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NATIONAL PLANTATION FORESTS DEVELOPMENT PROGRAMME (NPFDP) CAMEROON 2020 – 2045



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LIST OF ACRONYMS AND ABBREVIATIONS

2GS	2nd Generation Silviculture
AFR	Annual Forest Royalties
ANAFOR	National Forestry Development Agency
ATO	African Timber Organisation
CIFOR	Centre for International Forestry Research
FAO	Food and Agriculture Organisation of the United Nations
FESP	Forest/Environment Sector Programme
FSC	Forest Stewardship Council
GESP	Growth and Employment Strategy Paper
GHG	Greenhouse gas
ICRAF	World Agroforestry Centre
IITA	International Institute of Tropical Agriculture
ITTO	International Tropical Timber Organisation
IUCN	International Union for Conservation of Nature
LRAs	Local and Regional Authorities
MINDCAF	Ministry of State Property, Surveys and Land Tenure
MINEPAT	Ministry of Economy, Planning and Regional Development
MINTOUL	Ministry of Tourism and Leisure
NEPAD	New Partnership for Africa's Development
NFP	New Forestry Policy
NGO	Non-Governmental Organisation
NPDP	National Plantation Forests Development Programme
NTPP	National Tree Planting Programme
ONADEF	National Forestry Development Board
RDI	Research Development Institute
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SDG	Sustainable Development Goal
SFDF	Special Forestry Development Fund
TFPs	Technical and Financial Partners
UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

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EXECUTIVE SUMMARY

According to the FAO (2001), over two million hectares of dense forests and approximately 1 million hectares of moist savannah have disappeared in Cameroon over the last two decades. Mining, agro-industries and other development infrastructure cause a great deal of damage resulting in deforestation and degradation of forests, as well as the depletion of the genetic potential of plant formations.

There is no gainsaying that the indicator values for monitoring of forest cover loss in Cameroon such as deforestation and degradation rates, which stand respectively at 0.14% and 0.01%, are among the lowest in the three major tropical forest basins in the world. Nevertheless, the country has been witnessing an upward trend in recent years, which needs to be brought under control.

There is a crucial need for more innovative measures that will likely enable plantation forests to effectively play their role of increasing production per unit area, since there is no guarantee that the surface area of the country's "natural" forests will be stabilised in the long term, considering the pace of development of mining, agriculture, infrastructure and food production, the progressive degradation of some state forests and also the fact that wood needs (timber, construction and firewood) will increase.

It must be acknowledged that the Ministry of Forestry and Wildlife has initiated and implemented several measures, some of which include: strengthening the legal framework and forestry governance, as well as institutional, strategic, programming and budgetary reforms in the forestry and wildlife subsector.

The implementation of these measures has resulted over the years in considerable progress towards sustainable forest management (establishment of the permanent forest estate, which currently spans 15,689,586 hectares, representing approximately 33% of the national territory (MINFOF, 2015). However, much still has to be done, especially in addressing the issue as to whether timber production from natural forests will be able to definitely satisfy the needs of the people and industries.

Moreover, the internationalisation of the Paris Agreement of December 2015 following COP21 could result in increased conservation of natural forests of the Congo Basin and, consequently, those of Cameroon in support of the REDD+ process and the African Forest Landscapes Restoration Initiative (AFR 100).

Besides, land degradation, which is the direct consequence of vegetation cover loss, takes on increasingly alarming proportions in the country each year, particularly in arid savannah and to a lesser extent in moist savannah areas. According to AFR 100 statistics estimates, there are over 12 million ha of degraded lands across the nation.

At the same time, desertification is spreading. It is misunderstood as the expansion of existing deserts, but many researchers consider it to be land degradation due to human activities in drylands. The main drivers of land degradation in Cameroon are: (i) Inappropriate and unsustainable agricultural practices; (ii) Overgrazing and bushfires for agricultural, grazing or hunting purposes (resulting in increased soil erosion and biodiversity loss); (iii) Haphazard logging aggravated by growing population pressure (in the West and Centre Regions); (iv) Irrational management of agriculture, forest and pastoral lands with no zoning plans; (v) Weak drought response capability; (viii) Wrong perception by the population that the "land resource" is infinite or unlimited. All this is compounded by the chronic poverty level of the population.

In all respects, it seems the trend is likely to shift, as is the case worldwide, towards plantation timber, which is becoming increasingly important on the international market. In like manner, the current model of forest concessions should evolve towards a model that enshrines the productivity of management methods in areas with greater anthropic pressure while seeking to maintain tree cover. This should be done in recognition of the important social and environmental services that trees provide. The challenges of such a shift in tropical forest exploitation models include:

- Satisfying the demand for timber and fuelwood with wood from plantations;
- Maintaining natural forest areas;
- Maintaining industrial forest concessions;
- Increasing the powers of community concessions;
- Implementing productive and sustainable combined (Agroforestry) systems;
- Increasing productivity per unit area.

Several resource regeneration initiatives have been undertaken in the country, from the tree planting operations financed by FED funds and conducted by the colonial administration between the 1930s and 1960s, to the 2006 National Tree Planting Programme, characterised by the State's withdrawal from the productive sectors, through state-managed tree planting operations carried out initially by the forestry Service, and later by autonomous structures, which gave rise to present day ANAFOR.

A comparative projection of the implementation approach to these various forest resource regeneration initiatives (tree planting and forest regeneration) in relation to the commonly accepted definition of the concept of silviculture reveals a significant gap from a conceptual, strategic, structural and operational standpoint. Indeed, silviculture aims to reforest harvested areas and other non-forested lands, improve productivity and other conditions of forest stands, enhance wood quality by encouraging the growth of larger-diameter trees, and reduce the rotation age (the time to harvest). For their part, reforestation activities, which include land preparation, tree planting and plantation maintenance, complement natural regeneration and help abandoned farmlands to bounce back. They can also change the composition of forest stands by introducing preferred species or superior varieties that are resistant to pests and diseases or have better stem and plant characteristics.

The implementation of these initiatives met with all kinds of difficulties, which vary depending on the agro-ecological zones. In dense forests, most concession holders are not very keen on renewing the resource, and silviculture statistics, where they exist, are derisory (MINFOF, 2016). This is in addition to problems encountered in adapting management standards to the peculiarities of community forests. In moist savannah areas, the major problem is livestock, agriculture and forestry conflict management interests.

In addition, concerns about forests have overshadowed non-forest tree resources which, by virtue of their inter-sector and multifunctional nature, had to do with a much more diffuse approach through agroforestry, silvo-pastoralism, urban and rural forestry. Yet trees outside forests (fruit trees, farm trees, park trees, amenity trees, wild shrubs, small woods and groves, linear systems such as windbreaks and hedges, isolated coppices) have always been part of the daily life of people the world over. This may help explain the reluctance of some people to take part in some forest resource regeneration initiatives

and the fact that, nowadays, these are the main obstacle to the implementation of operations in this direction.

State forests, and in this case, forest reserves and reforestation areas, can be exploited as part of their management, and serve as a support for the development of new secure plantations for timber production, carbon sinks and capital in the REDD+ process. Non-permanent estate forests and degraded land areas in savannah regions can be used to develop socio-economic plantations for the production of fuelwood and construction timber.

This Plantation Forests Development Programme is necessary in that it is also intended to play a frontline role in the **"new generation"** strategies to be implemented in a bid to boost economic growth and job creation, in keeping with the Growth and Employment Strategy Paper (GESP) guidelines.

The development of this new strategic steering instrument is part of the **"silviculture transition"** initiated by MINFOF and underpinned by a **new generation approach**, in this case the **"2nd Generation Silviculture"** Concept (NGOMIN A. et al., MINFOF/GIZ, 2015). These lay the foundation for a new vision predicated on the paradigm shift from **"tree planting"** to **"modern silviculture development"**, rooted in the **"sector-based approach"**, and **"silvicultural value chains"**, in which all silvicultural operations and benefits generated at each stage of forest stand development must be considered. It supersedes the "first-generation silviculture" approach, characterised by the reforestation of forest reserves and reforestation areas under State management, which underpinned all previous forests resource regeneration initiatives.

The NPFDP, which is intended to be participatory, integrates emerging issues in terms of resource renewal, under the following approaches: plantation forests as structuring elements of a national economy as an alternative to the economy of timber production from natural forests; plantation forests and biodiversity conservation; plantation forests and climate change; plantation forests and watershed management; plantation forests and electricity transport; plantation forests and poverty alleviation; plantation forests and restoration of degraded landscapes and forests; plantation forests and timber production; plantation forests and incentives, etc.

Its implementation will, on one hand, contribute to Cameroon's achievement of **her set objective of reducing its greenhouse gas emissions by 32%, pursuant to the commitment made by the Head of State during the COP21** and, on the other, **the objective of restoring an estimated 12,062,768 hectares of degraded and deforested landscapes by 2030 under the African Forest Landscapes Restoration Initiative (AFR100)**, pursuant to the commitment made in February 2017 by Forestry and Environment Ministries within the framework of the New Partnership for Africa's Development (NEPAD), in support of climate action.

The aim of the NPFDP, at the end of its implementation, is to enable the country replace its wood supply, almost exclusively made up of wood from natural forests, with wood from planted forests. Thus, the programme envisages creating plantations that from 2045 will provide the bulk of the 2.5 million m³ of wood marketed by the country.

It is estimated that the PNDPF will cost CFA F 12,893 billion over 25 years, or an average of CFA F 115.72 billion per year. It will be implemented according to the Results-Based Management (RBM) method. It is centred around the following four technical axes and one support axis:

- **AXIS I:** Wood production and productions other than timber, construction and fire wood, wood products enhancement and silviculture value chains development (30,000 ha/year);
- **AXIS II.** Development of riverbanks/watershed areas/water catchment points – soil protection and restoration (5,000 ha/year);
- **AXIS III.** Restoration of Landscapes and Degraded Lands (5,000 ha/year);
- **AXIS IV.** Research–Innovation, Training and Capacity Building;
- **AXIS V.** Coordination.

RESUME EXECUTIF

Selon la FAO (2001), plus de 2 millions d'hectares de forêts denses et environ 1 million d'hectares de forêts de savane humide ont disparu au Cameroun au cours des deux dernières décennies. L'exploitation de type minier, la réalisation des agro-industries et autres infrastructures de développement, provoquent de nombreux dégâts qui conduisent à la déforestation et à la dégradation des forêts, ainsi qu'à l'érosion du potentiel génétique des formations végétales.

S'il est indéniable que les valeurs d'indicateurs de suivi de la diminution du couvert forestier au Cameroun à savoir, les taux de déforestation et de dégradation qui sont respectivement de 0,14% et de 0,01% restent parmi les plus faibles au niveau des trois grands bassins forestiers tropicaux du monde, il n'en demeure pas moins que le pays a amorcé depuis quelques années, une tendance à la hausse qu'il convient de maîtriser.

En l'absence de garantie que la surface des forêts « naturelles » du pays pourra être stabilisée sur le long terme, au regard de la dynamique de développement de l'exploitation minière, de l'agriculture, des infrastructures et productions vivrières, de la dégradation progressive de certaines forêts domaniales, et que dans le même temps, les besoins en bois (d'œuvre, de service et de chauffe) vont s'accroître, il devient impératif d'intensifier l'appropriation de mesures avant-gardistes, susceptibles de permettre aux forêts plantées de remplir efficacement leurs fonctions, pour en augmenter la production par unité de surface.

Force est de reconnaître que de nombreuses mesures ont été initiées et mises en œuvre par le Ministère des Forêts et de la Faune. Au rang de ces mesures, il convient d'évoquer, le renforcement du cadre juridique et de la gouvernance forestière ; et les réformes aux plans institutionnel, stratégique, programmatique et budgétaire du sous-secteur forêt et faune. L'opérationnalisation de ces mesures se traduit au fil des ans par des avancées considérables dans le cadre de la gestion durable des forêts [constitution du domaine forestier permanent dont la superficie à ce jour est de 15 689 586 hectares, représentant environ 33% du territoire national (MINFOF, 2015)]. Toutefois, beaucoup reste à faire, notamment, pour répondre à la question de savoir si la production de bois d'œuvre des forêts naturelles, pourra satisfaire indéfiniment les besoins des populations et de l'industrie.

Par ailleurs, l'internalisation de l'Accord de Paris du 12 décembre 2015 issu de la COP21 pourrait avoir pour conséquence, la conservation plus accrue des forêts naturelles du Bassin du Congo et par conséquent, celles du Cameroun en faveur du processus REDD+ et du processus de restauration des paysages forestiers dégradés (AFR100).

En outre, la dégradation des terres, conséquence directe de la perte du couvert végétal, prend tous les ans des proportions de plus en plus inquiétantes dans le pays, particulièrement en zone de savane sèche et dans une moindre mesure en zone de savane humide. On estime à plus de 12 millions d'ha les superficies de terres dégradées sur l'étendue du territoire national, selon les statistiques déclarées dans le cadre de l'Initiative de Restauration des Paysages Forestiers Dégradés en Afrique (AFR100).

Dans le même temps, la désertification, qui est comprise à tort comme l'extension des déserts existants, alors qu'il s'agit selon de nombreux chercheurs de la dégradation des terres due aux activités humaines en zones sèches, s'accroît. Les principales causes de la dégradation des terres au Cameroun sont en

effet : (i) les pratiques agricoles inadaptées et non viables ; (ii) les phénomènes de surpâturage et des feux de brousse, à des fins agricoles, de pâturage ou de chasse (avec comme effet l'aggravation de l'érosion des sols et la réduction de la biodiversité) ; (iii) la coupe anarchique de bois aggravée par une pression démographique croissante (dans les régions de l'Ouest et du Centre) ; (iv) une gestion irrationnelle des espaces agrosylvopastoraux en l'absence de plans de zonage; (v) une faible capacité de réponse à la sécheresse ; (vi) une perception erronée des populations sur l'existence infinie ou illimitée de la «ressource terre» ; tout cela renchérit par le niveau de pauvreté chronique de la population.

Il apparaît à tous égards, que la tendance devrait s'orienter, comme c'est le cas au niveau mondial vers le bois des plantations qui prend de plus en plus d'importance sur le marché international. De même qu'il faudrait faire évoluer le modèle actuel des concessions forestières, vers un modèle qui consacre la productivité des modes de gestion dans les zones à plus forte pression anthropique tout en cherchant à maintenir un couvert boisé. Cela devra se faire en reconnaissance des importants services sociaux et environnementaux qu'apportent les arbres. Les enjeux d'une telle réorientation des modèles d'exploitation de forêts tropicales sont de :

- répondre à la demande de Bois d'œuvre et de bois énergie par des plantations ;
- maintenir les espaces forestiers naturels ;
- maintenir les concessions forestières industrielles ;
- faire monter en compétences les concessions communautaires ;
- implanter des systèmes combinés (agroforestiers) productifs et durables ;
- augmenter la productivité par unité de surface.

De nombreuses initiatives de renouvellement de la ressource ont été entreprises dans le pays, depuis les opérations de reboisement financée par les fonds FED et conduite par l'administration coloniale entre les années 1930 et 1960, au PNR 2006, caractérisé par le désengagement de l'Etat des secteurs productifs en passant par les opérations de reboisement en régie conduit d'abord par l'administration forestière et en suite par des structures autonomes, à l'origine de l'actuel ANAFOR.

Une projection comparative de l'approche de mise en œuvre de ces différentes initiatives de renouvellement de la ressource forestière (reboisement et régénération forestière) par rapport à la définition communément admise de la notion de sylviculture, laisse apparaître un écart important d'un point de vue conceptuel, stratégique, structurel, et opérationnel. La sylviculture, en effet vise à reboiser des zones récoltées et d'autres terrains non boisés, à améliorer la productivité et d'autres conditions des peuplements forestiers, à rehausser la qualité du bois en encourageant la croissance d'arbres d'un plus gros diamètre et à réduire l'âge de rotation (le délai de récolte) ; tandis que les activités de reboisement, qui comprennent la préparation du terrain, la plantation d'arbres et l'entretien des plantations, servent de complément à la régénération naturelle et redonnent vie aux terres agricoles abandonnées. Elles peuvent également modifier la composition des peuplements forestiers en introduisant des espèces privilégiées ou des variétés supérieures qui sont résistantes aux ravageurs et aux maladies ou qui ont de meilleures caractéristiques en ce qui a trait à la tige et à la flore.

Les difficultés rencontrées lors de la mise en œuvre de ces initiatives sont de plusieurs ordres et varient selon les zones agro écologiques. En forêt dense, on révèle un faible engouement chez la plupart des concessionnaires à l'égard du renouvellement de la ressource, ainsi que le caractère dérisoire, lorsqu'elles

existent, des statistiques en matière de sylviculture (MINFOF, 2016), à cela s'ajoutent les problèmes d'adaptation des normes d'aménagement aux spécificités des forêts communautaires. En zone de savane humide il se pose surtout le problème des conflits d'intérêts de gestion entre l'élevage, l'agriculture et la sylviculture.

En outre, les préoccupations à l'égard des forêts ont occulté les ressources arborées hors forêt qui, par leur caractère intersectoriel et multifonctionnel, étaient l'objet d'une approche beaucoup plus diffuse, en passant par l'agroforesterie, le sylvo-pastoralisme, la foresterie urbaine et rurale. Or, depuis toujours les arbres hors forêt (arbres fruitiers, arbres des champs, arbres des parcs, arbres d'agrément, arbustes sauvages, futaies et bosquets de petite superficie, systèmes linéaires tels que brise-vent et haies, boqueteaux isolés) font partie de la vie quotidienne des populations du globe. Cela peut contribuer à expliquer la réticence de certaines populations vis-à-vis de quelques initiatives de renouvellement de la ressource forestière et fait que ces dernières constituent aujourd'hui le principal obstacle à la mise en œuvre des opérations dans ce sens.

Les forêts domaniales et en l'occurrence les réserves forestières et périmètres de reboisement, peuvent être exploitées dans le cadre de leur aménagement, et servir de support au développement de nouvelles plantations sécurisées pour la production du bois d'œuvre, de puits de Carbone et de capital dans le processus de la REDD+. Les forêts du domaine non permanent et les étendues de terres dégradées des régions de savane quant à elles peuvent être mises à profit pour le développement des plantations à vocation socio-économique, en vue de la production du bois-énergie et du bois de service.

L'élaboration du présent Programme consacré au développement des plantations forestières se justifie, dans la mesure où celui-ci est également destiné à jouer un rôle de premier plan dans les stratégies de « **nouvelles générations** » à mettre en œuvre pour contribuer à la relance de la croissance économique, et à la création des emplois, conformément aux orientations du Document de Stratégie pour la Croissance et l'Emploi (DSCE).

La mise en place de ce nouvel instrument de pilotage stratégique s'inscrit dans le cadre de la « **transition sylvicole** » amorcée par le MINFOF, et sous-tendue par une **approche de nouvelle génération**, en l'occurrence, le **Concept de « Sylviculture de 2^{ème} Génération** (NGOMIN A. et al., MINFOF/GIZ, 2015)». Ces derniers jettent les bases d'une nouvelle vision qui s'appuie sur la migration du « **paradigme de reboisement** » vers celui du « **développement d'une sylviculture moderne** », basée sur « *l'approche filière* », et des « *chaines de valeurs sylvicoles* », dans lesquelles, l'ensemble des opérations sylvicoles et bénéfiques générés à chaque étape de développement du peuplement forestier doit être considéré. Il supplante l'approche de « *sylviculture dite de première génération* » caractérisée par la réalisation des reboisements en régie par l'Etat dans les réserves forestières et périmètres de reboisement, et qui a sous-tendu l'ensemble des initiatives antérieures en faveur du renouvellement de la ressource forestière.

La formulation du PNDPF qui se veut participative, intègre les problématiques émergentes en matière de renouvellement de la ressource, sous le prisme des approches ci-après : plantations forestières comme éléments structurant d'une économie nationale alternative à l'économie de production du bois des forêts naturelles ; plantations forestières et conservation de la biodiversité ; plantations forestières et changement climatique, plantations forestières et gestion des bassins versants ; plantations forestières et

transport de l'électricité ; plantations forestières et lutte contre la pauvreté ; plantations forestières et restauration des paysages et des forêts dégradées en l'occurrence ; plantations forestières et production ligneuse ; plantations forestières et mesures incitatives, etc.

Sa mise en œuvre contribuera à l'atteinte par le Cameroun : d'une part, de **l'objectif de réduction de 32% de ses émissions de gaz à effet de serre qu'il s'est fixé, conformément à l'engagement pris par le Chef de l'Etat au cours de la COP21** ; et d'autre part de **l'objectif de restauration d'ici 2030, d'une superficie estimée à 12 062 768 hectares de paysages dégradés et déboisés dans le cadre de l'Initiative de Restauration des Paysages Forestiers Africains (AFR100), conformément à l'engagement pris en février 2017 par les Ministères en charge des forêts et de l'environnement dans le cadre du Nouveau Partenariat pour le Développement de l'Afrique (NEPAD), en faveur de l'action climatique.**

Le PNDPF ambitionne au terme de sa mise en œuvre de permettre au pays, de remplacer son offre de bois, quasi exclusivement constitué du bois des forêts naturelles, par un bois des forêts plantées. Ainsi, le programme envisage de mettre en place des plantations qui à partir de 2045 fourniront l'essentiel des 2,5 millions de m³ de bois mis sur le marché par le pays.

Le coût du PNDPF est estimé à 12 893 milliards de CFA sur 25 ans, soit une moyenne de 115,72 milliards par an. Il sera mis en œuvre suivant la méthode de Gestion Axée sur les Résultats (GAR). Il est structuré autour de quatre axes techniques et un axe support présentés ainsi qu'il suit :

- AXE I : Productions ligneuses et productions autres que le bois d'œuvre, de services et de chauffe, valorisation des produits bois et développement des chaînes de valeurs sylvicoles (30 000 ha/an) ;
- AXE II. Aménagement des berges/bassins versants/points de captage d'eau - Défense et restauration des sols (5 000 ha/an) ;
- AXE III. Restauration des Paysages et Terres Dégradés (5 000 ha/an) ;
- AXE IV. Recherche –Innovation, Formation et renforcement des capacités ;
- AXE V : Coordination.

PREFACE

Previous research on plantation forests, conducted mainly in the tropics, followed a basically silvicultural approach. They led to development proposals and actions that were mostly scientifically and technically reliable, but often complex and costly, and therefore ill-suited to the social and economic contexts of countries concerned, hence the mixed and sometimes even questionable results.

Due to new developments in concepts and expectations in the field of tropical forestry (such as biodiversity, carbon, certification, sustainability, implementation of management plans, landscape restoration, etc.) and the need to take into account social and economic issues, as well as emerging issues in forest management, there is need to reconsider the underlying vision of the development of plantation forests in countries like Cameroon.

After the last 20 years, when forest management was almost entirely devoted to logging with no guarantee for sustainability of forests, there seems to be renewed interest in plantation forests. This trend relates to:

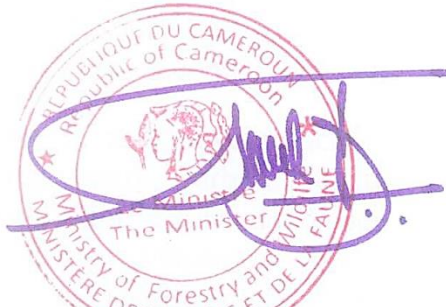
- Changing views of some donors on forestry policy (recent studies funded by the World Bank on plantations in Cameroon and Gabon);
- Willingness to transfer the management of forest resources from the state to private partners and communities, which may lead to the emergence of new actors;
- Strong environmental pressures on natural forests and timber harvested from these natural forests, leading to the preservation of large areas of production forests as well as a shift in demand from some markets towards tropical timber from plantations;
- Emergence of concepts such as "**Forest Landscape Restoration**" and "**2nd Generation Silviculture**", which afford an opportunity for the various planting methods to be ranked among more "ecological" new generation approaches;
- Development of management plans for production forests, requiring operators to maintain the environmental, economic and social capacities of the forests they manage;
- Growing market demand and enhancement tools, giving added value to smaller diameter timber, and the fact that some plantations have reached maturity for harvesting;
- Emergence of strong social demand for rural employment development, etc.

This general environment provided a backdrop for the transition from the 2006 National Tree Planting Programme, which advocated the granting of state subsidies to private actors and Local and Regional Authorities, to the new Plantation Forests Development Programme (PFDP), the backbone of the "silvicultural transition" underpinned by the concept of "2nd Generation Silviculture."

In addition to public institutions interested in resource regeneration issues, I urge the National Forestry Development Agency (ANAFOR), by virtue of the key role it has to play as part of the implementation

of the NPFDP, to take ownership of this new Programme and make it a real development tool for job creation, which contributes in addressing climate change. This appeal also goes to Local and Regional Authorities, the private sector, associations, civil society and the population at large.

Furthermore, I wish to underscore that technical and financial support from development partners, the contribution of forestry research, as well as capacity building for stakeholders are unquestionable levers for achieving NPFDP objectives.



Jules Doret NDONGO
Minister of Forestry and Wildlife

FOREWORD

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- Growing market demand and enhancement tools, giving added value to smaller diameter timber, and the fact that some plantations have reached maturity for harvesting;
- Emergence of strong social demand for rural employment development;
- The Plantation Forests Development Programme (NPFDP) fits into this 'broader picture'.

The development of the NPFDP is part of the process to apply the concept of "second generation silviculture," which underpins forestry transition in Cameroon. It aims mainly to increase the surface area of national forests, develop value chains as well as a forestry economy that would serve as an alternative to timber production solely from natural forests, contribute in meeting national objectives of addressing climate change and restoring landscapes. It also seeks to create growth and "green" jobs, in keeping with the Growth and Employment Strategy Paper (GESP) guidelines.

This handbook includes summary data of the National Plantation Forests Development Programme (NPFDP), in order to allow a greater number of stakeholders to grasp the content of the Programme paper, which is a scientific document drafted following a rigorous approach, and to enable all actors to understand and implement it easily.

It comprises 10 (ten) sections, namely:

- Background
- Legal Basis of NPFDP
- Some Key Concepts
- Goal, Vision, Objectives and Expected Outcomes of NPFDP
- Strategy for Implementation of Various Components
- Institutional Mechanism for Coordination, Monitoring-Evaluation, Gender Mainstreaming and Inclusion of Underprivileged Groups
- Implementation Stakeholders
- Programme Impact
- Sources of funding to be mobilised / explored
- Technical options.

1. BACKGROUND

1.1. International context

According to the findings of a global remote sensing survey (FAO, 12/2011), the total surface area of the world's forests was estimated at 3.69 billion hectares in 2005, thus 30% of the world's landmass. A study by Jean-François Bastin (2017) believes there could be an additional 10% more to this, representing the forest cover of arid regions and woodlands which, according to the FAO definition, cannot be considered as forests. It should be noted that four centuries ago, 2/3 of the land area was covered by forest, as against 1/3 today.

The World Resources Institute notes that 80% of the world's original forest cover has been cleared or degraded, mainly within the last 30 years. Between 1990 and 2000, more than 14.2 million hectares of forests disappeared with virtually irreversible consequences. This trend went upward between 2000 and 2012, with 23 million hectares of forests destroyed. Forest cover loss is largely due to clearing for agricultural purposes, increased demand for forest products and paper, use of firewood and, in recent years, the resurgence of bush fires, which have taken the annual loss of forested areas to a record high of 29.7 million hectares.

The depletion of the forest cover is the most tangible aspect of environmental degradation, with far-reaching consequences, especially in developing countries. Forests are intrinsically linked to soils and any forest degradation affects the soil. Forest degradation is the root cause of worsening drought and desertification.

Areas affected by land degradation are home to about one billion people in some 100 countries across all continents, representing 15% of the world's population. In its *Global Environment Outlook 4*, UNEP (2010) notes that land degradation disproportionately affects one-third of the world's population. Tropical Africa, south of the Equator, is among the regions of greatest concern.

The importance of forests in the biosphere and their role in terms of resources for societies, as a biodiversity reservoir, a major climate factor, etc. justifies the quest for their sustainable management, which has received special attention in international negotiations over the last 25 years. Thus, at the Rio Summit held from 3 to 14 June 1992, the most difficult discussions at the United Nations Conference on Environment and Development (UNCED) focused on the forestry sector. In addition to one of the 38 chapters of Agenda 21 (the action programme to prepare for the 21st century) devoted to the fight against deforestation, the Conference adopted the first ever political declaration on forests by a world summit of Heads of State and Government.

The crucial role of forestry activities in achieving sustainable development is recognised internationally both in the Rio Declaration and in various United Nations Conventions, notably the Framework Convention on Climate Change (UNFCCC), whose 21st session of the Conference of the Parties (COP21) was held in Paris from 30 November to 11 December 2015, the Convention on Biological Diversity (CBD) and the United Nations Framework Convention to Combat Desertification (UNCCD). This is also the case with the United Nations Forum on Forests (UNFF) and other key processes, meetings and publications.

In an attempt to compensate for the losses suffered by the world's forests, the UN organised the "Billion Tree Campaign" under the United Nations Environment Programme (UNEP). This operation has been organising the **International Plant A Tree Initiative** and raising public awareness since 2006. Trees are planted all over the world. According to UN estimates (2013), tree planting, in addition to natural reforestation, represents more than a billion trees each year, i.e. some 130,000 ha/year. To compensate for the number of trees lost over the last 10 years, **130 million hectares** or 1.3 million square kilometres (the size of Peru) would have to be planted. This area corresponds to 14 billion **trees planted over 10 years**, or 2 shrubs planted per person every year for 10 years. In 2010, **two billion** trees had already been planted worldwide thanks to UNEP (<https://www.planetoscope.com/forets/1817-plantation-d-arbres-dans-le-monde.html>).

Though, within a short period of time, reforestation cannot compensate for the loss of species that used to live in cleared forests, planted forests established through afforestation or reforestation play a particularly important role in sustainable forest management, poverty alleviation, carbon sequestration, soil stabilisation, biodiversity conservation and enhancement, ecosystem functionality, salinity regulation, flood protection and water quality, and also through the wide range of goods and services they can provide. The resulting timber resource is becoming increasingly important in global timber markets (about 35-40% of the market share of timber and timber products).

Besides, the international community is yearning to decarbonise the world economy by 2050 and keep global warming at 2°C, by reducing bioenergy demand, innovative biomaterials and promoting wood-based building systems to replace carbon-intensive materials such as steel and concrete, which keep rising. In future, demand for woody biomass should therefore far exceed supply. Thus, to meet the needs of the future bio-economy, there is a crucial need to invest in a bid to protect the remaining natural forests. However, it is especially important to restore secondary and degraded forests, achieve productivity gains on existing plantations and expand forest areas planned and managed sustainably on a global scale.

Given the significant impact of Climate Change on the lives of people, addressing it now stands as one of the priorities of the Governments of countries in the tropics.

Interest in the development of artificial forests has led many international bodies involved in sustainable forest management to lay down principles and guidelines whose implementation can inspire the development of National Programmes for the development of plantation forests. These include:

- ITTO (International Tropical Timber Organisation) and IUCN (International Union for Conservation of Nature) guidelines on plantation forests and restoration of degraded forests;
- Principle 10 on Biodiversity Conservation in Planted Forests;
- ATO/ITTO (African Timber Organisation/International Tropical Timber Organisation/) Principles, Criteria and Indicators on Plantation Forests and Restoration of Degraded Forests;
- Principle 10 of the FSC (Forest Stewardship Council) Standard for the Congo Basin.

1.2. National context

Cameroon has about 22 million hectares of dense rainforests, i.e. 46.25% of the national territory. With this potential, Cameroon is one of the four main countries with forests in the Congo Basin (FAO 2005). Mining, agro-industries and other development infrastructure cause a great deal of damage resulting in deforestation and degradation of forests, as well as the depletion of the genetic potential of plant

formations. Thus, over two million hectares of dense forests and approximately 1 million hectares of moist savannah have disappeared in Cameroon over the last two decades (FAO 2001).

There is no gainsaying that the indicator values for monitoring of forest cover loss in Cameroon such as deforestation and degradation rates, which stand respectively at 0.14% and 0.01%, are among the lowest in the three major tropical forest basins in the world. Nevertheless, the country has been witnessing an upward trend in recent years, which needs to be brought under control. By way of illustration, according to a study by the Centre for International Forestry Research (CIFOR, 2015), Cameroon's "Emergence Programme" (construction of hydroelectric dams, mining, road and rail infrastructure, agro-industries, etc.) could lead to the destruction of at least 2.02 million hectares of forests, i.e. 8% of the total current national forest cover, with complex induced short, medium and long-term effects or impacts.

There is a crucial need for more innovative measures that will likely enable plantation forests to effectively play their role of increasing production per unit area, since there is no guarantee that the surface area of the country's "natural" forests will be stabilised in the long term, considering the pace of development of mining, agriculture, infrastructure and food production, the progressive degradation of some state forests and also the fact that wood needs (timber, construction and firewood) will increase.

It must be acknowledged that the Ministry of Forestry and Wildlife (MINFOF) has initiated and implemented a number of measures, some of which include: strengthening the legal framework and forestry governance, as well as institutional, strategic, programming and budgetary reforms in the forestry and wildlife subsector. The implementation of these measures has resulted over the years in considerable progress towards sustainable forest management (establishment of the permanent forest estate, which currently spans 15,689,586 hectares, representing approximately 33% of the national territory (MINFOF, 2015). However, much still has to be done, especially in addressing the issue as to whether timber production from natural forests will be able to definitely satisfy the needs of the people and industries.

Moreover, the internationalisation of the Paris Agreement of December 2015 following COP21 could result in increased conservation of natural forests of the Congo Basin and, consequently, those of Cameroon in support of the REDD+ process and the African Forest Landscapes Restoration Initiative (AFR 100).

In all respects, it seems the trend is likely to shift, as is the case worldwide, towards plantation timber, which is becoming increasingly important on the international market.

Besides, land degradation, which is the direct consequence of vegetation cover loss, takes on increasingly alarming proportions in the country each year, particularly in arid savannah and to a lesser extent in moist savannah areas. According to figures from the Ministry of Environment, Protection of Nature and Sustainable Development (MINEPDED), it is estimated that more than 12 million ha of land is degraded nationwide. As a result, desertification is becoming more threatening and is today one of the challenges, indeed the major challenge, the State of Cameroon must rise to in its quest for better living conditions for locals of the relevant areas, and this necessarily entails reforestation of degraded land.

Desertification is misunderstood as the expansion of existing deserts, whereas many researchers consider it to be human-induced land degradation in drylands.

It is for all these reasons that State forests, in this case forest reserves and reforestation areas, can be exploited as part of their management, and serve as a support for the development of new secure plantations for timber production, carbon sinks and capital in the REDD+ process. Non-permanent estate forests and notably degraded land areas in savannah regions can for their part be used to develop socio-economic plantations for the production of fuelwood and construction timber.

Unfortunately, an analysis of reforestation experiences in Cameroon reveals that most plantation forests have always been developed without clearly defined objectives. The abandonment of forest reserves and reforestation areas supporting forest plantations, and the failure of tree planting programmes, are among the most visible consequences that at least could partly be ascribed to the 1990 economy liberalisation policy, and the "institutional review of the forestry Subsector in 2003". Indeed, this State policy shift, in addition to other measures, notably the liberalisation of the economy, caused the State to disengage from certain production functions, and these were taken up by the private sector.

Poor knowledge, low capacity and skills to develop effective and forward-looking policies, laws, regulations, plans and technical support systems made it difficult to support the creation and responsible management of planted forests. It turns out that some of the major investments made in creating planted forests have had very mixed outcomes, bordering on failure, due to: poor planning based on no clearly defined objectives, many conflicts generated by land use and unresolved land ownership issues, social and environmental problems, and minimal performance in terms of productivity and return on investment....

The creation, in 2002 of the National Forest Agency (ANAFOR) following the change in status of the former ONADEF (National Forest Development Board), in 2003 of the Forest/Environment Sector Programme (FESP), and in 2006 of the National Tree Planting Programme (NTPP), evidenced Cameroon's desire to implement a consistent sustainable development strategy for plantation forests. This development starts from seeds to the processing of plantation forest products, and the creation of a local market for timber and by-products from plantation forests.

To achieve this, the New Forestry Policy (NFP) is based on the 2020 Forestry Subsector Strategy which aims, in terms of forest resources regeneration, to promote the emergence and exploitation of plantation forests as against natural forests, organise and encourage sustainable and rational environmental development initiatives by individuals, associations, partners, civil society, etc... The fundamental elements of this strategy include, among others: (i) for arid and moist savannah, to promote community and private plantations and agro-forestry; (ii) for dense forests, to compensate for losses due to selective exploitation and conserve the biodiversity of natural ecosystems); (iii) in degraded areas with few future stems, to use artificial regeneration methods that proved successful in experimental projects; (iv) in primary forests under exploitation, to regenerate the resource in the case of management plan implementation and within the framework of one-off projects. At all events, the enhancement of natural stands should be prioritised. Community participation in the conservation and management of forest resources and the sustainability of productive potential through the regeneration of these resources, especially through plantation forests, is a major specific forestry policy objective.

This Plantation Forests Development Programme (PFDP) is necessary in that it is intended to play a frontline role in the "**new generation**" strategies to be implemented in a bid to boost economic growth and job creation, in keeping with the Growth and Employment Strategy Paper (GESP) guidelines.

The implementation of this new strategic steering instrument is part of the “**silviculture transition**” initiated by MINFOF and underpinned by a **new generation approach**, in this case the “**2nd Generation Silviculture (2GS)**” **Concept**. These lay the foundation for a new vision predicated on the **paradigm shift from “tree planting” to “modern silviculture development”**, rooted in the “*sector-based approach*”, and “*silvicultural value chains*”, in which all silvicultural operations and benefits generated at each stage of forest stand development must be considered.

The NPFDP, which is intended to be participatory, integrates emerging issues in terms of resource regeneration under the following approaches: plantation forests and biodiversity conservation, plantation forests and climate change, plantation forests and watershed management, plantation forests and electricity transport, plantation forests and poverty alleviation, plantation forests and restoration of landscapes and degraded forests in this case, plantation forests and timber production, plantation forests as structuring elements of a national economy as an alternative to the economy of timber production from natural forests, plantation forests and incentive measures, etc.

Its implementation will, on one hand, contribute to Cameroon's achievement of **her set objective of reducing its greenhouse gas emissions by 32%, pursuant to the commitment made by the Head of State during the COP21** and, on the other, **the objective of restoring an estimated 12,062,768 hectares of degraded and deforested landscapes by 2030 under the African Forest Landscape Restoration Initiative (AFR100)**, pursuant to the commitment made in February 2017 by Forestry and Environment Ministries within the framework of the New Partnership for Africa's Development (NEPAD), **in support of climate action**.

1.3. Some key concepts

Management: Generally speaking, management is the overall organisation of an area, methodically prepared for a specific use. Applied to natural production forests, management involves planning and implementing actions and activities necessary to achieve defined objectives, the main purpose of which is to produce timber, without jeopardising the sustainability of the forest stand. This planning must be carried out in full knowledge of the physical and socio-economic environment - which presupposes prior studies. The findings will then inform management decisions to be taken on the development of the concession area. Section 23 of Law N° 94/01 of 20 January 1994 to lay down Forestry, Wildlife and Fisheries Regulations defines management as: “the implementation, based on previously set objectives and a plan, of a certain number of activities and investments, with a view to the sustained production of forest products and services, without undermining the intrinsic value or compromising the future productivity of the said forest and without causing undesirable effects on the physical and social environment.”

Forest Management Plan: This document lays down the rules for the cultivation of various stages of a forest stand and exploitation standards. Management is a prerequisite for exploitation. The management option aims to make several uses of the resource compatible by reconciling several levels of interest, staying below irreversibility thresholds and preserving the interests of future generations. The theoretical outline of a management plan involves three key stages:

- **A set of analyses of forests and the forest environment**, hence the various contexts: legislative and regulatory (land use planning, etc.), historical and human (social needs, cultural aspects, etc.),

socio-economic (economic needs, infrastructure, markets, etc.), natural environment (fauna, flora, forest stands, etc.) and possible technical itineraries (clear-cuttings, thinning, logging intensity, regeneration of potential, etc.).

- **A set of syntheses leading to management decisions:** prioritisation of production objectives, forest zoning, choice of technical itineraries, programming of actions (felling, works, etc.) and social, economic and ecological approval of these programmes.
- **A monitoring-evaluation and control mechanism:** analysis of outcomes/set objectives and periodic reviews of the management plan.

