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# Assessing the Enabling Conditions for Translating Restoration Commitments to Restoration Actions: Case of Cameroon

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**Abstract**

Understanding governance and policy related conditions is relevant to determine what is needed to drive large-scale landscape restoration investments. Using Cameroon as a case study, this paper assessed the enabling conditions for large-scale forest restoration focusing on tree growing as the main practice. Descriptive statistics and correlation analysis were applied to understand trends in the opinions of 48 stakeholders sampled purposefully, including the review of forestry and land use related strategy and policy documents. Results indicated that stakeholders and strategy documents, strongly recognize the relevance of governance and policy related conditions to drive large-scale restoration. The trends in stakeholder insights revealed that the capacity of these conditions is currently weak and insufficient to enable large-scale restoration and progress towards improving these conditions have been very slow when compared to assessments made more than a decade ago. There is a need for a strong political will to improve these enabling conditions, though the technical arguments required to help guide and drive the political will are weak. The forest landscape restoration strategic framework needs to be revised and reinforced with appropriate and in-depth technical and operational orientations on how to improve each of the enabling conditions that will help achieve the large-scale restoration commitments in Cameroon.

**Keywords:** restoration potentials, human motivation, restoration actions, governance, political will, Cameroon

## 1. Introduction

In the last decade, forest landscape and land restoration have received national and global attention. This is within the framework of guiding the planet towards a sustainable path by reversing the damage to forest, wetlands, and other related ecosystems, caused by anthropogenic activities since the industrial revolution (van Noordwijk et al., 2020). The operationalization of the forest landscape restoration (FLR) agenda is linked to the implementation of a planned process with the objective to regain ecological integrity and enhance human well-being in deforested and degraded landscapes. In practice, the purpose is not to convert an entire landscape into forest, but to ensure that forest and other related ecosystems provide goods and services for the benefit of people (Mansourian, 2017). The restoration movement has received high political engagement, including a diversity of actors and institutions from the public and private sectors, academia and research, civil society, and local communities. Despite this massive global mobilization, restoration is not happening at scale (van Noordwijk et al., 2020), and progress towards attaining internationally agreed goals and national commitments have been limited (Chazdon et al., 2020).

Globally, millions of hectares of degraded forests and lands require large-scale restoration. This can only be achieved by involving all stakeholders, including smallholder farmers, and using simple and low-cost natural resource management practices that produce significant economic benefits to farmers and their communities. Large-scale restoration initiatives are predominantly implemented through tree planting and growing (Chazdon et al., 2020). This implies that forest ecosystems constitute an integral part of restoring terrestrial ecosystems throughout landscapes across the globe. Although, the primary motivation for the widespread adoption of restoration practices lies with rural communities, there is a clear need for external financial and technical support, including contributions from policymakers and researchers (Reij & Winterbottom, 2015). Restoration is often a human endeavor (Suding, 2011) and so even if a restoration project has ecological aims, this occurs within a social context.

Restoration success has been defined in various ways, including as factors related to actors' motivation to restore, having enabling conditions in place (including social, market and ecological), and capacity (Walters et al., 2019). It is asserted that for restoration to be achieved, a variety of factors must be in place such as policies, laws, capacity, and spaces in which to debate restoration decisions (Walters et al., 2019). These different factors influence the success of restoration efforts both positively and negatively and fall under the umbrella of governance (Mansourian et al., 2016). FLR is often characterized by the lack of focus on identifying, building, and enhancing enabling conditions from local, national, and temporary scales (Guariguata & Evans, 2020; Hanson et al., 2015).

Governance aspects are important because there are key aspects of governance that need to be addressed during restoration processes. For example, decision-making on what and where to restore, how to ensure stakeholders involvement, and the type of institutions that will support or hinder interventions (Mansourian, 2016; Mansourian et al., 2017). It is emphasized that governance issues may even be more critical than technical issues for successful restoration (Guariguata & Brancalion, 2014; Sayles & Baggio, 2017). As such, this study acknowledges the existence of key technical issues that are relevant for restoration such as species to be used, the timing and seasons to consider, management of nurseries etc. (Mansourian, 2017). Governance challenges are conceptualized as factors that are external to the farm level, and they interact and influence farm level decision-making by influencing the perception of the expected benefits and costs of tree growing relative to other land use options (Versteeg et al., 2017). The importance of these external factors in influencing tree growing have been documented (Mansourian, 2016; Mansourian, 2017). However, the perception and viewpoints of policy makers and other relevant actors in the tree growing policy domain in relation to the design, implementation and evolution of these factors require more attention (Mansourian, 2017). Policies and institutional issues are dynamic, and are evolving in accordance with national, regional, and international circumstances (Mansourian et al., 2014). Hence, these issues require continuous and periodic assessments in different contexts. Furthermore, the impact of enabling factors depends on the socioeconomic and political environment to which they are applied (Arvola et al., 2020). Therefore, context specific assessment of these enabling conditions is relevant. Despite focusing on tree growing, this study recognizes that restoration is more than simply planting trees and includes other restoration practices such as assisted natural regeneration, conservation agriculture, soil and water conservation, natural forest management etc. (van Noordwijk et al., 2020).

Cameroon is one of the countries that have made commitments to restore approximately 12 million hectares of degraded lands and forests in the context of the Africa 100 million hectares restoration initiative (AFR100) and the Bonn Challenge. The country sees restoration as an opportunity to contribute to the country's development agenda by 2035 (MINFOF-MINEPDED, 2020). At the same time, the strategic framework for forest landscape restoration highlights the need to improve the enabling environment for landscape restoration at scale. Thus, unpacking the enablers for large-scale landscape restoration in Cameroon is critical, especially in relation to the tree growing practice that dominates the operationalization of the forest and land restoration strategy (MINFOF-MINEPDED, 2020).

