Addendum for the Update of Chile's Emissions Reduction Program following the Recommendations from the Chair's Summary at the 15th Meeting of the Carbon Fund

National Strategy on Climate Change and Vegetation Resources of Chile (2017-2025)

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Contents

1. Chile's position on the Commercial Conditions of the ERPA

In 2014, the National Forestry Corporation of Chile (CONAF), an institution under the Ministry of Agriculture which represents the country in the United Nations Framework Convention on Climate Change (UNFCCC) as a focal point for the REDD + approach, signed a Letter of Intent (LOI) to implement an Emissions Reduction Program (ERP) that in turn triggers the signing of an Emissions Reduction Payment Agreement (ERPA) with the Forest Carbon Partnership's (FCPF) Carbon Fund.

The FCPF provides technical and financial support for the pilot of the Pay for Results phase associated with REDD +, through the development of technical elements for the preparation of the Emissions Reduction Program Document (ERPD), satisfying the Criteria and Indicators (C+I) that are established in a Methodological Framework (MF) approved by the participants of the Carbon Fund, dated December 20, 2013 and updated June 22, 2016. Chile's ERP is subnational, comprising the regions of Maule, Biobío, Araucanía, Los Ríos and Los Lagos, and was approved without conditional observations by the Committee of Participants of said Fund in December 2016.

The ERP is part of Chile's National Strategy on Climate Change and Plant Resources (ENCCRV), a public policy instrument composed of a set of direct and facilitating action measures (Figure 1) that, based on a process of national technical and participatory formulation, are focused on addressing climate change (mitigation and adaptation), desertification, land degradation and drought (DLDD) through the adequate management of plant resources in order to avoid or reduce historic rates of deforestation, devegetation and degradation of native forests, xerophytic formations and other plant formations, as well as promoting the recovery, afforestation, revegetation and sustainable management of these native resources of Chile.

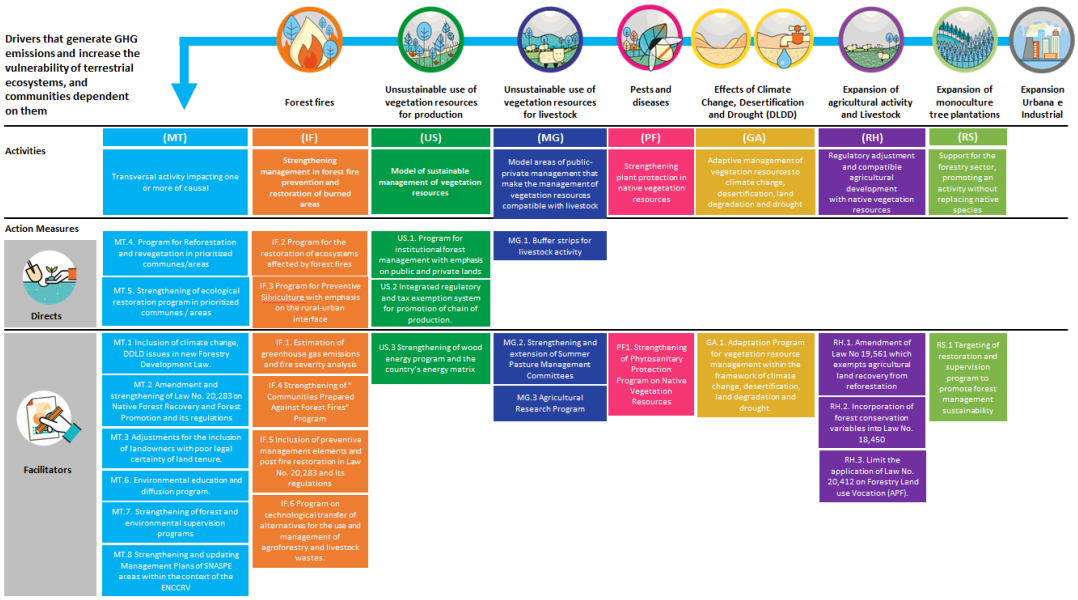

Figure 1. Diagram of Causes, Activities, and Action Measures Relating to the ENCCRV.

Each ENCCRV action measure is associated with a scope of action, which has a goal, a responsible institutional area (management, department, secretariat, etc. within CONAF) and a detailed budget outline to allow for adequate management over time. ENCCRV's set of action measures is articulated throughout the national territory and encompasses both forestry and non-forestry plant resources (for example *bofedales*, wetlands, and xerophytic formations). In the case of the ERP with the Carbon Fund, the ENCCRV's approach is delimited both geographically (it only covers five of the 15 regions of Chile) and by plant resource type, since it only considers forests, rather than all the other plant formations which would fall under the country's legal prescriptions.

The implementation of the ENCCRV aims to generate a paradigm shift in the national forestry sector, and adequately position the contribution provided by the country's other native plant resources, especially in relation to environmental services. In this sense and considering that direct[1] and facilitating[2] measures of action exist, evaluating the individual results of each one in an unconnected manner would result in an unrealistic simplification. This would be exacerbated in associated indicators, for example, in the reduction or capture of tons of carbon or other metrics associated with the environmental services provided by forests.

The above relates to the results of the ENCCRV public policy instrument and the ERP, which contemplates piloting with the CF, where it is not technically possible to estimate *ex ante* emissions reduction and capture potential since the methodological approach does not follow the same project logic as, for example, the Clean Development Mechanism's (CDM) forestry initiatives.

The correct approach in this sense is that the accounting method for forest carbon emissions and absorption would be technically consistent with the Reference Level approved by the CF and the UNFCCC Roster of Experts, which implies that there ought to be technical consistency between the approved Reference Level and future monitoring milestones, with project logic in accordance with the REDD + context.

As previously reported, the ERs that are available to the Carbon Fund are presented based on the REDD + Activities that have been included in Chile's Reference Level, namely Deforestation Avoided, Degradation Avoided, Conservation, and Stock Increases. In addition, the effectiveness required to establish scenarios in which it is possible to achieve the ERs committed to the Carbon Fund for each of the REDD + Activities (Table 1)[3] was determined.

Considering only a realistic scenario, it is possible to satisfy what Chile has established for the Carbon Fund as well as for other mitigation commitments, such as those included in the National Determined Contribution (NDC) associated with the national forestry sector. This situation also includes discounts associated with uncertainty and reversals.

[1] Concrete implementation measures in the territory, such as afforestation with native species
[2] Measures that correspond to improving management of direct measures and policy instruments
[3] Annex 1 presents other effectiveness scenarios according to the financing available.

Table 1. Emissions Reductions Contemplated in the ERPA.

ER under Effectiveness Scenario without Conditional Financing	Volume (TonCO2eq)
ERP Totals Contemplated in the ERPA	9,823,836
Uncertainty (8%)	785,907
Reversals (21%)	1,897,965
Available under Chile's ERP	7,139,964
Committed in the LOI to the CF	5,200,000
Not Committed by the Country to the Carbon Fund	1,939,964

The ER generation effectiveness scenario under consideration is conservative in terms of incremental financing availability (in addition to the efforts now being made by the country in budgetary terms). In order to implement the ENCCRV action measures in the accounting area, the scenario corresponds to a situation in which, at the end of the period, an ER of 12% is attained for the activity of avoided deforestation, 9% is attained for avoided forest degradation, 1.25% is attained from forestry conservation activities, and finally 2.5% is attained for increases in forest carbon reserves[4]. This effectiveness considers the most conservative scenario, taking into account reduction/capture **achieved solely by activities that have already secured financing at the country level.** This effectiveness **also does not take into account reinvestment of funds received from CF Pay for Results or other sources,** which makes it even more conservative and feasible to implement in terms of the volume of ER committed.

With these estimates for the ERPA, the following allocation is presented for Tranches A and B established by the Carbon Fund: 10% to Tranche A (520,000 TonCO2eq) where the country will not claim re-transfer, and 90% to Tranche B (4,680,000 TonCO2eq), with the possibility of negotiating reimbursement of this latter volume in national accounting associated with the forestry goals that Chile has included in its NDC. The price that has been established for both Tranches is USD 5 per TonCO2eq. Therefore, the transaction would total USD 26,000,000 under the concept of Pay for Results.

For the negotiation process, additional ERs have not been contemplated. This does not imply that, as a result of future negotiations between the country and the World Bank (on behalf of paying countries), the ER balance, equivalent to 1,939,964 TonCO2eq, is included in the ERPA in question. These eventual additional ERs would be negotiated under a scenario in which the price per ton is greater than USD 5, taking into account the reimbursement of a percentage for national accounting (basically so as not to affect compliance with the NDC forest goal).

With regard to the commercial options proposed under the commercial conditions of the ERPA, the Sweep Option is being contemplated for both Tranches in order to accelerate the fulfillment of

[4] In the case of avoided deforestation and forest degradation activities, ERs are considered as emissions reductions above the reference level; while in the case of conservation andiIncrease of forest carbon reserves, ERs are considered as an increase in absorption over the reference level.

commitments with the Carbon Fund in the least number of monitoring milestones possible, in case the results of the measures implemented generate a higher number of ERs in advance as evidenced by monitoring milestones, thereby accelerating financial income to the system for reinvestment in action measures contemplated by the ENCCRV.

