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STATE DEPARTMENT FOR CROP DEVELOPMENT AND AGRICULTURAL
RESEARCH

NATIONAL AVOCADO PROMOTION STRATEGY
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It is from the very vibrant and selfless engagements of various stakeholders throughout the process that we have put forth a vision for avocado industry, setting us on a trajectory that will ensure achievement of both our national and county commitments towards a vibrant, competitive and sustainable Avocado industry. We are grateful to all who contributed in one way or another in the development of this strategy document, who may not have been mentioned here. Kindly take this acknowledgement as an expression of sincere gratitude.

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Foreword

Agricultural growth and development are crucial for Kenya's overall economic and social development. Agriculture directly contributes about 33% of total Gross Domestic Product (GDP), about 27% to GDP through linkages with manufacturing and service-related sectors, employs more than 40% of the total population and about 70% of the rural population and accounts for 65 per cent of the country's export earnings.

The Government has outlined in Kenya Vision 2030, the key role agriculture sector will play under the economic pillar. The Agricultural Sector Transformation and Growth Strategy has nine flagship pillars aimed at ensuring that the aspirations of Vision 2030 are realized.

The strategies in these two documents aim at accelerating the growth of agriculture sector in order to improve the standard of living of Kenyans by substantially reducing the number of people affected by hunger, famine and starvation. A thriving agriculture sector will lead to increased production, incomes and employment opportunities.

In Kenya, the avocado fruit has gained increased importance due to its nutritive value and role in food security, availability as well as its processing potential. Currently, the country produces 318,087 tons of avocado. This is far below the country's potential. For instance, the average yield for avocado per tree is 480 fruits per year compared to the potential of 1000 fruits that can be achieved under optimal conditions and good husbandry practices. Some of the key challenges facing the subsector include weak and dysfunctional institutions across the value chain, inadequate quality planting material, underdeveloped local and international markets, inadequate information flow, low processing levels, low access to financial services, insufficient applied research and technology adaption.

This strategy therefore, has been developed to provide a clear roadmap for sustainable growth and development of the avocado industry in our country. Once implemented, the country shall have a well-streamlined sustainable and commercially viable enterprises producing required economic volumes and right qualities to be marketed both locally and internationally. It will also create both direct and indirect employment opportunities and increase desired incomes. Implementation of this strategy will take an integrated approach where all stakeholders and actors including public and private will be engaged in a coordinated manner to achieve the desired results.

Peter Gatirau Munya
Cabinet Secretary,
Ministry of Agriculture, Livestock, Fisheries and Cooperative

Acronyms and Abbreviations

AFA	Agricultural and Food Authority
ASOK	Avocado Society of Kenya
CA	Conservation Agriculture
CAADP	Comprehensive African Agricultural Development Programme
CAGR	Compound Annual Growth Rate
COMESA	Common Market for Eastern and Southern Africa
DRC	Democratic Republic of Congo
EPC	Export Promotion Council
EU	European Union
FAO	Food and Agriculture Organization
FAOSTAT	Food Agricultural Organization Statistical Database
FPC	Fresh Produce Consortium of Kenya
FPEAK	Fresh Produce Exporters Association of Kenya
GAP	Good Agricultural Practices
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
HCD	Horticultural Crops Directorate
ITC	International Trade Centre
JKIA	Jomo Kenya International Airport
KAEA	Kenya Avocado Exporters Association
KALRO	Kenya Agricultural and Livestock Research Organization
KEPHIS	Plant Health Inspectorate Service
KES	Kenya Shillings
MIS	Management Information System
NAPSP	National Avocado Promotion Strategy Plan
PCP	Pest Control Products
PFA	Pest Free Area
PPP	Public Private Partnership

SDGs	Sustainable Development Goals
SGR	Standard Gauge Railway
SWOT	Strengths, Weakness, Opportunities and Threats
TA	Technical Advisor
TAHA	Tanzania Horticulture Association
TMR	Transparency Market Research
TVET	Technical and Vocational Education and Training
UAE	United Arab Emirates
UK	United Kingdom
USAID	United States Assistance in Development
USD	United States Dollars

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Executive Summary

Avocado is one of the major tropical fruits amongst pineapple, banana, mango and papaya. It grows well in the sub-tropical climates of the world including Africa. Globally, it has emerged as a major contributor to worldwide economies and household incomes, thus impacting its rapid growth and global demand. World imports of avocados in 2018, stood at 2.5 million tons valued at US\$ 6.1 billion and is projected to grow at a rate of 5.7% by 2027.

In Kenya, production has continued to grow for example in 2016, production stood at 246,000 tons, 2017 production was at 297,000 tons while 2018, the production was 318,000 tons of avocado fruits valued at KES 4.6 billion, 5.6 billion and 6 billion respectively. The fruit is commercially grown in seven different regions of Central (54.4%), Eastern (9%), Western (3.3%), Rift valley (7.4%), Nyanza (21%), Coast (2.9%) and Nairobi (2%).

The National Avocado Promotion Strategy (NAPS) is therefore, in tandem with the implementation and orientation of Kenya Vision 2030, National Food Safety Policy 2013, Sustainable Development Goals 2030, the Horticulture Policy, Integrated National Export Promotion Strategy, Comprehensive African Agricultural Development Programme and the Agricultural Sector Transformation and Growth Strategy 2019.

The strategic issues identified include; low productivity, marketing inefficiencies, High Post-harvest losses, low product range and low quality of fruits. Other issues are inadequate accessibility to quality agribusiness support services, finance, quality inputs skills, knowledge and technologies.

This strategic plan is driven by five complementary strategic interventions or pillars. Each of the strategic pillar generates a set of activities that will enable the national and county governments and private sector players to implement this strategy in a progressive and coordinated manner and mobilize resources. The five strategic pillars are; Improved marketing, Increased production, Improved quality, Increased processing and Increased profitability.

This strategy therefore, outlines activities that will address identified challenges facing each pillar or industry by; capacity building of farmers, nursery and mother block operators; promote increased and quality production; establish a robust logistic and market infrastructure; promote domestic consumption and value addition technologies in the counties; establish an avocado pricing model and implement insurance business models for avocado value chain actors.

This strategy will therefore, provide a trigger for national, county governments and private sector investment and will deliver the following outputs; accurate baseline data; coordination mechanisms; appropriate infrastructure for handling of avocado; improved skills and knowledge and enabling environment for increased private sector investment.

1.0 CHAPTER ONE

1.1 Agriculture and the Kenyan Economy

According to Kenya's development blueprint *Vision 2030*, agriculture is identified as a key component in the economic pillar and it is envisioned to contribute 10% towards national economic growth. The Big 4 Transformative Agenda gave agriculture the mandate to ensure achievement of 100% food and nutrition security within 2018-2022 period. The sector contributes directly about 33% of total Gross Domestic Product (GDP) and 27% indirectly through linkages with manufacturing and service-related sectors. The sector employs more than 40% of the total population and about 70% of the rural population (ASTGS 2018). Further, Agricultural sector accounts for 65 per cent of the country's export earnings.

1.2 The Horticulture subsector

The horticulture sub-sector has 168 crops out of 207 (81%) of all the crops grown in Kenya. The crops are further divided into Vegetables (41), Fruits (23), Nuts (2), Medicinal and Aromatic Plants (MAPS 28), Flowers (73) and potato (Irish). These crops are suitable for diverse production systems starting from kitchen farming on rooftops, verandahs of houses to intensive irrigated farming systems.

In 2019, horticulture contributed 26% of the agricultural GDP and continues to register an annual growth rate of approximately 15%¹. The 26% translated to Ksh 142.7 billion generated from exports of flowers, vegetables and fruits accounting for 70%, 23% and 7% respectively². In the same year, the value of fruits export earnings increased to Kshs 13.2 billion which was an increase of 3% from 2018. The major fruit export that contributed included avocado, mango and passion among others.

The domestic value of horticulture production in 2018 amounted to Kshs. 248.47 Billion compared to Kshs. 207.52 Billion in 2017 equivalent to an increase of 19.7 per cent. Over the same period as seen in table 1, cultivated area increased by 3.6 per cent from 402,796 ha to 417,367 ha while total production increased by 7.7 per cent from 6.217 million tons to 6.696 million tons in 2018 compared to 5.88 million tons in 2017

¹ FAO Report 2018

² HCD report 2019

Table 1: Horticulture performance 2016-2018

Crops	2016			2017			2018			% Of Total
	Area (Ha)	Volume (MT)	Value (KES)	Area (Ha)	Volume (MT)	Value (KES)	Area (Ha)	Volume (MT)	Value (KES)	
Cut Flowers	13,265	133,658	70,829,466,905	13,280	159,961	82,248,862,888	13,310	161,227	113,165,186,323	45.54
Fruits	170,607	3,189,178	55,687,269,286	186,928	3,226,453	59,307,484,311	185,499	3,371,498	63,807,429,866	25.68
Exotic Veg	117,541	1,887,880	37,908,435,144	134,466	2,250,298	47,071,728,378	141,427	2,412,682	52,220,367,147	21.02
Indigenous Veg	63,287	229,491	6,842,976,893	45,508	219,458	7,320,796,948	54,740	292,096	8,151,716,317	3.28
Aromatic	12,383	124,642	5,791,117,070	12,942	160,448	7,395,277,047	14,734	180,841	7,163,976,384	2.88
Summer flowers	8,257	194,284	3,453,496,751	7,260	184,250	3,473,496,000	5,185	260,517	3,237,546,671	1.30
Asian Veg	1,510	16,311	738,234,406	1,673	12,853	629,643,613	1,745	14,040	650,301,293	0.26
Medicinal	460	3,492	128,330,500	739	3,563	81,782,241	727	3,483	81,795,991	0.03
Total	387,310	5,778,936	181,379,326,955	402,796	6,217,285	207,529,071,425	417,367	6,696,384	248,478,319,992	100.00

Source: AFA-HCD

Key challenges facing the horticulture subsector include: underfunded and uncoordinated stakeholder institutions, underdeveloped markets, inadequate quality planting materials, low processing levels, low access to financial services, insufficient applied research and technology development.

1.3 Contribution of Avocado Industry to the Kenyan Economy

1.3.1 Gross Domestic Product

Avocado contributes 7% to the Gross Domestic Product (GDP) of total fruit export. Ordinarily, Kenya is known to support its budget through agriculture from exports of tea, coffee and flowers. However, statistics started changing from 2018, when avocado exports got more attention. The Economic Survey of Kenya 2019 indicated that the value of horticulture exports increased by 33.3 percent which translated to 153.7 billion on account of improved production and improved international prices. According to HCD, avocado contributed 7% of the 33.3% towards horticulture's foreign exchange earnings³ and 84% of the total value of fruits exported during that year. This value increased from KES 5.64 Billion in 2017 to KES 5.97 Billion in 2018 which was a 5.9 percent increase from 2017. Cumulatively, in 2016 to 2018, avocado fruit contributed KES 10.839 billion.

1.3.2 Employment Creation

Avocado farming creates employment opportunities to producers, marketers, processors, and input suppliers along the value chain. Jobs are created at the production stage through mulching, harvesting, packhouse operations, transportation, and marketing. According to a USAID report on the impacts of tree fruit value chain in Kenya⁴, tree fruit sales were the primary source of household income of the 53 percent of all the sampled 790 avocado-farming households at the baseline and 60 percent at the end line. The study further found out that participating in export markets raises smallholder farmers' incomes by nearly 39% due to international markets demand for high quality avocados that require additional labour. The hired labour costs increase by about KES 1,300 (US\$13) and smallholder farmers' family labour inputs increase by about 15 days, if they participate in export markets.

Smallholder farmers account for over 70 percent of all farming activities including avocado⁵. Most of them own less than 2 acres of land. The avocado smallholder on average has 10-20 trees per homestead and constitute a greater percentage of the estimated 136,623 known avocado farmers. Of these 130,424 are smallholders, 6114 are medium holders and 85 are large scale. In 2018 Kenya produced approximately 318,087,000 kgs of avocado fruits valued at Kes 10.839 billion from a total of 40,757 acres. This production area is proportionately distributed as follows: 32,606 smallholders each planting on average 0.3 of an acre avocado trees, 6,114 medium scale who plant 1 to 24 acres of avocado, and 2,038 large scale planting 24 and above acres of avocado. There is also a total of 997 acres with non-bearing tree, which are immature.

1.4 Factors Stimulating Avocado Farming in Kenya

1.4.1 Availability of suitable land

³ Horticultural Crops Directorate (HCD)

⁴ USAID Report on Impacts of KBDS and KHDP 2008

⁵ Study of the mapping of distributors of fruits and vegetables in Kenya

Suitable land for avocado growing is estimated at 4,940,000 acres. The trees under production are estimated to be 1,988,064. Off of these, 1,630,299 trees are grown by smallholder farmers, 305,681 by medium and 101,894 by large scale⁶. It is also estimated that there are 264 registered and certified avocado nurseries, holding an output of 5,272,840 seedlings, with an average of 19,973 seedlings per nursery. Cumulatively there are approximately 9,655,577 seedlings in the country- some of which are not raised in registered and certified nurseries. Currently there are 33 registered mother blocks from where planting material (scions and rootstock) is sourced. However, there is no data available on avocado breeding schemes in the country⁷.

In terms of enhancing production, pruning of avocado trees is largely done manually and skills vary from farm to farm. Currently there is only one mechanized harvesting machine in the country and no data available for the number of harvesting machines with poles. There is an established agro-dealer system in the country that can be sensitized on specific package for fruit trees. Currently, there are a total of 689 public and private Technical Advisors (TAs) who are in public and private institutions.

1.4.2 Growing demand and opportunity window for avocado internationally

There is an ever-increasing demand from existing and new emerging markets such as European Union, Middle East, Russia and China. For instance, China has reduced the levy on Kenyan avocados from 30% to 7% to help Kenyans export without strain. This particular agreement with China has sparked interest in avocado farming from various counties – including non-traditional counties like Uasin Gishu who have plans to establish at least 1000 acres of avocado orchards annually; availability of local market and prioritization of avocado growing within the country

1.4.3 Growing national and county government support

Most counties have chosen avocado as one of the enterprises to support and have included it in their County Integrated Development Plans. They include; Baringo, Kiambu, Meru, Embu, Nyeri, and Murang'a. These counties have provided farmers with grafted seedlings, offered them technical support and helped them to acquire subsidized agro chemicals. Avocado now considered the “green gold” is turning around the economies of many smallholder farmers who produce approximately 115,000 metric tons of avocados annually.

The National government support includes sourcing and negotiating for new markets, creating publicity and other incentives. This has encouraged farmers to grow more avocados due to availability of export markets and exploit Kenya's competitive advantage of extended season over other exporting countries. In some recent cases, farmers have switched from coffee and tea for avocados in an effort to increase crop diversification.

⁶ Avocado strategy – Vision Data 2020

⁷ Avocado strategy – Vision Data 2019

The preferred variety is Hass whose harvesting season extends later into the year granting Kenya a window of opportunity in the export market and extracts more oil per fresh weight than South Africa's. According to HCD, avocado is the leading export fruit crop making Kenya a major player in the international market and ranks third globally.

1.4.4 Growing per-capita Consumption

Kenya has a good per-capita consumption of approximately 4.5kg as per the calculation from Avocado Vision Data 2019, in Annex II, compared to US of 5.0 kgs. Kenya too has a large population of over 47 million people as per the 2019 National Census, with 11.7 million households who offer a good local market. According to HCD data of 2019, out of the total avocado produced in Kenya, 80% is consumed in the domestic market while 20% is exported. Local consumption is predicted to grow by 5%⁸ per annum due to increased awareness of health benefits, growing population and improved purchasing power. Avocado pulp in Kenya like elsewhere in the world is used as a raw material in pharmaceutical, cosmetics and cuisines industry, producing products like guacamole, refined oils and skin-care products for both local and international markets.

1.4.5 Nutritional benefits

Globally avocado has experienced a fast-increasing demand due in part to the international popularity and its global recognition as a "super food" based on multiple health benefits. Various sources confirm the value of avocado as being rich in healthy mono and poly unsaturated fats, protein and an array of vitamins including Vitamin A, B1, B2, B6, B12, C, D, E, and K. The fruit also contains dietary fibers, minerals that are essential for healthy human growth which include calcium, potassium, phosphorus, sodium and magnesium which are needed for a healthy diet. It's also documented that steady intake of avocado fights inflammation and may contain anticancer properties.

Eating avocado equally helps better absorption of other fat-soluble nutrients and lowers glycemic index. Regular consumption of avocado is similarly associated with reduced prevalence of diabetes, stroke and pressure. Because of these nutritional values, avocado has recently developed a large market as a fresh fruit, salads, and value-added products such as yourghut, smoothies, guacamole and frozen products and pastes. It's also processed and used in pharmaceutical and cosmetic industry as well as in crude and refined oils (Téliz, 2000).

2.0 CHAPTER TWO

2.1 Situational Analysis

2.2 Global Avocado Production

On the backdrop of a rapidly growing global demand, world avocado production has continued to grow in the last decade. According to FAO and the International Trade Centre (ITC), global production of avocado has steadily increased over the years and rose from 5.62 million tons in 2016 to 6.3 million in 2018, representing 12 percent increase⁹. According to the Transparency Market Research report of 2020, 80% of the world's

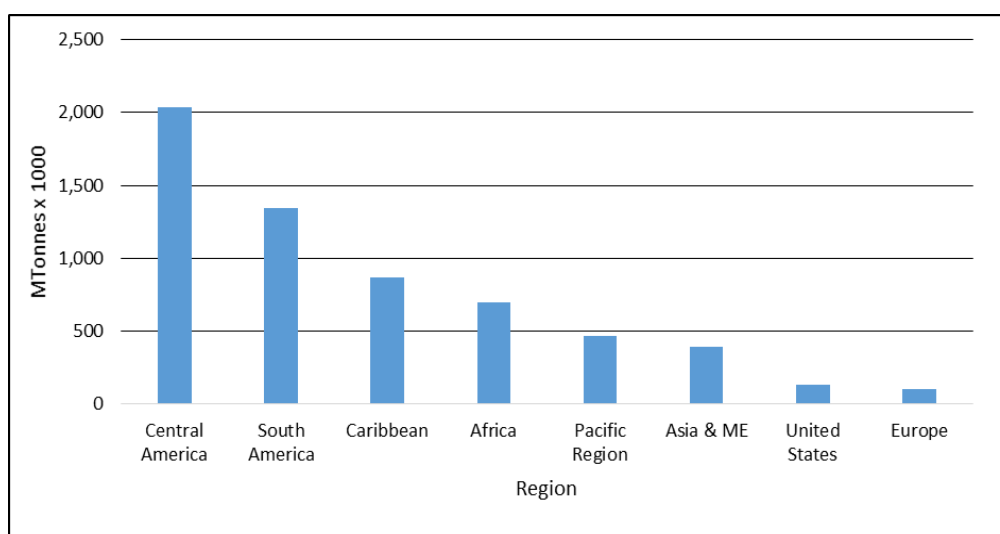
⁸ Avocado Strategy Development Workshop 2020

⁹ FAO-Major Tropical Fruits Market Review 2018

avocado is produced by 11 countries. Mexico leads this list with 33.9% share. Table 2 shows top 10 world avocado producing countries and Figure 1 shows avocado production per continent in 2017.