The content of a forest management plan must include at least four levels of information: social, political and cultural factors; physical, biological and ecological factors; financial and economic factors; and technical factors (silviculture, exploitation, processing). To ensure sustainability of forest stands, conditions for management plan development must be subject to satisfaction of the needs of the population in land and forest products (<http://www.fao.org/docrep/003/x4130f/X4130f08.htm>).

Inventory of Forest Resources: This is a census of forest resources. Generally speaking, a distinction is made between two types of inventories. Firstly, there are inventories for immediate exploitation, which concern only large-diameter trees and a limited number of useful species. Secondly, there are inventories in view of management based on the future value of existing stands and including, besides species of immediate commercial interest, those likely to become so, since all trees are counted as from a certain diameter classified by category. Several countries in the Congo Basin have already carried out inventories of their forest resources. An inventory should make it possible to determine the volume of exploitable timber, provide data on communities and conduct an evaluation of non-timber products.

Socio-ecosystem: This concept allows for simultaneous analysis of the forest ecosystem and the stakeholders interested in it (Janssen et al. 2007). The tipping point of the forest socio-ecosystem is defined as the critical point in a changing situation that causes it to tip towards irreversible development (Repenning et al. 2001). In the case of a forest socio-ecosystem, it may be the transition from a phase of intense deforestation to a phase of forest cover stabilisation or even reforestation.

Afforestation or reforestation: Afforestation or reforestation is defined as planting of trees with the aim of creating a woodland on an area that has long been devoid of trees, or has possibly never (on human time scales) belonged to the forest area. Formerly driven by the need to develop uncultivated land, afforestation is increasingly motivated by economics and the need for wood (<https://fr.wikipedia.org/wiki/Reboisement>).

Value chain: This is a tool for optimisation and value/cost analysis that creates awareness of the importance of coordination in an organisation, as each link in the company chain brings value that needs to be optimised

Deforestation: Deforestation is defined as *the long-term or permanent anthropogenic conversion of forest land to non-forest land*. Suffice it to note that in climate negotiations and REDD+, deforestation and forest degradation are considered only from the point of view of carbon stocks, leaving out biodiversity and other forest functions (Atyi et al. 2008). Simply put, **Deforestation** is the long-term or permanent anthropogenic conversion of forest land to non-forest land.

Forest degradation: This is a different process from deforestation. Several international bodies have proposed definitions. The FAO report (2011) points out that the ITTO (2002) definition is the most comprehensive and underscores that forest **degradation** refers to the *reduction in the capacity of a forest to produce goods and services*.

Table 1: International definitions of forest degradation/degraded forests

Organisation	Definition
FAO (2001)	Changes within the forest, which negatively affect the structure or function of the stand or site, and thereby lower the capacity to supply products and/or services.
ITTO (2002, 2005)	<p>Forest degradation refers to the reduction in the capacity of a forest to produce goods and services. (ITTO, 2002). Capacity entails maintaining ecosystems structure and functions (ITTO, 2005). A degraded forest provides only a limited amount of goods and services and conserves only limited biological diversity. It has lost the structure, function, species composition and/or productivity normally associated with natural forest (ITTO 2002).</p> <p><i>The Explanatory Notes</i> (ITTO 2002; 2005) distinguish among forests that have been altered beyond the normal effects of natural processes, degraded primary forest, secondary forest, and degraded woodlands.</p> <ul style="list-style-type: none"> (i) A degraded primary forest is a primary forest whose initial canopy cover has been affected by unsustainable timber and NTFP exploitation that has altered its structure, processes, functions and dynamics to the extent that the short- or medium-term adaptive capacity of the ecosystem is compromised; (ii) Secondary forest means woody vegetation that has been reconstituted on land where the original forest cover has been largely cleared (at least 90%). On the whole, secondary forests develop naturally on land abandoned after shifting cultivation, sedentary agriculture, pasture or failed tree plantations; (iii) Degraded forest land is old forest land that has been severely damaged by excessive exploitation of timber products or NTFPs, inappropriate management, repeated fires, grazing or other uses that have damaged the soil and vegetation to such an extent that it prevents or severely delays forest regeneration after abandonment.
CBD (2005, 2001)	<p><i>A degraded forest</i> delivers a reduced supply of goods and services and conserves only limited biological diversity. It may have lost its structure, function, species composition or productivity normally associated with a natural forest (UNEP/CBD/COP/6/INF/26).</p> <p><i>A degraded forest</i> is a secondary forest that has lost, through human activities, the structure, function, species composition or productivity normally associated with a natural forest. Hence, this type of forest delivers a reduced supply of goods and services and conserves only limited biological diversity. Biological diversity of degraded forests includes many non-tree components, which may dominate in the under-canopy vegetation (UNEP/CBD/SBSTA/7/INF/3).</p> <p><i>Degradation</i> is any combination of loss of soil fertility, lack of tree canopy cover, lack of natural function, soil compaction and salinization that prevents or delays forest regeneration not assisted by secondary succession. Forest cover loss, forest degradation and forest fragmentation lead to loss of forest biodiversity by reducing the available habitat for forest-dependent species and indirectly disrupt key ecological processes such as pollination, seed dispersal and gene flow. Forest</p>

Organisation	Definition
	fragmentation can also compromise the ability of plant and/or animal species to adapt to global warming as previously connected migration routes disappear. In some forest types, fragmentation may also increase the likelihood of forest fires, which further undermines biodiversity (UNEP/CBD/SBSTA/11/INF/2).
IPCC (2003)	Degradation represents a direct human-induced long-term loss, persistent (persisting for X years or more) of at least Y % of forest carbon stocks (and forest values) since time T and not qualifying as deforestation or an elected activity under Article 3.4 of the Kyoto Protocol.
IUFRO (2000)	Degradation is defined as damage to the chemical, biological and/or physical structure of a soil (soil degradation) and to the forest itself (forest degradation), as a result of inappropriate use or management which, if not improved, will irreparably reduce or destroy the production potential of a forest ecosystem. Explanatory note: external factors, such as air pollution, may also contribute to degradation (<i>Source: Nieuwenhuis 2000</i>).

Sources: Simula, 2009.

Land degradation: the persistent decline in the goods and services provided by an ecosystem, including water-related biological goods and services, and land-related social and economic goods and services.

Landscape and Forest Restoration: planned processes to restore ecological functionality and improve human well-being in deforested or degraded landscapes.

Ecological functionality: all ecological functions necessary to make the components of an ecosystem or habitat permanent. Functionality may be intrinsic to the environment under consideration or dependent on external factors.

Ecological integrity: a state of ecosystem development characterised by its geographic location, containing a diversity of native species and supporting processes present in sustainable numbers.

Well-being: a concept encompassing the factors that make human life comfortable, such as money, peace, health, food, water availability, stability and good governance.

Forest: The definition differs from one Body to another and even from one researcher to another.

- From a botanical point of view, a forest is a plant formation characterised by the size of the tree layer, but which also includes shrubs, low plants, vines and epiphytes. Many forest trees thrive in association with fungi and other micro-organisms and many depend on animals to transport their pollen, seeds or propagules.
- From an ecological point of view, a forest is a complex and rich ecosystem, providing numerous habitats for many animal populations and species, plants, fungi and microbes, most of which are interdependent.
- The FAO (2010) definition adopted by Cameroon considers a forest as a land area of at least 0.5 hectares, at least 10% of which is covered by trees whose height at maturity is at least 5 metres (Simula 2009).

The United Nations Environment Programme (UNEP) uses the threshold of 40% coverage for 'closed forests' and 10-40% for 'open forests', while the Tropical Ecosystem Environment Observations by

Satellite (TREES) project classifies areas with more than 70% tree cover as 'dense forests' and those with 40-70% tree cover as 'fragmented forests'.

Plantation Forestry: This is the action of planting trees through seed sowing or seedling transplant, with a view to creating forests, forest stands or plantations, usually for timber production or for soil and water protection. It refers at once to the land and the planted trees that grow on it. It is a forest estate established artificially either by transplanting or by seed sowing. (Green Facts - FAO 2001-2018). In some countries the seedling transplant operation is considered a plantation when the number of seedlings to be planted exceeds 1,875 seedlings/ha. Below this limit, it is considered replanting.

Tree Planting: This operation involves recreating woodlands or forests earlier destroyed by clear-cutting or by other diverse causes (over-exploitation, forest fires, overgrazing, war, etc.). Sometimes they involve purely protection forests.

Tree planting entails at least three major operations: production of plant material, planting and silvicultural maintenance. (<https://fr.wikipedia.org/wiki/Reboisement>).

Reforestation: This concept presupposes a more far-reaching objective in terms of surface area and ecological or landscape quality than that of tree planting. Indeed, the objective is generally to restore a forest-type ecosystem, and has to cover a significant surface area to justify the term 'forest'. (<https://fr.wikipedia.org/wiki/Reboisement>).

Regeneration Forestry: This refers to all the natural spontaneous processes and silvicultural strategies and techniques for restoring a forest cover. It can be natural or artificial.

Block: This term refers to the micro-zoning carried out at the level of a forest, in this case a production forest. It consists in grouping into more or less homogeneous stretches relatively identical areas with later identical management practices. Often, different land use situations are interwoven, making the task of defining the blocks to warrant the creation of blocks in which one situation or another is dominant. The block is therefore a set of plots, not necessarily connected, which form a unit in terms of purpose and management practice. Blocks are defined according to the richness of the stands in commercial species and ecological criteria:

- **Production Blocks** –All blocks in which wood harvest is envisaged sooner or later, and in which silvicultural activity could maximise the production function.
- **Production and Protection Blocks**- Timber harvesting can be reasonably envisaged yet with serious physical protection constraints. They are reflected in silvicultural stresses that no longer allow the production function to be optimised.
- **Protection Blocks**- The site conditions or protection constraints imposed on the management of stands give no hope of a saleable harvest. Stands ought to play a strong protective role. Silvicultural activities should ensure that the wooded state is maintained.
- **Non-framework Blocks** - No production or protection objective linked to wood seems to justify silvicultural activity even in the long term. The objectives that may be assigned to these series are agro-forestry-pastoral objectives, etc.
- **Biological Reserves** -The major objective here is to preserve natural resources and the scarce or endangered animal-type or plant-type biotopes.

Silviculture: This is an activity or series of methods and practices carried out by the forester to develop, manage and enhance a forest or woodland in a bid to obtain the economic benefits or certain services beneficial to society (under the so-called multifunctional forest approach). Effectively incorporating many sciences that give pride of place to the ecology, silviculture, which is equally grounded on the economy, can be defined as the application of scientific (biological) techniques to control the natural development of forests and guide their evolution towards targeted ends.

2nd Generation Silviculture in Cameroon: This concept refers to a set of actions and techniques which use forestation, reforestation and forest regeneration as props to the development of plantation forests, resource regeneration and reconstitution on uncultivated lands and degraded forests, serving as links in a value chain which, alongside biological, ecological, developmental and sustainable aspects, equally incorporates monitoring and control of forest stands, participatory management, processing, marketing of plantation products, financial and economic profitability, in order to effectively contribute to the wellbeing of the community and to growth and employment (Ngomin A *et al.*, 2015).

Silvopole: This is a group of forestry companies situated in a geographical area and which maintain a functional relationship in the production, processing (specific technology to put in place) and marketing of plantation forest products (thinning products, NTFPs, biomass, timber and service wood products, etc.).

1.4. Methodological approach to NPFDP development

The programme was developed in line with the mission's Terms of Reference, following a methodological approach presented at the start-up and briefing meeting with the Contracting Authority. The overall approach was based on the processing and analysis of recent secondary data published or not in scientific journals and study reports. This data was complemented with information collected in the field from various forestry stakeholders. The data provided a set of integrated concepts, coupled with a structured and systematic analysis of the prevailing situation in the forestry sector, especially with regard to plantation forestry.

The process was conducted in the following six phases:

- Documentary preparation and research;
- Design of data collection and entry tools;
- Field data collection tools;
- Data processing and analysis;
- Situational analysis (SWOT matrix);
- Drafting of the National Plantation Forest Development Programme.

1.4.1. Phase 1: Literature review and development of data collection and analysis tools

This involved reviewing all existing literature on the sector. This review included among other things:

- the historical background;
- the national political context (GESP, 2020 Forestry Subsector Strategy, National Tree-Planting Programme, etc.); and the global context (ODD, REDD+, various directives);
- the regulatory and institutional framework;

- existing programmes and projects.

Data collection tools developed were interview guides which formed the basis for discussions with the various stakeholders encountered. Collected data was summarised, analysed, and used to come up with the expected findings of the mission. This stage led to the drafting of the **Kick-off Report** which was presented during the start-up meeting of NPFDP drafting activities that held on 10 January 2018 in the MINFOF Conference Room.

1.4.2. Phase 2: Consultation of Stakeholders

Three workshops were organised, one at the *Hotel Relais Saint Hubert Garoua* from 14 to 16 February 2018, another at the *INO Hotel* in Bafoussam from 18 to 20 February and the third at the *Cinquantenaire Hotel*, Ebolowa from 28 February to 2 March. It was an opportunity to consult stakeholders in each of the three major ecological zones of the country. This stage led to the drafting of the **Preliminary Report of Field Missions** and the **Grassroots Consultation Workshop Report**.

1.4.3. Phase 3: Determining the Situation of the Forestry Sector and Plantation Forests in Cameroon

Based on information from the literature reviewed and data collected in the field from the stakeholders consulted, a situational appraisal of the sector was made. From this appraisal, the strengths, weaknesses, opportunities and threats were identified for all the components of the forestry sector. It was thus easy to determine the state of affairs in the forestry sector in Cameroon, forest uses, causes of forest degradation, measures taken to combat global forest degradation, and the outcomes of the implementation of previous forest resource regeneration initiatives in Cameroon. The analysis ended with the presentation of the political, legal and institutional framework of the sector.

The literature review enabled the mission team to fine-tune field data collection tools and plan meetings with stakeholders. In line with the mission's terms of reference, meetings with stakeholders consisted, first, in their participation in 3 workshops organised by MINFOF for grassroots consultations in each of the country's ecological zones. The meetings also involved exchanges with a number of relevant stakeholders in the central services and in six regions of the country, as well as visits to tree planting sites in the Centre, West and Far North Regions. The list of people met is included in Appendix 3 of this report.

1.4.4. Phase 4: Developing the Sector's SWOT Matrix

Data on the situation of the forestry sector enabled the development of a SWOT (Strengths, Weaknesses, Opportunities and Threats) matrix for the sector, pin-pointing the sector's difficulties. Using a cause and effect analytical approach, a problem tree was created and solutions sought, thus transforming the problem tree into a solutions tree.

The analysis phase led to the:

- evaluation of previous forest resource regeneration initiatives;
- assessment of land tenure security and access;
- development of a SWOT (Strengths, Weaknesses, Opportunities and Threats) matrix for the sector;

- identification of sector problems and their analysis using a cause-and-effect approach and creating a problem tree;
- identification of solutions to sector problems and creation of a solutions tree.

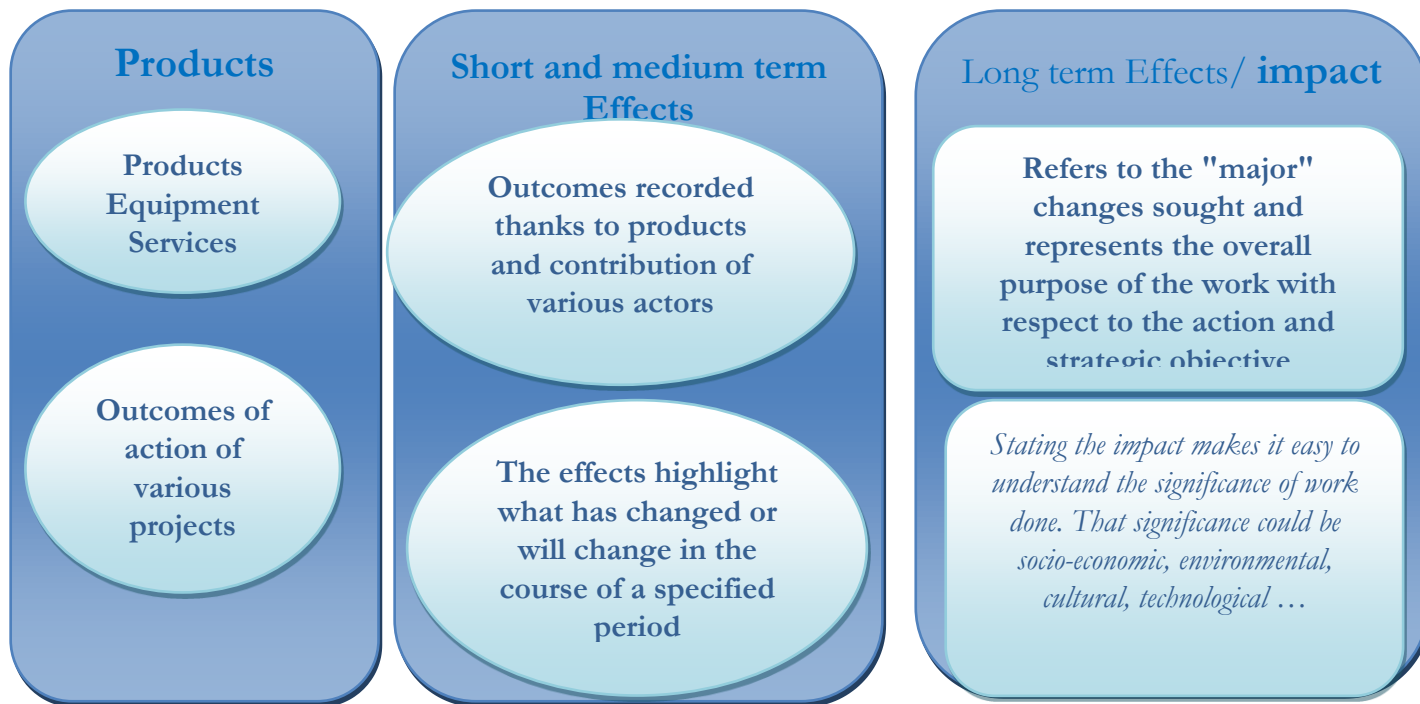
1.4.5. Phase 5: Developing a National Plantation Forests Development Programme

RBM is a **Programmes and Projects Management** strategy that focuses on performance and effective achievement of **Results**. It contrasts with conventional approaches that focus on following up activities, products and resources. RBM is primarily a tool for programmes, as well as a means of communication and sharing with all stakeholders. It sets out with a clear definition of expected outcomes, thus ensuring that the resources mobilised (human, financial and material) are adequate, and that the procedure followed will effectively enable the transformation of the resources into the outcomes¹. RBM is said to be gender-sensitive when implemented from a gender perspective; that is to say, it ensures that both sexes take part in defining outcomes and are involved at every stage of a project/programme on equal terms.

The achievement of outcomes is RBM’s central idea and major concern, and must be duly understood, since it can be read from different perspectives. For each project, besides concrete products and services, the overall idea is to determine both its quantitative and qualitative contribution to Programme Objectives.

Most of the major Multilateral Organisations define three levels of Results:

Figure 1: Diagram of results levels of a programme using RBM



Source: OIF Results-Based Management Handbook

¹OIF Results-Based Management Handbook

In line with the RBM approach, during the drafting of the project it became necessary to propose a forestry sector vision for the duration of the programme's implementation, and to breakdown this vision into strategic axes. This led to the development of a logical framework.

1.4.6. Working team

The NPFDP was developed by a multidisciplinary team consisting of five specialists including:

- DJOMO Elie, Socio-economist specialised in sector and value-chains, Mission Head;
- TCHOMGOUO NZALLI Gédéon, Managing Director of the contract winning firm, Coordinator;
- CHEUMANI NOUDJIEU Charlotte, Forestry Engineer, specialist in Environmental management;
- OVA MANGA C, Agroforestry Manager;
- SIEZE Nadine, Jurist, specialist in land tenure.

2. SITUATIONAL ANALYSIS OF CAMEROON'S PLANTATION FOREST WOOD SECTOR

2.1. Plantation forest wood sector

The plantation forest wood sector generally refers to the chain of actors who grow, fell, transport, process, market and recycle or destroy wood (especially by burning); from the source (forest, woodland, scattered trees) to the end user or the product's life end.

With variations as per country and context, the wood sector subdivides into more or less structured Subsectors, falling under community, public, private or mixed structures. The major subsectors include:

- Timber and construction wood;
- Primary wood (sawn timber, plywood, chipboard, etc.);
- Secondary timber (furniture ...);
- Fuelwood;
- Paper pulp and cellulose fibre market;
- A reuse/recycling sector, initially brought to develop within the framework of the circular economy and organised around waste collection centres and sorting, grouping and recovery platforms, involving especially pallet "re-packagers" who channel wood waste towards different outlets (depending on the quality of the waste).

2.1.1. Sector Stakeholders

A number of stakeholders contribute to the products output and distribution within the sector. They include:

- Seed suppliers;
- Nurserymen;
- Foresters;
- Processors (primary and secondary timber);
- Intermediaries (wholesalers and retailers);
- Transporters;
- Consumers.

2.1.2. Sector Products

2.1.2.1. Products for industrial use

a) Pulp and chipboard

The global pulpwood market has been growing steadily. The wood is used as raw material for paper pulp and various chipboards such as medium density fibreboards and oriented strand boards. Raw material for pulpwood mills may be got from pulpwood plantations, early clear cutting, the tree crown and minor plantation residues and sawdust.

The size of plantations is crucial if they have to supply factories with an average processing capacity of 300,000 to 1,000,000 m³ per year. Plantations generally have a high investment cost varying between 32 and 320 billion CFA francs (50 - 500 million US dollars). In Ghana (Subri), CFAF 6.55 billion (US\$10 million) was invested to create 5,000 hectares of Gmelina in the 1980s in order to start a paperwood industry. Fifteen years later, no industrial partner had been found to invest and use the material, owing to a combination of two factors: absence of barriers and refusal to invest in Africa. Malawi and Zambia experienced similar failures in their efforts to find an industrial partner, whereas in both cases the quality of the plantations was excellent.

With high investment costs, refusal to invest in Africa and lack of competitive advantage, it cannot be advisable to establish pulp wood plantations in Cameroon.

The transportation of pulp wood in form of logs from one country to another is not economically productive, given the low value of the raw material. Of course, the wood can be hewed into small pieces before being transported, but even then the margin is still very low

b) Wooden Transmission Poles

Transmission poles have to be pressure-treated with chemicals to prevent rot. These poles are a vital market for early clear-cutting products from plantations. Electricity companies have created a great need for poles for rural electrification extensions. There are private tree planting initiatives in the West and North-West regions, and ENEO Cameroon S.A. has invested extensively in controlled eucalyptus plantations for the production of electricity poles. Currently, this company buys about 100,000 poles per year from private individuals.

The market for treated poles is composed of neighbouring countries such as the C. A. R. Annual income from the sale of eucalyptus wood is quite substantial. For the years 2014 and 2015 it has been estimated at around 500 million FCFA per year, mainly from the sale of electricity poles and construction wood.

c) Construction wood / sawn timber

Most of the world's plantations specialise in the production of sawn timber and construction wood.

In Cameroon, the national demand for sawn timber and construction wood is currently supplied by wood from natural forests.

Generally speaking, wood from plantations must be treated against pests and other fungal attacks before it can be used.

The national and regional market for sawn timber by sawmills is rightly considered as a crucial target market for plantations in Cameroon.

2.1.2.2. Products for non-industrial use

a) Fuelwood

There are freewood markets in Cameroon, notably in Yaounde, Douala and in the North and North West cities such as Maroua, Garoua, Bamenda and Bafoussam.

The firewood market will be an essential rapid cash-flow source for plantations in the dry savannah zone and in the neighbourhoods of Douala and Yaounde, where fuelwood is an indispensable asset and a finished product of the plantation.

The firewood market is directly linked to the charcoal market. It is in high demand especially in the north and the cities of Douala and Yaounde. In general, charcoal is economically preferable to fuelwood in case of transportation over long distances.

b) Non Industrial Poles

Poles are used locally mainly in building or construction of fences. No estimates for their domestic market are available. This market is currently supplied mainly by native species. The recent Circular Letter No. 0059/c/MINFOF/CAB of 21 April 2016 on the ban on poles harvesting from the national estate, which has just instilled order in the sector, provides an opportunity for poles from plantation forests.

Eucalyptus Sp, Gmelina and Teak are of the most suitable species for the production of poles from plantations in Cameroon. While Eucalyptus has the advantage of easy hewing, Teak has the advantage of proven resistance to rot..

c) Non-Timber Forest Products

Plantation forests produce fewer Non-Timber Forest Products (NTFPs) than natural forests. The major NTFPs from plantations include fruit, fodder, honey and medicinal plants. There is very little information on most of these products, but there is some information on nutmeg, gum arabic and cashew nuts in the Far North. In general, the benefits of these products are not often taken into account in the financial analysis of economic studies on private sector plantations.

2.1.3. Plantation forest wood market

2.1.3.1. Demand for plantation forest products

The demand-based approach shows that the markets with a high demand for plantation products are those for local sawn timber/construction wood, whereas the market for primary hardwood is export. The domestic demand for construction wood and fencing poles and the domestic demand for fuelwood in the North and the major cities of Douala and Yaounde is on the rise.

Flexibility in the use of species is significant as demand may fluctuate over time. In this respect, Teak is a very flexible species. Teak requires a suitable location and does not grow just anywhere. On the other hand, it is used invariably as sawn timber, veneer, poles, fuelwood and charcoal.

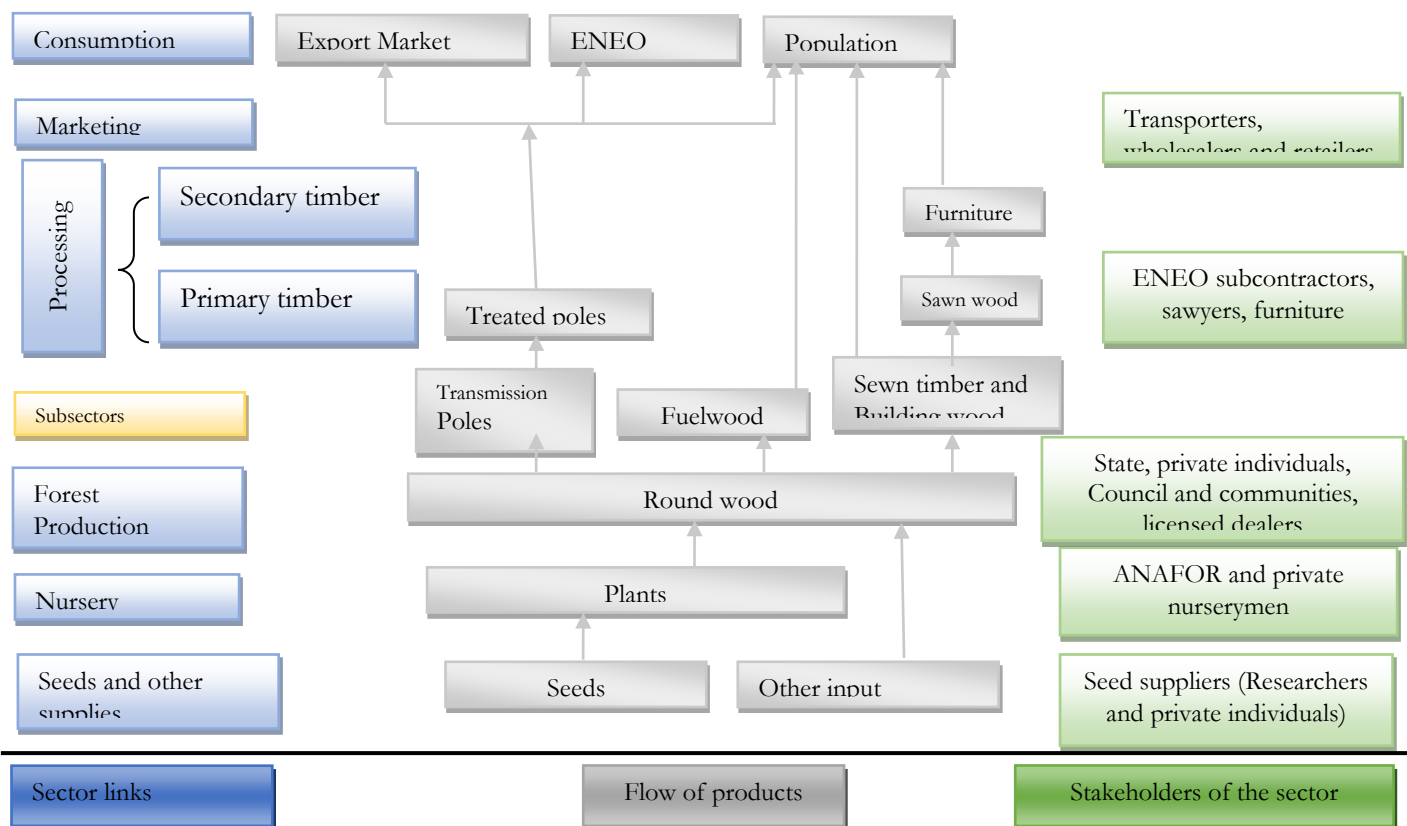
It is also important to set up a system to secure comprehensive information on prices, demand and elasticity throughout the supply chain. Table 2 below provides an overview of the demand for proven and recommended plantation species.

Table 2: Choice of tree species

Market	Market Demand for Plantation Wood in Cameroon	Proven and Recommended Plantation Species
Industrial Use		
Wood pulp	Low	Eucalyptus spp., Gmelina spp. and Pines
Transmission Poles	Average	Eucalyptus spp., Teak and Pines
Domestic Timber Market	High	Eucalyptus spp., Teak, Pines, Terminalia, Triplochiton, Maesopsis, Canarium
Export Timber Market	Low/Average	Pines Terminalia and Triplochiton
Export market for quality hardwood	High	Teak, Milicia, Meliaceae
Non-Industrial Use		
Fuelwood	High in cities of the North, North West, and in Douala and Yaounde	Eucalyptus spp, Gmelina, Acacia, Combretum et Teak
Building poles	Average / High	Eucalyptus, Teak
Produits non-ligneux	Low/Average	Native species e.g. <i>Prunus africanum</i> , <i>Canarium schweinfurthii</i> , <i>Butyro spernum</i> for special local needs, <i>Acacia senegal</i> (Gum), <i>Anacardium occidentale</i>

2.1.3.2. Flow of Products, Sector links, Stakeholders and their Functional Relationship

Figure 2: Diagram of Sector Structure



Source: culled from NGOMIN A. et al., MINFOF/GIZ, 2015

The figure above shows the flow of products and an outline of the current actors in the plantation wood sector. This sector is currently a predominantly eucalyptus forest sector, which alone accounts for the transmission pole Subsector and constitutes the bulk of plantation forest wood that is processed.

2.1.4 The plantation wood sector economy

The forest economy is generally understood to incorporate:

- Silviculture that produces trees and sells them as standing volumes;
- Logging which involves felling, hewing into logs, arranging by kind and destination, and marketing by roadsides, on wagons or sawmill gates;
- Sawing.

2.1.4.1. Economic analysis

Economic analysis is meant to determine the economic profitability of a given investment from society's perspective; that is, it considers costs and proceeds for all of society's economic agents, regardless of who pays and who receives. Economic assessment thus aims at measuring the welfare or total wealth of society generated by an investment. Opportunity cost represents the income and costs that the foregone alternative option produces.

Within the analysis of the economic profitability of forestry investments, opportunity cost is measured by a reference mechanism. By applying the concept of opportunity cost, economic assessment measures the extra wealth created by the investment. Thus, workers, forestry and processing companies and the government are all taken into account.

Reference mechanism: Within the analysis of the economic profitability of forest investments, opportunity cost is measured by a reference mechanism, to wit the natural forest exploitation mechanism. By applying the concept of opportunity cost, economic assessment measures the extra wealth created by investment in the planted forests.

Economic Income: Income accounted for in such an analysis not only corresponds to income from timber production and processing, that is the value of standing timber, the company's profits, wage rates and additional rates for quality and quantity, but also to the ecological benefits of the planted forests.

Economically speaking, previous chapters have sufficiently highlighted the profitability of planted forests. As a matter of fact, predictions on future uses of wood are optimistic if one objectively analyses the energy savings made by its use, the new technologies developed for its use, the long-term scarcity of fossil energy sources, the contribution of wood use in reducing the greenhouse effect through carbon sequestration, the stability and comfort of wooden houses, etc... Everything ought to be done to increase the opportunities offered by wood. Similarly, climate change and land degradation issues adequately justify the ecological benefits of planted forests, as well as the opportunities offered by REDD+.

2.2. Swot analysis of plantation forest activities in Cameroon

Findings of the situational analysis of reforestation and plantation forest operations in Cameroon have made it possible to summarise the overall analysis of the major strengths, weaknesses, opportunities and threats (SWOT) that influence this aspect of the forestry Subsector in each of the country's ecological zones.

2.2.1. In Dense Forests

Table 3: SWOT Matrix for reforestation in Dense Forests

<p><u>Strengths</u></p> <ul style="list-style-type: none"> - Continuous improvement of management planning methods (management plan, certification, etc.); - Mastery of the cultivation of a number of species of economic value; - Existence of private nurseries. 	<p><u>Weaknesses</u></p> <ul style="list-style-type: none"> - Paucity of forest research resources; - Unfriendly environment for the development of private forestry companies; - Low demand for seedlings; - Lack of a monitoring system for private nurseries. <p><u>In Community Forests</u></p> <ul style="list-style-type: none"> - The legal status of community forests does not protect these areas from the risk of land use change, either by the populations or public authorities; - Poor mastery of forestry matters by community forestry stakeholders.
<p><u>Opportunities</u></p> <ul style="list-style-type: none"> - Vast expanse of degraded mangroves, - Considerable potential for promoting agroforestry and enhancing NTFPs. <p><u>In FMUs and Council Forests</u></p> <ul style="list-style-type: none"> - FMUs are secure areas that require gazettement; - Cultivation of exploited species is mastered; - There are past initiatives in forestry that need to be capitalised on; - Human potential is available and begging to be used; - Silviculture is one of the major prescriptions of the development master plans approved by the State; - Costs of silvicultural action exist and can be improved; - Tree planting is one of the focal activities of the current forestry policy; - Political will for forest regeneration is affirmed; - There are opportunities for partnership with international organisations and friendly countries. <p><u>In Community Forests</u></p> <ul style="list-style-type: none"> - The State and the international community support all actions that contribute to improving the well-being of local communities; - NGOs are available providing support for this activity; - There are opportunities for partnerships with international organisations; - There is a zoning plan that facilitates the creation of community forests in the national estates; - The institutional bases exist, - There is a network of about 100 community forests; - There are support/advisory structures to support community forests (ICRAF, ANAFOR, NGOs, IRAD, etc.) in terms of resource regeneration. 	<p><u>Threats</u></p> <ul style="list-style-type: none"> - Increasing degradation trends in recent years (agricultural development, mining, urbanisation...); - Selective harvesting deemed "unfavourable to the regeneration of commercial species or their growth"; - Disturbing rapid depletion of biodiversity in forest concessions, due to selective harvesting, high loss rate, and settlement on forest space following the opening of forest tracks; - Poor mastery of natural regeneration itself; - Many uncertainties as to the effectiveness of the forestry techniques used, which have not yet completed a full cycle (60 to 90 years); - Problems of governance. <p><u>In FMUs and Council Forests</u></p> <ul style="list-style-type: none"> - Insufficient regeneration rate (only 65% of harvested potential could regenerate naturally); - There is still a 35% gap in forest cover exposed to degradation, entailing a decrease in biodiversity, an increase in desertification, and a fall in the economic impact of forest concessions; - Low enthusiasm in most concession holders for resource regeneration, as well as the scanty, if any, statistics on forestry (MINFOF, 2016). <p><u>In Community forests</u></p> <ul style="list-style-type: none"> - In dense forest areas, the simple management plans for community forests implemented do not take resource regeneration component into account - an inadequacy that in no way favours sustainable management in these forests; - Confusion over the definition of 'community' and the distribution of forest income can compromise the implementation of a number of activities, among them resource regeneration; - The selfishness observed within these communities can block community forest resource regeneration; - Resource regeneration is not a concern for community forest exploiters.

Source: Literature review and our survey

Box 1: Major Observations about Dense Forest Areas

Industrial logging is a situation of scientific uncertainty that may justify application of the "precautionary principle". The present context of logging has indeed been characterised by a trend towards the economic decline of forests, and a disturbing rapid depletion of biodiversity in forest concessions, owing to selective harvesting, high loss rates and cases of settlement in forest space following the opening of forest tracks.

In Community Forests: problems arise concerning the suitability of management standards to the peculiarities of those forests.

Besides, the elimination of seed dispersers like elephants (*Loxodonta africana*) and Duikers (*Cephalophus spp.*) brings about an ecological succession process tending towards a forest with a different specific composition. Forest clearing, even without human settlement, can result in invasion by bad aggressive plants such as the *Chromoleanaodorata* which hinder the regeneration cycle.

Sustainable exploitation of natural forests, in Central Africa as elsewhere, has a relatively low value production capacity per unit area. Considered strictly in terms of timber production, an industrial tree plantation covering just over 3% of the surface area of a forest concession could produce a volume of timber equivalent to that produced by the remaining 97%.

2.2.2. In Moist Savannah

Table 4: SWOT Matrix for Tree Planting in Dense Forest Areas

<p><u>Strengths</u></p> <ul style="list-style-type: none"> - Small holder farmers have a long forestry tradition; - Agro-forestry techniques are known and applied by the local communities (West and North-West). 	<p><u>Weaknesses</u></p> <ul style="list-style-type: none"> - Livestock husbandry practices are not well attuned to the presence of trees (Adamawa); - Marginal support for research; - Poor mastery of agroforestry techniques, particularly in the Adamawa.
<p><u>Opportunities</u></p> <ul style="list-style-type: none"> - Plantation forestry is profitable and has definite opportunities at national and even global levels (high demand for fuelwood, service wood, timber, transmission poles ...); - The agroforestry potential is tremendous; - The long experience of small holder plantations which used to benefit from technical and financial support from government and international organisations (PAFRA Project); - A vast extension programme envisaged for rural and urban electrification with wooden poles; - Significant need to protect the forest belts of watersheds and fight erosion; - Shrubby pastureland with potential for development. 	<p><u>Threats</u></p> <ul style="list-style-type: none"> - Serious land issues (West and North West Regions due to high population density); - Advanced conflicts between farming and livestock farming; - Usually poor-quality seeds (question of consanguinity); - Livestock breeding practices hostile to the presence of trees, particularly in the Adamawa.

Source: literature review and our survey

Box 2: Major Observations about Moist Savannah

The cattle rearing system is still very extensive. Trees on grazing land are eliminated on the basis of an erroneous cultural belief according to which the breeder still believes that trees and shrubs present a strong challenge to fodder plants. The resource is thus undermined.

The ecological zone is suitable for more intensive fodder production and for an integrated agro-pastoral production system. The future of the area largely depends on the capacity to change today’s breeding system towards an intensive and integrated agro-pastoral production system with an integrated and respected land use plan.

Protection of watersheds, forest belts and all other ecologically fragile zones is a major concern in the area.

2.2.3. In arid savannah

Table 5: SWOT reforestation matrix under arid savannah zone

<p><u>Strengths</u></p> <ul style="list-style-type: none"> - Raising awareness of local communities on the importance of trees; - Local communities, administrative and municipal authorities encourage and support tree planting; - Research and previous experience have helped in identifying and classifying forest species according to their importance (economic, social, environmental, food, pharmacological, etc.); - A number of forest reserves have been transferred to councils. 	<p><u>Weaknesses</u></p> <ul style="list-style-type: none"> - Created forest plantations are poorly monitored; - Forest species have been selected inadequately; - Low involvement of local communities in the creation of plantations; - Locals are not interested in maintaining and protecting joint plantations; - Cases of non-compliance with farming calendars; - Many stakeholders with sometimes limited skills; - Some areas where tree planting portions are created are not secured, and sometimes under contention with locals. (thus, trees are cut down fraudulently); - Houses are constructed on plots located close to urban centres in order to solve problems relating to the growth of urban centre; - Implementation problems on reforestation agreements signed by MINFOF under the current conditions; - Unfriendly environment for the development of private silvicultural initiatives; - Not enough opportunities for some products from fruit farming (mangoes in particular).
<p><u>Opportunities</u></p> <ul style="list-style-type: none"> - A significant need for combatting desertification; - A significant need for restoring degraded land; - A significant need for protecting watershed and fighting against water and wind erosion; - The primary source of energy is fuelwood; - The pasture is shrubby; - There are several trees used for diverse purposes that improve the living standard of locals; - Fruit farming contributes in feeding the population and poverty alleviation; - International Organisations support actions to combat desertification, namely tree planting; 	<p><u>Threats</u></p> <ul style="list-style-type: none"> - Scarcity of water; - Land tenure issues; - There is no legislation on creation of community plantation forests in these areas; - Nurseries are expensive (need for basic infrastructure, absence of arable land to fill pots, etc.); - Land set aside for plantation forests are often very poor; - Overgrazing seriously affects plantation forests; - Bush fires are devastating and difficult to control; - Climate variations and especially drought are a real problem to this area; - Population density is very high, especially in the Far North Region.

