

**DEISS**

CONSULTING AND  
TRAINING GROUP

# AVOCADO

INVEST IN BIODIVERSE ASSETS

## DISCLAIMER

THIS DOCUMENT IS NOT TO BE COPIED, DISTRIBUTED OR FORWARDED TO ANY PERSON OTHER THAN THE RECIPIENT. ANY FURTHER DISTRIBUTION, FORWARDING OR REPRODUCTION OF THIS DOCUMENT IN WHOLE OR IN PART IS UNAUTHORIZED. FAILURE TO COMPLY WITH THIS DIRECTIVE MAY RESULT IN A VIOLATION OF THE SECURITIES ACT.

## **AVOCADO – Invest in biodiverse assets**

- Avocado Market Value
- Avocado Insights and Opportunities
- Avocado Challenges
- Why Invest in Avocados?
- Why Limit Customers' choices to only a few Avocado Varieties?
- Avocado Recipes
- Avocado Health Benefits
- Honeybees Pollinate Avocado Trees
- Avocado Lifecycle
- Avocado Grafting Options
- Reading Avocado Leaves
- Recommendations
- Investment and Return (Use Case Example)
- Research



# AVOCADO MARKET VALUE

The global avocado market was valued at over US\$ 15.9 billion in 2023, and is forecast to reach to more than US\$ 30 billion by 2030. The global [avocado market](#) has grown due to its marketing as a healthy dietary option and a good source of healthful monounsaturated oil.



# AVOCADO INSIGHTS AND OPPORTUNITIES

- The global annual avocado consumption at nearly 5 million tons.
  - The global avocado market value is projected to reach USD 15.9 billion by 2027.
  - Avocado trees can live much longer than other fruit trees. Mexico has avocado trees as old as 400 years of age.
  - Avocado flesh can contain up to 30% oil; the seed holds  $\approx 2\%$  (proteins of up to 4%); and the skin  $\approx 7\%$  oil.
  - There are over 30 different varieties of avocados found in Zambia. Why limit customers' choices to only a few avocado sorts?
  - Avocado honey is one of the most mineral rich honeys on the planet. And the largest beekeeping area worldwide is in Zambia, with 5.2 million hectares.
  - The fruit of happiness. The brain-loving bundle of nutrients in avocado fights fatigue, boosts energy levels and elevates a low mood.
  - Avocado raw material has many uses in the food, pharmaceutical, cosmetic, textile, and other industry sectors for different end-products.
- Avocados are among the world's healthiest fruits
  - Avocados are the most iconic foods of the twenty-first century
    - Vegan friendly
    - Plant-based diets
    - Paleo-friendly (Paleo diets)
    - Carbohydrate restricted diets
    - Vegetarian friendly
    - Gluten-free
    - Low-salt diets.

# AVOCADO CHALLENGES

- 3 in 5 avocado species face the highest risk of extinction.
- Over 8% of the world's plant seeds, such as avocado, cannot be conserved if current preservation methods are not updated.
- Avocado trees produce up to a million flowers, but only 200-300 flowers per tree and season will hold and develop to maturity and harvest.
- The average post-harvest loss of avocado at the producer level was estimated at 24.1%, of which 5.7% was due to poor harvesting practices and 4.9% to poor storage practices.
- Growing an avocado tree requires patience. Avocado trees can take 5-12 years before you see the first fruit.
- Mexico produces more than 40% of the total global production of Hass avocado, and Hass avocado is 95% consumed in the United States.
- Avocado production drove 30-40% of recent deforestation in Michoacán, Mexico.
- The biggest challenge is sustaining the avocado plant's growth. Challenges include nutritional imbalance, environmental factors, improper pollination or fertilisation, water, pests, disease, invasive alien species, and other animals.
- The EU will set up a compulsory certification system for raw materials entering the European market.
- A UNESCO report showed avocados have a global average water footprint of 1,981 m<sup>3</sup>/ton.

# WHY INVEST IN AVOCADO?

**RETURN ON INVESTMENT:** The sale of avocados can provide a double-digit, uncorrelated source of income.

Representing a return of 34.9% on the total cost of production and marketing.