Foundjem-Tita et al. (2013) analyzed the legal and policy frameworks governing tree growing a decade ago. However, this study was limited only to content analysis of policy, legislative and strategic documents, without analyzing stakeholder viewpoints. Additionally, it is important to understand what evolution related to the policy frameworks governing tree growing has taken place during the past decade. Therefore, this study examined the enabling factors for restoration in Cameroon from a stakeholder perspective through the following research questions: (1) How relevant are policy and governance frameworks in enabling large scale restoration? (2) Is the current capacity of policy and governance frameworks sufficient to enable large-scale restoration? (3) How can these policy and governance factors be shaped and improved for large-scale restoration in Cameroon?

Understanding, shaping, and influencing enabling conditions can lead to effective and widespread implementation of restoration (Mansourain et al., 2017). This study is relevant for policy makers, practitioners, and other related key stakeholders as they develop and fine tune strategies for large-scale restoration in Cameroon. This angle of analysis is also relevant to the restoration literature and the debate within the restoration process in other countries that have made large-scale restoration commitments.

## 2. Materials and Methods

### *2.1 Analytical Framework*

The factors included in the analytical framework were formulated based on the governance literature related to the enabling factors for restoration with a special focus on tree growing. The factors are those that can easily be induced and influenced by the stakeholders involved and the causality of the factors with the outcome can easily be explained in time and space (Arvola *et al.,* 2020). The pre-identified enabling conditions served as the bases for

assessing stakeholder perceptions (Table 1).

Multiple definitions of governance exist in the forest and environmental literature, but they have a common denominator that refer to: (1) people (stakeholders or actors, groups, individuals), (2) decision-making actions (e.g., shaping, influencing, deciding), and/or (3) instruments that enable people to make those decisions (rules, regulations, institutions, policies, strategies, incentives) (Mansourian, 2016). Instruments in the form of rules, regulations, institutions, policies, strategies, and incentives fall under the "processes" dimension of governance. These instruments are considered as aspects that are dynamic and that evolve over time in accordance with national, regional, and international circumstances (Mansourian et al., 2014).

The mix of FLR governance processes and outcomes influence how motivations and interventions affect land use decision-making processes of various groups of stakeholders (Chazdon et al., 2020). This impacts the design, implementation, and outcome of restoration investments. These enabling factors influence tree growing and decision-making on land use directly or indirectly (Arvola et al., 2020). Factors that influence the implementation of restoration include policies and legislation to support restoration, financial incentives, stakeholder engagement processes, and institutions promoting restoration including tenure rights (Mansourian et al., 2022). Understanding the way stakeholders perceive these enabling conditions is relevant to help understand how to improve them to enhance restoration at scale.

### *2.2 Study Design*

Cameroon is located on the Atlantic coast along the Gulf of Guinea and forms part of the Congo Basin Forest block with a unique diversified ecosystem often qualified as Africa in miniature (RoC, 2021). The territory covers an area of 475,650 km$^2$, stretching 1,500 km from south to north (2-13°N) and 800 km from west to east (9-16°E). In the heart of the Congo Basin, approximately 46 % of the country is covered by forests (RoC, 2021). Cameroon is a party to the three key global conventions – climate change, desertification, biodiversity – where the government has made commitments in relation to the fight against climate change, land degradation and biodiversity loss. Forestry and especially tree growing has a critical role to play in the government's efforts to respond to these commitments. In terms of the biophysical potentials of the national territory, the country is capable to achieve its commitments (MINFOF-MINEPDED, 2020). However, other conditions could be necessary to transform these potentials into real actions on the ground at scale.

The study employed a cross-section descriptive approach to understand the enabling factors for restoration at this critical point in time in the restoration policy making process in Cameroon. The descriptive design helped to provide a clear picture of characteristics and trends in the thought process of policy making stakeholders regarding restoration in Cameroon. Based on the perceptions of stakeholders, the paper assesses the dynamics in the conditions that may at times limit or facilitate forest restoration. It is understood that perceptions condition the behavior, engagement, and compliance of stakeholders in the design and implementation of strategies and policies (Bennett, 2016; Carmenta et al., 2017). Thus, the way stakeholders perceived the enabling conditions was the entry point of the study. Stakeholders were sampled purposefully to identify and select individuals that had the capacity to provide rich information, in addition to their availability and willingness to participate and ability to communicate their opinions in an articulated, expressive, and reflective manner (Palinkas et al., 2015).

### *2.3 Data Collection*

Interviews were conducted in October and November 2021 with stakeholders involved in the forest restoration process at the national level in Cameroon. Many stakeholders were involved in restoration, for example local communities, however, the study was intended to focus on stakeholders who were directly involved in tree-growing and restoration policy processes. They were identified first from stakeholders who participated in workshops (stakeholder participation list) organized within the framework of the forest restoration strategy development process in Cameroon. Fifty-five stakeholders were invited to participate in the interviews, and only stakeholders that participated in at least 2 workshops were invited. Forty stakeholders from the list responded and participated in the interviews. Eight got involved through snowball sampling where the identified stakeholders further identified other relevant stakeholders (Gentles et al., 2015). Interviewees came from different categories of stakeholders (Forest and environment administration n=12; Financial and technical partners n=15; Civil society organizations/non-governmental organizations n=9; Independent Consultants n=5; Forestry Agency n=1; Research, and the academia n=6). This selective sampling guaranteed that interviewed stakeholders were active in the tree growing and restoration design and implementation policy and strategy process in Cameroon.

The interview tool had both open-ended questions and Likert scale questions. Each of the enabling conditions had on average two close and two open-ended questions. The open-ended questions allowed interviewees to further elaborate on their perceptions and reshape questions if needed. The Likert scale provides the opportunity to

measure views and attitudes of stakeholders in land use policy assessments and other related processes in general (Vijge et al., 2016; Tegegne et al., 2016; Alemagi et al., 2014). The perception of stakeholders was rated on a scale from 1-5, where 1 meant the participants strongly disagreed, and where 5 meant they strongly agreed. The likert-scale assessment was applied to all the identified key enabling factors. We also illustrated some insights with direct quotes from interview respondents, giving them a direct voice in our analysis when proven useful.

