



Promotion of environmentally sustainable and climate-resilient grid-based hydroelectric electricity through an integrated approach in Sao Tome and Principe

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Projet



- Promotion of environmentally sustainable and climate-resilient grid-based hydroelectric electricity through an integrated approach in Sao Tome and Principe
- **Financial Resources:** Global Environment Facility (GEF) Throught UNDP
- **Duration:** 2015 - 2019
- **Execution:** UNDP/ EMAE/ DGRNE/ DA/DF/Districts
- **Amount:** 5.2 Million AD

National context of Energy

- ① The bulk of electricity generation is based on imported diesel
- ② The country possesses several rivers that can be tapped to generate electricity from hydropower
- ③ Electricity generation in the country has been steadily increasing over the years with an increase of the thermal generation capacity
- ④ The need to shift electricity generation from utilizing less imported fuel to relying more on locally-available resources and small hydropower has recently become a cornerstone of the country's domestic and foreign policy
- ⑤ Electrical power in the country is provided by the Empresa de Agua e Electricidade
 - ➡ In January 2014, the available EMAE diesel generating capacity was 15.8 MW.
 - ➡ December 2013, EMAE had a client base of 30,781 customers (comprising 25,971 households and 4,810 in other categories)
 - ➡ 50% of the population still doesn't have access to a modern source of energy.

National context of Energy

Imported diesel/lubricants used for thermal electricity generation

Diesel/Lubricants	2009	2010	2011	2012	2013
Diesel (litres)	11,743,334	9,473,229	13,315,861	18,101,521	19,095,025
Lubricants (litres)	51,558	35,761	34,541	46,617	59,428
Total Cost (x 10 ³ Dobras)	137,176,456	113,291,764	193,367,754	267,024,011	289,494,914
Total Cost (\$)	7,838,655	6,473,815	11,049,586	15,258,515	16,542,567

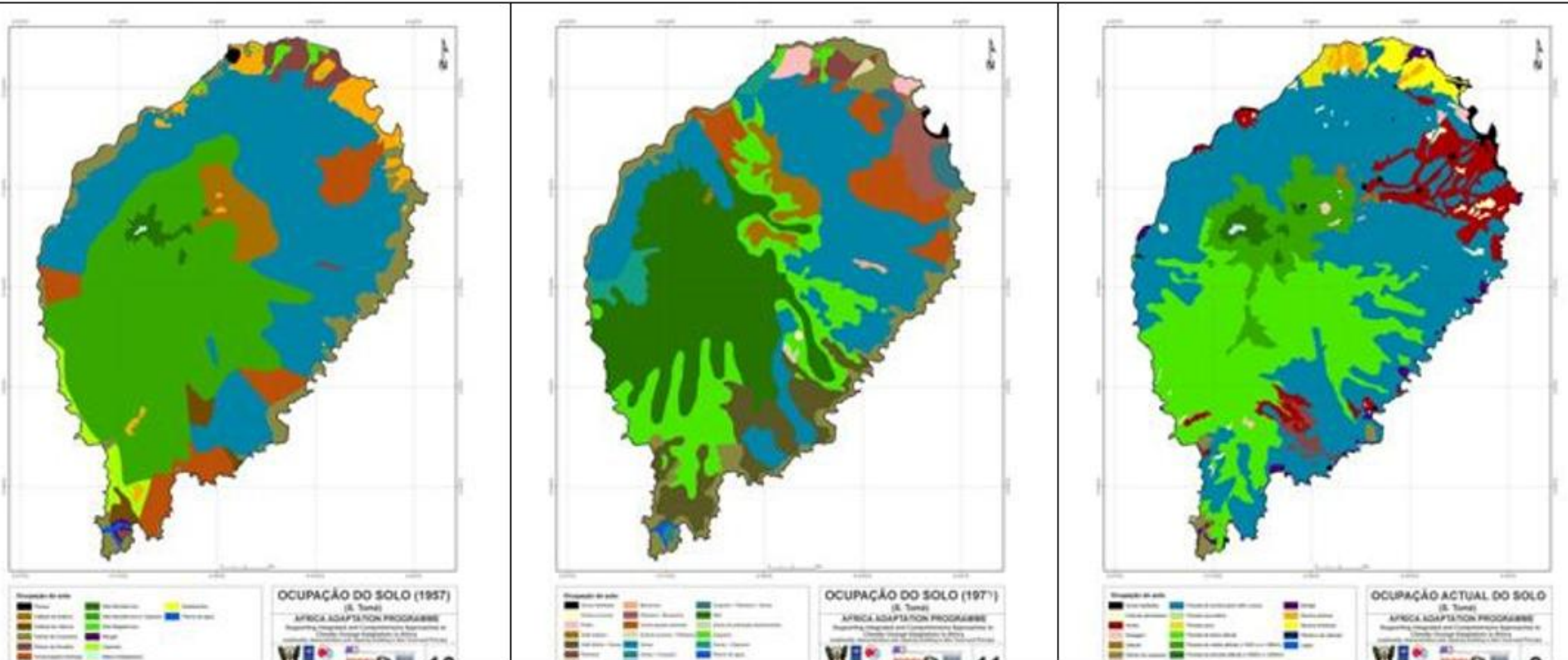
Ecosystems, land use and forest management