The monitoring milestones that are being considered - which will be addressed in detail in the chapter referring to monitoring - as well as the ER allocations for each Tranche (A and B) are presented in Table 2 and correspond to:

Table 2. Monitoring Milestone and ER by Tranche,

Monitoring Milestone	Years	Report	Tranche A ER (TonCO2eq)	Tranche B ER (TonCO2eq)
1	2017-2018	2019	119,950	1,079,552
2	2019-2020	2021	152,596	1,373,367
3	2021-2022	2023	220,725	1,986,525
4	2023-2024	2025	26,729	240,557
	Total		520,000	4,680,000

The technical elements associated with the implementation of ENCCRV action measures that address the causes of deforestation, forest degradation and problems associated with increasing forest carbon sinks identified in Chile, their subsequent monitoring and treatment of environmental and social safeguards, as well as financial execution, will be described in detail in relation to the provisions of the ERPD in the respective sections of this document.

2. Technical and Administrative Management of the Emissions Reduction Program

An estimated 20% of the total funds that are received from ERP payments (USD 5.2 million of the total USD 26 million that would be reported as payment for the 5.2 million tons at the price of USD 5 per ton) will be used during the entire validity period of the ERP (2025) in order to cover actions which make the system more sustainable, or that correspond to ENCCRV action measures, the execution of which are the exclusive responsibility of CONAF (for example, forest audit and extension), as well as for management under the ENCCRV of government-owned land managed by CONAF and other entities.

For greater transparency, this financing will be validated through CONAF-formulated activity planning, according to the funds received and disbursement terms attributable to each monitoring milestone. This will be submitted to the IMCCC for consideration. This financing will be distributed in general terms in 3 items, administrative and financial management, technical support, and implementation of ENCCRV action measures (mainly on government-owned land).

Administrative and Financial Management

Based on past experience, permanent staff will be required during the entire implementation period to resolve technical, administrative, and financial aspects related with the assignment, distribution, and follow-up of these financial resources.

These actions will require not only having permanent technical and administrative staff in each of the regions, but also having specialized staff in the central offices of CONAF, and at AGCID, as has been evidenced by the management of other international funds which have been managed in the ENCCRV formulation process.

Technical Support and Monitoring

In order to carry out the monitoring milestones, ER projections as scenarios evolve, and possible new focuses and methodologies, as well as the maintenance of monitoring, registration and safeguard compliance systems, financing will be required. This has been generally identified, as reflected in Figure 2.

Implementation of ENCCRV Action Measures

In order to give continuity to the actions carried out by CONAF under the ENCCRV, such as, for example, actions aimed at improving monitoring systems for better audits through technological tools, or interactions and synergies within the territory with the Wood Energy Strategy, CONAF will present, as part of the package to be evaluated by the CTICC, an execution plan for the action measures that are prioritized at the central level and that can potentially be focused on some regions, that are directly executable and which will be detailed in the chapter covering the ENCCRV Investment Plan.

Estimación Preliminar de Financiamiento para la Gestión Técnica y Administrativa del PRE (2019-2025	
Ítems	Financiamiento Estimado (USD)
Gestión Administrativa y Financiera	1.960.000.-
Soporte Técnico y Monitoreo	1.300.000.-
Implementación Medidas de Acción ENCCRV	1.940.000.-
Total	5.200.000.-

Figure 2. Preliminary Estimation of Financing for Technical and Administrative Management.

3. General Background of Land Tenure in Chile

In Chile, the situations of land tenure and/or property size are basic conditions for access to instruments that promote the forestry, farming, livestock, and environmental sectors. Land tenure conditions the access to benefits or incentives that can be received, with differentiated tenders based on property size, and restricts access to certain development instruments if the ownership title of the property is not regularized.

Within this framework, the ENCCRV contemplated the establishment of a transversal action measure related to this matter, which is called "*Adjustments for the Inclusion of Owners with Limited Legal Security of Land Tenure*" (MT.3), taking into account the percentage of rural owners which are in an irregular situation with respect to the ownership title of their property, but who possess the intent and potential to participate in diverse development tools which are aligned with the proposals to be implemented contained in the ENCCRV.

Within this framework it is fundamental to consider the following elements, which could be considered as additional elements when focusing on ENCCRV action measures:

- **Types of land rights,** resources and categories of rightsholders, present in the zones where ENCCRV action measures are implemented, including indigenous peoples and other pertinent communities.
- **Legal status of those rights,** and any significant void or ambiguity present in the applicable legal framework, including rights stemming from customary laws.
- **Feasible zones for the implementation of ENCCRV action measures**, where ownership is not regularized, but which correspond to land where the execution of ENCCRV direct action measures is feasible according to the resources present at the implementation sites.

In analyzing land tenure and current Chilean regulations, various categories of ownership of land rights can be found, such as Owner, Possessor, and other subjects such as Leaseholder, Bailee, Usufructuary, and Tenant. The following categories or types of owners are found:

- **Public Property or National Assets**, those whose domain belongs to the entire nation. Those National Assets whose use belongs to all the inhabitants of the nation are called National Goods of Public Use or Public Goods. If their use does not generally belong to the inhabitants of the nation, they are called State Assets or Fiscal Assets (Art. 589 of the Civil Code). In this sense, properties administered by CONAF and the Ministry of National Assets (MNA) are, in principle, of interest for developing activities that reduce and/or capture emissions, given the level of feasibility in terms of demonstrating their ownership and the consequent certainty of carbon rights transfer, since most of them are State or Fiscal Assets.
- **Owner of Private Property:** This category corresponds to the rest of the owners and will be the general rule as subject of tenure. Depending on the number of people who claim ownership of a property, we can differentiate between:
    - **Individual property:** sole property ownership.
    - **Collective property:** two or more ownership titleholders.
- **Small Forest Owner,** as already indicated according to Law No. 20,283, this is an owner who holds title to one or more rural properties, whose combined area does not exceed 200 hectares, with exceptions in the Lonquimay Municipality, in the Araucanía Region, in

Palena Province, in the Los Lagos Region, and in the regions of Aysén and Magallanes, and whereby income comes mainly from agriculture or forestry.

- **Other Small Forest Owners,** corresponds to:
    - **Agricultural communities** regulated by the Decree with Force of Law No. 5 of 1968 of the Ministry of Agriculture.
    - **Indigenous communities** governed by the Indigenous Law No. 19,253.
    - **Communities living on commonly-owned land** resulting from the Agrarian Reform process.
    - **Rain-fed farming societies** established in accordance with Article 1 of Decree Law No. 2,247 of 1978.
    - The **societies** referred to in Article 6 of Law No. 19,118 that grants benefits to purchasers of properties derived from the Agrarian Reform.
    - **Other forest owners,** natural or legal persons and communities that do not meet the requirements established in the definition of Small Forest Owner defined in Law No. 20,283.
- I**ndigenous owner**, Holder of property right to land listed in Article 12 of Law No. 19,253. This category has restrictions relating to land transfer and encumbrance, unless to persons of the same ethnicity. With the authorization of the National Indigenous Development Corporation (CONADI) of the Ministry of Social Development, land may be encumbered or traded with third parties. Nevertheless, there are no restrictions regarding the use of the natural resources present in their properties.
- **Indigenous Community,** regulated by Law No. 19,253 and understood as any grouping of people belonging to the same ethnic group and who fall under one or more of the following descriptions: (a) they are from the same direct family line, (b) they recognize traditional leadership, (c) they have or have had common ownership of indigenous lands, and (d) they come from the same settlement. They may be property title owners, currently specified in general by purchase made by CONADI through the Land Fund established in the same Law.
- **Indigenous Lands,** In Title II of Law No. 19,253, on the recognition, protection and development of indigenous lands, specifically in Article 12, indigenous lands are defined as:
    - Those that indigenous people or communities currently occupy in ownership or possession.
    - Those historically occupied and possessed by the Mapuche, Aymara, Rapa Nui or Easter Islanders, Atacameñas, Quechuas, Collas, Kawashkar, and Yamana people or communities, provided that their rights are registered in the Indigenous Lands Registry.
    - Those described in the above that are declared in the future as belonging to indigenous people or communities by the Courts of Justice.

- Those that indigenous people or their communities receive free of charge from the State.

Next,

Table 3 shows the quantity and area of rural properties duly registered in the ERP accounting area, according to the Natural Resources Information Center (CIREN).

Table 3. Quantity and Area of Rural Properties

Region	N° Properties	Area (ha)
Maule	45,208	1,806,610
Biobío	115,444	3,608,982
Araucanía	142,883	3,100,823
Los Ríos	19,328	1,347,243
Los Lagos	42,841	3,292,959
Total	365,704	13,156,617

Table 4 shows the area associated with Indigenous Peoples and Agrarian Reform, which possesses a total area of 2,006,311 hectares.

Table 4. Area Associated with Properties of Indigenous Peoples and Agrarian Reform of the Accounting Area.

