



**MINISTRY OF AGRICULTURE, LIVESTOCK, FISHERIES AND
COOPERATIVES**

REGULATORY IMPACT STATEMENT (RIS)

**THE SEEDS AND PLANT VARIETIES (FOREST TREE SEEDS)
REGULATIONS, 2021**

JANUARY, 2022

Introduction

The Regulatory Impact Statement for the proposed Seeds and Plant Varieties (Forest Tree Seeds) Regulations, 2021 was prepared in accordance with the provisions of sections 6 and 7 (1) and (2) of the Statutory Instruments Act, 2013. Section 6 of the Act requires the Regulation Making Authority to prepare a Regulatory Impact Statement for the proposed regulations indicating the costs and benefits of the proposed regulations on the public and stakeholders. Section 7(1) and (2) of the Act set out the contents of a regulatory impact statement for the proposed regulations as follows:

1.0 A Statement of the Objectives and Reasons for the Proposed Regulations

value chain by ensuring access to adequate and sustainable availability of high-quality seeds to commercial and on-farm tree growers across the country and other forest industry actors. The seed supply should be able to meet the increasing demand for forest tree seeds for commercial use and to support the national objectives on forest resources development as outlined in various government initiatives including the Forest and Landscape Restoration Action Plan (2021 - 2025), National Strategy for Achieving and Maintaining Over 10% Tree Cover By 2022, Kenya Commercial Tree Improvement Strategy and Vision 2030 among others. The Proposed Regulations seek to address the following key forest tree seed sub-sector concerns:

- i. To strengthen the legislation which has been weak in addressing production, processing, quality standards, certification, handling and management and marketing of forest tree seeds.
- ii. To enhance operationalization of the provisions of the Seeds and Plant Varieties Act (Cap 326) relating to the forest tree seed value chain.
- iii. To comply with Article 42 of The Constitution of Kenya, 2010 on the protection of the environment and other articles, focusing on environment and eco-systems protection
- iv. To facilitate forest tree seed market access for local seed markets, export and import markets and in adherence to internationally accepted forest tree seed standards for all potential tree growers.

Specifically, the objectives of the draft Seeds and Plant Varieties (Forest Tree Seeds) Regulations, 2021 are:

- i. To prescribe the forest tree seeds (forest tree species) for purposes of these Regulations.
- ii. To establish the National Forest Tree Seed Regulation Committee and the County Forest Tree Seed Advisory Panel.
- iii. To provide for the registration of forest tree seed merchants and stockists.
- iv. To provide for the registration and inspection of seed sources, and regulate seed collection.

- v. To guide on forest tree seed sampling, testing, standards and procedures for seed certification; the validity of certification and quality declaration.
- vi. To provide for inspection of forest tree seed processing.
- vii. To guide on forest tree seeds packaging, labeling and sealing.
- viii. To regulate the sale of forest tree seeds.
- ix. To monitor forest tree seed sales.
- x. To regulate import and export of forest tree seeds.
- xi. To establish and maintain forest tree seed records for traceability.
- xii. To provide an appeal mechanism in the forest tree seed sub-sector.

2.0 Statement on the Effect of the Proposed Regulations

2.1 Effects on the Public Sector

- i. The Government will establish a coherent and regulated forest tree seed chain that has largely remained informal for streamlined oversight. It will also improve the management of the forest tree seed chain to support national objectives in forestry sector development.
- ii. Forest tree seed standards and certification will be applied across both formal and informal tree seed chains and thus be harmonized with the certification of other crops seeds. This will assure the availability of internationally acceptable quality forest tree seed.
- iii. County Governments will have a clear role in the development of forest resources including forest tree seeds, commercial forest farming and on-farm tree production within the county. This will be achieved through the County Forest Tree Seed Advisory Panels and monitoring of forest tree seed sales and stocks movement. This will allow individual counties to employ county policies, strategies and existing frameworks at the local level, especially for the sensitization and mobilization of farmers, and providing support e.g. advisory services, nurseries development to promote commercial/on-farm forest tree farming in the Counties.
- iv. Through the Service (KEPHIS) structures, systems and implementation framework will be established for more effective regulation of the entire forest tree seed chain including both the formal and the informal seed chains. This will also facilitate collaboration between the Service and county governments and additionally provide for an inter-ministerial/ inter-agency working framework.
- v. The country will develop and maintain a database of all forest tree seed chain actors (seed merchants and stockists), seed sources, seed production, imports and exports, seed sales and stocks for monitoring purposes and to inform future forest tree seed chain planning.

- vi. The statutory payments, levies and fees prescribed in the Regulations (merchant registration fees, stockist registration fees, seed source registration fees, inspections fees, re-inspection fees, seed sampling fees, seed testing fees) will enhance the revenue which will sustain the operations of various institutions under the Regulations.
- vii. The broader forest sector and national economy will benefit from the increased tree establishment (contributing towards the desired 10% tree cover), tree production, and increased production of resultant wood and non-wood products. This increased wood production will substitute current wood imports of approximately 10.3 million m³ annually saving foreign exchange and thereby improving the country's balance of trade.
- viii. Provide opportunities for public-private partnerships in the realization of national objectives in forest resources management.

