for the accumulation in emissions since pre-industrial era (1750-2010). Annex I countries (OECD countries and the Economy in Transition) have emitted into the atmosphere a total of 1,160 GtonCO2 (58%), while the non-Annex I (Africa, Asia, Latin America and Middle East) countries have emitted 840 GtCO2 (42%).	With a greater historical responsibility, lower proportion in the distribution of carbon budget.

Information base of the calculation:
Indicator: cumulative emissions of CO2 from 1750-2010
Source: Carbon Dioxide Information Analysis Center, the Data Center United States Department of Energy, IPCC

Development Capability

Definition	Relationship to Indicator
It represents the conditions of economic and social development of each country.	With greater development capability, lower participation in the carbon budget

Information base of the calculation:
Indicators: GDP; HDI Percentage of population living on less than $us1.25 a day
Source: World Bank
UNDP
Statistics Division of the United Nations

Technological Capability

Definition	Relationship to Indicator
Measures the ability of countries considering their technological development spending on R&D and industrial performance of each country, considering the ability of each country to produce and export goods with high technology.	With greater technological capability, lower participation in the global carbon budget

Information base of the calculation:
Indicator: Expenditure on research and development as a percentage of GDP, industrial competition Performance
Source: World Bank
UNIDO

Development Capability and Technological Capability

- Development Capability = GDP+ HDI – poverty

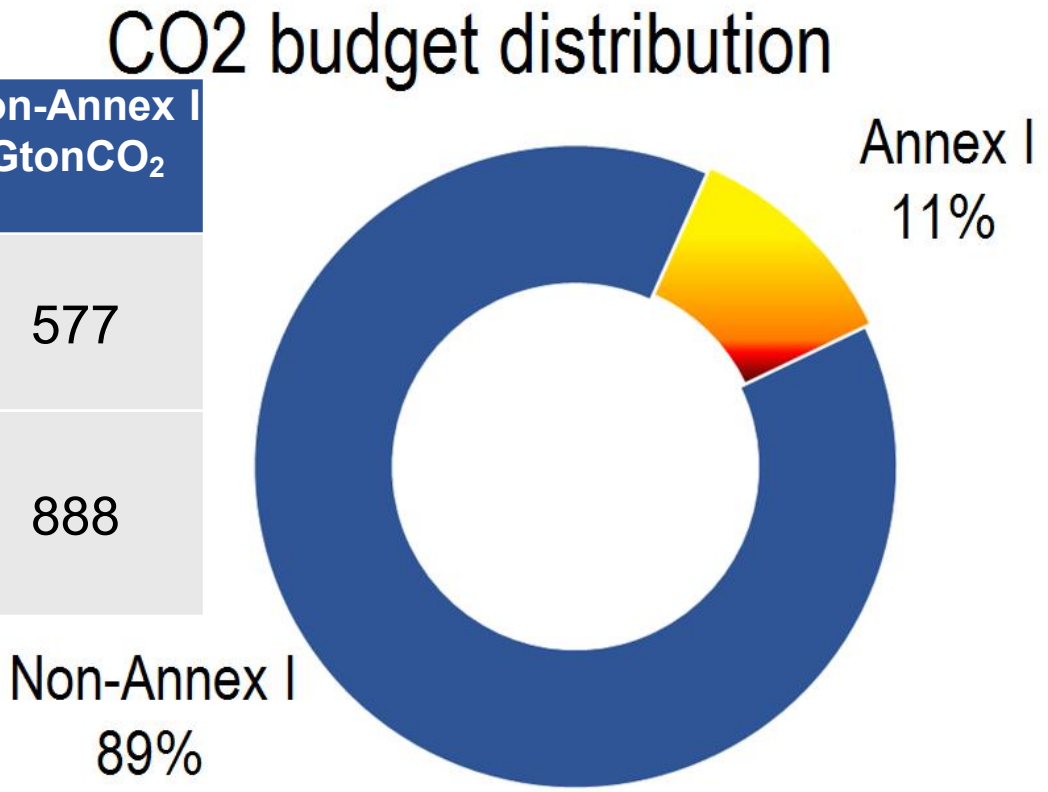
- Technological Capability = R&D Expenditure+ indicator of performance and industrial competitiveness

Data were normalized between zero and one using the formula:

$$\tilde{d}_j = \frac{d_j - min(d_j)}{max(d_j) - min(d_j)}$$

Fair distribution of carbon budget (2015-2050)

Scenario		$GtonCO_2$	Annex I $GtonCO_2$	Non-Annex I $GtonCO_2$
RCP 2.6	1,5ºC	650	73	577
	2ºC	1.000	112	888



Dimensions of the contribution of the Plurinational State of Bolivia

Bolivia presents its contribution in two dimensions:

1. The first dimension is linked to global structural solutions to the climate crisis.
2. The second dimension is linked to performance and national actions within the framework of holistic development.

Global structural solutions to climate crisis

1. Adoption of a new model of civilization in the world without consumerism, war-mongering, and mercantilism, a world without capitalism; build and consolidate a world order of Living Well that defends and promotes the integral rights of our peoples, undertaking the path of harmony with nature and respect for life.
2. Construction of a climate system based on responsibility to Mother Earth, the culture of life and the full realization of humanity in their holistic development, humanizing the economy, surpassing the simplistic approach to decarbonization of the economy.

Global structural solutions to climate crisis

3. Protection of Rights of Mother Earth in an articulated and complementary manner to the rights of peoples to their development.

4. Defense of universal common goods such as the seas and oceans, water, atmospheric space, as well eliminate the technological monopoly, promoting people's access to the common heritage.

5. Elimination of patents on technologies and recognition of the human right to science and technology of life.

6. Effective implementation by governments of the human right to water.

Global structural solutions to climate crisis

7. Establishment of the International Court of Climate Justice and Mother Earth to enable countries to fulfill their international commitments to climate change in a context of respect for the rights of peoples and those of Mother Earth.

8. Allocate the resources of the military machinery of the imperial powers and the war-mongers to finance the activities of the peoples against climate change.

Global structural solutions to climate crisis

9. Eradication of commodification of nature and carbon markets promoting business climate millionaires, which do not solve the problem of the climate crisis.

10. Decolonize natural resources environmental colonial biased views that see the peoples of the South as forest rangers of Northern countries and communities as enemies of nature.

Results and national actions under the Holistic Development (2015-2030)

Contribution of Bolivia

The contribution is specified in the following areas:

WATER

ENERGY

FORESTS

WATER

WATER

Objective:
Increase in a holistic manner the adaptation capacity and systematically reduce the hydric vulnerability in the country

BASELINE YEAR 2010

ADAPTABILITY

Drinking water coverage	75% national coverage of drinking water.
Water storage	596 Million m3 of water.
Irrigation coverage	296.368 hectares of irrigation.
Community social water management	5.901 Water social organizations (associations, communities, cooperatives, etc).

WATER

Objective:
Increase in a holistic manner the adaptation capacity and systematically reduce the hydric vulnerability in the country

NATIONAL EFFORT 2015-2030

ADAPTABILITY

Drinking water coverage	100% drinking water coverage by 2025 with delivery systems resilient services.
Water storage	Tripled (1.939 million m3) the storage capacity of water.
Irrigation coverage	Tripled the irrigated agricultural area exceeding 1'000.000 ha.
Community social water management	80% increase in the number of social organizations with resilient water management systems.

WATER

WITH INTERNATIONAL COOPERATION 2015-2030

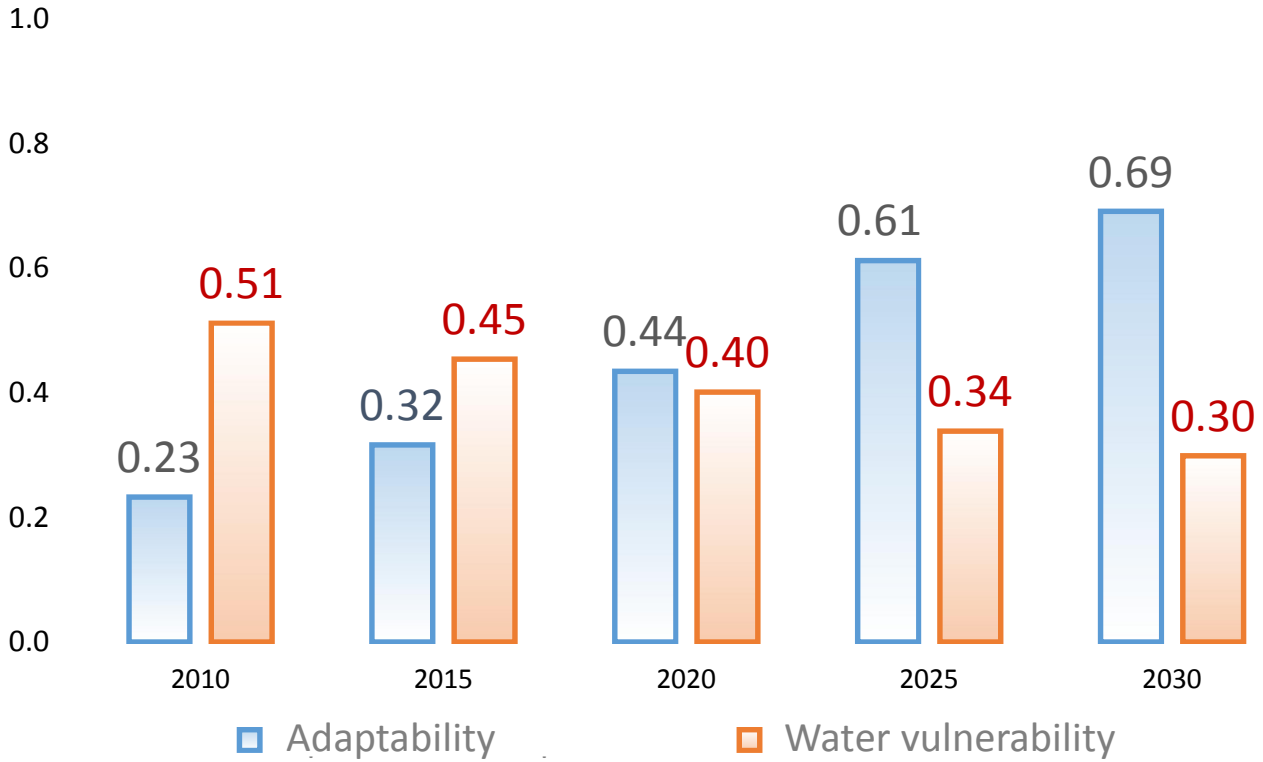
Objective:
Increase in a holistic manner the adaptation capacity and systematically reduce the hydric vulnerability in the country

ADAPTABILITY

Drinking water coverage	TOTAL COVERAGE
Water storage	Quadrupled (3.779 million m3) storage capacity of water.
Irrigation coverage	Quadrupled irrigated agricultural area exceeding 1'500.000 ha.
Community social water management	90% increase in the number of social organizations with resilient water management systems.

NATIONAL EFFORT

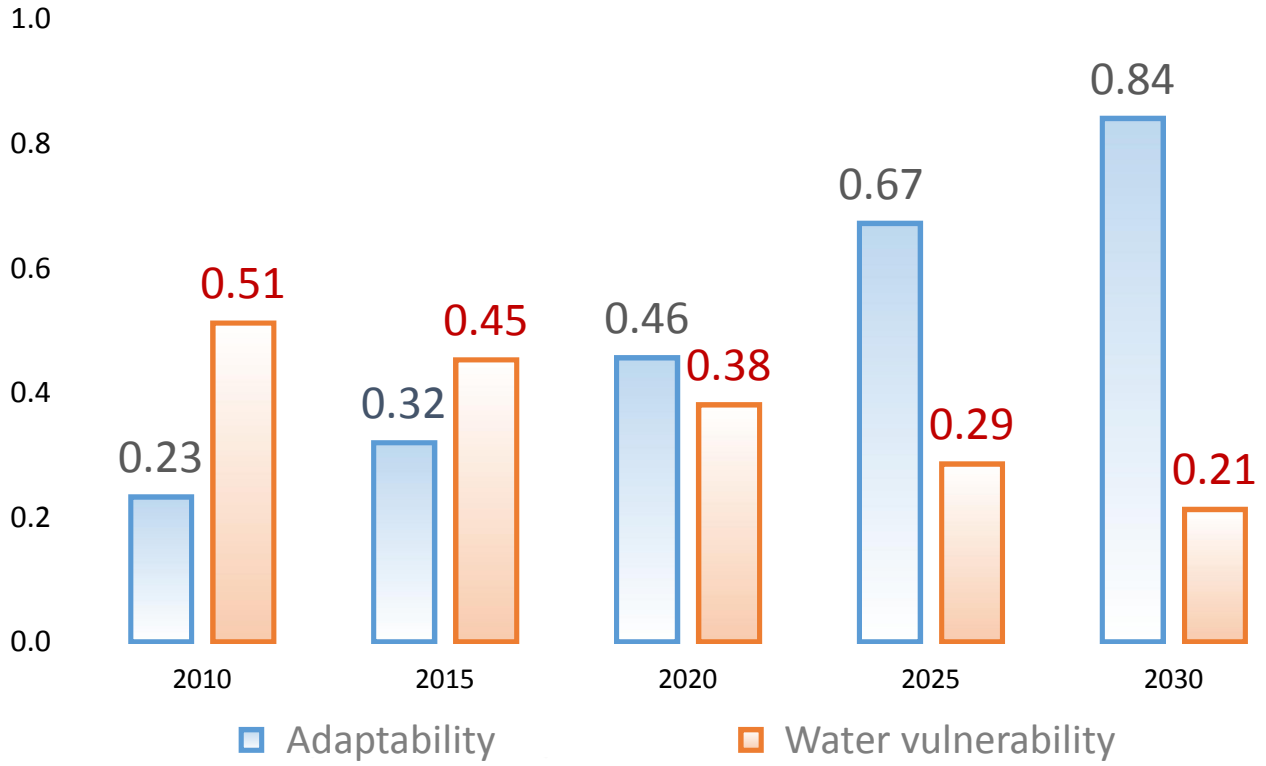
Adaptability (A) is increased
Water Vulnerability (WV) is reduced