Region	Indigenous Development Area	Native Title	Transfers	Agrarian Reform
Maule	-	-	-	-
Biobío	275,073	116,588	2,557	27,448
Araucanía	388,255	454,341	47,711	61,1444
Los Ríos	-	72,678	845	2,966
Los Lagos	-	-	-	6,405
Total	663,328	643,607	51,113	648,263

Therefore, the area comprising property duly registered by private individuals, and the area comprising the property of indigenous peoples and agrarian reform, there is a total regularized area of 15,162,928 hectares within the accounting area.

Table 5 shows the statistics, both of area and frequency, corresponding to the Small Forest Owners (SFO) and Non-SFO (corresponding to medium and large forest owners) who own a portion of land classified as Potentially Forestable Land (PFL), which is therefore land where ENCCRV direct action measures could be focused.

Table 5. Quantity and Area in Hectares of Small Forest Owners (SFO and other Owners)

Region	No. SFO	Area SFO	No. Non-SFO	Area Non-SFO
Maule	17,764	438,424	975	41,346
Biobío	63,368	863,419	1,677	9,975
Araucanía	44,566	97,174	224	0
Los Ríos	12,280	310,578	766	17,856
Los Lagos	29,253	652,043	653	21,979

Total	167,231	2,361,638	4,295	91,156

Given the certainty represented by SNASPE land and other National Assets in terms of title, area can be specified for the five regions included in the ERP for both categories, as shown in detail in Table 6.

Table 6. Area in Hectares of Public Property within the Accounting Area.

Region	SNASPE	Other NA land
Maule	18,899	5,400
Biobío	136,621	989
Araucanía	256,152	12
Los Ríos	99,945	4,363
Los Lagos	789,161	10,430
Total	1,300,778	21,194

It is important to highlight that this information will be taken into account in order to prioritize properties where different action measures are carried out, in order to optimize resources and maximize benefits, however, their relevance in the prioritization will be assigned by their respective RCCC.

4. Emissions Reduction Program Effectiveness Objectives

As can be seen from the standard table included in the ERPD structure, this document should establish the objective of effectiveness sought by the country for REDD + activity for the period of execution of the ERP against the estimated reference levels.

- Considering the first REDD + Technical Annex and the progress during the 2013-2016 period, it can be established that it is possible to achieve the ER of 5.2 million TonCO_2eq signed in the LOI.
- Effectiveness is estimated per monitoring period, taking into account that the last year included in the reports will be 2024.
- The estimates of ER available for transaction take into account discounts included in the buffer reserve due to uncertainty (8%) and for displacement risk and reversals (21%)[5]

The minimum effectiveness necessary to achieve the target of 5.2 million TonCO2eq, per year and REDD + activity, is described in the following table, establishing low percentages (%) for each of the REDD + activities:

Table 7. Minimum Effectiveness to Achieve ER Commitments of the LOI.

	Deforestation	Degradation	Conservation	Increase

[5] The estimate of uncertainty used takes into consideration suggestions made by the TAP and adopted by Chile according to the agreements reached at the CF15 meeting in December 2016. However, in Chile's ERPD there is an error that is corrected by increasing the final buffer to 29%.

Monitoring events	Year	ERPA effectiveness objective %	ERPA effectiveness objective %	ERPA effectiveness objective %	ERPA effectiveness objective %
1	2017	6.00	4.00	-	-
	2018	6.00	4.00	-	-
2	2019	6.00	4.00	1.25	1.25
	2020	6.00	4.00	1.25	1.25
3	2021	9.00	6.00	1.25	2.50
	2022	9.00	6.00	1.25	2.50
4	2023	9.00	6.00	1.25	2.50
	2024	9.00	6.00	1.25	2.50

These estimates are according to the actions developed at the institutional level with the functions of:

- Monitoring and encouraging the sustainable management of native forests, xerophytic formations, forest plantations, and the protection of protected species, through the dissemination and application of forestry and environmental legislation.
- Improving access of forest producers, with emphasis on small, medium, and indigenous producers, to the benefits of forestry and conservation tourism, through the use of forestry development tools and comprehensive technical assistance in the value chain of their goods and services in coordination with other public services.
- Promoting the generation of environmental services through promotion and maintenance of urban trees, peri-urban parks, natural infrastructure, and other types of plants with heritage and cultural value, spreading the benefits they provide to society.
- Protecting society from threats posed by forest fires, forest pests, invasive forest species and the effects of climate change on native forests, xerophytic formations, forest plantations, and heritage components present in the SNASPE.
- Conserving biological diversity by strengthening the SNASPE and other conservation instruments, the contribution of native forests, and xerophytic formations to quality of life, especially in local communities.

CONAF objectives in the current ENCCRV framework strengthen effectiveness for compliance with emissions reductions established in the LOI, which is demonstrated in the increase in ER reported in the REDD + Annex.

In order to increase effectiveness, priority is given to action measures associated with reduction of emissions from deforestation and forest degradation, since it is considered that the effectiveness of these activities is reflected in the short term in terms of ER, and with a lower implementation cost:

1. For each hectare in which deforestation and forest degradation is avoided, the volume of emissions avoided ranges from 97.5 to 858.7 tCO2e, depending on the region.

Table 8. ER per Deforestation and Degradation Avoided

ER per Deforestation/Degradation Avoided	
Region	tCO2e/ha
Maule	97.5
Biobío	280.1
La Araucanía	649.6
Los Ríos	858.7
Los Lagos	686.1

2. The average annual growth rate by forest type is substantially lower, with an average value of 9.5 tCO2e/ha captured per year, meaning that activities associated with increasing stocks have a lower ER effectiveness.

Table 9. ER per Increase in Forest Area and Recovery of Native Forest

ER per Increase in Forest Area and Recovery of Native Forest	
Forestry Type	tCO2e/ha/year
Larch	0.9
Guaitecas Cypress	8.0
Araucaria	9.4
Mountain Cypress	9.6
Lenga	12.3
Magellan's Beech	12.5
Magellan's Beech	12.5
Oak-Hualo	9.4
Oak-Raulí-Coihue	12.5
Coihue-Raulí-Tepa	10.4
Sclerophyllous	4.5
Evergreen	11.9

3. Reduced emissions from avoided deforestation and degradation are consistent with the historical reference level. Any update of this would result in a lower capacity to reduce emissions.
4. Absorption resulting from activities associated with an increase in forest carbon reserves has effectiveness over time, since, according to estimates from the Forest Inventory, native forest in Chile reaches an equilibrium condition when the Mean Square Diameter (MSD) average of the forest reaches 60 centimeters, which occurs in forests 80 years old or older.
5. Activities linked to the increase in absorption due to an increase in forest carbon reserves are associated with the generation of environmental and social co-benefits and have an important component as a measure of adaptation to climate change, combating desertification, land degradation, and drought. This means that in the framework of the ENCCRV and the ERP, they represent a greater value in the short and medium term when evaluated with metrics of other environmental services other than carbon.
6. While activities associated with ER due to deforestation and forest degradation are linked to preventative actions, activities associated with an increase in absorption due to an

increase in forest carbon reserves are linked to the execution of proactive actions such as afforestation or restoration, which means significantly higher costs.

7. Actions linked to forest inspection and awareness-raising of the value of the native forest, prevention of forest fires, among others, are part of CONAF's mandate and currently have a budget, so additional financing would be aimed at improving these activities.
8. Proactive actions such as forestation and restoration do not currently have an annual budget in CONAF and are generally carried out as private initiatives. Therefore, added to the intrinsic operating cost of these activities, the funding allocated for their implementation is considerably higher.

As a general base reference to demonstrate the country's ability to obtain this result, an example exercise has been carried out (Table 10) in which emissions were analyzed for deforestation and degradation by transforming native forest to forestry plantation, and the absorption by increase of stock associated with land use changes for the most recent data available, and the emissions and absorption for the same activities estimated in the reference level.

The date of the most recent information corresponds to the 2018 technical REDD + results annex which covers monitoring period 2013-2017.

The historic period of the RL covers the period 2001-2013 for all regions.

In the case of deforestation, the emissions estimated in the Reference Level are 3.45 million TonCO_2e/year. The most recent available emissions information is 3.0 million TonCO_2e/year. Therefore, for this activity the ER are 0.455 million TonCO_2e/year.

In the case of emissions due to degradation as a result of the transformation of native forest to plantations, in the RL emissions are 4.08 million TonCO_2e/year. The most recent available emissions information is 0.217 million TonCO_2e/year. Therefore, the ER for reduction of degradation are 3.858 million TonCO_2e/year.

In the case of stock increase, the RL reflects an absorption volume of 0.89 million TonCO_2e/year. However, in the most recent period, records indicate that absorption by stock increase is 1.019 million TonCO_2e/year. In this case, absorption for the most recent period is higher than that estimated in the RL by 0.128 million TonCO_2e/year.

In this scenario, taking into account that calculations of emissions and absorption in permanent forest have been excluded, the results indicate that in the most recent period the ER amounts to 4.93 million TonCO2eq per year.

Table 10. Estimated ER from the Period with the Most Recent Available Information Against the Reference Level.