<ul style="list-style-type: none"> - There are partnership opportunities with other Sahel countries; - Research findings on plantation forest in this ecological zone are available; - Initiatives of former ONADEF and NGOs in this Zone on forestry and agroforestry must be factored in. 	
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Box 3: Major findings on moist savannah zone

The arid savannah area faces the problem of desertification and land degradation. Thus, it is commendable that tree planting and degraded landscape restoration initiatives are being undertaken. Unfortunately, the success of these initiatives is still very insignificant due to failure to consider the interests of all stakeholders involved at all stages of the tree planting and/or restoration process of degraded landscapes.

Moreover, locals and authorities are sufficiently aware of the importance of the tree in their environment. As a result, several private and public initiatives are being implemented, but their success rate is still far from optimal. These initiatives face challenges, particularly prominent among which are: access to water, protection of planted trees against bush fires and animals.

2.2.4. In forest reserves and reforestation areas

Table 6: SWOT Reforestation Matrix for forest reserves and reforestation areas

<p><u>Strengths</u></p> <ul style="list-style-type: none"> - Forest reserves and reforestation areas have already been gazetted and can be easily secured for reforestation; - There are several reforestation initiatives in these areas that need to be factored in; - Thanks to research findings, there are numerous reforestation species available in these forests; - forest reserves and reforestation areas have significant planted areas where forest stand management and exploitation activities should be carried out, which could create jobs; - Facilities of the former reforestation structure are still available, and can be used by Local and Regional Authorities to support reforestation activities. 	<p><u>Weaknesses</u></p> <ul style="list-style-type: none"> - The current situation of forest reserves and reforestation areas still poses a more serious management problem.
<p><u>Opportunities</u></p> <ul style="list-style-type: none"> - Territorial and ecological representation: forest reserves and reforestation areas are spread over the 10 (ten) Regions and the 3 (three) agro-ecological zones; 	<p><u>Threats</u></p> <ul style="list-style-type: none"> - Local communities have been invading forest reserves and reforestation areas; this problem results from institutional instability (dissolution of ONAREF, ONADEF), which has almost led to the abandonment of these forests;

<ul style="list-style-type: none"> - Biological diversity: these forest units enjoy a high potential in terms of biological diversity; - There is a high forestry and land tenure potential for silvicultural development; - A wide range of prospective uses and actions would be available with the development of these areas; - Projects can address issues ranging from development to exploitation of resources in these reserves; - A wide range of missions available for managers; - A rich source of job creation and growth: a large workforce shall be required to prepare the land (clearing, drilling, laying markers), planting, silvicultural maintenance, logging and marketing of by-products as well as products from plantations, securing, forest fencing, creating forest roads, etc. 	<ul style="list-style-type: none"> - Plantations are destroyed either by shifting cultivation on slash and burn or illegal exploitation; - This situation has been exacerbated by the absence of reforestation structures and shortage of eco-guards; - There is no forest stand management programme in existing plantations and some plantations are exposed to bush fires (savannah zone); - There are portions for Forestry research in some plantations, but research findings are not widely disseminated or popularised; - Some reserves in densely populated areas are under pressure from communities in quest for farmlands (West and North West Regions), or for housing; - The legal status of these forests bars them from easy transfer: changing their initial objectives runs the risk of jeopardising work that has already been carried out there (plantations, enriched plots, etc.).
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Source: Literature review and our surveys

Box 4: Major findings on forest reserves and reforestation areas

Forest reserves and reforestation areas "in principle", cover 731,407 ha, for 17,047 ha of plantation forests. These figures do not seem to reflect the reality on ground, given that the demographic pressure and the absence of a security strategy expose the area to invasion.

It is obvious that 381,508 ha remain under permanent national estate forests, comprising 43 forest reserves and reforestation areas. A surface area of 230,422 ha, representing 14 (fourteen) forest reserves, 4 (four) reforestation areas and 1 (one) Forest Management Unit, were transferred to ANAFOR for the management of these units and the building of its operational capacity, while 151,086 ha were transferred to Local and Regional Authorities within the framework of the decentralisation policy.

In almost all the cases, the management of these forest areas poses a problem. As a matter of fact, drawing up management plans for these reserves (management inventory, mapping, marking and delineation of boundaries, socio-economic studies, environmental impact studies, drafting business plans in connection with the stakes of financial profitability, setting up timber exploitation sawmills, regeneration and conservation, setting up forest arboreta for conservation uses, restoring reserves, securing, developing forest plantation activities, etc.) require technical, human and financial resources that stakeholders involved in the process do not have.

Due, especially, to pressure exerted for fuelwood, forest reserves in the northern part of the country have been seriously degraded. These reserves have been damaged by the constant quest for fuelwood, and their importance has been highlighted in terms of soil protection, mitigation of the negative effects of climate change and carbon sequestration. As a result, these Protected Areas shift to development drivers that must be conserved and sustainably managed for the well-being of the population in general and local communities in particular. Henceforth, their management must comply with appropriate forest exploitation and conservation standards as well as with local management.

2.2.5. Urban forestry

Table 7: SWOT Matrix for urban forestry development

<p><u>Strengths</u></p> <ul style="list-style-type: none"> - Law No. 2004/018 of 22 July 2004 to lay down rules applicable to Councils and Law No. 2004/019 of 22 July 2004 to lay down rules applicable to Regions, specify competences transferred to councils and regions respectively within the framework of the decentralisation process, and place Local and Regional Authorities at the centre of urban forestry; - Trees have already been playing a major role in urban sanitation (draining of swamps); - There are urban forestry demonstration plots in some towns such as Maroua, Kousseri, Bamenda, Makak, Ngoumou, Bertoua, etc; - There are several small companies in major cities that produce ornamental plants or flowers. 	<p><u>Weaknesses</u></p> <ul style="list-style-type: none"> - Buildings do not always comply with urban development plans: most of the areas set aside for green spaces are usually occupied; - Apart from sanitation of some urban areas (tree planting in swamps), creating public gardens and planting trees along streets have not been planned adequately; - In some cities such as Yaoundé, Douala, Garoua, Bafoussam, Bamenda, etc., the development of peri-urban plantations does not take in account the real need in fuelwood; - Local and Regional Authorities fail to fully exercise transferred competences in urban forestry.
<p><u>Opportunities</u></p> <ul style="list-style-type: none"> - A regulatory framework has been drafted to enable the development of urban forestry (8,000 m² of plantation forest per 1,000 inhabitants); - The creation of green spaces is increasingly being considered in urban development; - There are partnership opportunities with other cities in the world (possibility of twinning); - Urban forestry contributes in developing ecotourism (creation of botanical and zoological gardens); - There is need to create green spaces in schools and health facilities in cities; - The creation of tree nurseries and green spaces is likely to generate several jobs opportunities (poverty alleviation). 	<p><u>Threats</u></p> <ul style="list-style-type: none"> - 8,000 m² per 1,000 inhabitants prescribed by law is not respected, and it is particularly difficult to enforce it in old cities; - Small seedling and flower production companies exist, but they do not grow in line with an urban development strategy; - The action of landscape gardeners seems insignificant; - The choice of ornamental species to be planted in public gardens has not been conducted carefully; - The issue of urban forestry highlights the change from forest land to farmland and helps in setting up urban facilities that are likely to negatively impact urban and peri-urban communities.

Source: Literature review and our survey

Box 5: Major observations concerning urban forestry

Reflection on more sustainable cities calls for the development of green spaces whose implementation is regulated by Law No. 94/01 of 20 January 1994 to lay down Forestry, Wildlife and Fisheries Regulations. Indeed, Article 33 of this law stipulates that: - “Urban councils shall respect, in towns, a ratio of at least 800 m² of wooded areas per 100 inhabitants. Such wooded areas may be broken or unbroken.”

However, urban forestry and horticulture related problems are poorly monitored or addressed in the Cameroonian context, which, in the absence of a concerted strategy, limits its contribution to the physiological, sociological and economic well-being of urban society, as well as urban development.

Under decentralisation, the following responsibilities devolve to Local and Regional Authorities, in terms of urban forestry:

- ✓ **For Councils**
 - Reforestation operations and the creation of council woodlands;
 - Development of council environmental action plans;
 - Creating, maintaining and managing green spaces, parks and gardens for common interest.
- ✓ **For Regions**
 - Managing, protecting and maintaining protected areas and natural sites under the region's jurisdiction;
 - Securing and implementing other local nature protection measures;
 - Creating wood, forests and protected areas of regional interest according to a duly approved plan by State representatives;
 - Conducting fire-breaks and early burning, as part of the fight against bush-fires;
 - Managing regional natural parks, according to a plan submitted for approval by State representatives;
 - Drafting, implementing and monitoring regional environmental action plans or programmes.

2.2.6. Forestry research

Table 8: SWOT Matrix for forestry research

<u>Strengths</u>	<u>Weaknesses</u>
<ul style="list-style-type: none"> - The long experience of forest research in Cameroon, dating back before independence; - IRAD and its branches deployed for forestry research in arid savannahs and dense forests; - Research findings applied on flagship forest species within the framework of the former ONADEF, particularly at the level of the Mbalmayo Cutting Park. Other experiments are also conducted by organisations such as IRAD, ICRAF, ITTO, GIZ, University of Yaoundé 1, etc. in dense forest zones; - Setting up of two Agro-Forestry Resource Centres by ICRAF since 1998, to support reforestation endeavours in the North West Region. 	<ul style="list-style-type: none"> - Research is based essentially on forest genetics: seed orchards, cutting parks, production of high productivity clones, but nothing is planned to effectively carry out silvicultural research; - In the past, forestry research focused on species of the dense forest zone and, to a lesser extent, on eucalyptus for the moist savannah zones and does not take into account the arid savannah zone.

<p><u>Opportunities</u></p> <ul style="list-style-type: none"> - Findings from investigations carried out on several issues in the field of forestry and agroforestry; - There are 23 operational nurseries managed by farmers around the Agroforestry Resource Centres set up by ICRAF and in the Bui and Boyo Divisions; - Results of surveys on the behaviour of plants in the Mouda life collection (near Maroua), in connection with forest genetic resources; this collection contains 60 species. 	<p><u>Threats</u></p> <ul style="list-style-type: none"> - Forestry research is under criticism because it is, or has been, disconnected from the reality on ground; - There is no national database that can be consulted in the field; there is shortfall in terms of a coordinated vision and supervision of all forestry research programmes conducted hitherto in Cameroon and there is no evaluation on the relevance of selected themes, findings obtained and their enhancement.
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Source: Literature review and our survey

Box 6: Major observations on forestry research

Cameroon still lags behind most countries at the same level of development in terms of seed supply and nursery capacity. Cutting parks have disappeared or are practically out of use for those that still exist.

Due to the information gap concerning research findings, inadequate communication, raising the awareness of locals and disseminating forestry programmes, potential stakeholders have not been able to effectively master problems relating to the regeneration of the resource.

With regard to the production of plant material, there is need to develop a specific programme for *Ayous*, which accounts for nearly 30% of Cameroon's timber exports. Emphasis should also be laid on species under pressure from logging, especially *Entendrophragma*, and the endangered Moabi in the East Region of Cameroon. Furthermore, species with high added value such as Teak, Eucalyptus, Pines, species producing non-timber forest products with high marketing value, as well as fruit farming should benefit from research support.

The problem of the sustainability of research support and funding should also be taken into account.

2.2.7. Advantages of and limitations to NPFDP implementation

Table 9: NPFDP SWOT Matrix

<p><u>Strengths</u></p> <ul style="list-style-type: none"> - The will and policy instruments (Forestry Law currently under review, and the implementation of the 2020 Forestry and Wildlife Subsector Strategy, Circular Letter No. 2464/LC/MINEF/CAB of 16 July 2001 to lay down conditions for fixing cutting boundaries and 1/30th of the surface area, and forest management standards); - Raising awareness in line with the supply of timber resources and related products have reduced drastically as compared to demand; - The country's target of reducing greenhouse gas emissions by 32%; - The Head of State's commitment during COP21 as well as the target of restoring about 12,062,768 hectares of degraded forests by 2030 within the framework of the African Forest Landscape Restoration Initiative (AFR100); - Savannah area communities have a culture and understand the need for tree planting. 	<p><u>Weaknesses</u></p> <ul style="list-style-type: none"> - Reforestation constraints are more or less the same in all ecological zones of the country; - Weakness of the private sector and private forests; - There is no national strategy for the development of the whole plantation timber sector; - Tendency to systematise the cultivation of some species (fast-growing species); - Inadequacies of the regulatory framework (reforestation and arid savannah management standards, etc.). - Agroforestry, development of private forest plantations, and development of integrated agro-forestry-pastoral systems are not adequately taken into account; - Forest revenue share reinvestment in the conservation of forestry capital is not effective (Forest Fund);
<p><u>Opportunities</u></p> <ul style="list-style-type: none"> - The output of wood in plantations is still higher than in natural forests; - Timber from plantation forests is becoming increasingly important on the international market; - Large, secure plantations can be developed in these areas (CO² programme); - The implementation of the Mechanism for Reducing Emissions from Deforestation and Forest Degradation, Sustainable Management of Forests and Forest Conservation (REDD+), and the development of plantation forests should contribute to meet the goal of reducing greenhouse gas emissions by 32%, set by Cameroon itself, in accordance with the Head of State's commitment taken during COP21; - The vastness of degraded land (more than 12 million ha), and the worrisome situation of mangroves; - The Bonn Challenge initiative. 	<p><u>Threats</u></p> <ul style="list-style-type: none"> - Tree planting for fuelwood purposes is not very often the immediate concern of the community; - Agricultural and pastoral practices that are incompatible with the presence of trees; - Unlike agriculture and livestock, people consider that silvicultural activities should be carried out solely by the State.

Source: Literature review and our survey

Box 7: Major observations serving as basic guidelines for the NPFDP implementation strategy

- The degradation trend of Cameroun's natural forests has worsened more or less, depending on the region. This trend is more prominent in the vicinity of main urban and savannah areas;
- This degradation is mainly caused by human factors which include destruction of forests in some areas in order to increase arable or grazing land, or forest resource over-exploitation for wood as in some parts of the country, where it is the only source of energy for locals, who deplete this forest resource for heating and cooking. All forests suffer this form of over-exploitation, including mangroves.
- People have always considered and continue to consider wood as a free natural resource, just like water, land, etc. As long as natural forests continue to produce wood that can be used as fuelwood, the planting of trees to be used mainly as fire-wood will never be economically cost-effective, neither will it be an immediate concern for locals.
- The failure of resource regeneration initiatives is more related to objectives and implementation actors than to ecological zones.
- Results of previous tree-planting initiatives have been uncertain, due in part to the gap between the level of investment and the very low implementation and achievement rates.
- Planting objectives differ less from ecological zones than from beneficiary interests.
- Endeavours under the forestry sector have mainly been directed towards the management of natural forests and the fight against desertification. Very little attention has been paid to agroforestry, the development of private forest plantations, urban forestry and the development of integrated agro-forestry-pastoral systems, although various planning documents drawn up hitherto lay emphasis on their importance.
- Strategies drafted so far have not taken much into account the participation of local communities and private individuals in the reforestation process.

2.3. Fundamental principles for programme implementation

An analysis of the main observations made above reveals a number of rules that must be respected in order to, at least, avoid the shortcomings that have plagued the implementation of previous initiatives. These rules are presented below and defined as fundamental principles that should guide the implementation of this programme.

Box 8: Fundamental principles for NPFDP implementation

- The implementation of this Programme will prioritise initiatives aimed at compensating the degradation of natural forests, particularly within the vicinity of main urban centres and savannah areas. This will particularly require solving problems relating to local communities, bearing in mind that they are the main cause of natural forest degradation.
- The Programme will have to involve raising the communities' awareness to the fact that wood from natural forests should no longer be considered as a free and inexhaustible natural resource. They must understand that tree planting for timber and fuelwood purposes is an important activity; and they should be reassured about its economic relevance.
- The objectives of the Programme's implementation must take into account the specificities of the country's different ecological zones. Planting objectives must include beneficiary interests of all stakeholders.
- Endeavours must be directed towards the management of natural forests as well as the fight against desertification, the development of public and private plantation forests, urban forestry and the development of integrated agro-forestry-pastoral systems.
- Strategies drafted must closely involve local communities and private individuals in the reforestation process as well as all other stakeholders.
- There is need that all parties involved should understand the importance of concerted effort in the management of natural forest ecosystems, be this in moist or dry tropical areas, in accordance with national policies and the interests of rural communities. It is also essential that rural communities searching for fire-wood, food, fodder and equipment to fabricate their agricultural tools, should create artificial forests in order to reduce the pressure on fragile natural ecosystems.
- Finally, it is necessary that all sectors as well as CSOs should opt for a synergy of action in any reforestation and/or land degradation project.

2.4. Identifying and analysing forestry sector problems with respect to plantation forests

The 2006 NTPP evaluation and SWOT analysis of reforestation endeavours demonstrate that the current level of contribution of plantation forests to resource regenerating does not guarantee in the long term to meet population needs, supply markets, protect and provide ecosystem services, and restore degraded landscapes and lands. The need to apply precautionary principles is much stronger now than ever. Several factors explain the increasing imbalance between the potential and forest resource needs, and the consequences have been felt at several levels. Figure 3 below, referred to as the problem tree, presents the causes and consequences of this imbalance. Figure 4, referred to as the solution tree, transposes the problem tree, formulating proposed solutions for each problem identified.

Figure 3 : Problem tree

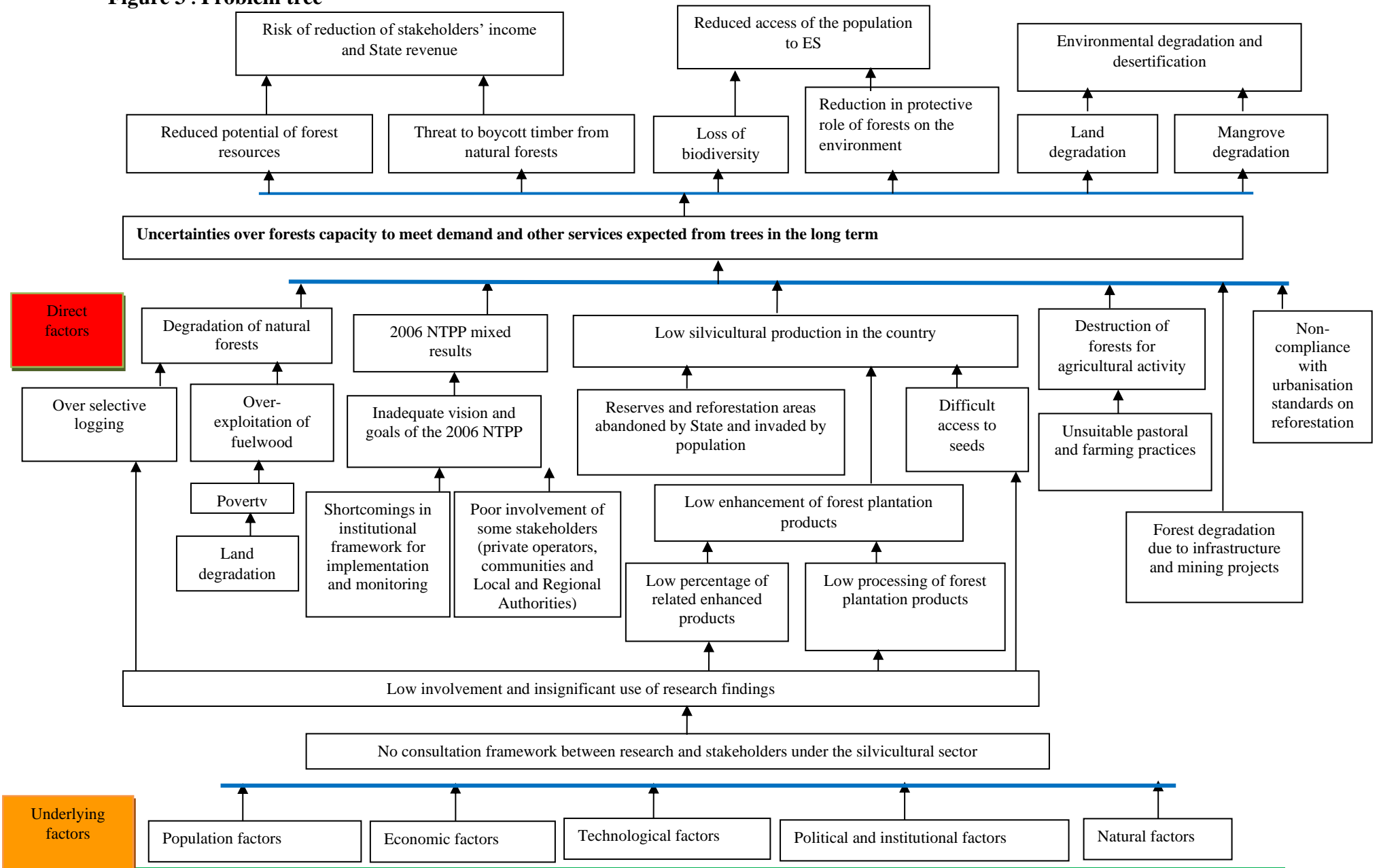
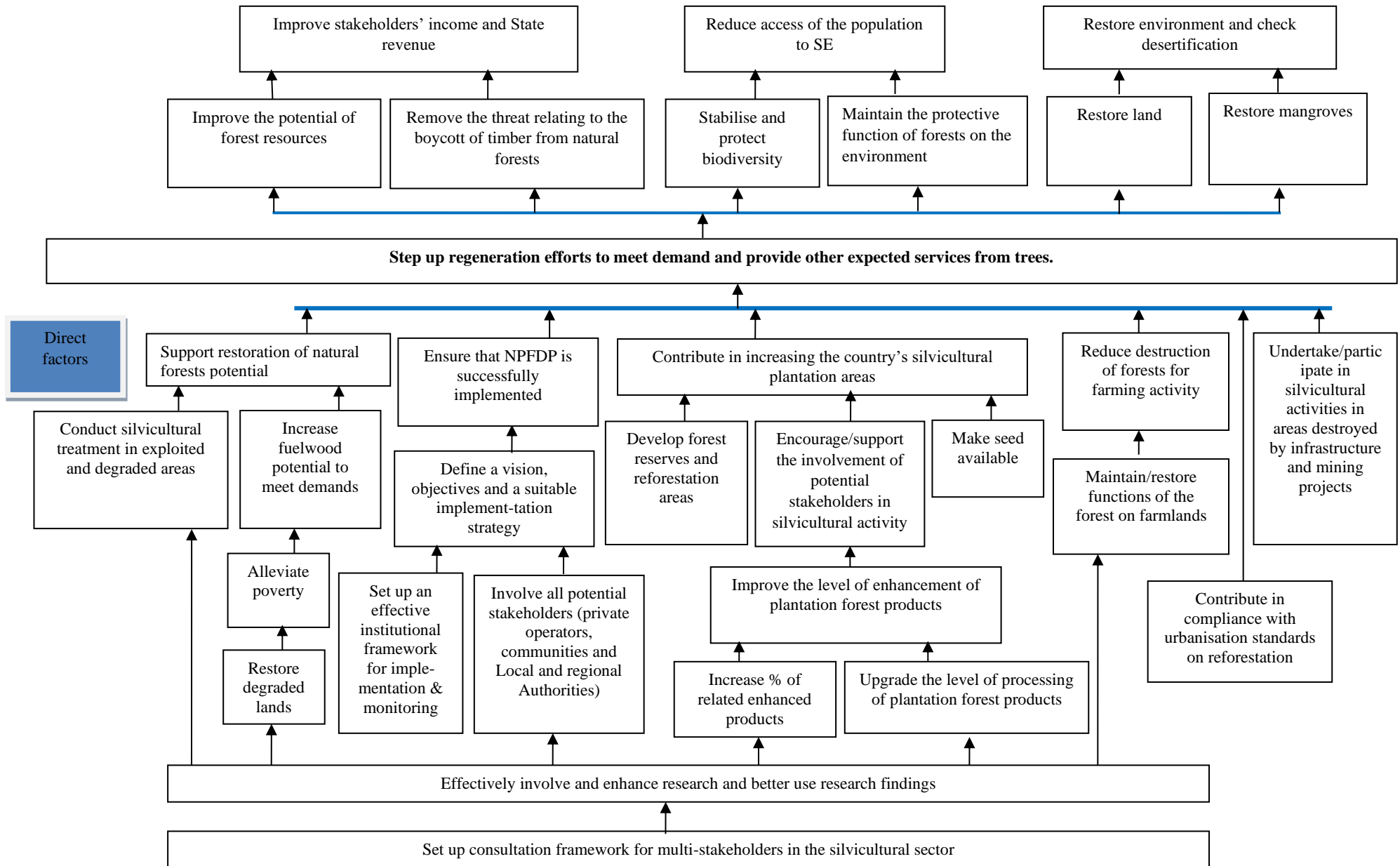


Figure 4: Solution tree (objectives)



3. STRATEGIC OPTIONS FOR PROGRAMME IMPLEMENTATION IN KEEPING WITH THE COUNTRY'S DEVELOPMENT POLICIES

The current global trend is an inclination towards plantation forest timber which is gaining prominence on the international market. Indeed, the model of forest concessions should evolve. This implies increasing productive management methods in areas under greater human pressure, while seeking to maintain the forest cover, acknowledging the important social and environmental services that trees provide. Such a re-orientation should include stakes such as:

- Meeting the demand for timber and fuelwood from plantations;
- Maintaining natural forest areas;
- Maintaining industrial logging concessions;
- Increasing the potentials of community concessions;
- Setting up combined productive and sustainable (agroforestry) systems;
- Increasing productivity per unit area;²
- Increasing the wooded surface area.

3.1. Goal, vision, objectives and expected outcomes of NPFDP

3.1.1. Goal of NPFDP

The 2020 Forestry and Wildlife Subsector Strategy assigns to regeneration and reforestation, the goal to:

- Increase timber potential;
- Slow down the advancing desert;
- Supply fuelwood in cities;
- Increase green spaces in urban areas;
- Safeguard forest gene pool;
- Preserve ecologically sensitive areas and catchment areas.

3.1.2. Vision of NPFDP

The vision of NPFDP is to contribute to increasing the national forest potential and developing a plantation forest economy that should serve as a sustainable alternative to a forest economy based almost solely on natural forests by 2045.

The State is concerned with catching up with the country's lag in the supply of planted forest wood. Indeed, the market share of timber and timber by-products from plantations worldwide have already been estimated at more than 35%. Moreover, the land potential of forest reserves should be developed in order, in accordance with Article 22 of Law No. 94/01 of 20 January 1994 to lay down Forestry, Wildlife and Fisheries Regulations, to contribute to fulfil the ambition of covering at least 30% of the total surface area of the national territory with permanent forests, representing the country's ecological diversity, support the development of new secured plantations in order to increase the share of plantation forest timber in the country's supply, and as well serve as a Carbon sink and an asset in the REDD+ process.

²Study on factoring in of lumber plantation experiences in Côte d'Ivoire; Adzope experiences - Agbo FLEGT project - REDD+ (FFEM) (ATIBT, 2017)

3.1.3. Objectives of NPFDP

3. OVERALL OBJECTIVE: Provide Cameroon with a strategic steering instrument that should help in planning the creation and development of plantation forests, harmonise the roles of all stakeholders while contributing to put in place a friendly institutional environment for private investors, in consonance with other national initiatives as part of the sector and value chain approach.

- **DEVELOPMENT OBJECTIVE:** Enhance the country's forest resource regeneration potential in order to contribute to the well-being of locals by improving their income and living standards.
- **PRACTICAL OBJECTIVE OF THE PROGRAMME:** Promote the growth and exploitation of plantation forests by creating 40,000 ha of forest per year and support stakeholders in the value chain of the silvicultural sector.
- **SPECIFIC OBJECTIVES: These include specifically:**
 - **Specific objective 1:** Increasing timber and non-timber production, services and fire-wood production and enhancing the value of wood products and developing silvicultural value chains;
 - **Specific objective 2:** Rendering eco-system services other than supply (recreation, etc.);
 - **Specific objective 3:** Restoring degraded lands and landscapes;
 - **Specific objective 4:** Supporting research - innovation, training and capacity building;
 - **Specific objective 5:** Implementing the programme coherently, ensuring the inclusion of all social categories from inception to implementation.

3.1.4. Expected outcomes

The following shall be expected from the Programme:

- **Expected Outcome 1:** Production of timber and other produce other than timber, service wood, fuelwood are increased; wood products are enhanced and silvicultural value chains developed;
- **Expected Outcome 2:** Ecosystem services other than supply (recreation, etc.) are provided, and protection of fragile ecological sites and other woodland sites are guaranteed;
- **Expected Outcome 3:** Degraded landscapes and lands are restored;
- **Expected Outcome 4:** Research and innovation, training and capacity building re-enforced;
- **Expected Outcome 5:** The Programme is implemented following a consistency that guarantees attainment of results and the inclusion of all social categories right from inception to implementation.

3.2. Programme axes

The programme comprises axes, each of which breaks down into components, sub-components and activities to make them practical and assess outcomes. The NPFDP has the following four axes:

- **AXIS 1:** Timber production and products other than timber, service wood, fuelwood, enhancement of wood products and development of silvicultural value chains;
- **AXIS 2:** Protection and provision of ecosystem services other than supply (recreation...);
- **AXIS 3:** Restoration of degraded landscapes and lands;

- **AXIS 4:** Research –Innovation – Training and capacity-building;
- **AXE 5:** Institutional set-up, governance and gender-based decision-making process.

3.3. Action mechanisms

The programme shall be implemented through the transition prism *from the managerial approach to the negotiation approach*. According to FAO (2003), transition from *the managerial approach to the negotiation approach*, among other things, allows for:

- integration of forestry development into national development in general and rural development in particular;
- involvement and empowerment of all stakeholders in the process of formulating, implementing and reviewing forestry policies and laws;
- aspects relating to the products value chain shall be decisive. The choice of projects should therefore be made on the basis of the possibility to incorporate the product into an identified sector.

3.3.1. Action Principles

The NPFDP targets all players in the forestry sector. By resituating *Man at the centre of the implementation strategy*, the programme shall aim to increase the wood potential of production forests, contribute in introducing trees into agricultural and pastoral systems, and preserve fragile ecological zones and catchment areas. Thus, the contribution of grassroots stakeholders (local and regional authorities, private individuals, civil society organizations, administrative authorities, community representatives, active forces, etc.) will be a major concern in the implementation strategy. This will be done by:

- Mobilising the various social actors through the structuring and concerted implementation of projects;
- Granting either ANAFOR or forestry companies an agreement to establish and conduct field monitoring operations in plantation forests, following a public tendering procedure;
- Supporting the establishment and development of wood processing units for planted forest wood and products from standing timber;
- Selecting and supporting the implementation of projects for the creation and development of council, community and private plantation forests/agroforests, development of green spaces in urban areas and restoration of degraded lands;
- Producing and distributing seedlings by ANAFOR, and supporting the establishment of private nurseries in areas not or little covered by ANAFOR;
- Supporting research and innovation, forestry training and capacity building for sector actors in order to provide the sector with quality staff with regularly updated knowledge, and the provision of nurserymen with quality seeds.

The activities carried out within the framework of the implementation of this programme shall be primarily structured around projects and micro-projects. These projects and micro-projects will vary depending on the needs of the target and according to the agro-ecological zones. In this regard, the

participatory approach will allow the involvement of beneficiaries at all levels, especially in the identification of their needs.

The success of such a programme depends very much on the involvement of grassroots actors (regions, councils, communities, civil society organisations and private operators). Measures must therefore be taken so that:

- Beneficiaries, in particular grassroots actors themselves, identify, develop and state their projects/micro-projects on the basis of their interests;
- Mechanisms for selecting funding beneficiaries offer guarantees of transparency and ensure project/micro-project profitability and efficiency;
- A mechanism for monitoring and evaluating the programme is put in place to report on its progress and the achievements made. This mechanism should be so designed as to guarantee the participation of all stakeholders, with priority given to the community as the final beneficiaries.

3.3.2. Basic principles for selection of projects and micro-projects submitted by grassroots actors

The selection of beneficiaries as well as the criteria for approval of projects and micro-projects will be guided by the principles of transparency, equity and social justice:

a) Eligibility criteria

To be eligible, the following conditions must be met:

- The project/micro-project implemented must belong to beneficiaries (council, community, Association, CIG, group of foresters, cooperative, private operators, etc.) identified beforehand and they must be involved at all levels in order to ensure long term transferability of operations. They must also have been active in the forestry sector for several years.
- Applicants must be holders of a title deed on the space dedicated to the plantation and provide all guarantee that this space will not be subject to a change of use.

b) Simplicity and transparency:

Procedures must be transparent and controllable, as well as simple and efficient, while being flexible enough to allow contracts to be signed with multiple operators (Associations, NGOs, POs, private individuals, etc.).

c) Gender equity

It is important to take into account gender concerns in order to ensure maximum equity, to ensure the participation of women, young people, the disabled and other disadvantaged groups in a meaningful and visible way, in all phases of the micro-projects cycle.

3.3.3. Basic principles of project and micro-project financing

Ownership of the programme by beneficiaries, their direct participation and their empowerment will condition the financing of projects and micro-projects. The conditions for beneficiary participation will be defined in a procedures manual. The projects and micro-projects to be financed must meet the needs of beneficiaries and be designed by them or at their request and must be oriented towards a previously

identified processing sector. Their participation in the development and future maintenance of projects and micro-projects must be guaranteed.

3.4. Strategy for implementation of various components

The NPFDP is intended as a unifying programme for the various tree planting initiatives and the creation of plantation forests throughout the national territory. It is structured into axes, components and sub-components as follows:

3.4.1. Axis 1: Timber production and products other than timber, fuelwood, enhancement of wood products and forest value chains development (30,000 ha/year)

The Problem: The Growth and Employment Strategy Paper (GESP) identified the timber sector as a sector with high potential for job creation and economic growth. An industrialisation plan was drawn up which aims to increase industrial activity in this sector, in particular by increasing forest harvest in accordance with the principle of sustained yield, restricting exports of timber in the form of logs and increasing processing both at the level of primary processing and at the level of Enhanced Wood Processing Products (EWPP).

The GESP aims at the further development of EWPP. EWPPs, also known as secondary and tertiary wood processing products and value-added wood products, have long been identified as an objective for the development of the tropical wood sector in Africa by bodies such as the International Tropical Timber Organisation (ITTO), the Inter-African Forest Industries Association (IFIA), the Food and Agriculture Organisation (FAO) of the United Nations, the International Tropical Timber Technical Association (ATIBT) and many other regional organisations (African Timber Organisation-OAB), sub-regional (Central African Forests Commission-COMIFAC) and national (Associations, Groups and Unions of industrialists). This theme is also the subject of axis 5122 of the COMIFAC convergence plan: *Promoting enhanced wood processing and the use of advanced technologies*.

Yet Cameroon's natural forests are on a more or less steep trend of decline depending on the region, in terms of surface area and in their potential and value in timber or service wood. This trend becomes more evident as one approaches the main urban centres and in savannah areas. For the country's industrial aspirations to be sustained, the forest potential needs to be stabilised and even improved.

Objective: Develop and structure the value chain of forestry products by establishing 20,000 ha of plantation forests for timber products, and 10,000 ha of plantation forests for products other than timber, construction wood and fuel wood, support the enhancement of timber products and the development of forestry value chains. This initiative can function following an integrated and structured system that should involve developing commercial plantation forests with « reforestation » species which have a short rotation period but have a high technological and commercial value.

Achievements in terms of availability of land for forest reserves and reforestation areas can be used to support the implementation of this axis of the programme. The land available spans close to 381,508 ha, comprising 43 forest reserves and reforestation areas; 151,086 ha transferred to Local and Regional Authorities as part of the State's decentralisation policy; and 14 forest reserves, 4 reforestation areas and 1 Forest Management Unit transferred to the National Forest Development Support Agency (ANAFOR).

The aim is to develop these structures and strengthen the functional capacity of this surface area measuring 230,422 ha.

3.4.1.1. Component 1.1: Timber production on 20,000 ha

The Problem: In Cameroon, timber production supplies the formal wood-processing industry as well as a broad informal sector. This production relies almost exclusively on natural forests. Since the development of the 2006 NTPP, the country has been aspiring to implement a coherent sustainable development strategy around plantation forests, through a process that begins with the seed and ends with the processing of plantation forest products, and by setting up a domestic market for timber and by-products from plantation forests. Unfortunately, this ambition has been slow in taking shape due to the difficulties encountered in the implementation of this important government programme and other resource regeneration initiatives. Meeting this aspiration requires:

- Developing a value chain for timber products, and
- Developing a value chain for by-products of standing volumes.

Objective: Develop and structure the value chain of forest products by establishing 20,000 ha of plantation forests for timber products.

3.4.1.1.1. Sub-component 1.1.1: Creation of timber production plantations

The Problem: Cameroon is blessed with a rich and diversified ecological and plant potential with over 600 species, 300 of them marketable in the form of timber of which about 60 only are exploited (FAO 2005). The country's timber production relies mostly on natural forests and mainly concerns five regions ranked as follows in terms of taxation: East, South, Centre, South West, Littoral and, to a lesser extent, the West Region. The regeneration capacity for exploited forest species remains largely unknown. Thus, timber production from natural forests does not guarantee that it can indefinitely meet the needs of the population and industries. As a result, the productivity and economic profitability of the timber sector will be threatened in the long term. Timber production in Cameroon is therefore seen as "high-risk" exploitation and must be substituted by an exploitation based on regeneration capacity as offered by plantation forests.

Activities:

- Surveying the Market and choosing species;
- Conducting an environmental and social evaluation of rehabilitation plan for reserves and reforestation areas;
- Designing and implementing a securing device for reserve lands and reforestation areas;
- Identifying and implementing a gazetting plan for substitute lands for completely invaded space;
- Monitoring development activities (nursing, planting and catering) in forest reserves and reforestation areas,
- Supporting development of reserves and reforestation areas under ANAFOR's care,
- Supporting activities of concession holders and to the reconstitution of Community forests.

Substitute lands must be gazetted in accordance with Law No. 94/01, which stipulates in Section 28- (1): A State forest may be declassified under conditions laid down by decree. (2) No forest may be completely or partially declassified unless a forest of the same category and equivalent area in the same ecological

zone has been gazetted.

3.4.1.1.2. Sub-component 1.1.2: Creation of plantations for production of construction wood

Timber and construction wood are obtained from virtually the same forest species. The difference is only in the use that is made thereof. As such, what applies to timber as presented above also applies to construction wood. Production targets should simply be set with respect to the intended use of the final product.

3.4.1.1.3. Sub-component 1.1.3: creation of pole production plantations

Objective of production: Circular Letter 0059/C/MINFOF/CAB of 21 April 2016 on the harvesting of poles in national estate, restricts the production of poles in those areas. The market for poles is an essential and growing market in our country. This circular thus offers an opportunity to be seized under this programme for poles from plantation forests. The idea is to set up plantation forests devoted to pole production.

Activities:

- Surveying the market and selecting species;
- Choosing the site, setting up the plots;
- Carrying out silvicultural treatment in order to produce poles;
- Managing plots.

3.4.1.1.4. Sub-component 1.1.4: Creation of fuel/fire wood production plantations

In Cameroon, it is estimated that 83% of the population depends on woody biomass as a source of energy and, in rural areas, it is sometimes the only source of energy available. Annual fuelwood consumption in Cameroon is estimated at 2,203,496 tons and 356,530 tons of charcoal. All this gives a turnover estimated at 188.33 billion FCFA per year (CIFOR Report, 2013). This large market, where fuelwood supply is largely from wood from natural forests, causes a considerable scarcity of the resource, especially in savannah areas. The development of this activity should be an essential component of the programme. This sub-component will focus on setting up plantation forests devoted to the production of fuelwood.