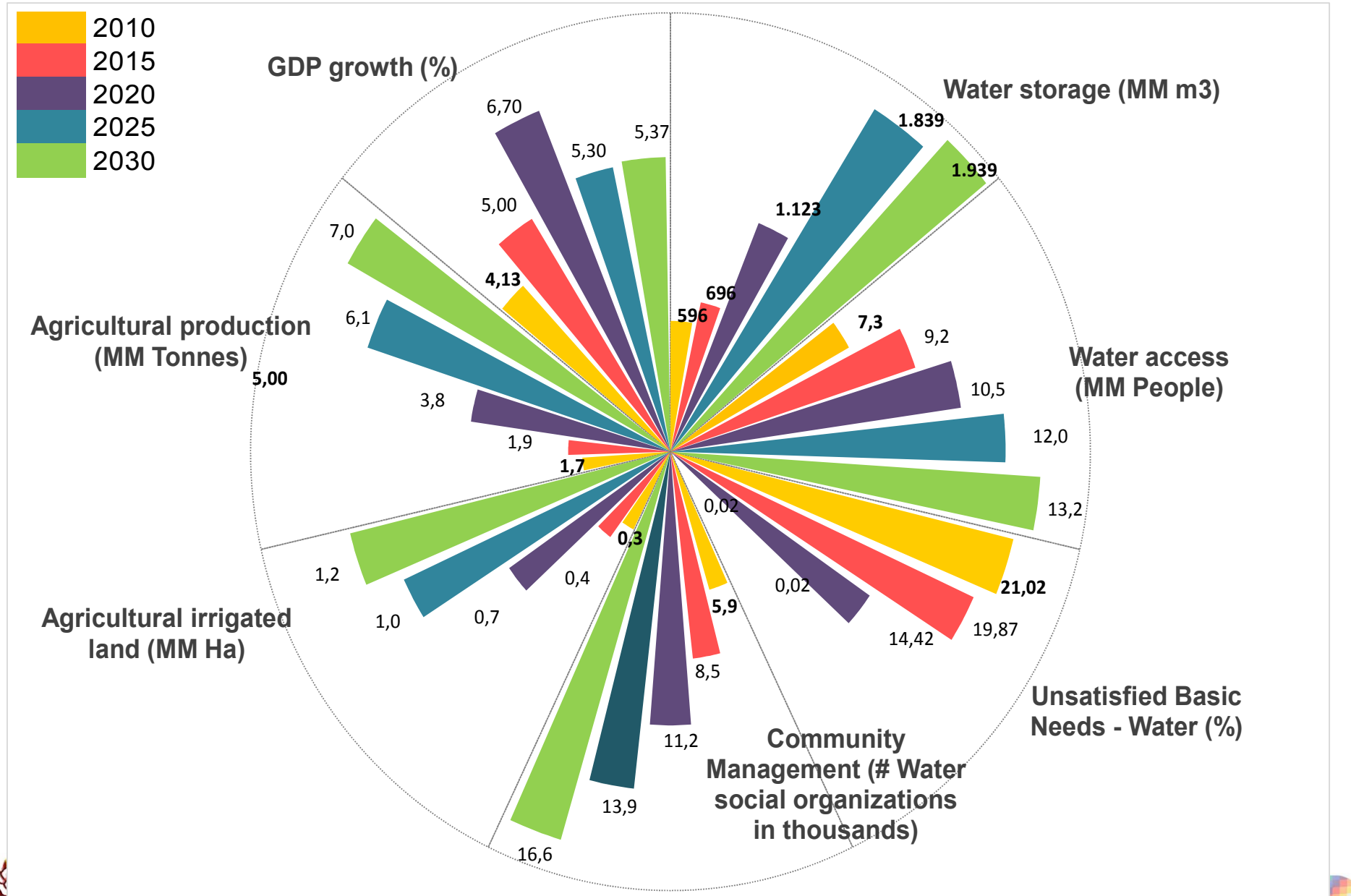
Note:
A = Storage + Community Management + production + Access to water - Poverty (NBI)
WV = Threat (drought / flood) + Sensitivity (shortage) - Adaptability

WITH INTERNATIONAL COOPERATION

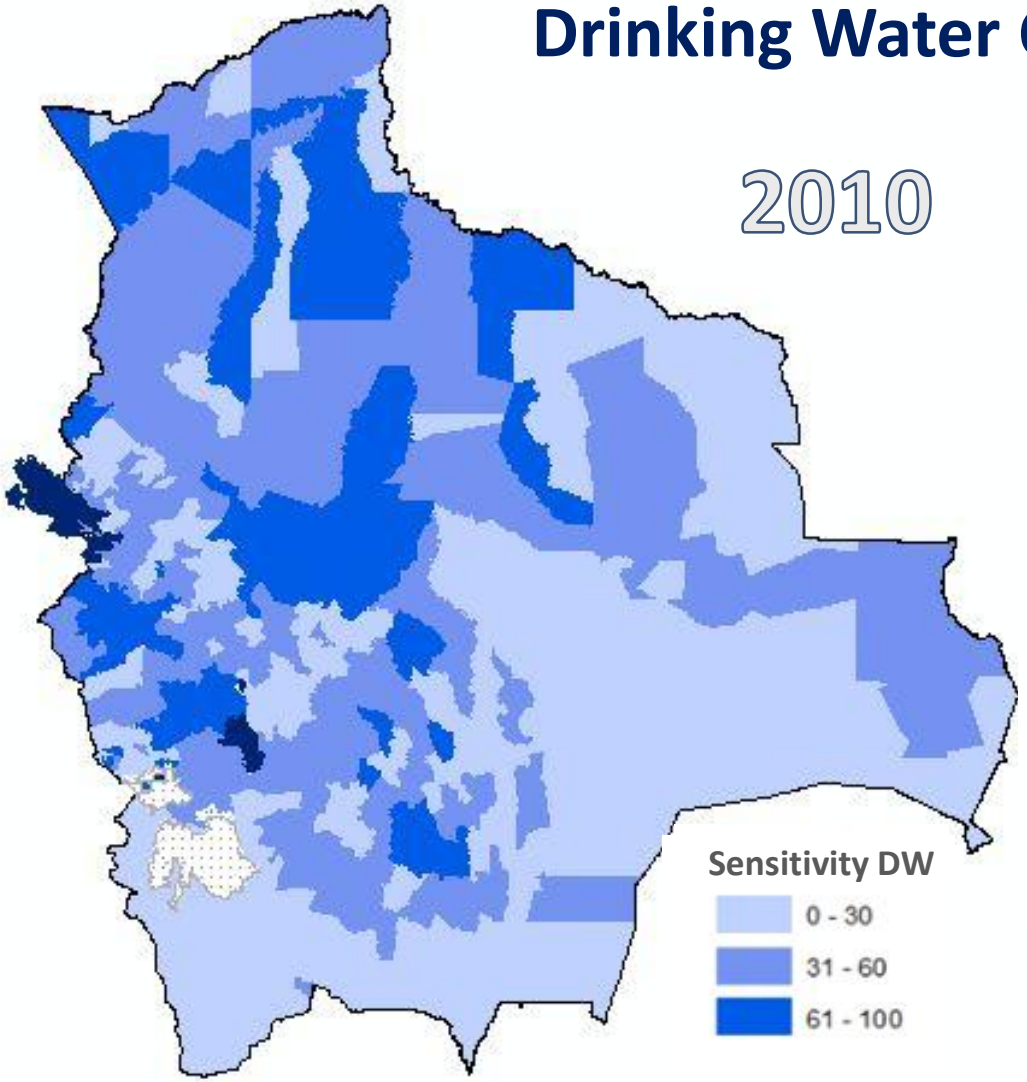
Adaptability (A) is increased
Water Vulnerability (WV) is reduced

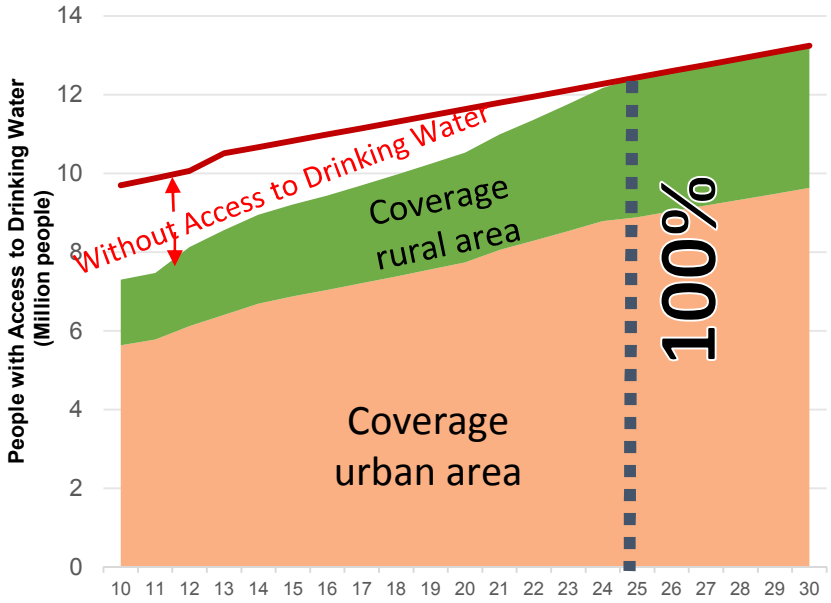


Note:
A = Storage + Community Management + production + Access to water - Poverty (NBI)
WV = Threat (drought / flood) + Sensitivity (shortage) - Adaptability


2010
2015
2020
2025
2030
GDP growth (%)
5,37
5,30
6,70
5,00
4,13
7,0
Water storage (MM m3)
596
696
1.123
1.839
1.939
7,3
Water access (MM People)
9,2
10,5
12,0
13,2
Agricultural production (MM Tonnes)
5,00
6,1
3,8
1,9
1,7
Agricultural irrigated land (MM Ha)
1,2
1,0
0,7
0,4
0,3
Unsatisfied Basic Needs - Water (%)
0,02
0,02
21,02
19,87
14,42
5,9
8,5
Community Management (# Water social organizations in thousands)
11,2
13,9
16,6