The assessment was complemented by the review of strategy and policy documents, particularly those related to the pre-identified enabling conditions, and in general, those related to tree-growing and the fight against land and forest degradation. For instance, the Strategic Framework on Forest Landscape Restoration; Land Degradation Neutrality Assessment Report in Cameroon; The National Strategy to Reduce Emissions from Deforestation and Forest Degradation; The National Program for Forestry Development; and The Rural Sector Development Strategy, were considered relevant documents.

*2.4 Data Analysis*

A Shapiro-Wilk test for normality was carried out to verify normality of data distribution since the data set had less than 100 respondents. The level of significance for each variable was less than 0.05, meaning they were statistically significant, a confirmation of the fact that our dataset was not normally distributed.

Word Excel and the Statistical Package for Social Scientists (SPSS V21) were used for data analysis. Descriptive statistics and correlation analysis methods were used to analyzed data collected. Frequency distribution and percentages were used to present the trends and characteristics in the opinions of stakeholders presented according to stakeholder groups, regarding the relevance and the capacity of the enabling factors to drive large-scale restoration in Cameroon.

Concerning the correlation analysis, since Likert scale variables are ordinal variables, we used Spearman rank correlation which is a non-parametric test used to measure the direction and strength of the relationship between two variables. The theory of correlation deals with the observation and measurement of the relationship between two or more statistical series. The joint variation among the pairs of values gives an idea of the relationship between the two variables (Murthy & Krishna, 2001). This test does not carry any assumptions about the distribution of the data and is the appropriate correlation analysis when the variables are measured on a scale that is at least ordinal. The correlation analysis was applied to understand the relationship among the enabling factors and between the capacity of the individual enabling factors and the composite variable of the enabling conditions.

Table 1. Key enabling conditions to enhance large-scale tree growing

| Enabling conditions (ENC) | **Source** |
|---|---|
| Land and tree tenure security (LTS) | Larson, 2012; Fenske, 2011; Gyau et al., 2012; Foundjem-Tita et al. 2013 |
| Tree growing incentives (INC) | Arvola et al., 2020; Pancel, 2016 |
| Tree seed/germplasm supply systems (TPS) | Cornelius and Miccolis, 2018; Merritt and Dixon, 2011; Kettle et al., 2011; Marunda et al 2017 |
| Capacity of research and extension systems to propagate tree growing knowledge (ETS) | Alemagi et al., 2015; Degrande et al., 2013; Etshekape et al., 2018, Yaméogo et al., 2018). FAO, 2014 |
| Alignment of tree growing technology in sectoral policies and strategies (ATT) | Buckingham et al., 2020; Schweizer et al., 2019; Sayer et al., 2020; Chazdon et al., 2020; Place et al., 2012; |
| Opportunities to valorise tree growing environmental services (OGE) | Gizachew et al., 2017; Karsenty et al., 2014; Place et al., 2012; Ajayi and Place, 2012 |

## 3. Results

### *3.1 Land and Tree Tenure Security*

Analysis of the stakeholders' responses revealed that stakeholder's opinions were the same regarding land and tree tenure security where 46% and 54% of stakeholders indicated land and tree tenure security to be very relevant and relevant, respectively, to enhance large-scale tree growing in Cameroon. In the forestry and land use related strategies where tree growing (both on farm and off-farm) was considered as a key technology, tenure security was underscored as an enabling factor for transformation. In the REDD+ strategy for example, tree growing is considered as a key activity for building carbon stocks on degraded forest and lands. The strategy acknowledges the importance of tenure security and emphasizes the need to enhance tenure security as one of the actions in the cross-cutting strategic options related to governance of natural resources in Cameroon (MINEPDED, 2018). The Forest Landscape Restoration Strategy Framework, where tree growing is a key technology, stresses the importance of tenure security for achieving the forest landscape restoration objectives in Cameroon (MINFOF-MINEPDED, 2020).

Regarding current tenure conditions, 10 % and 75 % of respondents strongly disagreed and disagreed respectively with the statement that tenure conditions were favorable and sufficient to support large-scale tree-growing (Figure 1). The 12 % of stakeholders that strongly agreed with this stance came from the research and academia and consultant categories of stakeholders. The opinion of the stakeholders that disagreed is supported by the fact that tenure security reforms (as indicated in the restoration strategy) is one of the crucial factors that is required to incite investments in large-scale tree growing/restoration objectives (MINFOF-MINEPDED, 2020). This factor identified more than a decade ago is a hindrance to tree growing and forest conservation in general (Foundjem-Tita et al., 2013). According to the stakeholders interviewed, little or no progress has been made in terms of policy reforms on tenure security. Stakeholders expressed worries regarding whether this will be possible soon. Thus, adapting restoration objectives and practices to the present tenure conditions is important and needs to be explored.

"*We need to identify and define a restoration approach that can fit our present land and tree tenure situation……..since we don't see evidence of a solution or improvement in the horizon" ….* A stakeholder commented. The results of the correlation analysis showed a negative significant correlation ($P<0.05$) between the capacity of land and tree tenure security to support large-scale restoration and the capacity of the research and extension system to support large scale restoration (Table 2).

