The role of the forestry sector in Nationally Determined Contributions around the Mediterranean Rim

by Nicolas PICARD

96% of Mediterranean countries have described the efforts they will undertake in the struggle against climate change through their Nationally Determined Contributions within the framework of the Paris Agreement on Climate. This article provides an initial quantification of the contribution made by the forest sector to the wider overall effort needed to meet the targeted climate objectives.

Introduction

The Paris Agreement, approved in December 2015 at the 21[st] Conference of the Parties (CoP) to the United Nations Framework Convention on Climate Change (UNFCCC), recognised the place of forests in the struggle against climate change, particularly in article 5 which is devoted to forests and which formalises the REDD+ mechanism (reducing emissions from deforestation and forest degradation, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks). The Paris Agreement requires each Party to submit an updated climate plan in which the Party must account for its emissions along with its efforts to reduce them. Such efforts are detailed in the Nationally-Determined Contributions (NDC) submitted to the UNFCCC by the countries. Prior to the 21[st] CoP, the countries were invited to submit an intended NDC. From the moment a country ratified the Paris Agreement, its intended NDC became its actual NDC unless the country decided to submit a new NDC different from the intended NDC.

The overwhelming majority of Mediterranean countries -here we are referring to 26 countries: Albania, Algeria, Bosnia-Herzegovina, Bulgaria, Croatia, Cyprus, Egypt, France, Greece, Israel, Italy, Jordan, Lebanon, Libya, Malta, Montenegro, Morocco, North Macedonia, Palestine, Portugal, Serbia, Slovenia, Spain, Syrian Arab Republic, Tunisia and Turkey- adhered to the Paris Agreement: 96% are signato-

ries and 88% of them have ratified it (UNFCCC, 2019a). Of these countries which therefore had a NDC, 13% produced a revised NDC after ratification while the others simply confirmed their intended NDC. Of the countries that have not yet ratified the Paris Agreement, three quarters have nevertheless submitted an intended NDC. The analysis presented here is based on the NDC or the intended NDC of this 96% of the Mediterranean countries (UNFCCC, 2019b).

Mediterranean forests represent important natural capital for the countries of the Mediterranean Rim. According to the FAO's (2015) Global Forest Resources Assessment (FRA), in 2015 the Mediterranean countries had a forest area of 88 million hectares (i.e. 10% of the countries' land), with an additional 32 million hectares of other wooded land. When focusing on forests of the Mediterranean type (in the biogeographical sense), the forest area is 25.5 million hectares, i.e. 18% of the Mediterranean terrestrial biome. Taken regionally, this forest capital is slightly on the increase: the total area under forest in the Mediterranean countries grew by 0.7% annually between 1990 and 2015, due mainly to forest expansion. During the same period, the carbon stocks harboured in Mediterranean forests rose more (by 1.6% annually), which denotes a greater density of the forests. This increase in the forest area went hand in glove with a drop in the area of other wooded lands. The countries which experienced the greatest rise in forest area (Spain, France, Turkey) are the same ones whose other wooded lands areas declined most; this confirms the densification of their forests. Portugal, in contrast, which is the only Mediterranean country whose forest area fell significantly, witnessed an increase in its other wooded lands area. Overall, the loss of other wooded lands area (-4 million ha in 25 years) is less than the gain in forest area (+14 million ha in 25 years), implying that this increase in Mediterranean forests is more than just the conversion of other wooded land into forest (FAO and Plan Bleu, 2018).

The forestry sector thus logically occupies an important place in the NDC of Mediterranean countries, side by side with other sectors such as energy, construction, transport, industry and agriculture. In this study, our aim is to link NDC to the forest characteristics of Mediterranean countries. Having first of all described the main features of the NDC of the Mediterranean countries (in accordance with a method resembling that of Hargita and Rüter, 2015), we establish a typology of the countries involved as a function of the characteristics of their forests. Then, finally, we examine to what degree the differences in forests across the countries correspond to differences in their NDC. As sources, we used the NDC and the intended NDC themselves, but also the data and tools of Climate Watch (2018) and the assessments of CAT (2018).