2.2 Effects on the Private Sector

The proposed Regulations will affect the private sector in the following ways:-

- i. Forest tree seed chain actors and stakeholders will stand to benefit from a streamlined, competitive and well-regulated forest tree seed chain devoid of unfair trade practices and other malpractices. All players will be granted an even playfield in forest tree seed production and collection, processing, sale, nursery registration and seedlings production and selling. There will also be compliance with quality standards and forest tree seed importation and exports.
- ii. Uniform standards will be applied across the forest tree seed chain to assess seed quality and standards in both the formal and informal forest tree seed chains. This will ensure that all forest tree seed produced, collected, imported or exported will be of the same and good quality which will facilitate improved seedlings production or meet forest tree seed export market standards. This will support increased commercial and on-farm forest tree farming locally and allow commercialization of forest tree seed exports from Kenya.

Worth noting, Kenya was admitted into the OECD Scheme for the Certification of Forest Reproductive Material moving in International Trade in 2014. The OECD Forest Seed and Plant Scheme is a certification system to facilitate international trade in forest seeds and plants by promoting the production and use of seeds, parts of plants and plants that have been collected, processed and marketed in a manner that ensures their trueness to name. Forest Reproductive Material covered by the Scheme and marketed under OECD certification is primarily intended for use in forestry and agroforestry. The introduction of

standards that are aligned to this scheme will further enable increased commercialization of forest tree seed in the country.

- iii. The private sector stakeholders will be represented in the National Forest Tree Seed Regulation Committee by representatives from associations of forest tree seed merchants, commercial forestry companies, commercial forestry farmers, seedlings producers and breeders. They will therefore effectively participate in policy and decision-making of the committee on the forest tree seed chain at the national level. This will ensure real industry issues are exhaustively addressed.
- iv. The private sector stakeholders will similarly be well represented in the proposed County Forest Seed Advisory Panel and will effectively be involved in the development of the forest tree seed chain advisories to the CECM and thus influence policy and decisions made at the county levels.
- v. The registration of forest tree seed merchants and stockists will ensure that only bona fide persons/entities who have the right facilities and have demonstrated knowledge on forest tree seed matters and capability to maintain the quality and viability of the seed will be allowed to operate in these roles. All rogue agents will be eliminated from the forest tree seed profession. This will translate to seed users accessing only good quality seed and adequate forest tree seed information.
- vi. The private sector will be able to identify, register and maintain recognized forest tree seed sources and thus can venture into commercial forest tree seed production for own use and sale or export after inspection by the service and undergoing the mandatory certification. This will also allow for traceability for every seed lot availed in the market.
- vii. The authorization of competent private sector persons to perform specified (certification) functions by the Service will present such agents with an opportunity to increase their income sources and to use their skills and experiences in the seed chain to the benefit of the forest tree seed chain.
- viii. Forest tree seeds inspections and seed sampling and testing for certification will serve to re-affirm the quality and viability of the seed. Therefore, seed merchants will only avail to the market good quality seed of high viability and discard that which does not meet the standards. This will protect the market reputations of the merchants or brands.
- ix. Seed packaging, labeling sealing guidelines will ensure that seeds presented in the market remain viable and merchants and stockists do not incur losses from the disposal of seed with deteriorated viability. This and the prescribed validity of certification and quality

declaration will be surety of what seed users are buying (varieties), viability and the source (traceability) of the seed.

- x. The process of importation and export of forest tree seed will be transparent and accessible to all eligible persons allowing for an even playfield for seed importation for own use or re-sale and seed exports, thus avoiding domination by a few agents.
- xi. Maintaining data and records by the Service on registered forest tree seed sources, registered forest tree seed merchants, registered forest tree seed stockists, processors and forest tree seed stock movement will enable private sector actors in forest tree seed business to be better informed to plan their businesses and make informed decisions.
- xii. Seed merchants or stockists already registered under the Seeds and Plant Varieties (Seeds) Regulations 2016 will be able to extend the scope of their registration to include forest tree seed without any additional costs.
- xiii. A person aggrieved by the decision of the Service may appeal to the National Forest Tree Seed Regulations Committee allowing the private sector actors to seek fairness in the forest tree seed chain.
- xiv. The resultant revamped forest tree seed chain will create new job opportunities in the private sector while stabilizing employment within the chain as forest tree seed production, seed collection, seed processing, seed processing and packaging and seed marketing become more formal.
- xv. Commercial forest tree farmers and eligible on-farm tree farmers can diversify their income streams by establishing and maintaining forest tree seed sources that they can lease out for seed harvesting or seed production, seed collection, seed processing and marketing.
- xvi. The broader forest sector actors will benefit from the increased tree production, and the resultant wood and non-wood products to meet the increasing demand for industrial raw materials.
- xvii. The requirement for registration of seed merchants or stockists as legal entities under the Regulations may be a barrier to the MSMEs and community organizations that are already practicing or would want to venture into this field. This is due to the compliance requirements under the regulations which are not in existence in the current forest tree seed subsector.

- xviii. The different fees prescribed in the Regulations (merchant registration fees, stockist registration fees, seed source registration fees, inspections fees, re-inspection fees, seed sampling fees, seed testing fees) will increase the cost of doing business for actors in the forest tree seed chain and will result in increased forest tree seed prices. This may take certified forest tree seed out of the reach of many farmers or increase the cost of commercial forest tree farming.

2.3 Effects on fundamental rights and freedoms

The proposed Regulations shall have a positive impact on fundamental rights and freedoms in the following ways:-

2.3.1 Consumer protection

The Constitution under Article 46(1) guarantees consumers the right to goods and services of reasonable quality. The proposed Regulations will protect consumers from the consumption of poor quality forest tree seeds. The Regulations prescribe different categories of forest tree seeds, seed testing and registration requirements for forest tree merchants and forest tree seed stockists. Additionally, the Proposed Regulations provide for compensation of buyers for losses from the purchase of forest tree seeds that do not meet the minimum laboratory standards. The provisions of the Regulations, therefore, reinforce consumer protection.