Activities:

- Surveying the market and choosing species;
- Supporting the production of seedlings;
- Setting up and managing plots;
- Monitoring management operations, especially in community forests.

3.4.1.2. Component 1.2: Manufacture of industrial products other than wood (5,000 ha/year)

The Problem: Non-timber industrial products have the dual advantage of being economically very profitable over a long period of time while preserving tree capital. Secondly, the tree that remains standing will continue to provide other ecological services. This asset has not been sufficiently enhanced due to the difficulties encountered in the implementation of government forest resource regeneration programmes. However, it would help achieve the economic results expected from the plantation forestry activity.

Objective: Establish 5,000 ha of plantation forest per year, for products other than timber, service wood and fuel wood.

Activities:

- Surveying the market and choosing species;
- Conducting an environmental and social evaluation of rehabilitation plan of reserves and reforestation areas;
- Monitoring development activities (nursing, planting and catering) in forest reserves and reforestation areas;
- Surveying the sector highlighting all ecological services (CO² sequestered)
- Giving environmental education to local communities.

3.4.1.2.1. Sub-component 1.2.1: Resin Production (latex, etc.), alcohol, pulp (Trituration/Cellulose), etc.

The Problem: Wood products such as resins (latex, etc.), alcohol, pulp (trituration/cellulose), etc. are important industrial raw materials. They are strategic raw materials for both developing and industrialised countries. Given the advantages of these products, the creation of plantation forests devoted to the production of these products may be seen as a huge financial opportunity for smallholders on one hand. On the other, it is an essential means of strengthening the wooded capital through the standing tree. The country has a number of plantations such as SAFACAM, HEVECAM and CDC which invest in these productions, sometimes with components that contribute in promoting smallholder plantations. Financial and socio-political crises have slowed down the activities of some of these plantations. It is advisable to take initiatives to strengthen these sectors so that the country can develop them to their full potential. This is especially so as, given the immediate profitability of such plantations, accessing funding would be easier.

Activities:

- Choosing plantation site;
- Producing seedlings in a community nursery;
- Surveying the sector highlighting all ecological services of the project;
- Recruiting and training local labourers to do the job;
- Designing a management plan;
- Setting up and managing plantation plots;

3.4.1.2.1. Sub-component 1.2.2: Production for agribusiness systems

The Problem: Many examples of plantation forests targeting agribusiness systems effectively contribute in sustainable development by securing land, stabilising families, diversifying income and fighting erosion (a particular case in point is cashew nuts which are increasingly gaining value in tropical countries. One of the main causes of the difficulties encountered in implementing previous forest resource regeneration initiatives has been failure to take into account the interests of locals. The social sustainability of the activities of this programme will closely depend on its capacity to take into account the interests of communities living in the vicinity of activity sites, an essential aspect of which is production for agribusiness systems.

Activities:

- Choosing species to be introduced;
- Choosing a suitable agroforestry system;
- Monitoring all operations involved in setting up forest plantations (choice of site, site preparation, planting, care, enhancement etc.);
- Protecting and securing plots against bush fires and animals.

3.4.1.2.2. Sub-component 1.2.3: Bamboo/rattan Production

The Problem: The socio-economic importance of bamboo and rattan is no longer debatable for countries like China, where this non-timber resource is an integral part of culture and civilisation. Today, the bamboo industry plays a major role both in the growth of the country's GDP and in social cohesion, given the millions of jobs it generates. These two products have a high market and spiritual value, which allows them to inject substantial income into the country's economic system.

According to the International Network on Bamboo and Rattan, both plants are gaining ground worldwide. Bamboo actually captures twice as much carbon as trees, which is an advantage for environmental conservation. Indian bamboo in particular is used for the restoration of degraded ecosystems. Bamboo is a short-cycle species that regenerates quite easily.

With a view to enhancing and capitalizing on the growing importance of these plants, the Cameroon government is developing initiatives to improve their value chains. However, the results still fall short of expectations. Incentive measures need to be taken within the framework of the PNDPF to help meet this challenge.

Activities:

- Surveying the sector highlighting all ecological services of the project;
- Monitoring all operations involved in setting up Plantations Forests (site choice, site preparation, plantings, care, enhancement, etc.);
- Securing and protecting plots;
- Designing a management plan.

3.4.1.3. Component 1.3: Products other than wood for human needs (food, pharmacopoeia, culture...) and animal feed (cattle) (5,000 ha/year)

The Problem: In arid areas, plant contribution to food and therapeutic treatments for rural communities is very highly recognised. About 350 plant species have been identified in Cameroon's dry areas and provide essential products such as medicinal substances, oil, nuts, resins, fibres, fodder, vegetables and, of course, fruit. (Tchigankong D. et al., 2017).

Moreover, contrary to certain preconceived ideas, the tree is neither a physical nor a physiological obstacle to crops. Rather, it is a valuable support! Trees protect crops and provide shade and comfort for animals, as well as extra fodder, improving soil quality and its water storage capacity.

The most useful and vital species in terms of human nutrition (baobabs, neres, karites, as well as the argan tree north of the Sahara) are subject to specific projects (Gouwakinnou et al., 2009; Bellefontaine, 2010; Raebild et al., 2011; Noubissié-Tchiagam et al., 2011). Most of the other less valued species are

endangered. Measures need to be taken to safeguard these biodiversity assets and this programme could afford a historic opportunity in this respect.

Activities

- Surveying the sector highlighting all ecological services of the project;
- Monitoring all operations involved in setting up Plantations Forests (site choice, site preparation, plantings, care, enhancement, etc.);
- Securing and protecting plots;
- Designing a management plan.

Production objectives: The practical objective is to set up 5,000 ha of plantation forests each year, devoted to non-timber products for human needs (*food, pharmacopoeia, culture...*) and animal feed (*cattle*).

3.4.1.3.1. Sub-component 1.3.1: NTFPs Production (4 000 ha/year)

The Problem: NTFPs are defined as items of biological origin (vegetables: including plants and mushrooms; and animals: including forest meat, insects and fish), other than timber, derived from forests, other woodlands and other non-forest trees such as saffron and cola nut trees. NTFPs exclude the exotic forest products that are exploited today and which are found in their natural state in the forests of the Congo Basin, such as rubber (*Hevea brasiliensis*) and quinine (*Cinchona spp.*).

Estimates of the contribution of NTFPs from plants to the Cameroonian economy include special products such as prunus, ebony, Gnetum and wild mango - products targeted by the forest administration which aims to regulate their exploitation for commercial purposes. The exploitation of NTFPs requires low investment compared to timber. They are of substantial economic importance to the communities concerned and over ten of them contribute significantly to export earnings. The value of exports has been estimated at around CFAF 12 billion a year, while the overall value of NTFPs marketed annually is around CFAF 17 billion. Given the economic, social and cultural importance of some of these products, it is expedient that the efforts made should go beyond quota measures and that the cultivation and enhancement of these plant species should effectively be included in forest resource regeneration initiatives. This matter ought to be given serious consideration within this programme.

Activities

- Choosing species from among major NTFPs;
- Surveying the market and the industry of major NTFPs;
- Monitoring all procedures for setting up plantations;
- Organising and structure stakeholders of NTFP industry;
- Designing and implementing a promotion and production plan for major NTFPs;
- Supporting the processing and marketing of NTFPs;
- Contributing to improve the legal framework of NTFPs.

3.4.1.3.2. Sub-component 1.3.2: Production of fodder trees (1,000 ha/year)

The problem: A number of trees produce fodder that is palatable to animals. Often it is the leaves and pods or even fruit. Some of these trees have permanent foliage which supplements feed for goats, cows

or sheep during the dry season period when grass fodder becomes scarce. As agroforestry management reintroduces trees into agricultural and livestock farming systems in an informed manner, it could help adapt exploitation to climate change by contributing to soil fertility and extending grazing periods, improving animal health, diversifying fodder production, and providing direct economic value through wood. These tree benefits have received little enhancement in most of the country's livestock farming areas owing to a misguided cultural mindset by which livestock farmers remain convinced that trees and shrubs still compete strongly with fodder plants. The resource is thereby depleted. Under this project, efforts must be made to better integrate trees into livestock farming systems.

Activities

- Choosing the sites;
- Drawing up and implementing a promotion and production plan for fodder trees;
- Training and involving actors in fodder tree production activities.

3.4.1.3.3. Sub-component 1.3.3: Production of Pharmacopoeia products and active properties of plants

The Problem: The various parts of some plants (roots, trunk, bark, leaves, sap, seeds) are harvested for therapeutic purposes and, in the African traditional pharmacopoeia, they are used to prepare a number of medicines and for other benefits for local communities and animals. It is these multiple uses that highlight the close relationship between these plants and Man in some parts of the country. Unfortunately, many of these forest species are increasingly depleting or even going extinct, owing to overexploitation and, even more so, to the absence of a focused conservation and protection strategy. This situation can be reversed if within the NPFDP a sub-component could be particularly devoted to forest species with proven importance in pharmacopoeia and those renowned for their active properties.

Activities

- Making an inventory of plants that provide pharmacopoeia items and active substances;
- Drawing up and implementing a plan for the protection and promotion of the plants.

3.4.1.4. Component 1.4: Development of silvicultural industry value chains and related value chains as a driving force for forest regeneration

The Problem: Generally speaking, Cameroon, like other countries of the Congo Basin, continues to be a reservoir of tropical logs for importing countries, mainly Asian countries, especially China. Historically, logs were mostly destined for the European market (mainly France, Germany, Italy, Portugal and Spain). However, since the beginning of the 2000s, China has been monopolising the bulk of log imports, while most of the tropical sawn timber from the countries of the Congo Basin has been directed towards the European market. Cameroon has for long banned log exports of high grade wood, excepting *Ayous* and sundry wood, which are allowed to be exported in logs.

Also, many non-timber products can be harvested from standing trees. This could be fruits and nuts, resins, roots, bark...). The economic, social, cultural and environmental importance of these products is already a proven. The value chain of any product is the recipe for the wealth of nations. The richest countries are those that give added value to everything they produce. For instance, some studies have reported that "African countries supply 75% of the world's cocoa production, but earn less than 5% of

the \$120 billion annual profits made from the chocolate market". Value chain development offers an opportunity to increase and diversify income from the exploitation of planted forests. But this can only be achieved by planting species selected on the basis of expected products and promoting their processing. This will involve promoting the development of "*silvopoles*" which should be the outcome of a consistent connection of the various links mentioned above.

Objective of the component: Promote the enhancement of plantation forest products and the development of related value chains, by directly supporting operators involved in the implementation of such initiatives.

Activities

- Defining and propagating the conditions for public authorities' assistance to operators involved in the implementation of initiatives to develop value chains for plantation forest products;
- Selecting and providing direct support to projects with a high potential for processing the products of forest plantations.

3.4.1.4.1. Sub-component 1.4.1: Wood value chains development

The Problem: Timber enhancement is the result of processing, which generally takes place at four levels, in accordance with Decree N° 0353/D/MINFOF of 27 February 2012 to categorise Processing Units and determine the degree of processing for wooden products. Primary processing takes place after harvesting and includes cutting, peeling and sawing of the logs. Secondary wood processing involves drying, producing finger-jointed and hydraulic timbers (BMR, BHA), and profiled wood (panelling, parquet flooring, plies, decks, etc.). Tertiary transformation, on the other hand, incorporates the production of wood briquettes, glued panels, chipboard, plywood and gadgets. Finally, there is a fourth level of processing that takes into account the manufacture of finished products such as frames, furniture, doors, windows and any other finished and/or readily usable product. All these processing levels must be enhanced for greater profitability of the country's plantation wood.

Objective: Support the setting up and development of primary and secondary Processing Units for plantation wood.

3.4.1.4.2. Sub-Component 1.4.2: Development of value chains for standing trees

Industries associated with NTFPs have been affected by unclear and ineffective regulation. This has made it difficult to develop them to their full potential. Significant effort is, however, being made to develop the NTFP sector, by developing modern exploitation techniques for some of them. Further efforts will still be commendable within the framework of this programme to help clear such barriers.

Objective: Support the setting up and development of Processing Units for plantation wood products.

Activities:

- Contributing to develop modern exploitation methods for high-value NTFPs;
- Contributing to improve sector regulation;
- Offering material support to Processing Units.

3.4.2. *AXIS II. Protection and provision of ecosystem services other than supplies (recreation...)* ***(5,000 ha/year)***

The Problem: Ecosystems, especially forest ecosystems, provide many services referred to as ecological services or ecosystem services. Ecosystem services are benefits that humans derive from ecosystems, some of which are vital for life (e.g. pollination). They are generally classified as common and/or public assets. Ecosystem services make human life possible, for example the supply of nutritious food and clean water, disease and climate regulation, contribution to crop pollination and soil formation, and provision of recreational, cultural and spiritual benefits. Ecosystems offer the world four types of services:

- Supply services: material benefits derived from ecosystems, such as food supplies, water, fibres, wood and combustibles. N.B: this service is not a subject of concern under this axis;
- Regulatory services: benefits derived from the regulation of ecosystem processes, for instance, regulation of air quality and soil fertility, combatting floods, illnesses or even crop pollination;
- Support services: necessary for the production of all the other ecosystem services; this involves, for example, providing plants and animals with living space, allowing for species diversity and conserving genetic diversity;
- Cultural services: non-material benefits that people derive from the ecosystem such as aesthetic inspiration and, in the field of engineering, cultural identity and spiritual balance.

Given the importance of forest ecosystem services, especially for communities in the dry and wet savannah zones of our country, it is evidently clear that forest degradation in these areas and the resource regeneration difficulties are highly detrimental to those communities. It is thus advisable to take measures within this programme to address these concerns.

Objective: increase ecosystem services of plantation forests to the communities by developing river banks, watersheds, water catchments and mangroves, and by developing urban forestry by 5,000 ha each year.

3.4.2.1. Component 2.1: Development of river banks/ watersheds/water catchments, soil protection and restoration (3000 ha/year)

The Problem: Forests hold the greatest proportion of rain water which is absorbed or sinks, restoring the water table (almost ten times more than grassland; it is even more effective than tilled land).

Forest decline (especially on slopes) provokes landslides, avalanches and mudflow, thus increasing turbidity and river pollution. This is detrimental to aquatic plants and fish stock, right down to estuaries and beyond.

Deforestation causes unstoppable, and increasingly costly and devastating overflows, floods and mudflow. The inevitable sediments carried off and polluted during transportation by water must be painstakingly picked. Indeed, they pose management problems right to the river mouth and into the sea where they worsen the dead zone phenomenon. Running water sweeps along soil which ends up on the river bed or mouth. Thus jammed, the riverbed expands, further worsening floods and causing deadly mudflows.

These phenomena, disastrous to the population and the country, are particularly frequent in the Adamawa Region of Cameroon, and in the plateaux of the West and North West, with their highly uneven topography. Measures will have to be taken under this project to fight these phenomena.

Objective: Create 3,000 ha of plantation forests each year, devoted to the development of banks/watersheds/water catchments, as well as soil protection and restoration.

3.4.2.1.1. Sub-component 2.1.1: Protection of River Banks

The Problem: Some lakes and rivers around the country are degraded as a result of human-induced eutrophication owing especially to the presence of blue-green algae, sedimentation, contamination by toxic elements, the introduction of exotic invasive species (in the buffer zone), water acidification and soil erosion.

It is recommended that as part of this programme, trees be planted to maintain an appropriate buffer zone to improve water quality and wildlife habitats around and along the lakes and rivers.

Activities:

- Identifying sites that can be developed;
- Drafting management projects;
- Implementing and monitoring development projects.

3.4.2.1.2. Sub-component 2.1.2 Erosion Control

The Problem: Erosion is the movement of ground material from their site by water, wind and soil tilling tools. In all its forms, erosion is a threat nationwide, and to other works such as roads. If well managed, forests are the ideal place for soil restoration. Indeed, humus fixes many heavy metals and pollutants (including natural eutrophying agents) in its clay-humus complexes. Forests check run-off, thus facilitating infiltration into the water table. Water filtered by alluvial forests is purified: 30 metres of riparian forests hold practically all the agricultural nitrates. Having seen the role of forests in fighting erosion and, by extension, protecting soils, the creation of plantation forests in areas that could suffer erosion should go a long way to fight it. It will thus be wise to create a subcomponent devoted to this activity within this programme.

Activities

- Identifying the site exposed to effects of erosion;
- Selecting anti-erosion species;
- Drawing up a site protection plan;
- Implementing the plan.

3.4.2.1.3. Sub-component 2.1.3: Protection of watersheds

The Problem: With population growth, many watersheds across the country are exposed to human activity especially upstream, which causes a significant increase in the sediment load of rivers and lakes downstream and the degradation of the environment and its resources, seriously undermining any use of the latter. This situation has led to scarcity of water resources due to pressure exerted by increase in demand as a result of population and economic growth, the deterioration of water quality, the exhaustion of underground water and a drop in the capacity of dam reservoirs due to silting.

The protection of watersheds, forest belts and all other ecologically fragile areas is a huge challenge, especially in the moist savannah areas of our country.

Watershed development is the coordinated implementation of a set of multidisciplinary and related activities aimed at building conservation and socioeconomic infrastructure in a bid to provide the inhabitants of a given area, drained by the same natural outlet (rivers, gully, etc.), the means to rationally use the natural resources around them to meet their main needs while protecting the same for the well-being of current and future generations

Activities: For each watershed identified, this shall involve devising and implementing a mechanism to protect both the environment and its resources. It will therefore be necessary to:

- Adopt an overall vision of difficulties encountered by considering groups of individual and collective plots (association, groups, etc.) as grassroots intervention units, defined based on local technical and sociological criteria.
- Set up a solid training mechanism for locals in order to arouse their interest in active and sustained participation in the planning, development and sustainability of the watersheds. This will require dialogue with all stakeholders concerned such as producers, local representative organisations, NGOs, the private sectors, public authorities, etc.).

3.4.2.1.4. Sub-component 2.1.4: Protection of water catchment (2,000 ha/year)

The Problem: A potable water catchment is a drinking water collection device (passively or using pumps) that helps collect water naturally from the ground (natural spring), or from the water table, rivers, natural lakes or dams.

Some water catchment areas in our country are vulnerable, especially due to human activities around them. In fact, since the soil is not completely impermeable and there could be leakage along or close to wells, pollutants can easily contaminate potable water networks (dissolved pollutants circulating by capillary action or dissolved in water), thus affecting drinking water. Furthermore, planting trees around catchment areas could help create a buffer zone for these areas. This should justify the inclusion of this sub-component in the programme.

Activities:

- Identifying possible watershed development sites;
- Drafting development projects;
- Supervising the implementation of development projects.

3.4.2.2. Component 2.2. Urban and peri-urban forestry development (Greening of urban and peri-urban landscapes) (2 000 ha/year)

The Problem: If well planned and managed, cities could be very pleasant places to live in. However, many urban development programmes are wreaking ecological havoc - ultimately causing problems such as urban "heat islands", floods, and atmospheric pollution with harmful effects on both communities and the planet. While communities are affected through a deterioration of their well-being, the planet suffers an increase in the emission of greenhouse gases and other waste as well as the degradation of land and rivers (FAO, 2018).

Thinking about more sustainable cities calls for the development of green areas. Cities need forests. A network of woodlands, tree clusters and single trees within and around a city plays a wide range of roles such as regulating the climate, carbon sink, eliminating atmospheric pollutants, reducing the risk of floods, contributing to food, energy and water security and improving not only the physical but also the mental health of city dwellers. Forests beautify cities and are crucial for social cohesion; they could even help reduce crime.

The United Nations and other bodies have long recognised that uncontrolled urban growth could cause poverty and inequality, and create global social and environmental problems. More recently, the Sustainable Development Goals (SDGs) clearly identified the need for sustainable urban cities with a view to "ensuring that cities and human settlements are inclusive, safe, resilient and sustainable". Today, forests are increasingly considered a vital part of this equation with many international organisations like the FAO currently supporting countries and other local authorities to better include forest issues into city governance.

In 2015, sustainable urban development was also at the centre of two major global development agreements endorsed by the international community: Agenda 2030 for Sustainable Development and the Paris Agreement on Climate Change. Drawing on the Millennium Development Goals (MDGs), Agenda 2030 (which encompasses 17 SDGs) urges countries to harness their efforts and eliminate all forms of poverty, fight inequalities and climate change, while ensuring that nobody is left behind. Agenda 2030 acknowledges that the sustainability of cities is an essential component of sustainable development and thus includes a specific goal on urban development (SDG 11): "ensuring that cities and human settlements are inclusive, safe, resilient and sustainable".

The challenge for future cities is therefore to successfully reconcile urban growth with the protection of natural spaces within and around cities. Countries are increasingly aware of these challenges and are thus taking measures to check the growth of their cities. This will entail creating Urban and Peri-urban Forests (UPF).

The design of UPF should take into account different aspects from an individual tree to a forest spreading across the entire city (FAO, 2017). It should further ensure² that structural, functional, ecological, landscape, social and cultural requirements are met to guarantee multi-functionality. Amongst structural requirements, the morphology of species (such as trees, shrubs and grass) and their distribution in the available space should be considered with a view to creating environments with a variety of vertical structures. Also, species should be selected in such a way as to enhance certain ecosystem functions. Tree size, lifespan and growth patterns are other areas for consideration (Gustavsson, 2002). A variety of species with different structures and functions and occupying different ecological niches curb the risk of widespread tree mortality in case of any specific threat and could also reduce any need for tree maintenance.

The creation of green areas in Cameroon is governed by Law N° 94/01 of 20 January 1994 to lay down Forestry, Wildlife and Fisheries Regulations. Under Section 33, "In towns, urban councils shall respect a ratio of at least 800m² of wooded area per 100 inhabitants. Such wooded areas may be broken or unbroken". The issue of urban and peri-urban forestry remains either poorly monitored or mastered in

Cameroon. Thus, the lack of a concerted strategy undermines its ability to contribute to the physiological, sociological, and economic well-being of urban societies and urban development.

Objective: Support the establishment or restoration of UPF (greening of landscapes) in every council in the country by establishing 2000 ha/year of plantation forests. This will entail establishing or restoring Council forests, green belts around cities and ecotourism sites in cities.

3.4.2.2.1 Sub- component 2.2.1: Creation/ restoration of Council woods

The Problem: To meet the demand for green areas, LRAs in the country have developed forest areas in cities and transformed them into urban "parks" with more emphasis on their recreational function than their production capacity. This is, for instance, the case with the 'Bois Saint Anastasie' in Yaounde. Nevertheless, such initiatives are rare in our country as the size of this infrastructure is not sufficient to meet the needs of cities. This programme shall take measures to help LRAs bridge the current gap. This sub-component thus aims at working in collaboration with LRAs to implement projects to establish and restore Council forests. The projects could focus on:

- Implementing greening activities (green areas) in cities in compliance with urban planning standards representing 800 m² for 1,000 habitants (Section 33 of the Forestry Law),
- Creating leisure gardens in urban areas (one leisure garden for a city of more than 50,000 inhabitants).

Activities

- Assisting councils in designing projects;
- Helping councils implement projects;
- Monitoring the implementation of projects.

3.4.2.2.2. Sub-component 2.2.2: Creation/ restoration of green belts

The Problem: A green belt is a network of protected natural or agricultural areas that surround an urbanised territory such as an agglomeration or municipality. Constructions and activities conducted in it are restricted in order to control urbanisation and protect the land and activities that depend on it (agriculture, forestry, tourism etc.). The growing difficulty in supplying cities with forest products and fuelwood in particular, the degradation of the natural environment and cities and the enormous problem of forest uses as well as access to nature, the ecological services provided to the community the preservation of cultural heritage are among the reasons for the establishment of green belts.

The need for settlements, transport and major infrastructure like airports are a threat to the integrity of protected areas. It is therefore necessary that, as part of this NPFDP, a strategy to develop green areas around our main cities be devised and implemented. This will involve the management of existing green belts and their development in other cities.

Objective: Support the establishment and restoration of green belts around cities of the northern regions and major cities in the country. This component shall involve working in collaboration with RLA to carry out projects aimed at establishing and restoring green belts around cities of the northern regions and main cities in the country.

Activities

- Assisting councils in drafting projects on green belts;
- Assisting councils in implementing projects;
- Supervising the implementation of projects.

3.4.2.2.3. Sub-component 2.2.3: Creation and restoration of ecotourism sites

The Problem: Endowed with a diversity of landscapes and cultures, Cameroon boasts an immense tourist potential. However, it is not cited among the best tourist destinations in the world. One of the obstacles to harnessing this potential is failure to develop sites likely to receive tourists. The construction of ecotourism sites could, therefore, significantly remove this obstacle. Given the importance of trees in the quality of tourist sites, plantation forests could be used. This justifies the inclusion of this sub-component in the NPFDP.

Objective: Work in concert with MINTOUL and LRAs to implement projects aimed at developing ecotourism sites.

Activities

- Assist councils in collaboration with MINTOUR to carry out projects on the development of ecotourism sites,
- Assist councils in implementing projects,
- Monitor the implementation of projects.

3.4.3. AXIS III: Restoration of Landscapes and Degraded Lands

The Problem: According to many researchers, land degradation is caused by human activities in arid lands. In Cameroon, it is mainly caused by: (i) inappropriate and unsustainable agricultural practices; (ii) overgrazing and bushfires for agricultural, grazing and hunting purposes, worsening soil erosion (especially in the West and Sudano-Sahel regions) and biodiversity loss; (iii) haphazard logging aggravated by growing population pressure (in the West and Centre Regions); (iv) irrational management of agriculture, forest and grazing lands with no zoning plans; (v) weak drought response capacity ; (viii) wrong perception by the population that the "land resource" is infinite or unlimited. All this is compounded by abject poverty of the population.

Land degradation either reduces or destroys the capacity of lands to produce (agriculture, forestry and grazing). Land degradation and its corollary, desertification, are not limited to Africa's arid lands. They affect almost half of the world's surface area, about 100 countries on all continents and a third of the world's population amongst which are the poorest and most vulnerable. The final stage of degradation is irreversible, as land becomes sterile.

The surface area for each level of degradation has been determined in each region of the country and sometimes in each division to collect regional and sub-regional statistics, given that they are very relevant in developing reforestation plans. It is estimated that there are 12,062,768 ha of degraded lands in the country. Cameroon has thus set the objective of restoring these degraded and deforested landscapes by 2030 under the African Forest Landscapes Restoration Initiative (AFR100), pursuant to the commitment made in February 2017 by Forestry and Environment Ministries under the New Partnership for Africa's

Development (NEPAD), in support of climate action. Tree planting for restoration purposes is amongst the solutions envisaged to achieve this objective and measures will therefore be taken to this effect in this programme.

Objective: Restore degraded lands and landscapes and combat desert encroachment by establishing 5,000 ha of plantations each year.

3.4.3.1.Component 3.1: Restoration of natural ecosystems and biodiversity conservation (1,000 ha/year)

The Problem: According to the Convention on Biological Diversity adopted in 1992 in Rio, biodiversity is the variability among living organisms from all sources, including, inter alia, land, marine and other aquatic ecosystems, and the ecological complexes of which they are a part. It is a function of both time (evolution) and space (geographic distribution). Biodiversity includes diversity within and between species and ecosystems. Many ecosystems across the country are degraded specifically due to human activities. The main causes of this degradation are agriculture (extensive agriculture) and wood exploitation (especially for fuelwood).

Changes in biodiversity can affect the provision of ecosystem services. It must therefore be protected and managed in a sustainable manner to make the most of ecosystem services.

Objectives: Participate in the restoration of natural ecosystems and biodiversity conservation by setting up 1,000 ha of plantation forests per year.

Activities

- Identifying the natural ecosystems to be restored and species affected by erosion;
- Drawing up a biodiversity restoration plan;
- Implementing the plan.

3.4.3.1.1. Sub-component 3.1.1: Recovery of endangered valuable endemic species (logging and other factors)

The Problem: Cameroon's natural ecosystems are increasingly overexploited and degraded. Despite development policies, logging in dense forest areas still poses a threat due to skimming while, in savannah areas, farming and the felling of trees for fuelwood deplete resources and threaten ecosystem stability.

With regard to mangroves, they are gradually degrading due mainly to human activities, notably intensive fishing and agricultural activities as well as widespread fish smoking activities. In Cameroon, the main threats to ecosystems are: (i) unsustainable harvesting of mangroves (especially *Rhizophora*, the dominant species) to smoke fish and build fishing settlements; (ii) industrial pollution (with yet unclear effects); (iii) logging; (iv) development of agro-industries with access to forests, which so far had relatively remained intact for the creation of palm groves; (v) oil exploration activities resulting in the massive degradation of mangroves and, finally, (vi) urbanisation.

Objective: Contribute to the maintenance or increase of primary and secondary productions and the improve biodiversity and the stability of natural ecosystems as well as their reintegration where they have been seriously fragmented.

Activities

- Supporting the regeneration and reforestation of dense forest areas in FMUs and Council forests pursuant to Circular N° 0086/LC/MINFOF/CAB of 18 May 2016 on obligations in terms of silviculture treatment in permanent forests. It prescribes the implementation of silviculture treatment by concession holders, in accordance with the management plans for FMUs and Council forests.
- Developing and implementing projects to restore natural ecosystems in conjunction with councils and communities.

3.4.3.1.2. Sub-component 3.1.2: Creation/ restoration of sacred, teaching and research forests, etc.

The Problem: Despite efforts made, the degradation of biological diversity has continued mainly due to habitat destruction, over-cultivation, pollution and the harmful introduction of foreign plants and animals. In Cameroon, sacred forests and teaching and research forests are conservation solutions that can likely tackle this problem. It is therefore appropriate that within the framework of this programme, actions be taken in this direction, thus justifying this sub-component.

Activities

- Recovering valuable endemic species endangered by logging and other factors;
- Establishing and restoring
 - Sacred forests,
 - Teaching and research forests,

3.4.3.2. Component 3.2: Combating desertification and restoration of degraded lands (4,000 ha/year)

The Problem: Land is a natural resource essential for its environmental, social and economic functions. It is used for agriculture and provides the space necessary for habitat and various human activities. It also hosts many living species and stores other natural resources such as water, minerals and fossil fuels and resources. In each ecological zone, soil quality alteration coupled with loss of related environmental services will cause land degradation marked by changes in land use and land development.

Objective: Participate in fighting desertification and restoring degraded lands by creating 4,000 ha of forest plantations a year

3.4.3.2.1. Sub-component 3.2.1: Combating desertification

The Problem: Desertification is a specific type of land degradation brought about by a gradual loss of soil productivity due to human activities (unsuitable agricultural and pastoral practices, deforestation, overgrazing, excessive harvesting of fuelwood, etc.) and climate change. (According to the UNCCD, desertification is “land degradation in arid, semi-arid and sub-humid regions resulting from various factors, including climate change and human activities”.) Two regions in the country are particularly affected by this phenomenon: the Far North in particular and to a certain extent the North region. However, huge efforts have been made by public authorities and many national and international

organisations to arrest, the situation especially through tree planting. These efforts do not rise to the challenge, which sufficiently justifies the inclusion of this sub-component in this programme.

Activities:

- Constructing windbreaks /hedges;
- Establishing integrated plantations (agricultural, forestry and pastoral systems).

3.4.3.2.2. Sub-component 3.2.2: Restoration of degraded lands

The Problem: Land degradation and the loss of the ecosystems that it structures are, above all, a gradual process caused by polluting agricultural practices, soil artificialisation, taking up much land for transport infrastructure, continuous dumping of toxic products and non-biodegradable waste. Land degradation leads to poverty and mass migration of communities due to famine and the resulting malnutrition.

Activities:

- Assisting relevant councils and communities in developing land restoration projects;
- Implementing tree planting projects.

3.4.3.3. Biodiversity enhancement

The Problem: The destruction and fragmentation of natural habitats, due especially to increasing urbanisation, the development of transport infrastructure and overexploitation of resources particularly affect biodiversity. The same goes for the disappearance of habitats (forests, etc.), overexploitation of living organisms (hunting, etc.), industrial and agricultural pollution, extension of cities and transport infrastructure, degradation and destruction of landscapes, introduction of invasive species, climate change, change in agricultural land use, desertification, etc. The causes of the disappearance of living organisms are many and the scale of the biodiversity crisis is now known.

Biodiversity enhancement is a priority to public authorities. It is the focus of the 2020 Forestry Subsector Strategy presented as follows: "Streamlining biodiversity management in Cameroon in a bid to contribute to growth and job creation in a context of sustainable development." In spite of the strides made, biodiversity loss is still a cause for concern, which justifies their inclusion in this programme. Solving this problem will require the creation of green infrastructure (gene bank, pollination reservoirs, arboreta, etc. for adaptation).

3.4.3.3.1. Creation of green infrastructure (gene bank, pollination reservoirs, arboreta, etc. for adaptation)

The Problem: According to many experts, our future is threatened by the depletion of one of the most important legacies of our universe, notably the genetic diversity of crops and related wild plant forms. All over the world, gene banks have been created to conserve seeds in cold and low humidity conditions, and other plant materials in test tubes or farm banks. The proliferation of these banks reflects the general concern to conserve a maximum of genetic resources. Although Cameroon is making efforts in this direction, they have not been up to the challenge. Worse still, the level of effort has dropped significantly over the years.

Biological resources are an asset likely to bear fruits in the long term. Action must therefore be taken to preserve and conserve genes, species and ecosystems for the sustainable management and use of biological resources. As part of this programme, in situ conservation sites will have to be set up and/or developed in the country. Furthermore, measures should be taken to protect genes from unfavourable weather conditions and disaster through the creation of gene banks to collect, store, maintain and describe plant materials in a bid to preserve them in the long run and make the genetic resources of major forest species readily available. Pollination reservoirs should also be set up.

Activities:

- Identifying sites and assess the need to create green infrastructure;
- Drafting a green infrastructure implementation plan;
- Implementing the plan.

3.4.4. AXIS IV: Research, Innovation, Training and Capacity Building

The design, development and dissemination of new technologies, knowledge and innovations as well as related skills, are the backbone of sustainable socio-economic development. However, the productivity and economic performance of the timber industry are threatened in the long term since the regeneration capacity of harvested forest species remains largely unknown. As such, the future of timber production for currently exploited species is uncertain. This “high risk” species exploitation must be replaced with one based on the scientific knowledge of the regeneration capacity of the species concerned. The main components of the biology of species must therefore be mastered and integrated into exploitation systems and standards: reproductive biology of species (ability to reproduce) and their level of genetic diversity (species adaptation capacity which will, for instance, enable them to adapt to future climate change). Such a study should be conducted species by species as each species is unique.

Objective: Support research and innovation, forestry training and capacity building for actors in the sector by establishing a framework for participatory and interdisciplinary consultation and coordination. This framework will focus on:

- Forestry research;
- Lifelong learning;
- Stakeholder specialisation;
- Sharing experiences on the various aspects of forestry.

3.4.4.1. Component 4.1: Research-Innovation Assistance

The Problem : Forestry research in Cameroon is characterised by a shortage in seed supply and nursery capacity. Cutting parks have either disappeared or are simply unsalvageable for those that do exist. Furthermore, there are problems of disparity in information on research findings, communication shortcomings, public awareness, and the extension of silvicultural processes.

Objectives: Ensure that research contributes to the implementation of missions relating to plantation forestry. Research should contribute to:

- Knowledge on silviculture and processing of forest products;

- Dissemination of knowledge on silviculture and processing of products notably by developing and reviewing silvicultural and products processing sheets;
- Forest genetics and plant seed technology;
- Forestry and agroforestry techniques;
- Processing techniques and enhancement of wood products from plantation forests;
- Forestry economy;
- Infrastructure development;
- Technical and scientific equipment.

3.4.4.1.1. Sub-component 4.1.1: Facilitation of Consultation Framework

The Problem: One of the major impediments to scientific knowledge enhancement is the compartmentalisation between research and the productive sector. In addition, there is no national database that can be consulted in the area and no coordinated vision and supervision of all forestry research programmes conducted so far in Cameroon, including an evaluation of the relevance of the themes selected, the results obtained and their enhancement.

Activities:

Creating a platform for sharing and disseminating knowledge on the link between research and forestry production via:

- Consultation meetings,
- Experience sharing sessions.

3.4.4.1.2. Sub-component 4.1.2: Silvicultural Projects and Research Assistance

The Problem: The development and dissemination of new technologies, knowledge and innovations require significant resources which are most often lacking in this branch of activity.

Activities:

- Developing applied research activities on agroforestry, fruit farming and pasture production;
- Contributing to the creation of seed banks;
- Contributing to the establishment of arboreta.

Research will also address issues such as:

- Research on the eucalyptus (carry out studies to clearly state the impact of this plant on water resources and related crops);
- Processing of timber and non-timber products from plantation forests;
- Research, development and innovation in the use of forest resources to develop new inputs and materials play a pivotal role, but the continuous supply of these raw materials is just as important.

In certain cases, it may be necessary to apply the law, especially Law No. 94/01 of 20 January 1994 to lay down Forestry, Wildlife and Fisheries Regulations which stipulates in Section 17 (4) that "the services in charge of forestry, wildlife and fisheries may, in order to preserve the diversity of the biological resources, initiate or participate in setting up ex situ units, such as genetic resources banks, botanical and zoological gardens, arboreta, seed orchards or nurseries". To this end, the relevant

administrations shall determine the methods of collection, processing, conservation and multiplication of genes and specimens taken from the natural environment.

3.4.4.1.3. Sub-component 4.1.3: Extension of Innovations

The Problem: One of the criticisms often made about forestry research is that it gives the impression that it is disconnected from the reality on the field. To address this problem, the programme will adopt a mechanism to disseminate and popularise research findings and achievements.

Activities:

- Communicating information on the products researched;
- Organising field trips.

3.4.4.2. Component 4.2: Stakeholder Training and Capacity Building

The Problem: The staff assigned to reforestation and forest regeneration activities has dropped drastically since the dissolution of the National Forestry Development Board (ONADEF). Furthermore, constant developments in the forestry sector are increasing the need for training a little more every day. Development goals such as the conservation of environmental services provided by forests (biodiversity, climate change adaptation and reduction of greenhouse gas emissions, water resources, tourism, poverty alleviation, etc.) are superimposed on the production of timber or non-timber forest products, broadening the scope of the sector and consequently, the number and diversity of stakeholders engaged at each level. Unfortunately, the necessary skills arising from this complexity are not always available. Bridging this yawning gap is a challenge that current forestry and environmental training programmes have difficulties rising to. There is an acute lack of information on the methods, procedures, techniques and specialised tools necessary for the sustainable management of forests, biodiversity, the evolution of forest resources and their economic consequences. While new topics (such as those related to climate change, payment of environmental services, forest certification for sustainable management, etc.) are not yet sufficiently integrated into teaching lessons, others, already well defined (participatory management approaches to natural resources, mediation in conflicts of use) are also no better integrated (COMIFAC, 2012).

The NPFDP could be confronted with problems of availability of qualified and experienced personnel in forest resource regeneration issues during its implementation.

Objective: Set up a silvicultural training system capable not only of developing skills for the needs of the programme, through existing institutions and training schemes, but also of enabling beneficiaries of the programme, that is the producers, to master the techniques of producing seedlings, transplanting them and managing the stands to maturity.

3.4.4.2.1. Sub-component 4.2.1: Lifelong Training

The Problem: The implementation of this programme will require a large number of staff trained following the current training system with emphasis on silviculture. Also, new themes (such as climate change, payment for environmental services, etc.) that are not yet sufficiently incorporated into training courses shall be included in the programme.

Activities: Ensure that the training scheme develops skills necessary to implement the programme. It will thus:

- Assist in updating the training master plan of the Mbal Mayo National Forestry School (ENEF);
- Help train enough staff in all relevant fields of forestry;
- Implement forest resource renewal initiatives and master the new concepts, techniques and tools that the implementation of the NPFDP will generate;
- Provide support and advice as well as ensure the training and retraining of management staff;
- Train populations in agroforestry and silvo-pastoral practices, etc.

To meet the challenges of forestry training, COMIFAC wishes to let the full potential of stakeholders to flourish while highlighting and adapting the knowledge and skills of each, by fostering increased and productive physical and intellectual investments that target high quality forestry and environmental training. It thus drew up the *Sub-regional Guidelines on Forestry and Environmental Training in Central Africa*

In addition, Component 5, 'Institutional Enhancement, Training and Research' of the Forest/Environment Sector Programme (FESP) complements other components in order to provide each stakeholder in the forestry sector with the necessary skills to perform their role.

The implementation of this sub-component should be incorporated into the initiatives undertaken as part of the various frameworks.