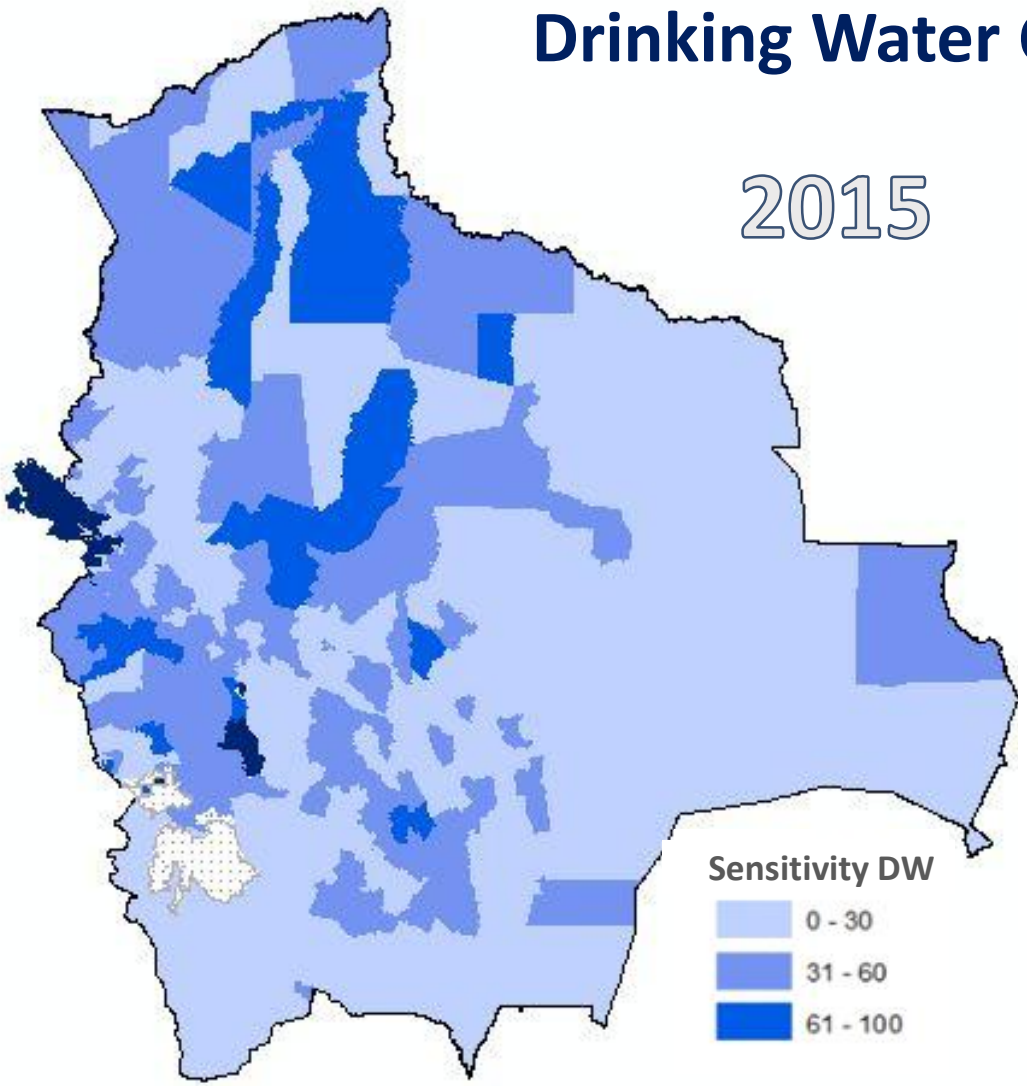
Drinking Water Coverage

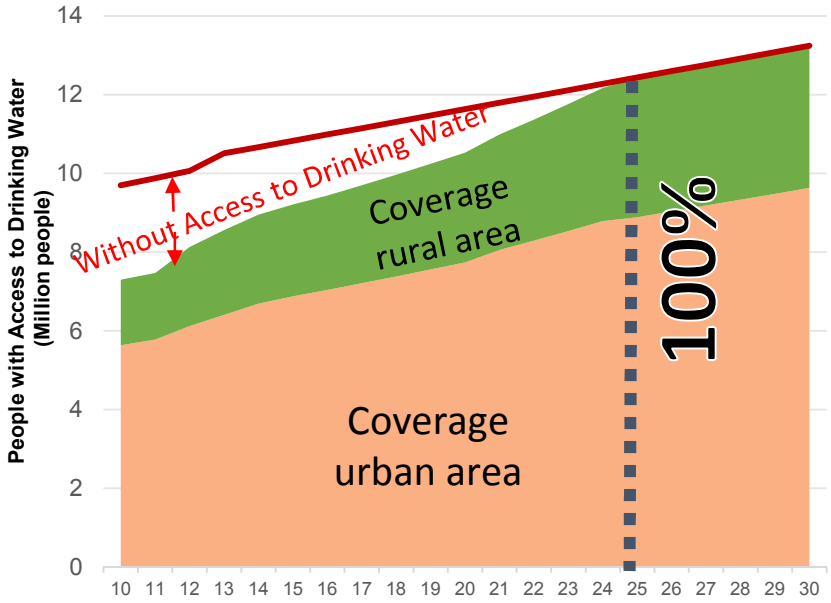




By 2025, 100% of Bolivians
will have access to drinking water

Drinking Water Coverage

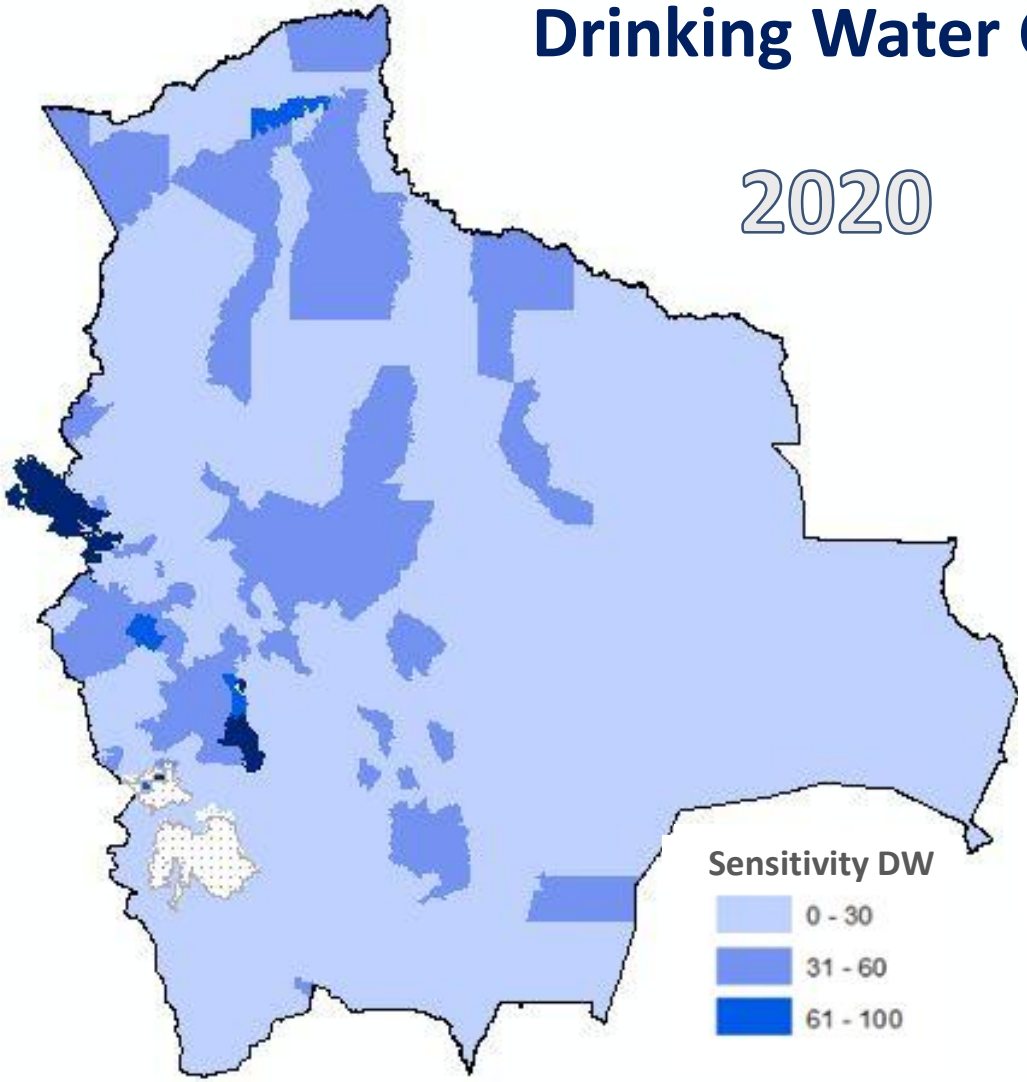


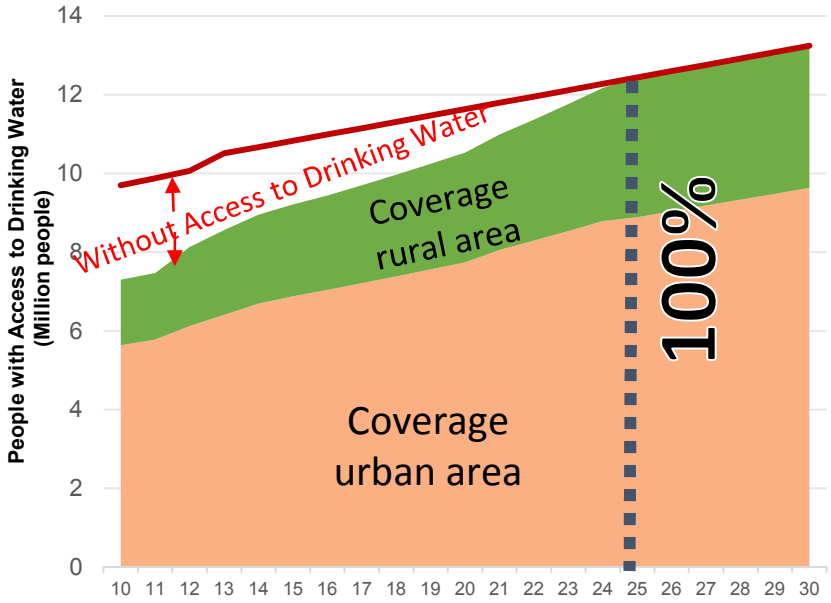


By 2025, 100% of Bolivians
will have access to drinking water

Drinking Water Coverage

2020

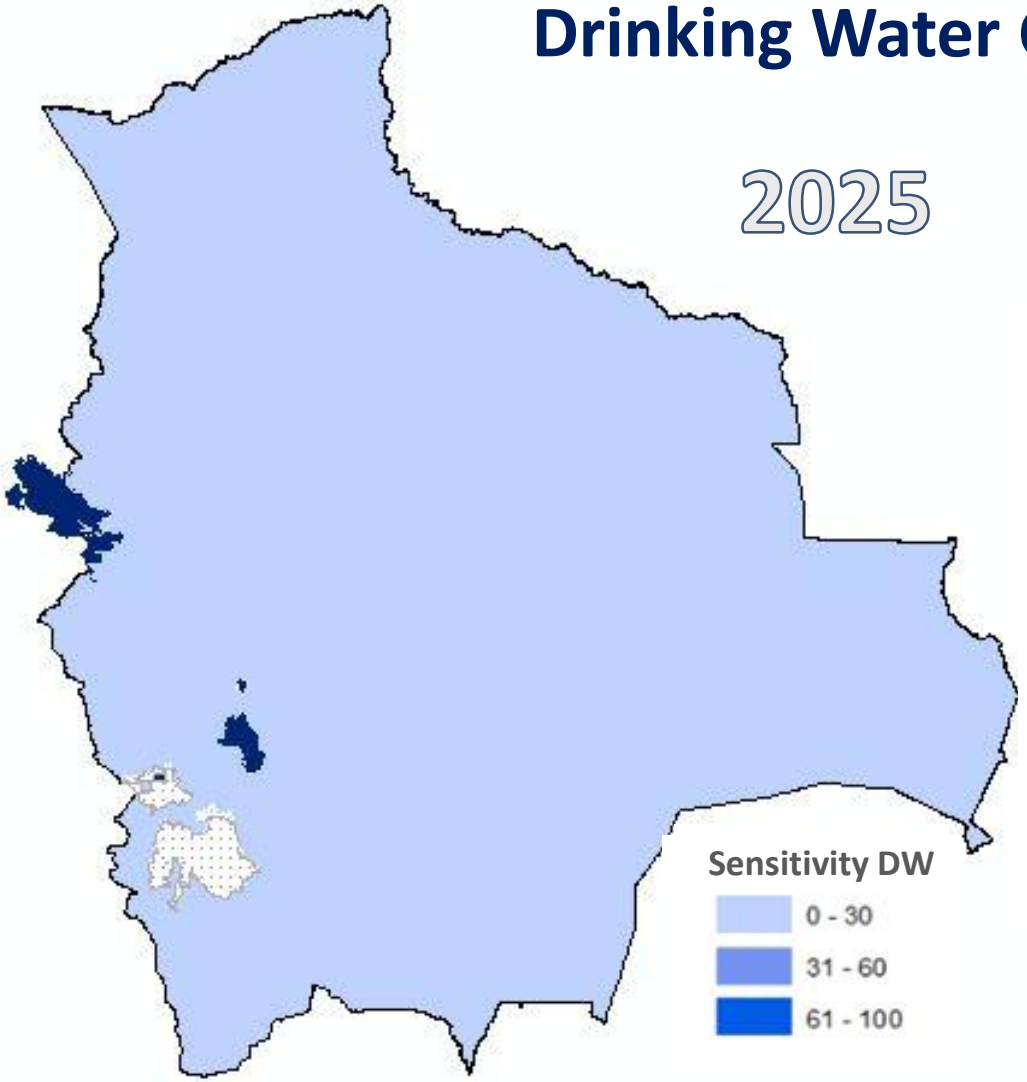


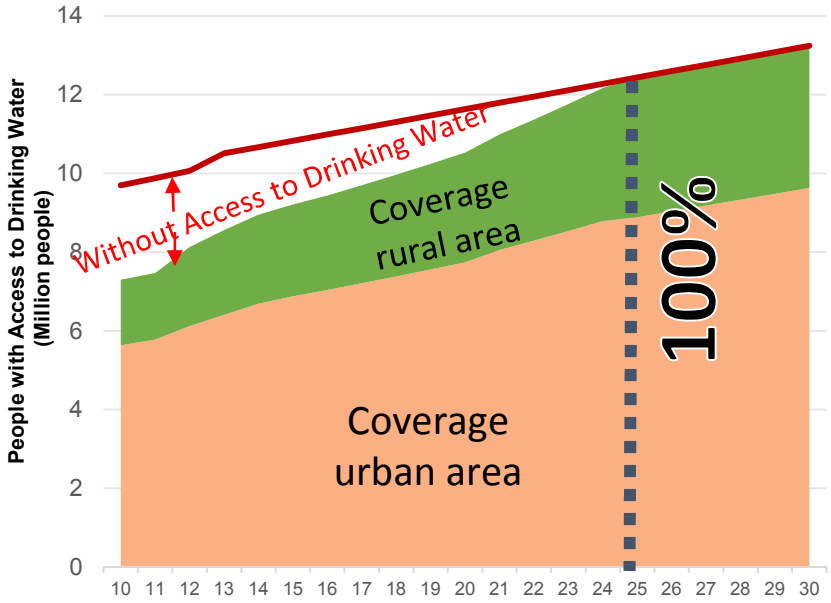


By 2025, 100% of Bolivians
will have access to drinking water