2.3.2 Rights of the Special Groups

The Constitution provides for the special application of rights under part 3 of the Bill of Rights. It categorically recognizes women, persons with disabilities and the youth under articles 27, 53 and 54 respectively. The proposed regulations provide for the representation of women, youth and persons with disabilities in the National Forest Tree Seed Regulation Committee which enhances inclusivity and participation of these special groups in accordance with the Constitution.

2.3.3 Fair administrative action and right of access to justice

The proposed regulations provide for administrative processes for the resolution of any disputes. Regulation 14 provides for the right to reasons upon inspection and the right to appeal for a re-inspection. The Regulations provide for the timelines for the resolution of disputes as well as the right to be heard. The Regulations also establish various dispute resolution bodies such as the National Forest Tree Seed Regulations Committee which employ alternative dispute mechanisms in the resolution of disputes. These provisions reinforce article 47 of the Constitution which guarantees the right to fair administrative action.

2.3.4 Right to information

Article 35 of the Constitution guarantees the right of access to information held by another person and is required for the exercise or protection of any right or fundamental freedom. This is reflected in the proposed Regulations which provide for certain categories of information to be included in the certificate label and sticker. The Regulations are specific on disclosure of information and obligate the Service to maintain information management systems that are necessary for the subsector.

2.3.5 Freedom of association

Article 36 of the Constitution provides that every person has the right to freedom of association, which includes the right to form, join or participate in the activities of an association of any kind. The proposed Regulations recognize different associations established in the commercial forestry and forest tree seed sub-sector. Regulation 6 recognizes different associations including the association of forest tree seed merchants, association of established vertically integrated commercial companies, association of farmers actively involved in commercial forestry, an association of seedling producers, and plant breeders association of Kenya. These provisions reinforce the freedom of association under the Constitution.

2.3.6 Economic and social rights

Article 43 of the Constitution of Kenya, 2010 provides for economic and social rights. It affirms the right of individuals and communities to an adequate standard of life including the right to be free from hunger and have adequate food of acceptable quality. The proposed Regulations, if enacted into law, shall create employment opportunities in commercial forestry which in turn shall ensure the realization of economic rights.

3.0 Statement on Regulatory & Non-Regulatory Options

3.1 Option 1: Maintaining the *Status Quo*

Before considering new interventions, it is important to consider whether the problem could be resolved by making changes to practices within the existing legislative framework, thus maintaining the status quo. Examples of this are:-

- i. Making use of existing seed laws, regulations, policies and/or guidelines which include:
 - The Constitution of Kenya 2010;
 - The Forest Conservation and Management Act 2016;
 - Economic Blueprint Vision 2030;
 - Devolved Government Act, 2012;
 - National Forest Policy 2014;
 - The Seed and Plant Varieties Act (amended in 2019);

- The Crops Act 2013;
 - Plant Protection Act (Cap 324);
 - The Agriculture and Food Authority Act 201;
 - The Seeds and Plant Varieties(Seeds) Regulations 2016;
 - The Seeds and Plant Varieties (National Performance Trials)Regulations 2016;
 - The Plant Breeder’s Rights Regulations 2001;
 - The National Seed Policy 2010;
 - Inter-governmental Relations Act, 2012;
 - The Land Act, 2012;
 - The National Climate Change Response Strategy;
 - Regional and international seed protocols; and
 - Other sector-specific legislations relevant to the forest tree seeds subsector.
- ii. Simplifying or clarifying existing regulations;
 - iii. Improving enforcement of existing regulations; or
 - iv. Making legal remedies more accessible or cheaper.

3.2 Option 2: Passing the Regulations

The government can achieve its policy objectives by using taxpayers’ money or through a range of non-spending interventions, including passing regulations in a specific sector. For instance, regulations such as the proposed Seeds and Plant Varieties (Forest tree Seeds) Regulations. Regulations aim to set rules to protect and benefit people, businesses and the environment; stabilize markets; and address market failures to support economic growth. Regulation can also create costs for businesses. If overused, poorly designed or implemented, it can stifle competitiveness and growth in a particular sector.

Adoption and operationalization of the proposed Regulations will:

- i. Support increased production of high-quality, viable and certified forest tree seed to meet the increasing demand of the different forest industry stakeholders- from both public and private sectors; and only from registered and traceable forest tree seed sources.
- ii. Support increased access to quality forest tree seeds and thus promote increased viable commercial forest tree production that will support the country’s forestry development agenda as envisaged in the NFP, Big 4 agenda, Vision 2030 and other government documents.
- iii. Streamline and coordinate players within the forest tree seed chain to remove underhand dealings that negatively impact the forest tree seed chain or on certain actors in the chain including in the production, marketing, importation and export of forest tree seeds.
- iv. Develop and maintain a realistic database on the forest tree seed chain inclusive of registers on forest tree seed sources, seed production, distribution and stocks movement, seed merchants, processors and seed stockists in Kenya for better control and planning.

- v. Increased forest tree seed management information access to users, especially smallholder farmers from seed merchants and stockists who will be required to have demonstrated knowledge on forest tree seed matters before registration. This will ensure more efficient handling and utilization of seeds distributed.

These Regulations are thus important for streamlining and organizing the forest tree seed value chain.

3.3 Option 3: Other Practical Options

Alternatives to regulation include information and education, market-based structures, self-regulation and co-regulation. In addition, existing policies can be improved, without further regulation, using techniques such as behavioral insight or changing enforcement practices to improve compliance. Such approaches may be better or worse for business and the economy than an equivalent regulatory measure.