Emissions Reduction ($tCO_2e\ year^{-1}$)				
Region	DEFORESTATION	DEGRADATION	INCREASE	TOTAL
Maule	64,219	31,374	-474,953	-379,359
Biobío	259,242	-2,264,554	-618,607	-2,623,918
Araucanía	249,636	-1,097,339	-310,795	-1,158,498
Los Ríos	422,835	-70,669	210,817	562,983
Los Lagos	-540,351	-1,118,997	10,192,463	8,533,114

Total	**455,581**	**-4,520,185**	**8,998,925**	**4,934,322**

These estimated volumes represent an emissions reduction effectiveness of 55% for deforestation, a negative effectiveness of 49% for degradation, and an effectiveness close to 90% in terms of increase in stock.

Table 11. Estimated Effectiveness Percentage Based on the Most Recent Information Included in the Reference Level

Emissions Reduction Effectiveness (tCO_2e $year^{-1}$)			
Region	DEFORESTATION Effectiveness %	DEGRADATION Effectiveness %	INCREASE Effectiveness %
Maule	75.6%	5.2%	-40.2%
Biobío	65.4%	-187.2%	-48.2%
Araucanía	23.6%	-57.5%	-20.5%
Los Ríos	65.6%	-5.1%	10.4%
Los Lagos	-42.6%	-27.6%	254.3%
Total	**13.2%**	**-49.4%**	89.9%

This result demonstrates the effectiveness of policies and actions implemented by CONAF prior to 2010. These actions must be maintained over time, in addition to incorporating improvements and adaptations to current technologies and socioeconomic and climatic circumstances. In the event that large-scale events did not occur during the accounting period (albeit these have already occurred, such as in 2017), the effectiveness could achieve much greater results than those laid out in the optimistic and pessimistic investment scenarios (Table 12.).

Table 12. Comparison of Effectiveness Percentage by Scenario and Based on Recent Historical Data

Effectiveness Objective Compared by Scenarios(%)			
Optimistic	0.20	0.15	0.20
Pessimistic	0.12	0.09	0.03
Recent Historical Data	**0.55**	**-0.49**	**0.90**

However, it must be taken into account that both the Commitments of Chile to the international community (such as the NDC) as well as internal public policy objectives (ENCCRV or Forestry Policy) consider forestry promotion, oriented toward afforestation and restoration of degraded forests, as one of the areas of greatest relevance, not only because of its mitigation effect, but also because of its relation with adaptation and reduction of vulnerability to climate change for the country as a whole.

For these reasons, the effectiveness objectives stated above link activities and available financing.

It must be considered that the annual budget of CONAF, which follows in detail for the year 2018, is USD 138 million, which covers the distinct programs executed by the Corporation in addition to the allocation at the national level (Table 13)

Table 13. CONAF Amounts According to the 2018 Budget Law

Area	Amount (USD) 2018

National Corporation	$	29,992,200
Fire Management Program	$	49,975,918
Protected Wild Areas	$	26,828,352
Forestry Management	$	28,901,926
Tree Planting	$	2,373,498
Total	**$**	**138,071,895**

However, upon evaluation of the investment linked to ENCCRV actions and to the ERP, this amount is smaller considering conservative financing, which for the 9 years of ENCCRV implementation would be USD 121.373 million, which is broken down in the following Table:

Table 14. ENCCRV Budget Amounts Broken Down by Program

CONAF Financing Source	Total
Wood Energy Initiative	17.533
Native Forest Department	2.312
Audit Management	2.697
Monitoring Department	5.948
Plantations Department	1.927
Fire Prevention Department	20.769
Climate Change and Environmental Services Unit (UCCSA)	1.416
Unit of Indigenous and Social Affairs (UAIS)	890
Ecological Restoration	1.349
Technical Assistance Program	15.375
Employment Program	135
Employment and Training Program (PROFOCAP)	37.039
Tree-Planting Program	13.984
Total	**121.373**

5. Investment Plan

The estimated budget for the implementation of the ENCCRV is USD 433 million, for a time horizon of nine years. Due to cost updates for each of the action measures, differentiated by region and by forestry type, a maximum implementation cost for the ENCCRV of USD 833 million has been established. This value will vary according to the region in which each of the action measures is executed and the forestry type used, and is not directly linked to the activities to be carried out for the Pay for Results of this ERP[6].

In order to fund all of the ENCCRV action measures, the following types of financing are being explored:

- National and international private contributions
- International bilateral contributions
- International multilateral contributions
- Incremental and non-incremental fiscal contributions

[6] More details in ERP investment plan.

The implementation of the ENCCRV considers a financial model based on the evaluation of the existing budget in CONAF, and current Law No. 20,283, as well as national and international financing sources that could be leveraged for the implementation of the action measures that form part of the three phases of the ENCCRV. Financing sources have been analyzed based on two scenarios, which correspond to the possibility of obtaining additional resources. The Pessimistic scenario does not contemplate conditional resources. It is based on better use and redirection of available national funds and the actions which are being carried out with international contributions (unconditional). This probability is directly linked to the amount assigned by each source to the action measures in general terms, and not exclusively to those associated with the ERPA but to the implementation of the ENCCRV as such, which means that even in the case that the action measures contemplated in the ERPA do not materialize completely in the planned technical scenarios, other ENCCRV action measures would generate ER associated with the ERP, thereby ensuring the Maximum Volume proposed in the LOI. Specifically, the scenarios that were analyzed correspond to:

- Optimistic: 100% conditional financing and 100% unconditional financing.
- Pessimistic (Conservative): 0% conditional financing and 100% unconditional financing.

The current sources of financing according to their origin are detailed below.

Available financing of international origin is 23,679,000 USD (Table 15), while available financing of national origin is 121,499,258 USD (

Table 16).

Table 15. Unconditional Financing of International Origin

International Unconditional Financing Source	Thousands of USD					
	2016	2017	2018	2019	2020	Total
Preparation Fund (FCPF)	3,800	5,000				8,800
Carbon Fund (FCPF)	650					650
COSUDE I	1,320	190	190			1,700
COSUDE II			800	800		1,600
GEF MST	5,863					5,800
Chile-Mexico	118,6					118,6
IDB	180					180
UNEP	40,4					40,4
UN REDD NJP		1,000	1,000	1,000	1,000	4,000
UN REDD TS	119	150	291			560
FERI		50				50
GEF Mountain Wildlife Corridors			90	90		180
TOTAL	12,091	6,390	2,371	1,890	1,000	23,742

Table 16. CONAF National Unconditional Financing

CONAF Financing Source	Estimated Annual Contribution (USD thousands) from Current National Unconditional Sources									
	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Wood Energy Initiative	1,404	1,516	1,638	1,769	1,910	2,063	2,228	2,406	2,599	17,533
Native Forest Department	185	200	216	233	252	272	294	317	343	2,312
Audit Management	216	233	252	272	294	317	343	370	400	2,697
Monitoring Department	476	514	556	600	648	700	756	816	882	5,948
Plantations Department	154	167	180	194	210	227	245	264	286	1,927
Fire Prevention Department	1,663	1,796	1,940	2,095	2,263	2,444	2,639	2,850	3,078	20,769
Climate Change and Environmental Services Unit	113	122	132	143	154	167	180	194	210	1,416
Unit of Indigenous and Social Affairs (UAIS)	71	77	83	90	97	105	113	122	132	890
Ecological Restoration	108	117	126	136	147	159	171	185	200	1,349
Technical Assistance Program	1,231	1,330	1,436	1,551	1,675	1,809	1,954	2,110	2,279	15,375
Employment Program	11	12	13	14	15	16	17	19	20	135
Employment and Training Program (PROFOCAP)	2,966	3,203	3,460	3,736	4,035	4,358	4,707	5,083	5,490	37,039
Tree-planting Program	3,078	2,449	2,014	1,657	1,362	1,121	922	758	623	13,984
Total	11,678	11,737	12,045	12,490	13,062	13,756	14,568	15,496	16,541	121,373

From the financing sources detailed above it is evident that in order to achieve the goals set out in the ENCCRV, strengthening partnership work between the public-private sector will be fundamental, as well as promoting regional initiatives by local funds. Progress will be made due to the strengthening of available capacity in the distinct regions of the country obtained by the preparation funds that have been leveraged to date. This data is being updated, due to changes in development funds and instruments which can be linked to the ENCCRV.

Nevertheless, and considering the technical analysis and conservative calculation of the ERs, it must be considered that achieving the commitment established in the LOI is possible. Evaluating distinct combinations of action measures in an example exercise and due to the cost-effectiveness of the actions, the following table describes the action measures to execute in order to reinvest resources from the Pay for Results and achieve emissions reduction of about 5.2 MTonCO2eq, as mentioned previously.

Table 17. ERP Costs as an Example of Cost- Effective Actions

Action Measure	Goal	Cost (USD)	Total (USD)
MT.4.	50,000	2,346	$ 117,000,000
MT.5	22,350	2,315	$ 51,740,250
MT.7	200	11,568	$ 2,313,621
US.1	64,200	821	$ 52,708,200
Total			$ 224,062,050

Furthermore, it should be noted that if unconditional classified resources are not obtained, priority will be given to action measures that represent greater cost-effectiveness, as described in the previous Table. In addition, CONAF is moving forward with existing programs to improve established institutional capacities, focusing efforts on achieving a real paradigm shift in the forestry sector, linking the institution's strategic objectives to the climate change approach, which is related to the more cost-effective measures linked to the strengthening of existing programs.