**HEALTH BENEFITS:** Scientific studies have proven that avocado fruit is beneficial for anything, including cancer, arthritis, liver health, and weight loss.

**LEAVE A LEGACY:** A legacy is to plant an avocado tree that will bear fruit for 200 to 400 years.

**BLOCKCHAIN TECHNOLOGY:** Blockchain technology already exists in the avocado sector, and investors continue exploring opportunities to make a difference in the world through innovation and technology towards creating a more sustainable and equitable planet.

**END PRODUCT:** Avocado raw material has many uses in the food, pharmaceutical, cosmetic, textile, and other industry sectors for different end products.

**JOB CREATION:** There are immense job creation opportunities in the avocado business sector, from avocado farming to selling trees, avocados, raw materials, and avocado honey.

**AVOCADO HONEY:** One of the most rare and mineral rich honey on the planet.

Honeybees are among the most helpful avocado tree pollinators. Therefore, many create additional revenue streams with avocado honey during avocado tree growth phase.

**GREEN ENERGY:** Some Zambian avocado farmers are green energy farmers and make avocados even greener by using solar to pump water from the reservoirs into the farm to water the avocado fruit trees and cash crops. The solar panels also light the farm and power all the machines.

**LOCAL DEMAND:** Due to not being able to meet the local demand for exotic Zambian avocados, Zambia imports avocados from Zimbabwe.



# WHY LIMIT CUSTOMERS' CHOICES TO ONLY A FEW AVOCADO VARIETIES?

Though industry experts estimate Zambia has over 30 avocado types, the Zambia avocado industry is still unexplored and running on a tiny scale where most farmers are informal with very little know-how, thereby deriving little income.

Still, when Zambian farmers looked at how Kenya and South Africa benefitted from the avocado industry, some began planting the Fuerte, Pinkerton, and internationally recommended Hass varieties, which became common Zambian avocado varieties.

However, why limit customers' choices to only a few avocado varieties? According to a study in the journal *Natural Human Behaviour*, researchers at Caltech determined that somewhere between 8 to 15 is the optimal number of choices.

Some may argue that fewer choices are preferable, while others suggest it depends on the decision you are making and what you want to eat. Though many will probably agree that having one or two options is not ideal.

Zambian avocados' USP (Unique Selling Proposition) can be to offer international market options.

SALES PROPOSITION (PITCH): *"Dear customer, Zambia offers the following exotic avocados for the international market."*

Enjoy our avocado assortments, ideal for specific dishes from:

- Jelita (2 seasons) or Zulu for smoothies
- Ndodo or Luma (2 seasons) for dishes
- Jelita or Madala (2 seasons) for dips
- Tongo or Nzuna for Salads
- Zulu or Inkezo for Appetisers
- Kabola or Mwana for Toasts
- Bwonse or Maline for Desserts

## NAMING CONVENTION



ZAMBIA'S FINEST EXOTIC AVOCADOS

# AVOCADO RECIPES

Avocados are consumed differently around the world; America consumes plenty of avocados in guacamole, Mexico uses leaves as wraps for flavour, Taiwan serves it with milk and sugar, and Indonesia makes drinks with milk and coffee.

The beauty of avocado is that it's versatile and a perfect pairing with various flavours, from sweet to spicy, from solid to soft. In general, avocado dishes should be eaten raw and eaten right away, even though eating discoloured avocado is not harmful.

Experiments in many regions concluded that avocado browning is due to oxygenation, and the bitterness of the flavour comes from heat and oxidation. In literature, many have documented the bitterness of cooking avocado.

Heating avocado makes it turn bitter, sour, or mushy; keep your cooking time short—no more than 5 minutes—or if you want to add avocado to a cooked dish, add it at the very end of the recipe as there will not be enough time for the bitterness to develop.