Table 2: Top 10 World Avocado Producing Countries

SN	Country	2018	2017	2016
1	Mexico	2,184,663	2,029,886	1,889,354
2	Dominican Republic	644,306	637,688	601,349
3	Peru	504,517	466,758	455,394
4	Indonesia	410,094	363,157	304,938
5	Colombia	326,606	314,275	294,389
6	Kenya	318,087	287,268	246,057
7	Brazil	235,788	213,041	196,422
8	US	168,528	132,730	124. 860
9	Venezuela	139,685	133,922	130,290
10	Israel	131,720	110,000	101,500



Source: FAOSTAT 2017

Figure 1: Avocado production by continents 2017

Globally, there are many varieties although two types of the cultivars stand out. Type “A” cultivars consists of Hass – the most popular variety traded internationally followed by green-skinned varieties such as Choquette, Lula, Reed, Pinkerton, Gwen, Maluma, while Type “B” cultivars include, Ettinger, Sharwil, Zutano, Brogden, Fuerte, Cleopatra, Bacon, and Monroe among others.

2.3 Avocado Production in Africa

Avocado production in Africa has increasingly grown over the past years from 2005 to 2018, though unevenly from 297,339 Mt in 2005, 751,881 MT in 2012 and 1,189,942 MT in 2018. Africa’s annual production growth has been closer to the global rate that between 2005 and 2012 averaged at 6.4%. Some of the major producing countries included Kenya, South Africa, Morocco and Tanzania which currently accounts for 41%, 35%, 13% and 7% respectively¹⁰. Other upcoming countries are Rwanda, DRC, Mozambique, Madagascar and Zimbabwe among others. Off the 132 countries that produce avocado globally, 27 countries are in Africa. Year-on-year growths have been the highest in Morocco (23%), Tanzania (20%), Rwanda (18%) and Kenya (10%).

The almost all-year round production period in Africa ranging from February to November and being home to some of the finest varieties gives it a competitive edge globally to fall back to when other big suppliers like Mexico, Peru and Chile are off season. Table 3 shows the top 10 African countries that grow avocado, their global ranking, production volumes and global market share as of 2018¹¹.

Table 3: Top 10 African Countries Producing Avocado (tons)

S. No	Rank globally	Country	Production volumes mts	Country % of Global Production
1.	7	Kenya	318,087	3.3
2.	15	Malawi	92,239	1.6
3.	17	Cameroon	75,221	0.2
4.	18	DRC	65,773	0.1
5.	19	South Africa	170,000	1.1
6.	20	Ethiopia	52,389	1.0
7.	22	Morocco	51,170	0.1
8.	23	Ivory Coast	37,983	0.0
9.	25	Madagascar	26,777	0.0
10.	33	Republic of the Congo	65,558	0.2

2.4 Avocado Production in Kenya

Avocado production in Kenya has grown from about 110,000 Mt in 2010 to 381,087 MT 2018, valued at KES 6 Billion. Its currently produced under an area of 16,500 ha in seven different regions namely Central (54.4%), Eastern (9%), Western (3.3%), Rift valley (7.4%), Nyanza (21%), Coast (2.9%) and Nairobi (2%). The leading avocado producing county is Murang’a as shown in the figure 2.

¹⁰ Africa Avocado Exports 2017

¹¹ Tridge report 2018

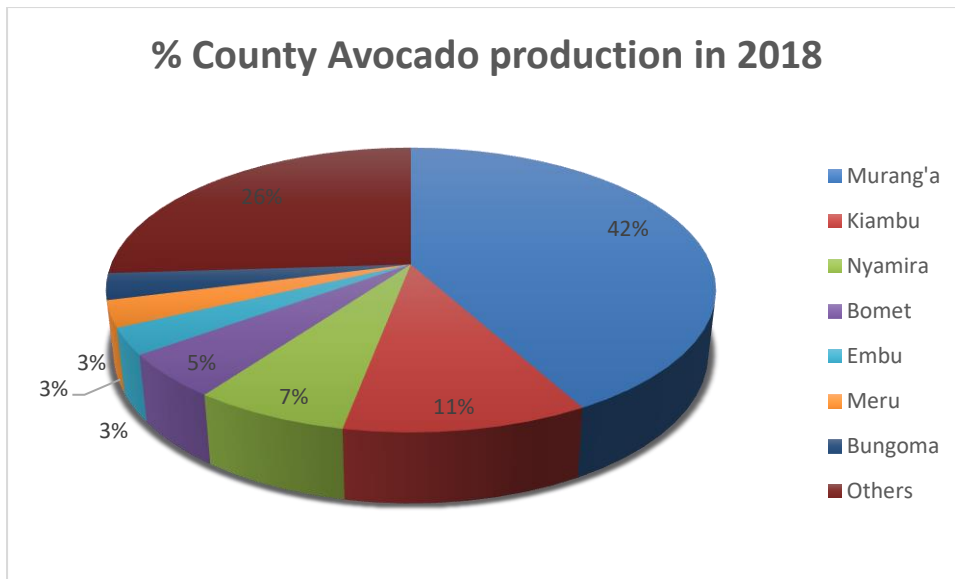


Figure 2: Top Avocado producing counties by %share

Annex IV shows Kenya's major avocado growing counties alongside area planted, volumes and values accrued in 2017 to 2018. In total, there are about 30 counties suitable for avocado growing and most of them have prioritized investment in avocado value chain in their County Integrated Development Plans 2018-2022.

In the years preceding 2005, the most preferred varieties for export was fuerte at 20%, followed by Hass at 10%. However, in a decade or so, changes have occurred and Hass is the current sought after variety for export. Farmers in Murang'a have top worked fuerte trees with Hass and most new orchards in Nakuru and other non-traditional areas such as North Rift are planting Hass. Other commercial varieties include Keitt, Reed, Booth 8, Simmonds, Pinkerton, Nabal, Puebla, Tonnage, Ettinger, Hayes, G6 and G7. Varieties currently used as rootstocks include Puebla, Fuerte, Duke, G6, and G7.

However, Kenya has not achieved its optimal production in avocado due to the following issues – which this strategy prioritizes to address in order to achieve the desired volumes and value by 2027.

2.5 Issues affecting Production of Avocado

Uneconomical land sizes: Majority of the avocado production in Kenya is through smallholder farmers. These farmers own less than 2 acres of land and plant 10-20 avocado trees on 0.3 of an acre, which is uneconomical. For farmers to operate sustainably and commercially viable, they need a minimum of 81 avocado trees planted on one-acre and each tree producing at least 1000 fruits per year per season at year 6. Going with the current smallholder acreage, Kenya therefore, needs a total of 62,725 acres of .25 each planted with good variety avocado to participate in sustainable and profitable businesses.

Inadequate access to quality input and services: Farmers source for inputs individually from different retail outlets and sometimes have to travel long distances. Secondly, there are a few service providers employed by the government to support

farmers on a number of areas, such as how to plant a healthy orchard, do pest and disease control measures, advise on harvesting, sorting, and transportation among others. Due to this shortage, farmers are forced to undertake these services on their own or rely on poorly equipped and farm-trained workers. This contributes to increased cost of production per unit area to individual farmers and increases post-harvest losses, hence reduced profitability.

Sale of seedlings that are not true to type: Farmers have inadequate ability to identify varieties at seedling level which is attributed to nursery operators using scions from unknown sources and therefore selling seedlings that are not true to type.

Lack of Breeding Programmes: There exists limitations of known avocado breeding programs in Kenya, and the little researches done - there are gaps in dissemination of that knowledge to benefit the farmers.

Few Quality Mother Blocks: In Kenya, most nursery operators source propagation materials from uncertified mother blocks, and only a small proportion get materials from credible institutions such as Kenya Prisons, private nurseries, KALRO, and universities.

Low number of registered Nurseries and Certified Seedlings: Although there are 264 registered nurseries, over 80% of avocado farmers source seedling requirements from unregistered nursery operators. The spread of these nurseries is obscure as some regions like Western and Rift Valley largely depend on supply from Central and Eastern Kenya nurseries. The capacities of some nurseries to provide quality seedling is low compared to the demand to supply quality planting materials.

Unplanned Seedling Establishment: Currently there is inadequate data to validate quantities of planted seedlings. This has facilitated local varieties to dominate thus affecting overall production. Presently, improved varieties suitable for export comprise approximately 20% of the total production¹².

Difficulty in acquiring true-to-type tree seedlings: At present farmers are experiencing challenges of not always able to procure “true-to-type” cultivars, contributing to the proliferation of so-called local varieties. Most farmers have low capacity to identify and differentiate the best variety for their climatic conditions, while responding to government call and desire to make profits. Currently the most preferred varieties for export are Hass and Fuerte. Right now, there is proliferation of many uncertified nurseries selling uncertified seedlings in many parts of the country.

Lack of Accurate Avocado Data: there is limited validated holistic avocado data, and the available information is mainly from secondary sources and based on estimates.

Low number of harvested fruits per mature tree: Presently, a tree of 3-5-year-old yields an average of 300-400 kgs per year, while a tree older than five years yields 800-1000 kgs fruits per year ¹³.

¹² HCD 2015 report

¹³ KALRO 2018 report

Weak Farm Linkages: There exists weak farm linkages between actors (smallholders and exporters) resulting in loss of market share.

Technical Advisors have limited skills: Avocado growing requires specialized extension approach due to its unique needs, but the current graduates have more theoretical knowledge with minimal exposure to practical skills and hence unable to adequately support the farmers. As a result of inadequate extension service skills, avocado farmers lack the requisite knowledge and skills on production, harvesting, and post-harvest techniques.

The few extension providers also lack harmonized operational programmes leading to poor service delivery and non-standardization of extension messages thus affecting productivity, processing and marketing of avocado and its products. However, some agencies such as Horticultural Crop Directorate and others offers limited specialized advisory services for domestic and export crops but only in specific high concentration areas.

Inadequate access to practical learning sites: There is inadequate practical learning sites where avocado farmers can complement theory lessons they learn in seminars and workshops.

Inadequate skills of Agro-dealer attendants: Kenya has presently a good network of agro-dealers in the entire country. However, the shop attendants have inadequate tailor-made technical knowledge to provide quality support services to avocado farmers.

Presence of pests and diseases: There exists known pests and diseases that lower the quality of avocado fruit, and if uncontrolled, render the fruits totally unmarketable. These include, phytophthora, anthracnose, and fruit fly. Additionally, there is inadequate knowledge on responsible use of pesticides leading to market produce with high residues, developing resistance by pathogens and environmental contamination. Further, there is inadequate surveillance and monitoring systems in avocado orchards.

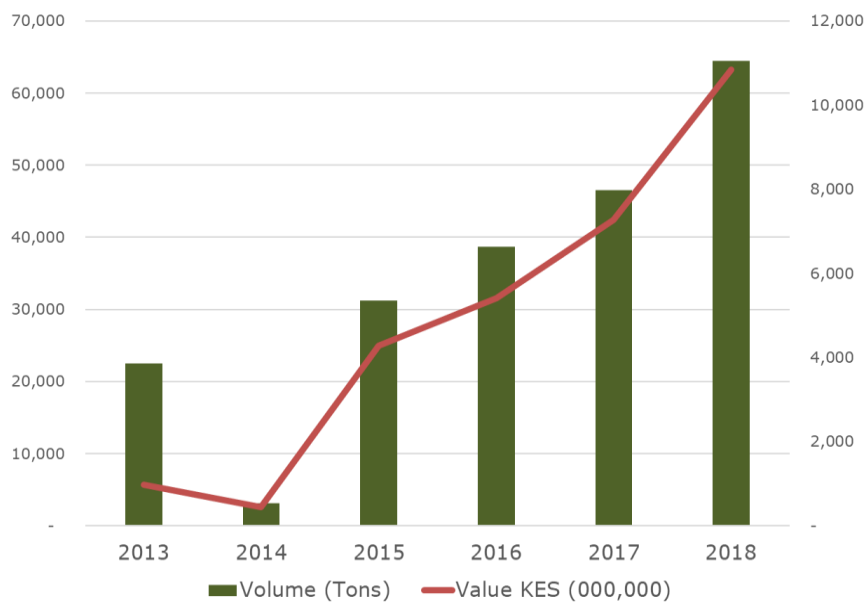
2.6 Opportunities within Production

- Conducive government policy, strong donor support and private-sector leadership has spiked the growth of this industry.
- The government has also identified avocado as one of the key enterprises that can drive growth in the economy. Towards this, the government has provided a total of 1,468,442 assorted subsidized fruit trees seedlings to smallholder farmers in the last two years. Because of this provision there has been a sharp increase in the area under avocado production
- There is also expansion of avocado production to non-traditional growing regions such as the larger Rift Valley and Western

2.6 Marketing

2.6.1 Kenyan Exports of Avocado

The Kenyan avocado industry is export-orientated and among the fastest-growing export with 221.1% growth behind Colombia and Morocco in the world. In 2018, total fresh and frozen avocado export was valued at \$ 119 million with untapped potential of about \$ 113 million¹⁴. Between 2017 and 2018, Kenya’s exports increased by 30%¹⁵ with an average growth pegged at 29% per year between 2014 and 2018. Again, in that year, the exports of fresh and frozen avocados were absorbed substantially by 3 countries namely, Netherlands (37.2%), France (20.7%), and Russia (10.9%). In that same year, Kenya’s exports to the African region was estimated at \$ 0.3 million and accounted for 15% of the region’s imports. As per the Vision Data, of 2018, the actual marketed avocado fruits in Kenya was 287, 868,735 kgs. Out of this, 64,477,082kgs was exported to international markets, 15,904350kgs was consumed on-farm while 223,391,653kgs was sold through informal traders. In the same period, there were 156 registered exporters although only 94 were active. This progressive improvement in avocado export and trade between 2013 to 2018 is shown in Figure 3.



Source: HCD

Figure 3: Avocado exports from Kenya 2013-2018 Volume (MT) and Value (KES)

In addition, Kenya’s growth in export value, market share and estimated untapped potential is shown in annex IV, and Figure 4 shows avocado export destinations and value contribution in 2018.

¹⁴ Kenya Export Council 2019

¹⁵ Kenya Export Council 2019

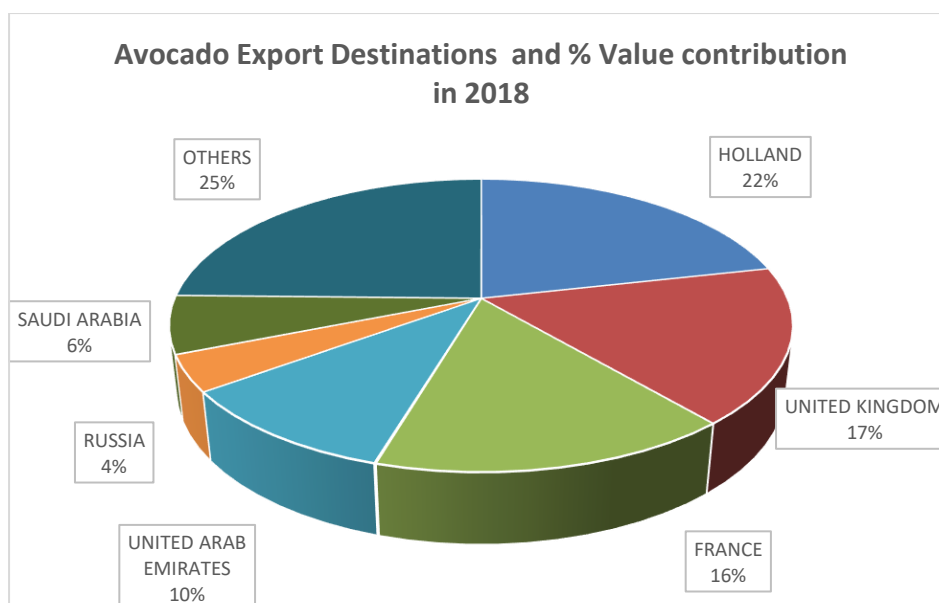


Figure 4: Avocado Export Destinations and Value Contribution in 2018

2.6.2 Import in Kenya

Kenya is not a major avocado import destination. In 2018, the country imported 96.6% and 3.4% of her national avocado deficient from Tanzania and Egypt respectively either as fresh or frozen, as explained in table 4. Other imports were from Uganda.

Table 4: Kenya's top import trade partners in tons

Exporters	2014	2015	2016	2017	2018	% share of World's in 2018
Tanzania	10	5	24	600	57	96.6
Egypt	0	4	5	0	2	3.4
UAE	0	0	1	0	0	0
Total	10	9	30	600	59	100

Source: International Trade Centre Database 2019, Compiled by EPC

Out of the total world imports in 2018 valued at \$ 6.13 billion, Kenya only managed to satisfy 1.9% of world demand.

For Kenya to support her aspirations of the fasted-growing exporter and marketer both locally and internationally, the following issues concerning marketing needs to be addressed and mitigated to facilitate access to emerging markets.

2.7 Issues affecting Marketing of Avocados

Poor distribution of avocado fruits in the domestic market: There are four distinct marketing channels for avocado namely: Exporting directly to an importer or with the assistance of an agent, a hybrid of direct or indirect exports, through

membership to a private or cooperative export organization and selling at the farmgate. However, there still exists a huge inconsistency in terms of avocado distribution due to poor infrastructures and handling logistics, inadequate flow of market information and low supply of avocados in most parts of Kenya.

Small number of formal markets: Currently there exists inadequate marketing hubs - which can serve as centralized one-stop for access to sales and services that farmers may require. Available data shows there are only four marketing hubs in the country against 47 countries which offer good domestic market.

Low per capita consumption: With the current population of over 47 million people, the approximate of 4.5kgs per capita consumption per person per year is low, given that 80% of the Kenyan production is consumed locally. Kenya should ordinarily experience a higher local demand for avocado.

Low volume of avocado fruit exported: In 2018 Kenya export of 64,477 tons against world import of 5.9 billion tons, with 3.3% share of the global market share due to some of these marketing issues.

Poor presentation and packaging of avocado fruits: Proper presentation and packaging improve the attractiveness of the produce and enhance branding. Grading and fruit storage facilities are lacking in most production areas, with only a small percentage of farmers able to access a grading and /or pack house facility. Kenya loses a lot of revenue due to poor packaging and inappropriate transportation that leads to loss of fruit quality and brand. Minimal branding of Kenyan avocado in the international market – gives room for importers to re-brand Kenyan produce and sale – denying Kenya the much-needed foreign revenue.

Low number of exporters: Currently only 94 out of 156 registered exporters are active which, impacts negatively and reduces Kenya's competitiveness in the international market

High cost of freight: Kenya has the advantage of both ocean and air transport, but there still exists a high cost of these services beside charges for cold storage and inspections.

Limited market information: Presently there exists a number of challenges in accessing real time market information partly due to over reliance on external market outlets mainly EU. This makes Kenyan export very vulnerable to changes in the demand for avocado products and unexpected non-trade barriers by foreign markets. In addition, over-dependence on traditional markets (EU) is due to limited investment for market research and development in information management systems Also, there is low promotional campaigns both locally and internationally including setting up marketing agents in the international markets

Low adherence to quality standards and food safety: The avocado industry in Kenya largely faces two most critical challenges of how to ensure quality and traceability. There is need for growers and exporters to ensure that avocado production methods meet

the required standards of the marketing industry (from farm to fork). The quality requirements include maturity, absence of disease damage and residues below permitted levels. The rejection of fruits due to lack of conformity to prescribed quality standards is more pronounced in the European market than in the Middle East. More often, exporters, middlemen and farmers flout adherence to market standards affecting competitiveness and reputation of the Kenyan Avocado in the international market.

Business plans: Currently many avocado growers operate in un-entrepreneurial ways and lack business plans which would prove their financial needs and expected income. This also leads to weak contract between smallholder farmers and exporters – which at times exploits the farmer.