However, progress is already being made in evaluating different national and international funds for the implementation phase of the ENCCR, which are described below.

Table 18. Conditional Contribution of National Origin

Estimated Annual Contribution from National Conditional Funding Sources (USD thousands)										
Source	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**Total**
Law No. 20,283 Incentives	1,750	2,573	3,473	4,457	5,531	6,700	7,974	9,357	10,342	52,157
Law No. 20,283 Research	250	368	496	637	790	957	1,139	1,337	1,477	7,451
Private	1,000	1,080	1,166	1,260	1,360	1,469	1,587	1,714	1,851	12,487
MT5 owners		1,640	1,806	1,904	2,002					7,352
IF2 owners		68	506	533	561	588	616	597	623	4,092
IF3 owners		414	443	472	501	177	187			2,194
US1 owners		963	1,351	1,418	1,485	1,939	2,023	2,107	2,191	13,477
US3 owner		265	348	365	382	399	415	432	449	3,055
FIA	553	581	610	640	672	706	741	778	817	6,098
FNDR FIC	4,449	4,671	4,905	5,150	5,408	5,678	5,962	6,260	6,573	49,056
Management of Protected Wild Areas	261	276	291	306	321	336	351	366	382	2,892
Total	8,202	12,840	15,338	17,088	18,964	18,907	20,962	22,925	24,693	160,311

Table 19. Conditional Contribution of International Origin

Estimated Annual Contribution from International Conditional Funding Sources (USD thousands)									
Source	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**Total**
PfR from the Carbon Fund		833	-	-	8,264	-	-	16,904	26,000
PfR from the FVC			-		10,000	-	-	10,000	20,000
GEF-6 MMA-CC	848	848							1,696
GEF-7			1,000	1,000	1,000	1,000			4,000
Total	848	1,681	1,000	1,000	19,264	1,000	0	26,904	51,696

Total financing, including currently available financing and conditional financing, is USD 357 million. This includes bilateral and multilateral contributions, donations, Pay for Results of international origin, as well as national governmental and private contributions. Overall, 23.24% is of international origin while 76.76% is of national origin. Additionally, 39.51% is unconditional, whereas 60.49% is conditional.

It is important to take into account that the unconditional budget, which corresponds to funds from the CONAF Budget Law, has made possible and will continue to strengthen the fulfillment of

the goals of the ENCCRV. Below are some of the actions carried out during 2017, and the planning for 2018 to enhance activities associated with Deforestation and Forest Degradation

Among the most noteworthy actions is the Wood Energy Unit. Since 2017, it has established a program of developers, similar to forest extension agents, which starting in 2018, will carry out joint work to meet the management goal of an annual 2,000 hectares for sustainable biomass production, associated with action measure US.3. This will strengthen the Wood Energy Program and the country's energy matrix. In addition, it will manage the interoperability of the SIGEFOR Platforms with other CONAF platforms, in order to strengthen the teams which work on the land in distinct disciplines (extension, development, inspection, benefits, etc.).

Since 2017, Environmental Audit and Evaluation Management (GEF) has implemented an Early Warning System (EWS), which strengthens the work done by the land inspectors in the detection of unauthorized woodcutting through the use of open access satellite images and an algorithm developed by CONAF on the Google Earth Engine platform. Another technology being used is drones, which optimize forest inspection activities on the ground by monitoring large areas, giving better accessibility options and providing greater security to operations. All of these actions are in line with action measure MT.7, strengthening environment and forest inspection programs, and RS.1, targeting restoration and inspection program to promote the sustainability of forest management.

From 2018, as well as continuing with the aforementioned actions, a mobile app will be launched to detect unauthorized woodcutting, as will a traceability system for primary products from native forests, which will directly address the causes of native forest deforestation and degradation.

Also, the Department of Forest Fire Prevention has implemented a program called "Prepared Communities," the objective of which is to disseminate information, educate and raise awareness in communities living at the urban/forest interface, or in critical zones for forest fires, about the risk of living in these places and to increase individual and collective responsibility in the prevention of forest fires. During 2017, this program was rolled out in around 20 communities from Region V to Region XII, representing 14,466 beneficiaries. For all the above, measure IF.4, strengthening of the program "Prepared Communities in the Face of Forest Fires" has greatly advanced, and during 2018 the reach of the program has doubled.

Also, during 2018 work has begun on putting together programs and manuals for the technical execution of 8 ENCCRV action measures. These manuals will guide the actions in the territory, prioritizing the most cost-effective actions possible, with the greatest beneficiary impact. This, together with prioritization system actions, will allow key parameters to be established for the implementation of action measures in the territory.

In addition, CONAF has started joint work with the recently-created Agency for Sustainability and Climate Change, which has been set up under the Production Development Corporation (CORFO).

This Agency has previous experience in establishing related public-private synergies, from when it was established as the former Council of Clean Production (CCP). Currently, CONAF collaborates with the Agency with the purpose of formulating its agenda to the year 2030, with a public and private committee to guide actions, allocating resources for the following 3 actions aligned with the ENCCRV and the ERP: 1) prevention of forest fires in alliance with private forestry companies (for example Arauco, MASISA, and CORMA), 2) forest management in public and private land with timber and wood energy products, and 3) restoration of areas affected by forest fires through compensation mechanisms that are carried out by private companies, mainly in the real estate and mining sectors.

In line with the above, financial instruments are being formulated along with CORFO in order to attract private investment for native forest management for timber purposes, and mainly for energy purposes.

Forestry companies have committed, with technical support from CONAF, to dedicate efforts to restoring native forest affected by the forest fires during the 2017 season, covering two of the five regions contemplated by the ERP -- Maule and Biobío -- adding to financial resources from the Undersecretary of Agriculture and through redirection of funds managed by the Foundation for Agrarian Innovation (FAI) and the Ministry of the Environment through its Environmental Protection Fund (EPA).

In terms of other public-private partnerships associated with action measure IF.3, a preventative forestry program with emphasis on the urban-rural interface, which has been accentuated following the 2017 forest fire season, called the "firestorm," the 2017-2018 investment which private forestry companies will make should be mentioned. These are prevention issues to reduce impact to extensive areas of native forest and exotic plantations.

In this context, these companies will invest close to USD 80 million for the 2017-2018 season and very probably in the years to come, given the high projected risk levels. This means an increase of 60% versus the historical average of USD 50 million that the private sector allocated each year, according to official data from the Chilean Wood Corporation (CORMA), an association which groups together 180 forestry and timber companies.

Specifically, this will increase the number of people dedicated to fire prevention and fighting from 2000 to 2700. This is in addition to the 226 watchtowers for fire detection, 24 airplanes, 25 helicopters, and 35 tanker trucks to provide water to the fire fighters[7].

All of the above shows that various public and private entities that contribute with concrete actions to the ERP area are carrying out activities aligned with the ENCCRV action measures, which

[7] See complete notice on the CORMA official site at: http://www.corma.cl/corma-al-dia/nacional/forestales-destinaran-us-80-millones-a-prevencion-y-combate-de-incendios#/0

will guarantee the results committed to in the LOI. It is important to highlight that the initiatives by the Agency for Sustainability and Climate Change, CORFO, and post-fire restoration mentioned above are not taken into account in the original evaluation of the conditional budget for ENCCRV, since they are posterior to the formulation stage of this initiative.

Considering the aforementioned background, it can be established that CONAF has solid planning when it comes to ER associated with deforestation and forest degradation, which has been demonstrated in the NREF, visualizing historical changes in the landscape due to the efforts made by CONAF and confirmed by the results obtained in the first REDD + Technical Annex.

Also, the direct measures of the ENCCRV, in which efforts to leverage new resources should be strengthened, as well as creating synergies with other services to achieve the fulfillment of the goals, could be implemented gradually, since current resources will be prioritized in these action measures.

6. Co-Benefit Indicators

The framework of the ENCCRV identifies different environmental and social co-benefits to be obtained as part of the products generated by direct action and facilitation measures that are being, or will be, implemented. In addition to carbon sequestration, different benefits may be obtained through actions taken, both tangible, such as greater availability of water in quality and quantity, erodibility control, soil productivity improvements, larger family incomes, biodiversity improvement, access to Non-Timber Forest Products (NTFPs), etc; and intangible, such as sociocultural benefits related to physical cultural resources, greater participation of women in plant resource management, improvements in the gender equity index, landscape improvement, scenic quality, increase in medicinal herbs, and preservation of indigenous cultural heritage, etc. All of this represents fundamental benefits which contribute to community development and greater linkages between the environment and society.

Follow-up and monitoring of co-benefits will be integrated as a component of the ENCCRV Measurement and Monitoring System, through the Co-Benefits System (SCB)[8] in those social and environmental benefits beyond carbon; and through the ENCCRV Property Monitoring System (SSP), for environmental indicators generated and identified at the territory level.