3.4.4.2.1. Sub-component 4.2.2: Capacity Building for Stakeholders

The Problem: The implementation of this programme will be accompanied by a number of new themes (such as climate change and payment for environmental services) that have not yet been necessarily mastered by current sector stakeholders.

Activities:

Organising and holding capacity building workshops.

3.5. Distribution framework for production targets

Table 10 : Distribution of production targets according to ecological zones, biomes and forest areas

Axis	Components	Sub-components	Ecological zones + <i>biomes and related forest estates</i>
AXIS 1: Wood production and products other than timber, construction and firewood, wood products enhancement and development of silvicultural value chains Production target: 30 000/year	1. Wood Production (20000/year)	<ul style="list-style-type: none"> • Production of timber • Production of construction wood • Production of wooden poles • Production of fuelwood (Firewood) 	-ZESH / ZTr: 5000 ha -ZESS / ZESH: 5000 ha -ZESS /ZESH/ ZEFD: 5000 ha -ZESS/ZESH/Zhu (Mangroves): 5000 ha
	2. Production of industrial products other than wood (5000 ha/year)	<ul style="list-style-type: none"> • Production of resins (latex, etc.), alcohol, Pulp (Trituration / Cellulose), etc. • Production for agro-food systems • Production of Bamboo from China / Rattan 	
	3. Products other than wood for human needs (food, pharmacopoeia, farming) and animal feed (livestock) (5000 ha/year)	<ul style="list-style-type: none"> • Production of NTFP (4000 ha/year) • Production of fodder trees (1000 ha/year) • Production of pharmacopoeia products and plant active ingredients 	ZESH: 1250 ha ZTr: 1250 ha ZEFD: 1250 ha ZHu: 1250 ha
	4. Development of silviculture and related value chains as a driving force behind forest regeneration	<ul style="list-style-type: none"> • Development of wood value chains • Development of value chains for standing timber products 	
AXIS 2: Protection and provision of ecosystem services other than supply (recreation,)	1. Development of riverbanks/watersheds/ water catchment areas - soil protection and restoration (3000 ha / year)	<ul style="list-style-type: none"> • Protection of riverbanks • Fight against erosion • Protection of watersheds • Protection of water catchment areas 	ZESS: 750 ha ZESH: 750 ha ZEFD: 750 ha ZTr: 750 ha
	2. Development of urban and peri-urban forestry (greening of urban	<ul style="list-style-type: none"> • Establishment/Restoration of council woods • Establishment/Restoration of green belts 	ZESS: 500 ha ZESH: 500 ha ZEFD: 500 ha

Axis	Components	Sub-components	Ecological zones + <i>biomes and related forest estates</i>
	and peri-urban landscapes) (2 000 ha/year)	<ul style="list-style-type: none"> Establishment/Restoration of ecotourism parks 	ZTr: 500 ha
	3. Biodiversity enhancement	<ul style="list-style-type: none"> Creation of green infrastructure (gene banks, pollination reservoirs, arboreta....for adaptation) 	
AXIS 3 : Restoration of landscapes and degraded lands (5 000 ha/year)	1. Recovery of natural ecosystems and biodiversity conservation (1 000 ha/year)	Recovery of valuable endemic species endangered by logging and other factors - Establishment/Restoration of <ul style="list-style-type: none"> Sacred forests Teaching and research forests 	ZESS: 200 ha ZESH: 200 ha Zefd: 200 ha ZTr: 200 ha ZHu: 200 ha
	2. Fight against desertification and restoration of degraded lands (4 000 ha/year)	- Windbreaks/ hedges - Integrated plantations (<i>agricultural, forestry and pastoral systems</i>)	ZESS: 1,000 ha ZESH: 3,000 ha
AXIS 4: Research– innovation – and capacity building	4.1 Research and innovation	4.1.1. Coordination of consultations	
		4.1.2. Funding of forestry projects and research	
		4.1.3. Popularisation of innovations	
	4.2 Stakeholder training and capacity building	4.2.1. Lifelong learning	
4.2.2. Stakeholder capacity building			
AXIS 5: Institutional organisation, governance and gender. Decision-making processes	<i>Institutional organisation, governance and gender</i>	<ul style="list-style-type: none"> Steering Coordination Governance Gender Monitoring and Evaluation 	

Table 11: Surface area distribution per sub-component in ecological zones

Ecological zone	Areas to be developed	Surface Area to be developed (ha)
ZESH	Timber processing products (2500 ha+2500ha+1700 ha + 1700 ha)	8,400
	Greenwood plantation products: 1250 ha	1,250
	River banks/watersheds /water catchment areas: 500 ha	500
	Urban and sub-urban greening: 500 ha	500
	Natural ecosystems reconstruction and biodiversity conservation: 200 ha	200
	Fight against desertification and restoration of degraded lands: 3000 ha	3,000
	Subtotal	13,850
ZTr	Timber processing products: 2500 ha	2,500
	Greenwood plantation products: 1250 ha	1,250
	River banks/watersheds /water catchment areas: 500 ha	500
	Urban and sub-urban greening: 500 ha	500
	Natural ecosystems reconstruction and biodiversity conservation: 200 ha	200
	Subtotal	4,950
ZESS	Timber processing products (2500 ha+1700ha + 1700 ha)	5,900
	Greenwood plantation products: 0	0
	River banks/watersheds /water catchment areas: 500 ha	500
	Urban and sub-urban greening: 500 ha	500
	Natural ecosystems reconstruction and biodiversity conservation: 200 ha	200
	Fight against desertification and restoration of degraded lands: 1000 ha	1,000
	Subtotal	8,100
ZEFD	Timber processing products: 1700 ha	1,700
	Greenwood plantation products: 1250 ha	1,250
	River banks/watersheds /water catchment areas: 500 ha	500
	Urban and sub-urban greening: 500 ha	500
	Natural ecosystems reconstruction and biodiversity conservation: 200 ha	200
	Subtotal	4 150
Zhu	Timber processing products: 2500 ha	2,500
	Greenwood plantation products: 1250 ha	1,250
	River banks/watersheds /water catchment areas: 0	0
	Urban and sub-urban greening: 500 ha	500
	Natural ecosystems reconstruction and biodiversity conservation: 200 ha	200
	Subtotal	4,450
GRAND TOTAL		35,500

3.6. Consistency with national development policies

3.6.1. At the International Level

Consistency with Sustainable Development Goals (SDGs):

The NPFDP aims at making timber and non-timber forest products more accessible and combating environmental degradation. Greater access to these resources will, first of all, enhance the community's access to some products that would help meet their food needs thus improving their living conditions. Secondly it will increase their income, giving them access to certain paid services. The NPFDP is thus perfectly in line with the Sustainable Development Goals (SDGs) as it addresses certain global societal challenges that the UN Sustainable Development Programme has set to meet by 2030. These challenges include:

- Ending poverty in all its forms everywhere;
- Ending hunger, achieving food security and improving nutrition and promoting sustainable agriculture;
- Ensuring access to affordable, reliable, sustainable and modern energy for all;
- Ensuring access of all to water and sanitation, and the sustainable management of water resources;
- Promoting inclusive and sustainable economic growth, full and productive employment and decent work for all;
- Taking urgent action to mitigate climate change and its impact;
- Protecting, restoring and promoting sustainable use of land ecosystems, sustainably managing forests, combating desertification, and halting and reversing land degradation and halting biodiversity loss.

The NPFDP, especially Component 1, which addresses the plundering of natural forests, as well as Component 4, which aims at creating arboreta and gene banks, will contribute in checking the disappearance of certain species. This puts the programme in line with the 2011-2020 Strategic Plan for biological diversity.

Similarly, SDG 5 acknowledges that there is inequality between women and men, that women are denied opportunities and are deprived of their human rights, and envisages achieving gender parity and empowering all women and girls.

Consistency with EU External Investment Plan

Box 9: Guidelines of the EU External Investment Plan

Energy is a very important driver of development and plays an essential part in providing solutions for a sustainable planet. Developing countries need it to promote inclusive growth and further improve living standards. Investing in sustainable energy can ensure and improve access to clean water, clean cooking, education, health care, as well as create jobs and support local businesses in an environmentally friendly manner.

The EU External Investment Plan under preparation sets out to achieve three main interrelated goals: address the lack of access to energy, increase energy efficiency and renewable energy generation to achieve a sustainable balance between energy production and consumption, and contribute to the global fight against climate change in accordance with the Paris Agreement. The EU and its Member States shall combat energy poverty by contributing to improve universal access to affordable, reliable, sustainable and modern energy, laying strong emphasis on renewable energy and energy efficiency.

The post-2020 ACP-EU framework reaffirms the commitment of the parties to work together to promote sustainable development and end poverty in all its forms, combat inequality and promote social cohesion, paying particular attention to the specific needs of young people, women and girls and the most vulnerable and disadvantaged, so that all human beings can fulfil their potential in dignity and in a healthy environment, leaving no one behind. The Parties shall pledge to promote and protect the equal rights of women and girls and ensure their economic, social and political empowerment.

To this end, the post-2020 ACP-EU framework for gender equality envisages providing a public and open platform for women to address issues concerning, inter alia, development cooperation programmes.

The fact that NPFDP provides for an official exclusively dedicated to handling issues related to gender equality and socially disadvantaged groups in its institutional implementation system situates the programme in line with the EU External Investment Plan under preparation.

3.6.2. At National Level

As a reference framework for Government policy and actions and convergence ground for cooperation with technical and financial development partners, the GESP has three central axes: growth strategy, employment strategy, State governance and strategic management. According to the GESP, the achievement of growth objectives in the forestry Subsector will notably involve the development and regeneration of permanent estate forests, which ties with component 1 of the programme. This shows the link between the NPFDP and GESP.

The overall objective of the Subsector Strategy, as contained in GESP, has been framed in the 2020 Subsector Strategy as follows: “biodiversity management in Cameroon shall be improved to enhance growth, and create jobs within the framework of sustainable development.” The breakdown of this global objective into functional units has made it possible to define four strategic axes. One of them concerns sustainable development and forest management, with regeneration and reforestation as a sub-component. This sub-component is presented as follows:

Service provided: Increase the productive capacity of forests through regeneration, reforestation and agroforestry.

Strategic objective: Promote regeneration, reforestation and agroforestry activities to increase the productive capacity of forests.

Expected outcomes:

- Forest productivity increased;
- Desert encroachment slowed down;
- Cities supplied with fuelwood;
- Urban green spaces increased;
- Forest gene pool conserved;
- Environmentally sensitive areas and catchment areas preserved.

Specific objectives:

- Promote reforestation in transferred forest reserves;
- Develop community plantation forests in savannah zones;
- Develop private plantation forests;
- Ease access to forest seeds;
- Promote agroforestry;
- Secure environmentally sensitive areas.

Outcomes:

- Reforestation is optimised in transferred forest reserves;
- Each community in savannah zones has a plantation forest;
- Individuals contribute to increase the surface area of plantation forests;
- Actors in the forestry sector have access to forest seeds;
- Agroforestry contributes to the preservation of ecological zones;
- Environmentally sensitive areas are secured;
- Secured green spaces are developed in the cities.

Strategies:

- Subsidise reforestation activities;
- Implement a national plantation development programme;
- Develop forest seed banks;
- Build the capacities of forestry sector stakeholders;
- Put in place a regulatory and an institutional incentive framework;
- Integrate agroforestry methods into all forestry, urban, livestock and agricultural management processes;
- Mobilise innovative funding from carbon stock replenishing and deforestation reduction initiatives.

4. INSTITUTIONAL MECHANISM FOR COORDINATION, MONITORING-EVALUATION, GENDER MAINSTREAMING AND INCLUSION OF UNDERPRIVILEGED GROUPS

For the programme to be implemented with consistency, it is paramount that a set of mechanisms (rules, standards, protocols, conventions, contracts, etc.) be put in place for proper coordination of stakeholders, each holding a position of power, in order to take consensual decisions and launch concerted actions.

4.1. Governance

A system of decision-making structures shall be involved in the implementation of the programme to direct activities. The implementation should be guided by ideal standards that shall require these structures to be run with transparency, ethics and efficiency.

4.1.1. Coordination mechanism

The Ministry of Forestry and Wildlife is responsible for developing and implementing the National forestry policy. As such, it is the structure for which the Programme shall be implemented. The Ministry shall present programme needs, define the programme objective, its calendar and the budget to be allocated to it. The expected outcome of the programme shall be the products to be obtained. This Ministry shall therefore be the contracting authority.

4.1.2. Strategic management

In order to ensure proper management, monitoring and evaluation of the programme, a Steering Committee (COFIL) shall be set up by decision of MINFOF. The Steering Committee shall be the highest authority for implementing the programme and shall be responsible for:

- ✓ *Ensuring that the general guidelines of the programme are respected;*
- ✓ *Reviewing and adopting work programmes and the annual budget of the programme;*
- ✓ *Scrutinising practical action plans drawn up by the project coordinator;*
- ✓ *Ensuring that programme activities are consistent with sector policies;*
- ✓ *Proposing measures to ensure efficient implementation of the project;*
- ✓ *Reporting on the annual progress of the programme and the financial execution of annual appropriations;*
- ✓ *Considering obstacles to the implementation of the programme and proposing necessary corrective measures within the framework of the action programme;*
- ✓ *Reviewing and approving the project procedures manual.*

This Committee shall comprise the following:

- *Chair: The Minister of Forestry and Wildlife;*
- *Vice-chair: The Secretary-General of the Ministry of Forestry and Wildlife;*
- *Coordinator of the Technical Secretariat: The Director General of ANAFOR;*
- *Deputy Coordinator of the Technical Secretariat: The Director of Forestry;*
- *Members:*

- ✓ *A representative of MINEPDED;*
- ✓ *A representative of MINADER;*
- ✓ *A representative of MINEPIA*
- ✓ *The representative of ANAFOR;*
- ✓ *The Director of Promotion and Processing of Forestry Products;*
- ✓ *A representative of MINEPAT;*
- ✓ *A representative of MINFI;*
- ✓ *A representative of MINDCAF;*
- ✓ *A representative of MINCOMMERCE;*
- ✓ *A representative of the Association of Mayors of Cameroon;*
- ✓ *Two representatives of Professional Forestry Organisations*
- ✓ *A representative of the Agricultural Research Institute for Development (IRAD);*
- ✓ *A representative of the Civil Society.*

The Chairman may invite certain persons to Steering Committee sessions: (i) Consultants, (ii) Experts and/or (iii) any individual or corporate body based on their knowledge of the issues on the agenda.

The Steering Committee shall meet twice a year in ordinary session at the behest of the Chair, as follows:

- (i) A meeting to review the programming of annual activities and budgeting;
- (ii) A semi-annual evaluation meeting of the Annual Budgetary Work Plan (ABWP)

The Chair may convene extraordinary sessions if need be. To discharge its duties, the Steering Committee shall have a Technical Secretariat headed by the Director of Forestry, assisted by the CSRRVS (Service Head for Regeneration, Reforestation, Silviculture Extension and Monitoring). In any event, the duties, composition and functioning of the Steering Committee shall be laid down by Decision of the Minister in charge of forestry, wildlife and protected areas.

4.1.3. Functional organisation

4.1.3.1. ANAFOR

Decree No.2002/156 of 18 June 2002 to approve the statutes of the National Forestry Development Agency (ANAFOR), stipulates that the purpose of ANAFOR shall be to support, directly or indirectly, the implementation of the **national programme for the development of private and community plantation forests**, by:

- Performing the following tasks with funding from the programme: conducting studies, planning, programming, monitoring and evaluating the programme as well as coordinating, informing, promoting and sourcing funding at the national and international level;
- Supplying private and community operators, following their request and funding, with seeds and seedlings as well as advisory assistance for their planting projects.

In accordance with these provisions, ANAFOR is responsible for the implementation of some components of the programme. For the others, implementation will take place upon award either to

ANAFOR or to forestry companies through agreements for the creation and conduct of plantation forest operations, following a public tenders procedure.

4.1.3.2. Local and Regional Authorities

Pursuant to Article 16 of Law No. 2004/018 of 22 July 2004 to lay down rules applicable to Councils, the powers devolved to Councils as part of the decentralisation process include the following:

- Tree planting operations and the creation of Council woodlands;
- Development of Council environmental action plans;
- Creation, maintenance and management of Council green spaces, parks and gardens.

In the same vein, Section 19 of Law No. 2004/019 of 22 July 2004 to lay down rules applicable to the Regions specifies the powers devolved to Regions. They include, among others:

- Management, protection and maintenance of Protected Areas and natural sites under the Region's jurisdiction;
- Taking prohibitive and other local environmental protection measures
- Development of forests and woodlands and creation of regional Protected Areas following plans duly approved by the State representative;
- Erection of firewalls and early burning as part of the fight against bush fires;
- Management of Regional natural parks, in accordance with a plan submitted to the State representative for approval;
- Development, implementation and monitoring of Regional environmental action plans or schemes.

4.1.3.3. Concession holders

Concession holders shall be involved in the implementation of the Programme through the provision of a number of services that will be awarded to them.

4.1.3.4. Specialised Institutions

The implementation of some components of the Programme may call for specialised expertise in the field, thus requiring the involvement of specialised institutions.

4.1.3.5. Research and Training

The design, development and dissemination of new technologies, knowledge and innovations, as well as related skills, are powerful drivers of sustainable socio-economic development. Research and training should be involved for this important role to be effectively played.

4.2. Project development and selection mechanism

A project manager shall be appointed and shall be responsible for:

- Drawing up the annual programme of activities under the programme's Projects Portfolio management;
- Identifying projects that can be implemented under the programme;
- Supporting potential beneficiaries in the maturation of projects;

- Evaluating projects, preparing evaluation reports and preparing documents for presentation to the Steering Committee;
 - Supporting the procurement officer of the Ministry of Forestry and Wildlife in monitoring the procedures for the provision of goods and services under funded projects, by giving an opinion at each stage of this procedure;
 - Coordinating the supervision and overseeing the implementation of the projects funded under the programme;
 - Coordinating and undertaking project completion missions with a view to drawing lessons and experience for the implementation of future similar projects.

4.3. NPFDP monitoring - evaluation system

Monitoring and Evaluation (M&E) is one of the most essential components of programmes/projects, especially in the context of Results-Based Management (RBM). In the RBM model, M&E does not only consist of monitoring the implementation process, but also monitoring outcomes/impacts/results. **Monitoring of the implementation process** involves monitoring the progress of planned activities and tasks. **Monitoring of outcomes** is the continuous and systematic collection and analysis of data to measure the effectiveness of actions. Though the monitoring of outcomes is continuous, since it is not a time-limited activity, it should be **periodic** so that change can be perceived. In other words, it is a matter of continuously gathering information about the achievement of an outcome and then periodically comparing the current situation to the baseline.

Evaluation, on the other hand, determines whether the objectives are being met, and ensures that the programme is developed in accordance with the baseline policies. It also makes it possible to verify that activities are carried out in accordance with the recommended guidelines and within the time limits, and that the outcomes have an impact on the living conditions of the beneficiaries.

Monitoring/evaluation is not just about collecting information on the project, but analysing and using it to improve project management and make timely decisions. However, for M&E to be truly useful, a number of conditions must be met: (i) organising M&E from the start of the project, which is the only way to understand the baseline situation; (ii) avoiding to adopt systems that are too complex or too ambitious; (iii) avoiding a proliferation of indicators that are difficult to measure. It is under these conditions that monitoring-evaluation will find its place in the project management system.

General objectives of monitoring and evaluation: Monitoring and evaluation shall be key activities in the implementation of the programme, and shall be useful for:

- Ensuring that the process is carried out in accordance the prescriptions of this programme paper; in particular, that its implementation is in accordance with the defined objectives and methods, Cameroon laws, the Forestry and Wildlife Subsector strategy;
- Identifying the difficulties encountered overall and those that the implementing actors might face in future, in order to find solutions;
- Ensuring that the living conditions of the beneficiaries are improved as a result of the implementation of the project;

- Evaluating the medium and long-term impact of the project on beneficiaries and their income and economic conditions, on the environment, local capacities, etc.

As a project management tool, besides facilitating measurement and ensuring the achievement of objectives and results within the given time frame, it also makes it possible to identify problems encountered and propose effective and efficient solutions, identify effects and impact on beneficiaries and document and communicate lessons learned to stakeholders in a timely manner to ensure better decision-making and programme sustainability.

NB: The programme should put in place a comprehensive M&E system (including the Integrated Management System (IMS) and Procedures Handbook), with a performance measurement framework that allows for the refinement of impact assessment indicators at the technical, environmental, financial and socio-economic levels. A study should be commissioned for this purpose.

4.3.1. The NPFDP monitoring and evaluation system

The monitoring and evaluation (M&E) system shall play an important role in the programme; it shall be essential for strategic and practical management, and for providing information necessary for corrections and adjustments along its implementation. The programme shall be endowed with an M&E software that shall enable technical and financial monitoring of the Annual Budgetary Work Plan (ABWP) execution.

One of the criteria for measuring the performance of the Programme shall be the level of effectiveness of the M&E system. Collection and analyses of information and self-evaluation methods shall be used in defining indicators and participatory M&E seminars shall be organised.

4.3.1.1. Monitoring

According to the Programme paper, monitoring shall be done to ensure that the proposed measures are implemented, and to correct, "in real time", the implementation methods used. Monitoring will focus on the following essential aspects:

- Implementation of planned activities/tasks;
- Technical aspects: overseeing and control of field operations (tree planting and monitoring, securing of sites, reception of activities ...);
- Social and economic monitoring: concerned with the condition of beneficiaries, the population's access to timber and non-timber products.

Monitoring will be both external and internal.

- **External Monitoring:** This shall imply ensuring that project activities are in line with MINFOF's strategy, while ensuring synergy with other projects of the Ministry.
- **Internal Monitoring:** Internal monitoring and evaluation shall be permanent, as its purpose is to monitor the implementation of the activities planned in the ABWP and the achievement of expected outcomes.

4.3.1.2. Evaluation

Evaluation shall be conducted to assess whether the overall development objectives have been met in accordance with national development policy guidelines, and to draw lessons from the operation in order to modify strategies for long term implementation.

The following references shall be used in the evaluation:

- The GESP;
- The 2020 Forestry and Wildlife Subsector Strategy;
- The country's international commitments.

The evaluation shall aim to:

- Evaluate the overall conformity of the implementation of the programme with the objectives and methods specified in the programme paper;
- Evaluate the conformity of programme implementation with the national planning paper and the country's international commitments;
- Evaluate procedures implemented;
- Evaluate the programme's impact on income, living standards and living conditions;
- Propose any corrective actions to be taken as part of the monitoring measures;
- Propose amendments to strategies and methods used.

Documents from internal monitoring shall be used in the evaluation. Besides, evaluators shall conduct their own field analyses through surveys on stakeholders and people impacted by the project.

Internal Evaluation: Evaluation activities shall seek to measure: (i) the impact of the project on beneficiaries, especially the groups, and the attainment of its objectives (overall and specific); (ii) the relevance of the implementation approaches and strategies; (iii) the effective involvement of the beneficiaries at the different stages of implementation included in the M&E activities; and (iv) the effectiveness of the coordination and monitoring mechanisms of the various components and activities.

Participatory M&E workshops will be organised at least once a year in each branch or administrative region. These workshops will help identify key lessons and appropriate recommendations to improve the subsequent implementation of the programme.

External Evaluation: It shall consist in periodically collecting and analysing data on the implementation of the programme in order to measure the impact of the performance and take appropriate decisions. The programme should be evaluated every five years (mid-term evaluation) and at the end (final evaluation).

4.3.2. The Monitoring and Evaluation Officer

A programme M&E officer shall be appointed within the Regeneration, Reforestation, Silviculture Extension and Monitoring Service and shall be responsible for developing and coordinating the monitoring and evaluation plan of the project. In collaboration with ANAFOR, he/she shall be responsible for drawing up the monitoring and evaluation plan and including it in the logical framework,

setting up an updated database, and for the various reports provided for in the monitoring and evaluation system. He/she must therefore work within a transparent and participatory framework to develop a monitoring-evaluation strategy and identify relevant performance indicators. He/she shall basically be responsible for:

- Assembling, organising, consolidating and analysing internal reports in order to monitor the programme dashboard and generate periodic M&E and programme execution reports;
- Organising and supervising baseline/thematic surveys to assess the impact of the programme on beneficiaries;
- Providing methodological support to CSRRVS officials and producers with respect to monitoring/evaluation.

4.3.3. Monitoring and Advisory Support Strategy at Local Level

Chiefs of forestry control posts and silvicultural advisers of ANAFOR are in charge of closely monitoring farms benefiting from the project's assistance. The silvicultural advisers shall support the technical implementation of the project/micro-project while the Chief of post shall collect monitoring data using a data collection sheet (based on the defined frequency) for monitoring the activities carried out by the beneficiaries, for transmission to the Divisional Delegate.

The Divisional Delegate shall verify the effectiveness of the implementation of activities, process the data collection forms received and forward them to the Regional Delegate after compilation if several projects/micro-projects are underway in his or her Division.

4.4. Mechanism for gender mainstreaming, and inclusion of youths and socially disadvantaged groups

4.4.1. Understanding Gender Mainstreaming and Inclusion of Youths and Socially Disadvantaged Groups

In development actions, gender, youth and social exclusion issues are still too often added as an afterthought or considered as separate categories, whereas they are cross-cutting issues that are crucial to the success of the project. Mainstreaming gender, young people and vulnerable groups in the project's cycle means asking questions at every stage of the project, from preliminary contacts and studies right to project evaluation: about the involvement, role and place of these groups in the project, and on the effects and impact of the project on the situation. This justifies the inclusion of this aspect in the new aid modalities of many international organisations.

Box 10: Role of Youth and Women in Development

Young people are actors of development and change and, as such, have a critical role to play in the programme by 2030, particularly through their innovative capacity. Neglecting the education, employment, social and political needs of young people will undermine the achievement of the MDGs and make young people vulnerable to crime and radicalisation, especially in conflict situations.

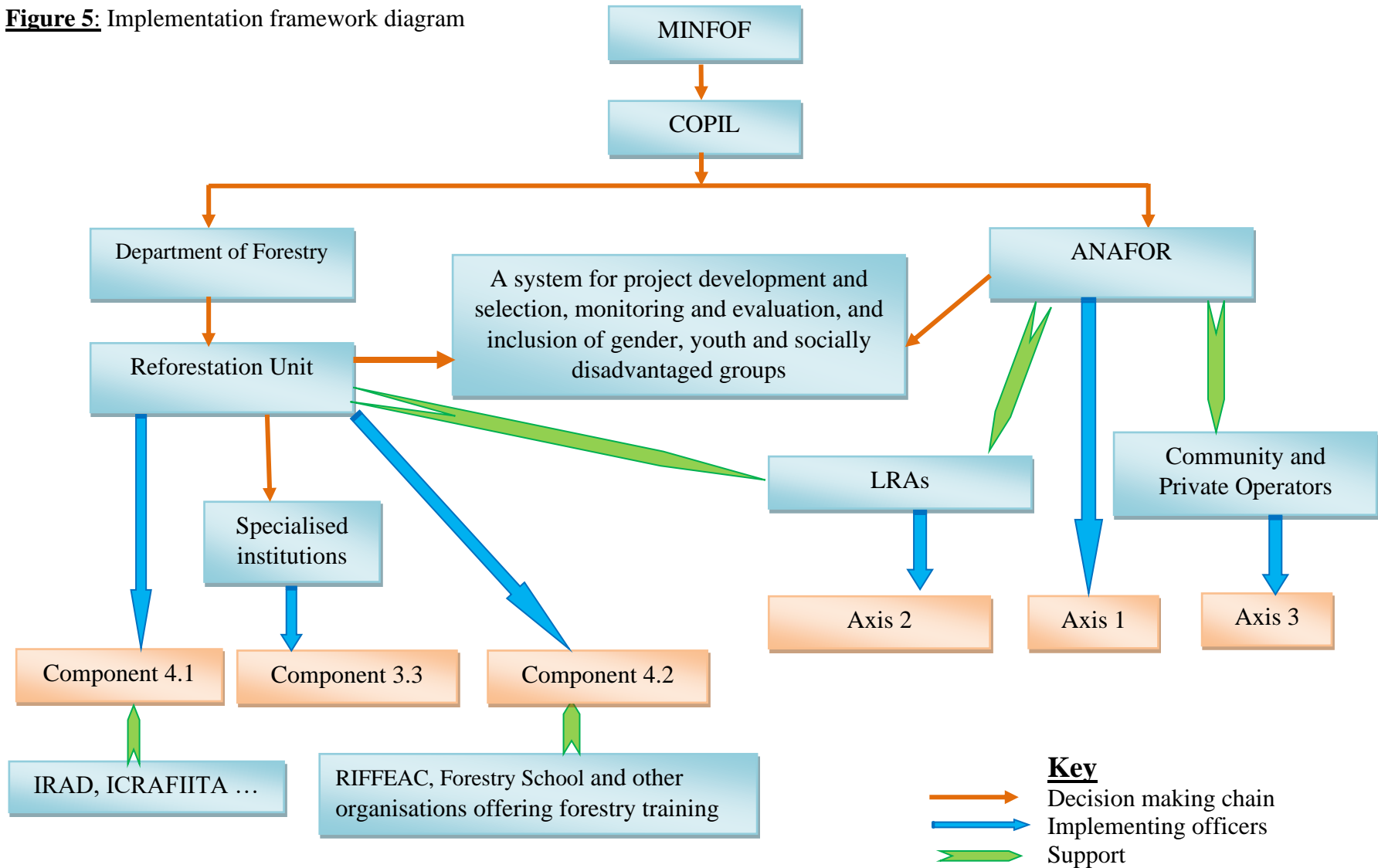
Gender equality between women and men at all ages is essential for sustainable development. It has a multiplier effect on the process of ending poverty and is fundamental for the development of democratic societies based on human rights, social justice and sustainability. Furthermore, there is a positive correlation between gender equality and increased prosperity, greater stability and better outcomes in areas such as health and education. The EU and its Member States see women and girls as key actors for development and change, acknowledging in particular the role they play in conflict resolution, peace building and humanitarian interventions. (Addis Ababa Action Agenda, 2015)

For the inclusion of women, young people and disadvantaged groups to be effective, the programme implementation team must appoint an official dedicated solely to these issues.

4.4.2. Officer in Charge of Gender Mainstreaming, Youth Issues and the Inclusion of Socially Disadvantaged Groups

An officer in charge of handling issues related to gender, youth and socially disadvantaged groups shall be appointed from within the programme team and shall be responsible for ensuring a cross-cutting approach to gender equality under the programme action and development tools. This implies that he or she will have to ensure that concerns such as gender equality, the representativeness of young people, and the non-exclusion of some social groups are taken into account, and carry out sociological and impact analyses.

Figure 5: Implementation framework diagram



5. LEGAL FRAMEWORK, IMPLEMENTING ACTORS - SYNERGY AND COMPLEMENTARITY

5.1. Legal framework

5.1.1. International Legal Framework

Since the Rio Earth Summit of 1992, Cameroon has been committed to ensuring the sustainable management of its forest resources by taking an active part in international dialogue and conventions on forests and biodiversity. These conventions include:

- The Yaounde Declaration of 1999 for the conservation and sustainable management of forest ecosystems of the Congo Basin, reviewed for strategic and operational purposes in the sub-regional convergence plan for the conservation and sustainable management of forest ecosystems of COMIFAC countries;
- The Sub-Regional Agreement on Forestry Control adopted in 2007 by the Council of Ministers of the Central African Forest Commission;
- The Anti-Poaching Tripartite Agreement between, Chad, CAR and Cameroon in December 2013;
- Cross-border initiatives for the concerted management of forestry and wildlife resources of the sub-region, in particular the Sangha Tri-national (TNS), the Tri-national Dja-Odzala Minkébé (TRIDOM), the Cameroon-Nigeria Cross-River Transboundary Initiative, the Séna-oura/Bouba-Ndjidda Binational (BSB-Yamoussa);
- The 1983 Agreement for Cooperation and Consultation between the Central African States for the Conservation of Wild Fauna;
- The Emergency Anti-Poaching Action Plan (PAULAB) in the savannah zone and the forest zone in Central Africa for all ECCAS member countries;
- African Strategy on Combating Illegal Exploitation and Illegal Trade in Wild Fauna and Flora in Africa;
- The International Tropical Timber Agreement of November 1983;
- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Washington, 1979.
- Convention on Biological Diversity (CBD), Rio, 1992.
- African Convention on the Conservation of Nature and Natural Resources, adopted in 1968 in Algiers.
- The Convention on the Conservation of Migratory Species of Wild Animals, CMS, 1979.
- The London Declaration on Illegal Wildlife Trade, 2013.
- Agreement on the Conservation of Gorillas and their Habitats (Gorilla Agreement), Paris, 2007.
- Declaration on Anti-Poaching in Central Africa, Yaounde, 2013.
- Declaration on anti-poaching of elephants and trafficking in ivory and other protected species, Paris, 2013.

Specific measures reflect a number of guidelines and principles including:

- ITTO and IUCN guidelines for on plantation forests and restoration of degraded forests, and;
- ITTO/ATO principles, criteria and indicators on plantations and restoration of degraded forests.

5.1.1. ITTO and IUCN Guidelines on Plantation Forests and Restoration of Degraded Forests

These guidelines, developed jointly by the International Tropical Timber Organisation (ITTO) and the International Union for the Conservation of Nature (IUCN), replace those of 1993. They set out the specific actions that policymakers, forest managers and other stakeholders should take to improve biodiversity conservation in tropical production forests. In this way, it aims to help in the conservation of arguably the planet's most valuable resource - its diversity of life. The issue is handled in Principle 10 of the said guidelines, which is broken down into guidelines (from 38 to 42) and priority actions.

- **Principle 10: Biodiversity conservation in planted forests:** states that planted forests should be managed in ways that benefit biodiversity, both with the planted forest itself and in areas of natural forest that are retained within the planted forest landscape.
- **Guideline 38: The creation of** Planted forests should focus on previously deforested areas or other degraded sites and not replace natural forest habitats of meant for conservation. As for any changes in forest land use, potential plantation areas should be surveyed to determine whether they contain biodiversity features of special concern. When such features are identified, the forest management plan should include measures to protect them.
- **Guideline 39:** Large-scale planted forests can provide a forest matrix within which areas of high conservation value can be protected and managed. A number of large-scale plantation schemes successfully manage biodiversity set aside within their landscapes. In some cases, the resources available to such companies are sufficient to enable them provide a higher level of protection than is available in nearby national parks and similar reserves.
- **Guideline 40:** Management systems that favour natural processes and native species and enhance the productivity and resilience of the planted forest should be developed. Appropriately managed planted forests can retain a surprisingly high level of local biodiversity. There are indications that longer rotation lengths, reduced soil cultivation and other silvicultural practices not only favour biodiversity but can also be good for plantation productivity. Reducing the use of herbicides and pesticides can help planted forests to retain more biodiversity, which in turn can benefit soils and forest productivity.
- **Guideline 41:** The use of native species and mixed species in planted forests enhances the biodiversity value of the stands. If exotic species must be used, those which provide the best habitat for local biodiversity should be chosen.
- **Guideline 42:** Measures should be taken to ensure that plantation forestry does not facilitate the introduction of invasive species, which could impact negatively on both the planted forest and neighbouring natural forests.

5.1.2. ATO/ITTO Principles, Criteria and Indicators on Plantation Forest and Degraded Forest Restoration

Since 2001, in Yaounde, Cameroon, the African Timber Organisation (ATO) and the International Tropical Timber Organisation (ITTO) developed a set of harmonised ATO-ITTO Principles, Criteria and Indicators (PCIs) for the sustainable management of African natural tropical forests. A product of the work of international experts and technical collaboration with the Centre for International Forestry Research (CIFOR), these PCIs are internationally recognised as a suitable tool for the sustainable management of Africa's natural tropical forests. These PCIs have been adapted for use in plantation forests as part of the activities of the joint ATO/ITTO regional project PD 124/01 Rev.2

(M), and the development of the ITTO-ABTO ICPs for the sustainable management of plantation forests in Africa takes into account the current efforts of West African countries.

Principle 10 of the FSC forest stewardship standard for the Congo Basin stipulates that plantations should be planned and managed in accordance with Principles 1-10. While plantations are capable of providing a variety of social and economic benefits and contributing in meeting the world's need for forest products, they should complement the management of natural forests. They should help to reduce pressures on natural forests and promote their restoration and conservation.

5.1.2. National Legal Framework

A. Forestry Laws

Legal instruments that provide forestry regulation include following:

- ✓ Law No. 94/01 of 20 January 1994 to lay down Forestry, Wildlife and Fisheries Regulations;
- ✓ Decree No.96/642/PM of 17 September 1996 to lay down the tax base and the conditions for recovery of forest royalties and taxes;
- ✓ Decree No. 95/531/PM of 23 August 1995 to lay down conditions for Forestry Law enforcement;
- ✓ Decree No. 95/466/PM of 20 July 1995 to lay down conditions for the enforcement of Wildlife Regulations.
- ✓ Decree No. 2006/0129/PM of 27 January 2006 to amend and supplement provisions of the Decree of 23 August 1995 to lay down conditions for the enforcement of Forestry Regulations;
- ✓ Joint Order No.076 MINATD/MINFI/MINFOF of 26 June 2012 to lay down conditions for the planning, use and monitoring of the management of Forestry and Wildlife revenue allocated to councils and local village communities;
- ✓ Circular letter No.0059/c/MINFOF/CAB of 21 April 2016 to lay down conditions for harvesting of poles in the national estate.
- ✓ Circular letter No. 033/LC/MINFOF/SG/DF/CSRRV of 15 February 2013 on the conditions of eligibility for reforestation assistance from the Ministry of Forests and Wildlife.

5.1.3 Legal framework applicable to the decentralisation process

Laws No.2004/018 of 22 July 2004 to lay down rules applicable to Councils and No. 2004/019 of 22 July 2004 to lay down rules applicable to Regions, spell out the powers devolved respectively to Councils and Regions in the context of decentralisation. Amongst these powers, the following feature prominently:

For Councils:

- Tree planting operations and the creation of Council woods;
- Development of Council environmental action plans;
- Creation, maintenance and management of Council green spaces, parks and gardens.

For Regions

- Management, protection and maintenance of protected areas and natural sites within the jurisdiction of the Region;
- Taking prohibitive and other local measures to protect nature;

- Creation of protected regional woods, forests and areas following a plan duly approved by the State's representative;
- Construction of firewalls and early burning to fight against bush fire;
- Management of regional natural parks pursuant to a plan to be approved by the State's representative;
- Development, implementation and monitoring of regional environmental action plans or schemes;

Decentralisation of forest management in Cameroon was initiated by Forestry Law No. 94/01 of 20 January 1994 to lay down Forestry, Wildlife and Fisheries Regulations and its implementing Decree No.95/531 of 23 August 1995. By virtue of this instrument, the Central State devolves powers and responsibilities to peripheral stakeholders, primarily local communities and local and regional councils. At local level, the decentralisation of forest management is predicated on two innovations. Firstly, powers and responsibilities are transferred to village communities to create community forests and community hunting areas, to exploit them and manage the Income derived therefrom on their own account. Secondly, powers are transferred to these same village communities to benefit from a share of the annual forest royalties paid to the State by logging companies to exploit forest concessions and as compensation for “sales of standing volumes³”.

A. Council Forest

The Forestry Law considers as Council Forests, “any forest gazetted on behalf of the council concerned or a forest planted by the Council.” As a matter of fact, Council forests are the private property of the relevant councils, but their exploitation and management must be approved by the Forestry Service. In the case of forest resources, it entails allocating forested areas from the State's Permanent Estate, which are bequeathed to councils through gazetting Acts.

B. Community Forest

The decree to lay down conditions for the enforcement of forestry regulations defines a community forest as, “a forest of the non-permanent forest estate under a management agreement signed between the village community and the Forestry Service. It should have a maximum surface area of 5,000 hectares in the forest area.” Locals living in the vicinity of the non-permanent forest estate therefore have right of pre-emption over the surrounding forest. The right of pre-emption was instituted by Order No.0518/MINEF/CAB signed by the Minister of Environment and Forestry on 21 December 2001, which sets out the terms and conditions for allocating any forest likely to be transformed into a community forest to the local community as a matter of priority. This is predicated on a fundamental principle: “*Forests likely to be transformed into community forests are allocated in priority to the closest village communities.*”

5.2 Implementation stakeholders

5.2.1 Government stakeholders

MINFOF: MINFOF is in charge of developing and implementing Government's forestry policy. It is therefore the Contracting Authority of the Programme.