## AVOCADO DISHES

- Avocado spaghetti with tomato and mushroom
- Baked avocado egg with chicken
- Avocados rice bowl

## AVOCADO SALADS

- Avocado peach tomato salad
- Avocado cucumber watermelon salad
- Avocado squash salad

## AVOCADO SMOOTHIES

- Avocado, apple and banana
- Avocado, kiwi and pear
- Avocado, strawberry and watermelon

## AVOCADO TOAST

- Avocado breakfast toast
- Grilled club sandwich with avocado
- Avocado and mushroom sandwich

## AVOCADO APPERTISERS

- Tomato bruschetta with avocado and peach
- Avocado toast with salmon
- Avocado, cheese and mango taco

## AVOCADO DESSERT

- Chocolate avocado mouse
- Chocolate avocado pudding
- Avocado brownies

## AVOCADO DIPS

- Mango and peach guacamole
- Chickpea guacamole
- Corn and black bean guacamole



# AVOCADO HEALTH BENEFITS

ALLEVATES  
OVERALL  
**WELL-BEING**

HELPS WITH  
**ANXIETY**

IMPROVES  
**BRAIN**  
FUNCTION

BOOSTS  
**COGNITIVE**  
FUNCTION

BEST FOOD  
FOR **DENTAL**  
HEALTH

HELPS  
MAINTAIN  
**EYE** HEALTH  
AS WE AGE

PREVENTS  
**DIABETES**  
AND **BLOOD**  
**SUGAR**  
INSTABILITY

SUPPORTS  
**FERTILITY** AND  
**PREGNANCY**

LOWERS THE  
RISK OF **HEART**  
**DISEASE**

CREATES A  
**HEALTHY DIET**

PREVENTS  
DISEASES AND  
IMPROVES YOUR  
**IMMUNE SYSTEM**

REDUCES **LIVER**  
DAMAGES

ENHANCES THE **LOVE**  
**HORMONE** (Oxytocin),  
**EMPATHY, SEXUAL**  
ACTIVITIES, AND  
**RELATIONSHIP**  
BUILDING

AVOCADO SOURCE  
OF BIOTIN  
BENEFITS **SKIN,**  
**HAIR AND NAIL**

LOWERS  
**CHLESTOROL**  
AND **BLOOD**  
**PRESSURE**

CONTRIBUTES  
TO **MUSCLE**  
**RECOVERY**

BETTER  
**NUTRITIONAL**  
**ABSORPTION** OF  
VITAMINS AND  
ANTIOXIDANTS

PROTECTS YOU  
FROM **DISEASES**

HEALTHIER  
**SEMEN**, AS IT  
FUNCTIONS AS AN  
**APHRODISIAC**,  
WHICH IS  
ESSENTIAL IN  
TESTOSTERONE  
SYNTHESIS

**STOMACH AND**  
**INTESTINES**  
ARE KEPT  
IN GOOD WORKING  
CONDITION

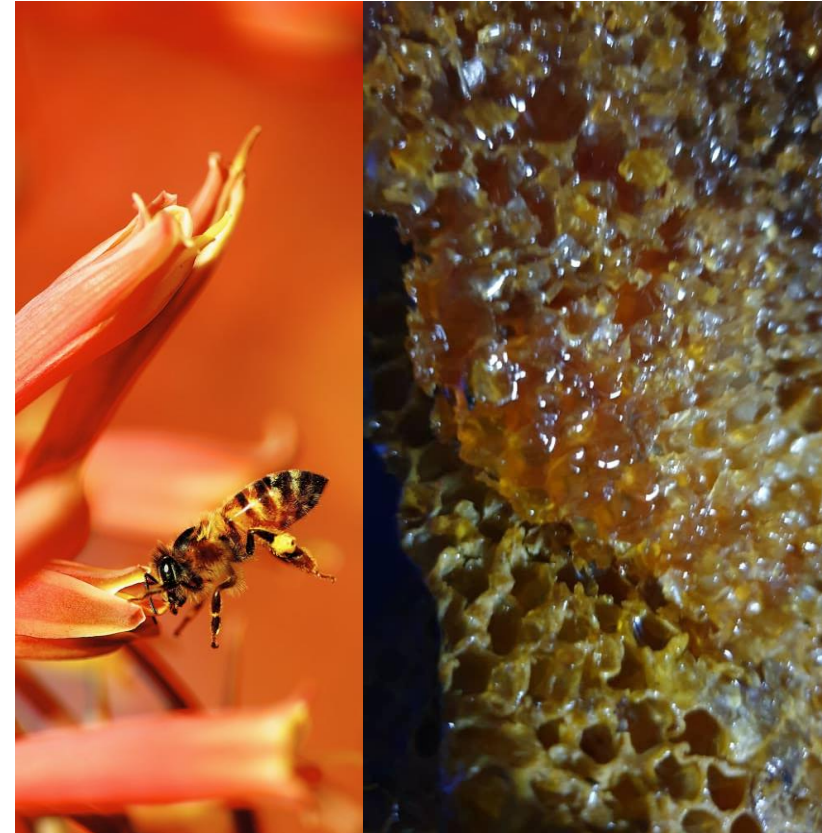
AIDS **STROKE**  
**RECOVERY** AND  
REDUCES  
**METABOLIC**  
SYNDROME RISKS