Drinking Water Coverage

2025

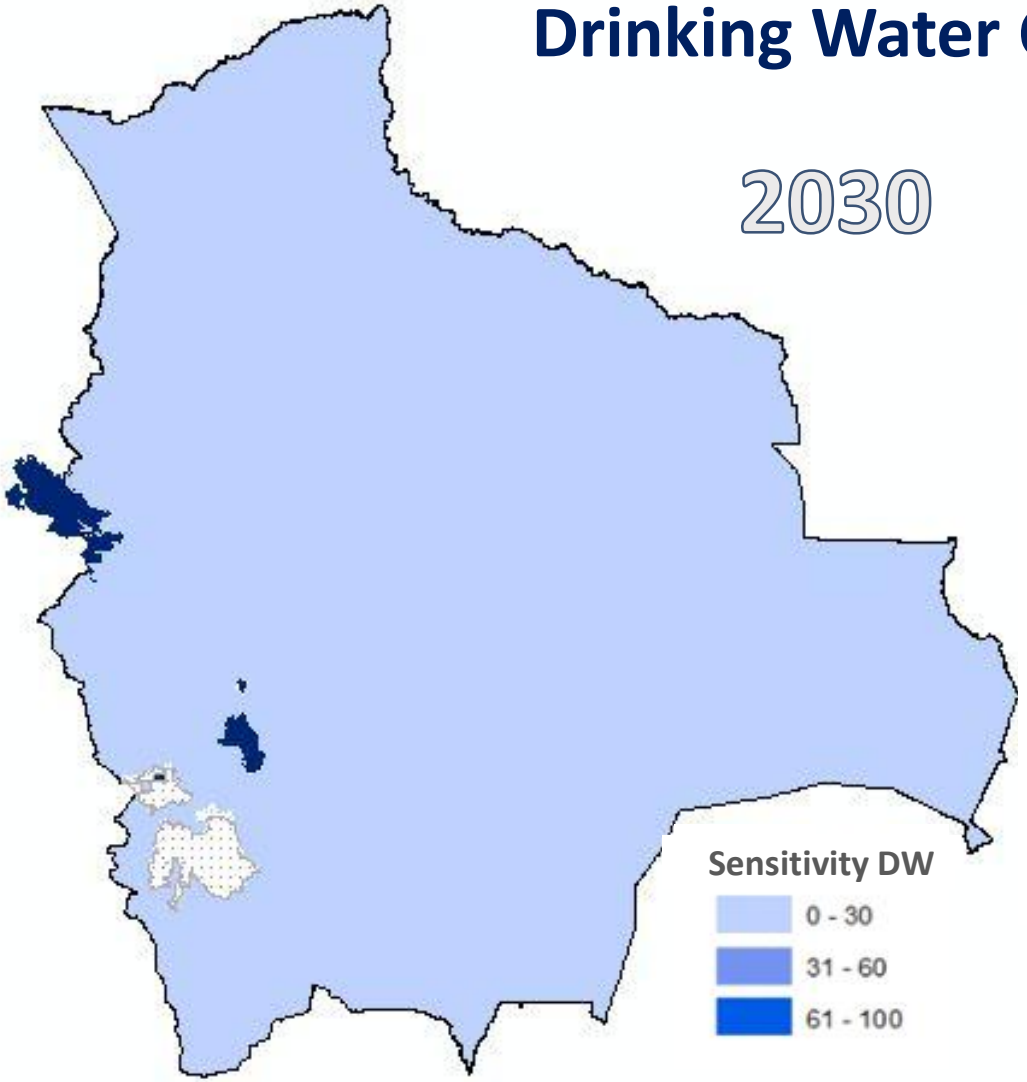


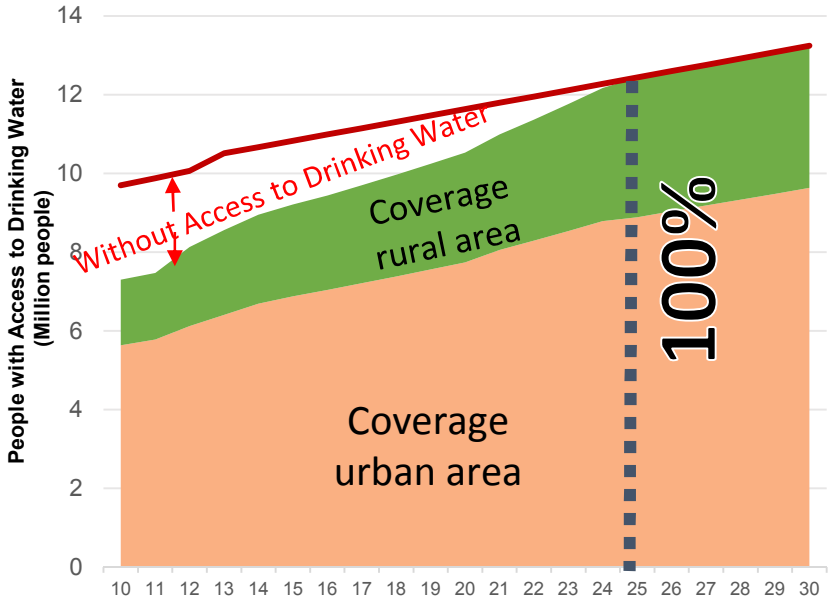


By 2025, 100% of Bolivians
will have access to drinking water

Drinking Water Coverage

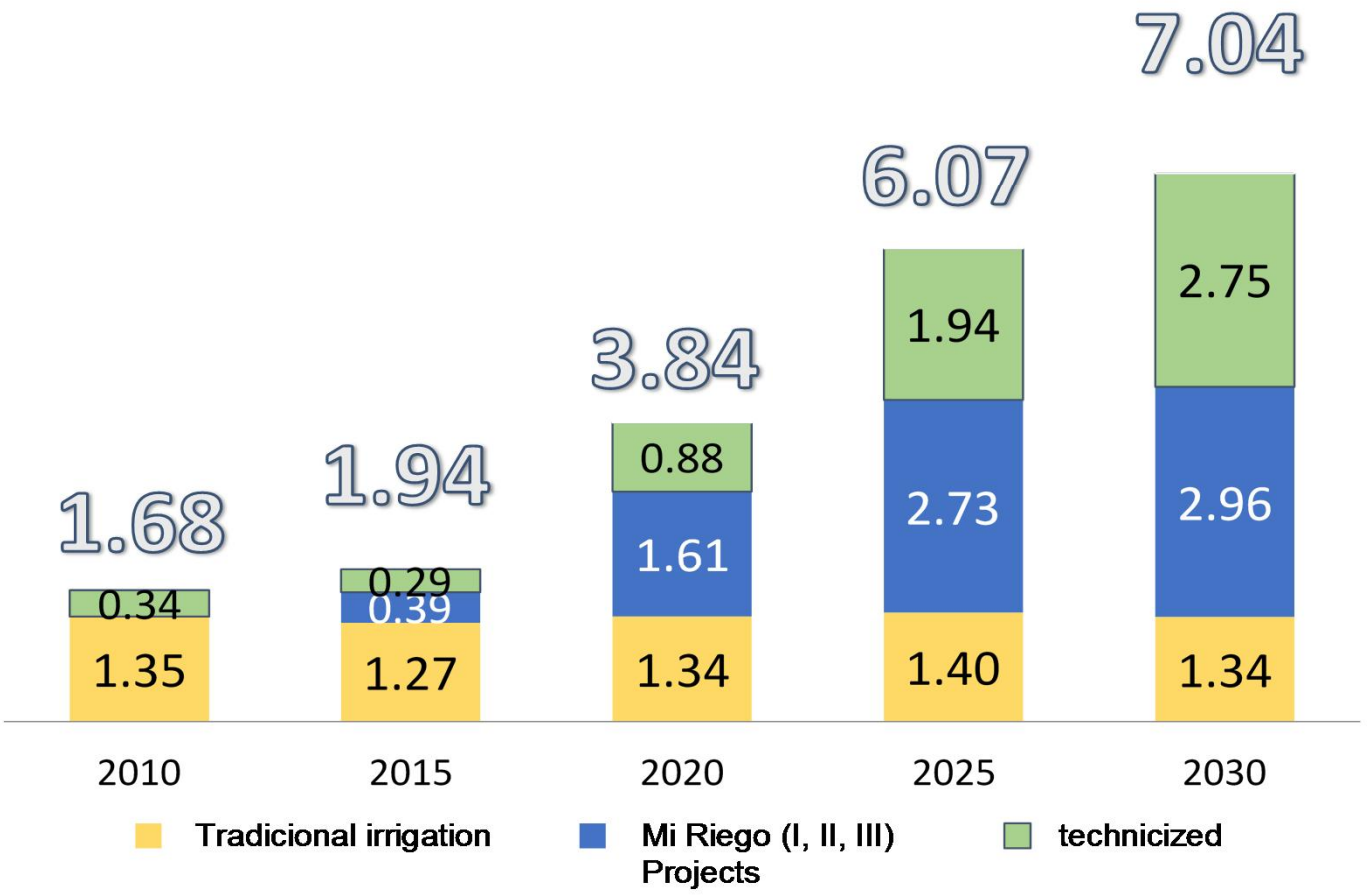
2030





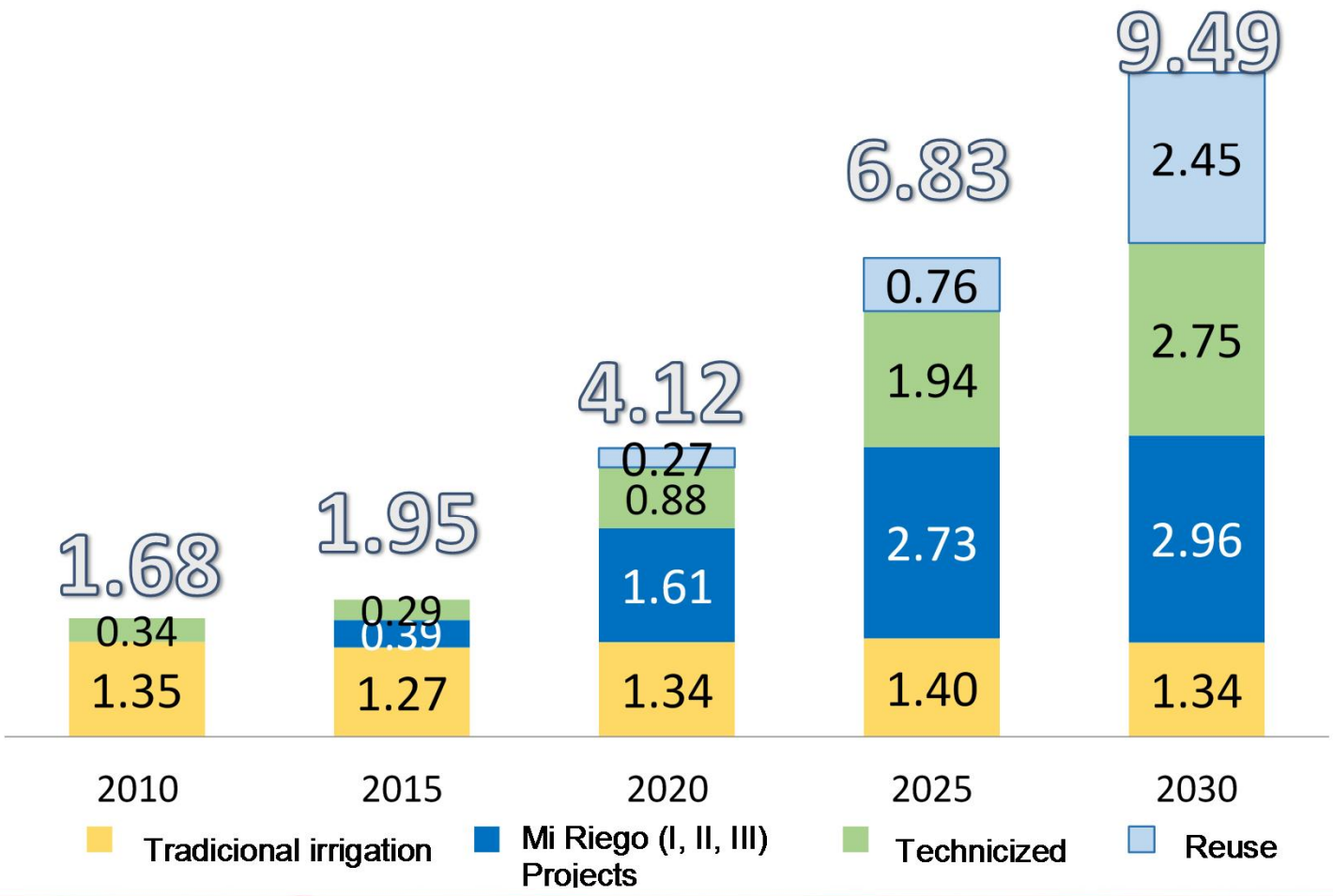
By 2025, 100% of Bolivians
will have access to drinking water

Irrigated Agricultural Production (Million tonnes)



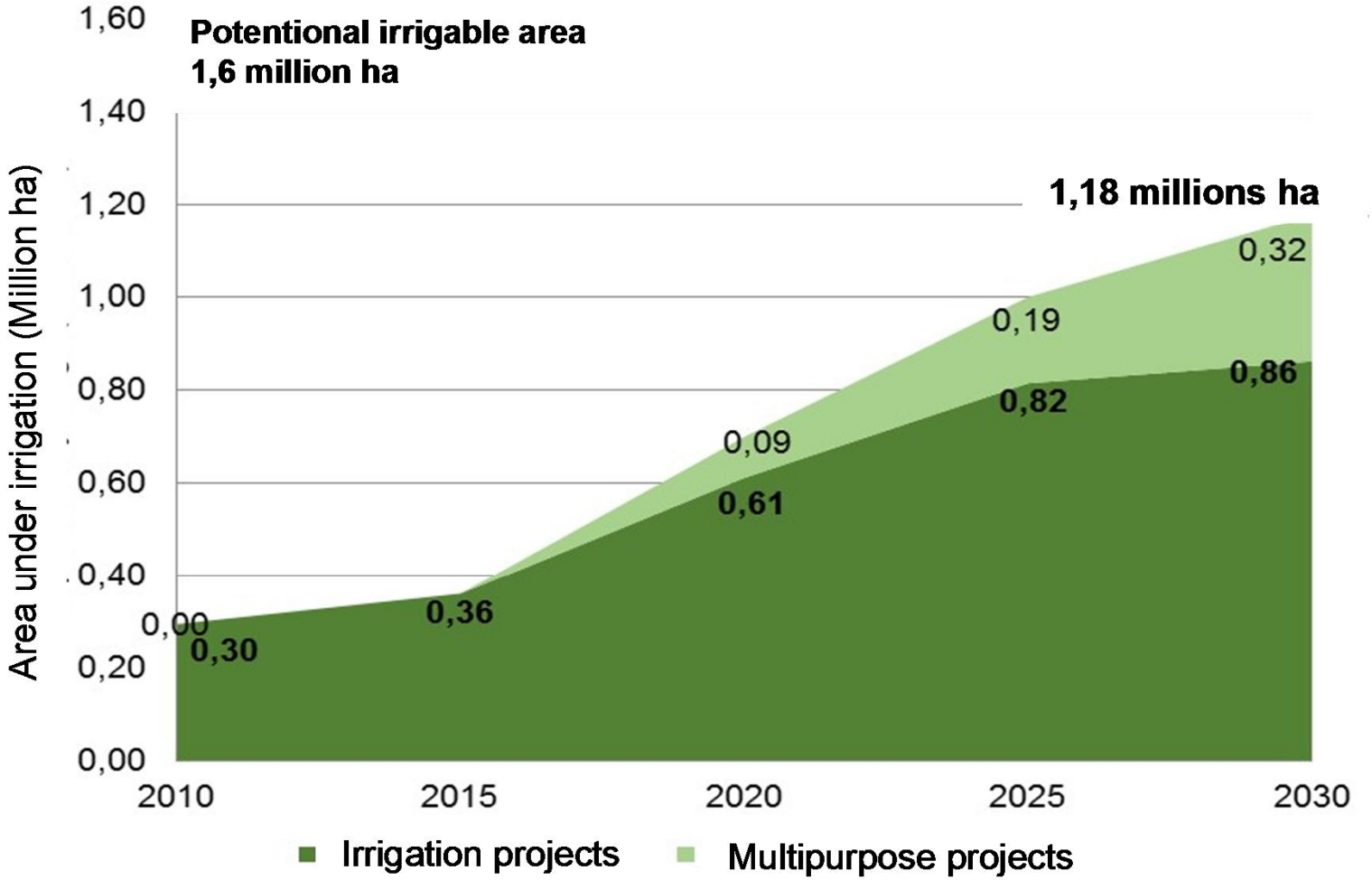
Irrigated Agricultural Production (Million tonnes)