Figure 1: Distribution of Mediterranean countries according to the type of objective given in their NDC or forecast NDC aimed at reducing greenhouse gas emissions.

Undertakings involving forests clearly identified but the contribution of forests to achieving climate targets lacks visibility

The UNFCCC gives some latitude to countries in how they may define their objective for the reduction of greenhouse gases (Lee & Sanz, 2017). Almost half (48%) of the Mediterranean countries chose to define their target in reference to a given year (Figure 1). These countries include all the members of the European Union who have adopted a commonly-held NDC. For all these countries, 1990 is the reference year and the target year is 2030. Thus, they all have as a shared objective that their emissions of greenhouse gases in 2030 will be reduced by X% (where X is the target) compared to 1990.

A large number (36%) of Mediterranean countries have chosen to define their objective for reduction in relation to a reference scenario. In this approach, a country extrapolates into the future its historical trends regarding emissions, according to two sce-

narios: in the first, nothing special is done to reduce emissions ("business as usual" or BAU); in the second, measures are implemented to this end. The objective is defined as the difference in a target year between the BAU level of emissions and the NDC level. With the single exception of one country that chose 2040 as its target year, all the other Mediterranean countries opting for an objective based on a reference scenario chose 2030.

Lastly, two Mediterranean countries opted to define their reduction target in relation to the intensity of their greenhouse gas emissions. In this approach, the emissions are assessed in relation to a unit of an economic or demographic co-variable and the objective for reduction is defined in relation to this intensity. Tunisia has thus defined its objective as a reduction of its greenhouse gas emissions in relation to each unit of its gross domestic product in 2030 as compared to 2010. In Israel's case, the country has defined its objective as a reduction in greenhouse gas emissions per inhabitant in 2030 as compared to 2005.

The UNFCCC leaves open to countries the additional possibility of envisaging several reduction targets of their greenhouse gas emissions depending on whether or not they receive support to attain their goal. Such support can be financial but may also consist of technological transfers or capacity building. Countries can thus formulate within their NDC a reduction objective conditional on such support, as well as an unconditional objective. The conditional or unconditional targets for the reduction of greenhouse gases vary between 9% and 42%, depending on the Mediterranean country (see Figure 2). Given the differences in approach in defining objectives, a direct comparison of figures remains a sensitive issue: an objective defined in relation to a reference scenario may correspond to a rise in an emissions level in relation to the reference year if the BAU scenario provides for a big increase in emissions. On the other hand, an objective defined by reference to a target year may correspond to only little effort in the forestry sector by a country if its historical tendency (BAU scenario) has been towards a rise in forest carbon stocks. Moreover, the various countries do not display the same level of development nor do they have the same historical responsibility for the present greenhouse gas concentrations in the atmosphere. In order to take into account these various factors, the CAT (2018) assessed for 46% of the Mediterranean countries the level of their "ambition" in terms of climate, which weights the reduction target expressed in each one's NDC in the light of national circumstances (state of the forests, economic dependency on forests, etc.). According to this CAT (2018) "ambition evaluation", only one Mediterranean country, Morocco, has a truly ambitious stance compatible with limiting the rise in temperatures to a pre-industrial level, below 1.5°C. All the other countries assessed showed insufficient ambition (with rises in temperature up to 4°C) or, indeed, seriously inadequate ambition (rises exceeding 4°C).