Alternatives to regulation include:

1. No new intervention/do nothing;

This may include making use of existing laws and regulations; simplifying or clarifying existing laws and regulations; improving enforcement of existing laws and regulations; or making legal remedies more accessible or cheaper and as discussed in the section above, the status quo in the sector is likely to remain.

2. Information and education;

Information and education can be used to empower forest tree seed chain players to make their own decisions, improving choice for the mutual benefit of all. However, there are potential risks associated with this. Information and education can take time to make an impact. Moreover, access to information and the ability to use it can vary within a community and may therefore not reach all equally. It may also not be straightforward to assess how people will react or change their behavior in response to the information provided and it will increase costs for government and businesses that will be providing the information and education required.

3. Incentive/market-based structures;

The government can use economic instruments such as taxes, subsidies, quotas and permits, vouchers etc. as initiatives to realize the desired objectives. These initiatives, however, are only practically possible in well-developed and efficiently functioning sectors which have well-defined structures, unlike the forest tree seed sub-sector. Further, often such systems need their own regulations to establish the framework and may have additional costs to the government. These mechanisms are unlikely to be effective in the forest tree seed sub-sector.

Alternatives to regulation:

i. Self-regulation

An industry or a profession can self-regulate, for example, through the use of codes of conduct, customer charters, standards or accreditation. In many cases, rules and codes of conduct will be formulated by the industry representatives or organizations under their own initiative. In the absence of a well-developed and all-inclusive forest tree seed industry organization as is the case in Kenya, self-regulation currently cannot be effectively possible.

ii. Co-regulation

Co-regulation is an intermediate step between state-imposed and self-regulation that involves some degree of explicit government involvement where the industry may work with the government to develop a code of practice and enforcement by the industry or a professional organization accredited by the government. In absence of well-developed and all-inclusive forest tree seed industry organizations as is the case in Kenya, effective co-regulation is not possible currently in the country.

4.0 Costs-Benefit Analysis (CBA)

4.1 Economic, Environmental and Social Impacts

a) Economic impacts of the regulations:

The economic benefits of the proposed regulations include;

Economic benefits

- i. The forest tree seed quality standards introduced by these Regulations will ensure that tree farmers are assured of the quality and viability of the seeds they procure and do not have to sow the seed or wait for the trees to grow to confirm the seed quality, thus saving them time to wait and the cost of purchasing replacement seed. Currently, it is estimated that informal seed sources provide up to 60% of the national forest tree seeds requirements whose quality are not verified.
- ii. The regulations will promote access to quality seeds for use in agroforestry in the country by introducing the distribution and marketing of forest tree seeds through the existing 6,000 plus seed merchants' nationwide distribution network.
- iii. The quality of trees produced from quality certified forest tree seed will be high, devoid of common poor tree quality characteristics such as splitting, knotting, discoloration, disease, etc. This will reduce rejections or low-quality grading by the market, thus assuring farmers of good returns per tree sale or unit area of forested land.
- iv. Increased commercial tree production. The increased access to adequate and quality seeds for forest tree farmers, both farm forestry and plantations, and improved access to forest tree seed management information will see increased production and better quality of commercial forest trees which will contribute to an increase in the forestry sector's contribution to the national GDP, contribute to the realization of the national 10% forest cover target and an increase in farmers' households earnings.
- v. Increased afforestation and re-afforestation of the gazzetted public forest lands, dry areas and private lands. The increased access to adequate and quality seeds will facilitate the afforestation and re-afforestation across all the potential afforestation areas, contributing to increased production of forest products and the realization of the national 10% forest cover target.
- vi. Increased forest products produced from both commercial and public forests will bridge the country's annual wood deficit of approximately 10.3 million m³. It will substitute

imports and save the country's foreign exchange and thus improve the country's balance of trade with its trading partners.

- vii. Increased production of forest products will support the sustainability of the different sub-sectors in the forest industry including seed production and collection, forest tree stands management, sawmilling, furniture, charcoal, firewood, and construction. Other industry auxiliary services including equipment suppliers, financial and insurance services will be supported thereby creating and/or securing thousands of jobs in the forest industry.
- viii. Increased incomes. A streamlined forest tree seed chain will translate to increased incomes for the different forest tree seed chain actors from the increased production or collection, processing and sale of forest tree seeds, sale of increased forest tree products, and value-added forest tree products and other services delivery in the industry.
- ix. Increased foreign exchange earnings from increased regional and international trading and export of forest tree seeds.
- x. The different fees prescribed in the Regulations (merchant registration fees, stockist registration fees, seed source registration fees, inspections fees, re-inspection fees, seed sampling fees, seed testing fees) will increase revenue collection for services anticipated in the proposed regulations.

Economic Costs of the Proposed Regulation

- i. Effective implementation of the Regulations will require increased investment in research and development, production, processing, seed sampling and testing, packaging, marketing, registrations, certification and licenses which will increase the cost of doing business. This cost is likely to be transferred to the users thus increasing the forest tree seed prices.
- ii. Implementation of these Regulations will require concerted efforts and investments to support a rigorous and effective regulatory system from the Service, county governments and other complimenting agencies.
- iii. The national and county governments have to invest in forest tree seed stakeholders' education on the Regulation. This is essential for the full and effective implementation of the regulations by all relevant forest sector actors including by local communities engaging in tree seed collection and sale.