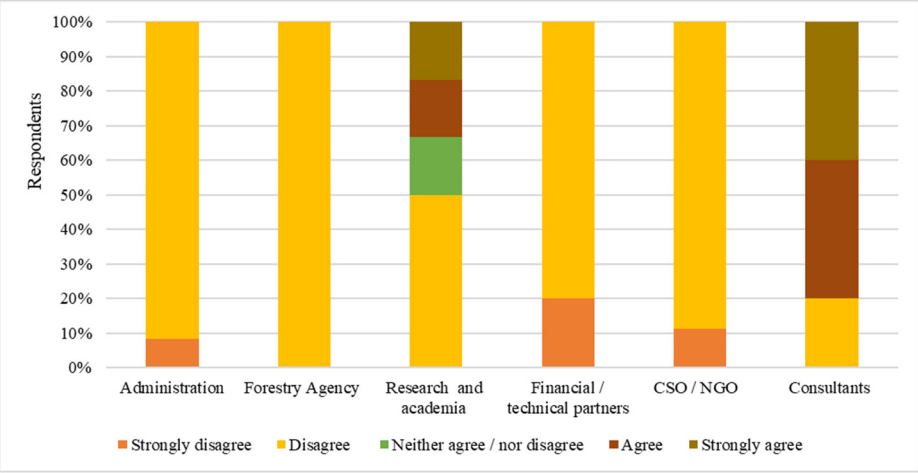


Figure 1. Stakeholder perceptions on whether current tenure security condition can support large scale tree growing

### *3.2 Incentives*

Regarding the role of incentives in large-scale tree growing in Cameroon, 27 % and 73 % of respondents perceived this enabling factor as very relevant and relevant, respectively. At the same time, respondents indicated that Cameroon has limited experience on incentive mechanisms that can guide the creation of viable incentive systems for large-scale tree growing. One of the interviewed stakeholders stressed that "*incentives are important to motivate farmers and communities to involve in tree planting, but how to design a suitable scheme could be challenging because lessons from past initiatives have not been well documented in the country*".

Concerning current tree growing incentive conditions, stakeholders were of the opinion that they are insufficient. In fact, 10 % and 71 % of the respondents strongly disagreed and disagreed, respectively, with the statement that current tree growing incentives are sufficient to support large-scale tree growing (Figure 2). The 8 % of the stakeholders who agreed that tree growing incentives were sufficient to support large-scale tree growing came from the administration. The FLR strategy underlines the need to create incentive mechanisms that will support local restoration initiatives and motivate private sector investment in tree growing (MINFOF-MINEPDED, 2020). The Forestry and Wildlife Sub-sector Strategy (2013-2020) also stressed the need to provide tree growing subventions to promote regeneration, agroforestry, and reforestation (MINFOF, 2012).

The results of the correlation analysis for incentives indicated a weak relationship between the capacity of incentives to support large-scale restoration and the capacity of the other enabling factors, including the composite variable of the enabling conditions. However, the relationship with the enabling conditions such as research and extension systems to propagate tree growing knowledge, the articulation of tree growing technology in sectoral policies and strategies and the opportunities to valorize tree growing environmental services were weak but positive (Table 2).

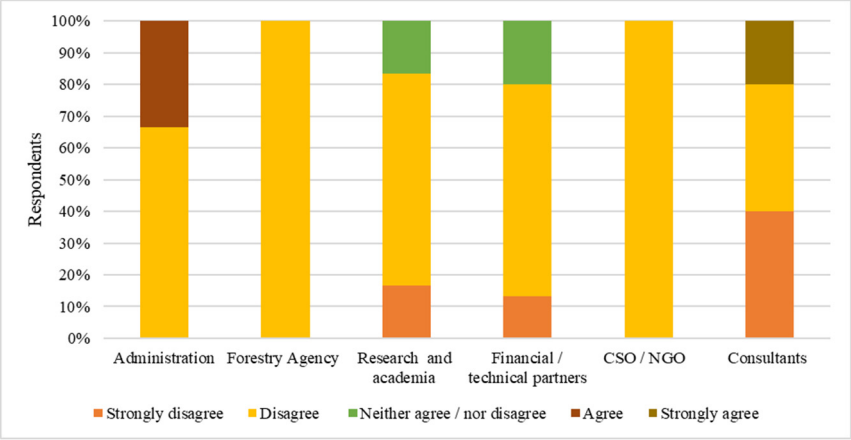


Figure 2. Stakeholder perceptions on whether current incentive mechanisms can support large-scale tree-growing

### *3.3 Tree Seed/Germ Plasm Supply Systems*

The analysis indicates that 36 % and 60 % of respondents acknowledged that effective and efficient seed/germ plasm supply systems were very relevant and relevant, respectively, for upscaling tree growing in the context of restoration in Cameroon. Respondents perceived that the current system comprised of a combination of public and private actors will be unable to produce and supply the expected quantity and quality of planting materials for large-scale restoration. Concerning the public seed/germ plasm supply system, 13 % and 81 % of respondents strongly disagreed and disagreed, respectively, with the statement that public tree seed/germ plasm supply system has the capacity to support large scale tree growing in the context of the restoration of degraded lands and forests (Figure 3). The perception was the same with the private seed/germ plasm supply system where more than 70 % of respondents perceived that the system was operating below satisfaction. The interviewed respondents further indicated that both the private and the public seed/germ production and supply systems were characterized by limited technical capacity, limited financial resources, organisational problems, and weak entrepreneurial and institutional arrangements. The FLR strategy also highlights the importance of the production and supply of seeds to achieve the objectives of large-scale restoration, with clear indications that current capacity is insufficient. The strategy recommends the creation of seed centers, but in terms of approach, it does not provide any direction (MINFOF-MINEPDED, 2020). The Forestry and Wildlife Sub-sector Strategy (2013-2020) stress the need to create forestry seed banks to permit interested actors in the forestry sector to have access to forestry seeds (MINFOF, 2012). However, no progress concerning the improvement in the tree seed production and distribution system has been achieved so far.

The results of the correlation analysis for tree seed/germ plasm supply systems indicated a weak relationship between the capacity of tree seed/germ plasm supply systems to support large scale restoration and the capacity of the other enabling factors, including the composite variable of the enabling conditions. However, the relationship with the enabling condition related to the opportunities to valorize tree growing environmental services was weak but positive (Table 2).