Seasonality and Price Fluctuation: The Kenya avocado seasonality impacts on supply and demand with the market. The fuerte variety matures in February and the Hass variety matures in mid-March, and the harvesting season runs upto October. However, during the off-season the marketers export Jumbo variety, which is available throughout the year. The deficit of Fuerte and Hass varieties is supplemented with imports from neighboring countries such as Tanzania and Rwanda. This seasonality further pushes farmers and exporters to harvest premature fruits which negatively impact on quality and reputation of Kenyan avocado in the international market. These Fluctuations in supply and demand affects both domestic and international market prices.

2.7.1 Opportunities within Marketing Pillar

- In 2019, the country ventured into new market outlets to broaden its exported avocado products such as frozen avocados which are exported to China. China is the 9th largest importer absorbing avocados worth US\$ 133 million, which is US\$ 14.3 million more than Kenya's avocado exports in 2018.
- The Kenyan population of over 47 million presents a huge domestic market for fresh and processed avocado products.
- The presence of improved infrastructure such as the rural road network, Standard Gauge Railway, Mombasa port and Jomo Kenyatta International Airport (JKIA) gives Kenya an advantage as a marketing point.
- Promote Kenyan avocado to other African countries, which import from outside the continent. For instance, Morocco imports from the Netherlands, France and Peru; South Africa imports from Spain and Israel; Egypt imports from Lebanon, Netherlands, USA and Thailand and Nigeria also imports from the Netherlands
- Target Common Market for Eastern and Southern Africa (COMESA) which made up of 20 countries with a combined population of 470 million people. Kenya has an opportunity to export avocado products that qualify under the COMESA Rules of Origin on preferential tariff basis

- Exploit all countries that Kenya has concluded bilateral trade agreements with, (numbering over 30 countries) excluding those that fall under the above multilateral trade arrangements
- Enhance activities in Kenyan Foreign missions with physical presence to grow export trade.

2.8 Produce Quality

With avocado emerging as one of the non-traditional exportable horticultural crops in the recent past, there is increased sharp focus to comply with necessary food safety requirements and guidelines that are either public or private. This calls for adherence to comprehensive practices along the value chain to ensure quality of the produce. The current poor practices often result with loss of quality and ultimately leads to low uncompetitive prices – both locally and internationally. Below are some of the critical quality issues which needs to be addressed to improve Kenyan produce.

2.9 Issues affecting Quality of Avocado fruit

- **Poor post-harvest handling:** Poor post-harvest handling leads to external and internal damage to the fruit resulting in loss of aesthetic and nutritional value. Loss of quality starts from poor harvesting methods which lead to bruises on the fruits and contamination with soil. Majority of avocado transporters use open pick up and trucks thus exposing the fruits to weather elements such as wind, sun, rain and pollution from car fumes and smoke.
- **Harvesting of immature fruits:** Fruits picked too early or too late are more susceptible to physiological disorders and have shorter shelf-life. Immature fruits do not ripen, prompting international buyers to lower confidence with Kenyan produce resulting in low competitiveness. The regulators and county governments have inadequate maturity testing kits to monitor and advice on maturity status of the fruits.
- **Poor crop husbandry:** Avocado trees are perennial and require nutritional supplementation, soil and water analysis, and regular pruning. Scarcity of farm-yard manure and fertilizers, high cost of soil and water analysis, and tallness of the trees limit production per tree.
- **Inadequate capacities:** Avocado farmers across the board experience capacity limitations along the value chain, which ultimately contribute to quality of the produce. Some of these include compliances along the value chain, enforcement of standards, and traceability.
- **Inadequate cold chain infrastructure:** Reduction of field heat is critical to good storage and shelf life of avocado fruits. However, precooling of the fruits before transportation is not practiced, and minimal sorting and/or grading is done at the farm level. There are approximately 47 bulk coolers and 257 farm coolers whose capacity is inadequate for current production levels.

- **Few Harvesting Poles:** The avocado growers require harvesting poles to minimize damage while harvesting fruits. The number of the available poles has been difficult to establish.

2.9.2 Existing opportunities within the Quality

- To sensitize the MSME sector to fabricate harvesting poles which can be distributed through the agro-input shops and aggregation centers
- Promote investment on quality infrastructure including cool chain and cold storage facilities.
- Sensitization to growers and marketing agents on the need to practices sound harvesting techniques, undertake sorting, grading and packaging coupled with appropriate transportation

2.10 Processing

Prior to 2004-2005, most avocado produced in Kenya was sold through local markets primarily by wholesalers and retail fresh fruit sales for domestic consumption. Since then, three medium scale avocado oil industries, and four cottage industries are now operational and provide a growing demand for the Grade 2 avocados—which are not suitable for export or sale in the domestic fresh market. Currently two out of the three processors are active consuming approximately 21,577 kilograms of avocado per day, which they process into crude oil sold in Europe and South Africa for further refining. They also process pure virgin oil for export and cosmetics for local and regional markets.

Due to limited processing capabilities and capacities, the country has foregone multiple benefits and revenue through sale of fresh avocado instead of processed avocado products. To mitigate against these situations there is need to address the issues listed below limiting full exploitation of the processing of avocados into various products and quantities.

2.11 Issues Affecting Processing of Avocado

- **Inadequate volumes for processing:** Although there has been an upsurge of farmers planting avocado within the last 5 years, the volumes are still low. In addition, there is competition between exporting the fresh fruits versus processing for oil extraction.
- **Low number of processors and capacity utilization:** Although there are 6 registered processors with a current daily demand of 21,575 kgs, this is still way below their optimum potential and the capacity of cottage industries is yet to be established.
- **Low number of processed avocado products:** Despite the existing potential of processing avocado into multiple products including cosmetics, healthcare and lubricant or fuel oil, most avocado in Kenya is consumed fresh. The processing

sub-sector is operating below capacity with a narrow range of products in food security such as yoghurts, smoothies, guacamole and juices, as well as cosmetics.

- **Poor branding:** Currently, there is a lack of an established Kenyan exclusive avocado brand. This state has limited international market access due to inadequate investment in branding and promotional campaigns. Some importing countries rebrand Kenyan avocado as their own, denying Kenya the anticipated revenues.

Opportunities in and Processing

- There is opportunity for SMEs to invest in processing of avocado and take advantage of the current government support to the manufacturing pillar in the Big 4 transformative Agenda
- There is opportunity for the country to invest in promotional and branding of the Kenya avocado as a preferred choice in the international market.
- There is opportunity for investors to diversify processed products from the current narrow range of oils, cosmetics and cuisines.

2.12 Profitability

The situational analysis and profit and loss margins (see annex VI) reveals that most farmers particularly smallholder are making losses. This is partly attributed by: the number of trees planted; the amount of fruits yielded per tree; agronomic inefficiencies such as fertilizer applications, water, pesticides, and pruning; poor pricing of avocado fruits at farm gate and not many farmers fully embrace avocado farming as a business. This partial engagement with low investments greatly effects their optimal returns from avocado farming. Again, many of them are driven by emerging fast benefits and/or as an occupation.

To transform this mindset and invest in avocado as a commercial, sustainable and profitable enterprises, the issues listed here need to be addressed.

2.13 Issues Affecting Profitability

Unstructured avocado pricing: Kenyan avocado pricing fluctuates significantly due to quantity, variety, fruit size, fruit quality and type of buyer. Although in some situations, marketing agents exploit smallholder farmers by buying in bulk at farm gate and offer immediate cash but at very low prices. They sell the produce to the exporters who pay after weeks or months but at competitive prices.

Lack of price risk mitigation: There is generally low-price risk mitigation. Some of the variables that affect price risks include climate change; natural disaster like floods and mudslide; quality of seedling and poor-quality inputs and seasonality among others. Non cushioning of farmers against these price risks greatly affect their businesses.

Low business volumes: In 2018, Kenya exported 64,477,082 kgs of avocados against 5.6 billion tons of world market demand. This low business volume is largely due to low

production volumes, unstructured domestic distribution channels, limited marketing hubs and high post-harvest losses.

Competition: Currently the Kenyan avocado faces competition from South American producers, such as Peru, Chile and Colombia. Exporters in the competing countries have also learned the importance of managing and controlling the supply chain by opening offices in Europe or forming joint venture with Dutch exporters. Staff at these offices not only monitor all shipments, but also form close relationships with importers, supermarkets and identify and form relationships, with media outlets such as health magazines, celebrity chefs, women's magazines, and national press for publicity and promotional campaigns. Kenya is yet to extensively engage in such high-level marketing.

Existing Opportunities in Profitability

Formation of farmer clusters/cooperatives will drive realization of many benefits of avocado farmers such as the following:

- Give farmers a bargaining voice for better pricing
- Procure bulk farm inputs
- Ease access to market information
- It will enable hiring of technical advisers/field scout
- It will enable Installation packhouses/handling facilities/cold facilities
- It enables harmonized pest and disease control operations
- It will enable bulking of the avocado produce
- It will facilitate internal mechanisms of self-regulation among the farmers

2.14 Cross-Cutting Issues

Gender: Most of the cross-cutting issues include gender. This is due to a number of reasons, including: women and youth not ordinarily included on the sharing of profits from the sale of agricultural produce, and yet they do most of the work; not empowered by the current land ownership, the current land tenure system disfavors them, where land belongs to the man; have less access to finances, they lack collateral to access loans and have poor access to quality inputs.

Environmental issues: Avocados are grown as a single-crop. The same crop (avocado trees) growing in the same land year after year for many years. This mass-scale agricultural technique may be more (economically) interesting for producers, but in the long run, it can be very harmful to the environment. It leaves soils more vulnerable to diseases, which may lead to the need of using pesticides. Pesticides can contaminate not only the soil (together with chemical fertilizers) but also the surrounding biodiversity (human lives included). In many parts of the world growing avocado, forests, scrubs, and grassland have been destroyed to pave way for avocado farms.

Horticultural Centres of Excellence: The country has inadequate centres of excellence that provide avocado tailored skills and processing. In addition, the collaboration between national and county levels of government to support the farmers is disjointed. It's also noted that the TVET institutions do not offer skills for the avocado sub-sector.

Produce Traceability system: In Kenya, there is poor implementation of traceability system especially for the domestic market. Marketing agents pick up fruits from various farmers and mix them up in one pick-up or truck. Fruits from individual farmers are neither sorted nor packaged and this makes it very difficult to trace fruit origin.

Financing of avocado enterprises: Most smallholder farmers have restricted access to formal loans due to stringent bank requirements.

Infrastructure: An array of infrastructural constraints hinders the farmer from making profits. They include:

- underdeveloped rural roads and other key physical infrastructure leading to high costs of transporting avocados to the markets and farm inputs - reducing the competitiveness of the Kenyan avocado;
- erratic supply of electricity in the rural areas reducing investment opportunities such as irrigation and agro-processing; poor avocado marketing information systems and structures that inform the value chain actors on real-time and facilitates quick movements of avocados given their fragile and perishable nature; and
- multiple taxes at both county and national level- in the form of cess without corresponding provision of requisite services and weak contractual agreements between smallholders and national exporters impacts on the smallholder negatively.

All these have contributed to reduction in the net farm incomes and created distortions in marketing structures without necessarily improving the revenues for both local authorities and quality control systems.

2.15 Stakeholder Analysis

The analysis of stakeholder along the value chain helps to identify key actors and their functions in order to catalyze synergy and identify weak points which can be supported to stimulate a commercial and sustainable avocado enterprise. The objective is to enhance coordination, coherence and derivation of value from the various stakeholders in the industry. Currently, the avocado value chain actors operate in disjointed manner leading to price loss by farmers, quality and volume wastage and dominance of marketing agents over farmers and exporter. Some of the key actors in the avocado value chain include: input suppliers, producers, transporters, traders and facilitators whose roles and functions are detailed here below

2.16 Value Chain Actors

Agricultural input Suppliers

Agro-dealers

Agro dealers are mainly private sector and are important in ensuring access of farm inputs to farmers. They are registered by KEPHIS on sale of certified seed and by PCPB on sale of approved pest control products. The major agricultural inputs include fertilizers, pesticides, spraying and punning equipment, which range from hand secateurs to motorized sprayers, Personal Protective Gear, pruning tools, and watering kits among others.

The input actors comprise of large and independent dealers that supply agro vet shops who in turn sell to producers. Agro vets as located near production areas and play an important role in providing technical advice when need arises. However, some of the agro-vet personnel are not qualified to offer technical advice on various aspects of

production. Additionally, some of the agro chemicals are of inferior quality and their lacks means of verifying.

There exist informal and unregistered suppliers who peddle agro chemicals to farmers contributing to poor quality fruits. It should be noted that small-scale producers use minimal agro chemicals particularly pesticides and fertilizers on fruit trees. Farmyard manure is commonly used in place of inorganic fertilizers.

Nurseries Operators

Nursery operators propagate seedlings for sale to producers. They are registered by HCD and the planting material certified by KEPHIS. The operators range from individual, self-help groups or established companies. The prison nurseries have been critical in capacity building inmates on nursery management and grafting techniques which has empowered them to engage in nursery operations after serving jail term. They also have established mother blocks that supply scions.

There has been concern on the source of seeds used in propagating avocado seedlings because of disease infection and suitability in a variety of soils. Additionally, concerns are raised of the scions used for grafting which at times is not true to type. HCD conducts training of nursery operators to ensure seedling raised are of required quality.

There exist roadside nursery operators who remain unregulated.

Packaging material Suppliers

Avocados collected from small scale producers are packed in gunny bags on site or loaded directly into pickups for supply to the domestic or export market. Exporters who have own farms and large-scale producers use crates to pack the fruit before transporting to the pack house.

Packaging companies servicing the export sector include Dodhia Packaging Ltd, Megvel Cartons Ltd, Thermopak Ltd, Dofran Trade Labels, Kenya Flexo, Market Centre, Signode, and Carton Manufacturers. Kenya imports the raw materials used in the manufacture of boxes, which makes costs higher than competitors.

The packaging consumables sector in Kenya is constantly updating processes and modernizing equipment to reduce cost and produce quality products. Products packed at source reduce costs and time delays and lengthens the product life guarantee to the final consumer. Among the latest developments in Kenya is the Modified Atmosphere Packaging (MAP), which is produced locally for use in packing both high and low care products. Other innovations include outer boxes that are lighter in weight and more durable.

Producers

Individual producers

Producers are key in utilizing factors of production to produce and market the fruit. In Kenya, the smallholder farmers account for over 70 percent of all farming activities

including avocado¹⁶. Most of them own less than 2 acres of land. The avocado smallholder on average has 10-20 trees per homestead and constitute a greater percentage of the estimated 136,623 known avocado farmers. Of these 130,424 are smallholders, 6114 are medium holders and 85 are large scale. Large scale production is done under single stand orchards like Kakuzi and Mt. Elgon Orchard Ltd. Depending on the scale of production, the enterprise can be capital intensive or low investment ultimately affecting the yield returns with majority of production being done under rain fed conditions.

Producers from the central and eastern part of the country grow for the international market while those in the Western Nyanza region majorly produce for the domestic market. However, due to sensitizations and promotions conducted by counties and national governments, there has been a shift by producers to production of Hass variety through top working and deliberate plantings to expand production. It is for this reason that some maize, coffee and tea farmers in have adopted Avocado production.

Producer groups

Some farmers are organized into groups of at least 10 members and above which can be registered or unregistered with Ministry of Social services. The groups have a governance structure, which is responsible for day-to-day running of the group, and contact with institutions. The Groups are contracted by exporters or marketing agents who support them to attain GLOBALGAP certification and setting up infrastructure for compliance. Organized producer groups have access to private technical assistance from contracted parties, government and non-governmental entities and benefit from trainings and material support.

However, there are farmers that supply to marketing agents without contracts and technical support and therefore do not benefit from economies of scale.

Traders

Marketing agents

Their main role is buying, aggregation and transporting of produce. They form an important link by penetrating villages to source produce. Marketing agents, commonly referred to as brokers, are registered by the HCD as dealers in the value chains. A dealer is defined as a person involved in buying and selling of horticultural produce (HCD Order, 2011).

Marketing agents play a significant role of consolidating, initial sorting and grading, and delivering produce to the exporters. In addition, marketing agents also supply produce to local markets, processors, wholesalers, retailers and institutions. They often harvest the fruits and transport fruits in inappropriate vehicles, which compromises product

¹⁶ Study of the mapping of distributors of fruits and vegetables in Kenya

quality, and hence often cited as the main cause for failures in produce traceability. There were also an estimated 38 marketing agents dealing with avocados in Kenya¹⁷.

Local Market traders

The local market traders are divided into wholesalers and retailers who operate either formally or informally. They do not exclusively deal with Avocados and combine other fruits in the business depending on their seasonality. Some local traders use the online platform to sell their products like Twiga foods, Carrefour and Naivas supermarket among others. There are approximately 120 open air market, 60 supermarkets and numerous green groceries where avocados were traded across the country. Wholesale market

The wholesale markets in Kenya are designated by County governments. The largest wholesale markets are located in Nairobi (Wakulima, Kangemi and Gikomba market), Mombasa (Kongowea Market), Eldoret and Kisumu (Kibuye Market) counties. Wholesalers may purchase the fruit from farmers or from marketing agents while still unripe and sell to retailers or big bulk buyers directly. Formal wholesalers like Twiga fruits have contracts with their suppliers and besides selling through traditional sales methods use digital platforms for supplying their products to customers.

Retail Market

Retailers on the other hand purchase fruits from farmers for those located in the rural areas while those located in the urban areas obtained fruits from wholesalers or from marketing agents. Retailers can be formal like supermarkets and grocery stores or informal selling in open air market, along roadside, small shopping centres or kiosks in the estates. They are largely not regulated but they have a significant market share. According to Tschirley and Ayieko (2009), 19 percent of retail traders in Nairobi sourced their fresh fruits and vegetables directly from farmers, while the rest were sourced from wholesale markets in the city. A USAID-KHCP survey (January 2012) showed that hawkers and green grocers transacted 58 percent of the total volume of fruits at the retail level, while supermarket and large shops had a market share of one and four percent respectively. The concerns of informal wholesalers and retailers is that they are unable to comply with market requirements and standards as they are not mainstreamed

Exporters

Exporters supply international markets and are registered by HCD and are required to comply to food safety and Phytosanitary requirements. There are approximately 100 exporters of Avocado some of whom are exporting other products. Some exporters have their own orchards while majority source produce from marketing agents and out growers.

Exporters have made investments on infrastructure like packhouses, cold stores and grading machine line and human resource to process the fruit according to quality requirements specified by the regulators and market. To ensure quality fruit, exporters rely more on their own staff to supervise produce delivered to pack houses to guarantee quality and minimize. Fruits are sorted on the basis of variety, color, and level of

¹⁷ Avocado strategy – Vision Data 2019

maturity, lack of spots and insect damage, and size. There are exporters who lease the packing facilities from other exporters who possess an automated avocado packing line.

They also deal with large volumes of produce and due restriction in harvesting by HCD, they source fruits from Rwanda and Tanzania to sustain exports. They source, provide and disseminate market information and foster market linkages.

Processors

The leading processors of Avocados are Sunripe Ltd dealing in frozen Avocado and Olivado and Jungle Nut dealing in Processed oil. Others are Kencado, noble and Croftcado among others.

The processors of Avocado oil can be categorized as; Micro whose processing activities are manual and operate from home or small leased premises; Small who have invested in basic processing tools and equipment with capacity to process 1 – 5 tons per day; Medium who have invested in modern, avocado oil processing equipment with capacity to process a minimum of 1500 - 2500 tons of avocados per hour or Large who have invested in modern avocado oil processing with capacity to process at least 3000 tons of avocado per hour.