- iv. Given a large number of actors in the forest tree seed production, collection and utilization, and their spread across the country, the investment to monitor for compliance has to be significant to realize and sustain the benefits of the Regulations.
- v. The Regulations may also introduce additional transactional costs and bureaucracy in the short term period due to the many processes envisaged in the Regulations and still evolving implementation structures. This may result in increased costs of doing business and time delays for businesses in the forest tree seed chain.
- vi. Implementation of the Regulations may result in a change of livelihoods for some actors in the forest tree seed chain from the realignment of their businesses especially small and rural community forest tree seed agents unable to meet the minimum requirements set in the Regulations and/or due to the increased cost of doing business.

b) The social impact of the regulations:

The social benefits of the proposed Regulations are: -

- i. Income diversification - Commercial forest tree production will provide an alternative source of income for commercial and smallholder farmers from forest tree production and trading from the traditional agricultural value chains, most of which are performing poorly due to various challenges being experienced.
- ii. Source of livelihood- A streamlined forest tree value chain can provide rural farm households with alternative sources of livelihood through forest tree seed production and collection, seed processing and grading, and the management of forest tree seed sources and private forest plantations.
- iii. Improved income distribution among the farm families and the communities in general and thus reduced inequalities due to equity in access to quality seed and a level playing field in the forest tree seed and forest industry.
- iv. Improved education levels and reduced illiteracy, health and social amenities access in the societies due to improved incomes and improved income distribution, thus improved social wellbeing of the rural communities.
- v. Improved access to more affordable energy for rural households, 80% of which rely on biomass to meet their household energy requirements from the resultant increased production of forest products.

- vi. Reduced tide of rural-urban migration in search of employment opportunities due to increased employment opportunities created in the commercial forest industry in the rural areas.
- vii. Improved and preservation of natural ecosystems, including water sources and soil conservation due to increased tree cover, assuring the rural population of reliable water supply and sustainable agricultural production.
- viii. The regulations will promote establishment of community forest Associations across the country which will be important in strengthening regulation and coordination in the forest tree seed value chain.

Social Costs of the Proposed Regulation

The social costs of the proposed Regulations are:-

- i. Increased commercial and on-farm forest tree seed and trees production may result in food insecurity due to on-farm enterprise substitution as farmers replace food crops with the more reliable and lucrative farm forestry resulting in reduced food production at household, regional and national levels.
- ii. Increased forest tree seed production and collection may see increased child labour engagement in the financially attractive industry, especially given that some activities are viewed as better suited for children. As a social cost, there may be increased family conflicts on sharing of income from tree seeds ventures.
- iii. Increased tree production will increase availability of biomass. In the absence of access to preferred or recommended healthy alternative energy sources, this will result in increased use of biomass (firewood) as an energy source for rural households which will predispose the families and especially young children to smoke inhalation-related health problems.

c) The environmental impacts of the regulations

The environmental impacts of the proposed regulations include: -

Environmental Benefits;

- i. Improved tree cover from the established seed sources, resultant commercial forest tree stands and from the afforestation and re-forestation of designated public forest lands.
- ii. Improved protection of natural ecosystems and biodiversity including water sources and water bodies.

- iii. Reduced soil degradation due to improved tree cover from the established forest tree seed sources, resultant increased commercial forest tree stands and from the afforestation and re-forestation of designated public forest lands.
- iv. Improved land utilization and management especially land currently underutilized for agricultural production and utilized or underutilized land in low potential areas through provision of sufficient suitable tree species seed.

The possible negative environmental impact of the Regulations may include:

- i. Some of the indigenous species in Kenya may be smothered to extinction by the more aggressive imported tree species.
- ii. Importation of forest tree seed may introduce new pests and diseases in the country while increased specific commercial tree species plantations may also encourage increased pests and diseases incidences in the country.
- iii. The increased farm forestry and commercial plantations may contribute to increased forest fires especially in the dry seasons due to the increased continuous swaths of flammable biomass material.

However, with proper and effective implementation of these Regulations, these negative environmental impacts can be significantly mitigated and impacts reduced.

4.2 Administration and Compliance Cost

RIA noted that resources would be required for operationalization of the Regulations which will include human resources and operation costs for inspections and enforcement as well as for awareness creation of the Regulations to the different forest tree seed and forest industry players. It is assumed that additional resources will go to the implementation of the wider national agricultural and forest policies which support forest tree seed and commercial tree production, forest tree seed and forest research and development, provision of advisory services to commercial forest tree farmers for strengthening knowledge transfer and technology distribution among the farmers, capacity building of industry actors, and in the implementation of the Regulations, individual national forest industry, agricultural and trade strategies, the Government's Big 4 agenda, Vision 2030, County CIDPs and other relevant sector national policies and strategies.

4.3 Assessment of Return on Investment (Benefit)

Passing and operationalization of the proposed Regulations will be critical in facilitating the development of the forest tree seed sub-sector first by streamlining Kenya's unstructured forest tree seed sub-sector to allow coordinated control of the forest tree seed value chain, create a level playfield for all value chain players and promote fair trade practices to support the production and access to quality forest tree seeds to facilitate increased afforestation and commercial forest tree production which will contribute to the realization of Kenya's manufacturing pillars as envisioned in the Big 4 agenda and environmental preservation as stipulated in the Constitution of Kenya, 2010.

A well-regulated forest tree seed sub-sector will support increased productivity of quality forest tree seeds to support increased forest products production that meets international market standards. This will ensure consistent provision of quality raw material for forest industries sustainably to guarantee improved incomes for farmers and various industry actors. This will lead to improved livelihoods and social welfare for communities while guaranteeing other businesses within the industry good returns and higher forest tree seed export earnings for the country.