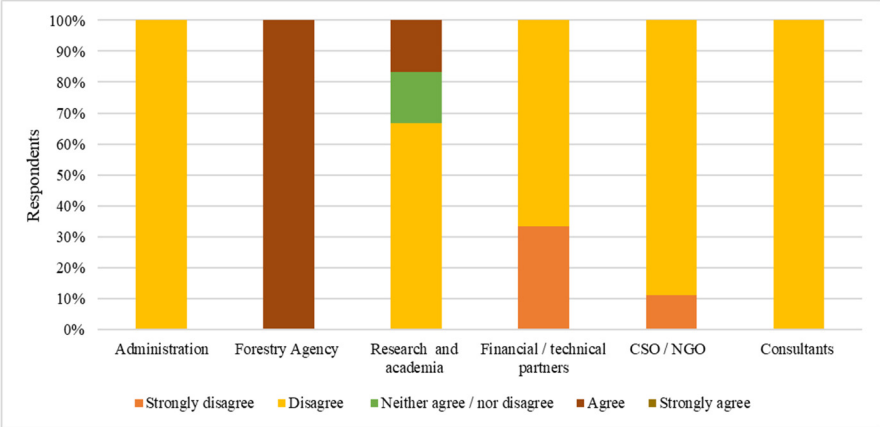


Figure 3. Stakeholder perceptions on the capacity of current seed/germ supply system to support large-scale tree-growing

### *3.4 Research and Extension Systems to Propagate Tree Growing Knowledge*

The respondents underscored that research and extension must play a key role to upscale restoration. The results indicate that 21 % and 77 % of respondents acknowledged that research and extension systems were very relevant and relevant, respectively, to propagate tree growing knowledge for upscaling tree growing in the context of the restoration in Cameroon. Respondents views were divided on the capacity of current research and extension system to propagate tree growing knowledge and technology. The analysis indicated that 4 % and 27 % of respondents strongly agreed and agreed respectively, while about 6 % and 46 % strongly disagreed and agreed respectively. Most of the respondents who agreed came from the administration category, while the respondents who disagreed came from the research, academia, financial and technical partners categories of stakeholders (Figure 4). One of the stakeholders mentioned that *"rural extension system in Cameroon have been dominated by agriculture experts, with little knowledge on forestry issues"*.

The enhancement of the role of research in the implementation and upscaling of FLR is one of the key strategic orientations of the FLR strategy. However, the strategy makes no reference on the role of extension systems to promote research and innovative tree growing technologies and knowledge (MINFOF-MINEPDED, 2020). The results of the correlation analysis for research and extension systems to propagate tree growing knowledge showed a positive significant correlation *($P<0.01$)* with the composite variable of the enabling conditions (Table 2).

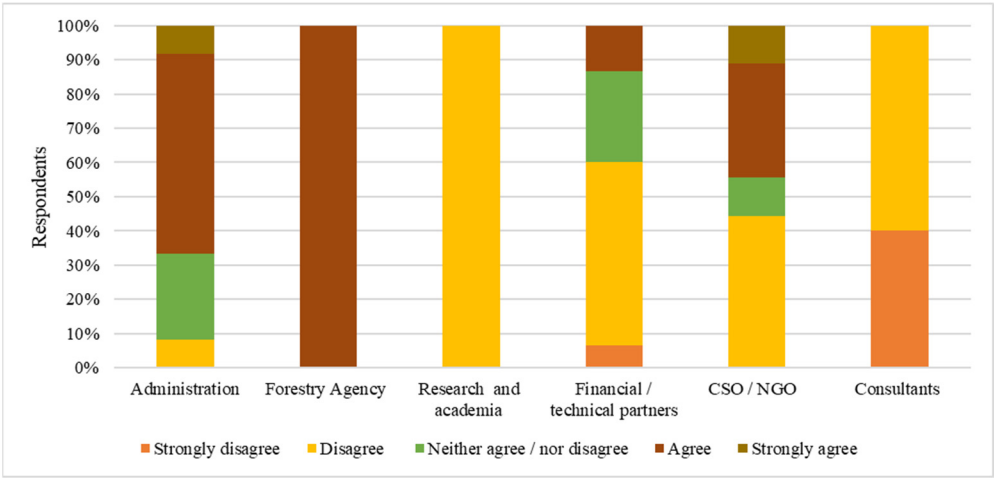


Figure 4. Stakeholder perceptions on the capacity of current research and extension systems to propagate tree growing knowledge

### *3.5 The Articulation of Tree Growing Technology in Sectoral Policies and Strategies*

Trees on farms either through planting or natural regeneration is one of the key activities identified by the

government of Cameroon for large-scale restoration (MINFOF-MINEPDED, 2020). It is also considered an important activity by other land use and forestry sector strategies (e.g., the REDD+ strategy) (MINEPDED, 2018). Despite its importance, it is not clear whether trees on farms are under the control of the forestry and/or agriculture strategy and policy orientations (Foundjem-Tita et al., 2013). About 48 % of respondents indicated that tree growing (especially on-farm tree growing) should have a clear institutional, policy and strategic anchorage. One of the respondents mentioned that "*on farm tree growing (agroforestry for example) is like a child without parents waiting to be adopted either by the forestry or agriculture administration*".

Only 8 % of the respondents did not see the issue of institutional anchorage as being important. About 44 % of the respondents were not able to decide whether on-farm tree growing had a sectoral and institutional anchorage. In addition, 58 % of stakeholders were unable to assess whether the current policy and institutional anchorage of on-farm tree growing can contribute to the enabling environment that will attract public and private sector investments in relation to research and extension, human and financial resources allocation. The group of indecisive stakeholders was dominated by stakeholders from the financial and technical partners, and administration categories (Figure 5). The results of the correlation analysis for the articulation of tree growing technology in sectoral policies and the composite variable of the enabling conditions showed a significant correlation ($P<0.01$) (Table 2).