In the NDC of the Mediterranean countries, the forestry sector is not kept distinct from the land use sector: either land use, land-use change, and forestry (LULUCF) are considered in concertation as an option for the reduction of greenhouse gases within the NDC, or none of these aspects is taken into account. Slightly more than three quarters (76%) of the Mediterranean countries have identified the LULUCF as a sector capable of contributing to the attainment of their greenhouse gas reduction goal. Of the 24% of the countries not having taken LULUCF into account, half of them have specified that LULUCF will be considered in a later draft of their NDC, when more data will have become available on the potential contribution of LULUCF to the reduction of greenhouse gases. Even though the forest sector is specifically mentioned in the NDC of countries which have noted the LULUCF as a sector involved in the reduction of emissions, it remains difficult to get an accurate insight from an NDC into just what the forest sector will contribute to a reduction in emissions. One Mediterranean country alone, Morocco,

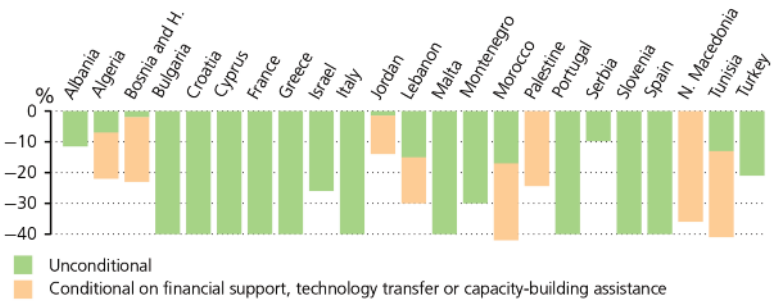

Figure 2:
Targeted reductions in greenhouse gas emissions in Mediterranean countries (by percentage in reference to a given year, a reference scenario or a reference intensity of emissions).

has specified a definite objective for the forestry sector: it should contribute 11.6% of the national mitigation effort during the period 2020-2030 and 12.1% in 2030.

This hazy view of the exact contribution of forests to reducing emissions is compensated for in most of the countries' NDC by a good description of forestry undertakings suitable for implementation in attenuating climate change or adapting to it (Figure 3). In a certain number of cases, quantified objectives have been assigned to forestry measures. Algeria, through its National Reforestation Plan, has thus planned for the reforestation of 1.2 million hectares by 2030. Jordan has committed to the goal of afforesting 25% of its barren forest areas. Morocco foresees the reconstitution of forests on 200,000 hectares by 2020; also, by 2030, the protection against erosion of 1.5 million hectares spread over 22 priority catchment areas, along with the reforestation of 600,000 hectares.

Forest typology in Mediterranean countries reflects the region's geography

A principal component analysis (PCA) has made possible an ordination of Mediterranean countries according to the characteristics of their forests. To serve as the basis for this analysis, thirty-nine forest statistics extracted from the FRA (FAO, 2015) were compiled for the 26 Mediterranean countries. The projection of the countries onto a plan of the PCA formed by the first and second principal components shows a structuring of the countries that is coherent with the geography of the region (Figure 4). Four countries on the Mediterranean's northern rim (Spain, France, Turkey and Italy) make up the "big" forested countries of the Mediterranean. All possess extensive forest area which is on the increase, a large growing stock and standing biomass, which is also increasing, and large areas of other wooded lands. In contrast, there are countries in the Balkans and in the Near East, as well as Portugal and Malta, which have comparatively small forest areas and standing stocks. Their other wooded lands areas are spreading, a notable feature of these countries.

Independent of this first structuring axis, a second axis reflects the relative rate of change in forest statistics and the importance of the forests relative to a country's surface area or the size of its population. On the one hand, there are the Balkan countries whose forest areas and stocks are big compared to their size and population; on the other, the countries of Africa and the Near East whose forested areas and stocks are small relative to the size of both their area and population.