The SSP aims to monitor progress and results of the implementation of ENCCRV direct action measures. This tool will be adapted to generate reports according to the Modalities, Procedures and Guidelines for the Reinforced Transparency Framework of Chile's Paris Accord NDC for its forestry sector. It will also monitor the implementation of the ENCCRV at the property level,

[8] System in planning stage, the tender will be financed by the FCPF II and in it the baseline and methodology for each of the indicators will be prepared.

systematizing information derived from field interventions based on instruments defined by legislation for the registration of this type of action, mainly the Management Plans.

The environmental co-benefits that the country is able to measure and evaluate, as a response measure to activities aimed at improving climate change adaptation capacity, have a direct relationship to providing, maintaining, or improving environmental services provided by the forest, those being: (1) water resources; (2) soil resources; and (3) biodiversity, ecosystems, and landscapes; for which a series of easily registered and monitored indirect indicators (proxies) have been defined.

6.1. Environmental Indicators

Description of Water Resources and Water Erosion Indicators

Indicators linked to water resource variation and water erosion tend to be developed based on a series of information sources which feed complex models in order to estimate variations in water flows and in sediment transport as a result of weather events.

However, standardizing the diverse variables that determine water flows in order to compare different modeled scenarios isolating the effect of the implementation of the ENCCRV from dynamic weather variations is not feasible.

According to the above, each year will see a different water balance as a result of weather conditions and the amount and distribution of rainfall during the season. Therefore, the results based on theoretical approaches could be far from the effective reality in the territory and their publication could have negative repercussions.

In this sense, co-benefit indicators related to water resources and water erosion have been proposed as follows:

- ✓ water resource: area in hectares affected by the ENCCRV direct action measure at a distance of up to 100 meters from the edge of a basin, sub-basin, sub-sub-basin, or smaller area to be defined.
- ✓ water erosion: area in hectares affected by the ENCCRV direct action measure according to range of inclines as per the following Table:

Table 20. Classification According to Slope and Description.

Description	Incline (%)	RANGE
Flat to slightly inclined	0-2	1
Mild to moderately inclined	2-8	2
Heavily inclined to moderately steep	9-25	3
Steep to very steep	25-65	4

For the monitoring of both indicators as a base element, there is spatial coverage for the ERP area that delimits the area relevant to each indicator, within the framework of the "Hidrofor" project which include zoning of edaphoclimatic standards and parameters for soil and water conservation included in Law 20,283[9], carried out by CIREN under the Ministry of Agriculture with funding from CONAF through the Native Forest Research Fund. For monitoring of the indicator, spatial information will be used to register at the property level the affected area and the type of action executed in the implementation of the ENCCRV action measures. The information will be registered based on management instruments established by national regulations for this type of intervention. The information of greatest relevance will be the different types of forest management plans that include qualitative and quantitative information on planned intervention and the features of the intervention site.

Description of biodiversity, ecosystems, and landscapes indicator

Conservation, restoration, and sustainable use of biodiversity are considered a central part of climate change adaptation strategies, since it is predicted that they could reduce negative impacts of climate change on human populations. At the same time, biodiversity conservation measures, protection, restoration, and promotion of connectivity are a way of ensuring and safeguarding the resilience and adaptation of ecosystems in the face of climate change, maintaining their environmental functions and services. Also, biodiversity is valued by society for its intrinsic value, aside from the benefits it provides through ecosystem services, such as pollination, food, medicine, energy, timber, scenic beauty, and water provision and infiltration, to name just a few.

Habitat fragmentation and loss is one of the most influential factors in the loss of biodiversity, productivity, and biological resources (Badii and Ruvalcaba, 2006). In addition to this threat, over-exploitation of natural resources by humans, the introduction of exotic species, and secondary effects of extinction are also considered as major threats to biodiversity loss. As a consequence of fragmentation, a habitat is fractured and divided in various fragments or "islands," and the productive capacity of these islands compared with that of the original habitat is normally and historically reduced (Badii et al., 2000).

In this sense, the following indicator for co-benefits related to biodiversity is proposed:

- ✓ biodiversity: reduction of forest ecosystem fragmentation, measured as the average of 6 indices or metrics, as a result of the implementation of ENCCRV direct action measures.

Analysis to determine fragmentation will be carried out using Fragstats software version 4.2 and Software Patch Analyst 5.2, specifically the version which works in vectoral/raster format as an

[9] More information at: http://bibliotecadigital.ciren.cl/bitstream/handle/123456789/26163/Hidrofor2.pdf?sequence=1&isAllowed=y

extension of ArcGis. The fragmentation index will be estimated before and after carrying out activities in the field, using the following metrics and descriptive indexes:

- **NumP**: *No. of Patches* – Number of patches or fragments. Number of total fragments and of each class.
- **SI**: *Shape Index*: Calculates fragment shape complexity compared to a standard shape. Applicable at fragment, class, or landscape level.
- **PAR**: *Perimeter Area Ratio*. Calculates shape complexity.
- **AWMPFD:** *Area Weighted Mean Patch Fractal Dimension*. Corresponds to the weighted dimension of the fraction of the weighted average patch. This is the same as the fractal dimension of the average patch with the addition of the weighting of the area of the individual patch applied to each patch. Because larger patches tend to be more complex than smaller patches, this has the effect of determining the complexity of a patch regardless of its size. The unit of measure is the same as the average fractal dimension of the patch.
- **FD**: Fractal Dimension. Calculates the degree of complexity of each fragment based on the relationship between its area and perimeter.
- **MPAR**: *Mean Perimeter Area Ratio*. Calculates the complexity of the shape; the result corresponds to the sum of each ratio of the perimeter of the patch/fragment divided by the number of patches.

The final fragmentation index will correspond to an average of the indexes described above. As the fragmentation index moves away from 1, it is equivalent to more fragmented forests. When the index approaches 1, it is equivalent to less fragmented forests:

$$Indice\ de\ Fragmentacion\ = \frac{(NumP + SI + PAR + AWMPFD + FD + MPAR)}{6}$$

6.2. Social Indicators

Social indicators, as well as environmental indicators, will require among other things, the design and development of baselines to evaluate and contrast the variables that will be measured through qualitative and/or quantitative monitoring and tracking.

In this context, the ENCCRV considers the following social Indicators:

Indicator	***Number of Safeguards Respected and Complied with in Relation to Participation and Consultation in the Implementation Phase of ENCCRV Actions, in the ERP Area***
Description	This indicator is intended to account for compliance with national and international regulations applicable to the ENCCRV and therefore to the ERP and will be applied both to mitigation and climate change adaptation projects. Therefore, it is transversal to the initiatives to be implemented. It includes the "c" and "d" Cancun safeguards, World Bank Operational Policy 4.10, Indigenous Law 19,253, ILO Convention 169, Supreme Decree No. 40 establishing Regulation of the Environmental Impact Assessment System, Supreme Decree No. 66 of the Ministry of Social Development establishing the procedure for indigenous consultations, and Law 20,500 on citizen participation, among others related to the national framework of safeguards included

	in the SESA.
Methodology for the baseline	The baseline will be safeguards activated on participation and consultation in the ERP regions, and defined activities in order to comply with them.
Measurement in time	It will report on the execution of the defined activities to comply with activated safeguards through project monitoring. Measurement will be continuous, or more precisely, in direct correlation with the implementation of the respective projects.

Indicator	***Gender Equity Index***
Description	This indicator seeks to promote gender equity in employment practices, training opportunities, the number of beneficiaries of action measures, involvement in participation processes, and other actions that can be implemented within the framework of the ENCCRV. It is an indicator that will be applied both to mitigation and climate change adaptation projects. Therefore, it is transversal to the initiatives to be implemented within the ENCCRV for the ERP area.
Methodology for the baseline	To generate the baseline, statistics produced by, among other sources, the National Institute of Statistics (NIS) of Chile, the National Socioeconomic Characterization Survey (CASEN), local-scale employment and income data from municipal sources, participation in forestry activities, participation in activities at the forestry, farming, and livestock level, among other official information, will be used. This is to determine current participation levels of women in issues related to the ENCCRV.
Measurement in time	As this indicator is associated with all types of ENCCRV activity, measurement of this indicator will be carried out periodically during the implementation of projects and activities. Measurement will correspond to the level of compliance delivered by the consolidation of the goals proposed by the different activities and/or projects. If compliance is greater than 80% of the individual committed goals, the index will have a value of 1 and it will be taken to be fulfilled. On the contrary, if the compliance level is lower than 80% of the individual goals for the committed activities and projects, the index will have a value of 0, which will mean that it has not been fulfilled.