The challenges experienced includes high cost of operation, government taxes and licenses, inadequate supply of raw materials.

Transporters

Avocados are mainly transported with hired or trader owned trucks (ranging from 3-ton to 30-ton) or pickups. In rural areas, donkey carts and motorcycles are used to move Avocadoes from the farm to market centers or roadsides where large trucks can pick them up. Marketing agents use pickups and trucks to collect fruits from harvested farms. The fruits are loaded directly on the pickups and trucks without any primary packaging resulting to bruising on the skin. Fruits transported on Motorcycles and donkey carts are packaged in gunny bags.

Avocados destined for the local market are packed in gunny bags and loaded on trucks if destined to distant markets and sometimes transported alongside other fruits or vegetables to various markets.

Consumers

Consumers of Avocado are both in the domestic and international markets. Whilst the international market demand high quality standards, the domestic market does not require certification. International consumers have different requirements, which are communicated to exporters to comply failure to which the produce is rejected. The requirements are different depending on the market. For example; the EU market has more stringent requirements on fresh Avocado as compared to the UAE market. Consumption of Avocados worldwide is done in different forms as both food and non-food depending on the objective of the consumer. In the cases of glut, the surplus is sometimes used as animal feed.

2.16 Horticulture industry Associations

There are several associations operating in the Avocado value chain with the aim of lobbying, offering technical services and representing members' interests in stakeholders' meetings. The registered export Associations in the Avocado value chain are Fresh Produce Exporters Association of Kenya (FPEAK), Fresh Produce Consortium of Kenya (FPC Kenya) Avos Kenya. The membership to these Associations is voluntary and through annual subscription by applicants. The Avocado Society of Kenya also draws membership from farmers and exporters belonging to other Association.

The Agrochemical Association of Kenya (AAK) comprises of manufacturers, formulators, re-packers, importers, distributors, farmers, and users of pest control products (pesticides). The primary objective of AAK is to promote safe and effective use of pesticide chemicals besides lobbying and representing their members in forums.

Fruit tree nursery operators Association draws membership from nursery operators in the country formed to assist in marketing of fruit tree seedlings. Though the Association indicates that it's a national outfit, its membership lacks national representation due to inadequate marketing of the association.

2.17 Public Institutions

Ministry of Agriculture livestock, Fisheries and Cooperatives (MOALFC)

The Ministry is the lead agent in agricultural transformation in the country. The ministry provides overall policy, regulation and operational direction. It also Supports and facilitates agricultural research, technological delivery and input supply.

Other ministries whose mandates directly affect Avocado value chain include Water and Irrigation, Public Health and Sanitation, Environment and Mineral Resources, Local Government, Cooperatives development and Marketing, Trade and Regional Development Authorities.

County governments

The county government are mandated to adopt national policies, regulation and standards to the extent that they affect the prioritized commodities and value chain actors within the county. Various departments in the county including Departments responsible for Agriculture, Trade, Cooperatives, health and enforcement, implement the Avocado value chain activities. The County is responsible for extension service provision, regulating trade within the county and enforcing standards. The national government is required to capacity build county government on national policies and standards to enable adoption. There exists a coordination mechanism between national and county governments that ensures information flow and smooth implementation of activities between the two levels of government.

Counties like Murang'a and Nandi have been in the forefront of supplying producers with Avocado seedlings in an effort to promote production. The deliberate efforts are

identified through the County Integrated Development plans which prioritize enterprises for investments at county levels to enhance poverty eradication, uptake of high-quality inputs.

Agriculture and Food Authority - Horticultural Crops Directorate (AFA-HCD)

AFA-HCD was established through the AFA ACT of 2013 to facilitate the development, promotion, coordination and regulation of the horticultural industry in Kenya. The Directorate registers dealers in the Avocado value and ensures they comply with industry standards like the KS1758 part 2, HCD code of practice that regulates contractual farming, harvesting guidelines and analysis of fruit oil content before export.

Kenya Plant Health Inspectorate Services (KEPHIS)

The Kenya Plant Health Inspectorate Service (KEPHIS) was established by the Kenya Plant Health Inspectorate Service Act, 2012 under the State Corporations Act (Cap 446). KEPHIS is the designated competent authority with the responsibility of regulating plant health issues relating to phytosanitary and seed matters.

Kenya Agricultural and Livestock Research Organization (KALRO)

KALRO was established under the KALRO ACT of 2013 to regulate, promote and undertake research in all aspects of production, management, postharvest and processing of Agriculture and Livestock research. The Horticulture Research Institute in Thika is responsible for all matters relating to horticulture research in the Country.

Institution of learning and higher

The institutions responsible for training and academic research are responsible for ensuring that the industry has skilled professional and conducting academic research.

The Pest Control Products Board

The Pest Control Products Board (PCPB) is established under the Pest Control Products Act (Cap 346). Its functions are to regulate the importation, exportation, manufacturing, distribution and usage of pest control products.

Kenya Bureau of standards

The Kenya Bureau of Standards (KEBS) is established under the Standards Act (Cap 496). Its primary function is to promote standardization in commerce and industry. Kenya Industrial Research and Development Institute.

1.18 SWOT Analysis

This is the summary assessment of the sector's strength, weaknesses, opportunities and threats as indicated in the table below. Some of the key strengths are derived from the sector's long-standing culture of horticultural produce export and favorable all-year round climatic conditions. The weak points relate to low volumes and high post-harvest losses. The available opportunities include the expanding markets and government

support including provision of high-quality seedlings, and exploration of new markets. The key threats emanate from increased competition from other countries, stringent international market standards, and the risk of invasive trans-boundary pests and diseases.

Strengths	Weakness
<ul style="list-style-type: none"> -Large smallholder base – 70% of avocado producers -Support from public and private sectors -Expanded acreage of the Hass variety -Availability of short, regular transit to market destinations -Good climate that allows all year around production -Established regulatory, research and training institutions and infrastructure - -Large population of over 47 million to boost local consumption -Good network of agro-input suppliers -Established Markets in the European Union (EU), United States and the Gulf Cooperation Council (GCC) states -Presences of technical advisers in the country -Experienced exporters 	<ul style="list-style-type: none"> -Non adherence to international market quality and Phytosanitary requirements by farmers and exporters -Inadequate distribution channels for avocado across the country -Inability of Kenyan avocado to penetrate special market niche like “organic” avocado -Inadequate volumes for exports and processing -over reliance on sale of primary products -Inadequate data in avocado industry -Inadequate accessibility to quality planting material planting materials -Fragmented smallholder growers -Inadequate provision of supportive services -Uneconomical land sizes, low number of trees, low yields, wrong choice of varieties -lack of investments in Avocado research programs

Opportunities	Threats
<ul style="list-style-type: none"> -Diversification to new markets such as COMESA, other African countries and China -Investment in processing, logistics -Diversification of Avocado products -Thriving private sector -Better bargaining power through bulking -Long history of exporting horticultural produce including avocado -Good air connections with Europe and the GCC -Expansion of avocado production to non-traditional areas -increasing productivity per tree to enhance volumes for export and local markets 	<ul style="list-style-type: none"> -Increased competition from other countries -Changes in export market requirement -Recurrent droughts due to climate change -Recurrence of food safety compliance requirements and standards -Changes in consumer demands -Danger from invasive pest and diseases -change from Avocado enterprise to another crop by farmers

Legal, Policy and Institutional Framework that Support Avocado Growing

Access to food is a fundamental right of all humans in the world, and ensuring food security for humanity has emerged as a global agenda by the United Nations (UN), with

Sustainable Development Goal No. 2- (SDG 2) being dedicated to “End hunger, achieve food security, improve nutrition, and promote sustainable agriculture”.

Regionally, the AU 2063 Agenda and the Comprehensive Africa Agriculture Development Programme (CAADP)/ Malabo Declaration is Africa’s policy framework for agricultural transformation, wealth creation, food security and nutrition, economic growth and prosperity for all (The World Bank, 2016). The 23rd Ordinary Session of the African Union Assembly held in June 2014 in Malabo, Equatorial Guinea recommitted to the CAADP principles and goals and defined a set of targets and goals referred to as the Accelerated Agriculture Growth and Transformation Goals 2025 (World bank, 2016)

Status of legal and institutional framework in Kenya

The right to food for all citizens is given prominence in the Kenyan Constitution. “Every person has the right to be free from hunger, and to have adequate food of acceptable quality.” As articulated in Article 43, Constitution of Kenya (2010), which further embraces sustainable exploitation, utilization, management and conservation of the environment and natural resources, and identifies sustainable development as an important value and principle of governance. Schedule 4 of the constitution outlines the roles of the two levels of government including areas of consultation and cooperation in production and trade of agricultural products.

Additionally, various development blueprints have prioritized agriculture as key in contributing to the achievement of 100% nutrition and food security for the country. These include the Kenya Vision 2030, the Medium-Term plans and the Big 4 Agenda.

This Avocado Strategy also supports actualization of some of the important regulations, strategies and policies in the Agriculture sector in Kenya that address the food and nutrition security agenda of our country. These include;

- Crops Act No. 16, 2013
- Kenya Agricultural and Livestock Research Act No. 17, 2013
- Agricultural Sector Transformation and Growth Strategy 2019-2029
- Draft National Agriculture Policy, 2016
- National Food and Nutrition Security Policy, 2011
- National Food and Nutrition Security Policy Implementation Framework, 2017-2022
- Agricultural Sector Development Strategy, 2010-2020
- National Agricultural Sector Extension Policy, 2012
- National Agricultural Research Systems Policy, 2012
- National Horticulture policy, 2012

Challenges

- i) There is poor enforcement of sanitary and phytosanitary standards, environmental standards, pesticide use, labour laws, ethical trade practices and public health, among others.

- ii) The review of the Acts of parliament and subsidiary legislations have not kept pace with changing needs of the industry.
- iii) Duplication and overlaps in mandates of regulatory institutions.
- iv) Inadequate funding

Proposed interventions

- i) Establish mechanisms to enhance enforcement of laws and regulations.
- ii) Undertake regular reviews of relevant statutes and subsidiary legislations to match the changing needs of the industry.
- iii) Enhance coordination of the regulatory institutions.
- iv) Increase funding of the Horticulture Fund.

Institutional framework

Current status

The Avocado industry is regulated directly by AFA-HCD, KEPHIS at the national level and County governments. Other institutions that influence the development and promotion of the sector include KALRO, KEBS, PCPB, KEPROBA among others. National government institutions are established under various statutes and have a national mandate on various regulatory aspects with a view to improving service delivery. The Government has designated a competent horticultural authority structure to coordinate the horticulture industry consisting of KEPHIS, KALRO, AFA-HCD and PCPB. Private institutions are based on voluntary membership and focus on capacity building of their members and advocacy. There is an increase in registration of commodity-based associations that serve interest of industry players.

Non-governmental institutions have played a key role in development and promotion of the sector. The International Trade Centre, USAID-RTI among others have been pivotal in capacity building public and private institutions to enhance their service delivery.

Challenges

- i) Inadequate attention to Avocado issues by the Horticulture competent authority structure.
- ii) Inadequate resources for institutional operations.
- iii) Weak and ineffective linkages among public and private institutions that undertake regulatory, developmental and support functions resulting in inefficiencies in the industry.

Strategic Interventions

- i) Develop a framework to enhance inter-institutional coordination to be established.

- ii) Support an Avocado working group within the Horticulture competent Authority Structure.
- iii) Enhance capacity through public–private partnerships to improve service delivery.

Strengthening of Stakeholder organizations and institutions to enhance linkages and partnerships among players along the value chain.

1.19 The Avocado Industry Strategy Gap Analysis

From the situation analysis, it is clear that avocado industry has a great potential for growth if appropriate interventions are employed to overcome the existing challenges. Table 5 below shows the strategic gaps in the industry

Table 5: The Avocado Industry Strategy Gap Analysis

Parameters	Current 2020	Actual	Targets for 2030	Gap Analysis	% Increase	2020 Current/ budget Kshs	Vision 2030 investment/ budget Kshs
Global Avocado produced in kg annually	5,920,000,000		7,920,000,000	2,000,000,000	34%	236,800,000,000	316,800,000,000
Global Amount Marketed	5,624,000,000		7,624,000,000	2,000,000,000	36%	224,960,000,000	304,960,000,000
Actual Avocado produced in Kenya	318,087,000		762,400,000	444,313,000	140%	12,723,480,000	30,496,000,000
Actual Marketed in Kenya	287,868,735		724,280,000	436,411,265	152%	11,514,749,400	28,971,200,000
Actual Export	64,477,082		362,140,000	297,662,918	462%	10,832,149,776	60,839,520,000
Average kilograms of fruits produced per tree per year	160		250	90	56%	3,200	5,000
Average Number of Trees per Acre	50		81	31	62%	160,000	405,000
Number of trees in production	1,988,044		3,049,600	1,061,556	53%	7,708,553,738	11,824,692,227
Total number of acres in production	39,761		77,410	37,649	95%	12,487,857,055	24,312,549,282
Total number of trees in production	1,988,064		8,339,019	6,350,955	319%	7,708,553,738	11,824,692,227
Total acres on avocado trees	40,757		78,407	37,649	92%	12,487,857,055	24,312,549,282
Land under immature trees	997		1,993	997	100%	7,708,553,738	11,824,692,227
Average acreage per avocado farmer	0		1	1	235%	93,695	314,074
Total acreage of small holder farmer (.25 acres)	32,606		62,725	30,120	92%	10,240,689,306	19,700,443,088
Total acreage of medium scale farmer (1 acre)	6,114		30,568	24,454	400%	1,920,129,245	9,600,646,225

Parameters	Current 2020	Actual	Targets for 2030	Gap Analysis	% Increase	2020 Current/ budget Kshs	Vision investment/ Kshs	2030 budget
Total acreage large scale farmer (24 acres)	2,038		10,000	7,962	391%	640,043,082	3,140,740,000	
Number of trees of small holder farms	1,630,299		32,617,251	30,986,952	1901%			
Number of trees of medium scale farmers	305,681		11,921,560	11,615,879	3800%			
Number of trees of large-scale farmers	101,894		31,200,000	31,098,106	30520%			
Total number of small holder farmer (.25 acres)	130,424		250,902	120,478	92%	23,343,125	217,284,000	
Total number medium scale farmer (1 acre)	6,114		6,114	-	0%			
Total number of large-scale farmer (24 acres)	85		417	332	391%			
Total number of avocado farmers	136,622		257,432	120,810	88%			
Average kilograms of Avocado consumed on farms	15,904,350		38,120,000	22,215,650	140%	636,174,000	1,524,800,000	
Average of Avocado sold informal traders	223,391,653		434,568,000	211,176,347	95%	8,935,666,120	17,382,720,000	
Average post-harvest loss	14,313,915		7,624,000	(6,689,915)	-47%	572,556,600	304,960,000	
Registered Marketing Agents	38							
Total number of registered exporters	156		156	-	0%	69,436,858	389,996,923	
Number active exporters	94		156	62	66%	115,235,636	389,996,923	
Exporters			-	-	#DIV/o!	-	-	

Parameters	Current 2020	Actual	Targets for 2030	Gap Analysis	% Increase	2020 Current/ budget Kshs	Vision investment/ Kshs	2030 budget
Number of clearing and forwarding agent								
Number of Distributors (local market)	120		233	113	94%	11,169,583	11,190,592	
Open markets	120			(120)	-100%			
Number of groceries (super market)	60			(60)	-100%			
Per capita consumption	5		13	8	174%	190	520	
What is the current population in <Location>?	47,000,000		65,000,000	18,000,000	38%		520	
Total number of households in the <Location> area?	11,750,000		16,250,000	4,500,000	38%			
Average size of household farms	4		4	-	0%			
Land in the area suitable for avocado production?	4,940,000		4,940,000	-	0%			
Acreage under avocado	40,757		103,294	62,536	153%			
Number of registered nurseries	264		528	237	90%	2,396,745	2,396,745	
Number of certified nurseries								
total number of seedlings	9,655,577							
Total number of certified seedlings	5,272,840		10,006,823	4,733,983	90%			
Number of seedlings per nurseries	19,973		19,973	-	0%	898,780	898,780	
Number pruning/harvesting machine	1		180	179	17900%	5,000,000	900,000,000	
Harvesting machine and pole	-		257,432	257,432	#DIV/o!		514,864,432	

Parameters	Current 2020	Actual	Targets for 2030	Gap Analysis	% Increase	2020 Current/ budget Kshs	Vision 2030 investment/ budget Kshs
Number bulk coolers (TONS)/pack houses	47		180	133	283%	893,000,000	3,420,000,000
Number of farm coolers	-		257,432	257,432	#DIV/o!		28,000
Mobile coolers	100		180	80	80%	1,000,000,000	1,800,000,000
Number of Agro-dealers	-		180	180	#DIV/o!		
Number of avocado cooperative/cluster/Farmer association	4		180	176	4400%		900,000,000
Number of avocado processors	6		30	24	400%	583,682,148	2,918,410,740
Number of active avocado processors	2		30	28	1400%		2,918,410,740
Number of cottage avocado SMEs	4		180	176	4400%	2,000,000	90,000,000
Daily processing capacity per processor	10,788		15,000	4,212	39%	1,232,877	1,714,286
Avocado processed in kg/ day	21,575		450,000	428,425	1986%	2,465,753	51,428,571
Number of Pest Free Areas (PFAs)	-		30	30	#DIV/o!	-	325,800,000
Breeding Farm	1		7	6	600%		49,000,000
Mother Blocks	33		35	2	6%	10,364,442	10,992,590
Technical advisors	689		14,453	13,764	1998%	-	7,242,800,000
Maturity testing kit	2		180	178	8900%	2,000,000	180,000,000
Number of post-harvest treatment facilities (Export)	29		180	151	521%	580,000,000	3,600,000,000
Number of avocado training centres of excellence	-		7	7	#DIV/o!	-	1,400,000,000
Avocado demonstration farm			-	900	#DIV/o!		141,333,300

Parameters	Current 2020	Actual	Targets for 2030	Gap Analysis	% Increase	2020 budget Kshs	Current/ Kshs	Vision investment/ Kshs	2030 budget
Number of TVETS skilling Technical advisor/farmer			-	30		-		4,129,224,171	

2.20 Justification

The avocado fruit has previously been grown by small scale producers without much attention to improve its competitiveness. However, with the growing global demand that have led to increased exports, a lot of interest has been generated in the counties and among individuals which has driven investments in production, and other nodes of the value chain. There is therefore, need to guide these investments and other interventions to promote a coordinated growth in the industry.

The Agricultural Sector Transformation and Growth Strategy 2019 is aligned to vision 2030. The strategy has a high priority on transforming subsistence and informal avocado production to commercialized farming with a focus on expanding Kenya's global market share. The revolutionized avocado farming will catalyze wealth creation and impact a high-quality life compliant with requirements for high standards of public and environmental health.

The development of this National Avocado Promotion Strategic Plan (NAPSP) is also in tandem with the implementation and orientation of Kenya Vision 2030, National Food Safety Policy 2013, Sustainable Development Goals (SDGs) 2030, the Horticulture Policy, and Integrated National Export Promotion Strategy and CADDP.

3.0 CHAPTER THREE

3.1 Strategic Direction

This strategy will give priority to the creation of a vibrant and efficient coordination mechanism from National to County Government. The strategy provide guideline for establishment VC actors' institutions and stakeholder forums in each county for organized agribusiness support of the subsector.