The Regulations will introduce applicable seed quality and certification standards which will ensure that the quality of forest tree seeds produced and available in Kenya meets the set quality standards. Compliance with these standards and the establishment of an effective traceability mechanism also envisaged in the Regulations will make Kenya's forest tree seed more competitive in the regional and global forest tree seed markets, opening a business opportunity for Kenyan seed merchants.

The Regulations will also control forest tree seed imports and exports thus eliminate illegal tree seed trade actions that can negatively impact the local forest tree seed and export markets by

distorting local tree seed supply, demand and prices or by introducing new tree pests and diseases into the country.

Implementation of the Regulations will also create numerous employment opportunities both on-farm to increase management of seed sources, seed production and collection, seed processing and marketing of forest tree seeds and in the commercial tree production; and off-farm in the industry and the provision of auxiliary services in the industry.

In broad terms, the RIA noted that the following broad benefits and returns on investment will be achieved:

- i. The Regulations will support the establishment of a well-structured, streamlined, and regulated forest tree seed sub-sector in the country that will transform and improve forest tree seed production to internationally accepted standards and promote fair trade practices in the marketing, import and export of the forest tree seeds for the benefit of all forest industry stakeholders and the country.
- ii. The introduction of seed quality standards, certification and an effective traceability mechanism will serve as a means of quality assurance for the local market and will also improve the competitiveness of Kenya's forest tree seed in the regional and global forest tree seed markets. Further, it will guarantee all forest tree seed users of the quality and viability of Kenyan forest tree seeds.
- iii. Support the development of forest tree seed agro-enterprises including smallholder farmers, community-based organizations and SMEs seed traders, most of whom have faced challenges to establish themselves in an industry dominated by a few to increase or intensify forest tree seed production and trade.
- iv. Improve commercial production of forest trees with improved farmers' access to adequate quality seed, seed and forest tree seedlings management advisory by seed merchants and stockists and from the detailed seed labels.
- v. Improved access to comprehensive reliable data and information continuously maintained by the Service and the different actors in the forest tree seed sub-sector will provide a planning and decision-making basis both for the government and private sector businesses in the forest tree seed value chain, commercial forest tree production and the forestry industry in general.
- vi. Create numerous employment opportunities both on-farm and off-farm across the forest tree seed sub-sector and support industry auxiliary services, trading and marketing processes within the sub-sector.

- vii. Increased incomes for forest tree seed producers resulting from an increase in seed production, adoption of seed standards, seed certification and fair trade practices, and thus improved livelihoods and social well-being of the rural communities.
- viii. Increase in commercial forest tree production resulting from the improved access to quality forest tree seeds, translating to increased incomes and thus improved livelihoods and social well-being of the commercial tree farmers.
- ix. Increased national forest tree seed and commercial tree production and trading will translate into reduced timber imports, improved balance of trade with specific trading partners, increased foreign exchange earnings and an increased forest sector contribution to the national GDP. Control forest tree seed imports and exports thus eliminate illegal tree seed trade actions that can negatively impact the local forest tree seed and export markets by distorting local supply, demand and prices or by introducing new tree pests and diseases into the country.

4.4 Quantification of the Benefit

While seed production and trade statistics are readily available for crops, such information is generally not available for forest tree seeds (Whiteman, 2005), making planning difficult for tree germplasm collectors, producers and traders. Few countries produce tree germplasm statistics.

The benefit-cost ratio on the use of quality (certified) seed has been based on data from a comparative analysis on the use of low and high-quality seeds of two species: *Dovyalis caffra* (Kei apple) and Pine (*Pinus Patula*) from studies by KEFRI.

From the studies, the objective was to determine the difference in seedlings propagation respectively from certified and uncertified seed lots. The analysis results showed very wide differences on all key seed quality parameters including:

- In both species, the purity of uncertified seed was only 40% compared to 95% for the certified seed.
- In both species, the germination rate for the uncertified seed was only 30% compared to 98% for certified seed.
- For Kei apple, the volume of uncertified seed required to propagate 5000 seedlings was 1.19Kg compared to only 0.15 Kgs for certified seed, while for Pine it would require 0.56 kg of uncertified seed compared to only 0.072 Kgs of certified seed to propagate 10, 000 pine seedlings.

- With Kshs 2,000/Kgs and Kshs 7,000/Kgs as the cost of seed for Kei apple and Pine respectively, to propagate 5000 Kei apple seedlings would cost Kshs 2,381 when using uncertified seed compared to only Kshs.307 when using certified seed; while it would cost Ksh. 3,889 to propagate 10,000 Pine seedlings using uncertified seed compared to Kshs. 501 when using certified seed.

The benefit-cost ratio (BCR) for the 4 sets of 1kg seed lots, two (certified and uncertified) for each of the two tree species has been calculated as follows:

Table 3: Case 1(Pine) - Cost Benefit Ratio

No	Item	Pine	
		Low quality (uncertified)	High quality (certified)
i.	No. of pure seed /Kg (= i* iv)	60000	142500
ii.	No. of Germinating seed/Seedlings (= viii*v)/100	18000	139650
iii.	Seedling mortality (Assume 10%) (= ix*10%)	1800	13965
iv.	Ready seedlings for sale(=ix-x)	16200	125685
v.	Cost of nursery management (@ KFS rate of Shs. 4 per pine seedlings lot =ix*4) assuming same nursery area	502740	502740
vi.	Total seedling production cost(= i+vii)	509,740	509,740
vii.	cost of seedling (Kshs)	20	20
viii.	Seedling sales (xi*xiv)	324000	2513700
ix.	Margin	(185,740)	2,003.960
x.	Seedlings production Benefit cost ratio (BCR= xv/xiii)	0.64	4.93

(Source: KEFRI, 2021)

From the table above, the BCR of producing seedlings in Pine using uncertified (low quality) seed is too low at 0.64, far below 1 which means that this investment does not break even and the operator is going at a loss of Kshs. 0.36 (0.64-1) for every shilling invested. On the other hand, when using certified (high quality) seed, the BCR is 4.93 meaning that the investment is breaking even (above 1) and returning a margin of Kshs. 3.93 (4.93-1) for every shilling invested and leaves a positive margin from the investment.