STP's ecosystems are rich and diverse and capable of providing multiple services and resources but they are also being significantly degraded.

- **40% of the country is natural forest, called “Ôbô”.**
- **21% of the country is secondary forest, called “Capoeira”.**
- **29% of the country is shade forest**
- **Poorly managed shifting agriculture and the absence of forests management plan degrade soils and ecosystems.**
- **Major pressures on the ecosystems are driven by demand for wood and for charcoal as a domestic fuel in the capital**
- **The forest degradation rate at the national level has not been estimated yet because of the absence of a complete forestry inventory.**

Ecosystems, land use and forest management

Table 6. Evolution of the land occupation in STP in 1957, 1975 and 2013 (from left to right).



Water resources

- Water resources potential in the country is not well defined
- Master Plan which but it's not implemented
- Water flow is coming from rainfall



Barriers to achieve the integrated solution



Inexistence of Policy and legal instruments relating to community management and benefit-sharing in secondary forest



Poor understanding of the natural resource base, ecosystems and ecosystems services flows and the impacts of land management



Poverty, cultural habits and lack of alternatives, innovation and investment at village level

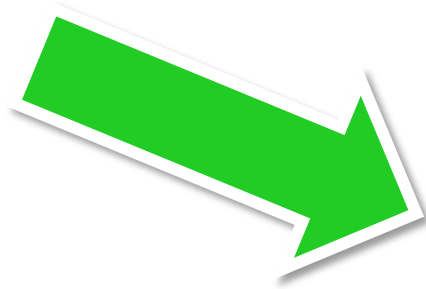


Poor understanding of the IWM model and of conservation farming, ecosystems and potential carbon benefits

The objective of the project is to introduce an integrated energy and ecosystems-based approach to grid/isolated-grid-based mini/small hydro-electricity generation in Sao Tome and Principe