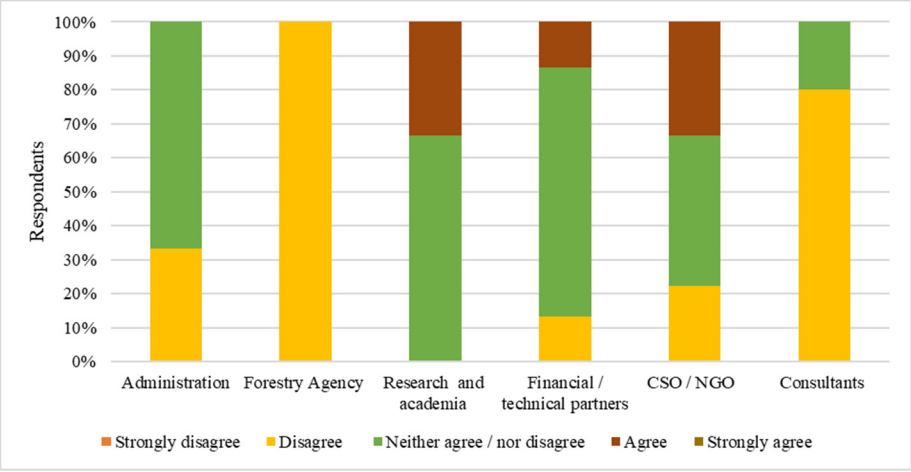


Figure 5. Stakeholder perceptions on whether the current articulation of on-farm tree-growing in sectoral policies and strategies is appropriate and capable to provide orientations towards large-scale tree growing

### *3.6 Opportunities to Valorize Tree Growing Environmental Services*

Large-scale tree growing requires financial resources. The FLR strategy indicates that resources will be mobilized from national and international public and private sources, including market sources through the valorization of tree growing environmental services (MINFOF-MINEPDED, 2020). The Forestry and Wildlife Sub-Sector Strategy (2013-2020) stress that there is a need to mobilize innovative financing related to the efforts in rebuilding carbon stocks and reducing emissions caused by deforestation (MINFOF, 2012). About 92 % of stakeholders underlined the relevance of international financial opportunities or economic/market instruments to enhance the uptake of tree growing at scale. However, the current efforts to valorize tree growing through opportunities, such as Payment for Environmental Services (PES) and REDD+, or other market mechanisms are insufficient. In fact, about 84 % of the respondents strongly disagreed with the statement that current efforts to valorize tree growing through opportunities like PES and REDD+ or other market mechanisms were sufficient to support stakeholders to mobilize financial resources to enhance large-scale tree growing. The results of the correlation analysis for the opportunities to valorize tree growing environmental services enabling condition and the composite variable of the enabling conditions showed a positive significant correlation ($P<0.05$) (Table 2).

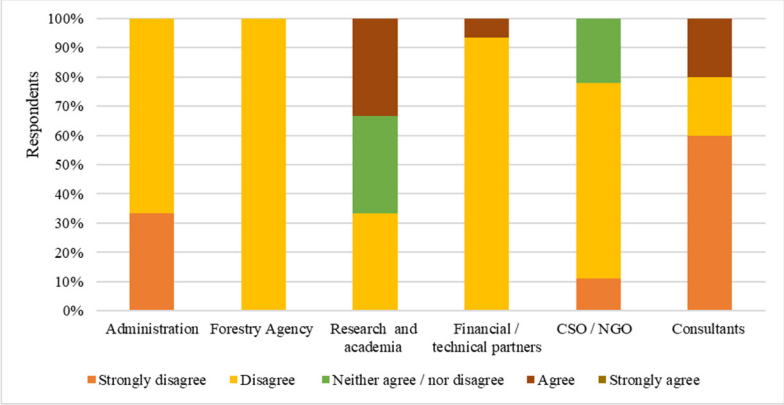


Figure 6. Stakeholder perceptions on the capacity of current efforts to valorise tree growing through opportunities like PES and REDD+ or other market mechanisms to enhance large scale tree growing

Table 2. Correlation matrix among the enabling conditions and the composite variable of the enabling comditions

| | LTS | INC | TPS | ETS | ATT | OGE | ENC |
|---|---|---|---|---|---|---|---|
| LTS | 1.000 | -0.087 | 0.218 | -0.307* | -0.076 | 0.069 | -0.126 |
| | | *P=0.555* | *P=0.136* | *P=0.034* | *P=0.607* | *P=0.642* | *P=0.394* |
| INC | | 1.000 | -0.223 | 0.205 | 0.096 | -0.220 | 0.044 |
| | | | *P=0.128* | *P=0.163* | *P=0.518* | *P=0.133* | *P=0.769* |
| TPS | | | 1.000 | -0.083 | -0.039 | 0.082 | -0.083 |
| | | | | *P=0.575* | *P=0.795* | *P=0.580* | *P=0.577* |
| ETS | | | | 1.000 | .168 | -.147 | .469** |
| | | | | | *P=0.254* | *P=0.319* | *P=.001* |
| ATT | | | | | 1.000 | 0.110 | 0.508** |
| | | | | | | *P=0.456* | *P=0.000* |
| OGE | | | | | | 1.000 | 0.295* |
| | | | | | | | *P=0.041* |
| ENC | | | | | | | 1.000 |

P=Probability value (P value)

*. Correlation is significant at the 0.05 level

**. Correlation is significant at the 0.01 level

## 4. Discussion

The study found that large-scale tree growing for restoration objectives in Cameroon requires the implementation of several factors to drive the biophysical potentials expressed in the restoration commitments, to actions on the ground. Overall, stakeholders interviewed as well as the content of policy and strategy documents indicate the importance of these conditions. However, stakeholders generally expressed a negative perception on the capacity of each of these factors to drive restoration at scale in Cameroon.