Table 4: Case 2 (Kei apple) - Cost Benefit Ratio

No	Item	Kei apple
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		Low quality (uncertified)	High quality (Certified)
i.	No. of pure seed /Kg (= i* iv)	14000	33250
ii.	No. of Germinating seed/Seedlings (= viii*v)/100	4200	32585
iii.	Seedling mortality (Assume 10%) (= ix*10%)	420	3259
iv.	Ready seedlings for sale(=ix-x)	3780	29327
v.	Cost of nursery management (@ rate of Shs. 2 per kei apple seedlings lot season =ix*2) assuming same nursery area in both cases.	58653	58653
vi.	Total seedling production cost(= i+vii)	60,653	60,653
vii.	cost of seedling (Kshs)	10	10
viii.	Seedling sales (xi*xiv)	37800	293265
ix.	Margin	(22,853)	232,612
x.	Seedlings production Benefit cost ratio (BCR= xv/xiii)	0.62	4.84

(Source: KEFRI, 2021)

Analysis of the results are as follows:-

Similarly, in the production of Kei apple seedlings, the BCR when using uncertified (low-quality seed) is 0.62 which also is below 1 meaning the investment does not break even and instead there is a loss a loss of Kshs 0.314 (0.686-1) for every shilling invested. On the other hand, when using certified (high quality) seed the BCR is 4.84, meaning that the investment is breaking even and leaves a margin of Kshs. 3.84 (4.84-1) for every shilling Invested and yields a positive margin for the investment of Kshs. 232,612.00 from the 1Kg certified Kei apple seed.

It can therefore be concluded that the use of high-quality certified forest tree seeds is critical in seedling production. The envisaged national objectives in the forest industry development stipulated in the different government policies and strategies can only efficiently be realized with the use of high-quality certified seed.

Similarly, viable commercial forest and on-farm tree farming can only efficiently be realized through the use of high-quality certified seed to guarantee investors of good returns and to attract even more investors to this value chain.

4.5 Secondary Benefits of Forest Tree Seed Regulations

A well-regulated and efficient forest tree seed sub-sector will contribute to increased afforestation and increased commercial tree farming with clear secondary benefits. A study on a detailed analysis of the forest sector's potential in Kenya reveals that by the year 2035 with the realization of the forestry industry objectives including a well-regulated forest tree seed sub-sector the following benefits will be realized:-

- i. 1 million-plus household generating an additional collective \$50 million per annum from tree-growing;
- ii. 11,000 additional, formal and skilled jobs created in wood value chains;
- iii. \$261 million per annum value added to finished products;
- iv. Nearly 200,000 Ha of additional commercial forestry coverage;
- v. Long-term carbon sequestration of 28.7 MtCO₂ equivalents, and presenting for opportunities for carbon financing and trading for forest tree growers and introduction payment for ecosystems (P.E.S) in the country which will promote enhanced environment conservation
- vi. Increase production of biomass to facilitate wood product dependent industries including the important tea sector.

The realization of these benefits is only possible with the establishment of a sound forest tree system in the country.

5.0 Reasons why other Regulatory Options are not appropriate

5.1 Option 1: Maintaining the *Status Quo*

Maintaining the status quo will mean that the country does not provide a legal and regulatory framework to guide the development, promotion, and streamlining of the forest tree seed chain for the benefit of all stakeholders in the forest tree seed value chain and the forest industry at large. This will deny forest tree seed producers, forest tree seed merchants and stockists, nursery operators, on-farm and commercial forest tree farmers, saw millers, other forest industry players and other interested parties the prospects to benefit from the many opportunities in the forest tree seed and forest industry. It will also curtail the realization of the country's development objectives, including the following:

- i. The anticipated regulation of the forest tree seed chain will not be realized in the country which will leave it operating without common, set seed quality standards; unorganized,

unstructured and not effectively regulated and still with underhand dealings. This will allow continued shortages of quality forest tree seeds in the country; forest tree seed production, importation, exports and marketing domination by a few players; and continued operation of unscrupulous, quick-for-profit forest tree seed players and cartels who do not comply with set quality standards. This will negatively impact on the activities and businesses of forest tree seed users in the country both from public and private sectors.

- ii. The existing certification standards for forest tree seeds in the country have not been formalized and fully operationalized which will mean continued limited access to quality certified forest tree seeds for commercial forest tree farmers and smallholder on-farm forest tree farmers.
- iii. The lack of adequate quality forest tree seed will deny commercial forest tree farmers access to sufficient quality seed which would have facilitated increased commercial tree farming and contributed towards achieving the forest cover of at least 10% of the land area. This will ensure sustainable resource use, growth and employment creation as envisaged in the Constitution of Kenya, 2010 and economic blueprint Vision 2030.
- iv. The country will not be able to reduce the current wood shortage of 10.3 million m³ annually which is met by imports. Instead, this shortage is expected to rise as wood demand is projected to increase from the current estimated 50 million cubic meters to 66 million m³ by 2030 thus tripling the wood deficit in the country and thus continuing to drain scarce foreign exchange through wood imports.
- v. The forest tree seed actors and especially the low-level actors in the forest tree seed sector will continue having an insignificant voice in the sector together with other forest industry sector actors who have limited participation in policy and decision-making in the industry that would be otherwise provided through the proposed National Forest Tree Seed Regulation Committee and County Advisory Panels.
- vi. The private sector forest tree seed actors and commercial tree farmers will be denied the opportunity to identify, establish, register and maintain recognized forest tree seed sources and venture into commercial forest tree seed production.
- vii. The proposed forest tree seed traceability mechanism is important for enforcing responsibility for the quality of the seed that seed merchants produce and the market will not be established. This will allow for the continued availability of poor-quality forest tree seed in the country.