INTERNATIONAL COOPERATION

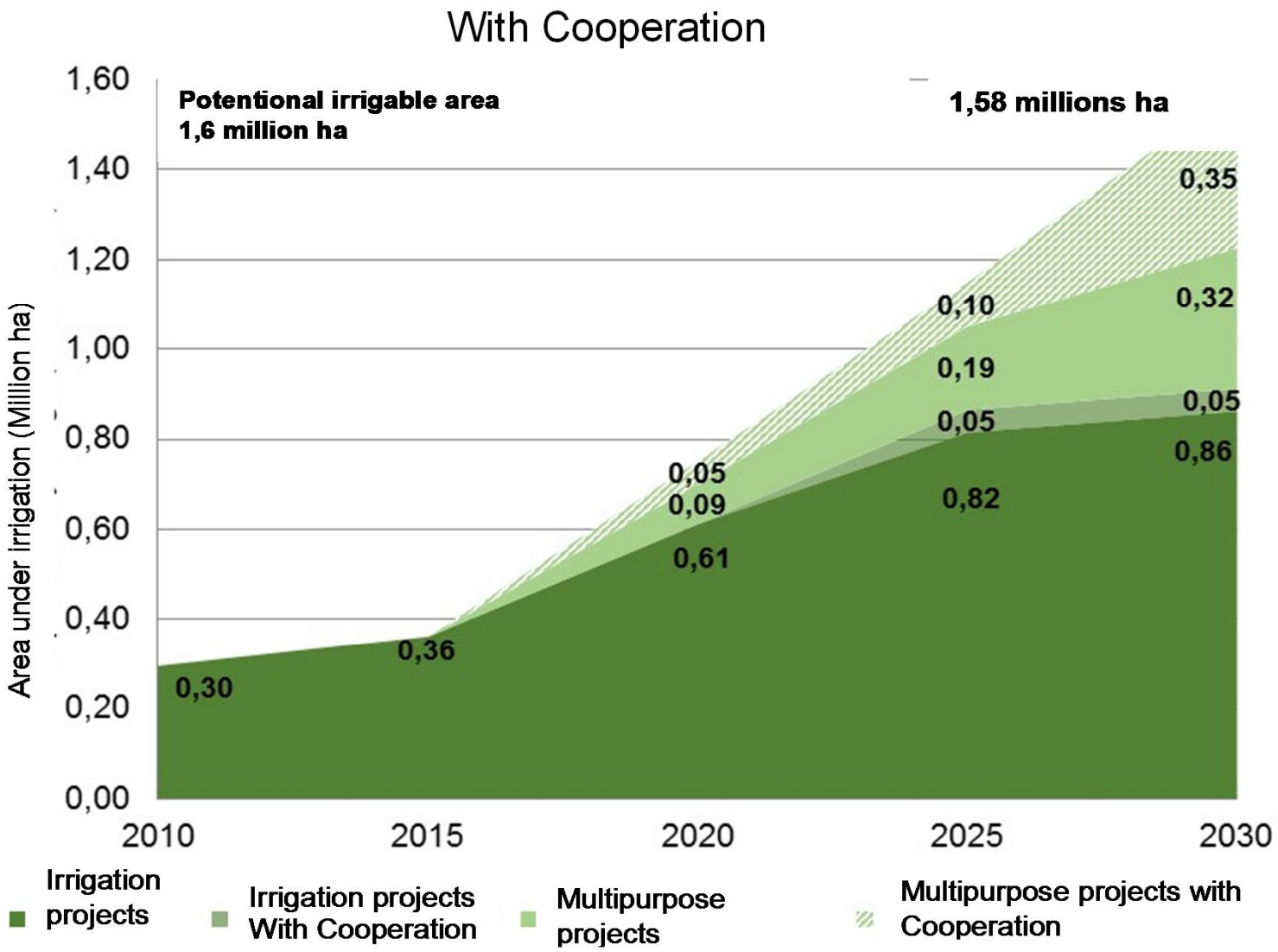


Irrigation Coverage

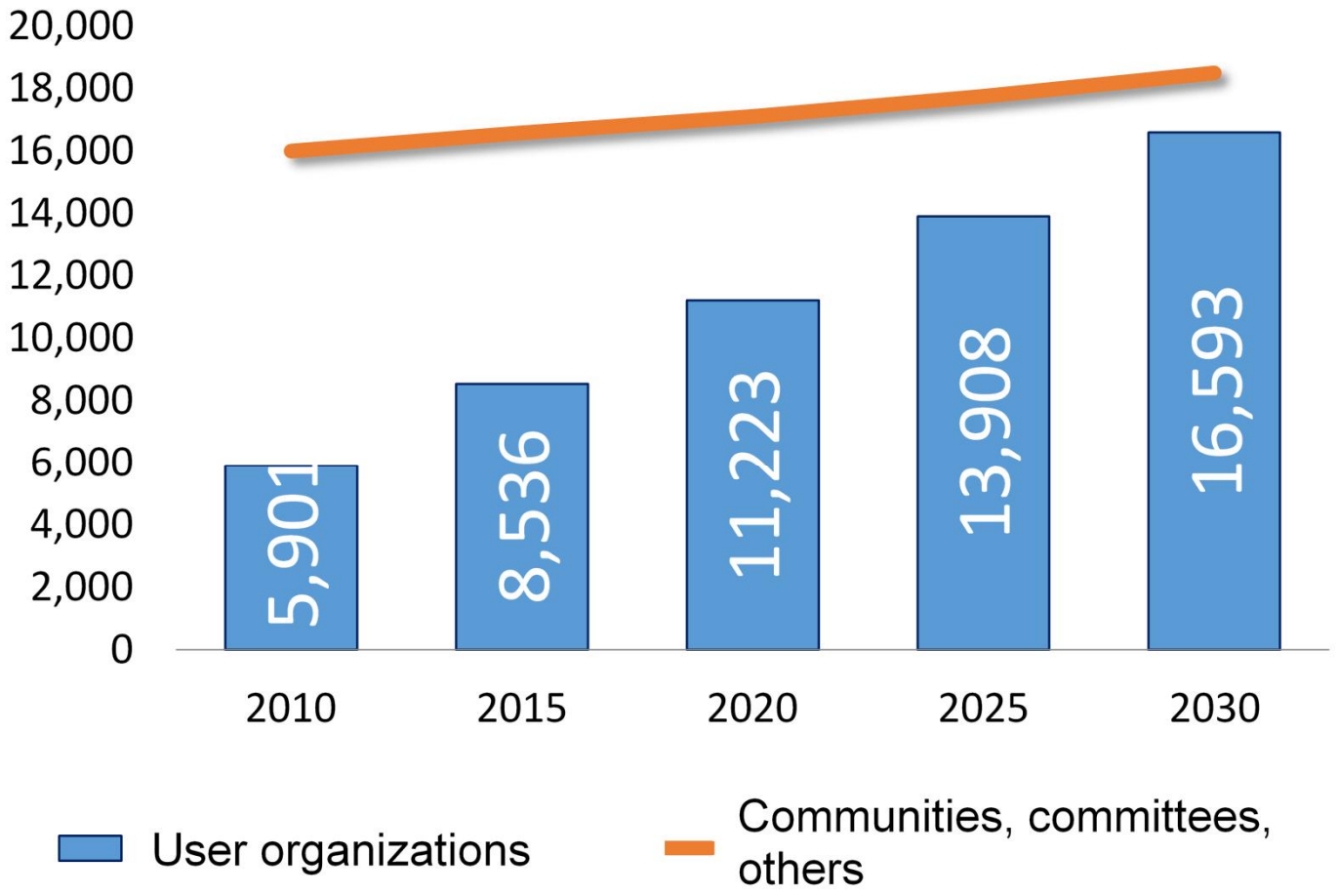
National Effort



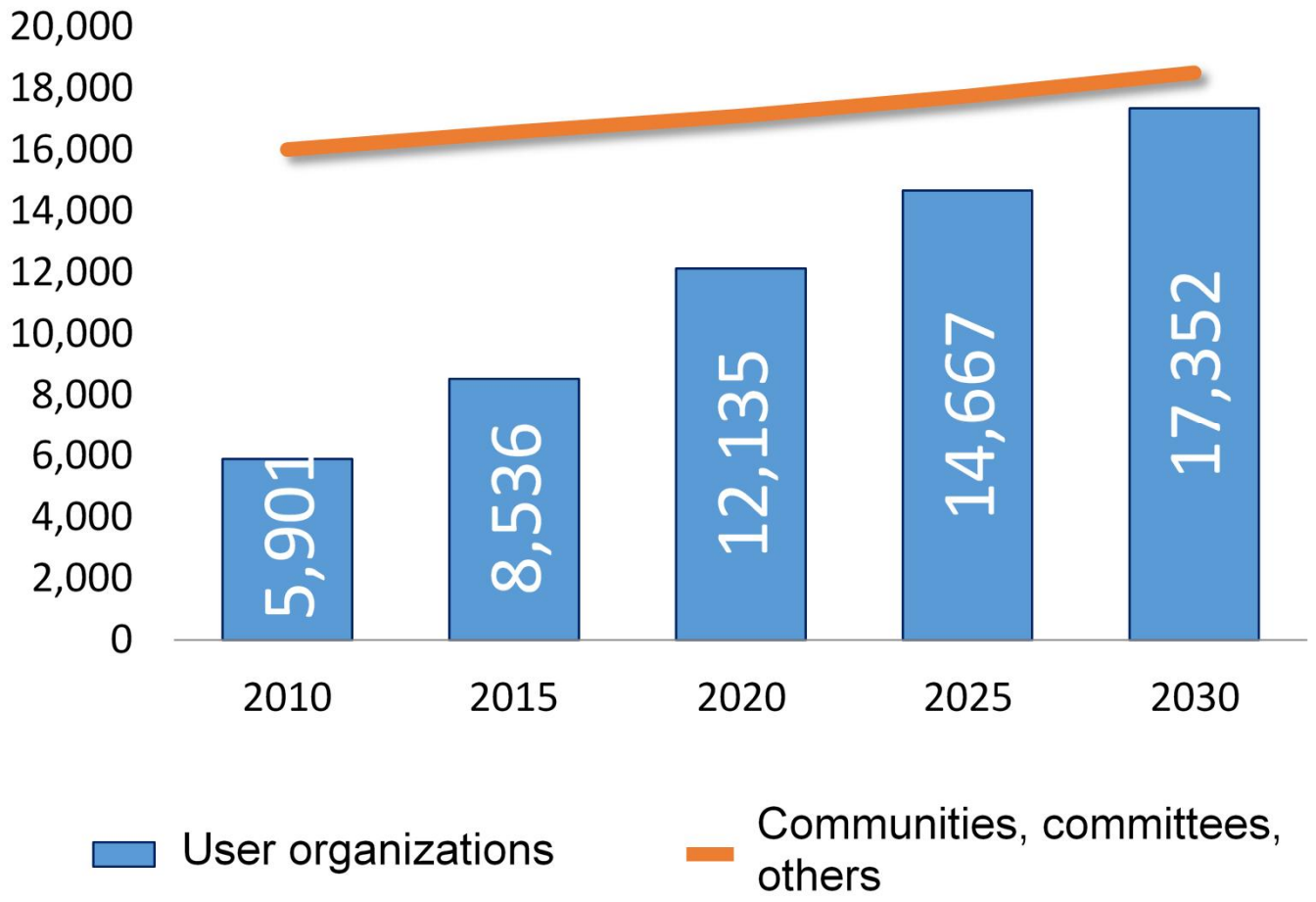
Irrigation Coverage



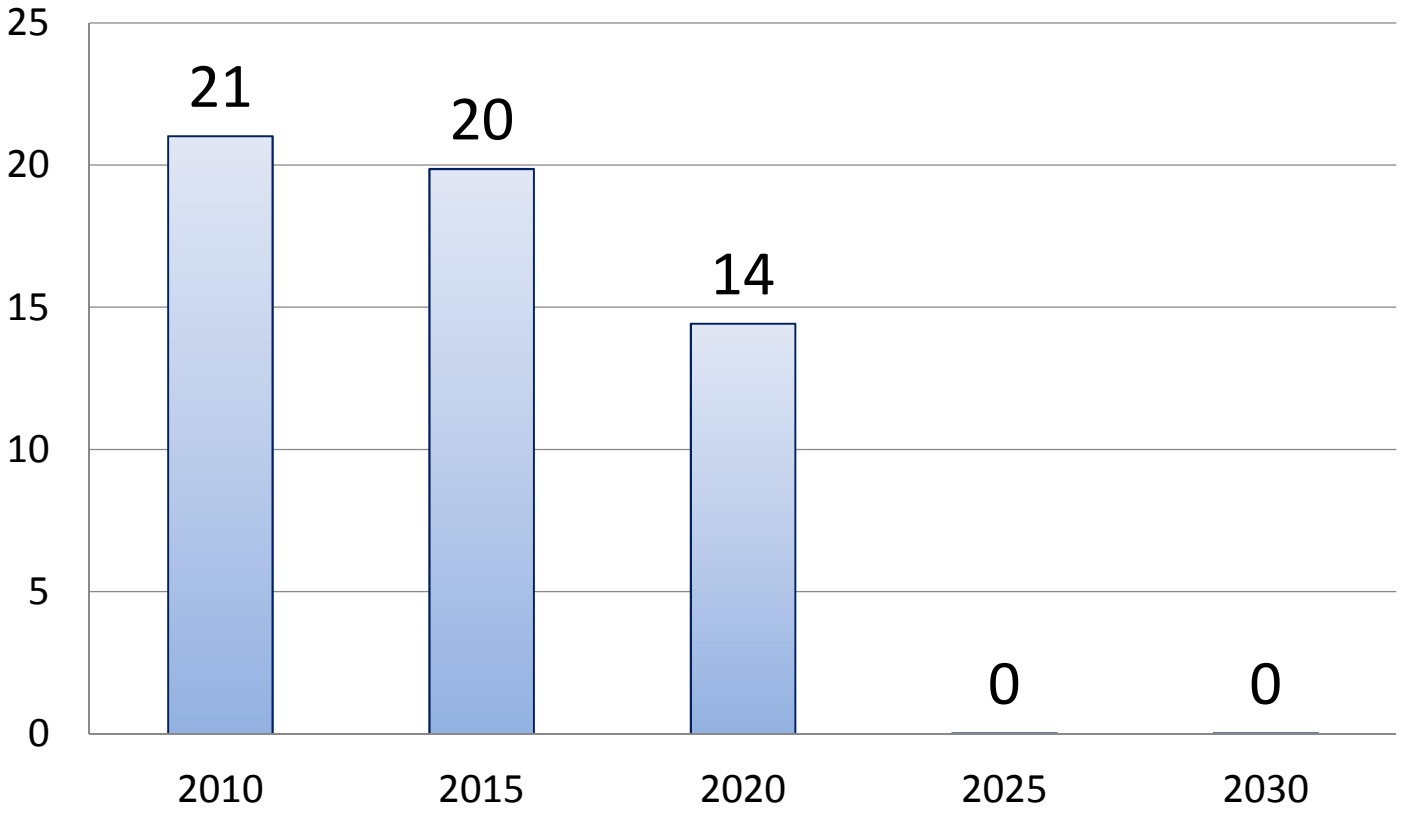
Community Water Management
(# Organizations)
NATIONAL EFFORT



Community Water Management
(# Organizations)
INTERNACIONAL COOPERATION



Poverty (% UBN for Water)



ENERGY

“BOLIVIA: ENERGY HEART OF SOUTH AMERICA”

Energy Security

Universal Service Access

Export surplus

Prioritized investments

Thermoelectric Plants (Combined Cycle)

Hydroelectric Power Plants

Alternative energies (Geothermal, Photovoltaics, Wind)

To Generate Additional power period 2015-2020
3.253 MW

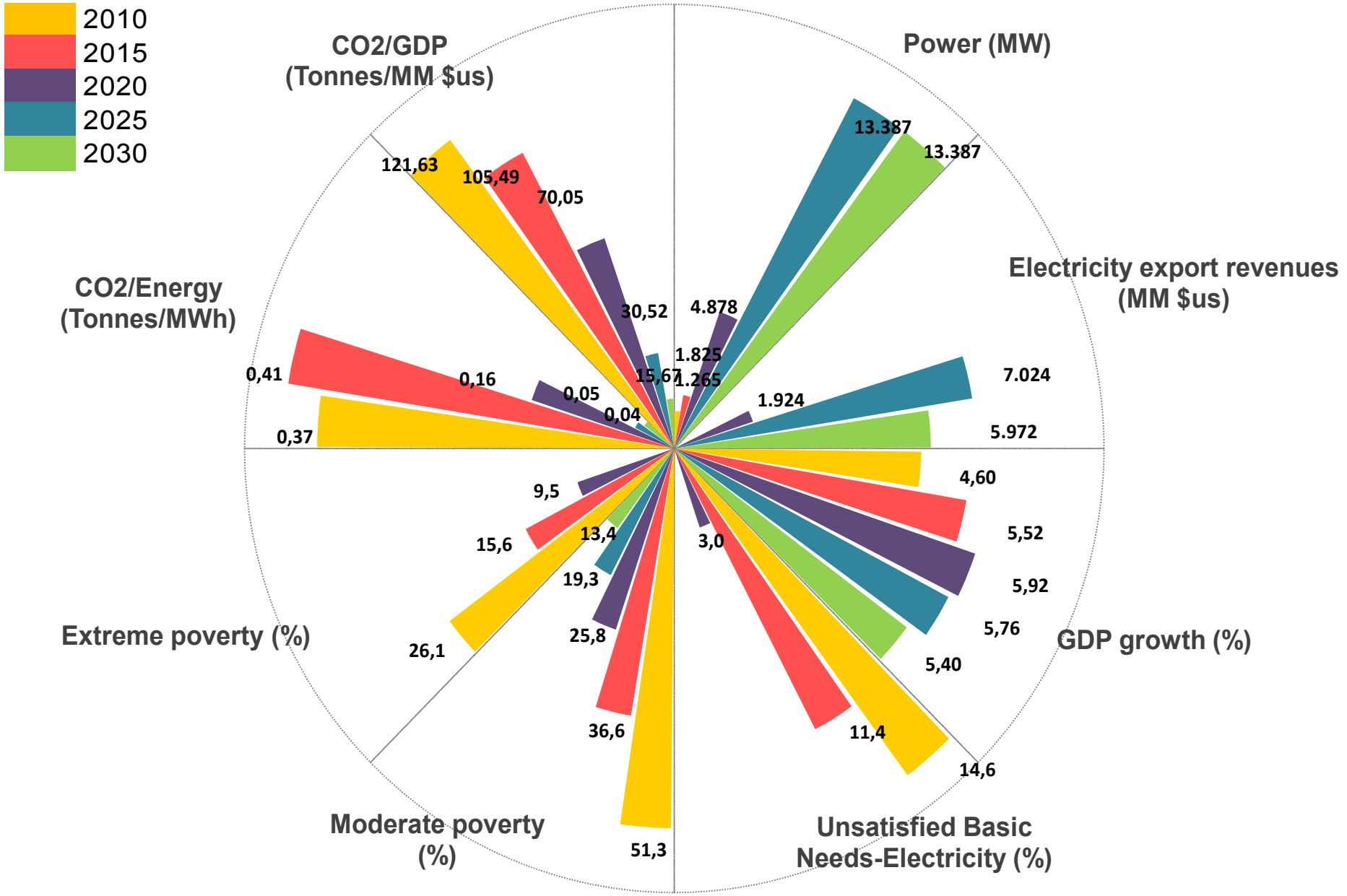
2030´s exports:
8.930 MW

ENERGY

OBJECTIVE: "Increase the capacity of electricity generation through renewable energy for local and regional development"

