



AN OPPORTUNITY TO TACKLE THE FOOD CRISIS AND IMPROVE GLOBAL HEALTH

The President of the European Commission, Ursula von der Leyen concluded intense discussions with world leaders and partners at the 77th session of the United Nations General Assembly in New York with a series of pledges to tackle the food crisis and improve global health. President Ursula von der Leyen announced the doubling of the Commission’s funding to Global biodiversity would result in 7 billion invested to protect biodiversity around the world. In addition, the President announced that the European Union is preparing forest partnerships with five countries – Uganda, Zambia, Congo, Mongolia and Guyana.

In this article, I’ll comment on a strategic opportunity which found strong support to fight the food crisis and improve global health that could be evaluated; specifically, the avocado fruit due to its health benefits and since it’s arguably the most iconic food of the twenty-first century that went from a little-known regional delicacy to a global embrace and social media fame in less than one hundred years.

THE KEY RATIONALS BEHIND INVESTING IN AVOCADOS

Avocados have a long cultivation history in Zambia and add to the country’s revenue through trading. Zambian avocados have numerous advantages and enable a broad range of applications and financial incentives; they’re rich in flavour, soft, mild, and have a creamy texture with high oil content, long post-harvest shelflife and come in different varieties.

Research has been scanty to represent the country’s premium avocado production, local trading, diversity, and usage. The Zambia avocado industry is unexplored and runs on a tiny scale where most farmers are informal with little know-how, thereby deriving little income. Still, in many regions, avocado farming has become a source of income.

Though Zambian farmers know the yield of avocado trees depends on the quality of the seedlings, the variety, proper farming methods, and climatic conditions; the Zambian avocado industry has not performed optimally due to several challenges, including not accessing international markets due to farmers not growing avocados demanded by global markets, lacking linkages and reliability of supply, insufficient sectorial organisation, marketing strategy, and inadequate understanding of quality requirements in the export market.

While the entire article explains the rationale behind investing in avocados, the following offers additional perspectives:

RENEWABLE ENERGY

Solar energy is the most abundant of all energy resources and can even be harnessed in cloudy weather. Solar technologies can deliver heat, cooling, natural lighting, electricity, and fuel for a host of applications. The cost of manufacturing solar panels has plummeted dramatically in the last decade, making them affordable and often the cheapest form of electricity. Solar panels can have a lifespan of roughly 30 years.

Today, some Zambian farmers are considered green energy farmers that make avocados even greener by using solar to pump water from the reservoirs into the farm to water the avocado fruit trees. The solar panels also light the farm and power all machines.

BLOCKCHAIN TECHNOLOGY

Capital is pouring into renewables with the green energy market predicted to reach USD 1.9T by 2030 and start-ups innovate just about every aspect of how energy is generated and used.

The world is moving away from fossil fuels and towards renewables. Many start-ups are leading this transformation, and the cryptocurrency community is right there with them, investing in these companies and helping to bring about a cleaner, more sustainable future. These start-ups are tapping into the enthusiasm among cryptocurrency investors for projects that have a positive social and environmental impact.

Blockchain technology already exists in the avocado sector and investors continue to explore opportunities to make a difference in the world through innovation and technology towards creating a more sustainable and equitable planet.

LITERATURE AND ART

In addition to ensuring sustainability in using natural resources, aspects of indigenous knowledge which promote environmental protection and sustainable use of natural resources should be at the forefront of harmonious coexistence among various socioeconomic groups.

There's a need to rewrite history from a Zambian perspective because many children don't know much about their ancestors' greatness since they do not learn it, nor does it exist from a Zambian perspective. Indigenous knowledge has value for the culture in which it evolves and for scientists and planners striving to improve conditions in rural localities and beyond.

Literature and art plays a crucial role in the preservation of crops when we can see and read about how people today in some regions have continued to cultivate, forage, hunt, cook, and consume what the rest of us have forgotten or didn't even know existed. We can also discover people who were fighting for the survival of these foods and food cultures. For instance, the diet of the Hadza people of East Africa consists of eight hundred different plants and animals.

CULTURAL TOURISM

Using food for destination marketing efforts is a commonly recognised practice that grows the number of tourists travelling to a destination and helps sustain cultural tourism.

The local food marketplace contributes to destination marketing and growth has been explored within the cultural tourism sector, yet research into the understanding and meaning of local food is few. Using food for destination marketing enhances Agri-and-cultural tourism diversification, as avocados are a food source of the 73 Zambian tribes' cuisine.

AVOCADO HONEY

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

Honeybees aren't the only insects that contribute to the pollination of avocado trees but are among the most helpful, widely available, easy to maintain and introduce into avocado farms. This environmental friendly idea frees up the avocado tree for other uses, such as beekeeping and habitat for other wildlife.