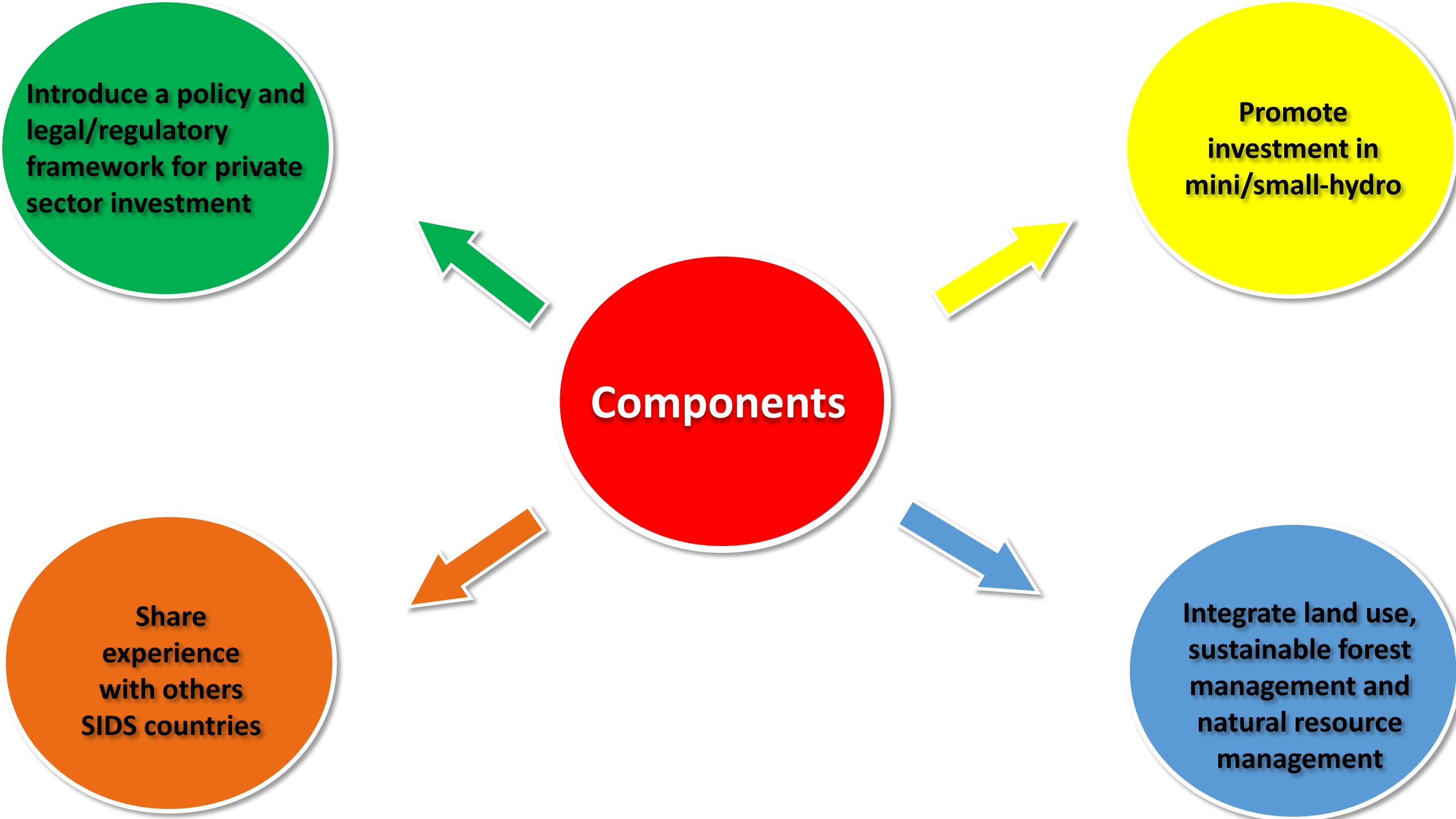
Long-term solution

- ★ **An innovative participative method of forest management will be implemented for upstream lands**
- ★ **The project will support the introduction of sustainable Agricultural Land Management**
- ★ **Activities will be developed in communities to meet their needs for food, wood and other natural resources, harvested sustainably, and to provide alternative income-generation**
- ★ **A financial mechanism will be set up by the project in order to sustain the Integrated Management of the Watershed**



The focus of the project is on mini/small hydropower development to substitute for the electricity generated from diesel power stations that burn imported fuel and to provide additional capacity to enable EMAE to meet the needs of the approx. 50% of the population that has no access to electricity services. This is proposed to be achieved through the participation of the private sector.





Projet Results Framework

Formulate a comprehensive policy and legal/regulatory framework for private sector investment



Frameworks finalized and available for consultation by potential investors and by watershed stakeholders.

Promotion of investment in mini/small-hydro through appropriate catalytic financial incentives for project investors.