Land and tree tenure insecurity was identified decades ago as a barrier to tree and land investments in Cameroon (Foundjem-Tita et al., 2013). As of 2020, no effort has been made to reform the legal frameworks regarding tenure to guarantee security over land and trees. Stakeholders are of the opinion that a strong political will is required to initiate and guide reforms to favor security over land and trees. Land and tree tenure insecurity is also an issue in relation to tree growing in other countries with restoration potentials. For example, in Burkina Faso, Togo, Senegal (Place et al. 2012), Bangladesh and Indonesia, tenure insecurity was found to be a hindrance for smallholder farmers to invest in tree growing (Rahman et al., 2017; Rahman et al., 2016). The regulatory framework in Cameroon inhibits tree growing on farms by regulating harvesting, cutting, and sale of tree products (Foundjem-

Tita et al., 2013). This regulation has been criticized for more than two decades, but very little progress has been made towards accommodating the worries of small-scale land users in Cameroon. In some countries of South America (Nicaragua, Panama, Honduras), strict regulations for timber harvesting from on-farm tree systems contributed to demotivating farmers from integrating trees in their crop lands (Schweizer et al., 2019).

Land and tree tenure has evolved in some countries, where governments have used land and tree tenure as one of the strongest factors to promote tree growing e.g., Vietnam, Laos, and Uganda (Arvola et al., 2020). Arvola et al. (2020) further noted that in Tanzania, the presence of tenure prompted more tree growing whereas the government had previously followed a "laissez-faire" approach for smallholder tree growing in village lands. In Madagascar, the promise of tenure security (through "community contracts") have been critical for encouraging local community engagement and participation in forest restoration (Mansourian et al., 2014).

In Vietnam, Uganda, and Laos, Arvola et al. (2020) found that land allocation to smallholder farmers for tree growing was one of the key motivations favoring the expansion of tree growing. The perception of the stakeholders regarding the relevance of incentives that look to enhance large-scale tree growing agrees with results from different countries involved in tree growing practices. In Madagascar, forest restoration was promoted through some form of payments (e.g., ecosystem services, free seedlings), providing an added incentive for communities to engage in restoration. In Indonesia, reforestation programs crafted incentives in relation to low interest loans (Arvola et al., 2020). In Paraguay, a law on reforestation permitting the government to provide economic incentives and subsidies that will cover about 75 % of reforestation cost was passed (Mansourian et al., 2014). Findings from Burkina Faso (Etongo et al., 2015), Kenya (Glover, 2012; Oeba et al. 2012), Tanzania (Kulindwa, 2016) indicated that access to market for tree products was key in incentivizing investments in forest restoration. In Bangladesh and Indonesia, the marketing of tree products experienced price instability, and poor market information and infrastructure that affected the attitudes of smallholder tree growers towards investing in forest management practices (Rahman et al., 2017).

Designing incentives is one thing, and making incentives achieve long-term results in terms of tree growing is another. Cameroon has limited success stories in the design and implementation of tree growing incentive schemes. For more than two decades, the ministries of the environment and forestry has been providing incentives in the form of direct financial resources, planting materials, and technical support to different categories of tree growers. However, lessons on the successes and failures of these incentives have not been well documented. This could have served as the basis to review the scheme or design new schemes that are adapted to current restoration objectives. The current effort of the government on tree growing incentives is insufficient to drive large-scale tree growing. Limited government resources is a key challenge to the existing incentive scheme. A new type of incentive arrangement is needed that take into consideration the availability of sufficient tailored resources, the improvement in governance related to the identification of beneficiaries, the disbursement of resources, monitoring and evaluation, and knowledge generation and sharing on lessons learned.

The study results showed that stakeholders strongly recognized the challenges in seed production and supply systems. The sector is currently plagued by limited financial and technical resources, insufficient organizational capacity, and a lack of entrepreneurship including structured production and distribution systems. The current seed production and distribution is championed by both the public and private sectors, thus, efforts to improve seed production and distribution should target both sectors. The private sector has a major role to play in restoration (Sayer & Boedhihartono, 2018). Their engagement in forest restoration can enhance the economic and livelihood benefits of local communities. Furthermore, public-private partnerships can increase support and capacity building for restoration (Chazdon et al., 2020).

Globally, deficits in seed supply are well recognized and the present and future supply is far less than current demands (Broadhurst et al., 2015a; Broadhurst et al., 2015b). To respond to the global and national restoration commitments, decision-makers have been called upon to reinforce national seed production and supply systems to provide enough genetically appropriate seeds for restoration (FAO, 2014). Private sector engagement and public-private sector partnerships are truly relevant in the production and distribution of quality planting materials to farmers (Nyoka et al., 2015; Cornelius & Miccolis, 2018).

Several common problems in the tree germplasm sector have been identified across Africa (Place et al., 2012; Marunda et al., 2017). In some countries, the sector appears neglected, and it is occasionally difficult to distinguish between the forestry and agroforestry seed systems, since forest agencies or departments have the mandate for all tree supply systems (Marunda et al., 2017). In these cases, more effort is put on forest and plantation species as compared to agroforestry species. The seed supply structures are also often dominated by forestry staff who are less aware of the agroforestry issues. They lack agriculture extension staff that have a better understanding of

farming systems and the importance of integrating trees on farms (Place et al., 2012). In some countries (e.g., Burkina Faso), efforts have been made (Marunda et al., 2017), but the scale might not be sufficient to respond to the current expectations of tree planting on farms in the context of restoration. Based on the challenges identified, investment in seed production systems is crucial in Cameroon, but any investment should be based on an in-depth assessment.