# HONEYBEES POLLINATE AVOCADO TREES

Avocado farmers face several challenges; one of the most significant is achieving good fruit production from each tree. However, some growers have found a way to potentially improve their yield with the help of a particular insect, the honeybee.

- The 2019 report on ten countries with the most extensive organic wild collection and beekeeping areas was; Finland (mainly berries), followed by Brazil and Zambia (beekeeping).
- The largest beekeeping areas worldwide are in Zambia (5.2 million hectares), and certified organic products are recognised only in a few domestic markets, including Egypt, South Africa, Uganda, Kenya, Ghana, Zambia, Senegal, and Tanzania.
- The ten species of stingless bees were the main pollinators of the three avocado races: Mexico, Guatemala, and West India.
- Israel and the United States (California) are in the top ten countries for avocado producers; both use bees as their primary avocado pollinators, while in Florida, Trinidad, and Jamaica, the primary pollinators are the Politest wasp and *Metabolybia sigulata*.

Zambia can exhibit a competitive advantage over Kenya and South Africa when selecting honeybees as avocado tree pollinators since it's one of the ten countries with the most extensive organic wild collection and beekeeping areas.





# AVOCADO LIFECYCLE

Grafted avocado trees grow in greenhouses for over two years before being planted in fields with enough nutrition and attention to ensure a good harvest and income within 5 to 7 years.



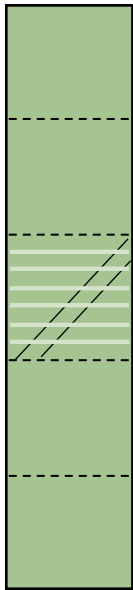


# AVOCADO GRAFTING OPTIONS

Grafting is a way to clone a specific avocado tree, which is very useful when preserving the genetics of special trees. For instance, it can be a rare variety or even a tree that other people in the area want their kids to enjoy someday.

When growing an avocado tree from an avocado seed, you may have to wait up to six years before seeing any fruit. Avocado tree grafting isn't technically needed to get fruits to grow, but it speeds up the process of fruit-bearing and guarantees a tree produces good harvests.