MINEPDED: As the body charged with developing and implementing Government's policy on environmental protection, MINEPDED is concerned with issues of deforestation, forest degradation and the resulting land degradation. Cameroon has set as objective to restore a surface area estimated at 12,062,768 hectares of degraded and deforested landscape by 2030, within the framework of the African Forests Landscape Restoration Initiative (AFR100), pursuant to the commitment taken in

February 2017 by Ministries in charge of forestry and the environment under the New Partnership for Africa's Development (NEPAD) to promote climate. MINEPDED and MINFOF are the two main stakeholders for the implementation of this process. MINEPDED is equally very concerned by threats on mangroves in the country.

MINADER and MINEPIA: Both ministries are in charge of developing and implementing Government's policy on plant and animal production respectively. The overlap between these two key sectors of rural production and silviculture is indicative of the involvement of both ministries in the development and implementation of the NPFDP.

MINRESI: The Ministry of Scientific Research and Innovation (MINRESI) is in charge of implementing Government's policy on scientific and technical research. It is supported in this mission by Faculties and Institutes of some State Universities (Bamenda, Buea, Douala, Dschang, Maroua, Ngaoundere and Yaounde I) which are under the Ministry of Higher Education (MINESUP). MINRESI is therefore the supervisory authority of several research institutes including the Agricultural Research Institute for Development (IRAD) operating through its various operational structures (research centres, stations and branches) across the country. The various structures of MINESUP, together with IRAD, form the National Agricultural Research System of Cameroon (SNRA).

IRAD: Under the supervisory authority of MINRESI, IRAD is the prime mover of the National Agricultural Research System of Cameroon. It comprises about forty research operational structures in each of the 10 (ten) regions of the country. There are 5 (five) Regional Agricultural Research Centres (CRRA) in Maroua, Wakwa, Bambui, Ekona and Mbalmayo. Each CRRA covers one of the five agro-ecological zones in Cameroon. Administratively it is in charge of several multi-purpose (SPRA) and/or specialised (SSRA) agricultural research stations, sites for the setting-up and implementation of IRAD's scientific and technical activities. Moreover, there are about thirty agricultural research branches spread across the country and linked to SPRA. The research mechanism is completed by 3 (three) regional and international specialised agricultural research centres like the Research Centre for Forestry and Environment (CEREFEN).

These institutions are supplemented by other research institutions set up and supported notably by TFPs. They include (i) ICRAF (World Agroforestry Centre) involved in the domestication of forest species. It has contributed in identifying high value-added species whose sale can generate substantial income for the local community. In view of popularising research findings, ICRAF for example, has in the past organised the training for trainers. Structures managing community forests could benefit from such training. These professional training courses focus on techniques for the production of improved plant materials such as the cutting; grafting; layering and the production of seedlings). IRAD and IITA (International Institute of Tropical Agriculture) specialise in research and innovation activities for improved seed supply, technical support on request and specialised training.

MINDCAF: The Ministry of State Property, Surveys and Land Tenure (MINDCAF) and its decentralised services in regions and divisions is in charge of land management.

MINATD: MINADT acts as the Ministry of Interior and as such its decentralised services represent all administrations in territorially. Its local officials (Governors, SDOs and DOs) chair divisional gazetting commissions pursuant to the rules governing the jurisdiction of the Commissions;

The PNDP: under the supervisory authority of MINEPAT, the National Participatory Development Programme (PNDP) is the organ set up by the Government to ease the decentralisation process and support councils by funding council and community projects and development hubs;

Local and Regional Authorities (LRAs): Decentralised administrative units are completed at the local level by Local and Regional Authorities pursuant to the Constitution of 18 January 1996 on regions and councils.

The 22 July 2004 Laws stipulate the pre-eminent role of Local and Regional Authorities in land management. Regarding land management, Section 13 paragraphs 2 and 3 of the law of 22 July 2004 stipulates that “For the projects or operations which it initiates on national land, the State shall take a decision after consultation with the council concerned, except where national defence or public policy requirements dictate otherwise.” Even in these two cases, the decision of the State shall be communicated to the concerned municipal council for information.

In addition, legislative instruments on decentralisation devolve a number of powers to councils and regions, which make them key players in forest resource regeneration in the renewal of forest resources. These powers include:

- Reforestation and creation of Council Forests;
- Development of a council plan of action for the environment;
- Creation, maintenance and management of council green spaces, parks and gardens.
- Securing and other local measures for nature protection;
- Creation of woods, forests and Protected Areas for regions following a plan duly approved by a State representative;
- Management of regional natural parks;
- Etc.

5.2.2 Non-state stakeholders

Communities: The 1994 Law makes provision for the creation of community forests, in view of improving the livelihoods of local communities of forest areas. Products of such forests should be managed sustainably by the beneficiary local communities under the supervision of the State.

Traditional Authorities: Traditional authorities are auxiliaries of the administration. They are under the authority and control of the Divisional Officer. They are in charge of relaying to their subjects the instructions of the D.O and ensuring their implementation. Among other things, they help in maintaining law and order in their area of jurisdiction and social cohesion through the management of day-to-day affairs (land tenure in particular). They also contribute to the socio-economic and cultural development of their communities, improving their living conditions and ensuring adequate spatial occupation and exploitation of natural resources. The traditional ruler is assisted by the Council of elders or notables made up in general of quarter heads, elite and/or princes of the chiefdom who, in turn, relay information to the population via leaders of associations, cultural and political groups.

Technical and Financial Partners (TFPs): TFPs support the State in defining and implementing its forestry policy, by funding of several projects developed by the Government and NGOs in the forestry sector.

The private sector: In the current context, the State is withdrawing from forest production, processing and marketing of forest products. The contribution of the private sector in the implementation of the

NPFDP thus becomes fundamental. It will be involved in the supply of plant materials (seeds and seedlings of forest and ornamental species), forestry operations and site management. Micro finance structures are equally expected to provide supplementary funding of projects (credits) for stakeholders in the sector.

The State shall take all necessary measures to guarantee the participation of the private sector through awareness raising campaigns and meetings with various employer groups (GICAM, MECAM...).

The civil society: Non-Governmental organisations contribute greatly to the development of forestry activities. They participate in reforestation, forest protection and conservation operations, and in awareness raising and population mobilisation campaigns.

Central African Network of Forestry and Environmental Training (RIFFEAC): RIFFEAC is a combination of twenty-one training institutions in the Central African sub-region with the objective of developing skills and structures needed for joint and sustainable management of environmental and forest resources. RIFFEAC was established in Libreville, Gabon in 2001. In 2001, it became the partner of the Central African Forests Commission (COMIFAC) for the implementation of Strategic Axis No.7 of its Convergence Plan on “Capacity building, participation of stakeholders, information and training”, in view of providing the sub-region with necessary and sufficient skills and structures to jointly and sustainably manage forest resources.

5.3 Synergy and complementarity amongst stakeholders

Several stakeholders will be involved in the implementation of the NPFDP. As such, policy choices and programme management should necessarily involve these stakeholders to enable them play their role in accordance with the legal framework and usual practice. To this end, the Forestry Service should set up consultation organs both at national and regional levels to promote partnerships and collaboration amongst stakeholders for any specific activities.

The Ministry of Forestry and Wildlife will therefore work in close partnership with other ministries of the rural sector, to encourage all stakeholders to adopt agro-forestry methods that will promote timber and charcoal production needed by the population while developing agriculture and livestock farming.

To better coordinate tree planting activities, it will be expedient to recognise MINFOF as the “National Authority” in the areas of reforestation, regeneration and silviculture;

Several partnerships will then be developed with stakeholders likely to provide complementarity in the implementation of the programme, notably in developing the skills of stakeholders to generate and integrate new skills in their production process, as well as in equipping and improving their production structures.

With MINEPDED

Cameroon has set as objective to restore an estimated surface area of 12,062,768 hectares of degraded and deforested landscape by 2030, as part of the African Forest Landscape Restoration Initiative (AFR100), pursuant to the commitment taken in February 2017 by ministries in charge of forestry and the environment under the New Partnership for Africa’s Development (NEPAD) to promote climate. MINEPDED and MINFOF are the two main players in the implementation process. MINEPDED is equally very concerned by threats to the country’s mangroves. A consultation

framework should therefore be set up to pilot the implementation of components 2.3 and 2.4 of the programme concerned by these two issues.

With MINADER and MINEPIA

MINFOF and ANAFOR in particular will work in collaboration with MINADER and MINEPIA in implementing component 3.

With ICRAF

MINFOF and ANAFOR will collaborate with ICRAF in the domestication of forest species. Indeed, for tree planting and forest regeneration to be successful in community forests, the choice of species should take into account the needs of the population and contribute in improving their well-being. Research has helped in identifying species with high added value, whose sales can generate substantial income for the local community. In view of popularising research findings, ICRAF for example, has in the past organised the training for trainers. Structures managing community forests could benefit from such training. These refresher training courses focus on techniques for the production of improved plant materials such as cuttings; grafting; layering and seedling production). Measures should be taken in the implementation of component 3.1 to associate this organisation in the process.

MINFOF and ANAFOR will work in collaboration with:

- ✓ Traditional and local administrative authorities; they are key partners in identifying potential layout sites as well as advertising the programme and managing beneficiaries;
- ✓ NGOs and consultancy services providers on self-development, decentralisation, community development and improvement of living conditions in rural areas, for the mobilisation and close management of beneficiaries;
- ✓ Support Programme for the competitiveness of smallholder family farms (ACEFA) of the French Development Agency (FDA) for the funding of viable micro projects, some of which could be main-streamed into agro-forestry;
- ✓ IRAD and IITA for research and innovation activities, the supply of improved seeds, technical support upon request and specialized training (conventions);
- ✓ NPFDP to support decentralisation and fund council and community projects as well as development hubs;
- ✓ MINDCAF for land tenure security;
- ✓ External development partners (FAO, IFAD, UNDP...) that could provide support in terms of experience sharing and other forms of support;
- ✓ Micro finance structures for supplementary funding for sub-projects of sector stakeholders in the form of credits; for instance, the Cameroon Cooperative Credit Union League (CAMCCUL) accounting for 70% of micro finance in Cameroon, with 200 Credit Unions across the country; (ii) the “Credit du Sahel” funding the productive sector in the northern part of Cameroon; (iii) the “*Mutuelles communautaires de croissance*” (MC2) providing adequate financial services and self-managed by the poor population of the southern regions of Cameroon (savings, transfer, stock collateral, tailored loans); (iv) the MIFED network of village funds...

5.4 Other expected stakeholders

The plantation timber sector is currently dominated by eucalyptus farming which, alone, accounts for the transmission poles Subsector and provides most of the plantation forest timber processed. It is imperative that, alongside the implementation of the NPFDP, measures be taken by the State to encourage the introduction and development of other potential stakeholders, especially those to be included in the various Subsector links of NTFPs, timber and construction wood from species other than *Eucalyptus* sp. (Cameroon Industrialisation Master Plan, 2017).

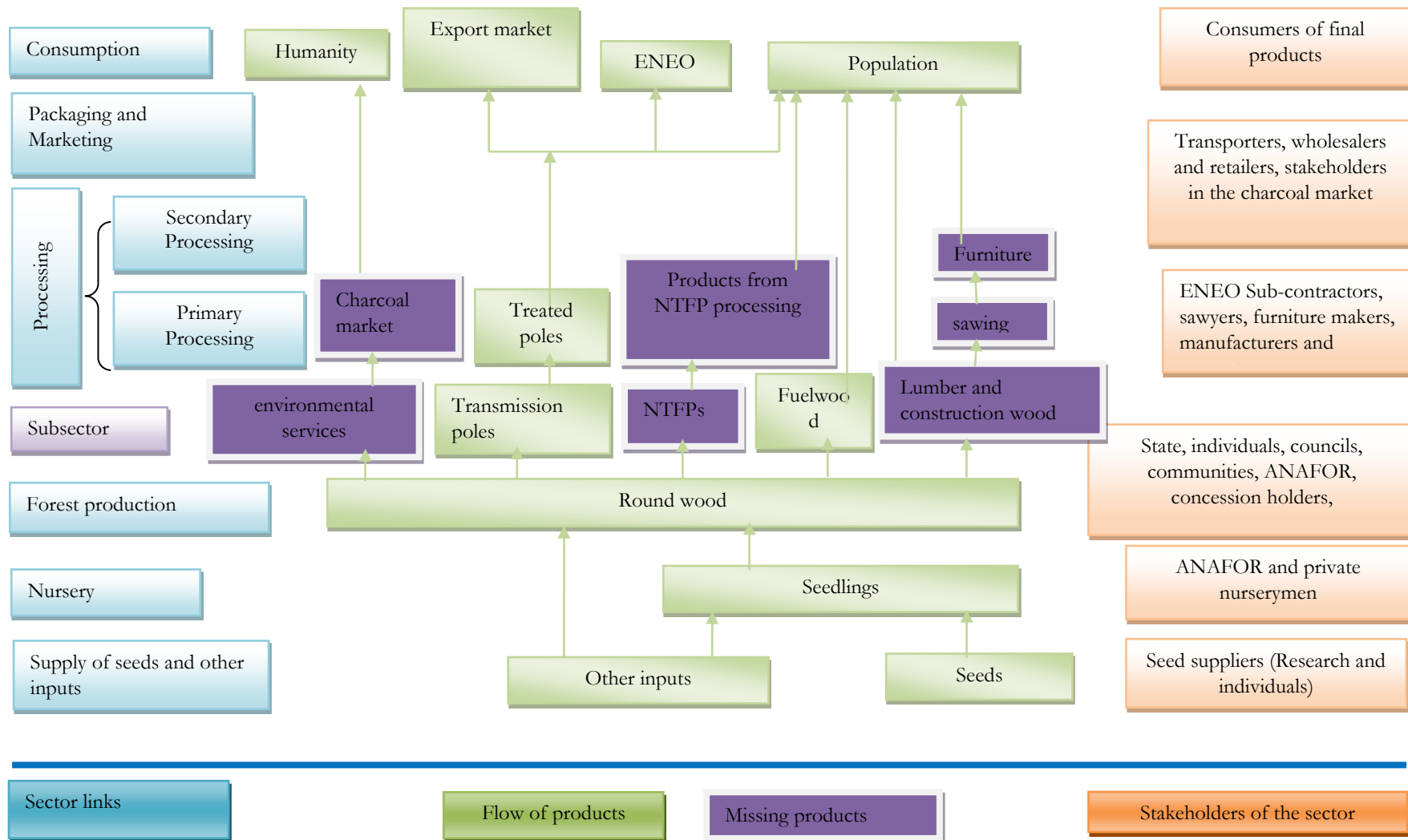
The diagram below shows the flow of products and the mapping of potential stakeholders that should be involved to set up a sustainable and economically viable and profitable forestry sector, according to ecological regions and the development of forestry value chains.

In comparison to the current structure of the sector, a number of stakeholders should be involved. They include:

- Stakeholders of the processing link of timber and construction wood from other plantation forest species;
- Stakeholders of the charcoal market;
- Stakeholders of the entire plantation forest NTFPs Subsector

This could be effective through the creation and development of “silvopoles” which could result from the harmonisation of the various links mentioned above. Detailed feasibility studies on the introduction and development of these stakeholders should be carried out.

Figure 6 : Diagram of the ideal structure of the plantation forest timber sector



Source: Adapted from NGOMIN et al 2015, and PDI 2017

6. IMPLEMENTATION COSTS AND BENEFITS, ASSUMPTIONS, RISKS AND IMPACT ANALYSIS

The NPFDP shall be implemented based on a multi-annual plan broken down into Annual Work Plans. Components and activities of the programme shall be carried out under projects to be implemented through an investment plan that will be funded by institutional partners of the State and the State's own resources.

6.1. Cost of programme

Estimates to set up a production forest are drawn from “*the Analytical Accounting Plan*” of the National Forest Regeneration Board (ONAREF, 1987) and the Paper titled “*Module for the creation of one hectare of forest plantation*” drafted by ANAFOR and the Technical Centre for Council Forests (ANAFOR and CTFC, 2011). They indicate the number of trees per hectare, average spacing, the surface area to be reforested or regenerated, the average cost to set up one hectare of plantation and forest maintenance for the 4 years following the year of planting.

- Average cost to set up 1 (one) hectare of forest plantation of 5m x 5m in full = CFAF 1,000,000;
- Maintenance after planting = CFAF 500,000/year, representing CFAF 2,000,000 for 4 years of maintenance;
- Total cost to set up one hectare of forest plantation + 4 years of forest maintenance = **CFAF 3,000,000.**

These estimates are based on Teak, a reforestation species currently recording major successes in the global timber market and whose planting is mastered in several tropical countries.

- Number of feet per hectare in the plantation = 2,500 feet;
- Number of exploitable stands per hectare after 20 years = 200 stands/ha;
- Volume corresponding to the 200 stands/ha (average diameter=30 cm and height=10 m) = 150m³

If 150 m³ of lumber and construction wood can be harvested from one hectare of plantation, the corresponding surface area to reconstitute the 3 million m³ of timber harvested yearly in Cameroon stands at 20,000 ha/year.

Considering that the total cost to set up one hectare of forest plantation + 4 years of forest maintenance = CFAF 3,000,000.

Table 12: Programme cost assessment tables

Axis	Components	sub-components	ECOLOGICAL AREAS/ZONES	Cost
			+ associated Biomes and forest estates	
AXIS 1: Production of timber and products other than lumber, construction wood and fuel wood; enhancement of wood products and development of forest value chains Production target: 30,000/year	1. Timber production (20,000/year)	<ul style="list-style-type: none"> · Lumber production · Construction wood production · Pole production · Fuelwood production (<i>firewood</i>) 	-ZESH / ZTr: 5000 ha	3,75E+11
			-ZESS / ZESH: 5000 ha	3,75E+11
			-ZESS /ZESH/ ZEFD: 5000 ha	3,75E+11
			-ZESS /ZESH/ Zhu (Mangroves): 5000 ha	3,75E+11
	2. Manufacture of industrial products other than wood (5000 ha/year)	<ul style="list-style-type: none"> · Resin production (<i>latex, etc.</i>), alcohol, paper pulp (<i>Trituration/Cellulose</i>), etc. · Production for agro-food systems · Production of Indian bamboo /Rattan 		3,75E+11
	3. Products other than wood for human needs (<i>food supplies, pharmacopoeia, culture...</i>) and animal feed (livestock) (5,000ha/year)	<ul style="list-style-type: none"> · Production of NTFPs (4,000 ha/year) · Production of fodder trees (1,000 ha/year) · Production of pharmacopoeia products and active plant ingredient 	ZESH: 1250 ha	93,750,000,000
			ZTr: 1250 ha	93,750,000,000
			ZEFD: 1250 ha	93,750,000,000
			ZHu: 1250 ha	93,750,000,000
4. Development of the forestry (sector) value chain and related value chains as prime mover of forest regeneration.	<ul style="list-style-type: none"> · Development of timber value chains · Development of value chains for standing tree products 	FF	2,000,000,000	
AXIS 2: Protection and provision of ecosystem services other than supply (recreation)	1. Development of banks/water sheds/water catchment points - protection and soil restoration (3,000ha/year)	<ul style="list-style-type: none"> · Protection of banks · Fight against erosion · Protection of watersheds · Protection of water catchment points 	ZESS: 750 ha	56,250,000,000
			ZESH: 750 ha	56,250,000,000
			ZEFD: 750 ha	56,250,000,000
			ZTr: 750 ha	56,250,000,000
		· Creation/Restoration of Council woods	ZESS: 500 ha	37,500,000,000

	2. Development of urban and peri-urban forestry (<i>greening of urban and peri-urban landscapes</i>) (2 000 ha/year)	<ul style="list-style-type: none"> · Creation/Restoration of green belts · Creation/Restoration of ecotourism parks 	ZESH: 500 ha	37,500,000,000	
			Zefd: 500 ha	37,500,000,000	
			ZTr: 500 ha	37,500,000,000	
			ZHu: 500 ha	37,500,000,000	
	3. Promoting biodiversity	<ul style="list-style-type: none"> · Creation of green infrastructures (genes banks, pollen reservoirs, arboreta.... for adaptation) 		500,000,000	
AXIS 3: Restoration of Landscapes and Degraded Lands	1. Reconstitution of natural ecosystems and Conservation of biodiversity	Reconstitution of endangered <i>endemic value</i> species (<i>as a result of logging or other causes</i>)	ZESS: 200 ha	15,000,000,000	
			- Planting/Restoration of	ZESH: 200 ha	15,000,000,000
			· Arboreta	Zefd: 200 ha	15,000,000,000
			· Sacred forests	ZTr: 200 ha	15,000,000,000
			· Forests for teaching and research	ZHu: 200 ha	15,000,000,000
	2. Fight against desertification and	- Windbreaks/ hedgerows	ZESS: 1000 ha	75,000,000,000	
	3. Rehabilitation of degraded lands (4 000 ha/year)	- Integrated plantations (<i>agro-silvo-pastoralism systems</i>)	ZESH: 3000 ha	75,000,000,000	
AXIS 4: Research – Innovation – Training and capacity building	1 Research and innovation	Animation of consultation framework		500,000,000	
		Financing forestry projects and research			
		Popularization of innovations			
	2 training workshops to build the capacity of stakeholders	Continuous training		500,000,000	
Capacity building of stakeholders					
AXIS 5: Institutional set-up, governance, type, decision making process	<i>Institutional set-up, governance and type</i>	<ul style="list-style-type: none"> · Piloting · Coordination Gender · Monitoring and Evaluation		2,000,000,000	
Total				2,893E+12	
Annual cost of project				115,720,000,000	

6.2. Profitability of programme

With the obligation in 1997 to create a wood industry for each Forest Management Unit (FMU) exploited and the prohibition, in June 1999, of timber exports in the form of logs for most traditional species, most of Cameroon's forestry sector stakeholders are now involved in sawing activities.

As with any traditional investment, it would be proper to know the profitability or at least the factors that influence it. Stakeholders will be interested in:

a) Seeking the best profit per hectare and per year of sustainable management in the short, medium and long terms. This is probably the approach adopted by most private businessmen who do not consider their forests as an item of speculation. This is equally the case for Government business officials whose focus is in increasing annual income (or reducing deficits). This analysis cannot be dissociated from growing stock value development.

b) Finding out highest return rate for invested capital.

In calculating the financial returns of a plantation forest, the income collected is compared to the cost incurred to acquire and own the plantation forest.

A) Cost incurred

a) **Expenses to set up the plantation:** Expenses to set up a plantation will depend on:

- The size of the plantation site;
- Accessibility notably to transport the equipment;
- The variety and size of species;
- The planting method;
- The type of protection and site preparation.

b) **Silvicultural investments:** This involves all measures related to biological production: creation of stands, nurturing, and their improvement right up to the designation of trees to be felled. Investments necessary for the planting of trees or shrubs are:

- Picketing and staking to ensure a regular alignment or network;
- Site preparation (auger, sub-soiling, ploughing and surface work);
- Supply of seedlings;
- Planting;
- Propping;
- Protection (individual plants against small and large animals; mechanical, with 3 to 4 picket lines per tree or wire fence with at least 3 wires and a picket line every 4m maximum against livestock; electrical protection: installation and supply against livestock);
- Mulching in jute, felt or biodegradable plastics;
- Relining;
- Pruning;
- Trimming

NGOMIN A. et al., MINFOF/GIZ, 2015 made estimates to set up a production forest drawing inspiration from the "*Analytical Accounting Plan*" of the National Forest Regeneration Board (ONAREF, 1987) and the Paper titled "*Module for the creation of one hectare of plantation forest*" drafted by ANAFOR and the Technical Centre of Council Forests (ANAFOR and CTFC, 2011). These estimates indicate the number of trees per hectare, average spacing, the surface area to be

reforested or regenerated, the average cost to create one hectare of plantation and forest maintenance for the 4 years following the year of planting.

- Average cost to set up 1 (one) hectare of forest plantation of 5m x 5m in full = CFAF 1,000,000;
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These estimates concern Teak, a species for reforestation currently recording a major success in the global timber market and whose planting is mastered in several tropical countries.

- Number of feet per hectare in the plantation = 2,500 feet;
- Number of exploitable stands per hectare after 20 years = 200 stands/ha;
- Volume corresponding to the 200 stands/ha (average diameter=30 cm and height=10 m) = 150m³

c) Harvesting: Its cost depends on the average thickness of the wood or the volume of an average tree, its quality, the spreading of the trees in the logging area, the volume exploited per unit surface, the service system: partitioning and roads. All of these factors depend on management contrary to the topographical situation, relief and the nature of the soil over which the manager has no influence.

d) Equipment: Investment and maintenance – Any forest managed in view of obtaining economic benefits requires service equipment comprising operational partitioning, skid trails, truck access roads and depot space, rational organisation of all the work requires dividing the forest into management plots and the area should be clearly visible and indisputable. Depending on the nature of the soil, a sanitation system could be indispensable. All this equipment represents the investment capital and the maintenance expenses that should influence the final result.

e) Administration, management, surveillance and general costs: It is important to make a clear distinction between the indispensable, the useful and the superfluous. Efficient management is that which maximises proceeds by harvesting the largest possible volume of highest valued wood while minimising all costs, be they forestry, harvest, real estate maintenance or general costs, in relation to both the volume produced and the unit area.

B) Income derived: The income derived varies with the type of silvicultural production

Tree productivity for a given species is influenced by:

- The site (soil quality, depth, richness, drainage system, compaction...);
- The altitude;
- The space available for lateral root growth depending on the type of root (tap or tracer).

C) Logging: Logging will be more profitable if there are many trees to be felled on a small surface or short distance. The minimum threshold that does not disfavour transportation is a quantity of wood that trucks can load representing about 30m³. Below this volume, the transportation cost per m³ will be at a disadvantage proportionate to the distance.

Factors that influence costs and hence financial output:

a) Forest growth: Growth is the determining factor of the financial output of a forest. This varies depending on the species, age, density, soil and climate. For example, a plantation growing on fertile

soil will yield more to its owner than a plantation growing on poor soil. The farmer can equally influence the growth of the stands through silvicultural activity. These activities have a major influence on the diameter of the trunks.

b) Wood prices: Tree species do not all have the same value. Wood price also varies with the quality of logs produced. Producers therefore increase the profits of their forests by producing logs to be sawn instead of logs to be processed into paper and pulp.

c) Variation in land value: The value of the “wood” component of forest property depends on the volume and the net price of each wood category minus the operation costs required for its harvest. The result is the value of the standing wood. As for the “land” component, the value is mostly determined by demand and supply. This depends notably on the location, accessibility, the “leisure” aspect and zoning. Property located near a big city, accessible throughout the year by tarmac road will be more demanded than a plot far from big cities and with roads poorly maintained during the rainy season.

d) Active management: Active management of a plantation forest requires the planning of future projects and their realization at the expected period.

e) Forest taxation: The forest taxation policy in force involves only natural forests.

Income is derived from:

- ✓ **Timber sales:**
 - Lumber, including quality timber;
 - Industrial timber;
 - Firewood.
- ✓ Other forestry products: barks, decorative branches, mushrooms, fruits... Diverse uses (hunting, fishing, pasture, leisure tracks) are sometimes considerable supplements to the budget of a property.
- ✓ **Payments from “non-market” services:** Non-market services may be developed within the forest as a meaningful supplement to re-establish profitability, but lengthy discussions are still needed before this payment becomes operational and attractive for the forest owner. Not all hope is lost yet given that forest management still encompasses relatively unknown treasures for rationalisation and improvement.

D) Profitability Analysis

Annual net income is the difference between income and expenditure. To analyse the profitability of a plantation forest, the company first looks at the total volume of production and the proportion of timber, industrial wood and fuelwood with respect to overall production; under timber, it equally assesses the percentage of valuable wood in their various species, including their development with time.

One of the major difficulties of forest management lies in the possible confusion between production capital and yield or income. As long as it is alive, a tree is an element of production capital, and it takes nothing more than a decision from the forester, to transform it into a harvest or maintain it in production. The analysis of the annual results of the operating account alone is therefore obviously insufficient to assess the quality of management, if the analysis of the production capital is also neglected in all dimensions.

The assessment of the profitability of a forestry investment is usually conducted by adding a capital rate (with compound interest) to expenditure and comparing the results with expected revenue. When updated costs and revenue are equal, it gives the Internal Rate of Return (IRR) of invested capital.

The best profitability is that which helps offset the highest rate. This method of calculation is not questionable. Either through production cost by capitalising the initial investments or through the anticipation of expected revenue (discounting projected income), it allows for the calculation of the current value of an immature stand sometimes considered as a future value. All experts use it, both for the assessment of stands and, in the case of damages, to find the basis for compensation. Its application to the assessment of entire forest estates, with more or less varied age classes with varying degrees of balance, faces more serious difficulties, notably, when it has to do with determining the limit of mature and immature stands, and moreover for mixed forests where the classes of size, height and age intersect. However, professionals perfectly know methods to overcome these difficulties. On the contrary, the use of the IRR to define the strategy of a forest estate, and to take silvicultural decisions, seems very unreliable and even perilous.

Above all and more fundamentally, no forester is able to predict fluctuations in timber prices for a period spanning beyond a few years. Changes in the prices of certain species in the course of time tell of the fluctuations which can occur. It therefore seems necessary to warn foresters against applying the IRR during their brainstorming and strategic decision-making.

6.3. Programme impact

6.3.1. Social impact

- The community will through the programme enjoy forest resources, contribute in improving their income and living conditions through silviculture thus enabling them to find solutions to their social problems such as paying their children's school fees and ensuring their family's health.
- The programme will create several direct and indirect jobs for rural households (especially women with serious fuelwood needs).

6.3.2. Financial impact:

6.3.2.1. *Marketing of plantation forest products*

Based on calculations made in the production of Teak (NGOMIN et al, 2015) close to 150m³ of softwood timber and construction wood could be harvested from one hectare of plantation after a 25-year cycle. If it is considered that the market price for species of the same value stands at about CFAF 250,000 per m³, then, the programme will help to generate CFAF 750 billion/year³.

6.3.2.2. *Marketing or sale of some forest regulatory functions*

In addition to the productive resources of the forest (such as timber, Non-Timber Forest Products [NTFPs], genetic and medicinal resources) already sold in the market, the trend today is towards the marketing or "sale" of some forest regulatory functions. To this effect, four categories of forest regulatory functions stand out worldwide, especially as their demand is under suitable conditions. These categories include hydrographic services or watersheds, carbon sequestration/storage, the conservation of biodiversity and the beauty of landscapes. It should be noted that, these services are very often intertwined, giving rise to such expressions as "package", "basket" ("bundle") of environmental services.

³ 250,000 (price of m³ of wood in the market) X 150 m³ (volume of wood produced per ha) X 20,000 (annual surface area planted)

Payment for Environmental Services (PES) is based on the observation that, there is a degradation in the quality of the environment caused by external factors and that, services rendered are not adequately economically valued despite the existence of a latent demand and a disposition to pay by at least a cross-section of beneficiaries (Mayrand and Paquin, 2004). PES therefore aims at remunerating the supply of positive environmental externalities by transferring the financial resources of beneficiaries and ecological services to suppliers of the said services who are very often environmental resource managers or land users (Mayrand and Paquin, 2004). Land users are therefore encouraged to include the supply of environmental services in their land or resource use decisions. Carbon sequestration could help gain CFAF 124,006/ha/year (MINFOF, 2013). This means that the implementation of the NPFDP will help gain CFAF 4,960,240,000/ha/year of potential revenue for carbon sequestration.

6.3.3. Economic impact

The most significant economic impact is the creation of jobs. According to estimates (NGOMIN et al, 2015) the cost of setting up one hectare of plantation forest could be about CFAF 3,000,000. Considering that all costs incurred in this activity relates to labour, if the labour cost of this kind of activity is considered at about CFAF 3000/day, it can be estimated that setting up one hectare of plantation forest would require the labour of 1,000 men/day. This represents close to 3.5 (at 288⁴ men/day/year) jobs for the four years of plantation monitoring. The programme should thus generate close to 70,000 jobs yearly over the implementation period.

The NPFDP will equally have an economic impact through:

- Increase in production that will undoubtedly boost the country's GDP. The export of timber will improve the trade balance and attract foreign currencies.
- Contribution to the promotion of local development through private sector development support. To this end, the implementation of some tasks notably technical activities should rest as much as possible with service providers (companies, economic operators, NGOs).

6.3.4. Environmental impact:

The programme will contribute in stopping desertification and the genetic depletion of forest resources, restore degraded lands and mangroves as well as protect forest belts and watersheds.

6.3.5. Cultural impact:

The programme will contribute in stopping the genetic depletion of resources and ensure the sustainability of some important cultural species for the communities.

6.4 Assumption and programme risk assessment

The main risk in implementing the NPFDP is the lack of available financial resources and governance, not only for project managers but also for beneficiaries. In addition to these major obstacles should be added other constraints such as slowness in the release of funds, which is sometimes done at odd periods, making it difficult to control the technical itinerary of the crop and to match training with the crop cycle.

It is worth noting that the poor organisation of stakeholders is a risk factor for the success of project initiatives, notably as concerns the implementation of micro projects.

⁴ Equivalent to 24 labour days during 12 months)

7. IMPLEMENTATION INSTRUMENTS AND FUNDING STRATEGY

7.1. Technical options of plantations

The forest manager has several plantation tools depending on the degradation of the natural forest and population pressure, as illustrated in the figure below.

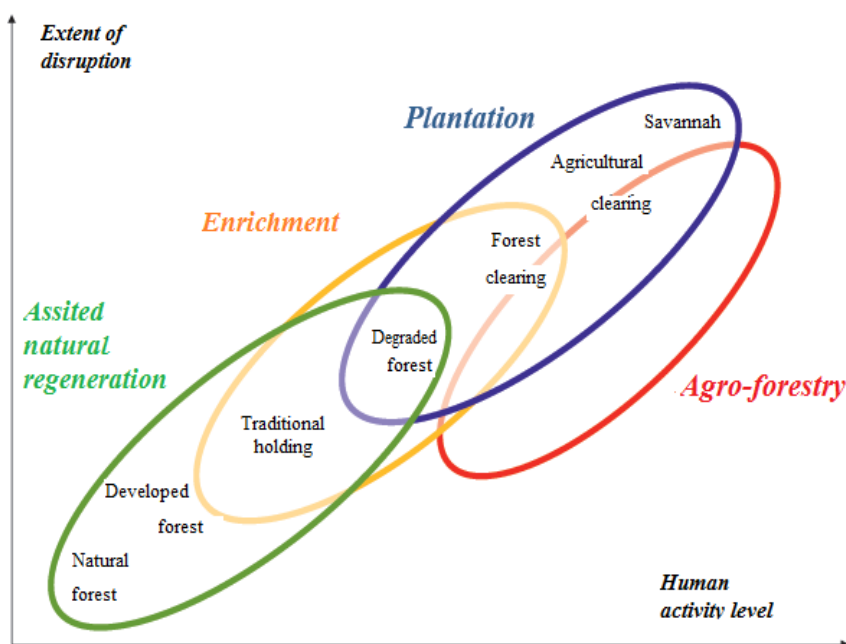


Figure 7: Relative importance of various ‘plantation’ tools depending on the level of degradation of natural forests and population pressure

7.1.1. Technical options of plantations depending on ecosystems:

Several technical options are open to plantations depending on the ecosystem as illustrated in the table below.

Table 13 : Technical options of plantations depending on ecosystems

	Size of residual forest cover		
	A little residual forest remaining	No residual forest on the site	
Possible restoration options	<p>Option 1:</p> <ul style="list-style-type: none"> -Count mainly on natural successional processes -Protect the forest and allow nature to act -Protect the forest and manage trees in a way to promote certain species (by proceeding for example with crop care or thinning) -Protect and enrich the forest by introducing species with market value 	<p>Option 2:</p> <ul style="list-style-type: none"> -Set-up plantations using choice species -Use single-crop species capable of adapting to the conditions of the site (preferably local species) - Use single crops but plant different species in different areas of the landscape depending on the conditions of the site - Use single crops, and grow subsistence crops non-timber products at the sub-layer - Create plantations of diverse tree species 	<p>Option 3:</p> <ul style="list-style-type: none"> -Use cover crops or plant species capable of facilitating the growth of choice species - Use species capable of adapting to site conditions and eliminate weed, preserve or improve soil fertility and enable the future growth of choice species

7.1.2. Various onsite option scenarios

The scenarios summarised below illustrate how ecological and forestry factors could have an influence on RPF choices.

Scenario 1: Landscape with a large forest cover though having been widely exploited.

State: The landscape still has a large forest surface area. Lowlands are mainly covered with secondary forests or regrowth forests, while the mountainous areas are still covered with intact, natural forests. Agriculture is only practised in a small relatively flat area in lowlands.

Recommended approach:

Protect as much as possible remaining forest areas against likely major disruptions, and allow them to regenerate naturally or repair previous degradations.

Develop the secondary forest given that this measure could be useful in commercial terms.

If deforestation is necessary for agriculture, give priority in this case to spaces where conservation is less important and endeavour to obtain or maintain good connectivity between wooded areas.

Comment: In this case, it is not necessary to invest huge sums for restoration given that the overall landscape has preserved most of its original biodiversity. In the long run, natural successional processes will restore the landscape since the main ecosystem mechanisms in their majority remain intact.

Scenario 2: Landscapes are more seriously degraded

State: Only small fragments of natural forest still exist and even steep slopes of hills are no longer covered by trees.

The vegetation is mainly composed of grass or shrubs and erosion is rampant.

Productive agriculture is possible on much flatter lands in the valleys but on more steep lands only temporary crops are grown given erosion problems.

Recommended approach:

Avoid further agriculture on hilly lands and replant trees on the steep slopes to check erosion (given that there is not enough wooden regrowth for natural regeneration to take place rapidly).

Use species that can adapt to these soils including exotic species if necessary, while giving priority to high value species if plantations would lead to harvest at the end and if long rotations are envisaged. On these slopes, wood harvest should be handled with care in order to protect watersheds as much as possible. This harvest however should be avoided in some situations.

Comment: In such circumstances, the main objective shall be to restore ecological services (such as watershed protection and biodiversity preservation) and not to maximise wood production.

Opportunity costs resulting from the halt in agricultural production are low, given that this low yield short term agriculture was probably less profitable to the local agricultural community.

An increase in the forest cover of the steepest slopes will contribute in promoting the adoption of more sustainable agricultural practises in the lowlands.

Scenario 3: Productive agricultural landscape comprising many small groves

State: The landscape was deforested on a large scale due to agriculture.

Though its farm is now productive, the level of biodiversity has dropped considerably and the future of agriculture could be undermined.

Recommended approach:

Develop smallholder farms by planting a variety of high value timber species of in under-utilized soils, with priority given to erosion prone areas (steep slopes, riparian areas for example) and areas with plantations that could be used to ensure connectivity between the other parts of the forest.

Comment: Functional advantages and the values of biodiversity will increase if reforestation can be effective in some strategic areas of the landscape.

This approach could be difficult when there are many landowners and even more difficult if these owners have only small plots of land. However, plantations whose location was chosen with care and with a variety of species of higher value will probably offer better protection ecologically and economically, reduce risks and lead to more sustainable agricultural systems.

Table 14: Main objectives and major management actions for various types of forest lands and other degraded lands

Types of forests /degraded lands	Restoration Objectives	Management actions						Desired outcomes
		PROT	CONS S&E	MAN REG	PLANT ENR	PLANT	AGRO-FOR	
Agricultural Lands	Restore fertility							<ul style="list-style-type: none"> • Agricultural production systems • Agroforestry • Tree planting • Protected forests • Restored forest cover • Developed secondary forests • Multi-purpose forests
	Restore and boost productivity							
	Meet subsistence needs							
	Generate income							
	Protect against fire , grazing; wind, etc.							
	Restore/preserve biodiversity							
Riparian areas	Protect river banks							<ul style="list-style-type: none"> • Protected forests • Restored forest cover • Stabilised rivers
	Improve water quality downstream							
	Restore/preserve biodiversity							
Watersheds	Prevent and control erosion							<ul style="list-style-type: none"> • Protected forests • Restored forest cover • Stabilised slopes
	Stabilise drainage basins							
Production forests	Restore/boost productivity							<ul style="list-style-type: none"> • Developed/restored forests • Tree planting • Protected forests
	Restore/preserve biodiversity							
	Protect against fire, illegal logging, poaching, colonist, etc.							
	Prevent and control erosion							
	Generate revenues							
Protected areas	Restore ecological integrity							<ul style="list-style-type: none"> • Protected forests • Restored forest cover
	Restore/preserve biodiversity							
	Increase the population of endangered/threatened species							
	Protect against fire, illegal logging, poaching, etc.							
Protected zones	Restore ecological integrity							<ul style="list-style-type: none"> • Rehabilitated areas • Restored forest cover

‘The filled boxes indicate better conservation actions to achieve desired objectives; PROT = protection measures; CONS S&W = soil and water conservation; MAN REG = management of natural regeneration (including practises aimed at maintaining, inducing and supporting natural regeneration); PLANT ENR = enrichment planting; direct planting (mixed or pure species) AGROFOR = agroforests

a) Onsite restoration strategies in degraded primary forests

The ITTO (2002) defines a degraded primary forest as: *a primary forest whose initial cover has been compromised by unsustainable harvesting of timber and/or non-timber forest products in a way that its structure, processes, functions and dynamism are altered beyond the short term resilience of the ecosystem; meaning the ability for these forests to fully recover from exploitation, rapidly or in the medium term has been compromised.*

The degradation of primary forests is frequently ascribed to excessive harvest of timber and non-timber forest products, overgrazing and fires. Among these causes, uncontrolled logging, with the use of heavy equipment and inappropriate harvesting methods are probably the main problems in moist tropical areas. This has negative effects on land, remaining trees, water and wildlife.