- viii. The process of importation and exportation of forest tree seed will remain inaccessible to all interested parties and dominated by a few actors to the disadvantage of the majority.
- ix. Maintenance of commercial forest tree seed data and records in the country will not be mandatory and future seed and industry planning and decision making by both public and private sector industry actors will not be based on any reliable real-time data and information.
- x. The anticipated employment opportunities to be created by a revamped commercial forest tree seed chain and the resultant increase in tree production that are key in stabilizing businesses and employment within the forest tree seed and across the wider forestry industry stakeholders will not be realized.

Maintaining the status quo is thus undesirable, and the RIA recommends that the proposed Regulations be implemented to realize the optimal development, promotion, and regulation of the forest tree seed chain for the benefit of the seed chain actors and other stakeholders across the wider forestry industry in the country. This will enable the forest industry, in general, to effectively contribute to the realization of the objectives of Vision 2030, the National Forest Policy, the Government's Big 4 Agenda and the respective Counties' CIDPs and specific County Policies and Strategies on natural resources management.

5.2. Other Practical Options

Alternatives to regulation include:

- i. No new intervention/do nothing

This may include making use of existing regulations; simplifying or clarifying existing regulations; improving enforcement of existing regulations; or making legal remedies more accessible or cheaper. However, with this approach, the status quo is likely to remain as the forest tree seed in the country has had no form of regulation in the past. In absence of any new intervention, the forest tree seed sub-sector would therefore remain as it currently is and this will be to the detriment of all the sector stakeholders and the country in general.

- ii. Information and education

Information and education can be used to empower stakeholders to make their own decisions, improving choices for the mutual benefit of all. However, information and education can take time to make an impact and still may not be acceptable to all. This approach may also increase costs for the government and businesses that will be providing the information and education required. The desired objectives are unlikely to be realized within a reasonable time for the common good of all.

iii. Incentive/market-based structures.

The government can use economic instruments such as taxes, subsidies, initiatives to realize the desired objectives. However, these initiatives are only practically possible in well-developed and efficiently functioning sectors which have well-defined structures and often such systems need their own regulations to establish the framework and may have additional costs to the government. This is unlikely to be effective in the forest tree seed sub-sector in Kenya as it is yet to be well developed.

5.3 Alternatives models of regulation include:

i. Self-regulation

The forest tree seed sub-sector in the country does not have an all-inclusive industry representation that could formulate and implement codes of conduct or practice, customer charters, standards or accreditation system acceptable to all sector actors for self-regulation and the necessary mechanisms to monitor the effective implementation of such self-regulation. This therefore makes effective self-regulation in the forest tree seed sub-sector as it is currently structured not possible.

ii. Co-regulation.

Co-regulation is an intermediate step between state-imposed and self-regulation that involves some degree of explicit government involvement where the industry may work with the government to develop a code of practice whose enforcement would be by the industry or a professional organization accredited by the government. The forest tree sub-sector in Kenya currently has no universally accepted and all-inclusive industry representative organization(s) that can mobilize and organize the actors towards this. This therefore makes effective co-regulation in the forest tree seed sub-sector as it is currently structured not possible.

6.0 Conclusions

The forest tree seed value chain needs to be well-structured and regulated for the reasons discussed in the previous parts of this report. The proposed Regulations seek to ensure that the production and availability of adequate quality forest tree seed meet the national requirements of both the public and private sector forestry industry actors. This includes the target of production of 360,000 kg seeds annually required to produce 1.8 billion seedlings in four years as envisaged in the National Strategy for Achieving and Maintaining Over 10% Tree Cover by 2022. This will support the achievement of 10% national land tree cover and increase commercial forestry in Kenya. Commercial forestry is fast gaining currency with the realization that forestry is an attractive investment that can support industrialization in the rural areas in addition to the potential benefits of afforestation to the ecosystem.

In addition to the anticipated economic, social and environmental benefits of increased afforestation, a well-regulated and efficient forest tree seed sub-sector will contribute to the country's ability to realize its objective of being self-sufficient in wood production, thereby transforming the country from being a wood deficit country. Currently, there is wood products supply deficit projected to grow to 6.3 million m³ by 2045 with the existing forest sector status.

A well-regulated and efficient forest tree seed sub-sector will streamline and standardize operations across the entire forest tree seed value chain including in the identification, establishment and registration of forest tree seed sources, forest tree seed production and collection, seed processing, testing and certification, seed handling, packaging, labeling, storage and marketing, field, processing and marketing inspections, registrations of seed merchants and stockists; seed documentation, and importation and export of forest tree seed to facilitate sustainable support to forestry and commercial tree farming development. It will also ensure a fair playfield and conducive environment for the operations of all forest sector stakeholders.

The proposed Regulations will act as regulatory tools for the realization of the above benefits in the interest of the national common good.

7.0 Recommendations

The RIA thus recommends the passing and operationalization of the proposed regulations.