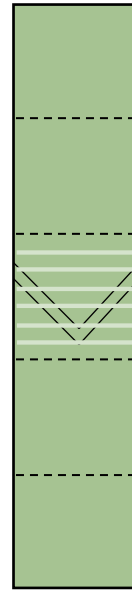
SPLICE GRAFTING



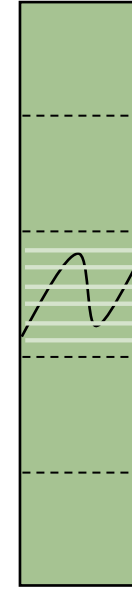
BARK GRAFTING



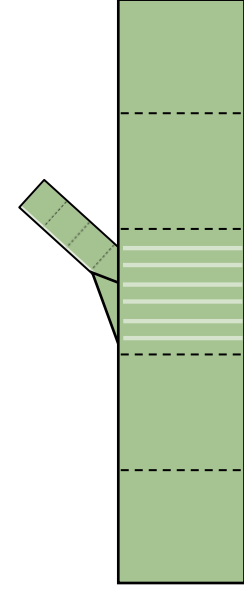
CLEFT GRAFTING  
**(Recommended)**



TONGUE GRAFTING



SIDE GRAFTING



# READING AVOCADO LEAVES

Based on several research reports, we continue to see the avocado tree leaf as a source of general information and an indicator of the tree's health. Each leaf provides a brief, concise summary that helps you decide how to manage your avocado orchards. The density and colour of the leaf are vital in identifying potential challenges with the avocado tree's growth and fruit production.

- **HOT TEMPERATURES:** Keeping the soil saturated with water ensures it reduces heat reflection, meaning there is no heat reflection back onto the plant.
- **COLD (FROST) TEMPERATURES:** An avocado plant that lacks sufficient sunlight cannot produce enough food to sustain itself.
- **LEAVES CURL:** Avocado leaves curling commonly appears due to overwatering or caterpillars.
- **LEAVES DROP:** Leaves dropping in the spring is an entirely natural process during flowering, mainly in spring and accompanied by the growth of new avocado leaves. While pests, disease, and watering cause leaves to drop, a common problem is the amount of water since they can be overwatered or underwatered.
- **LEAVES TURN BLACK:** Fungal diseases blacken and damage leaves where they will harvest a reduced yield of avocados or sabotage any reproduction.
- **LEAVES TURN PURPLE:** Avocado leaves usually turn purple due to a phosphorus deficiency plant disorder that inhibits or prevents the increase of root and shoots growth, leading to a low root-to-shoot ratio.
- **LEAVES TURN YELLOW:** While hot summers can damage healthy green avocado leaves, causing them to bleach and become sunburned, leading to yellow leaves, the same applies to cold temperatures.
- **WHITE SPOTS:** Leaves with white spots can come from pests such as spider mites, thrips, and whiteflies, or the result of certain fungal diseases.
- **BROWN SPOTS:** Brown spots on leaves are typical of an avocado mite infestation or the result of salt buildup in the soil.
- **YELLOW SPOTS:** Most yellow spots are caused by pests or fungal diseases. It may also be the beginning of the ageing process.

# RECOMMENDATIONS

- Start by researching which varieties grow best in your region.
- Plant avocado trees before summer for it to become acclimatised to the new environment before the temperatures increase.
- To get rid of mites, use sulfur oil emulsion sprays to have the best impact or spraying neem oil on the leaves.
- To ensure ideal pollination and an additional income with honey, it is wise for avocado growers to use honeybees for pollination. Increasing honeybee hive density will likely increase production but may not be cost-effective in all contexts.
- Avocados grow better when cross-pollinated with other avocado sorts. Avocado farmers should cultivate more than one avocado variety (plant a type A and a type B avocado tree in your orchard) with different maturity times to spread the risk of losses and workload during harvest.
- Allow the plant to thrive in the pot until it achieves a sturdy ball of roots before transplanting it to a spot with adequate sun exposure and no competing plants around to curtail the spread of its roots.
- As the avocado tree grows, you want to attend to the plant through different growth stages. It is crucial to know what to look out for to maintain a healthy tree until it reaches maturity.
- When facing difficulties growing avocados, look at the usual culprits: the amount of sunlight they receive, irrigation, and nutritional imbalance.
- When avocados don't get harvested, they can stay on the tree until the following year's fruit harvest, thus farmers can sell their avocados when the demand is high.
- Ensure cash crop rotation, organic compost and fertiliser, including solar technology to water the avocado trees and cash crops.