Restoration strategies for degraded primary forests will depend on the state of the forest stand, the restoration objectives of the programme and available resources. Generally, four main restoration strategies (which are not necessarily mutually exclusive) can be used:

- Protection and natural recovery;
- Management of natural regeneration;
- Enrichment planting; and
- Direct planting.

Each of these strategies requires a number of silvicultural interventions with the aim of facilitating the survival and the development of the pre-existing regeneration (seedling, saplings, and stakes) as well as various planting methods as in the last three cases. Following is a successive discussion of the four strategies as well as the silvicultural interventions needed.

Enrichment planting

Enrichment planting refers to the introduction of valuable species in degraded forests without eliminating the valuable species already present.

Enrichment can be justified in sectors where the natural regeneration of desirable species is inadequately or irregularly distributed, or when the objective is to introduce precious species that do not easily regenerate.

This silvicultural technique was widely used in the tropics to supplement the natural regeneration of stands by planting or sowing species for commercial purposes, especially when soil features were not suitable for other land uses. It has evolved from a simple planting in gaps, to planting in layers subjected to more intensive supervision, and even to a tightly planted conversion system.

The spatial sowing arrangement is reflected in the various terms used for enrichment planting:

- *Understory plantation* – this is when artificial regeneration is carried out under the cover of a number of residual trees with no commercial purpose;
- *Block planting* – this is when seeds are planted in groups depending on the expected spacing of the main forest stands;
- *Line planting* – this is when trees are planted all along the cleared lines; and
- *Planting in gaps* – this is when seeds are planted in natural or artificial empty spaces.

b) Onsite strategies for management of secondary forests

The ITTO (2002) defines secondary forest as: *the regrowth of the woody vegetation on lands largely cleared of their original forest vegetation (that is having less than 10% of their original forest cover).*

With this definition, it would appear that secondary forests:

- Result from a *significant disruption* of the original primary forest with major changes in its structure and its composition. In that regard, a “secondary forest” cannot be considered as a primary forest undergoing selective cutting;
- *Differ* from shrub lands, grasslands or any other non-forest vegetation. A tree is normally defined as a plant of more than 3 metres of height and the FAO defines a forest as a land with a forest cover on more than 10% of its surface area; and
- Are in the successional stage *between* non-forest vegetation and primary forest. Over long periods, secondary forests could have structures and functions similar to those of the original forest.

Table 15: Management systems and examples of technical options for secondary forests

Management objectives	Management system	Example of technical option/management techniques
Boost the efficiency with which fallow vegetation accelerate the recovery of soil productivity in view of a future farm business	Improved fallow in short cycle	<ul style="list-style-type: none"> • Leguminous cover crops • Organic fertilizers produced out of the farm (ex: animal fertilizers, earthworms) • Growing of hedges following the contours and vaults rotation
Increase the availability of useful products to be used in the agricultural system and to diversify production	Improved fallow/enriched in the medium cycle	<ul style="list-style-type: none"> • Select and treat (timber and non-timber) tree species naturally established and useful, palm trees or small trees • Enrich with desired tree species (for ex: those preferred for timber, fuelwood, fruits, medicine or fodder) • Useful semi-perennial and perennial crop species
Boost the productivity and the value of secondary forest in view of generating income through the sale of ligneous and non-ligneous products and services of the forest.	Production forests in medium and long cycles	<ul style="list-style-type: none"> • Conservation and management of seed species of commercial interest • Thinning clearing in favour of trees for commercial interest • Cover opening and cleaning of the understory to favour regeneration establishment of commercial interest • Soil exposure to favour desired regeneration • Enrichment (in lines, blocks or in empty spaces) with tree species of commercial interest
Ensure the sustainability of secondary forests in view of improving its functions and protective/environmental/recreational values	Conservation forest	<ul style="list-style-type: none"> • Protection of species useful to wildlife, and as seeds • Collection of natural seeds (young plants, saplings) of desired species to replant in farms and enrich fallows, high forests, etc. and • Management of wildlife

Sources: Smith and al. (1997)

c) Onsite strategies for the rehabilitation of degraded forest lands

Degraded forest lands were defined by the ITTO (2002) as: *ancient forests seriously damaged by excessive harvest of wood and/or non-wood forest products, poor management, repeated fire disasters, grazing or other hazards and land use damaging to the soil and vegetation to the extent*

that the forest regrowth has been inhibited or that the forest recovery has been seriously retarded after being abandoned.

Degraded forest lands are characterised by:

- Lack of forest vegetation (though one block or several blocks of trees and/or pioneer shrubs could be found);
- Less fertile soil;
- Poor soil structure (including soil compaction, waterlogging, salinization or other physical or chemical obstacles);
- Soil erosion;
- Repeated fire disasters and a greater predisposition to fire;
- Serious competition between grass and ferns in particular; and
- Lack of micro-habitants capable of promoting the germination or establishment of seeds.

There are four strategies for the rehabilitation of degraded forest lands:

- Protection measures;
- Measures aimed at accelerating natural recovery;
- Measures aimed at facilitating natural regeneration; and
- tree planting.

Agroforestry can be considered as the fifth strategy applicable to these sectors.

d) Onsite strategies for the restoration of forest functions on agricultural land

Agroforestry, as currently defined by the International Centre for Research in Agroforestry is: *an ecology based system with dynamic management of natural resources, which, through the planting of trees in farms and the agricultural landscape, diversifies and sustains production while increasing social, economic and environmental advantages to the benefit of land users at all levels* (CIRAF, 2000).

More specifically, it is a set of land use practices, which involves deliberately associating trees, food crops and/or animals on the same management unit, depending on the spatial and temporal sequential system (Lundgren & Raintree 1982).

Agroforestry went through several development stages and its scope has broadened: it began by providing farmers with direct productivity gains demonstrated onsite, and later provided 'public goods' or to fulfil significant off-site forest functions at the level of the landscape. Off-site advantages could comprise watershed improvement, biodiversity conservation and agroforestry systems could be classified under three major types of structures, notably:

- *Agroforestry (arboriculture systems)*: it is a land use system in which agricultural and forest products are developed simultaneously or alternately;
- *Silvo-pasture (systems associating trees, pasture and livestock)*: In this system, land use is a combination of forest and livestock management through fodder production and organised grazing.
- *Silvo-pasture* is the land use system predominant in arid regions and generally areas for livestock farming;
- *Agroforestry-pasture (systems associating trees, crops and livestock)*: In this case, land use associates the three activities mentioned above, that is, agriculture, forestry and livestock. They all occupy the same piece of land but not at the same time. Trees providing fodder for animals and nutrients for crops; crops providing food for farmers, fodder for animals and

organic matters for the soil; and animals providing manure, which is used as organic fertilizer to increase soil fertility and boost crop and tree growth.

7.2. Type of operations

a) Reforestation

Reforestation is an operation which consists in creating wooded areas or forests that were destroyed by clear-cutting (or “clear-cuts”) or destroyed by various causes in the past (overexploitation, forest fires, overgrazing, war...)

Reforestation helps in adapting forestry to climate change or to new market demands, with the use of new species, origins and improved varieties (qualified or tested orchards, tested cultivars, tested forest stands) or in the management of new forestry itineraries. Reforestation can equally be the replacement of species found off-site following mistakes made in the past or consequences of climate change. The return to the wooded state is contained in sustainable management documents (development of public forests, simple management plans ...)

The decision to plant trees deserves to be analysed depending on the stakes of the territory and more specifically:

- The absence of agricultural challenges justifying the setting-up of afforestation regulations in the council area, the project context, the absence of strong environmental stakes related to the maintaining of non-afforested areas (like sites classified as natural reserve areas);
- Sufficient stationing potentialities to enable the emergence of an economically viable forest settlement;
- Availability of good roads for the evacuation of timber after cutting.

The choice of species, key aspect in constituting future forests, deserves to be analysed keenly based on:

- An analysis of site potentials of the land based on an assessment of the depth, the composition, the structure and the soil richness, as well as climatic data collection notably annual rainfall;
- Economic opportunities and the availability of a vibrant market for expected products;
- Possible environmental or landscape prescriptions limiting the planting of some species considered inadequate;
- Existence of disturbing factors or elements likely to undermine the future of some sensitive species. This could be for instance a large deer population on particularly palatable species or a topographical position favourable to wind throw.

There are many stages in the definition of a reforestation/afforestation project, for which persons reforesting must question the expediency of each of their choices.

Choice of planting technique: There is no universal technique, given that factors such as the nature of the land, its topography, the quantity of spontaneous natural vegetation and climatic conditions prevailing have an impact on the most appropriate technique.

Based on studies carried out at each stage and response elements provided, a definition of the reforestation project will lead to:

- Delimiting areas that really need to be reforested;
- Determining the main production species to prioritise given the site characteristics of the land and eventually completed by the introduction of support species, depending generally on environmental or landscape stakes;

- Selecting the origin(s) of the most suitable regional order. For use at altitude, give priority to the growing of seedlings at altitude or under continental climate influence;
- Defining a plantation density, corresponding to spacing between lines and spacing between seedlings on the same line (appendix 10). The consultation of silviculture guides could be useful in preserving an adequate density, compatible with future logging constraints.

When the reforestation project is finalised, it will define:

- The nature and the date of preparatory works before planting;
- The quality of seedlings desired depending on species selected, based on the respect of standards in quality and dimensions;
- Conditions for the planting of seedlings;
- The nature and the period of interventions after planting;
- The plan and financing modalities.

It will be necessary to check that all the preparatory work for planting or sowing has been carried out in accordance with the specifications and within the planned timeframe (treatment of the initial vegetation, ploughing, shifting, etc...).

Under Section 63 of Law No. 94/01 of January 20 1994 to lay down Forestry, Wildlife and Fisheries Regulations, reforestation is considered as a forest development operation in Cameroon. In this regard, forest development comes within the purview of the Ministry of Forestry that implements this through a public organ (Section 64 paragraph 1) or which sub-contracts some development activities to private or community structures.

According to Article 3 (7) of Decree No. 95/436/PM of 23 August 1995, a reforestation area is a reforested or destined to be reforested land and whose objective is the production of forest products, and/or the protection of a fragile ecosystem. User rights for hunting, fishing, grazing and harvesting are equally regulated depending on the assigned objective of the reforested area.

Section 19 of Law No. 94/01 stipulates that incentive measures should be taken when necessary, in order to encourage reforestation. It is in this perspective that Section 75 of Law No. 96/12 of 5 August 1996 to set up an environmental management framework provides that any operation contributing in curbing erosion, efficiently combating desertification or any afforestation or reforestation operation, any operation contributing in promoting the rational use of renewable resources notably in the savannah areas and the northern part of the country shall benefit from funds provided for by this Law.

Even though Section 30 of the law of 1994 provides that incentive measures could be taken when necessary in view of encouraging reforestation, land tenure issues and ownership of planted trees, and their use are at the core of the reforestation and regeneration problem, thereby necessitating the amendment of its legislation and regulations.

Article 34 paragraph 7 regulates user rights of local communities in reforested areas.

b) Forest regeneration

It could be natural or artificial.

Natural regeneration uses natural cycle reproduction of existing stands. It corresponds to all interventions in the regeneration of forest stands using seeds from standing trees. Seedlings develop from the grains of these trees (seed trees) which are progressively removed.

A study of the forest stands should precede any natural regeneration operation: quality of seed trees in the plot and in proximity, fruit bearing period, soil quality and technical constraints. The natural regeneration phase comprises some or all of the following tasks:

- Preliminary land preparation (ploughing, picking);
- Protection against game;
- Refill in case of insufficiency of natural seeds. The success of natural regeneration depends on a series of good fruit yields; these yields themselves depend on good climatic conditions, the age of trees, exposure of the tree crown to the sun, the absence of excessive hunting and harvesting.

Recommendations should be taken into account:

- Before carrying out replenishing, a diagnosis should analyse the reasons for its initial failure. It is important to assess the need for an additional enrichment of a natural regeneration;
- It is not necessary to complete all open spaces of the plantation or of natural regeneration. Taking advantage of the surrounding vegetation (stuffing) is a good way to make seedlings grow, given that it prevents the creation of lateral branches;
- The density of the operation should take into account the species planted and the presence or not of surrounding vegetation (and eventually conditions for eligibility for grants). This varies from one region to the other;
- Protection against game should be adapted to the real pressure it represents and the surface to be protected;
- A preliminary diagnosis helps in assessing the advantage in investing in this relatively costly protection.

Regeneration may require that the site be declared out of bounds. Article 3 (14) of Decree No. 95/531/PM of 23 August 1995 to lay down conditions for enforcement of Forestry Regulations, defines land declared out of bounds as a degraded area closed to any human activity during a well determined period of time, in view of developing forest regeneration on this land and to restore its productive capacity.

Conditions for creation, maintenance and development of such a space are set out in Section 17 (1) and (2) of Law No. 94/01 of 20 January 1994 and provisions of Decree No. 95/531. As stipulated in paragraph 1 of this law, “some lands may be declared out of bounds or declared ecologically fragile areas, in order to enable forest regeneration and/or restoration of the production capacity of degraded lands”. The act of classifying an area to be ecologically fragile as well as the prohibition of lands are taken by a Decision of the Governor of the Region concerned, on the basis of a technical file drawn up by the regional the Administration in charge of the environment (Article 10 paragraph 2 of the Decree). This file should comprise the following:

- a. Minutes of a consultation meeting with the community and Administrations involved;
- b. Action plan developed based on conclusions of minutes mentioned above.

The implementation of prescriptions of plots of land out of bounds is the duty of the forest administrative authority, councils covering the area concerned and the population (Article 11 of Decree). According to Article 26 (3), user rights of local communities are not considered in Protected Areas and the classification of these plots lead to the prohibition of clearing or exploitation activities.

c) Agroforestry

Agroforestry is the association of trees and agricultural productions (plants and animals) on the same area. Traditionally, agroforestry systems take the form of hedge systems or meadow orchards, associating fruit trees and meadow. Today, all configurations are however possible: fruit or forest trees associated to meadows as well as the cereal crops or market gardening around or in the plots.

For the farmer, objectives are varied:

- Economic diversification;
- Integrated crop protection (biodiversity, auxiliaries);
- Improving animal well-being (windbreaks, protection against the sun);
- Mitigating extreme phenomena (creation of micro-climates).

Consequently, agroforestry systems can take several forms, depending on the objectives pursued as well as local soil-climate conditions.

Defining the project should not be neglected, given that an agroforestry project is a long-term endeavour. Firstly, there should be that passion for trees when setting up an agroforestry project.

Diagnosis of area of intervention: It is important to study the environment: the area for the plantation of trees (topography, hollow) and existing species.

Selection of the plot of land: It is advisable to start an agroforestry project with a few hectares in order to avoid work overload during the first years. A plot of land should be selected depending on:

- The size and the form: the more the plot is square, the more rapid farm work will be. It is recommended to have a plot of at least 100 metres long;
- Climate orientation of the plot: it is advised to have a plot less sensitive to frost;
- Cultural background: a rapeseed or pivotal alfalfa opens way for soil penetration, cereals clear broad leaf weeds, etc.

Location: After selecting the plot, verify from the relevant council authorities to ensure that the plot is not in an area destined for the council tree plantation.

Soil survey of the plot: It is recommended to dig a soil pit with a digger (a pit for each homogeneous soil unit) in order to better assess the soil (various horizons, useful reserve, possibility of root passage). It is equally advised to do soil analyses (pH, presence of active limestone, phosphorus and potassium) to select species.

Selection of species: Tree selection is done depending on several factors:

- Adaptation to the environment: depending on the soil, climate and topography;
- Objectives of the project: shade, biodiversity, production of lumber, firewood, ramial chipped wood (RCW);
- Intercrops to be planted.

The selection of inappropriate species is the main cause of failure of plantations on agricultural soils. It is advised:

- Not to neglect the criteria mentioned above;
- To mi species, given that it reduces economic and health risks. It equally increases biodiversity;
- Consider shrub planting (hawthorn, blackthorn) between trees to maximise biodiversity.

Choice of orientation and density of trees:

- In order to grow trees right up to their logging, it is recommended to keep distances that are twice the height of adult trees;
- The distance between shaft lines (4 to 10 meters) depends on the quality of seeds (less light if the trees are of good quality).

The orientation of shaft lines is done following some criteria:

- Fighting erosion: shaft lines on contours if the plot is sloping;

- Wind protection: shaft lines against the direction of dominating winds;
- Seeking exposure to the sun adapted to the need of crops: a north-south orientation is advised to for sunlight to spread evenly on crops. However, this could be interesting on a meadow that the illumination is uneven and shifts young grass.

d) Enrichment

Enrichment is an extensive forestry method for natural forests with low commercial species. It entails creating spaces in a degraded forest stand to plant more viable species and even to supplement the number of pre-existing commercial species through the close planting (3-4 meters) of precious species in parallel transect lines in the forest (20-30 meters apart). Enrichment planting is an interesting option given that this approach replicates the way several hardwoods of value regenerate naturally. Enrichment in a shrubby and forest environment increases the presence of quality trees in a forest. The forest cover provides a partial protection to new stems against animal grazing. In addition, planted trees better resist environmental disturbances (diseases and insects).

Though extensive in nature, its follow-up requires great rigour. Enrichment maintains the forest in its natural state without major disruptions but equally has some disadvantages: difficulty in controlling works, planning for long-term interventions, high demand for human labour.

Table 16 : Technical silvicultural recommendations for dense rainforests

Natural regeneration	<i>During logging</i>	<ul style="list-style-type: none"> - Maintain more than 15 m²/ha of standing land surface (optimal 20-25 m²/ha). - Limit sampling during logging: maximum of 25 m³/ha. - Control the felling of trees, skidding and evacuation of wood. - For valuable species, it is necessary to keep seedlings regularly distributed for all species. - The sampling should be moderate to protect the future species stands and the regeneration planted and also, to limit the spread of creepers and other undesired weeds in farm spaces. - Reducing logging damages that could destroy or damage a major section of the regeneration.
	<i>After logging</i>	<ul style="list-style-type: none"> - Do not re-export before the end of rotation. A period of thirty years is necessary, depending on groups of species to reconstitute in number the initial stock of exploited commercial stems. - <u>Upper floor</u>: Clearing and respite (if necessary) for commercial species. - <u>Lower floor</u>: Re-cutting strands broken due to logging. Facilitate regeneration in spaces.
Enrichment	<ul style="list-style-type: none"> - Open the forest to a minimum of 3 metres with lines of a distance of less than 25 metres. - Adjust lines E-W to facilitate the lighting on seedlings. - Use rapidly growing sun-loving species with high stems (2 years). - Plant close to the line (< 3 meters). - Keep the lines open to limit competition and allow enough time for seedlings to the dominant stage. - To have at disposal enough labour to ensure maintenance for the time needed. - Brighten if necessary. - Do not re-exploit the forest during this period of recovery. 	
Intensive planting	<ul style="list-style-type: none"> - Diversify used species. Use quality plant material. - Respect the site/species/constitution adequacy. - Reforest much degraded forest formations in priority. Avoid soil stripping. - Reconstitute complete cover rapidly (naturally or artificially). - Plant very closely (> 700 saplings/ha). - Ensure that seedlings have enough light. - Ensure early lighting access. - Ensure protection from fire. 	

Technical recommendations for dry forests

- Groups of timber species will be constituted through dominant use (fuelwood, timber, fruit tree, fodder, etc.)
- For each group species, a management mode (minimum exploitation area, rotation, sanitation cutting, height and cut back period, protection and conservation system) should be defined.
- After logging, it is recommended to declare out of bounds for a short term (grazing, fire) of a few months to facilitate natural regeneration.
- For coppice, the minimum exploitation diameter is set at 6-8 cm depending on species. Rotations are short, 7 to 14 years. The height of cutting-back will be adapted to each species.
- For timber forest, minimum exploitation diameters are 30-35 cm with 20-40-year rotations; at times more (50-60 years).
- Intermediary forestry operations, sanitary thinning and clearing should be planned every 10-15 years in trees destined for timber.
- Fruit species will be completely protected with sanitary thinning removing declining trees.
- Pruning and trimming of fodder trees will be controlled. Fodder species will be trimmed to a height of over 2 metres to protect them from cattle.
- Multiplication by vegetative method will complement the sexual method as often as possible, especially under unfavourable biotic conditions.

e) User rights/ownership of planted trees

In general, user or customary right granted the local community is defined in Section 8 (1) of Law No. 94/01 of 20 January 1994 to lay down Forestry, Wildlife and Fisheries Regulations. According to the Law, it is the right granted the local community to use all forestry, wildlife and fishery products except protected species in their private interest. Article 26 (1) of Decree No. 95/531/PM of 23 August 1995 buttresses that local communities shall conserve their user rights which consist in carrying out their traditional activities notably the harvest of secondary forest products, within national forest estates. According to sub section 2, to satisfy household needs notably firewood and construction wood, the relevant local community can fell a number of trees to cover their needs. However, this population is obliged to justify their use during forest controls and cannot, by any means, sell or exchange the wood of these trees.

Section 39 (1) of Law No. 94/01 considers individual forests as forests planted by physical persons or corporate bodies on their acquired land in compliance with the laws in force. Owners of such forests are obliged to prepare a simple management plan with the support of the forestry administration.

The user rights of trees planted or the use of individual forests is defined in Article 97 (1) of the Decree of 23 August 1995 giving the possibility that this exploitation be done, either by the owner or any person designated by him. However, the concerned individual is obliged to inform the local forestry administration authorities. Paragraph 2 of the same Article 97 of the Decree gives the possibility to the Forestry Administration to suspend the exploitation when it is likely to undermine the environment.

In the case where the logging is carried out by the owner (felling permit for personal use), Article 94 (2) (new) of Decree No. 2006/0129/PM of 27 January 2006 to amend and supplement certain provisions of the Decree of 23 August 1995, stipulates that the felling permit for personal use is issued

by the Minister of Forestry, after the individual must have paid the selling price of the forest products solicited, on the basis of a file from the Regional Delegate with territorial jurisdiction giving his reasoned opinion. This permit cannot exceed five months and 50 m³ of raw logs. The permit equally defines the area to be exploited and the number of trees per species authorized for logging.

Should the logging be carried out by any other person designated by the owner, this person (physical or moral) must have a logging permit (Article 35 paragraph 1 of the Decree) and have the required technical skills (Article 35 paragraph 2). The authorisation is granted by Decree of the Minister in charge of Forestry, following opinion of the technical Committee for Approvals delegated by the Prime Minister, Head of Government.

Concerning the exploitation of Special Forest Products, poles, fuelwood, Article 86 (1) (new) of Decree No. 2006/0129/PM of 27 January 2006 to amend and supplement certain provisions of the Decree of 23 August 1995, provides that exploitation authorisations for small-scale processing shall be exclusively granted to individuals of Cameroonian nationality or to companies in which they own the entire capital or have all voting rights. Article 125 of the Decree of 2006 requires that the species harvested, the quantities, dimensions, the weight and the volume of products as well as the place of the harvest should be specified.

Section 27 of Law No. 94/01 stipulates that the gazetting a forest can only be effective after compensation has been paid to persons having invested on the land, before the launching of the gazetting procedure by the administration.

Specific measures, on the other hand, refer to a number of guidelines and principles amongst which are ITTO and IUCN guidelines on forest plantations and the restoration of degraded forests.

7.3. Economic analysis

The economic analysis has as objective to measure the economic profitability of a specific investment vis à vis the society. This means that it takes into account costs and income for all economic agents of the society regardless of who pays and who receives. The economic assessment aims at measuring the well-being or the total wealth of the society created by an investment. Opportunity cost corresponds to income and expenditure that the other option generates.

7.3.1. Economic profit

Under the economic profitability analysis of forest investments, opportunity cost is measured through a baseline scenario. By applying the notion of opportunity cost, economic assessment measures additional wealth created by investment. It takes into account workers, forestry and processing companies and the Government.

Baseline scenario: Under profitability analysis of forest investments, the “the baseline scenario” is an exploitation scenario of natural forests. By applying the notion of opportunity cost, the economic assessment determines additional wealth created by investment in planted forests.

Economic income: Income accounted for in such an analysis corresponds not only to income from production and processing of wood resources representing the value of standing wood, profit of companies, wage earnings and additional income for quality and quantity, but also to the benefits of ecological services of planted forests.

From an economic standpoint, the profitability of planted forests is obvious. In fact, prospects of future wood jobs are high judging objectively from the economies that its use generates, the new

technologies developed from its use, the long term scarcity of fossilised energy, the contribution of wood jobs in reducing greenhouse gases through carbon sequestration, the stability and the comfort of wooden houses, etc... Everything should be made to increase wood related opportunities. In the same vein, climate change issues and the degradation of lands clearly justify the benefits of ecological services of planted forest as well as opportunities provided by REDD+.

7.3.2. Financial profit

With the obligation in 1997 to create a wood industry for each Forest Management Unit (FMU) exploited, and the prohibition in June 1999 to export most traditional species of wood in the form of logs, most of Cameroon's forestry sector stakeholders are involved in sawing activities.

As with any traditional activity, it is important to know its profitability, or at least the factors that influence it. Stakeholders will be interested in:

- Seeking the best profit per hectare and per year of sustainable management in the short, medium and long terms. This is probably the approach adopted by most businessmen who do not consider their forest as an item of speculation. This is equally the case for Government business officials whose focus is in increasing annual income (or to reduce deficits). This analysis cannot be dissociated from growing stock value development.
- Finding out highest return rate for invested capital.

In calculating the financial output of a plantation forest, income collected is compared to the cost incurred to acquire and own the plantation forest.

A. Cost incurred

a) Expenses to set up the plantation

Expenses to set up a plantation will depend on:

- The size of the plantation site;
- Accessibility notably to transport the equipment;
- The variety and size of species;
- The planting method;
- The type of protection and site preparation.

b) Silvicultural investments: This involves all measures related to biological production: Creation of forest stands, nurturing and improving them up to the designation of trees for felling. Investments necessary for the planting of trees or shrubs are:

- Picketing and staking enabling a regular alignment or networking;
- Site preparation (auger, sub-soiling, ploughing and surface work);
- Supply of seedlings;
- Planting;
- propping;
- Protection: (Individual plants against small and large game; mechanical, with 3 to 4 picket lines per tree or barbed-wire fence with at least 3 wires and a picket line every 4m maximum against livestock; electricity: installation and supply: for livestock);
- Mulching in jute, felt or biodegradable plastics,
- Relining;
- Size;
- Pruning.

NGOMIN A. et al., MINFOF/GIZ, 2015 made estimates to set up a production forest drawing inspiration from the “*Analytical Accounting Plan*” of the National Office for Forest Regeneration (ONAREF, 1987) and the Paper titled “*Module for the creation of one hectare of plantation forest*” drafted by ANAFOR and the Technical Centre of Communal Forest (ANAFOR and CTFC, 2011). These estimates indicate the number of trees per hectare, average spacing, the surface area to be reforested or regenerated, the average cost to set up one hectare of plantation and forest maintenance for the 4 years following the year of planting.

- Average cost to set up (01) one hectare of forest plantation of 5m x5m in full = CFAF 1,000,000;
- Maintenance after planting CFAF 500,000/year, representing CFAF 2,000,000 for 04 years of maintenance;
- Total cost to set up one hectare of forest plantation + 4 years of forest maintenance = **CFAF 3,000,000.**

These estimates are made on Teak, “a species for reforestation” which has high ecological, forestry, technological and commercial potentials and promising long term prospects, as it can be seen in tropical African countries already experiencing it. They include:

- the number of trees per hectare in the plantation = 2,500 trees;
- the number of saplings to be used per hectare after 20 years = **200 saplings/ha**;
- the volume corresponding to 200 saplings/ha (average diameter=30 cm and height=10m) = **150 m³.**

c) Harvesting: Harvesting cost depends on the average thickness of wood or the volume of an average tree, its quality, the spreading of trees over the logging area, the volume to exploit per unit surface, the service system: partitioning and roads. All of these depend on the management contrary to the topographical situation, relief and the nature of the soil over which the manager has no influence.

d) Equipment: investment and maintenance: Any forest managed in view of obtaining economic results requires service equipment comprising farm partitioning, skid trails, truck access roads and depot space. The rational organisation of all the work requires that the forest be divided into management plots and the perimeter should be clear and indisputable. Depending on the nature of the soil, a sanitation system could be indispensable. All this equipment represents the investment capital and the maintenance expenses that should influence the final result.

e) Administration and management, surveillance and overhead costs: It is important to make a distinction between what is indispensable, what is useful and what is superfluous. Efficient management is that which maximises income by harvesting the highest volume of the most valuable wood while minimising all expenses not only forestry but for harvest, real estate maintenance and general expenses, gotten not only for volumes produced but the surface unit.

B. Factors that influence expenditure

Factors that affect expenditure and hence influence financial output:

- **Forest growth:** Growth is the determining factor of the financial output of a farm. This varies depending on the type of species, age, density, soil and climate. For instance, a plantation which grows on fertile soil shall yield more for its owner, than a plantation which grows on poor soil. The proprietor may also influence the growth of his forest stand by carrying out silvicultural works. All these have a considerable influence on the diameter to which trunks grow.

- **The price of timber:** Tree species do not all have the same value. The price of timber is also influenced by the logs produced. Producers therefore improve the yields of their forests by producing logs for sawing rather than logs for pulp and paper.
- **Fluctuations in value of land:** As far as the “land” component is concerned, the value is mostly determined by demand and supply. This is notably influenced by the location, accessibility, the “leisure” aspect and zoning. For instance, property situated close to a big city, accessible throughout the year by a tarred road, is subject to higher demand than a plot far from major cities, with poorly maintained roads.

C. Income derived:

Income derived varies with the type of forestry production.

a) Productivity: The productivity of trees of a specific species is influenced by:

- The site (soil quality, depth, fertility, drainage, compaction...);
- Altitude;
- The space available for lateral root development depending on the type of root (taproot or creeping).

b) Exploitation: The more the number of trees to be exploited on a small surface area or distance, the more profitable logging will be. The minimum transport-friendly is a multiple of the volume of timber that the trucks can load, that is, about 30 m³. Below this volume, the cost of transport per m³ shall be advantaged proportionately to the distance.

Income is derived from:

- ✓ **Sales of timber:**
 - Lumber, including quality timber;
 - Industrial timber;
 - Firewood.
- ✓ Other forestry products: barks, decorative branches, mushrooms, fruits... Diverse uses (hunting, fishing, pasture, leisure tracks) are sometimes considerable supplements to the budget of a property.
- ✓ **Payments from “non-market” services:** Non-market services may be developed within the forest as a meaningful supplement to re-establish profitability, but lengthy discussions are still needed before this payment becomes operational and attractive for the forest owner. Not all hope is lost yet given that forest management still encompasses relatively unknown treasures for rationalisation and improvement.

D. Profit analyses

Annual net income is the difference between income and expenditure. To analyse the profitability of a plantation forest, the company first looks at the total volume of production and the proportion of timber, industrial wood and fuelwood with respect to overall production; under timber, it equally assesses the percentage of valuable wood in their various species, including their evolution with time.

One of the major difficulties of forest management lies in the possible confusion between production capital and yield or income. As long as it is alive, a tree is an element of production capital, and it takes nothing more than a decision from the forester to transform it into a harvest or maintain it in

production. The analysis of the annual results of the operating account alone is therefore obviously insufficient to assess the quality of management, if the analysis of the production capital is also neglected in all dimensions.

The assessment of the profitability of a forestry investment is usually conducted by adding a capital rate (with compound interest) to expenditure and comparing the results with expected revenue. When updated costs and revenue are equal, it gives the Internal Rate of Return (IRR) of invested capital. The best profitability is that which helps offset the highest rate. This method of calculation is not questionable. Either through production cost by capitalising the initial investments or through the anticipation of expected revenue (discounting projected income), it allows for the calculation of the current value of an immature stand sometimes considered as a future value. All experts use it, both for the assessment of stands and, in the case of damages, to find the basis for compensation. Its application to the assessment of entire forest estates, with more or less varied age classes with varying degrees of balance, faces more serious difficulties, notably, when it has to do with determining the limit of mature and immature stands, and moreover for mixed forests where the classes of size, height and age intersect. However, professionals perfectly know methods to overcome these difficulties. On the contrary, the use of the IRR to define the strategy of a forest estate, and to take silvicultural decisions, seems very unreliable and even perilous.

Above all and more fundamentally, no forester is able to predict the evolution of timber prices for a period spanning beyond a few years. Changes in the prices of certain species in the course of time tell of the fluctuations which can occur. It therefore seems necessary to warn foresters against applying the IRR during their brainstorming and strategic decision-making.

7.4. Sources of funding to be mobilised/explored

7.4.1. Resources to be mobilised

Meeting the objectives of the NPFDP requires not only the mobilisation of a number of stakeholders, but also financial mobilisation beyond the State's capacity. The sources of funding to be mobilised are as follows:

- Funding provided for by Law N°94/01 of 20 January 1994, to lay down the Forests, Wildlife and Fisheries Regulations;
- State subsidies;
- Income from ANAFOR's financial empowerment process;
- Contribution from LRAs;
- Local taxation;
- Contribution by concession holders;
- Participation of local community and private operators;
- Funding from international Funds.

7.4.1.1. Funding under Law No. 94/01: The Special Forest Development Fund

Established by Decree No. 96-237-PM of 10 April 1996, the Special Forest Development Fund is, pursuant to the law, a special appropriation account of the State Treasury to finance the management, conservation and rural development of forest resources. The most crucial problem is the fact that the money destined for the Special Forest Development Fund, like any other public funds, must transit through the centralised State treasury. This provision is likely to compromise NPFDP activities

dependent on this funding, given that they are subject to very strict timelines: transfers into the Special Fund for forest development often come in late and the quotas are not always respected.

7.4.1.2. Plantations development fund

Pursuant to Article 17 of Order No. 1950/MINEF/MINEFI of 20 June 2002, there are plans to jointly set up (Ministry in charge of Forestry; Ministry of Finance) a Fund for plantations commonly called the Plantations Development Fund, in view of launching the National Plantations Programme through the FESP. Like the Special Forestry Development Fund, this Fund should be fed from a percentage to be deducted from some forestry taxes.

Ngomin et al. 2015 are of the opinion that the establishment of this Fund will play a double role and that, it is better to ensure timely transfers into the Special Forestry Development Fund, a part of which shall be reinvested to fund reforestation. Considering the degraded state of forests in Cameroon, and the rising importance of planted timber on the international market, as well as the threat to boycott natural forest products, there is need to strengthen this Fund for reforestation activities. In this regard, the Special Forestry Development Fund shall finance the drafting of management or development plans for forest reserves or reforestation areas, sub-contract forest management activities, as well as support and evaluate the implementation of forestry programmes, through the Ministry in charge of Forestry.

7.4.1.3. Financial empowerment of ANAFOR

As part of the project to endow ANAFOR with financial, a heritage of 14 forestry reserves, 4 reforestation areas and 1 Forestry Management Unit (spanning 230,422ha), has been transferred to the National Forestry Development Support Agency (ANAFOR) for their development and operational capacity building. The empowerment of ANAFOR implies strengthening it, notably through:

- Exploitation of timber from mature forest plantations, and fuelwood by retrieving plantation by-products after silvicultural treatment;
- Acquisition of technology for the processing, enhancement and promotion of plantation timber.

These important tools should be reinforced to give the organisation greater financial autonomy for a more significant contribution to the implementation of the programme.

7.4.1.4. Contributions from LRAs

Pursuant to Section 16 of Law no. 2004/018 of 22 July 2004 to lay down the rules applicable to Councils, the following powers have been devolved to Councils as part of the decentralisation process:

- Reforestation operations and the creation of council forests;
- Development of council action plans for the;
- Creation, maintenance and management of Council green areas, parks and gardens.

In the same vein, Section 19 of Law No. 2004/019 of 22 July 2004, to lay down the rules applicable to Regions specifies the powers transferred to Regions, including among others:

- Management, protection and maintenance of Protected Areas and natural sites within the Region's jurisdiction;
- Taking prohibitive and using other local measures for nature protection;

- Creation of regional woods, forests and protected areas on the basis of a plan duly approved by the State representative;
- Setting up firewalls and early burning, as part of the fight against bush fires;
- Management of regional natural parks, with prior approval of the State representative;
- Development, implementation and monitoring of environmental regional action plans and schemes.

The LRAs should mobilise to contribute to the implementation of the programme.

7.4.1.5. Income from community involvement in the sustainable management of forestry resources as well as the contribution of income from forest exploitation

The implementation of the forestry policy in Cameroon provides for the involvement of locals in the sustainable management of forestry resources as well as the contribution of income from forestry and wildlife exploitation in the promotion of local development and poverty alleviation. Local communities participate in the management of forestry resources through Council and community forests.

Joint Order No.076 MINATD/MINFI/MINFOF of 26 June 2012 to lay down conditions for planning, use and monitoring of the management of income from the exploitation of forestry and wildlife resources destined for local village councils and communities, defines the conditions for use of resources derived therefrom.

At council level: Planning and monitoring of the management of forestry resources destined for Councils is ensured by a Council Management Committee, set up within each council, on the basis of the following provisions:

- The share of income destined to Local and Regional Authorities is set at a maximum of 30% to support the recurrent budget of those councils and a minimum of 70% for investments.
- The 70% income earmarked for investments shall be used on the basis of a Council Development Plan along with an annual operational plan of projects approved by the Council in the presence of members of the Council Committee invited as observers. This plan highlights terms and conditions for the evaluation of its implementation.

At community level: Planning, implementation and monitoring of the management of forestry resources destined to local village communities shall be ensured by the local management committee, set up within each local village community. The projects of local village communities eligible for funding from forest management revenue shall be in essence:

- Village water projects;
- Rural electrification;
- Construction and/or maintenance of roads, bridges, works of art and sport equipment;
- Construction, maintenance and/or furnishing of school establishments or health facilities;
- Purchase of drugs;
- Reforestation and protection of wildlife resources;
- Any other social or economic project, for community interest as decided by each community itself.

It shall be incumbent on the Ministry of Forestry to ensure that reforestation projects effectively feature among the projects funded by the income derived from council and community forests.

7.4.1.6. Tax revenue

The forestry sector in Cameroon is subject to two taxation types: general taxes and taxes specific to the forestry sector. Special forestry sector taxes apply to the exploitation and processing of forestry products. Examples of taxes here include, Annual Forest Royalties (AFR) and certain incidental taxes. Forestry taxation addresses the need for rational management of financial windfalls from forestry exploitation. As such, specific taxation may be understood as a sort of eco-tax derived from the principle of polluter-payer. Five major reasons are generally brought up to justify the sharing of income with local and regional administrative authorities. They are: (i) to compensate for the destruction of natural resources from lands owned by its inhabitants (ii) to replace existing revenue with sources of economic development for future generations (iii) to repair the environmental damage caused by harvesting (iv) to prevent autonomous taxation efforts by local authorities if they are not duly compensated, and in extreme cases, (v) to preserve harmonious political relations between the central government and the hinterland (Beauregard and al, 2006).

A. Annual Forest Royalties (AFR)

The law of 20 January 1994 highlights its social objective in the following words “for the development of local village communities from some exploited state-owned forests, a share of the Income derived from the sale of forestry products should be remitted to those communities. The General Taxation Code stipulates that the tax base for annual forest royalties is hinged annually on the surface area of the forest exploitation licence and consists of the floor price and financial offer.