The role assigned to forests in climate objectives reflects the weight of forest resources

The projection of NDC data of the Mediterranean countries as supplementary variables of PCA makes it possible to visualise the correlations in these Mediterranean countries between emissions or the goals for reduction in greenhouse gas emissions and the characteristics of their forests. As to emissions, there is a very clear correlation between the level of a country's total emissions and, firstly, the level of emissions due

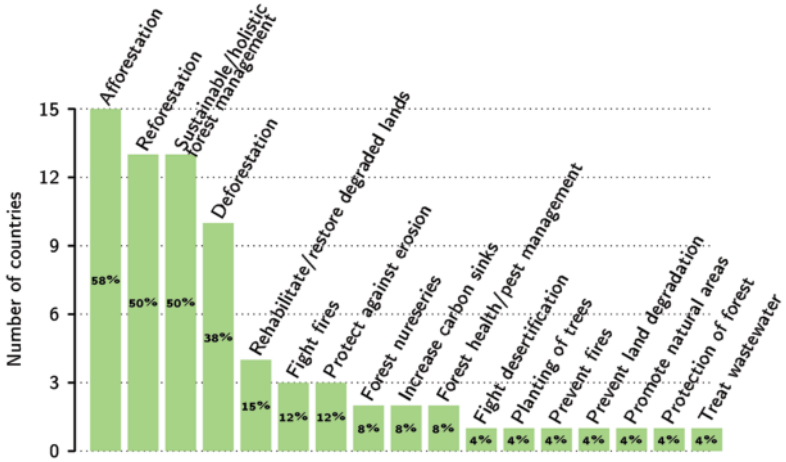

Figure 3:
Number and proportion of Mediterranean countries mentioning in their NDC various forest undertakings aimed at the mitigation of or adaptation to climate change.

to LULUCF and, secondly, the first axis of the PCA (Figure 4). Thus, the "major" forested countries are those that emit the most greenhouse gases while at the same time having the highest levels of absorption of such gases thanks to their LULUCF (big carbon sinks). In contrast, the "minor" forested countries have the lowest overall level of emissions at the same time as their LULUCF sector absorbs the least amount of greenhouse gases (or even, functions as a source of carbon).

Some variables that characterise emissions or emission reduction targets do not correlate with features of the forests in these Mediterranean countries. This is so for the emission reduction goals (in percentage terms, as shown in Figure 2), for the part due to LULUCF in total greenhouse gas emissions, or the intensity of emissions per inhabitant.

Interestingly, and quite naturally, there is a clear link between a country's forest characteristics and their determination to integrate the LULUCF sector into their NDC. All those Mediterranean countries without exception which have not taken into account their LULUCF sector are the "minor" forested countries whose LULUCF sectors absorb little of their greenhouse gas emissions (or even, function as a source of carbon). All the "major" forested countries, in contrast, whose LULUCF sectors function as carbon sinks (with increasing forest areas and stocks) have taken into account their LULUCF sectors in their NDC. In between lies the interesting case of the North African and Near Eastern countries: the majority of these countries, despite the relative modesty of their forests compared to their areas and populations, have nevertheless opted to take their LULUCF sectors into account in their NDC.

In conclusion, the role assigned to forests by the Mediterranean countries in setting their climate objectives naturally reflect the importance of the forest resources which they possess. Though the range of possible forestry actions undertaken to mitigate climate change or to adapt to it is well detailed in these countries' NDC, there is often a lack of quantified targets assigned specifically to the forest sector and, above all, the part assigned to forests in trying to reach their targets for the reduction of greenhouse gas emissions is not at all highlighted or obvious. It is very important that the forests' role in reductions be made clear and visible insofar as forests can contribute in various ways (some of which are mutually antagonistic) to the fight against climate change (Grassi *et al.*, 2018). More generally, it is of significance to know how the NDC taken overall will facilitate, or not, the attainment of the objectives of the UNFCCC as well as of other international commitments, notably the United Nations Sustainable Development Goals. This will be a future stage in the analysis of NDC whose results are already available for some Mediterranean countries (Crumpler *et al.*, 2018).