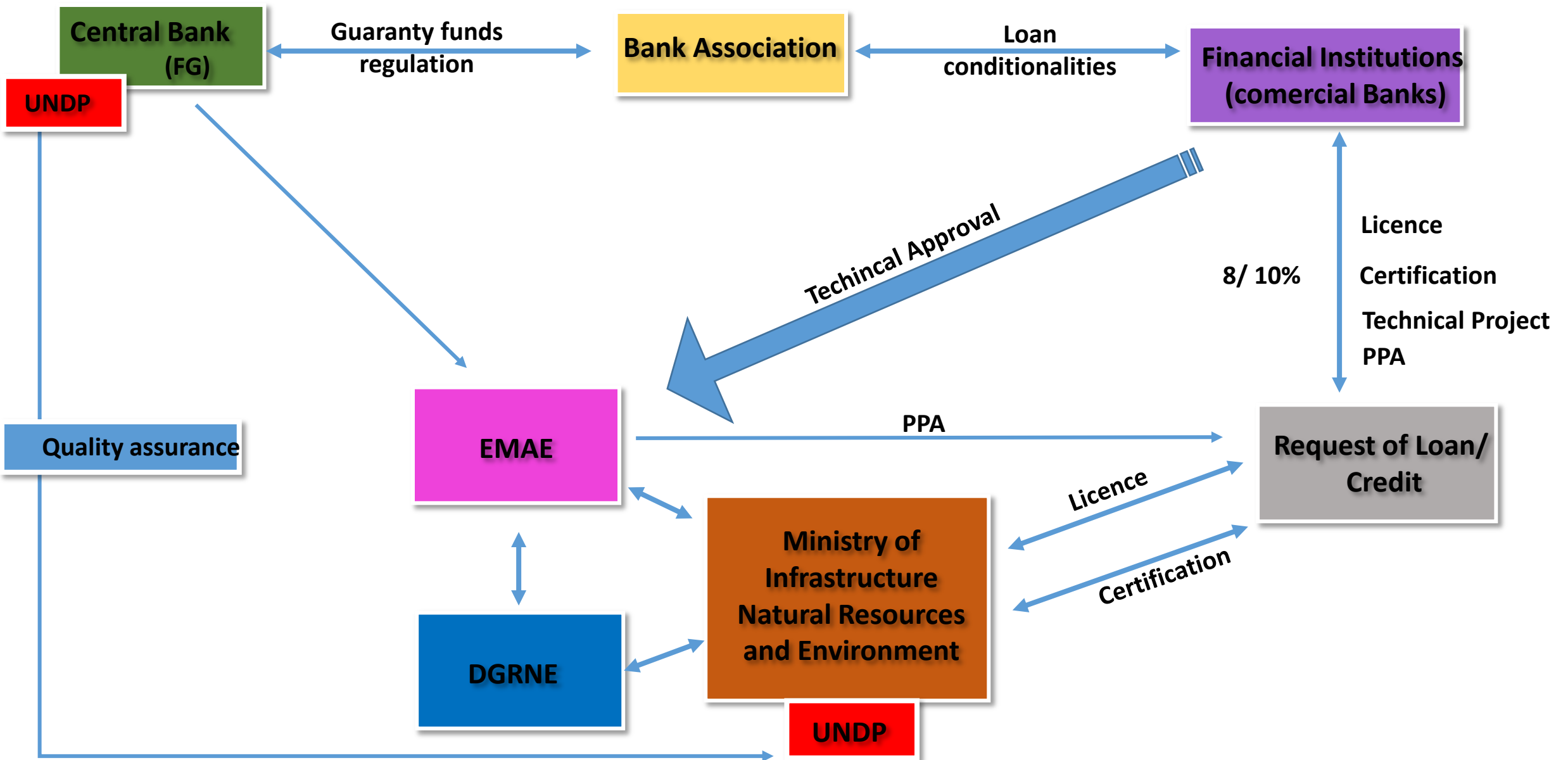
Document outlining incentives drafted, approved and available to investors.

Integrated land use, sustainable forest management and natural resource management provide social benefits and sustain environmental services



**Number of ha under SALM practices.
Carbon stock enhanced in the forests.
CO2 sequestration with trees plantation / forest rehabilitation**