Indicator	***Percentage of the Population Living in Poverty Benefiting from the ENCCRV***
Description	This indicator aims to measure the percentage of beneficiaries living in poverty which benefit from the ENCCRV. It is an indicator that will be applied both to mitigation and climate change adaptation projects. Therefore, it is transversal to the initiatives to be implemented at the heart of the ENCCRV.
Methodology for the baseline	The methodology for establishing the baseline will be based on the compilation of data from official sources for the municipality where the initiative related to the ERP will be implemented, such as the Ministry of Social Development's social registry of households, the National Socioeconomic Characterization Survey (CASEN). The social registry of households that allows for socioeconomic characterization is built using the sum of disposable income of all household members. It should be noted that the data is available by municipality. Likewise, information is available from the National Institute of Statistics of Chile related to country-level economic data, which could contribute to the generation of the indicator baseline.
Measurement in time	Measurement will be for all of the projects that are implemented in the ERP area, and the minimum percentage to be reached in

	order for the indicator to be fulfilled will be a focus on at least 30% of beneficiaries living in poverty with respect to the official percentage for each municipality in which projects are being implemented.

7. Monitoring Plan

7.1. Introduction to the Monitoring Plan

The ERP Monitoring Plan describes:

- The timing of monitoring milestone execution,
- Systems and methodologies to be used,
- Institutional arrangements involved.

The objective of the Monitoring Plan is to consistently provide data and transparent information that is adequate for the measurement, reporting, and facilitation of emissions verification by source, and absorption by sinks. Chile's ERP Monitoring Plan is part of the Measuring and Monitoring System (MMS) of the ENCCRV, which is currently in the process of design and preparation with the aim of starting implementation and operation in 2019.

The objectives of the ENCCRV Measuring and Monitoring System are:

i. Optimize generation processes and ensure the execution of monitoring events for primary elements (Land Use and Land Use Change Maps; Forest Inventory) for the estimation of emissions and absorption linked to REDD+.
ii. Generate interoperability protocols for the integration of information at different spatial scales, time scales, file formats, and differentiated purposes, including Co-Benefits and Safeguard Monitoring information.
iii. Automate report generation processes and increase their degree of transparency.
iv. Have a visualization and consultation platform with the aim of facilitating the dissemination of results which respond both to verification criteria for international entities as well as to institutional needs and citizen inquiries.

To design the System, a series of basic criteria has been considered, which must be fulfilled to achieve robust and sustainable results:

i. Build on existing systems and information, identifying weaknesses and developing improvements based on technological advances.
ii. Be built participatively, with the collaboration of national and international institutions and subject matter experts
iii. Build on the country's capacities and current technical development
iv. Generate publicly-accessible and transparent protocols and standards for all information used, including reporting uncertainties.
v. Guarantee the sustainability of the System from 2020 onwards.

7.2. Systems and Methodologies to be Used

As specified previously, ERP Monitoring will continue to be integrated within the SMM of the ENCCRV, and as part of this, the execution of a series of activities has been planned in order to optimize the methodological processes already used to create the Reference Levels, and integrate processes with the aim of increasing transparency, reducing execution time, and facilitating reporting and verification processes.

7.2.1. Development of Consultation and Social Interaction Workshops with Experts and National and International Institutions for the Participatory Design of the ENCCRV Measurement and Monitoring System.

Focused on generating Land Use Change activity data and Permanent Forest carbon flow analysis data. The activity will take place between the first and second half of 2019 according to the following schedule:

Phases

i. Preparation of material based on work carried out in a series of projects linked to the ENCCRV, as well as other academic literature at the national and international level.
ii. Identification of relevant actors and initial contact
iii. Methodology design to optimize information collection
iv. Execution of 4 workshops: Austral Macrozone, Temperate Macrozone, Mediterranean Macrozone, Far North and Near North Macrozone
v. Consolidation of results
vi. Final validation workshop with representation from participants of macrozone workshops.

Depending on the level of progress at the start date, co-benefits (environmental) and prioritization of intervention areas may be incorporated into the workshops.

Expected Results

i. Definition of tools and methodology/ies to estimate land use change.
ii. Requirements to increase the frequency of updates to activity data, linked to the cadastre, with homogeneous legal criteria.
iii. Development and validation of the institutional structure of the system
iv. Creation of a support committee of external experts and links with the environment.

7.2.2. Development of ENCCRV Information Platform, Made Up of Spatial and Alphanumeric Databases.

The platform should include a semi-automatic information integration tool and a web mapping display. Different user profiles should be developed which can 1) develop reports, 2) reconstruct information, 3) perform specific consultations semi-automatically, and 4) disseminate the information generated clearly and transparently. The execution of this activity began during the first half of 2018, and will take 24 months according to the following schedule:

Phases

i. Generation of protocols for the standardization of spatial and alphanumeric information generated under the ENCCRV
ii. Standardization of existing information and quality control of information being produced
iii. Database architecture development
iv. Report generation tool development
v. Web mapping display development
vi. Basic development of registry system. This tool will depend on the state of progress of the National System for the Registration of Emissions Reduction.
vii. Platform maintenance and adjustments
viii. Technology transfer and training for CONAF professionals for the internal implementation of the platform.

All tools and information should be developed in open coding languages which avoid dependence on developers.

All tools developed should maintain interoperability with the CONAF Land Information System, and/or other systems that the Corporation develops.

Expected Results

i. Platform which allows for the adequate storage and presentation of the information generated under the ENCCRV Measurement and Monitoring System.
ii. Tools for the optimization of information integration and reconstruction tasks
iii. Tools for report generation at different scales and for different needs, responding to international requirements, such as specific requests from the executive body of the institution or citizen queries.

7.3. Timing of Monitoring Milestone Execution

As detailed in Figure 3, carbon accounting within the Emissions Reduction Program consists of three main stages:

i. Reference Period: Historical stage in which average emissions are estimated. These are then projected to the future as a reference level.
ii. Exclusion Period: Intermediate stage between the end of the Reference Period and the beginning of the Emissions Reduction Program implementation. Emissions and/or absorption produced during this stage are estimated and excluded from the results of the program.
iii. Monitoring Period: Implementation stage of the Emissions Reduction Program. In this stage emissions reduction and/or increase in absorption is estimated with respect to the Reference Level. Results are obtained based on measurements of flows between each Monitoring event with respect to the base year.

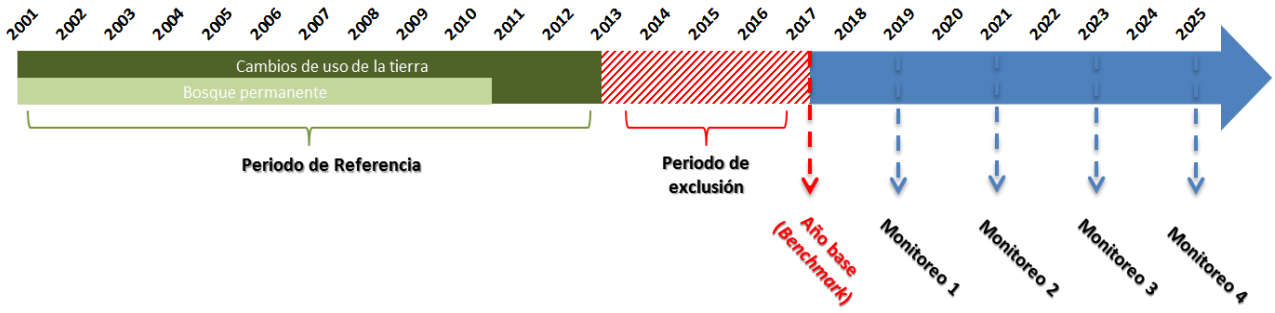

Figure 3. ERP Accounting Stages.

Regarding the Monitoring Period, the following specific planning has been established:

i. Base year or benchmark corresponding to 2017. For this, a monitoring milestone will be created that will allow the estimation and exclusion of emissions from the end of the Reference Period to the base year. In order to carry out this estimate, data will be used from the 2017 Forestry Inventory and an update of cadastre data based on satellite images corresponding to the window of time between the end of 2016 and the beginning of 2017, corresponding to the Southern Hemisphere summer. This will provide greater availability of images with low or no cloud cover and in suitable phenological stage for analysis. This will allow emissions reductions to be estimated for the years 2013, 2014, 2015, and 2016.
ii. Monitoring Milestone 1: Cadastral data from the end of 2018, beginning of 2019, and 2019 Forestry Inventory. This will allow emissions reductions to be estimated for the years 2017 and 2018.
iii. Monitoring Milestone 3: Cadastral data from the end of 2020, beginning of 2021, and 2021 Forestry Inventory. This will allow emissions reductions to be estimated for the years 2019 and 2020.

iv. Monitoring Milestone 3: Cadastral data from the end of 2022, beginning of 2023, and 2023 Forestry Inventory. This will allow emissions reductions to be estimated for the years 2021 and 2022.
v. Monitoring Milestone 5: Cadastral data from the end of 2024, beginning of 2025, and 2025 Forestry Inventory. This will allow emissions reductions to be estimated for the years 2023 and 2024.

The following table summarizes the years included in the accounting, and the date reports are generated for each monitoring milestone.

Table 21. Monitoring and Reporting Milestones.

Monitoring Milestone	Years	Report
1	2017-2018	2019
2	2019-2020	2021
3	2021-2022	2023
4	2023-2024	2025

In order to generate information, and taking into account system planning and methodology to be used, the following phases are considered:

7.4. Generation of Base Year Data and Development of the First Monitoring Milestone at the Subnational Level for the Emissions Reduction Program Area.