Improved coordination is key to the success of this strategic approach. It will ensure there is targeted support to address majority of weakness by providing suitable entry points to all interested service providers along the entire avocado value chains. In addition, the approach will identify the strengths and build on them while at the same time convert any threats to opportunities that will be exploited to enhance the sub sector competitiveness. The institutions created will be value chain actors owned and led but with defined functions supported by consistent relevant capacity building, deliberate facilitation and regulation by the state agencies. This will be done using accurate data collected and analyzed to give the true picture of the current baseline situation.

3.2 Vision

To be an innovative and commercially viable avocado industry in Africa

3.3 Mission

“To transform avocado value chain into commercially viable enterprises through organization of Seed development, production, marketing and processing activities and ensuring all-inclusive participation of all gender categories and value chain actors for improved wealth creation, food and nutrition security and environmental health”

3.4 Goal

To enhance the contribution of avocado industry to the GDP from current 7% to 12% of total fruit export,

3.5 Strategic objectives

This strategy provides a stimulus for public and private sector investment in avocado industry in Kenya. It aims at transforming the industry to ensure there is improved and equitable profits along the value chain for improved livelihoods for all value chain actors. The following are the strategic objectives for the strategy.

1. Establishment of coordination, implementation and mutual accountability mechanisms for avocado industry to ensure smooth flow of agribusiness information and services at national and county level
2. To increase production volumes through the use of demand-driven and climate smart, technologies
3. To increase volumes of avocado traded locally and internationally
4. To improve compliance to quality and market standards
5. To increase volumes of processed avocado in Kenya,

6. To improve efficiency and profitability distribution along the avocado value chain
7. Mainstream all gender and environmental concern at all level of the value chain

3.6 Expected outcomes

The following are the expected outcomes of the strategy.

1. National and county coordination mechanism established
2. Accuracy of avocado baseline information improved from 60% to 90%,
3. Volumes of avocado traded increased from 287,781,735 to 715,896,000 Kgs,
4. Production volumes increased from 318,087,000 kgs to 762,400,000 kgs,
5. Compliance to quality and market standards improved
6. Volumes of processed avocado increased from 21,575 kgs per day to 450,000 kgs per day,
7. Efficiency and profitability along the avocado value chain increased by 10%.

3.7 Strategic Approach

The State Department for Crops targets to enhance wealth creation, food and nutrition security, employment, manufacturing and environmental health, through transformation of the avocado value chain into commercial enterprises. The present and new challenges in Kenya's economic concerns have necessitated a paradigm shift in strategy development and implementation. The NAPS therefore propose interventions that are data-based and market led that will ensure robust profitable avocado industry.

3.8 Strategic Pillars

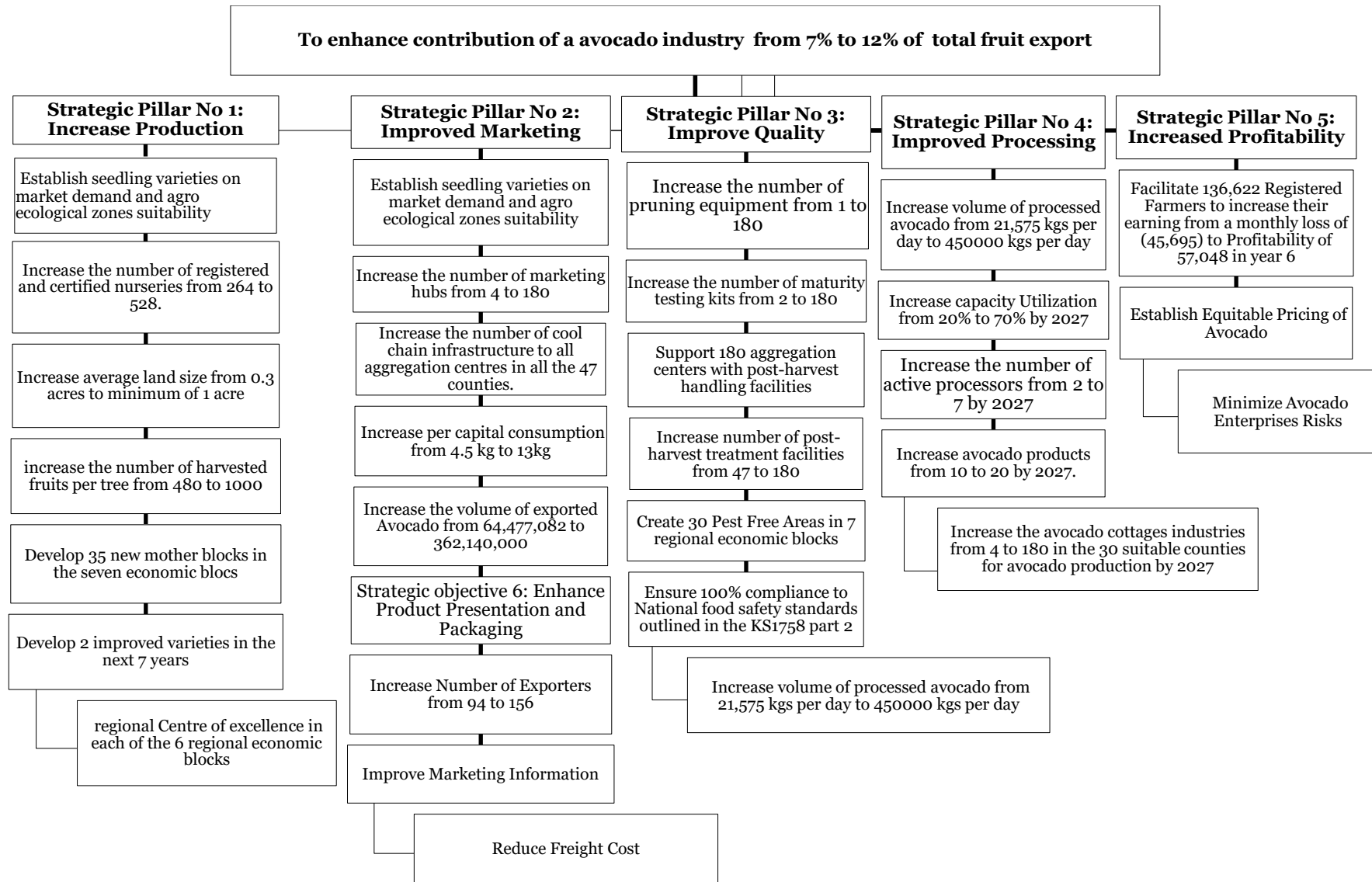
This strategy is driven by 5 key strategic pillars and outputs that define the focus of all interventions to enhance contribution of avocado industry from 7% to 12% of total fruit export. The 5 pillars are as follows:

- Foundation Pillar aims to establish a basic structures and institutions to support a vibrant avocado industry,
- The Marketing pillar endeavors to ensure avocado production is market led in terms of quantity and quality, improve the distribution, marketing infrastructure of avocado to all 47 counties
- The Production pillar targets to increase and promote production of avocados as per the market demand and agro ecological zones suitability.
- The quality pillar aims to improve the harvesting and post-harvest handling of fruits by ensuring mature fruits are harvested using the appropriate tools and equipment.
- The processing pillar aims at diversifying Avocado products by supporting availability of raw material and investments into processing facilities in counties.
- Profitability pillar seeks to promote Avocado as an profit making enterprise.

This strategy therefore, provides a stimulus for national, county governments and private sector investment in the avocado industry to transform the sub-sector into a commercial and vibrant industry that contributes to the country's food security needs, the development of agro-industries, employment creation and improved livelihoods.

The pillars and specific objectives are shown in Figure 5.

Figure 5: Strategic Goal and Strategic Pillars



4.0 CHAPTER FOUR

4.1 Implementation of the strategy

This strategy is intended to enhance efficient production, increased processing and marketing volumes of avocado. The focus will be to develop a Management Information System, establish institutions that bring together value chain actors. A system of linking stakeholders will be created for efficiency and effectiveness of information flow and provision of services. The strategy has put in place interventions that will ensure increased clean seed production, sustainable input supply improved market access and development of modern market infrastructure.

The strategy therefore forms a framework to guide the implementation and participation of all VC actors. It stresses the importance of sharing responsibilities among stakeholders and between national and County Governments, donors, investors/private sector. This will be done through formal Memorandum of Understanding (MoUs) and contractual agreements between relevant parties. The National Government shall take the lead in areas of policy formulation, capacity building, development and dissemination of national, regional standards, and market development in close consultation with donor agencies/private sector. Technical assistance, formation of stakeholder institutions, research and technology development will be done in collaboration with private sector and donor agencies and other stakeholders. On the other hand, the County Governments will mainly be involved in actual implementation of activities, data collection and enforcement of all quality standards

4.2 Establishment of coordination, implementation and mutual accountability mechanisms

4.2.1 Formation of coordination structure for avocado development partners

The highest level of the sector Mechanism is the Intergovernmental Forum on Agriculture (IGF). The legal mandate of the IGF is rooted in Intergovernmental Relations Act, 2012; article 13. 1&2 which empowers the Intergovernmental Relations Secretariat to establish sectoral working groups or committees. The Cabinet Secretary has been mandated to convene consultative fora on sectoral issues of common interest to the national and County Governments.

Coordination structures shall be established at both levels of Government. The National horticultural crops Technical Working group will consist mainly of MDAs and representatives of relevant development partners and service providers at national level while the County will consist of similar members at county level.

The implementation will be at ward level and will be coordinated by the Cluster Management Teams whose members shall be elected from among the key value chain actors and supported by competitively sourced technical and support staff. The coordination and implementation structure is shown figure six below.

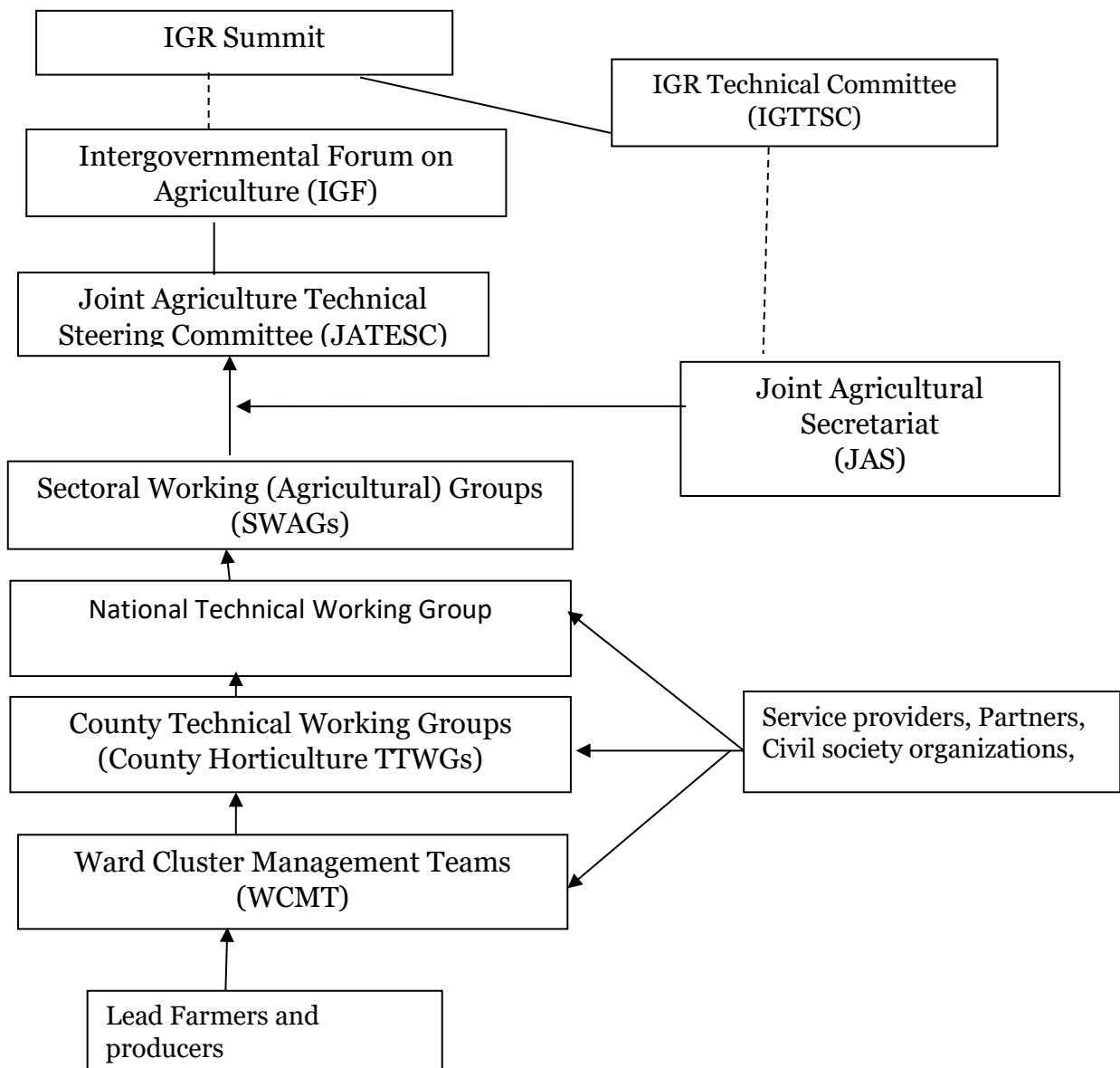


Figure 6: Agriculture Sector Consultation & Cooperation Mechanism

Notes:

- All service providers, development partners, civil society groups will only proceed to work with the communities after consultation by National, County Technical Working Groups and Ward cluster Mgt Teams.

National Horticulture Transformation Technical Working Groups (NHTWG)

The NATWG will work directly under the Joint Agriculture Technical Steering Committee and will also coordinate with all the County horticultural crops Technical Working Groups. The Avocado TWG will provide the critical link between markets within the country as well as regional and international markets. In addition, it will be responsible for information dissemination with all relevant stakeholders.

b). County Avocado Technical Working Group (CATWG)

The TWG will work closely with the National Technical WG. Main responsibilities include:

- 1) Coordinate development partners and service providers to build synergies in the development of the sector
- 2) Profile all projects, associations in avocado
- 3) Interpret market information into production statistics and disseminate to the wards,
- 4) Capacity build ward cluster management teams on produce standards and code of practice,
- 5) Coordinate production and marketing activities at various wards,
- 6) Compile county production and marketing data and processing capacity,
- 7) Compile an inventory of agribusiness equipment and machineries in county,
- 8) Supervise seed production by smallholder producers in the counties,
- 9) Identify space and assemble/rehabilitate the idle assets,
- 10) Recruit processors and coordinate training in Good Hygiene practice and Good Manufacturing Practice,
- 11) Supervise and enforce collection of taxes, levies and other charges at aggregation centers,
- 12) Resolve market land dispute/allocations issues,
- 13) Facilitate EIA studies for establishment of handling, storage, processing infrastructure,
- 14) Report defects in the market for repair by the county,
- 15) Organize planning and review meetings between ward cluster teams in county.
- 16) Prepare and submit reports to the National TWG on a quarterly basis.

4.2.2 Establishment of production and marketing clusters

Clusters are geographic concentrations of interconnected companies or institutions that manufacture products or deliver services to a particular field or industry. Clusters typically include companies in the same industry or technology area that share infrastructure, suppliers, and distribution networks. Supporting firms that provide components, support services, and raw materials come together with like minded firms in related industries to develop joint solutions and combine resources to take advantage of market opportunities.

Clustering will facilitate access to better quality services, inputs and markets, enhanced competitiveness in the horticultural crops industry, diffusion of innovation and efficient channeling of public and private sector support. It will also contribute to brand identity, improved food quality and safety, efficiency in productivity, responsiveness to consumer demands and products traceability. In addition, the clusters provide a location where farmers network with traders, service providers and consumers; leading to improved access to food and reduction of post-harvest losses.

Membership to the clusters will be voluntary and will include all households, individuals, existing groups, cooperatives, associations dealing in production and marketing as well as other horticultural value chain actors and institutions among others. The process of electing

cluster leaders shall be inclusive and transparent and candidature shall be through self-interest. The cluster shall be independent but with defined linkages with all relevant support institutions. There shall be an efficient channel of communication and information flow from the Government to the cluster and vice versa. Each cluster will have an aggregation centres that shall be established at an identified public market or an existing public asset in each Ward. The clusters may establish additional produce collection centres depending on their geographical coverage of the respective wards.

Establishment of production clusters and improvement of existing local market outlets/produce collection centres in rural areas will help in alleviation of marketing problems faced by small scale producers who are normally scattered across the counties.

4.3 Avocado Logical Framework

The logical framework in table 6, provides an overview of the strategy’s goal, activities and anticipated results. It provides a structure to help specify components of the strategy, activities and how they relate to one another.

Table 6: Logical Framework

Intervention Logic	Key Performance Indicators	Means of verification	Important Assumptions
Goal; Ensure improved livelihood of all value chain players	Improved contribution of avocado value chain to GDP Increased profits along the value chain agribusiness Number of jobs created along the value chain	KNBS assessment reports and economic surveys Progress reports	Government policies to be favorable for the development of the industry Sufficient mitigation measures against climate change and other risk
Purpose Build commercially viable avocado enterprises	Increase number of commercial avocado enterprises by establishing 180 clusters by 2027 Increased Institutional linkages by 20%	National avocado production reports by HCD	Enabling policy and business environment • Funding will be availed • There will be Efficiency and competitiveness in the industry
Outcomes			
Pillar I: Outcome 1: National and county coordination institutions and mechanisms established	• No. of functional agribusiness institutions and platforms Approved framework implemented • No. of active contracts • No. of functional Technical committees at national and county levels	Reports in the Kenya Gazette • Reports of meetings and forums • MOUs and business contracts established Framework document • Active membership to cluster	Conducive environment for operations • Member’s willingness to associate • There will be Economic, Social and political stability

Intervention Logic	Key Performance Indicators	Means of verification	Important Assumptions
	<ul style="list-style-type: none"> • No. of financial institutions offering financial services • No. of groups and individuals accessing tailor made financial products 	<ul style="list-style-type: none"> • Financial reports and records 	<ul style="list-style-type: none"> • Confidence of VC chain actor on Financial services offered
Pillar I: Outcome 2: Accuracy of avocado baseline information improved from 60% to 90%,	<ul style="list-style-type: none"> • improved baseline data from 60% to 90% number of training held 	Comprehensive data capture forms	Adequate funds will be available for data collection
Pillar II: Volumes of avocado traded increased from 287,781,735 to 715,896,000 Kgs	<p>Increase per capita consumption of avocados by 13% by 2027</p> <p>Increase marketing structures (180 production hubs, 180 marketing hubs, and other retailing outlets)</p> <p>Increase No. of new products developed</p> <p>Improve data capture from 60%-to-90%</p> <p>Increase the number of farmers making profit by 80% of the 257,432 registered farmers</p>	National and County government reports	Farmer willing to participate in audits
Pillar III: Production volumes increased from 318,087,000 kgs to 762,400,000 kgs	<p>Number of acres of idle suitable land, Template for long term land lease,</p> <p>Number of business plans for avocado production</p> <p>Number of farmers trained</p> <p>Number of registered mother blocks established</p> <p>Number of high health certified nurseries established</p> <p>Number of TVETS imparting skills in Technical advisor/farmer</p> <p>Number of avocado demonstration farms</p> <p>Number of trial sites for the new varieties</p> <p>Number of avocado training Centres of excellence</p>	<p>Reports on new improved varieties released</p> <p>Report on mother blocks established</p> <p>Report of certified and registered nurseries</p> <p>Report on the number of certified seedlings sold to farmers</p>	Availability of improved varieties
Pillar IV: Compliance to quality and market	<p>Number of cooling facilities installed</p> <p>Number of pruning equipment bought</p>	Contracts signed for facility use,	Willingness of traders to use the facilities

Intervention Logic	Key Performance Indicators	Means of verification	Important Assumptions
standards improved by 30%	Number of harvesting equipment bought Standard operating procedure developed Volumes of immature fruit stopped seized	Report of tonnage of produce handled by cooling facility Number of farmers using pruning equipment's Number of farmers using harvesting equipment's	Farmers will adopt use of the equipment's.
Pillar V: Volumes of processed avocado increased from 21,575 kgs per day to 450,000 kgs per day	Data base of existing processing facilities Number of processors trained in productivity improvement Daily processing capacity per processor recorded Number of processors linked to production hubs Number of industry standards in processing Number of active avocado processors Number of feasibility studies conducted Number of environmental impact assessment conducted Number of meetings for investors held Number of cottage avocado SMEs	Report on the volumes of avocado availed for processing	Willingness of stakeholders to get participate
Pillar VI: Efficiency and profitability along the avocado value chain increased by 10%	Reduce current farmer loss from (45,695) to 57,048 per month Number of pricing model developed Number of value chain players trained on appropriate costing and pricing and its benefits Number of insurance products for avocado VCA, Number of avocado value chain actors accessing insurance Number of insurance products No Technical advisors Number bulk coolers established in project counties	HCD reports	Farmers willing to adopt new proposed strategies Willingness of stakeholders to get participate Farmers willing to acquire more lease land

4.4 Foundation Pillar: Data and Institutional Strengthening

Avocado like all other sub-sectors in agriculture lack reliable baseline and real-time data that can inform planning and development of the industry. Equally public and private institutions are uncoordinated in driving the avocado value chain. This pillar therefore plans to establish infrastructure for collection of baseline data and real-time data as well as vibrant stakeholder and public institutions with strong linkages from the ward to the National level to provide sound basis upon which the industry shall be anchored. The institutions include avocado ward clusters, County Horticulture Technical Working Group and the National Horticulture Task Force.