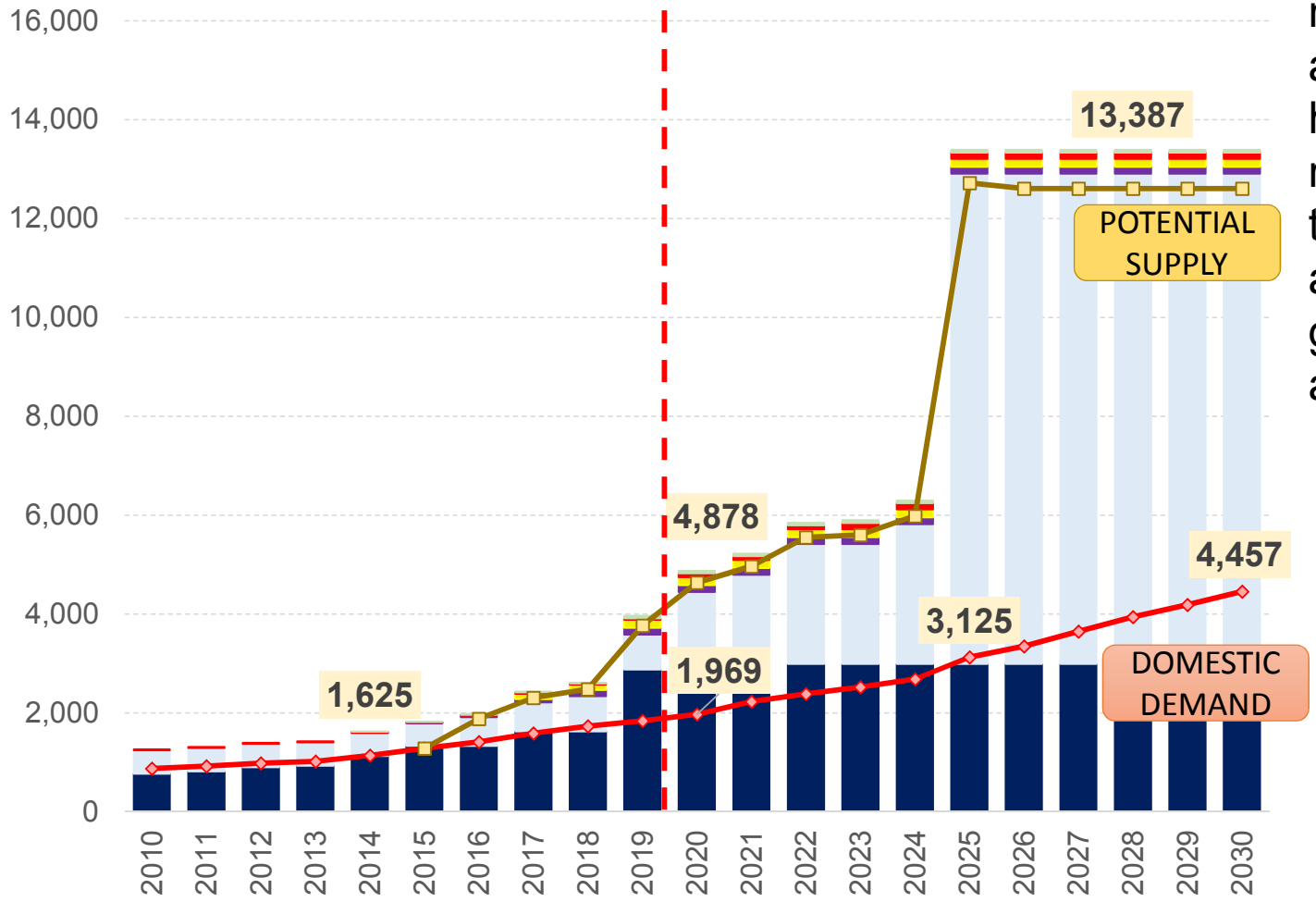
ENERGY SECTOR
2015-2030

	National Effort	With Cooperation
CAPACITY	13.387 MW	14.946 MW
RENEWABLE SHARE	79%	81%
ALTERNATIVE AND OTHER FUEL SOURCES SHARE	9%	9%


2010
2015
2020
2025
2030
CO2/GDP (Tonnes/MM $us)
Power (MW)
Electricity export revenues (MM $us)
GDP growth (%)
Unsatisfied Basic Needs-Electricity (%)
Moderate poverty (%)
Extreme poverty (%)
CO2/Energy (Tonnes/MWh)
121,63
105,49
70,05
30,52
15,67
4.878
1.825
1.265
13.387
13.387
1.924
7.024
5.972
4,60
5,52
5,92
5,76
5,40
11,4
14,6
3,0
9,5
13,4
19,3
25,8
36,6
51,3
15,6
26,1
0,41
0,16
0,05
0,04
0,37

POWER SYSTEM – NATIONAL EFFORT
(Megawatts)

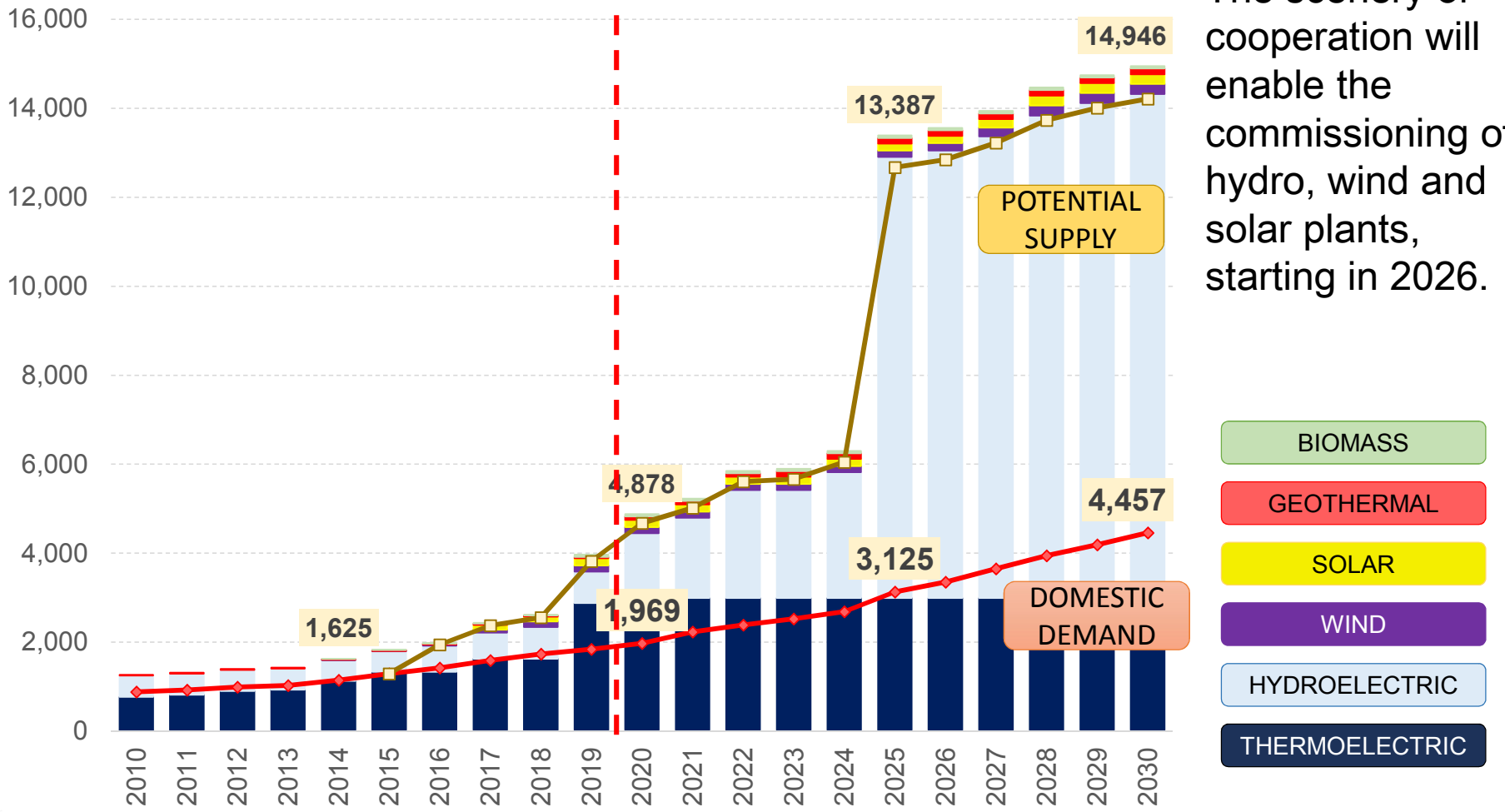
Estimated Export Potencial by 2030: 8,930 MW



From 2020, national efforts will aim to have a higher bid for renewable technologies, such as hydro, geothermal, wind and solar.

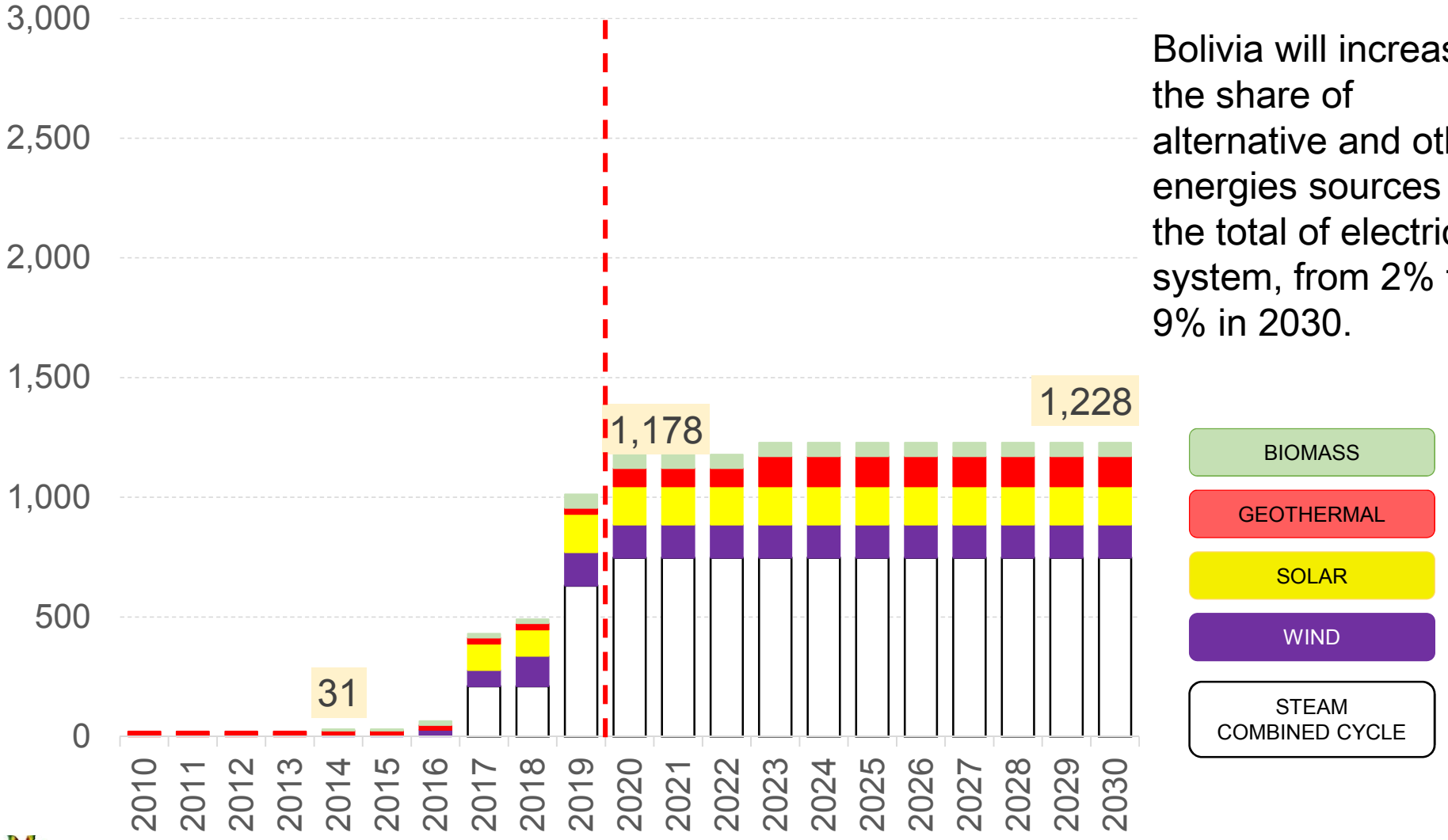
BIOMASS
GEOTHERMAL
SOLAR
WIND
HYDROELECTRIC
THERMOELECTRIC

POWER SYSTEM – WITH COOPERATION
(Megawatts)



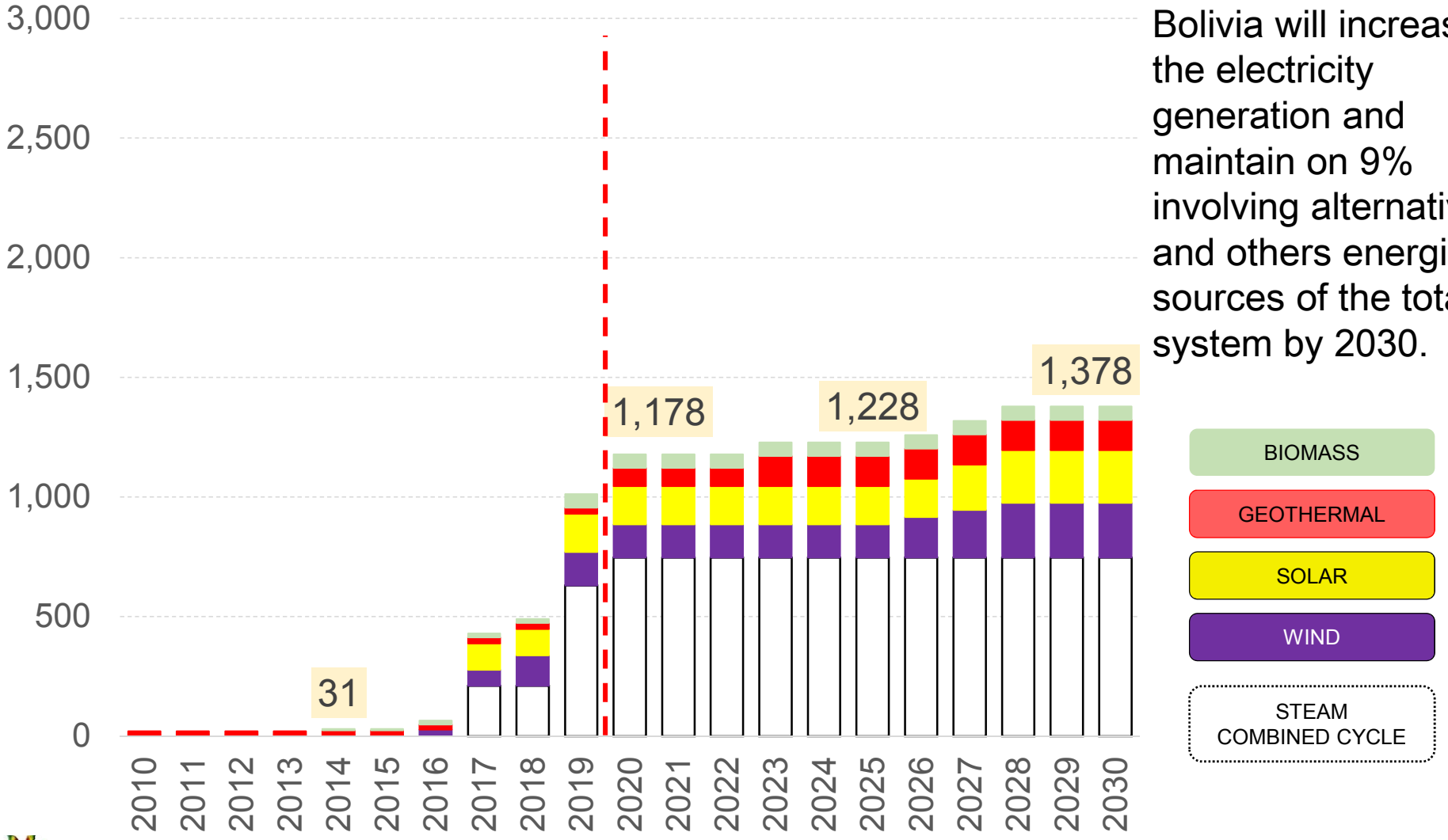
The scenery of cooperation will enable the commissioning of hydro, wind and solar plants, starting in 2026.