# INVESTMENT AND RETURN (USE CASE EXAMPLE)

INVESTMENT			
ONE OFF (Preparation phase)	Unit price	Quantity	Amount
Location purchase and preparation	-	-	-
Fence (Security)	-	-	-
House (Cottage)	-	-	-
Water (Borehole)	-	-	-
Manure (organic)	-	-	-
Resources (Workforce)	-	-	-
Driplines (6'000m) - blind	-	-	-
Microjet + connectors + tools	-	-	-
Avocado trees (4 different Varieties - grafted)	ZMK 75.00	400	ZMK 30,000.00
<b>SUB TOTAL</b>			<b>ZMK 30,000.00</b>

ONE OFF - SERVICES (Labour)	Unit price	Quantity	Amount
Site tree measurements (1 day - 2 workers)			ZMK 2,500.00
Digging holes (3 days - 3 workers)	ZMK 10.50	400	ZMK 4,200.00
Planting trees (3 days - 3 workers)	ZMK 10.50	400	ZMK 4,200.00
Irrigation installation (4 days - 3 workers)			ZMK 9,600.00
Driplines (6'000m) + hole measurement + microjet (2 days - 3 workers)			ZMK 5,000.00
Project Manager			ZMK 3,500.00
<b>SUB TOTAL</b>			<b>ZMK 29,000.00</b>

MONTHLY COSTS	Unit price	Quantity	Amount
Salary (1 worker)			ZMK 1,300.00
Monitoring and Coordination			ZMK 2,500.00
<b>SUB TOTAL</b>			<b>ZMK 3,800.00</b>

TOTAL INVESTMENT			ZMK 62,800.00
------------------	--	--	---------------

*Investment can be reduced through the number of trees planted per hectare.*

INCOME (After 7 to 9 years)			
INCOME	Avocado sell price	Quantity	Amount
Avocado (400 avocado trees x 200 avocados per tree/per season = 80'000 avocados)	ZMK 5.00	80000	ZMK 400,000.00
<b>TOTAL NCOME PER SEASON</b>			<b>ZMK 400,000.00</b>

A Zambian farmer can transform their existing one-hectare farm into a self-sustainable avocado orchard with an investment of around ZKW 62'800.-- (USD 3'521.--) when planting 400 avocado trees per hectare with a distance of 4 m x 6 m from tree to tree.

## SPACING

The traditional tree spacing is 7 m x 7 m at 200 avocado trees per hectare or 8 m x 8 m at 160 avocado trees per hectare.

The ideal tree spacing for avocado planting is 4 m x 6 m, resulting in a total of 416 avocado trees per hectare.

High-density plantings range from 5 m x 3 m at 666 trees per hectare, and experimental spacing exists as high as 2.5 m x 2.5 m at 1'600 trees per hectare.

## RETURN EXAMPLE

Planting 400 avocado trees in one hectare, of which each avocado tree produces 200–300 fruits once it reaches five to 7-9 years of maturity.

The income from planting 400 avocado trees per hectare with a distance of 4 m x 6 m from tree to tree equates to 80'000 avocados per season once the trees have matured.

- 400 (avocado trees) x 200 (minimum harvested avocados per tree) = **80'000** (avocados)
- 80'000 (avocados) x 5k (avocados wholesale price) = **ZMK 400'000** (per season).
- 200 years (avocado tree lifespan is 200–400 years) x ZMK 400'000 (per season) = **ZMK 80'000'000**.