4.5 Strategic Pillar No 1: Increase Production

Among the existing agricultural sectors, horticulture offers the best alternative for increased food self-sufficiency; food security; improved nutrition; foreign exchange earnings and ensuring the generation of increased incomes and employment. Avocado has lately become the most sort after cash crop earner replacing coffee and other traditional cash crops benefiting both farmers and the country. However, in order to further improve the margins, Kenya has to re-focus on enhancing production efficiency so as to meet the ever-growing demand – both locally and internationally. This can be achieved through the following strategies:

Strategic interventions 1: Establish 2 seedling varieties suitability trials for each avocado growing agro ecological zone: The strategy intends to support the farmer to grow the right varieties for specific market by providing information on the varieties required in the market. Information will be obtained through undertaking market survey to enable establishment of nurseries in the 7 economic blocks to supply the demanded high-quality varieties.

Strategic interventions 2: Increase the number of registered and certified nurseries from 264 to 528: In order to increase the supply of certified seedlings there is need to increase the number of certified nurseries by registering and certifying commercial nurseries. This is one area that can benefit the youthful population in the country. The strategy also aims to increase the number of certified seedlings from 5,720,840 to 11,436,000 by advocating for reduction in cost of certification and creating advocacy on seed certification with the involvement of certified institutions.

Strategic interventions 3: Increase average land size from 0.3 acres to minimum of 1 acre: The strategy aims to increase the viability of the smallholder avocado farming by ensuring each farmer has a minimum of 81 trees in an acre of land. This will be done through developing long-term land lease template, facilitating development of business plan and identifying suitable idle land for this earmarked long-term land lease.

Strategic interventions 4: Increase the number of harvested fruits per tree from 480 to 1000: by the sixth year through implementation of good agricultural practices. This will require TAs to be trained and linked to service hubs. The TAs will be required to train and support farmers implement the GAPs.

Strategic objective 5: Develop 35 new mother blocks in the seven economic blocs: Clean scion availability is critical for increased production of quality planting

materials. The strategy aims to support development of more mother blocks to avail the scions by improving and developing existing and new mother blocks through identification and mapping of sites for mother blocks establishment. Efforts will be made to promote variety selection from the registered mother blocks.

Strategic objective 6: Develop two improved varieties in the next 10 years: Avocado breeding is critical in developing varieties according to ecological zones. The strategy aims to develop two new varieties during the first seven years of the plan, through establishment of an avocado breeding program, by identifying traits of economic importance, develop recording and data evaluation system.

Strategic objective 7: Establish 1 regional Centre of excellence in each of the 7 regional economic blocs: Skills, knowledge, technology and attitude change through centres of excellence is critical in industry development. The strategy promotes development of a Centre of excellence in each of the 6 regional economic blocs to enhance practical training for Service Providers and VCAs through organizing sensitization meetings with the leadership of the 6 institutions, developing TVET curriculum, Training Modules & Assessment Tools. This will also include recruiting and train Technical Advisors (TAs) & Lead Farmers in skills and finally conducting follow up & Assessment of the TAs. The six Regional economic blocs are according to the Ministry of Devolution and ASALS, State Department of Devolution.

Strategic objective 8: Promote avocado skill training in 30 TVETS across the country and skill 14,453 TAs on Good Agriculture Practice: Skill development through TVET is critical in supporting knowledge-based graduates to improve practical farm productivity skills. The strategy aims at sensitizing selected TVET institutions to introduce Avocado curriculum and train TAs. The capacity needs of the identified TVETs will be assessed in order to determine the budget requirements for funding the TVET program. Training will be conducted to TAs and farmers depending on training needs.

Strategic objective 9: Link at least 200 avocado trees to a Private Technical Advisor: Farmers are making losses due to low productivity as a result of low skills in avocado orchard management. In order to improve access to production technologies, the strategy aims to link farmers to private Technical Advisors. Each hub shall set aside a fund for payment of the TA salary for first 2 years, and sustainable financing model will be implemented at each hub for paying of the TA thereafter. Part of the duties of TAs is to improve the production of older trees, and advise on types of integrated agriculture within the first three years of orchard planting to caution farmers.

Strategic objective 10: Establish 900 practical learning sites in avocado growing clusters: Demonstration farms also known as practical learning sites are critical in imparting practical skills to farmers for increased productivity. The strategy aims to support establishment of a lead farm in every ward in the 30 targeted counties to avail practical learning sites closer to farmers by visiting and assessing trained lead avocado farmers and upgrade the avocado farms to serve as teaching centers. Follow up & Assessment of farmer training by TAs will be done continuously.

Strategic objective 11: Link all the 180 clusters to at least 1 registered agro dealer: Access to quality and affordable inputs and services is critical in enhancing productivity. The strategy aims at ensuring each farmer is linked to a certified agro dealer working through the cluster management for supply of farms inputs. The agro dealers will be sensitized and trained and linked to TAs and clusters.

Strategic objective 12: Develop real time avocado industry data to improve accuracy from 60% to 90%: Real time data is critical in decision making, research, management, production and marketing in the avocado industry. The strategy aims to develop a county based digital management information system through developing and digitizing data collection tools and development of the data collection system. The data will be overlaid in the MIS with satellite imaging data.

Theory of change in avocado production

The thrust of increased production is based on changing extension service from farmer training to farm management approach. Technical Advisors (TAs) will be skilled to work with the farmers to manage over 200 trees each to ensure maximum production through GAP, access to services, financial and market linkages. The TAs will be skilled on GAP in Avocado production through the TVETS curricula that will be linked to centers of excellence based in universities. The TAs will be managed and paid by aggregation center management teams supervised by county government who will oversee and ensure quality of service. In addition, the strategy plans to ensure that the TAs are more versatile to support other value chains that farmers engage in. It is expected that the youthful population will benefit from the over 14,000 jobs to be created by the interventions.

4.6 Strategic Pillar No 2: Improve Market access of Avocado Products and Produce

The marketing pillar will ensure the availability of the volumes demanded by consumers and buyers according to their quality specifications as well as the development of Kenyan avocado brand. Currently the prime avocado market for Kenya is EU followed by middle East and Far East. From situation analysis, it is clear that the volumes traded is still low (287,781,735, tons). The purpose of the pillar is to increase volumes traded from 287,781,735 kgs to 715,896,000 Kgs. To ensure this pillar achieves its optimal purpose, here below are the strategic interventions, to address the marketing of the fruit for both local and international markets: –

Strategic intervention 1: To increase volumes traded from domestic market from 302,100,000 to 399,500,000Kgs.

To increase domestic demand, market survey will be done to know the customers, how much they demand in terms and the variety needed as well as the prices they are willing to offer. Business to business meetings will then be organized between cluster leaders and the potential buyers so that they can negotiate trading terms. Appropriate promotional campaign will be done to increase demand for avocado

Strategic intervention 2: Streamline distribution channels

This strategy plans to streamline the distributional channel by improve the distribution of avocado by setting up 180 smallholder wholesale hubs in all the 47 counties by 2027 -

complete with appropriate handling and storage facilities and equipment such as cool chains. A guideline on how to set up modern hubs will be developed and shared to improve business in the local markets. The existing and new avocado retailers will be facilitated to increase their sales quantities by running promotional campaigns through print, audio and social media on the benefits of avocado consumption and use as a cash crop.

Strategic intervention 3: Increase per capita consumption from 4.5 kg to 13kg:

To ensure increased traded volumes locally, the strategy aims to increase the per capita consumption from current approximate of 4.5kgs to 13kgs per person per year by 2030. This will be done through promotion of health benefits of avocado consumption, development and promotion of new avocado recipes and cuisines, development of new products and improved convenient packaging. The strategy plans to run awareness campaigns during county cultural weeks; through sports, radios and TV promotional scripts and social media platforms. Further, to improve availability of the fruit to all consumers, all outlets (informal and formal, small, medium, and large-scale retail) will be linked to aggregation centres. The informal traders include kiosks, street vendors and hawkers.

Strategic Objective 4: Increase the volume of exported Avocado from 64,477,082kgs to 362,140,000kgs:

The strategy plans to increase volumes exported through improved compliance to market requirements by facilitating training and access to GAPS, harvesting and post-harvest handling and storage technologies of avocados as discussed in production. This will be followed by targeted promotion of Kenyan avocado in the international markets through the BrandKE and various International conferences, trade shows and exhibitions. Kenya will also organize an international avocado trade fare annually to showcase the Country's avocado products and produce and to vigorously promote demand for Kenyan fruits while maintaining current markets. The strategy will ensure the State Department responsible for international trade initiates and conclude all trade agreements as well as provide trade attachés with enough avocado promotional materials.

Strategic objective 5: Enhance Product Presentation and Packaging:

The strategy plans to review and enforce regulations on packaging of avocados for export so as to reach the buyer in good condition. The strategy will also advocate for capacity building of exporters in on packaging, branding and labelling of products. The products will have mark of origin for traceability and ease of market penetration in the international market.

Strategic objective 6: Increase Number of Exporters from 94 to 156:

The strategy plans to increase the number of active exporters by flagging out business models to potential exporter and offering export readiness training. In addition, a facilitated survey will be conducted to establish factors affecting market access such as; information gaps, types of information on various platforms mostly visited by existing and potential clients, avocado products mostly demanded and any other information that may benefit exporters. The survey findings will also inform what needs to be changed, and how to tap into new markets and new products for export. The exporters will also undergo training in business skills and various market standards to improve efficiency thus reduce costs.

Strategic objective 7: enhancing trade facilitation to bring down cost of doing business: The current air and sea freight charges on Kenyan fruits are high due to lack of logistical support to exporters to enhance efficient movement of the fruit from farm to various market destination entry points. The strategy aims to develop close working relationship between shipping companies, Kenya Airports Authority, Kenya Ports Authority and SGR in order to move consignments efficiently to market destinations. The collaboration will also be extended to Kenya Revenue Authority, Kenya Power and Kenya Water to pursued them to maximize on all logistical cost for resources and review their fee and charges.

Strategic objective 9: Improve Traceability: The strategy will facilitate establishment of traceability system which will include all records of all activities carried out at the farm level through to the market. AFA as the regulator will ensure this is complied with.

Strategic objective 10: Facilitate market information flow: The strategy plans to improve dissemination of available market data and streamline the remote accessibility to data by all value chain actors. Such information may include the current and emerging global markets, production projections in major exporting countries; new market regulations; varieties required; quantities and prices offered. The strategy will also ensure avocado related portals are integrated to websites of line ministries, relevant departments and agencies such as KOMEX, Ken Invest portal, and relevant company websites among others.

Theory of Change in marketing

The thrust to improve marketing is based on changing the current way of doing business of farmers selling individually to forming of clusters for harnessing volumes and bargaining power. Increase the number of clusters from 4-180 to cover all avocado growing areas for ease access by farmers., Establishment of cool chain in all the 47 counties to improve distribution and hold more avocado health benefits campaigns to increase domestic consumption.

4.7 Strategic Pillar No 3: Improve Quality of Avocado

This pillar aims to enhance the Quality of the Avocado fruit for both domestic and international markets. Kenya's small share of the global trade (3.3%) is largely attributed to the quality issues.

The quality pillar will seek to ensure the issues affecting and hindering achievement of quality fruit are addressed through the following strategic objectives:

Strategic Objective 1: Increase the number of pruning equipment from 1 to 180 and introduce 257, 432 harvesting equipment: Post-harvest losses contribute to loss of income and revenues which can be prevented by, facilitating harvesters with harvesting poles, pruning equipment, training the harvesters on SOPs, and handling of the fruit.

Strategic Objective 2: Increase the number of available oil content testing kits from 2 to 180: The strategy aims to develop and implement a sampling and inspection protocol which will facilitate monitoring and harvesting of mature fruits. TAs will be facilitated with maturity testing kits and will be trained on their use. Farmers and

harvesters will be facilitated with harvesting kits and trained on SOPs for harvesting of the fruit.

Strategic Objective 3: Support 180 aggregation centers with post-harvest handling facilities: Quality starts from farm to market destination. To actualize this, the strategy aims to facilitate set up of post-harvest handling facilities at each aggregation Centre. This will be done through a feasibility study to be conducted to select appropriate sites in each cluster. The handling facility will contain and not limited to, a food grade holding shed, crates and refrigerated truck.

Strategic Objective 4: Increase number of post-harvest treatment facilities from 47 to 180: Treatment facilities are key in ensuring safe handling of the fruit. The strategy proposes to identify suitable sites for establishing the treatment facilities in each avocado producing Ward after conducting an impact assessment study. Many a times moisture loss contributes to reduced shelf life of the fruit. The facilities will also facilitate exporters with a sorting, grading and waxing machines.

Strategic objective 6. Create 30 Pest Free Areas in 7 regional economic blocs: The strategy aims to create pest free areas in the 7 regional blocks by holding awareness campaigns amongst stakeholders. The process will begin by conducting a baseline survey and mapping of avocado production zones. The strategy will then promote implementation of integrated pest management to minimize use of pesticides. Avocado orchards will be monitored to maintain pest free status and facilitate the certification of production sites as PFA. Common user packhouses will be facilitated to acquire post-harvest treatment facilities to eliminate quarantine pests of Avocado.

Strategic objective 7: Ensure 100% compliance to National food safety standards outlined in the KS1758 part 2 through certification of Avocado farms: Consumer safety has been advocated nationwide and by import countries. Compliance to pesticide residue maximum limits and microbial contaminants prevention are a key requirement to ensure safe fruit. The strategy intends to create awareness on compliance to national horticulture standards to comply with fruit safety requirements and enhance market access. producers and exporters will be required to be certified to KS1758 standard. The strategy in the implementation matrix has elaborated on the process by which the producers and exporters will be capacity built on how to comply to pesticide maximum residue levels as well as prevention of microbial contamination.

Theory of Change in improving avocado quality

The thrust is to improve quality of fruits through improving post-harvest handling by facilitating installation of 180 cooling facilities, increase number of pruning equipments to 180 and introduce 257, 432 harvesting equipment. All these will be stocked at cluster agro-store for easier accessibility by farmers. The financial institution will also prepare friendly products to enable farmers access loans to purchase some of this equipment and some will be owned by clusters to lease out to farmers at a fee.

4.8 Strategic Pillar No 4: Improve Processing of Avocado

This pillar aims to enhance avocado processing from current 21,575 kgs to 450,000 kgs per day, through increase of current capacities from 20% to 70%, increasing processing industries from 2-to-7 and cottage industries from 4-to-180. To achieve this goal, the following strategic objectives will be of essence to achieve the aspirations of this pillar.

Strategic objective 1: Increase volume of processed avocado from 21,575 kgs per day to 450,000 kgs per day: The strategy aims to achieve this intervention through characterization of avocado varieties to establish those suitable for oil processing. It will also promote establishment of nurseries propagating varieties with high oil content (>20%) and of 20% dry matter.

Strategic objective 2: Increase capacity Utilization from 20% to 70% by 2027: The avocado processing is currently under performing due to competition between fresh and processing volumes. The strategy aims to increasing the current capacity by developing a data-based production plan and volumes of raw materials required. The strategy will start by profiling all existing avocado facilities and offer them training on product improvement and link them to hubs and or aggregation centres.

Strategic objective 3: Increase the number of active processors from 2 to 7 by 2027: Kenya currently has two active processor. The strategy aims to establish a processor in each of the 7 economic blocs, starting in the 30 producing counties. The strategy plans first to conduct feasibility studies and environmental impact assessments for suitable sites, encourage participation of all stakeholders, and both national and county governments to provide incentives to the investors who may wish to establish avocado processing plants.

Strategic objective 4: Increase avocado products from 10 to 20 by 2027: The number of avocado products currently remain narrow and only include, oils, cosmetics, frozen avocado, avocado based yogurts, smoothies, puree (guacamole), salads and juices. The strategy intends to facilitate new product development initiatives. This will be achieved through product profiling, facilitating; feasibility study, establishment of a start-up fund, research on product development and promotion and campaigns of the new products.

Strategic objective 5: Increase the avocado cottages industries from 4 to 180 in the 30 suitable counties for avocado production by 2027: To ensure more volumes are absorbed into value-addition, the strategy aims to set up more cottage industries. It is hoped the cottage industries will be attractive to vulnerable groups and marginalized populations such as women and youth. The process will start by conducting a survey and profiling existing avocado cottage industries. It will further facilitate feasibility studies of the individual cottage industries and advertise for submission of start-up proposals to county governments. Furthermore, it will facilitate establishment of incubation and innovation centres by setting up a start up financing fund.

Theory of Change in avocado processing

The thrust is to improve processing of fruits through increasing utilization of the processors from 20% to 70%, increase avocado products from 10 to 20 and increase the avocado cottages industries from 4 to 180. All these will consume more avocados, and eliminate the gluts during peak season and diversify income streams of farmers.

4.8 Strategic Pillar No 5: Improving Profitability of Avocado Farmers

Smallholder farmers form the bulk of avocado production in Kenya. They are mainly motivated to growing avocados for a range of reasons and yet make minimal earnings.

The profitability pillar aims to facilitate and spur growth of these smallholder initiatives to commercially viable enterprises - by enabling all value chain actors to make profits at every stage of the industry. This will require a pricing model at each transfer point of the fruit along the value chain for the benefit of all, while minimizing costs associated with transfer and multiple handling of the fruit. The strategic objectives that will contribute to profitable enterprise are:

Strategic objective 1: Facilitate 257,432 Registered Farmers to increase their earning from a monthly loss of (45,695) to Profitability of 57,048 in year 6: The strategy aims to increase the profit of registered farmers by facilitating them to plant at least 81 certified seedlings to spur volume and number of fruits per day at year 6. To achieve this the farmers will be provided with technical support through an established farm management model.