NATIONAL EFFORT
POWER IN ALTERNATIVE AND OTHER FUEL ENERGY SOURCES
(Megawatts)



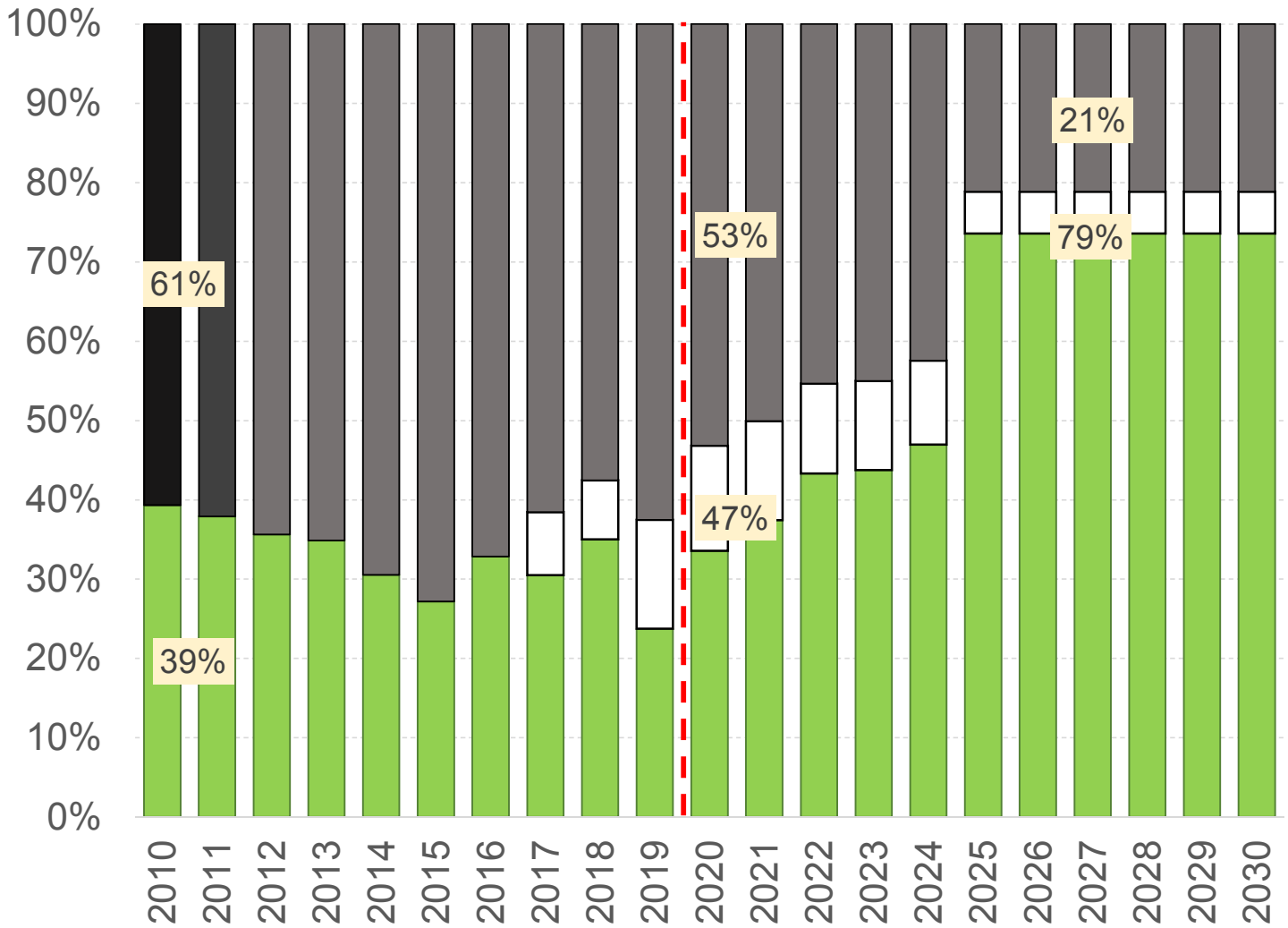
Bolivia will increase the share of alternative and other energies sources in the total of electrical system, from 2% to 9% in 2030.

INTERNATIONAL COOPERATION
POWER IN ALTERNATIVE AND OTHER FUEL ENERGY SOURCES
(Megawatts)



With cooperation, Bolivia will increase the electricity generation and maintain on 9% involving alternative and others energies sources of the total system by 2030.

COMPOSITION OF THE SYSTEM – NATIONAL EFFORT
(In share)



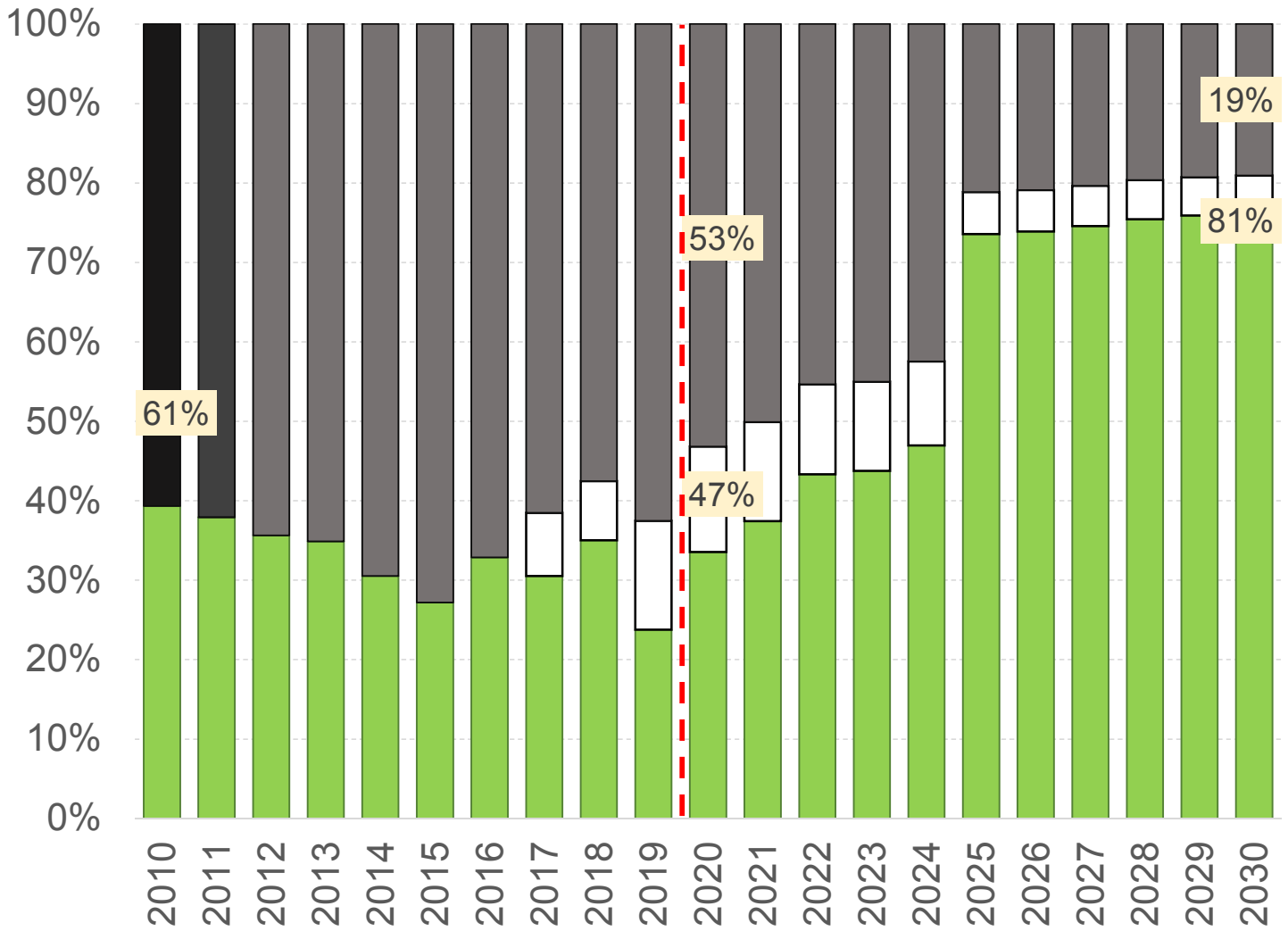
Bolivia will increase the share of renewable energies from 47% by 2020 to 79% by 2030, of the total electrical system.

NON RENEWABLE (NATURAL GAS)

STEAM COMBINED CYCLE

RENEWABLE

COMPOSITION OF THE SYSTEM – INTERNATIONAL COOPERATION
(In share)



Bolivia will increase the share of renewable energies from 47% by 2020 to 81% by 2030, of the total electrical system.

NON RENEWABLE (NATURAL GAS)

STEAM COMBINED CYCLE

RENEWABLE

FORESTS

FORESTS

BASELINE (YEAR 2010)

OBJECTIVE: Increase the capacity of joint mitigation and adaptation through integrated and sustainable management of forests.

Environmental functions	28.905.984 hectares provide environmental functions.
Community Management	3.145.234 hectares with forest management plans.
Production	14.619.566 ton of forest products, non-timber, timber and food.
Poverty	348.524 people under extreme poverty.
Reforestation	1.215 hectares deforested.
Coverage	53.422.700 hectares of forest.

FORESTS

NATIONAL EFFORT
(2015-2030)

OBJECTIVE: Increase the capacity of joint mitigation and adaptation through integrated and sustainable management of forests.

Environmental functions	Increase in the area of provision of environmental functions (MM 28.6 hectares).
Community Management	Quintupled the surface of community forest management in relation to 2010.
Production	Quadrupled the forest timber production, non-timber and food.
Poverty	Eradication of extreme poverty in forests population.
Reforestation	4.5 million hectares deforested.
Coverage	Increase forest coverage area to 54.1 million hectares.

FORESTS

WITH INTERNATIONAL COOPERATION (2015-2030)

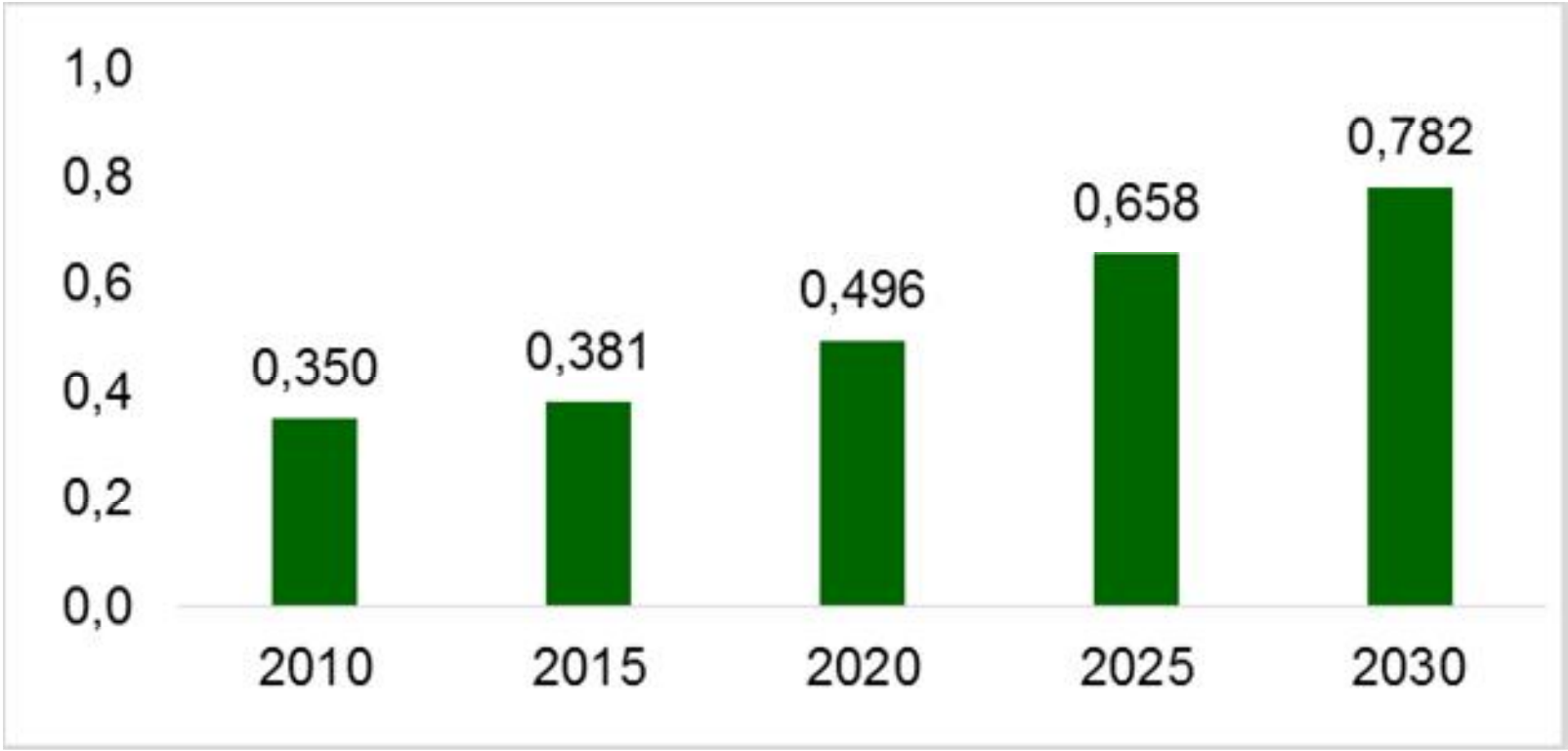
OBJECTIVE: Increase the capacity of joint mitigation and adaptation through integrated and sustainable management of forests.

Environmental functions	Increase in the area of provision of environmental functions (MM 29.2 hectares).
Community Management	Seven times more surface community forest management in relation to 2010.
Production	Increased timber and non-timber forest production by 40% compared to the national effort.
Poverty	ZERO POVERTY
Reforestation	Additional 1.5 million hectares reforested from National Effort.
Coverage	55.6 million hectares of forest.