As one of the ten countries with the most extensive beekeeping areas and certified as organic products, Zambia's competitive advantage using honeybees as avocado tree pollinators will create new job opportunities for the dark brown coloured honey that's very sweet.

ENVIRONMENTAL – WATER CONSUMPTION

A UNESCO report shows water consumption for one kilo of avocado accounts for 1'000 litres of water while one kilo of meat accounts for 5'500 litres of water. Other comparisons show a single avocado requires 140-272 litres of water while the same amount of beef requires 2.315 litres of water, chicken 650 litres, and butter 833 litres.

As the continued growth in avocado production sustainably will require more land planning policies based on soil suitability and water availability, there is still the need to practice caution in avocado production to prevent adverse environmental effects. The good news is the agricultural practices adopted by Zambian farmers are predominantly environmental friendly and ensure products produced are herbal and organic.

Designating sufficient land for avocado farming and planting compatible crops on the same soil is a proven way to protect the ground and eliminate the need for excessive fertilisers. For this reason, farmers with irrigations systems to water their young avocado trees traditionally use their irrigations systems to plant cash crops (e.g. chilli, onions, watermelon, etc.) in between the young avocado trees and later introduce honeybees to pollinate their avocado-growing trees. Cash crops and honey are used for own consumption or to generate an income till the avocado trees bear fruit.

MONOCULTURE WON'T PRESERVE BIODIVERSITY FROM EXTINCTION

Quality of life has been preserved and enhanced for generations through the environment and sustainability of forests and fruit trees. However, global diversity has declined as monocultures of crops take up more land than ever and provide little nutrition for pollinators.

Although the monoculture practice has allowed increased efficiency in planting and harvesting, it's been criticised for resulting in unsustainable environmental linkages to soil degradation and deforestation. The monoculture nature of agriculture leaves food supplies more vulnerable to threats of diseases, it requires widespread pesticide use to destroy insect populations and contributes to drought, including the risks to human health and the planet.

Agriculture systems have heavily invested in monoculture methods where large-scale polyculture fields are nearly non-existent. Still, research and resources have not been devoted to increasing the prevalence of polyculture fields which proves polyculture from an economic standpoint don't make sense. Yet, polyculture encourages biodiversity as they inherently contain a more diverse array of plants, not only to contribute to soil health but also to the health of plants, animals, insects, and the people that finally consume food varieties.

Though polycultures' justification is better for the environment, monocultures are not going anywhere; thus resulting in wild relatives of some of the world's most important crops, including potatoes, avocados, and vanilla, being threatened with extinction, according to a study. Three in five avocado species face the highest risk of extinction, listed as endangered or critically endangered on the International Union for the Conservation of Nature's (IUCN) red list of threatened plants.

When the climate crisis hampers yields, and wild relatives aren't around to help crops adapt, favourite fruits such as avocado could be at risk of disappearing. The extinction risk now is to the wild relatives of crops. The soil salinity is changing, and crops can't adapt. As temperatures continue to rise due to climate change, pests and diseases will alter and can have a massive impact on cultivated plants that could lead to shortages of food.

Reversing global warming is to preserve the region's crop wild relatives and their genetic diversity, and since locals traditionally use these diverse species as food or medicine, numerous cultural groups have the obligation to their preservation.

Climate change poses many severe risks to humans, and it's becoming a critical force behind the continued rise in global hunger, accelerating droughts and floods that degrade food production leading to an increased migration of people. Most vulnerable to climate change is the Sub-Saharan region which relies on agriculture, grazing, and fishing. Rains are getting even shorter and less predictable in this region, making the area warm faster than the global average.

These challenges are compounded by the impact of air pollution, toxic water and groundwater pollution, including the emergence of new pest species, and an increase of diseases affecting human health, thereby undermining the development efforts in the region. Its noticeable climate change affects people, economies, and environments differently in different regions.

PRESERVING BIODIVERSITY IS NOT LIMITING CONSUMERS THE CHOICE

Agriculture takes up 50% of all habitable land on earth, and 80% of extinction threats to mammals and birds are due to agriculture. Modern food systems are the biggest contributor to climate change, responsible for around a third of all greenhouse gas emissions, with more than half of these coming from animal agriculture.

Agricultural practices have dramatically changed in the last 50 years with technological enhancements for large-scale crop production. Though crop yields have increased, biodiversity has decreased to the point where about 30 crops provide 95% of human food-energy needs. Aside from preserving biodiversity, it's of immense importance to maintain and preserve traditional seeds while working to promote non-hybrid and GMO food.