Strategic objective 2: Establish Equitable Pricing of Avocado: To accomplish an equitable pricing model that will be beneficial for all value chain actors, the strategy aims at develop and implement an integrated data collection system capturing all costs for inputs and services at all stages of the value-chain. All actors will be trained on costing and pricing approaches so as to remain competitive.

Strategic objective 3: Minimize Avocado Enterprises Risks: The avocado farmers experience a lot of risks such as weather, price fluctuation, non-payments and produce rejections associated with production and marketing. The strategy will facilitate the development and implementation of financial services products for all value chain actors that incorporate insurance. The strategy will also facilitate access by avocado value chain actors to a commodity fund to be set-up.

Theory of Change in avocado profitability

The thrust is to increase profitability of farmers by working with known registered farmers – who will increase the number of trees owned to 81 per acre producing at least 1000 fruits per season, as well embracing the new price model which benefits everybody along the value chain.

4.9 Sustainability

The sustainability of the avocado promotion strategies will be achieved through a combination of a number of factors, most importantly the embedded demand driven participatory approaches factored in the implementation to promote ownership by beneficiaries.

Strengthening of value chain players will enhance their management skills and bargaining power. The strategy will focus on capacity development, including training the beneficiaries on aspects of crop management, quality requirements marketing, processing finance management and linkages. Suitable service providers, with experience in capacity

development and training for transformation will be identified and contracted to institute the process of participation and empowerment among stakeholders during implementation.

The institutionalization of a beneficiary contribution, the use of best service providers and reputable partners will minimize failure and sustain flow of outputs. A key issue to the strategy's sustainability will be the flow of additional resources and incomes to the resource poor communities which will be achieved through application of best practices and provision of wide range of options add value to sustainability in flow of resources. The strategy has been designed in such a way that the commitments of the beneficiaries are obtained from the outset, thus fostering a sense of ownership. The fact that clusters will assume ownership and responsibility of the infrastructure after construction, and will thus bear the responsibility for Operation and maintenance, will further sustain flow of project benefits.

4.10 Avocado Value proposition to investors

A value proposition is a statement that clearly identifies the benefits a company's products and services will deliver to its customers. A well-crafted value proposition will differentiate the company and/or its specific product or service in the marketplace and among a target market or target audience.

Avocado industry is one of the most important economic activities in Kenya providing 136,622 farmers and 1,233 registered dealers with income. The industry is characterized by small scale operations coupled with other farming activities at production while relatively larger operations at the exporter(s) level.

The industry currently contributes 7% of the Agriculture GDP and this proposition seeks to raise the contribution to 12% by 2030. To achieve this, avocado promotion strategy will open up opportunities across the value chain by introducing sustainable coordinated and appropriate interventions in production, produce quality, marketing and processing. These interventions shall have a well-streamlined, sustainable and commercially viable avocado value chain that will increase production volumes of quality fruits from 318,087 to 762,400 tons, volumes traded international market from 64,477 to 362,140 tons, volumes of processed avocado from 21.5 to 450 tons per day. The strategies shall lead to creation of 650,000 new direct and indirect employment opportunities therefore raising the social economic status of players and communities engaged directly and indirectly in avocado value chain.

The strategy will improve efficiency along in the value chain by setting up of hubs with centralized storage, packaging and strategically positioned sales points and setting up of real time Avocado information and dissemination platform for use by all industry players thus enabling data-based business decision making.

5.0 CHAPTER FIVE

5.1 Monitoring and Evaluation for Avocado Promotion Strategy

5.2 Monitoring

This will be a continues process of collecting, updating, analyzing and reporting on the performance of all parameters listed in the Vision data in Annex II. This will be done through a harmonized Avocado Promotion Information System which will be used to generate data reflecting the contribution of all stakeholders including national and county governments, and private sector towards the implementation of strategies outlined in the implementation matrix (Annex I) in fulfillment of this strategy. The data will be crucial for tracking the programs and /or projects' performances –towards the realization of this strategy. The system will also track financial resources and build an evidence-based structure for decision making.

The MIS system will be harnessed to covers all required data levels from the Ward, Sub-county, County and all the way to National level. This mode of delivering information will be efficient because data will be analyzed, interpreted and used at different points of collection and relayed to the various levels from the Ward to National aggregations for decision making and feedback.

To efficiently track programs and projects performance and resources to the interventions, a monitoring plan will be developed based on the Avocado Promotion goal, objectives, strategic pillar objectives, interventions and activities, based on output indicators as discussed in section three above. The county governments respective departments will be instrumental in actioning the monitoring plan particularly the agriculture committees with support from the NHTWG within the national government.

The monitoring plan will enable stakeholders to track routine and periodic indicators identified for the various activities and actions. It will essentially help Avocado promotion strategy implementers measure the processes, interventions, changes and successes accrued. The progress of implementation will be measured by monitoring and tracking output indicators throughout the life of the plan (see output indicators in the implementation plan 4.0). During the tracking progress, the relevant national and county officers will be able to periodically or when required report on the status of the interventions and accordingly provide feedback.

In addition, standard reporting formats will be developed to capture all the information and other significant events and outcomes within the target groups/counties. The county relevant department will be expected to provide quarterly information on the progress in the implementation of the planned activities and any achievements and /or challenges experienced.

5.3 Evaluations

In respect to evaluations, the State Department of Crops and Horticulture Crops Directorate will develop impact indicators to be assessed at the end of each five-year

implementation cycle. This would be external evaluations conducted by firms to be identified by key stakeholders. Findings of such evaluations will be made public and both national and county governments and private sector will be encouraged to implement the recommendations.

6.0 ANNEXES

Annex I: Implementation Matrix

The Implementation Matrix outlines how the strategic issues described in section three above will be carried out. The matrix is broken down into key strategic issues, objective, intervention, activities and output level indicators as related to each of the five complementary pillars. All the actions areas reference the vision and goal of this avocado promotion strategy – creating sustainable and profitable avocado enterprises

Implementation Matrix

Strategic Issue	Strategic Objective	Strategic intervention	Activity	Output	Output Indicator	Time Frame	Responsible Persons	Inputs Required	Units	Unit Cost KES	Total Cost KES	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5			
Foundation Pillar I: Avocado Data and Institutional Strengthening																			
Inadequate VC data, and coordination for implementation of avocado initiatives	Improve accuracy of avocado baseline data from 60% to 90%	Establish a system of collection of baseline and real-time data for avocado	Develop and pre-test data tools	5 sets of data tools validated	Online data tools	Oct-2020	MoALF&C, JKUAT, MIT&ED	Airtime, lunches, fare refund, DSA (officers, drivers)											
			Sub-Total										1,000,000						
			Collect baseline data and undertake data analysis	Baseline data collected	Report of the current status of avocado	Nov-20 to Mar 2021	MoALF&C, JKUAT, MIT&ED	Lunches, Airtime, transport Expenses											
			Sub-Total										153,000,000						
			Develop MIS platform for data analysis and dissemination of information	1 MIS platform	Operational MIS	Jan to June 2012													
			Sub-Total										10,000,000						
			Initiate continuous data collection	Real-time data collected	Accurate real-time data														
			Sub-Total										162,000,000						
Sub-Total Baseline Data Collection										326,000,000									
Strengthen and Establish structures and Coordination mechanisms at national and county levels	Establishment of coordination mechanism at national and county levels	Constitute committees at both levels of government	31 HTWG formed	Minutes of TWGS	Continuous	Agric, Trade, competent authorities, private sector	Lunches, meeting allowances, hire of venue, stationaries	1,488	2,000	2,976,000									
			1,488	4,000	5,952,000														
			124	5,000	620,000														
			1,488	500	744,000														
			Sub-Total Coordination										10,292,000						
			Organization of avocado VC players into clusters	Awareness creation	No. of awareness campaigns organized	Report on awareness and materials													
						Registration of value chain players by cluster	No. of value chain players registered	Database of all VC players											
Formation, election and training of cluster leaders	180 clusters formed	Credible and competent cluster mgt teams formed																	
Establishment of aggregation centres	Mapping and assessment of existing aggregation facilities	No. of and location of aggregation centres	Status report																
			Estimated cost of rehabilitation	Bill of quantities															
			Undertake rehabilitation of existing	54 facilities rehabilitated	Reports on facilities improved														

			aggregation centres facilities																
			Establish new aggregation centres according to manufacturing practices (GMP), GHP and GAPS	126 new aggregation centres constructed	Report of new facilities constructed														
			Mentorship of the leaders in record keeping, business plans development, financing mgt and marketing	1,080 mentorship sessions held	Improved efficiency of avocado business														
			Undertake on-site consultancy to improve production, marketing and financial systems for (SMEs) and institutions	No. of avocado SMEs and institution consulted	Consultancy report														
			Sub-Total establishment of aggregation centres													370,109,280			
		Establish sustainable financing system for aggregation Centre operations	Develop a financing services policy	1 policy developed	Policy documents														
			Establish a revolving fund account for each cluster	180 fund accounts operational	Final accounts														
			Develop online financial systems	1 financial system developed	Operational financial mgt system														
			Procure group insurance for credit advanced to VCAs	180 clusters insured	Insurance certificates														
			Sub-Total Establishment of a financing system													201,000,000			
		Capacity development of existing institutions	Implement government internship programmes	3,570 technical advisors cluster clerks	Report on the internship program														
			Sub -Total													1,071,000,000			
			Refresher programs on customer care and technical skills	20 trainings for 50 staff organized	No. of staff trained														
			Sub-Total													5,000,000			
			Strengthening existing and formation of national avocado BMOs	4 vibrant BMOs formed (nursery owners, producers, business	Registration certificates	1 year	MoALF&C, Trade, Interior, county govt	Radio airtime, forms, DSA, Transport, Elections of national officials											

			Provide guidelines for set up of wholesale hub	No. of standard wholesale hubs			SDT, MoALF&C,	Hall, DSA, stationaries											
			To increase the number of cool chain infrastructure to all 47 counties	47 cool chain hubs	Operational ized cool chain reports			Architctural design fee, Bill of quantity, Building fee											
		Increase per capita consumption from 4.5kgs to 13 kgs per person	Sensitization of consumers on the benefits of avocado	No. of sensitization forums	Per capita consumption average kgs of Avocado														
			Develop avocado recipes	No. of recipes developed															
		Enhance Avocado promotions campaigns	Design media messages	3 channels															
			Roll out of the campaigns	No. of campaigns held															
		Increase the volume of exported Avocado from 64,477,082 to 362,140,000 kgs	Organize an international avocado trade fairs and exhibitions in Kenya	1 annual trade fairs	Trade fair reports														
			Participate in international avocado trade fairs	5 international fairs	Reports														
			Support attaches on promotional materials	Facilitate international fairs and exhibitions															
			Negotiation of new markets for Kenyan avocadoes	No. of bilateral agreements signed															
		Increase the number of active exporters from 94 to 156	Assessment of dormant exporters	No. of exporters															
			Develop and share export business models	No. of business models developed															
			Undertake export readiness training	No. of potential exporters trained	Training reports														
		Enhance trade facilitation for avocado business	Organize meetings with trade facilitation agencies	No. of facilitated trade meetings															
		Enhance product	Improve the quality of	No. of exporters															

		presentation and packaging	packaging materials	implementing the standards																
			Facilitate reduction in cost of packaging materials	Report on cost of packaging materials zero rated																
			Implement mark of origin and branding																	
Sub-Total Enhance product packaging and presentation																				
Pillar II: Total Budget for Improved marketing																				
Pillar III: Increase Production																				
Inadequate volumes of avocado produced	To increase production capacity from 318,087,000 to 762,400,000 kgs	Match varieties demanded by the consumers with production	Undertake variety indexing for existing orchards	No. of avocado varieties confirmed	Report	Mar-May 2021	KALRO, KEPHIS Academic institutions	DSA for officers, drivers, lunches, fuel, maintenance, airtime	270 90 360 4,000 4,000 18	10,500 4,900 1,500 103 50 1,000	2,835,000 441,000 540,000 412,000 200,000 18,000									
		Sub-Total										4,446,000								
			AEZ suitability trials for demanded varieties	No. of suitability trials	Assessment tool	2021- to- 2025	MoALF&C, Trade, HCD, KALRO, KEPHIS	Land preparation, planting inputs, Labour (skilled and unskilled), Other materials, maintenance of nurseries	6 6 6 1,500 3,000 6 6 6 420	50,000 50,000 100,000 3,000 1,500 200,000 600,000 100,000 1,000	300,000 300,000 600,000 4,500,000 4,500,000 1,200,000 3,600,000 600,000 420,000									
		Sub -Total										15,720,000								
			Sensitization of experts on the new varieties	No. of sensitization forums	Reports			Conference facility, stationaries, fare refund, fuel, hire of LCD, pre-workshop preparation	60 60 20 20 1 1	2,500 150 2,000 103 3,000 46,900	150,000 9,000 40,000 2,060 3,000 46,900									
		Sub-Total										250,960								
			Introduce at least 2 new varieties	No. of introduced varieties	Demonstration sites		KALRO' Universities	DSA for officers, drivers' lunches, fuel, maintenance	540 270 270 4,000 4,000	10,500 4,900 1,500 103 50	2,835,000 441,000 540,000 412,000 200,000									
		Sub-Total										4,770,920								
			Awareness creation on the stakeholders on demanded and new varieties	No. of awareness forums	Report		MoALF&C, Trade, HCD, KALRO, Counties	DSA for officers, drivers' lunches, fuel, Maintenance, conference facility, stationaries, fare refund, hire of LCD	180 60 4,000 200 60 60 60 30	10,500 4,900 103 1,000 2,500 150 2,000 3,000	1,890,000 294,000 412,000 200,000 150,000 9,000 120,000 90,000									

			Sub-Total										3,165,000							
			Link producers to other value chain actors	No. of linkages formed	Reports		HCD, Counties TAs	Done concurrently with other activities												
			Capacity build producers on business plans	No. of trainings held	Reports		Trade, Counties TAs	Lunches DSA for officer/drivers fuel	600 150 140	1,500 4,900 103	900,000 735,000 14,420									
			Sub-Total										1,649,420							
			Sub-Total Increase land under avocado										4,814,420							
		Increase harvested fruits per tree from 480 to 1000	Develop a GAP mgt program	1 GAP mgt program	Report		HCD, KEPHIS MoALF&C, KALRO,	DSA for officers, drivers, lunches, fuel, conferece facility	180 60 4,000 200 60	10,500 4,900 103 1,000 2,500	1,890,000 294,000 412,000 200,000 150,000									
			Sub-Total										2,946,000							
			Capacity build TAs on GAP mgt	No. of TAs trained	Report		HCD, KEPHIS MoALF&C, Centre of Excellence,	DSA for officers, drivers, Hire of LCD Stationaries, fare refund	180 60 30 60 60 30	10,500 4,900 3,000 150 2,000 3,000	1,890,000 294,000 90,000 9,000 120,000 90,000									
			Sub Total										2,493,000							
			Support implementation of GAP program	No. of training done	Report		HCD, KEPHIS MoALF&C, Counties TAs,	DSA for officers, drivers' Accommodation, fuel, Maintenance, demo materials, conferece facility, stationaries, fare refund, hire of LCD	900 30 180 1 1 600 600 42 10 10 50	3,000 3,000 300 100,000 100,000 103 50 10,500 4,900 8,400 2,500	2,700,000 90,000 54,000 100,000 100,000 61,800 30,000 441,000 49,000 84,000 125,000									
			Sub-Total										3,834,800							
			Sub-Total Increased number of fruits per tree										9,273,800							
		Develop 35 new mother blocks in seven economic blocks	Review existing selection criteria for mother block land	Selection criteria developed	Report		HCD KALRO	DSA for officers, drivers', SS conferece facility, hire of LCD fuel	30 6 6 8 5 100	10,500 4,900 8,400 2,500 3,000 103	315,000 29,400 50,400 15,000 10,300									
			Sub-Total										440,100							
			Identify and select qualified applicants	No. of applicants	Report		MOALF HCD Private sector	No cost												
			Registration of mother blocks	Suitable land	Certificate		HCD Counties	Lunches Fuel	30 1,440	2000 103	60,000 148,320									
			Sub Total										208,320							
			Certification of mother blocks	Identified	Certificate		KEPHIS Counties	Lunches Fuel	30 1,440	2000 103	60,000 148,320									
			Sub-Total										208,320							

		Establishment of mother blocks	No. of mother blocks established			KEPHIS Counties KALRO HCD	Land preparation Inputs Labour (skilled & unskilled Other materials Nursery maint Orchard maint	7 7 500 700 7 7 7	30,000 100,000 500 1,000 50,000 300,000 500,000	210,000 700,000 250,000 700,000 350,000 2,100,000 3,500,000						
		Sub-Total								7,810,000						
		Sub-Total Development of Mother blocks														8,666,740
	Breeding two new avocado varieties in the next 10 years	Selection of parental material	No. selected	Preferred Genotype		KALRO	DSA for officers, drivers' SS Fuel Fuel Airtime	42 10 10 840 840 10	10,500 4,900 8,400 103103 1,000	441,000 49,000 84,000 86,520 86,520 10,000						
		Sub-Total								757,040						
		Establish breeding programs on site	No. of programs	Reports		KALRO	Land preparation Inputs Labour (skilled & unskilled Other materials Nursery maint Orchard maint	1 1 500 1,000 1 1 1	50,000 200,000 500 2,000 700,000 500,000 1,000,000	50,000 200,000 250,000 2,000,000 700,000 500,000 1,000,000						
		Sub-Total								4,700,000						
		Under take area wide field trials	No. of field trials conducted	List of potential varieties for release		KEPHIS Counties KALRO HCD	Land preparation Inputs Labour (skilled & unskilled Other materials Nursery maint Orchard maint	30 30 200 500 30 30 30	20,000 100,000 500 200 50,000 200,000 500,000	600,000 3,000,000 100,000 100,000 1,500,000 6,000,000 15,000,000						
		Sub-Total								26,300,000						
		Convene experts review forum to share results	No. Varietal approved	Approved varieties for release		KALRO HCD	Conf. exp Stationaries Fare refund, Fuel Hire LCD Pre-workshop	60 60 20 20 1 1	2,500 150 2,000 103 3,000 46,900	150,000 9,000 40,000 2,060 3,000 46,900						
		Sub-Total								100,960						
		Varietal release to certified multipliers	No. of seedlings purchased	Report		KEPHIS KALRO MOALF	Conf. exp Stationaries Fare refund, Fuel Hire LCD Pre-workshop	60 60 20 20 1 1	150 2,000 103 3,000 46,900	,000 40,000 2,060 3,000 46,900						
		Sub-Total								100,960						
		Sub-t-Total Breeding of 2 new avocado varieties														31,958,960
	Facilitate establishment of I regional Centre of excellence in each of the 7 economic blocks	Develop criteria in selecting institutions as centres of excellence	Criteria	report		Counties HCD MOALF	DSA for officers, drivers', SS conference facility, hire of LCD fuel airtime	30 6 6 6 8 5 100	10,500 4,900 8,400 8,400 2,500 3,000 103	315,000 29,400 50,000 20,000 15,000 10,300 10,000						