NATIONAL EFFORT
(2015-2030)

Increases Capacity of Joint Mitigation and Adaptation in forests:

Sustainable Living in Forests Index

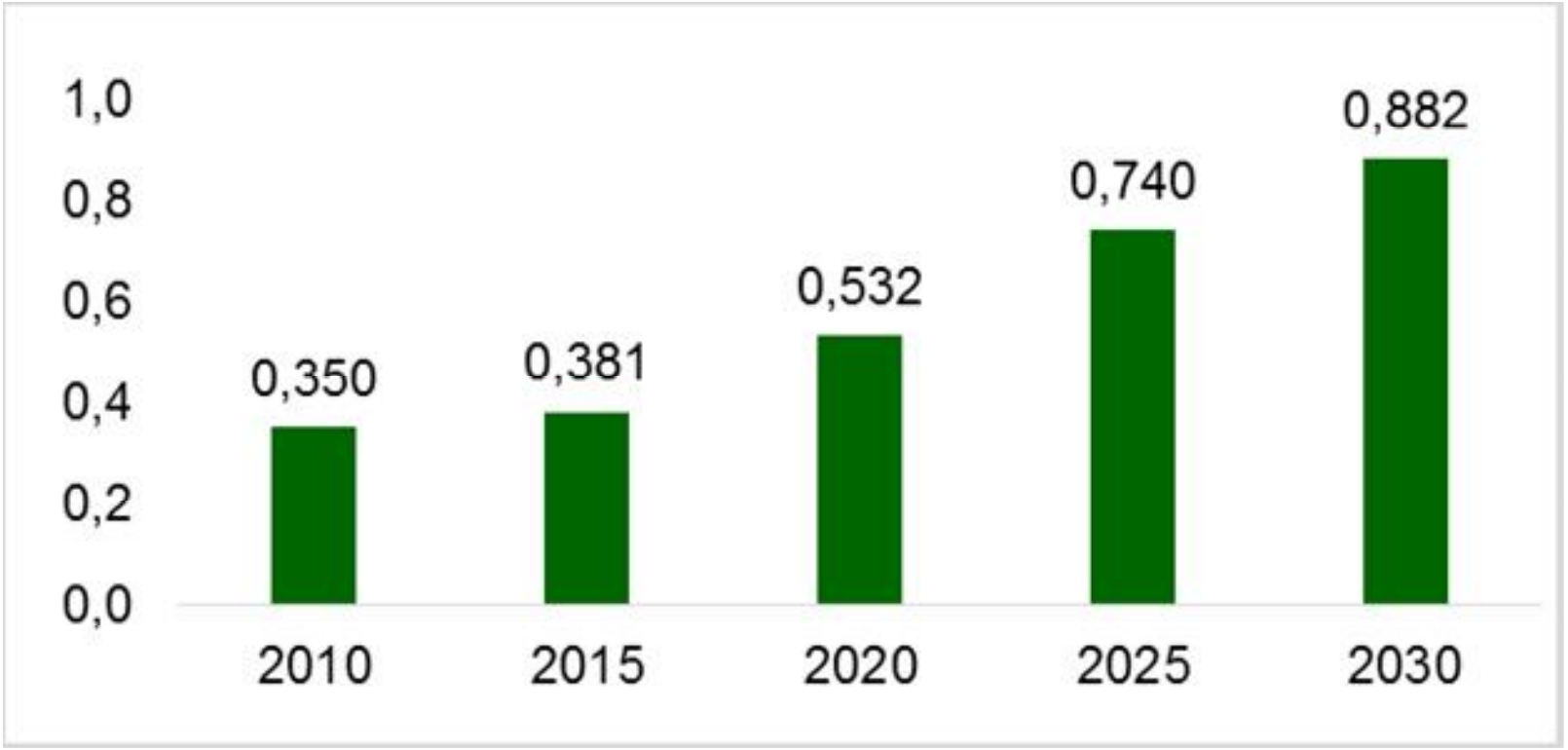


ENVIRONMENTAL FUNCTIONS + COMMUNITY MANAGEMENT + PRODUCTION + FORESTS COVERAGE - POVERTY

INTERNATIONAL COOPERATION (2015-2030)

Increases Capacity of Joint Mitigation and Adaptation in forests:

Sustainable Living in Forests Index



ENVIRONMENTAL FUNCTIONS + COMMUNITY MANAGEMENT + PRODUCTION + FORESTS COVERAGE - POVERTY

Sustainable Living in Forests National Index

The index is calculated using data from environmental functions (a_j), poverty (p_j), community management (g_j), production (y_j) and forest coverage (c_j) betweeen j-years in 2015 and 2030.

The Forest Index (i_j) It was obtained by multiplying each variable by a standard weight $\theta \in \mathbb{R}^{0,1}$ and adding the result to the expression,

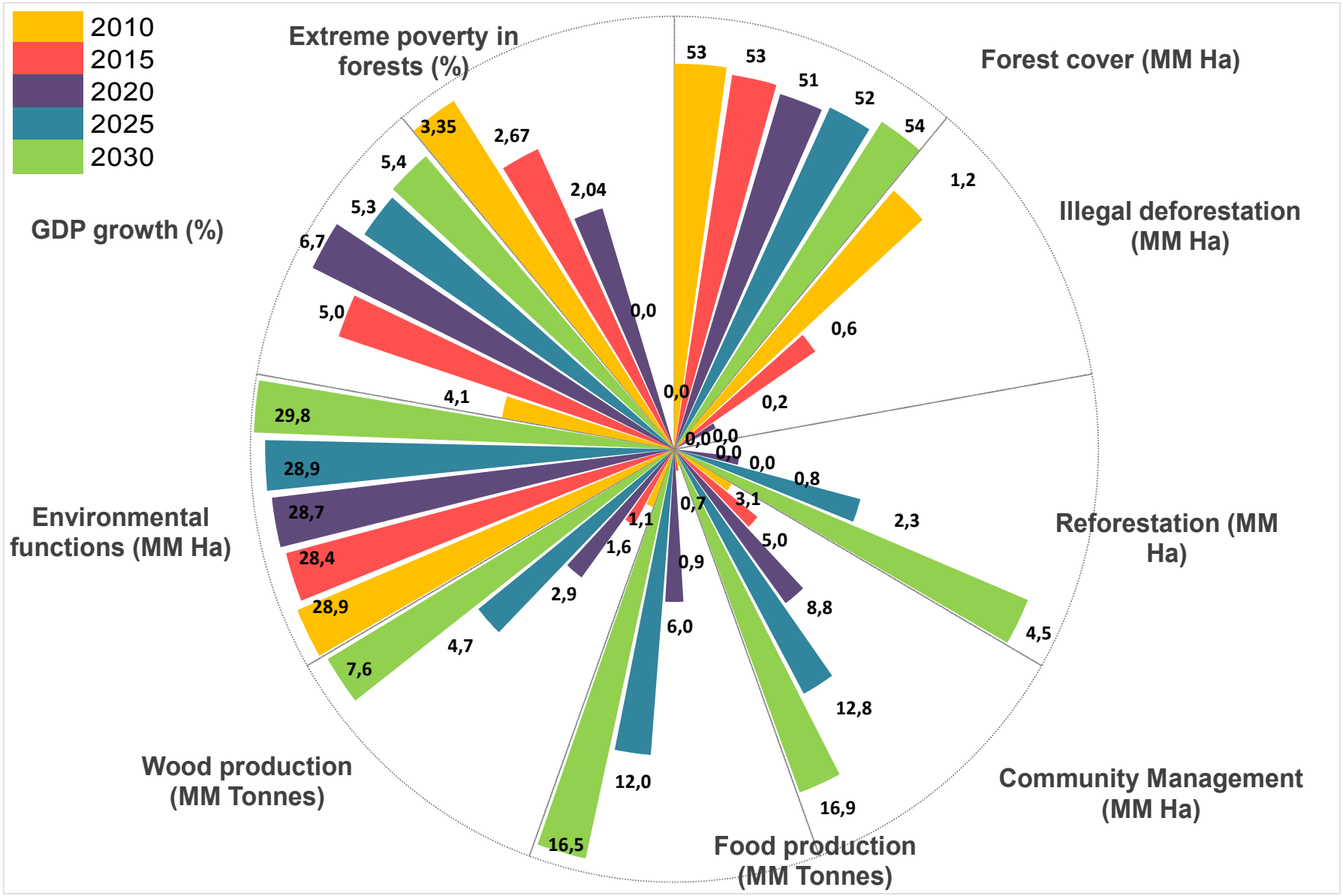
$$i_j = \theta_1 \tilde{f}_j - \theta_2 \tilde{p}_j + \theta_3\, \tilde{g}_j + \theta_4 \tilde{p}_j + \theta_5 \tilde{c}_j,$$

so an increase in environmental functions, community management, production and net forest cover will increase the value of the indicator (As in $i_j \to 1$ there will be a greater capacity to mitigate and adapt), whereas an increase in poverty will reduce the value of the indicator (As in $i_j \to 0$ there will be a reduced ability to mitigate and adapt).

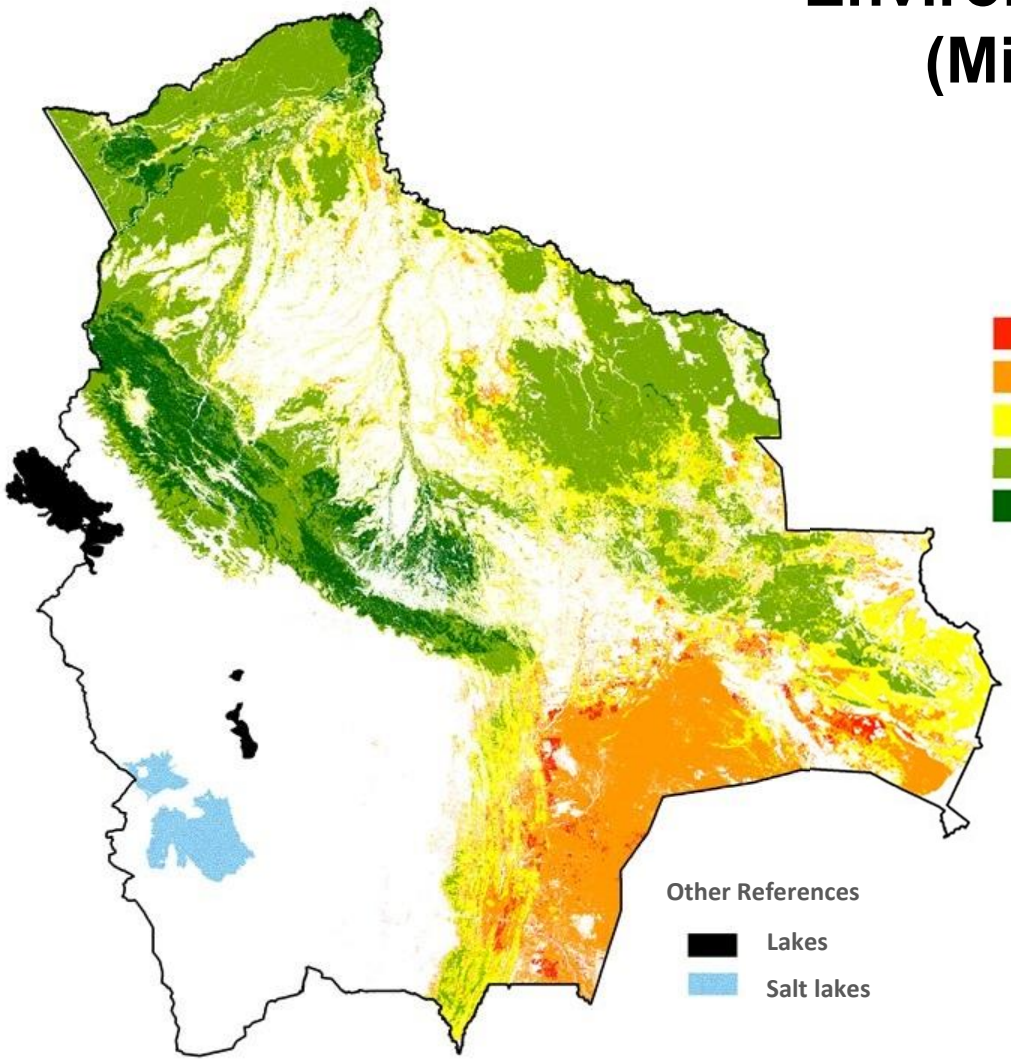
Sustainable Living in Forests National Index

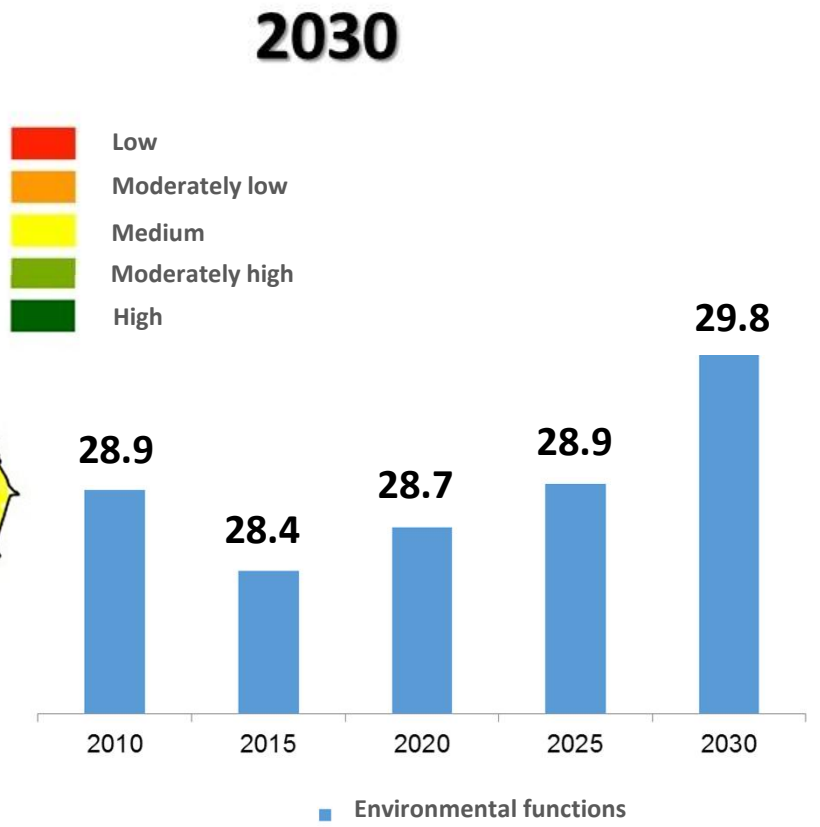
The weights of the equation were chosen according to the importance of each variable for mitigation and adaptation in forest.

Variable	Weight θ
Environmental functions	0,25
Poverty	0,25
Community management	0,20
Production	0,20
Net forest coverage	0,10


2010
2015
2020
2025
2030
Extreme poverty in forests (%)
Forest cover (MM Ha)
GDP growth (%)
Illegal deforestation (MM Ha)
Environmental functions (MM Ha)
Reforestation (MM Ha)
Wood production (MM Tonnes)
Community Management (MM Ha)
Food production (MM Tonnes)
53
53
51
52
54
3,35
2,67
2,04
5,4
5,3
6,7
5,0
4,1
29,8
28,9
28,7
28,4
28,9
7,6
4,7
2,9
1,6
1,1
16,5
12,0
6,0
0,9
0,7
16,9
12,8
8,8
5,0
3,1
4,5
2,3
0,8
0,0
0,0
0,0
0,0
0,0
0,0
0,2
0,6
1,2

Environmental Functions (Million hectares)





Organic matter in the soil	Carbon capture and storage	Water availability	Habitat conservation and biodiversity

Total production (Million tonnes)