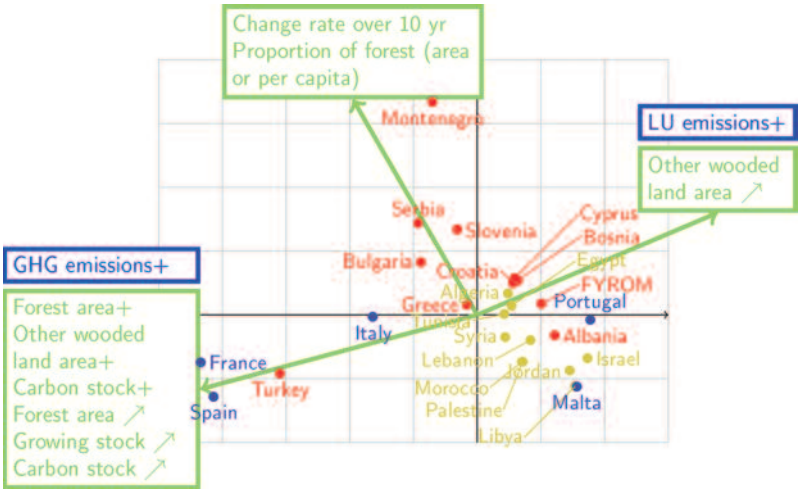

Figure 4: Projection of Mediterranean countries onto the axes of principal component analysis of their forest characteristics; and the correlations between these characteristics and the variables describing the greenhouse gas emissions of Mediterranean countries.

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Summary

The role of the forest sector in the Mediterranean Nationally Determined Contributions

An overwhelming majority (96%) of Mediterranean countries have specified in their Nationally Determined Contribution (NDC) under the Paris Agreement on climate change the efforts they will undertake to fight the climate crisis. The targets on the reduction of greenhouse gas emissions differ between countries with respect to their level and the accounting method. Three quarters (76%) of Mediterranean countries have included the forest sector in their NDC as a sector that can contribute to reach their target of emission reductions. Forest-based actions that can contribute to climate change adaptation and mitigation are duly described in NDCs. However, there is no clear and quantitative indication of the share of the forest sector in the overall effort that is required to reach the climate targets. The role assigned by countries to the forest sector in their NDC is closely related to the importance of the forest resources that they have. Major Mediterranean forest countries whose forest area and stock are increasing and whose forests are an important carbon sink have all included the forest sector in their NDC. On the contrary, countries that have not included the forest sector in their NDC are all minor forest countries whose forests have little capacity to sequester carbon (or even are a carbon source).

Résumé

Le rôle du secteur forestier dans les Contributions déterminées au niveau national en Méditerranée

Une écrasante majorité (96 %) des pays méditerranéens ont décrit dans leurs Contributions déterminées au niveau national (CDN) au titre de l'Accord de Paris sur le climat les efforts qu'ils entreprendront pour lutter contre le changement climatique. Les objectifs de réduction des émissions de gaz à effet de serre diffèrent d'un pays à l'autre par leur niveau et par leur mode de définition. Les trois quarts (76 %) des pays méditerranéens ont inclus le secteur forestier dans leur CDN en tant que secteur pouvant contribuer à l'atteinte de leur objectif de réduction des émissions. Si les actions forestières pouvant contribuer à l'atténuation ou à l'adaptation au changement climatique sont bien décrites dans les CDN, il manque une quantification de la contribution du secteur forestier à l'effort total requis pour atteindre les objectifs climatiques. Le rôle assigné au secteur forestier par les pays dans les CDN reflète l'importance des ressources forestières dont ils disposent. Les « grands » pays forestiers méditerranéens ayant une superficie et un stock forestier en augmentation et dont les forêts se comportent comme un important puits de carbone ont tous inclus le secteur forestier dans leur NDC. À l'inverse, les pays qui n'ont pas inclus le secteur forestier dans leur NDC sont tous de « petits » pays forestiers dont les forêts contribuent peu à séquestrer du carbone (voire qui se comportent comme une source de carbone).