In this stage, financing will be available from the FCPF Additional Fund, and it will be executed between January 2018 and March 2020. It includes information gathering to estimate emissions and absorption by land use change and in permanent forest in the years 2017 and 2019.

Phases

i. Generation of land use change maps for the years 2013-2017 and 2017-2019, based on methodology and tools from the consultation and social interaction workshops; comparable and compatible with the methodology used in estimating the ERPD Reference Level.
ii. Generation of Carbon Variation Maps in permanent forest for the years 2010-2015, 2015-2017, and 2017-2019, through the methodology established in the ERPD Reference Level.
iii. Information integration and monitoring report generation including estimation and propagation of uncertainty, for which tools will be developed to reduce possible systematic error, improve information storage, transparency, and reconstruction protocols, as well as information presentation and publication.

Expected Results

i. Emissions/absorption report for exclusion period (2013-2017)
ii. Emissions/absorption report for monitoring period 1 (2017-2019).

7.5. ENCCRV Measuring and Monitoring System Expansion and Optimization at the National Level.

It aims to develop a series of activities that are conducive to the expansion of the monitoring system on a national scale and to the improvement of base information, both within the ERPD area and outside of it. The activities described are being developed in various phases at present and have an execution horizon up until 2019. It has varied sources of financing.

Phases

i. Analysis of carbon variations and co-benefits at property level to monitor the progress and results of the ENCCRV action measures
ii. Development of stocking charts for all forestry types
iii. Development of cadastre updates with homogeneous legal criteria for the Regions in which these have not yet been developed. This would allow the baseline of land use change to be adjusted in the regions in the Austral, Mediterranean, and Far North Macrozones under the legal criteria of forest definition.
iv. Methodology adjustments for the estimation of emissions/absorption in permanent forests in the Austral macrozone
v. Development of monitoring system for co-benefits, neutral degradation of the Earth, desertification, and drought at the national level, integrated in the ENCCRV information platform.

Expected Results

I. Stocking charts for all forestry types
II. Cadastral baseline updated to legal criteria for the whole country
III. Reference Levels for degradation, stock increase, and conservation at the national level
IV. Baseline and criteria for monitoring co-benefit indicators

7.6. Autonomous Operation, Based on State's Own Financing and the ENCCRV Measurement and Monitoring System

According to ENCCRV Measurement and Monitoring System plans, autonomous financing and operation, with country financing, is expected from 2020. For this, the following phases are considered:

Phases

i. Development of optimization and periodicity protocols for specific activities in the field of generation of land use change maps from cadastre updates. A schedule will be made according to the estimation of costs derived from the advances produced in order to make a 10-year schedule (2019-2029) for the execution of biennial land use change maps and updating land information collected through the COT methodology.
ii. Institutional arrangements for the inclusion of carbon stock maps as a product to deliver along with the annual/biennial INFOR Continuous Forest Inventory reports in the period 2019-2029.
iii. Inclusion of the maintenance of the ENCCRV information platform and the execution of biennial reports as part of the mandatory reporting elements of CONAF.

Expected Results

i. Biennial maps of land use change 2019-2029
ii. Biennial maps of carbon variation in permanent forest 2019-2029
iii. Biennial reports from the ENCCRV Measuring and Monitoring System 2019-2029

7.7. Institutional Arrangements

Institutional arrangements should be considered as elements for information generation and elements for reporting.

The base information sources for the execution of the monitoring events within the PRE Monitoring Plan are the cadastre, the CONAF forest fire statistics, and the Continuous Forest Inventory.

As established by the "Law on the recovery of native forest and forest development," Law No. 20,283 of 2008, in Article 4, "*the Corporation* (CONAF) w*ill maintain a permanent forest cadastre, in which it must identify and establish, at least cartographically, the forest types existing in each region of the country, their state and those areas where there are ecosystems in the presence of native forests of spatial interest for conservation or preservation, according to the criteria established in the regulations of this law, "* which obliges CONAF to update this primary information source of the Measurement and Monitoring System.

Cadastre updates report the base information for estimating:

- Area of permanent forest
- Area of deforestation
- Area of native forest replacement
- Area of native forest restoration
- Area of increase in forest surface
- Area of forest conservation

CONAF also generates official area statistics by type of coverage affected by forest fires, which are updated permanently through the Digital Information System for Operations Control (SIDCO) and reported annually for each season.

The Continuous Forest Inventory is part of the Inventory and Forest Ecosystems Monitoring Program, included in the guidelines: "Development of Productivity and Sectoral Competitiveness," of the Forestry Institute (INFOR), which has a specific area according to Budget Law, for updating according to the established technical planning.

The Continuous Forest Inventory is a key element in the PRE Monitoring Plan, since it generates the base information for:

- Development and updating of biomass stock values by forest stratum
- Generation of base data of biomass stocks for data interpolation and estimation of emissions/absorption in permanent forest

Parallel to the aforementioned base information, there is a set of second order information, which must be generated within the framework of the ERP Monitoring Plan:

- Density graphs or stocking charts for all forestry types. Currently, work is being done on a special agreement between CONAF and INFOR to develop this information.
- The development of necessary institutional arrangements should be deepened so that the generation of carbon content maps becomes an integrated product in the annual/biennial reports of the INFOR Continuous Forestry Inventory for the 2019-2029 period.
- As a key point of CONAF's institutional development, inclusion of the maintenance of the ENCCRV information platform and the execution of biennial reports as part of the mandatory reporting elements of CONAF should be considered.

As for the elements linked to the report, the links between the ERP Monitoring Plan and the reports to the UNFCCC should be considered.

The objective of the Corporation, as a national focal point for REDD + at the UNFCCC, is to conduct, in parallel, ERP monitoring reports and REDD + Annex of results reports. It should be noted that the documents presented as Reference Level in the ERP and the document submitted to the UNFCCC are identical from the point of view of carbon accounting.

With regard to the consistency between the Reference Level and the National Inventory of Greenhouse Gases (INGEI), once these documents were published, technical teams from CONAF and the Forestry Institute, and the INGEI, held a series of communications in which an alignment process between the methods applied in this report and those used in the INGEI was identified as an element of vital importance, with the objective of improving and maintaining the consistency of both instances. For this purpose, the necessary institutional arrangements are being made to

formalize the corresponding joint work, within the framework of the Intraministerial Committee on Climate Change of the Ministry of Agriculture.

The following figure is a graphic representation of the way in which the previously described institutional arrangements are structured:

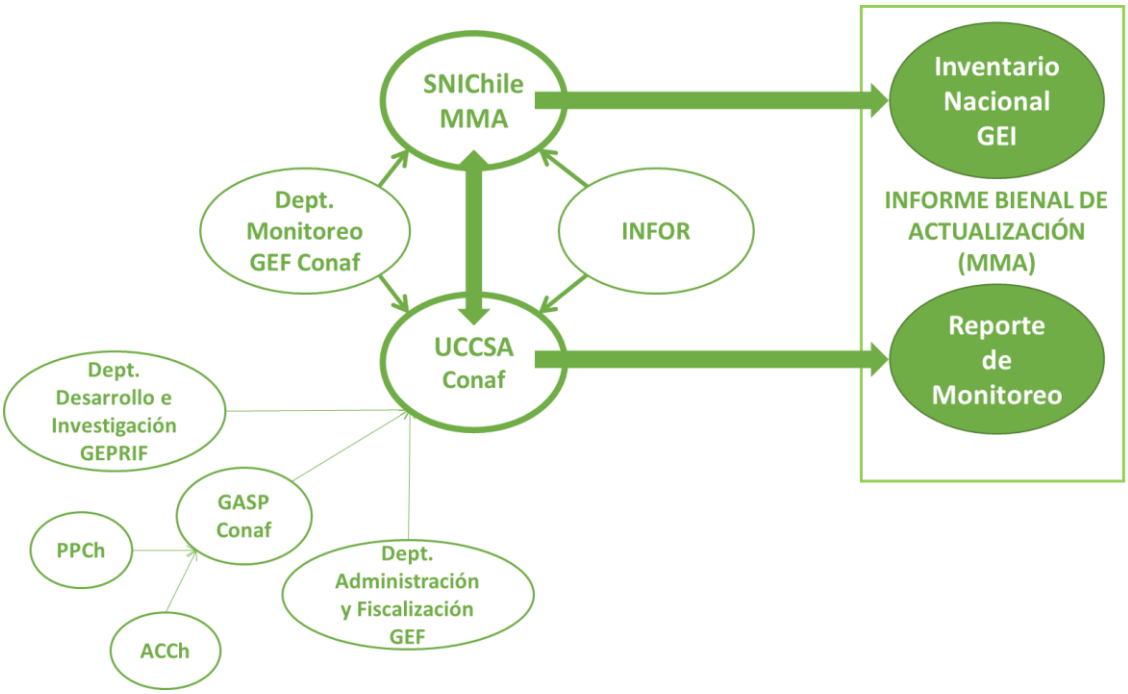

Figure 4. Institutional Arrangements for the Generation of Information and Elements for the Report