		Development of curriculum for YVETS	No. of training programs	Curriculum developed				HCD MOALF&C Trade KEPHIS Min Education Counties	DSA for officers, drivers', SS Conf Exp Hire of LCD Fuel Airtime	108 21 14 23 5 140 10	10,500 4,900 8,400 2,500 3,000 103 1,000	1,134,000 117,600 57,500 15,000 14,420 10,000							
		Sub-Total										1,451,420							
		Facilitation of TVETs to undertake training	No. of actors trained	Report				MOALF&C Min Education	Funds	30	6,000,000	180,000.000							
		Sub-Total										180,000,000							
		Sub-Total Facilitate avocado skill training in TVETs										183,279,800							
		Total Budget for Improving Avocado production										316,556,228							
		Pillar II: Total Budget for Processing																	
Limited processing capabilities and capacities	To increase volumes of processed avocado from 21,575 kgs/day to 450,000 kgs/day	Improve access to raw materials	Asses variety required for processing	7 Assessment Report															
			Sensitization of SME processors on available suitable processing varieties	7 sensitization forums	Report														
			Sub-Total																
			Organize B2B forums between Aggregation centres processors for suitable	30 forums	Report														
		Sub-Total																	
		Sub-Total Improved access to raw materials for processing																	
		Reduce trade facilitation barriers	Convene forums for trade facilitation Stakeholders to review and elimibnate technical barriers to trade	1 meeting held	Minutes of meeting														
				Sub-Total															
		Sub-Total Reduce trade facilitation barriers																	
		Enhance compliance to industry standards	Develop/ review industry guidelines	1 guideline developed	Guideline document														
Sub-Total																			
Sensitize processors on guidelines	1 sensitization			Report															
Sub-Total																			
Sub-Total Enhance compliance to industry standards																			

		To increase the No. of avocado cottages industries from 4 to 180	Conduct survey and profile cottage industries	1 survey conducted	Feasibility report on avocado cottage industries													
			Sub-Total															
			Facilitate feasibility study	1 study														
			Sub-Total															
			Organize start-up competition	No of start-up competition organized	Report start-up competition													
			Sub-Total															
			Set up avocado incubation and innovation centres	No of incubation centres	No of operationalized incubation centres													
			Sub-Total															
		Sub-Total Increase the number of cottage industries																
		Increase the range of avocado products from 10 to 20	Profile current products	No of processed products	Profiling report													
			Sub-Total															
			Prepare a call for avocado product development	No of proposals	Approved proposals													
			Sub-Total															
			Facilitate development of product	No of new products developed	products													
			Sub-Total															
			Facilitate awareness of new products with potential investors	forums	Reports													
			Sub-Total															
		Improve access to raw materials	Promote increased production of varieties suitable for avocado processing	No of varieties identified	Characterization of avocado varieties for processing													
			Sub-Total															
				No of mother blocks with processing varieties	Increase the no of mother blocks for varieties such as Duke variety													
				Avocado processed in kg/day	Increase production of duke variety by sensitizing farmers to													

				plant more of them														
			Sub-Total															
	Increase installed capacity utilization from 20%to70%	Develop data-based production plans	Daily processing capacity per processor	Facilitate avocado baseline survey														
		Sub-Total																
			Environmental impact assessment report	Facilitate environmental impact assessment														
		Sub-Total																
			Compliance to industry standards report	Facilitate compliance to industry standards														
		Sub-Total																
	To increase the No of active processors from 2 to 7	Facilitate establishment of one avocado processing plant in each of the 6 economic blocks	Feasibility study report	Facilitate feasibility study														
			Feasibility study report	Facilitate feasibility environmental impact assessment														
		Sub-Total																

Total Budget for Improving avocado Processing

Pillar IV: Improved Quality

Low compliance to quality and market standards from	To improve compliance to quality and market standards	Increase the number of pruning equipment from 1 to 180 and introduce 257.432 harvesting poles	Procurement of harvesting equipment	179 sets of pruning and harvesting equipment	Report on equipment distributed	Year 2	MOALF&C HCD	Pruning equipment Harvesting poles	179 257,432	10,000 7,000	1,790,000 1,802,024,000									
		Sub-Total										1,803,814,000								
			Training of TAS	List of beneficiaries and trained TAS	Responsibilities of beneficiaries and trainees			MOALF&C HCD County governments	DSA/Conference Fuel	1,180 3,000	13,000 110	15,340,000 330,000								
		Sub-Total										15,670,000								
		Sub-Total Introduce pruning and harvesting equipment										1,819,484,000								
		Increase the number of available oil content testing kits from 2 to 180	Procure oil content testing kits	208 kits bought	Procurement documents, Kits in use reports			MOALF&C HCD County Govt	Testing equipment	178 60	450,000 8,400	80,100,000 504,000								
		Sub-Total										80,604,000								
			Distribution and capacity building users	178 TAS trained	Report of training								- - -							
		Sub-Total										80,604,000								
		Sub-Total Procurement of Avocado Oil Testing Kits										80,604,000								

		Support 180 aggregation centres each with one post-harvest handling facility	Develop designs for post-harvest handling facility	1 design for post-harvest facility developed	Designs and bills of quantity for facility		MOALF&C HCD County Government	Conference	7	13,000	91,000							
			Sub-Total								91,000							
			Procurement and installation of equipment	180 post-harvest facility developed	Tender Documents, Tender Documents,			Hot water Treatment	180	5,000,000	900,000,000							
								Waxing equipment	180	13,000,000	2,340,000,000							
			Sub- Total								3,240,000,000							
			Test run of equipment	180 operational equipment	Reports			4 runs per Centre	720	10,000	7,200,000							
			Sub-Total								7,200,000							
			Training of the operators/ technicians	900 technicians trained	Training report			5 per Centre	900	7,400	6,660,000							
			Sub-Total								6,660,000							
			Sub-Total Establishment of Post-harvest Treatment facilities									3,253,951,000						
		Installation of post-harvest treatment facilities from 47 to 180 (hot water)	Develop designs for housing structures	133 designs and BQs developed	Design report Bill of quantities		NG, CG, HCD Private sector Consultants	Conference DSA Airtime	7	13,500	94,500							
			Sub-Total								94,500							
			Construction of housing units for post-harvest facilities	133 units constructed	Completion report	5 years	NG, CG, Private sector HCD Consultant				-							
			Sub-Total								-							
			Test run of equipment	39 test runs conducted	Operationalized equipment	3 years	HCD, NG, CG, Consultants	Consumables	399	10,000	3,990,000							
			Sub-Total								3,990,000							
			Training of the operators/ technicians	665 technicians trained	Training report			Conference DSA	665	7,400	4,921,000							
			Sub-Total Installation of Post-Harvest handling facilities									9,005,500						
		Create 15 pest Free area of low pest prevalence	Constitute technical team	8-member team constituted	Letters of appointment		NG, CG, HCD, KALRO, KEPHIS	DSA Fuel	240 3,000	8,400 110	2,016,000 330,000							
			Sub-Total								2,346,000							
			Awareness creation for farmers and county technical team	Number of actors sensitized	Reports						-							
			Sub-Total								-							

			Procurement of pests	142,800 traps bought	Procurement documents			Pest control traps	142,800	400	57,120,000						
			Pest Control Products														
			Sub-Total								57,120,000						
			Distribution of pest control products	142,800 traps distributed	Report on beneficiary farmers			DSA	240	8,400	2,026,000						
								Fuel	3,000	110	330,000						
			Sub-Total								2,346,000						
			Monitoring Pest populations	35,686 acres of low pest prevalence area created	Surveillance report			DSA	240	8,400	2,016,000						
								Fuel	3,000	110	333,000						
			Sub-Total								2,346,000						
			Sub-Total for creation of Low Pest Prevalence Areas										64,158,000				
		Ensure 100% compliance to national food safety KS 1758- part 2	Create awareness	Number of farmers actors sensitized	Report on awareness materials			KEPHIS, HCD, KALRO, Universities CABI, ICIPE, NMK	DSA	540	8500	4,590,000					
								Fuel	18,000		1,980,000						
			Sub-Total								6,570,000						
			Prepare farmer groups for audit	180 of groups identified and prepared	report			Conference	300,000	180	54,000,000						
			Sub-Total								54,000,000						
			Recruit audit firm and auditing	Audit firm identified	Tender documents audit reports			Procure firm	300,000	180	54,000,000						
			Sub-Total								54,000,000						
			Certification to KS 1758	180 of certified group	certificates			Certificates	70,000	180	12,600,000						
			Sub-Total								12,600,000						
			Sub- Total Improved Compliance to Standards										127,170,000				
			Total Budget for Improving Quality of Avocado										5,354,372,500				
Pillar VI: Improved avocado industry Profitability																	
Low profitability along the value chain	To improve profitability of value chain actors to 5%	Improve efficiency and productivity along the value chain	Conduct value chain profitability assessment	No of value chain nodes assessments done	Value chain assessment report												
			Sub-Total														
			Sub-Total for improving efficiency and productivity														
		Establish equitable pricing along the value chain	Develop a pricing models/software that factors cost of production and services along the value chain	1 model/software	Operational software												
			Sub- Total														
			Analysis of data of production and services														

			along the value chain															
			Sub-Total															
		Sub-Total establishment of equitable pricing along avocado value chain																
		Facilitate farmers to reduce the period of return on investments from 6 years to 4 years	Link farmers to Tas for intensive management of avocado															
			Sub-Total															
			Sensitize on the use of skilled service providers															
			Sub-Total															
		Sub-Total for reduction of period on return on investment																
Total Budget for Improved Profitability																		
Grand Total Implementation of avocado Strategy																		

Annex II: Value Pro-Position to Investors

Value Proposition to Farmer Monthly Profit of Kes 57,047.54						
Input/ Output	Units	Number of Tress	Number of Fruits per Tree	Total number of Fruits	Price per unit	Total revenue
NUMBER OF AVACADO FRUIT	NUMBER	81	1000	81000	10	810000
AVACODO LEAVES						
Total Revenue	ksh		0			
B. COST OF PRODUCTION						
1: Cost of intermediate inputs						
land hiring	0.81				10000	8100
Soil Analysis	0				2000	0
WATER ANALYSIS	0				600	0
land preparation	0				2500	0
Herbicide	0				1000	0
herbicide application(man day)	0			1	300	0
making holes(PW)	0	81			50	0
manure(KG)	10	81			1.5	1215
manure transport	1				500	500
Fertilizer(kg)						
TSP	0.225				40	9
CAN	0.225				60	13.5
Foliar	0.12	81			1000	9720
Labour	1				425	425
seedlings	0	81			150	0
Transport seedlings	0	81			10	0
fungicide	0.12	81	0		2000	19440
planting (pw)	0	81			5	0
STAKING(MD)	0				425	0
weed control	4				425	1700
irrigation(litres)	20	81		210	0.01	3402
labour (MD)	1				425	425
pegging	1		2		425	850
FCM TRAPS	1			0	300	0
fruit fly traps	1			0	300	0
pesticide	0.12	81	0	0	1500	14580
maturity test	1				300	300
security	2				12750	25500
harvesting	1			81000	0.1	8,100
TISSUE TESTING	1				14000	14,000
prunnig-once	1				425	425
sorting	1			20.25	500	10,125
transport	1			20.25	500	6,600
Total Cost						125,430
PROFIT						684,571
MONTHLY PROFIT/LOSS						57,047.54

Value Proposition to Exporters		
Stakeholder	Price	Percentage
Farmer	40	20%
Bulking Agent	5	3%
County Cess	0.7	0%
Transporter	5	3%
Pack house	10.5	5%
Packaging	16.25	8%
Exporter Margin	85	43%
Freight cost (sea)	22.25	11%
Documentation	5	3%
Marketing	10	5%
Consumer	200	100%
Importer Price	200	100%

Value Proposition to Technical Advisors (Earnings Kes 62500 per Month)		
Stakeholder	Price	Percentage
Farmer	37	19%
Bulking Agent	15	8%
County Cess	0.7	0%
Transporter	5	3%
Pack house	10.5	5%
Packaging	16.25	8%
Exporter Margin	36	18%
Technical Advisor	20	10%
Freight cost (sea)	22.25	11%
Documentation	5	3%
Marketing	10	5%
Consumer	178	89%
Importer Price	200	100%

Value Proposition to Agro-dealers							
Cost of intermediate inputs	Y1	Y2	Y3	Y4	Y5	Y6	Total
Herbicide	78,406,853						78,406,853
TSP	470	470,441	6	705,662	705,662	705,662	1,057,873
CAN	705,662	705,662	9	1,058,493	1,058,493	1,058,493	4,586,810
Foliar	762,114,608	762,114,608	762,114,608	762,114,608	762,114,608	762,114,608	4,572,687,650
Fungicide	1,524,229,217	1,524,229,217	1,524,229,217	1,524,229,217	1,524,229,217	1,524,229,217	9,145,375,301
Pesticide	1,143,171,913	1,143,171,913	1,143,171,913	1,143,171,913	1,143,171,913	1,143,171,913	6,859,031,476
Total							20,661,145,963

Value Proposition on Machinery		
Parameter	Target 2027	Vision 2027 investment budget Kes
Number of pruning/harvesting machine	180	900,000,000
Harvesting machine and pole	257,432	514,864,431
Number of bulk coolers (tons) packhouses	180	3,420,000,000
Number of farm cooling facilities	257,432	28,000
Mobile coolers	180	1,800,000,000
Maturity testing kit	180	180,000,000
Number of post harvest treatment facilities (export)	180	3,600,000,000
Total		10,414,892,431

Value Proposition Job Creation 342.723 Direct and Indirect		
Type of Employment	Section	Jobs Created
Employment Manual	Land preparation	1,361
Employment Manual	Herbicide application(MD)	163
Employment Manual	Making holes (PW)	2,205
Employment Manual	Labour	1,157
Employment Manual	Planting (PW)	220
Employment Manual	Staking (MD)	231
Employment Manual	Weed control	3,933
Employment Manual	Labour (MD)	1,157
Employment Manual	Pegging	1,851
Employment Manual	Harvesting	8,820
Employment Manual	Pruning	925
Employment Manual	Sorting	11,025
Employment Technical	Technical Advisors	14,453
Employment Technical	Number of Agro-dealers	360
Employment Technical	Number of active avocado processors	450
Employment Technical	Number of cottage avocado SMEs	540
Employment Technical	number of avocado Coops/clusters/farm associa	1,800
Employment Technical	Mobile coolers	360
Employment Technical	Number of bulk coolers(packhouse	360
Employment Technical	Registered marketing agents	33
Employment Technical	Total number of registered exporters	156
Employment Technical	Number of active exporters	
Employment Technical	Number of clearing and forwarding agents	5
Employment Technical	Number of distributors (local markets	233
Employment Technical	Open markets	180
Employment Technical	Number of groceries (supermarkets)	254
	Farmers	257,432
Total		309,664

Annex III: Production and Value of Avocado in selected Counties - 2017 – 2018

County	2017			2018			% of total
	Area (Ha)	Volume (Tons)	Value (Ksh)	Area (Ha)	Volume (Tons)	Value (Ksh)	
Murang'a	4,319	120,645	2,537,654,000	4,321	123,555	2,543,873,660	42.6
Kiambu	1,505	29,004	570,675,000	1,819	37,964	682,031,000	11.4
Kisii	1,529	31,383	497,573,500	1,532	28,830	429,530,000	7.2
Nyamira	1,474	28,435	298,640,199	1,482	29,280	309,280,000	5.2
Bomet	379	6,786	118,710,000	474	10,590	217,800,000	3.6
Embu	692	13,180	195,000,000	709	14,543	216,525,000	3.6
Meru	743	15,253	225,268,512	755	8,553	209,966,667	3.5
Bungoma	268	3,802	105,552,100	299	6,028	201,320,000	3.4
Kirinyaga	433	5,282	120,532,000	367	5,892	147,040,000	2.5
Nyeri	176	2,268	31,222,748	584	5,784	112,702,064	1.9
Makueni	332	3,073	100,087,500	335	3,078	100,187,500	1.7
Taita Taveta	177	6,888	62,071,660	180	9,183	85,129,940	1.4
Vihiga	292	2,105	45,660,000	389	4,554	83,705,000	1.4
E Marakwet	321	3,200	74,761,658	371	3,493	80,950,035	1.4
Homabay	263	2,176	68,770,000	299	2,061	71,070,000	1.2
Migori	457	7,477	160,987,500	315	3,284	67,684,200	1.1
Nandi	117	1,652	49,941,500	127	2,073	56,581,000	0.9
Baringo	180	2,438	49,440,000	202	2,760	56,000,000	0.9
Kericho	88	1,456	43,980,000	93	1,554	45,885,000	0.8
Nakuru	116	1,464	36,369,000	371	1,664	42,140,000	0.7
Narok	135	1,071	38,260,000	155	1,519	34,130,009	0.6
Machakos	526	3,467	104,964,000	298	2,280	33,925,000	0.6
Others	521	1,632	42,195,603	713	6,280	76,964,153	1.3
Total	15,353	297,122	5,638,000,680	16,501	318,087	5,972,104,428	100.0

Source: Horticultural Crops Directorate report 2018

Annex IV: Kenya exports Fresh and Dried Avocados (2014-2018)

SN	Importers	Value exported in 2018 (USD thousands)	Share in Kenya's export (%)	Growth in Exported value between 2014-18 (% , p, a)	Estimation of untapped potential trade, USD thousands
1	Netherlands	44,247	37.2	33	61,996
2	United Kingdom	2,191	1.8	22	11,629
3	Norway	1,255	1.1	32	7,982
4	Switzerland	564	0.5	19	5,785
5	Germany	6,973	5.9	28	3,960
6	USA	-	-	-	3,792
7	Japan	-	-	-	3,179
8	Sweden	1	-	-	2,860
9	Finland	639	0.5	51	2,235
10	Spain	10,338	8.7	46	1,715
11	Canada	-	-	-	996
12	Australia	-	-	-	911
13	China	-	-	-	694
14	Poland	39	-	-	670
15	Morocco	929	0.8	41	474
16	Ireland	1,008	0.8	102	419
17	Oman	-	-	-	413
18	Korea Republic	-	-	-	410
19	Denmark	3	-	-	391
20	Italy	9	-	-	363
22	Thailand	-	-	-	325
23	South Africa	-	-	-	262
24	Latvia	-	-	-	243
25	Czech Republic	-	-	-	136
	Total	119,074	100	29	113,241

Annex V: Profit and Loss Margin Analysis

Input/Output	Units	Number of Tress	Number of Fruits Per Tree	Total number of Fruits	Price per unit	Total revenue
Number of Avocado Fruit	Number	15	300	4500	5	22500
Total Revenue	ksh		0			
Cost of Production						
Cost of intermediate inputs						
Land hiring	0.125				10000	1250
Soil Analysis	1				2000	2000
Water Analysis	1				600	600
Land preparation	0.125				2500	312.5
Herbicide	0.125				1000	125
Herbicide application(man days)	1			1	300	300
Making holes(PW)	1	15			50	750
Manure(KG)	20	15			1.5	450
Manure transport	1				500	500
Fertilizer(kg)						
TSP	0.15				40	6
CAN	0.15				60	9
Foliar	0.12	15			1000	1800
Labour	1				425	425
seedlings	1	15			150	2250
Transport seedlings	1	15			10	150
Fungicide	0.12	15	0		2000	3600
planting (pw)	1	15			5	75
Staking(MD)	1				425	425
Weed control	1				425	425
Irrigation(litres)	20	15		210	0.01	630
Labour (MD)	1				425	425
Pegging	1		2		425	850
FCM TRAPS	0.125			4	300	150
Fruit fly traps	0.125			4	300	150
pesticide	0.12	15	0	0	1500	2700
maturity test	1				300	300
security	2				12750	25500
harvesting	1			4500	0.1	450
Tissue Teasting	1				14000	14,000
Prunnig-once	1				425	425
Sorting	1			1.125	500	563
Transport	1			1.125	500	6,600
Total Cost						68,195
Profit						-45,695
Monthly Profit/Loss						(3,807.92)