B. Incidental taxes and recovery taxes

a) Incidental taxes

Incidental taxes are all the taxes which are not provided for in the Finance Law, but are laid down by regulatory instruments, and which foresters have to pay regularly. It is the contribution of forestry entrepreneurs to the construction of socio-economic infrastructure defined in the specifications of the entrepreneur and the CFAF 1,000 per cubic metre of timber felled for sale. It was instituted by Circular Letter No. 370/LC/MINEF/CAB of the Ministry of the Environment and Forestry of 22 February 1996 for the benefit of local village communities. It is therefore reserved to all relevant local communities and cannot be allocated.

b) Recovery tax

Section 113 of Law No.2009/019 of 15 December 2009 on local taxation stipulates that the recovery of products from non-council and non-community forests, unless otherwise provided for, shall go with the payment of a compensatory contribution to the council of origin, called tax on recovery products. This tax is paid by the owner of the products recovered at CFA F 2,000 per m³.

C. Social service contributions

Pursuant to the legal framework, notably joint order No.076 MINATD/MINFI/MINFOF of 26 June 2012, contribution to the provision of social and economic services is defined in the specifications or in the development plan approved by the Ministry in charge of Forestry;

The forestry taxation system could be amended, notably at local level to contribute to NPFDP financing.

D. Regeneration tax

Another tax envisaged is the “*regeneration tax*” currently levied only on NTFP exploiters. Some actors of the sector propose its extension to exploiters of the timber sector, so that financial resources generated be channelled to a *Special Fund*, the Minister in charge of Forestry being the Authorising officer, and ANAFOR the user, for the exclusive funding of plantation forest development activities, be it in licensed logging concessions, the national estate, or forest reserves and reforestation areas. The fear, however, is that of overburdening timber exploiters with a multiplicity of taxes.

7.4.1.7. Contribution of concession holders

As part of the implementation of FMU development plans, Concession holders fund forestry activities pursuant to the provisions of Circular Letter No.0086/LC/MINFOF/CAB of 18 May 2016 on the obligations of silvicultural activities in permanent forests. This could be done either by directly recruiting employees to execute their annual silvicultural operations plan, or by sub-contracting these activities to small and medium-size forestry companies.

7.4.1.8. Contribution of beneficiaries

The plan is to operate with subsidies granted to partially fund plantation forest projects. This entails drawing from past experiences in the area, notably obliging promoters to present credible projects and launch them by themselves once an agreement is signed. Subsidies will be paid in instalments and only after verification of the actual completion of the work provided for in the agreement. Under no circumstances can the State be committed to pre-financing of plantations, or post-plantation maintenance. This is to avoid funding fictitious projects or plantations that are not maintained or protected against fire. This also implies a rapid review of the legal and regulatory framework to reassure investors, facilitate planting and, above all, allow their exploitation.

7.4.1.9. State subsidies

Desertification, climate change and land degradation issues are increasingly getting acute and have severe consequences on the people of certain regions of the country. Reforestation, which is the key solution to the fight against these scourges, has become a capital public service. Efforts of public authorities in this area, even though considerable, have fallen short of expectation. The State, which should be the guarantor of the security and welfare of all, should reassert its place in the implementation of the NPFDP by mobilising considerable subsidies.

7.4.2. Resources to explore

Resources should be explored both internally and externally.

7.4.2.1. Internally

Legislative and tax-related measures inspired from environmental principles such as the principle of “polluter-payer” should be considered from within, not only to address drivers of deforestation and forest degradation, but also to mitigate their impact. As far as forests are concerned, we could also speak of “degrader-payer”. It should be recalled that the prime drivers of deforestation and forest degradation are agriculture, fuelwood, mining and infrastructure. As such, the following measures should be explored.

For agriculture: The creation of a deforestation tax for major farmers establishing in dense forest areas. Such a mechanism exists in France as a “clearing tax”, created in 1969. French lawmakers had

two expectations: on the one hand, to dissuade clearing by using taxation to repair the disparities noticed between the value of forests likely to be cleared and other lands, which disparities could explain the pressure of clearing; on the other hand, to partly compensate the consequences of clearing by allocating the product of the tax to reforestation operations and land development. As such, “a credit equal to the product of the tax is registered each year in the budget of the Ministry of in charge Forestry to fund reforestation and forest development activities by the State, local authorities and private forest owners or for financing the expansion of State owned forests.”

For mining and infrastructure: The creation of a “deforestation tax” could be envisaged consecutively on any deforestation they carry out on mining areas covered by their mining rights, as is the case in some countries of the sub-region. Besides, provisions should be made to ensure compliance with measures contained in the Impact Assessment Project, to protect vegetation cover and compensate damages caused to the environment. This requires, among others, the participation of local MINFOF authorities in Environmental and Social Management Plan Monitoring Committees of projects implemented at divisional level.

For fuelwood: A tax should be instituted to regulate this activity and the income used to fund reforestation.

The value of these two taxes could be added in two ways:

- Payment into a Fund which shall be set up, only destined to reforestation, or
- Funding forestry activities within a forest (private or public) chosen by the concerned and approved by the Ministry.

The second option is most probably the more preferred, given that it allows for “short-circuit” funding of certain forestry activities, especially in private forests, which probably would not have been conducted for lack of financial capacity or profitability.

7.4.2.2. Funding from international Funds

▪ Payments for environmental services (PES)

PES seeks to remunerate the supply of positive environmental externalities by transferring the financial resources of beneficiaries of ecological services to suppliers of the said services who are most often managers of environmental resources or land users (Maynard and Paquin 2004). Land users are therefore motivated to include the supply of environmental services in their decisions to use land or resources. Several multilateral organisations have established mechanisms for such operations. Such is the case of the African Development Bank (AfDB) which in 2008 launched, the “Fund for the Congo Basin Forests” (FCBF) with an overall package of \$ 110 million. This money is destined for the establishment of PES notably to mitigate climate change. The World Bank, with “Forest Carbon Partnership Facility”, like the United Nations - UNDP, UNEP, FAO - all have considerable funding to establish deforestation programmes. In the past, the World Bank, through the Forest Carbon Partnership Facility (FCPF), signed Grant/Loan agreements with the Cameroon Government for the preparation of a REDD Readiness Preparation Proposal (R-PP2). The World Environment Fund (WEF) also launched a “Strategic Programme to Support the Management of Congo Basin Forests” which seeks to add value to environmental services.

Sourcing international funds is indispensable in the current context, considering the high rate of NPFDP implementation. A move to seek funds from international donors should be undertaken, notably international funds dedicated to the conservation of ecosystems, and it could be envisaged through compensation mechanisms.

- **Enhancement of carbon sequestration**

Payment for carbon restoration or sequestration takes three principal forms: Clean Development Mechanism (CDM), reduction of emissions from deforestation and degradation (REDD+), and initiatives related to the voluntary market. The REDD+ is a funding facility which seeks to remunerate the efforts made by developing countries like Cameroon, to avoid deforestation and degradation of forests. The facility seeks as such to compensate countries that prevent the release of greenhouse gases into the atmosphere.

7.4.2.3. Multilateral donors

The International Tropical Timber Organisation funds the reforestation projects of its member States. This path should be explored by the Forestry Service, notably ANAFOR and the other stakeholders who shall be submitting projects to the ITTO for funding.

Other multilateral donor organisations such as the FAO, EU (ECOFAC, STABEX, WORLD FUND), IDA, WB, ADF, ADB have credits for reforestation or the fight against desertification. For each of these partners, action should be conducted on the basis of their own funding strategy which is often focused on the following activities:

- Support to the development of plantation technologies (transfer of know-how) as part of the implementation of pilot projects;
- Involvement in institutional support programmes (improving governance, capacity building);
- Bilateral donors.

Among donors (Foreign Institutions or Agencies) working in this sector to financially and technically assist the State of Cameroon, we can mention:

- The AFD Group (FAC and CFD), SCAC on behalf of France; - GTZ DED on behalf Germany;
- ACDI on behalf of Canada; - USAID, on behalf of the USA;
- DFID on behalf of Great Britain;
- SNV/DGIS on behalf of the Kingdom of Netherlands;
- Other potential sources.

Innovative funding is beginning to emerge in this regard, and action is required to make it more productive in Cameroon. For the duration of the programme, it is estimated that the minimum rise in surface area of plantation forests could be from 19,721 ha to 26,000ha. This estimate is still low and does not take into account private and agro-forestry plantations whose activities are not directly related to those of MINFOF, but which remain a priority, and for which the ministry would have facilitated their development.

It is nonetheless important to bear in mind that plantations are long-term investments while the funding of projects by donors is short or medium-term. Even when the first yields from plantations arrive, six or seven years later (for pulpwood), the low market value of this timber makes it necessary for several rotations to be required for a return on investment. For timber, it is several decades behind, incompatible with the cycles of donors. The latter generally consider that forestry investment ends some years after planting and first maintenance. Yet, it is necessary to fund subsequent works to ultimately obtain high-quality timber with a high market value, because penetration pruning and the first thinning produce small dimension timber which is abandoned on site for lack of pulpwood

factories, which is the case in our country. Thinning produces poles and pegs which, when sold, can only fund the cost of work. This absence of rapid financial profit created problems within national reforestation programmes in the 1980s. Measures should be taken to supplement funding from international donors through internal resources in view of covering maintenance and monitoring costs after the cessation of funding from donors.

Large-scale private companies could be a source of funding for the forestry sector if they are motivated to get involved in forestry business. They may borrow from banks and reinvest the money in setting up plantations and encouraging other factories to set up.

7.5. Mechanism for project sustainability

Projects implemented under this programme are conceived in the spirit of ensuring sustainability in every respect.

7.5.1. Financial sustainability

The financial sustainability of projects shall be fostered by the:

- a) “Multi-annual” funding of the new MINFOF Special Support Fund (CAS) destined exclusively to investment, in compliance with the new taxation regulation of the State;
- b) **Promotion of forestry economy, based on the creation of silvicultural value chains**, as reliable levers for the effective enhancement of plantation forests of the reserve, through their exploitation and the marketing of forest products;
- c) Exploitation and marketing of by-products (construction wood and fuelwood) derived from development/exploitation of plantations, by local communities on a contract basis with Councils and ANAFOR, against financial payments to be made by these communities to those beneficiaries;
- d) Development of participatory management, to limit human resource, financial and material costs of managing plantations by Councils and ANAFOR.

Such a model of participatory management shall be achieved by the creation of Participatory Management Units (CEP) by the State, Councils and ANAFOR. The latter shall manage “forest-people” relations by means of awareness-raising, training, education, in a bid to improve necessary understanding for better cohabitation with the local communities of the plantation sites.

To this end, the local community may be organised into a Village Committee for Participatory Forest Management (COGEPAF) around plantations, as a consultation platform. These Committees shall organise their communities to conduct a series of activities such as:

- ✓ Exploiting and marketing fuelwood;
- ✓ Producing plants;
- ✓ Clearing strips;
- ✓ Sub-contracting maintenance and felling activities.

Income generated by the local community shall be devoted in part to the provision of basic socio-economic services, the other part being set aside for ANAFOR and the National Forestry School (ENEF), which will substantially boost their finances.

- e) Promoting “public-private” partnership which enables companies endowed with expertise in forestry matters as well as the technological or financial wherewithal to carry out important projects of the “Build and Operate (BO)” or “Build Operate and Transfer (BOT)” model. This

partnership shall aim at optimising the performances of the public and private sectors respectively, in view of carrying out, in the shortest possible time, urgent or complex projects.

This approach highlights numerous advantages, namely:

- Improved planning and organisation of activities and actions selected within the framework of the development of reserves;
 - Adopting a life-cycle approach which involves optimal mobilisation of resources and is quality oriented;
 - Specifying risks in detail, to improve project performance.
- f) Creating within the programme execution area, of an economic space dedicated to the production, processing and marketing of plantation forest products, within the scope of the programme. These spaces made up of one or more developed geographical areas, equipped with infrastructure, should allow for the production of goods and services under optimal conditions.

The economic space may include:

- Fuelwood distribution poles;
- Industrial companies for the processing of forest timber and non-timber products;
- Companies for forest exploitation, service enterprises, company nurseries or incubators, scientific or technological poles, technopoles and/or “**silvopoles**” (*NGOMIN A. 2nd Generation Silviculture in Cameroon– MINFOF/GIZ, 2015*).

7.5.2. Institutional or political sustainability

Institutional or political sustainability shall be ensured among others by:

- The on-going review of the forestry policy and its enabling instruments, in a bid to adapt them to new issues around forestry management (development of plantation forests, REDD+, restoration of forest landscapes, addressing climate change...)
- Enhancing forestry governance through the implementation of VPA/FLEGT signed between Cameroon and the European Union;
- Collaboration between sectors in view of a joint enforcement of national and international policies and regulations on the sustainable management of forests and the environment;
- etc.

7.5.3. Land sustainability

The sites chosen for the development of plantation forests within the framework of this programme, shall, as a matter of priority, be forest reserves, reforestation areas, Forestry Development Units falling under the remit of the permanent forest estate (DEP) with the status of gazetted private State-owned land, the registration process of which is on-going on behalf of the State. As far as other sites are concerned, measures shall be taken to ensure that promoters hold an ownership deed for the space dedicated to the plantation and offers all the guarantees that this space shall not be subject to a change of use.

7.5.4. Sustainability related to the replicability of models

- ✓ Capacity building for stakeholders;
- ✓ modelling;
- ✓ scaling;
- ✓ Sustainable management of achievements.

CONCLUSION

Cameroon's forestry sector is one of the major pillars of its economy. Not only does it support the formal industry, but also a large timber-processing informal sector, as well as subsistence needs in food, energy and medicinal plants. In addition to these economic and social services, forests provide key regulating and supporting ecosystem services that are of local, national and global importance.

Often considered as an inevitable counterpart of economic and social progress, environmental degradation is now presented as contravening the very interests of the people. The “*Millennium Ecosystem Assessment (MA)*”, launched in June 2001 by then UN Secretary-General, Kofi Annan, which is the first programme on a global scale to assess interactions between economic, social and environmental issues, suggests that 60% of Environmental Services (ES) are in decline, particularly as a result of human pressures on ecosystems (MA, 2005). The findings of the MA reveal both a considerable degradation of forest ecosystems and an extreme vulnerability of the poorest communities, who could become the main victims of the absence of strict forestry laws in Central African countries.

The current model, based on exploitation, through the system of concessions in the “evergreen” forest areas, and through a limited annual harvest of valuable timber in forests of moist Savannah regions, has undermined the potential of natural forests. In like manner, concerns for forests have always focused on forests strictly speaking, neglecting non-forest tree resources.

Deforestation and forest degradation are mainly related to human activities which, today, are considered more profitable in the short term than sustainable management of forests. It is the outcome of the excessive use of forestry resources and/or forest destruction (clearing) by man, which may lead to a change in land use (forest replaced by an urban territory, transport ways, cultivated or grazing land, desert....). Deforestation and the disappearance of tropical forests were unnoticed by the society in the late 1980s, but have become major environmental concerns. It has since been proven that, to meet the needs of the future bio-economy, it is essential to invest in protecting the remaining natural forests, restore secondary and degraded forests, make productivity profits on existing plantations and extend sustainably planned and managed forest areas worldwide.

It goes without saying that efforts made by the State of Cameroon to renew forest resources did not yield the expected results and that wood production (timber and fuelwood) from natural forests, under current exploitation conditions will indefinitely satisfy population and industrial needs. Moreover, the pervasiveness of conservation issues and the sustainable management of the environment is threatening timber from natural forests with a boycott on the international market. Besides, plantation forests are also carbon reservoirs with a function that could be enhanced once international negotiations on climate issues have been concluded. Plantations should be able to compensate for forest cover loss, provide cities with firewood, charcoal and construction wood, and eventually with timber. Within urban areas, plantations should be able to embellish and make the cities green, as such, improving the living conditions of the people. It is obvious that Cameroonian authorities must take all appropriate measures to orientate the sector towards plantation timber which is increasingly gaining ground on the international market. Other countries with a similar level of development have already subscribed to this trend and it is in the interest of Cameroon to catch up.

Difficulties encountered are of several kinds and vary according to the agro-ecological zones. In dense forests, there is little enthusiasm among most concession to regenerate the resource, as well pathetic silviculture statistics when they do exist (MINFOF, 2016). There are also problems in adapting

management standards to the specificities of community forests. In the moist savannah zone, there is above all the problem of conflicting management interests between livestock, agriculture and forestry. Such poor results highlight the need for a change in reforestation, and NGOMIN A. et al., MINFOF/GIZ, 2015 propose the concept of “*Second Generation Silviculture*” in support to such a change, as opposed to “*first generation silviculture*” which, according to the authors, underpinned all previous forest resource regeneration initiatives. The concept can be defined as: “a set of actions and techniques which make use of afforestation, reforestation and forest regeneration as baseline for the development of plantation forests, resource regeneration and restoration on uncultivated lands and degraded forests, and constitute links in the value chain which, in addition to biological, ecological, developmental and sustainability aspects, also takes into account dimensions for the monitoring and control of forest stands, participatory development, processing, marketing of products, financial and economic profits, for an efficient contribution to the welfare of the people, growth and employment.”

In a bid to provide Cameroon with a strategic steering instrument to facilitate planning of the creation and development of private and community plantation forests, harmonise the contribution of all stakeholders, while contributing to the establishment of an attractive institutional environment for private investors, the State is implementing the NPFDP, for purposes of coherence with other national initiatives under a sector and value chain approach. (*Growth and Employment Strategy Paper [GESP], Strategy for Territorial Management and Sustainable Development [STRADDT], National Action Plan for the Fight against Desertification (PAN-LCD), Rural Sector Development Strategy [RSDS], National Participatory Development Programme [NPDP], National Agricultural Investment Programme [NAIP], etc...*).

The NPFDP targets all stakeholders of the forestry sector. The programme seeks to ensure the establishment and development of plantation forests, contribute to reforestation and introduce the tree in agricultural and pastoral systems. As such, the contribution of reforestation and grassroots stakeholders (local and regional authorities, private sector, Civil Society Organisations, Administrative Authorities, representatives of the people, active players, etc.) is a major concern in the implementation strategy, as well as gender main-streaming, youth and underprivileged social categories.

Meeting the objectives of the NPFDP will require besides mobilising these stakeholders, financial mobilisation beyond the State’s capacity. As such, all potential sources of funding shall have to be mobilised and many more explored.

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POLICY DOCUMENT

Cameroon Vision 2035

GESP: Growth and Employment Strategy Paper

FESP: Forest Environment Sector Programme

MINFOF 2020 Strategy

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APPENDIXES

Appendix 1: List of persons met

Names of persons and personalities met	Structures and functions	City
Dr. Saleh Adam	Regional Delegate MINFOF, West	Bafoussam
Mr Banenelen Benoit Celestin	Regional Delegate MINDEAF, West	Bafoussam
The Lord Mayor of the Penka Michel Council		Penka Michel
The Lord Mayor of the Baleng Council		Baleng
Mrs Ngo Biend Epse Mouhom Perpétue	SG Bafoussam 3 Council	Bafoussam
Person in charge of forestry activities in the Bandjoun Council		Bandjoun
Mr Nono Joseph	West Regional Service Head of Forestry,	Bafoussam
Mr DonfackNzeko Alain	West Regional Service Head for Protected Areas,	Bafoussam
Mr Nziali Jean	Delegate from the ASPA CIG	Baham
Mrs Kuimo Josephine	Member of the ASPA CIG	Baham
Mr Djoumessi Pierre	Divisional Delegate MINFOF/MIFI	Bafoussam
Mr Kouotou Ngnignikoua Paul	Vice-President of the ADEDEN Association	Foumban
Mr Ngoua Emile	Production of ENEO poles	Bafoussam
Mr Nguimedjo Pierre Paul	Private producer	Babadjou
NORTH WEST REGION from 26/02/2018 to 01/03/2018		
Mr Christian Manga Bell Epie	Regional Delegate MINFOF, North-West	Bamenda
The Lord Mayor of the Tubah Council		Bamenda
Mr Mbambo Abel Chengi	The Lord Mayor of the Ndop Council	Bamenda
The Lord Mayor of the Bamenda 1 Council		Bamenda
The Lord Mayor of the Oku Council		Bamenda
The Lord Mayor of the Nkambe Council		Bamenda
The Lord Mayor of the Santa Council		Bamenda
The Lord Mayor of the Jakiri Council		Bamenda
Mr Acha Emile	Natural resource Officer SIRDEP (NGO)	Bamenda
Mr Wirsy Emmanuel Binyuy	Team Leader CAMGEW (NGO)	Bamenda
Mr Primus Julius	Awing traditional council	Bamenda

Appendix 2: Forestry reserves and reforestation areas in cameroon per ecological zone and per region

“UPDATE: REFORESTATION UNIT /DF/MINFOF – AUGUST 2015”

Dense forest						
Order N°	Name of the reserve	Surface area (in ha)	References	Surface area of Plantations (ha)	Observations	
Centre Region						
1	Mbalmayo	9 700	OR N° 69 of 29-07-47	197.5	Inventory conducted	Management Plan (MP)
2	Makak	3,125	OR N° 355 of 08-10-36	1,287		
3	Ottotomo	2,472	OR N° 218 of 29-07-47	246		
4	Kiki	2,000	Non- classified area	05		
5	Zamakoé	4,200	OR N° 445 of 08-1947	27		
6	Loungahé	20,000	OR N° 264 of 10 -06-1948	1,264		
7	So'olala	39,780		ITTO project		
Total Centre	07	81277		3026.5		
South Region						
1	Kiékné-South	25,000	OR N° 393 of 08-11-47	5,606.5		
Total South	01	25000		5606.5		
South Region						
1	Bambuko	26,000	OR du 16-02-50	380.5		
2	Edjagham	74,000	Official Gazette of 23-04-1934	413.5		
3	Bakossi	5,517	OR of 18-04-51 and of 01-08-56	241	Inventory conducted	
4	Buea	300	OR N° 231 07-1953	46	Inventory conducted	
5	Sud-bakundu	19,425	OR of 25 - 04-1940	307.5	Inventory conducted	
6	Lac Barombi Mbo	921	1940		Inventory conducted	
7	Meme River	4,865	1952		Inventory conducted	
8	Mungo River	4,622	1951		Inventory conducted	
9	Mbembe Forest Reserve					

10	Mawne River Forest Reserve					
11	Mokoko River Reserve					
12	Nta Ali Forest Reserve					
Total South-West	12	135650		1388.5		
East Region						
1	Deng-deng	227,000	Decree N°71/182/COR of 08-10-1971	270	Inventory conducted	Approved Management Plan
2	Bazzama	21,200	OR N° 60/ 277 of 31-12-1960	379		
Total East	02	248200		649		
Littoral Region						
1	Loum	1,000	OR N° 162 of 10 -06-1932	306		
2	Sollé	18,000	OR N° 53 of 18-02-1948	481.5		
3	Bakaka	13,000	OR N° 261 of 10-06-1948	1,050		
4	Muyuka kompina	3,000	OR No. 626 of 15- 08-1932	129	Inventory conducted	
5	Melong	3,000	AR No. 502 of 23- 12-1947	40	Inventory conducted	
6	Dibombé Mabobé					
7	Bangobé					
8	Maneas					
Total Littoral	08	38000		2006.5		
Humid Savannah						
West Region						
1	Baleng	300	OR No. 53 of 01- 03-1934	160	State of surfaces covered	
2	Bamougoum	76	OR No. 262 of 29- 07-1947			
3	Bangou	10	OR No. 262 of 29- 07-1947			
4	Bandjoun	10				
5	Baham	100	OR No. 262 of 29- 07-1947		Inventory conducted	

6	Koutaba	200	OR No. 122 of 12- 05-1934	131		
7	Mélap	1,705	OR No. 224 of 29- 62907-1947			
8	Bamendjin	145	OR of 13 - 03- 1976 28.5			
9	Baloum	83		32.5	Inventory conducted	
10	Noun Plain	1,400	Decree N°79/506 of 08-12-1979	146		
11	Baloungou	169		68		
12	Balengou	312	Decree N°79/506 of 08-12-1979	46		
13	Nkouyaman	716	Decree N°79/506 of 08-12-1979			
14	Nzemabou Nkoutouop	2,540	Decree N°79/506 of 08-12-1979			
15	Mt Bamboutos	200	OR No. 263 of 10- 10-1948	22.5		
16	Doumouo	60				
17	Metche Ngoum	6500	OR No. 262 of 29- 07-1947			
18	Mongoue Nkam	1,200	OR No. 262 of 29- 07-1947			
19	Tsena Nkam	2,600	OR No. 262 of 29- 07-1947			
20	Maha	460	OR No. 262 of 29- 07-1947			
21	Fiba Mahou	6,500	OR No. 262 of 29- 07-1947			
22	Moa	300	OR No. 262 of 29- 07-1947			
23	Kouptchankap	400	OR No. 431 of 28- 12-1935			
24	Mou	300	OR No. 503 of 23- 12-1947		Inventory conducted	
25	Ngambouo	600	OR No. 503 of 23- 12-1947		Inventory conducted	
26	Bana	209		80	Inventory conducted	
27	Bamendou	62				
28	Fongo Tongo	8				
29	Foréké Dschang	2,200	OR No. 63 of 05- 06-1953			
30	Menoua quinquina	100	OR No. 334 of 08- 11-1934			
31	Signal Dschang	50	OR N° 53 of 10 -03-1934			
32	Foréké hills	3000	OR N° 63 of 06-06-1956		Inventory conducted	
33	kouabang	309	OR N° 93/ 390 of 27-04-1993			
34	Bapouh – Bana	4,800	Order No. 262 of 29-07-47			
35	Malap Njibanchi					

36	Santchou					
Total West	36	37624		686		
Adamawa Region						
1	Ngaoundere	4,400	Order No. 22-08-1933 of 03-06-1947	1200		
Total Adamawa	01	4,400		1,200		
North West						
1	Bafut Nguemba	3,248	Order N° 140 of 1953	457		
2	Bali Nguemba	1,147	Classified on the 21-07-1934	132.5		
3	Fungom	84,758	Order N° 14 of 1951			
4	Bambui	85	Order N° 35 of 1961	33	Inventory conducted	
5	Mbembe Ako	28,296	Official Gazette No. 050 of 21-07-1974	133		
6	Kom Wum	8,029	Order N° 108 of 1951	255	Inventory conducted	
Total North West	06	125,563		1,010.5		
Arid savannah						
Far North Region						
1	Mogode	250	Order N° 180 of 30-06-1947	87.5	Inventory conducted	PA
2	Mayo Louti	3,500	Order N° 180 of 30-06-1947	02		
3	Laf Madiam	6,003	Order N° 146 of 19-04-1948	20	Inventory conducted	PA
4	Moumour	600	Reforestation area	50		
5	Mokyo	1,000	Reforestation area	140		
6	Mayo Ferengo	150	Reforestation area	135	Inventory conducted	MP
7	Mayel Ibbe	130	Reforestation area	95	Inventory conducted	MP
8		20	Order No. 179 of 03-06-1947	05		
9	Zebe	151	Reforestation area	51		
10	Gaspala and Ziam	575	Reforestation area	150		
11	Tchidam	1,000	Reforestation area	200		
12	Sabakale	1,000	Reforestation area	50		

13	Amchidere	1,000	Reforestation area	25		
14	Makary	380	Reforestation area	10		
15	Kalfou	4,000	Order of 1947			
16	Zamay	3,500	Reforestation area		Inventory conducted	MP
17	Camp Sonel	-	Reforestation area			
Total Far North	17	23,259		1,020.5		
North Region						
1	Gashiga	1,193	Order N° 392 of 08-11-1947	338	Entrusted to ANAFOR	
2	Sanguere	10,000	Reforestation area	100	IRAD	
3	Mayo Oulo	300	Reforestation area	05		
4	Lam	941	Order N° 86/ 936 of 26-07-1986	10		
Total North	04	12,434		453		
General Total	94	731,407		17,047		



Reserves and reforestation areas transferred to Councils in 2012

Reserves and reforestation areas transferred to ANAFOR in 2015

Summary Table

STRUCTURE	ENTITY/TYPE OF FOREST	NUMBER	SURFACE AREA (in ha)
ANAFOR	Forest reserve	14	137,822
	Reforestation area	04	12,600
	FMU N°08-008	01	80,000
TOTAL ANAFOR			230,422
COUNCILS	Forest reserve and Reforestation area	43	151,086
Advanced School of Water and Forestry (ENEF)	FMU 08- 008	01	35,795
FR and PR not transferred	-		

Source: ANAFOR

Appendix 3: Economic analysis as applied to silviculture

REPUBLIQUE DU CAMEROUN
Paix – Travail – Patrie

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**MINISTRY OF FORESTRY
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ECONOMIC ANALYSIS AS APPLIED TO SYLVICULTURE

1. Modelling the economic indicator

Silvicultural economics stands as a means of analysis, an interdisciplinary link, but also and most importantly, as a decision-making tool for the implementation of genuine sustainable forest management, likely to guarantee **economic and financial profitability of existing or future forest stands**.

Using the **net annual profit of forest as economic criterion**, some experts hold that a balanced forest with an accounting system is the only valid production unit.

For others who adopt as **economic criteria both the overall net income of the activity and its profit rate**, production units should be the sets of plots on which the same production activity is carried out.

According to Faustmann (1849) as cited by Jean-Luc Peyron (2014), it is not advisable to calculate the value of stands that are not yet exploitable by the market price of their current wood volume, but by the value obtainable from the price of their harvest when exploitable.

The practical advantage of this calculation lies in the fact that it is possible to obtain necessary information on forest value both in cases of voluntary or involuntary sales, and to determine the most profitable silvicultural system as well as the rotation period.

Therefore, the value of a forest depends on its future (net) profits, and on setting its discount rate as well.

As part of the project to develop economically oriented (industrial) plantation forests (with fast-growing tree species), **silvicultural value chains** will be developed. An **economic indicator model** will also be designed to enable foresters and plantation forest promoters to quickly assess the expected economic profitability (**Internal Rate of Return**) of the chosen plantation forest scheme, depending on its objectives and characteristics.

2. PROFITABILITY OF PLANTATIONS

COMPARISONS OF PROFITABILITY CAN BE MADE USING THE INTERNAL RATE OF RETURN ON CAPITAL INVESTMENT, WHICH TAKES INTO ACCOUNT THE SUM OF ALL EXPENSES AND INCOME RELATED TO THE LIFE OF A PLANTATION (EDENS, 1991. FOREST MANAGEMENT AND REGENERATION PROJECT (FMRP)).

FOR THIS MEASURE, THE HIGHEST PROFITABILITY IS ACHIEVED WHEN INITIAL COSTS ARE MINIMISED AND INCOME GENERATED AS QUICKLY AS POSSIBLE (EITHER THROUGH THE SALE OF THINNING PRODUCTS OR THROUGH SHORT ROTATION PERIODS).

a. Cost-benefit assessment methods

Cost-benefit assessment can be approached by **discounting costs and profit** and using **profitability criteria**, which include **net discounted earnings (NDE)** and the **profit/cost ratio**.

In the case of state-developed mono-specific plantations, discount calculations can be made at 3% and 4% for ecology-oriented plantations. For private plantations, discount rates can be 7% and 8% given the risks to be managed and investment repayment requirements.

For this project, assumptions are based on cases where direct income will be derived solely from final timber harvests (thus excluding thinning products and other associated benefits such as aesthetic, wildlife and ecological values as well as carbon credits). It is also assumed that timber prices increase by 2% annually.

Profitability can be calculated with the Excel software.

b. Revenue and costs are discounted using the following general discounting formula:

VA = current value

$$VA = VF \left[\frac{1}{(1+a)^n} \right]$$

VF = future value year n

a = discounting rate

n = number of years to the future value.

3. Net profit discounted is obtained by the following formula:

$$BNA = \sum_{i=1}^n \frac{R_i}{(1+a)^i} + \sum_{i=1}^n \frac{C_i}{(1+a)^i}$$

BNA= net profit discounted

R_i = revenue in year i

C_i = costs in year i

a = discounting rate

4. Profit/cost is calculated using the following formula:

C/P= cost/profit ratio

$$B/C = \frac{\sum_{i=1}^n \frac{R_i}{(1+a)^i}}{\sum_{i=1}^n \frac{C_i}{(1+a)^i}}$$

R_i = revenue in year *i*

C_i = costs in year *i*

a = discounting rate

3. Table presenting a cost benefit simulation of a plantation forest (open, mono-specific, agro-forestry, etc.).

Costs and benefits									
Service		Costs (CFAF)	Costs + contingencies	Total CVST	MVST	Discounted benefits	Discounted costs	Discounted benefits	Discounted costs
		CFAF/ha				Discount rate		Discount rate	
		Base (Assumption year)			Age of plantation		Age of plantation		
Plantations + roads	1	Year 1							
Manual repairs									
	2	Year 2							
	3	Year 3							
	4	Year 4							
	5	Year 5							
Contingencies									
Annual increase in wood prices									
		Poles							
Total									
BNA									
B/C									
TRI									

CVST: Commercial volume of standing timber in m³;

MVST: Market value of standing timber in CFA Francs;

DNP: Discounted net profit in CFA Francs;

C/P: Cost/profit ratio;

IRR: Internal Rate of Return.

Source: Anicet NGOMIN – MINFOF

Appendix 4: Simplified fact sheet for reforestation and forest regeneration monitoring and evaluation

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SIMPLIFIED FACT SHEET FOR REFORESTATION AND FOREST REGENERATION MONITORING AND EVALUATION

SECTION 1: GENERAL INFORMATION

Organisation or Business Name:

Identity of Representative:

Address:

Tel: P.O. Box/E mail:

Actor: FMU/CFs/Council/Cooperative/CIG/Association/Chiefdom:

References of FMU and Council Forest:

Description of land (Title deed):

Total surface area (ha):

Stand prior to afforestation or reforestation:

Nature and source of funding:

Amount:

Stakeholders:

Number of employees:

Categories: No. of young people adults

Sex: Number of men.....women.....

SECTION 2: TECHNICAL SILVICULTURAL PROCESSES

Execution of Work (*specify if approved in silviculture*)

Owner of organisation:

Service provider:

Others (*specify*):

A. PLANTATIONS

2.1. Nature of activity

Afforestation:

Reforestation Reforestation with diversification

Regeneration (method: natural? artificial? Others (*specify*):

Targeted objective:

Expected outcome:

End result:

2.2. Preparatory work**Nursery: (Production of seedlings)**

Site.....size.....objectives..... production volume

Propagation/production technique: Generative.....Vegetative.....

Watering (type, frequency and period (specify)).....

Treatment: fertilisation.....phytosanitary.....

Species used (*scientific, trade and vernacular names*)

- -

- -

- -

Site preparation

- Full ploughing..... Windrowing

- Row ploughing Sub-soiling.....

- Treatment with herbicides..... Mechanical potting

-

Fertilising.....

- Others (*specify*):

2.3. Setting up

Plantation density (Number of seedlings /ha)

Watering (type, frequency and period (specify)).....

2.4. Plantation protection

Treatment..... Type of protection.....

Others (*specify*):

2.5. Maintenance

Weeding/clearing.....

Filling

Pruning.....

Number of clearings envisaged

Type of clearing /Manual..... with machine

Companion planting

Others (*specify*):

2.6. Indicators

Number of trees/ha.....

Surface area planted/Linear.....

Survival rate.....

Achievement rate (*compared to objective*)

Success rate.....

B. NATURAL REGENERATION

Method.....

Surface area treated.....

Names of species targeted by regeneration activities

Number of seed companies/identified/marked/geo-referenced per species

.....

Seed shed and harvest.....

Density of valuable planting species.....

Survival rate of young plants.....

Growth rate of young plants

Removal of unwanted trees.....

Other activities.....

Thinning (number/target surface area/period....)

C. ARTIFICIAL REGENERATION

Method:
 Other methods (*specify*).....
 Targeted species
 Improvement planting on gaps: density (Number of seedlings/ha).....
 Others: density (Number of seedlings/ha)
 Others:density (Number of seedlings/ha).....

D. AGROFORESTRY BLOCKS / DOMESTICATION

Method.....
 Sites:
 Techniques:
 Others.....
 Species:

SECTION 3: PROJECT/ACTIVITY IMPACT ASSESSMENT (BY ASSESSOR)

3.1. MONITORING

Administrative.....
 Socio-organisational.....
 Financial.....
 Technical.....

3.2. EVALUATION

Relevance (*relation between stakes, problems or needs observed and objectives identified to address them, added value compared to what is existing*).....

Effectiveness (*level of attainment of objectives*)

Efficiency (*profitability, cost effectiveness, rational use of means available, assessment of level of attainment of objectives at minimal cost (financial, human and organisational)*).....

Sustainability/Continuity/Impact (*impact of long-term effects of the activity upon completion*).....

SECTION 4: FOR OFFICIAL USE ONLY

Conclusion/resolutions/recommendations:

-
-
-
-
-
-
-

File reference:.....

Field inspection:.....

Date:.....

Name and signature (MINFOF official).....

Appendix 5: Fact sheet for monitoring and evaluation of production and distribution of plant material

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FACT SHEET FOR MONITORING AND EVALUATION OF PRODUCTION AND DISTRIBUTION OF PLANT MATERIAL BY (To be kept for each nursery)

SECTION 1: GENERAL INFORMATION

Branch

Regions covered:

Location of Nurseries:

Region.....

Division:.....

Localities/Villages:

Names and addresses of Nursery managers per site

.....

.....

SECTION 2: DESCRIPTION OF NURSERY

2.1. Type of nursery:

-Makeshift/temporary nursery (< 30 000 seedlings):

-Permanent Nursery (>30,000 seedlings):.....

2.2. Nursery sites /Factors /Infrastructure (Tick existing items (tick existing items):

Rich soil - level ground or slightly sloping (2%) - accessibility at all seasons - steady and enough water supply - protection against strong winds - available labour supply - germination area - store for working equipment - administrative and records office - wood park (trees and plants that provide plant material - for instance grafts, cuttings, etc.) - seedling transplanting space - space for storage of transplants and for filling - fencing and shading - shed for storage storing substrate and acclimatising young transplants - propagation frame (rooting propagator) for cuttings - rehabilitation frame (giant frame) for propagation by layering - irrigation systems (engine pump, wind pump, basins, piping) - production blocks - composting rooms.

2.3. Equipment (tick existing items):

Secateurs, grafters, scalpels, scissors, sprayers, watering cans, planters, buckets, wheelbarrows, spades, hammers, machetes, hoes, files, drums, sieves, saws, ladders, knives, rope, other inputs and insecticides.

2.4 Equipment maintenance – and seedling care

Technique used

 Means.....

2.5. Distribution and marketing of plant material

Means applied:.....
 Total number of seedlings supplied by each player + Amount per seedling and per actor:
 1- 6 -
 2- 7 -
 3- 8 -
 4- 9 -
 5- 10 -

Total number of seedlings:
Total amount (CFAP):
 Date delivery:
 Place of delivery:.....
 Plantation site:

SECTION 3: DIMENSIONS AND CONFORMITY OF PLANT MATERIAL

- Botanical, phenological and technical specifications of species:.....

- Quantity of species:

- Age of each species:

- Average size of each species:

- Root system of each species:

- Number of leaves per species:

- Type of seedling (bare roots, cups, plugs, etc.):

- Qualifying criteria: (quality, non-conformity (defects), health and physiological condition...):

- Post-production conservation:

SECTION 4: TECHNICAL PROCESSES

- Seed sources?.....

- *In situ* conservation? *Ex situ* conservation?.....
- Seed treatment?

- Vegetative propagation (techniques applied?):.....
- Generative propagation (techniques applied?):.....
- Germination rate of each species:.....
- Survival rate of young plants per species:.....

SECTION 3: ACTIVITY IMPACT ASSESSMENT (BY ASSESSOR)

3.1. MONITORING

Administrative:.....
 Socio-organisational:.....
 Financial:.....
 Technical:.....

3.2. EVALUATION

Relevance (*relation between stakes, problems or needs observed and objectives identified to address them, added value compared to what is existing*).....

Efficiency (*level of attainment of objectives*)

Efficiency (*profitability, cost effectiveness, rational use of means available, assessment of level of attainment of objectives at minimal cost (financial, human and organisational)*).....

Sustainability/Continuity/Impact (*impact of long-term effects of the activity upon completion*).....

SECTION 4: FOR OFFICIAL USE ONLY

Conclusion/resolutions/recommendations:

-
-
-
-
-
-

File reference:.....

Field inspection:.....

Date:.....

Name and signature (MINFOF official).....

Appendix 6: Forest reserves and reforestation areas in Cameroon