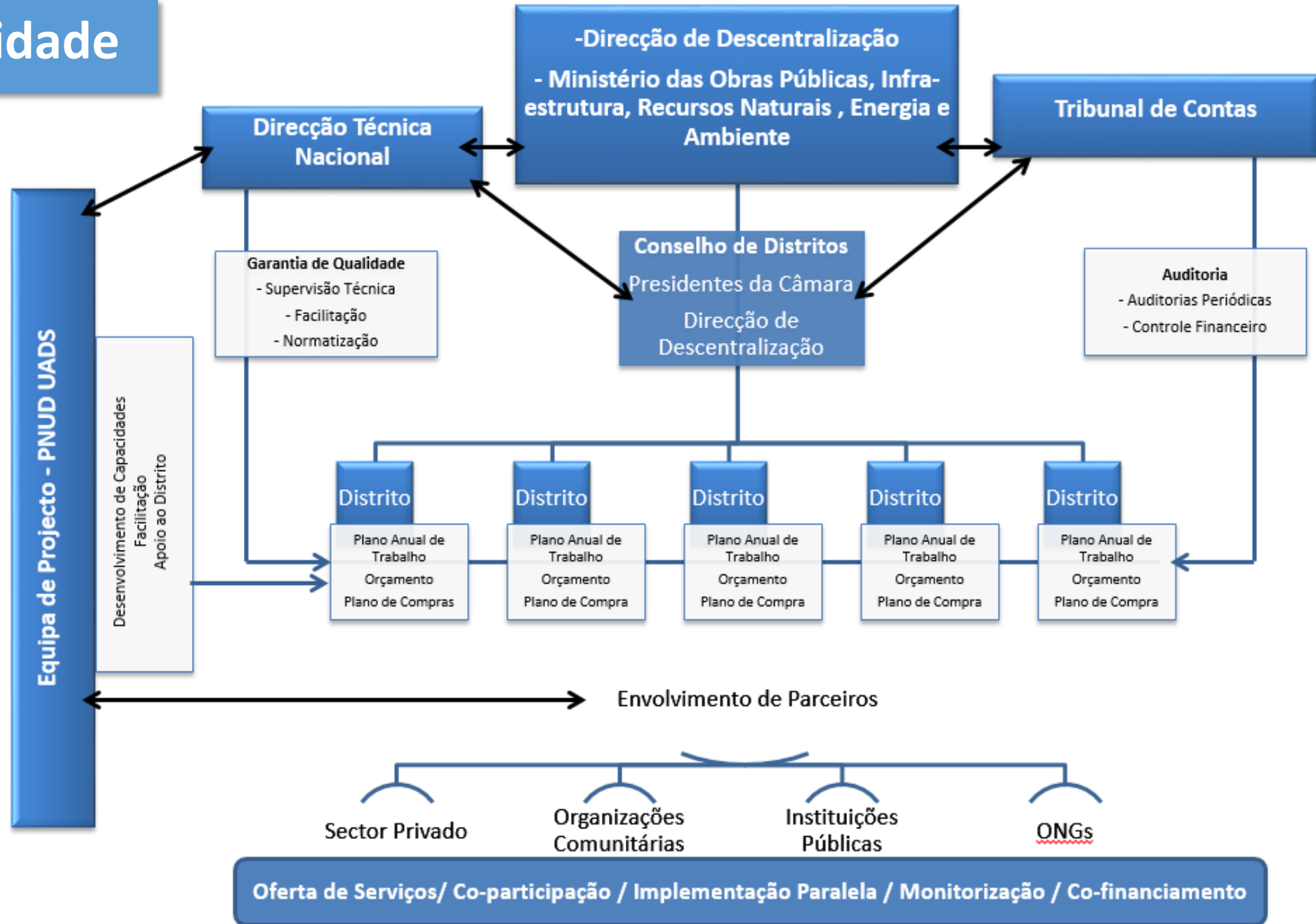
Management



Potential Sites for Hydropower Development

No.	Site	River	Installed Capacity (MW)	Head (m)	Estimated Annual Generation (MWh)*
1	Cruz Grande	D'Ouro	0.88	100	3,461
2	Agostino Neto	D'Ouro	0.34	60	1340
3	Almeirim	Agua Grande	0.44	50	1,731
4	Santa Luzia	Manuel Jorge	1.15	380	4,746
5	Santa Clara	Manuel Jorge	0.89	190	3,667
6	Mato Cana	Abade	2.0	60	5,599
7	Claudino Faro	Abade	2.0	100	5,348
8	Bombaim	Abade	4.0	280	9,685
9	Dona Eugénia	Ió Grande	9.6	80	30,448
10	Meteus Sampaio	Umbugu	0.5	28	1,519
11	Neves	Provaz	2.0	95	7,287
12	San João	Contador	0.9	200	1,382
13	Santa Irene	Lemba	3.0	100	9,229
14	Monte Verde	Xufexufe	0.80	60	2,935
15	Monte Rosa	Quija	3.75	260	10,427
16	Caldeiras	Carvão	0.02	50	100

Nova Modalidade





Thank You