At the farm and community levels, the adoption of tree growing practices is influenced by the level of awareness and training that farmers and stakeholders receive through extension systems (Yameogo et al. 2018; Degrande et al., 2013, Alemagi et al*.,* 2015; Etshekape et al., 2018). The stakeholders have stressed that research and extension is relevant to upscale tree growing in Cameroon, although the current capacity of forestry extension is too weak to properly support large-scale restoration objectives. The stakeholders further indicated that all the efforts that has been made in terms of research need to be disseminated to tree growers. Interviewed stakeholders highlighted that there is a need to restructure the forestry and research extension system, which is currently hampered by limited financial, technical, organizational, and institutional arrangement capacities. The forestry extension services currently available are sporadic and rely on project-based support provided by financial and technical partners. Generally, the effectiveness and efficiency of extension and training systems depend on government policies and efforts. In Cameroon, the forestry extension depends on the Ministry of Forestry and Wildlife, however, tree growers are not receiving the expected support. The extension system is limited by financial and technical resources. In Vietnam, Indonesia, and Uganda, it was found that government and project interventions incited tree growing by introducing models and providing initial knowledge and resources (Roshetko et al., 2013; Maryudi et al., 2017; Ofoegbu & Babalola, 2015). In Bangladesh and Indonesia, farmers mentioned the need of knowledge and technical assistance from government extension services. Farmers stressed that extension services should go beyond just setting demonstration plots to closely accompany them in terms of providing continuous support to understand which tree species is suitable with their specific land use type, and how to manage trees and marketing of tree resources (Rahman et al., 2017). In Laos, tree growers expressed the need for government extension services to support their tree growing investments (Arvola et al., 2019). In Indonesia, institutional support to improve the knowledge and skills of poor resource farmers was identified as key for farmers to integrate trees on their farmlands (Rahman et al., 2016).

According to the results, some stakeholders perceived the relevance for certain tree growing practices such as agroforestry to have a clear institutional anchorage. While other stakeholders were not able to decide whether on-farm tree growing had a sectoral and institutional anchorage. This is an indication that some of the stakeholders are not aware of the implications of sectoral and institutional anchorage for tree growing on farms. Currently, it is not clear whether trees on-farms are under the control of the forest legislation, agricultural legislation, or both (Foundjem-Tita et al., 2013). Such an institutional or policy gap inhibits both public and private sector investments in relation to research and extension, and the channeling of human and financial resources. For climate change response in Cameroon, agroforestry is highlighted in REDD+ and climate change adaptation measures led by the environment ministry. The environment ministry does not have the capacity to support agroforestry at the project/operational level, hence, it must rely on other ministries, notably the Ministry of Forestry and Wildlife and/or the Ministry of agriculture for support. Strong institutional collaboration and coordination is required in this case to guarantee the flow of the required support. For large-scale restoration to be implemented and sustained, it is necessary to integrate it into national institutions and ensure sectoral integration at the national and landscape level (Mansourian et al., 2022).

Stakeholders acknowledged the need for alternative funding sources to accompany government efforts in financing tree growing. However, stakeholders perceived that the government is not making sufficient effort to establish the conditions that will enable interested parties to get exposed and take advantage of existing funding opportunities. The government is expected to lead in facilitating access to the different alternative funding opportunities. For example, building the technical capacity of stakeholders in the development of bankable projects, and developing the appropriate instruments to get the country ready for results-based payments for the case of REDD+. Currently, there are opportunities where carbon services can be rewarded through the voluntary and other market mechanisms and approaches (Ajayi & Place, 2012). Notwithstanding, national governments should play a key role to facilitate systems and mechanisms (e.g., provide guarantees and to reduce transaction cost) that can link buyers of ecosystem services to project proponents who are willing to supply these services (Place et al., 2012). Slobodian et al. (2020) asserts that to implement restoration at scale, supportive policies must mobilize programs that provide pathways for on-the-ground action such as extension services, incentives, financing, and partnerships.

The results show that the factors identified are relevant to the problems and solutions of land degradation. However, the capacity of these factors to drive the large-scale restoration of degraded land is weak. Stakeholders having

similar position regarding the enabling factors is a major indication that policy change can easily be achieved, though this is not the case. Efforts have been insufficient to improve on these factors in relation to policy design and implementation. These factors appear not to be high on the political agenda, due to insufficient stakeholder backing at the higher bureaucratic level. It is asserted that the more bureaucracies are informed, the more their interests are increased and the more they get involved in backing and influencing a policy (Sahide et al., 2015). Currently, pure, concrete and verified information on how each of these policy related factors can be transformed has not been generated and submitted to the high-level bureaucracies. There is a need to provide information that will contribute to make these factors relevant to the higher policy level through the creation of task force bureaucracies to build momentum on reforms related to these factors.

The results of the correlation analysis generally shows that the relationships between enabling conditions is weak, meaning that each enabling condition does not depend on another or the sum of the enabling conditions. Each factor is crucial as far as large-scale restoration is concerned. Thus, the efforts to improve an enabling factor, should not be done at the expense of another. Relevance should equally be given to all initiatives and efforts that converge to enhance the enabling environment for large-scale restoration.

## 5. Conclusions

Cameroon has made commitments to restore millions of hectares of degraded lands based on its biophysical potentials. There is a need to translate the potentials to actions on the ground through large-scale implementation. Better understanding of what factors can enable and support large-scale restoration will accelerate implementation. This study has assessed the enabling conditions for tree growing in the context of restoration in terms of their relevance, capacity to drive change and how they can be improved. Results indicate that all the enabling conditions identified in the context of this study were perceived as relevant to help attain large-scale restoration objectives. These conditions were also underscored as levers in land use related strategies where tree growing is one of the key activities to achieve their objectives. Despite their relevance, these enabling conditions were perceived as weak and insufficient in terms of driving change towards large-scale tree growing. Additionally, efforts from the past two decades at the level of policy and decision-making, have not been able to improve these enabling conditions.

There is a need for a strong political will to improve on these enabling conditions. However, the technical argument that is required to help drive the political will to improve these conditions is weak. The forest landscape restoration strategic framework needs to be revised to provide appropriate technical and operational orientations on how to improve each of these conditions that will help achieve the objectives of the strategy.

This study is relevant to fuel the policy and strategy development processes towards including reforms that will improve the enabling conditions for large-scale restoration in Cameroon. Further research is required to explore the perception of tree growing stakeholders at the level of the landscape and communities in relation to these enabling conditions. This is relevant to have a holistic view to guide policy making. Furthermore, the identified enabling conditions investigated in this study, require further unpacking through in-depth analysis of each of the enabling factors from a policy, institutional and operational perspectives.

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