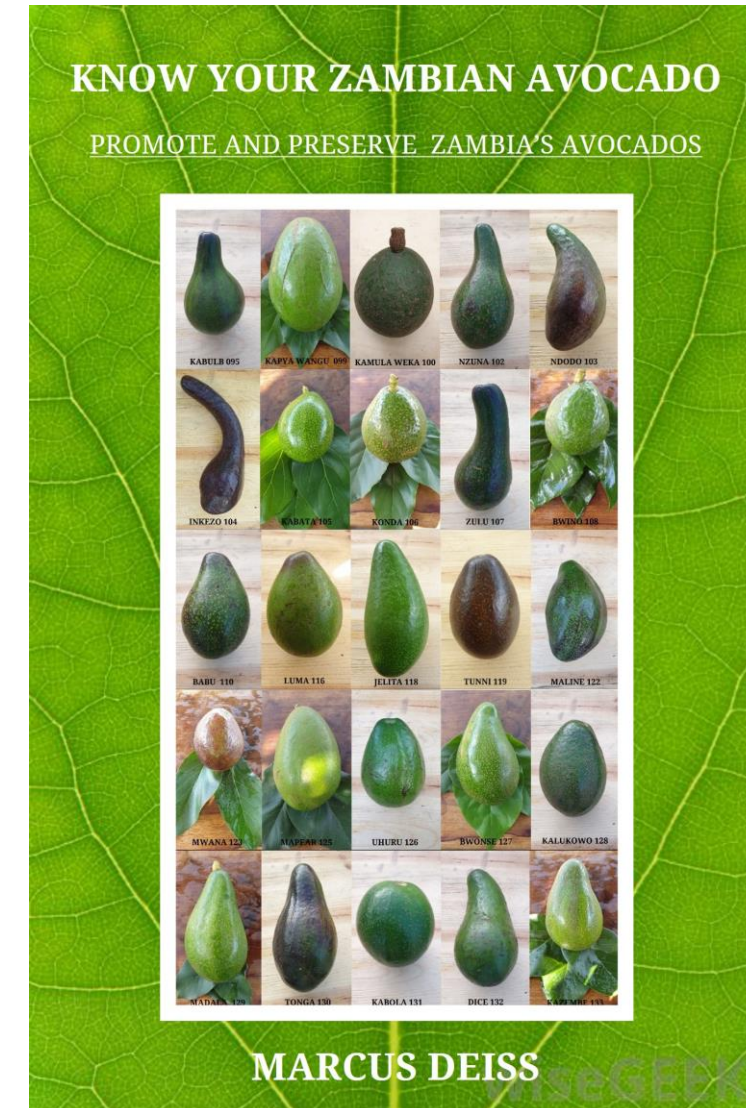
After 18 months of research and interviews, we're excited to self-publish "Know Your Zambian Avocados".

As history will attest, humans may not save all biodiverse species threatened by extinction, so who decides which biodiversity needs saving first over other species? And what are the reasons behind saving that specific species?

The research:

- comments on the medical and health benefits of consuming avocados and reveals culinary uses with 21 delicious recipes that help prevent and reverse diseases.
- provides over ten reasons for investing in avocados for readers, investors, and consumers to form an independent opinion that may uncover new opportunities.
- lays out a socioeconomic development strategy with a Zambian-specific USP (Unique Selling Proposition), thus contributing to the preservation, protection, and promotion of a region's exotic avocado species' wealth and variety.
- incorporates a business case study of a green energy farmer over forty years who promoted and preserved 25 different Zambian avocado varieties and uses green energy to make avocados even greener.
- provides detailed research and findings on the food industry and monoculture practices that limit consumers' choices, neglecting a region's avocado biodiversity, thus contributing to secondary climate effects and driving a region's crop to extinction.
- takes readers on a journey through the historical events of the avocado fruit, its evolution, and trends in the globalisation of the avocado fruit.
- seeks to inform, inspire, and provide best-practice methods and lessons learned in environmental sustainability for avocado farming.
- comments on and promotes the development of avocado farming enterprises using honeybees (*Apis mellifera*) to pollinate avocado trees, contributing to socioeconomic development in the avocado honey business.
- includes an action plan to promote the conservation of a region's avocado biodiversity in the educational curriculum.
- ...and much more.

*"The real crisis humans face is the loss of biodiversity"*





**DEISS**

CONSULTING AND  
TRAINING GROUP

**THANK YOU FOR YOUR ATTENTION**

**DISCLAIMER**

THIS DOCUMENT IS NOT TO BE COPIED, DISTRIBUTED OR FORWARDED TO ANY PERSON OTHER THAN THE RECIPIENT. ANY FURTHER DISTRIBUTION, FORWARDING OR REPRODUCTION OF THIS DOCUMENT IN WHOLE OR IN PART IS UNAUTHORIZED. FAILURE TO COMPLY WITH THIS DIRECTIVE MAY RESULT IN A VIOLATION OF THE SECURITIES ACT.