The following are some examples of biodiversity decline:

- The U.S. lost over 90% of its fruit and vegetable varieties since the 1900s.
- Only 10% of the rice varieties China used in the 1950s are still available today.
- Of the roughly 6,000 different plants once consumed by humans, only nine remain major staples today.
- Rice, wheat and corn are the only three providing 50% of all our calories, making food supplies vulnerable when climate change causes harvests to fail.

According to [Galindo-Tovar et al. \(2007\)](#), avocado was cultivated and domesticated by the first Mesoamerican cultures (The Mokayas) who must have transmitted this practice to later cultures such as the Mayas and Olmecs. Though tracing the origin of avocado farming has been challenging to infer, given the wide distribution of its wild ancestors and species, knowledge of the avocado history relies on archaeological findings.

One of the oldest evidence pieces of avocado use was found in a cave located in Coxcatlán (Puebla, Mexico) dating around 10'000 BC. Seed (or pulp) remains found in ancient human settlements in the Tehuacan Valley suggest avocados could have been used as early as 8000 to 7000 BC and possibly domesticated at least 5000 BC by Mesoamerican groups (Smith, 1966, 1969).

History and research teaches us about avocados originating from Mexico, and they are over 500 different avocado varieties in the world that fall into one of three groups – Mexican, Guatemalan, and Indian. Still, with such a wide avocado variety, the avocado monoculture industry position hybrid avocado types for the international over the genetic biodiversity from Mexican, Guatemalan, Indian or other regions avocado genetic biodiversity.

What has happened is that international in-demand products have overshadowed the local crop species forcing farmers to meet the international demands with hybrid avocados, even if this means introducing a new species into that region where regional farmers may have no guarantee of the return.

The international avocado procurement apparatus built on monoculture methods forced farmers globally to grow specific avocado varieties. Therefore, limiting customers' choices, neglecting the region's avocado varieties, contributing to secondary climate effects, and potentially driving a region's crop to extinction.

Despite the inherent challenge of scarce research data on genetic variation and the number of avocado varieties available with their local naming convention, industry experts estimate Zambia has over 40 avocado species, so why limit local and international customers' choices to only a few avocado species?

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, respectively what you want to eat. Many will probably agree to have one or two options is not ideal because this may trigger the decision-maker to search for more options, even when presented with a suitable number of options. Often, we have too many or too few options.

Developing new strategies to enable avocado farmers to breed for variety resistance yield and preserve the local avocado varieties from extinction, underpins Zambia's strategy to promote its avocados locally and worldwide.

The proposed option herein is not to neglect the international in-demand avocado types, but (i) to annually plant 10'000 local avocado varieties to preserve the region's wild relatives and genetic diversity in the ten Zambian provinces, and (ii) to offer the local and international market a menu of avocados. The Zambian specific USP (Unique Selling Proposition) is to offer the local and international market a menu list of avocados varieties ideal for specific dishes from:

- *Jelita or Zulu for smoothies*
- *Ndodo or Luma for cooked dishes*
- *Babu or Tunni for dips*
- *Tonga or Nzuna for Salads*
- *Zulu or Inkezo for Appetisers*
- *Kabola or Mwana for Toasts*
- *Bwonse or Maline for Desserts*

Reversing climate change is preserving the region's wild relatives and genetic diversity while not limiting customers' choices. For this reason, a Zambian farmer who for forty years stood in as preserver and guarantor of regional avocado biodiversity identified over 25 exotic avocado varieties found in Zambia.

Local farmers acting as biodiversity preservers and guarantors of avocados should be accommodated by authorities with lands and funds for knowledge transfer initiatives to raise awareness of a region's biodiversity in the educational curriculum; highlighting the career opportunities which encourage locals to venture into the avocado industry while helping communities develop healthier eating habits.

Knowledge transfer initiatives for the educational curriculum can provide the opportunity for ministries to sponsor and showcase their committed efforts in the preservation of the region's avocado genetic biodiversity where they get adequate appreciation from students and communities for the way regulatory institutions operate and innovate in the Zambian economy.

THE END.... OR A NEW BEGINNING

Exploring the crops disappearing today due to corporate consolidation and climate change is an ongoing topic for the need to save the world's rarest foods, and preserve genetic diversity, traditional food cultures, and the planet. Avocado agriculture biodiversity won't solve all the world's food problems but it's an essential component of the future iconic food supply.

It's now a matter of self-survival and self-preservation that requires the mobilisation of multiple funding modalities of public, private, multilateral, and bilateral aimed to shift from a project-based approach to a more science-integrated and economically inclusive policy to the climate deal.

Biodiversity and ecosystems provide food, and medicine, protect us from natural disasters, fertilise the soil, and regulate the climate. The drivers of biodiversity loss are a result of unsustainable activities and behaviour. To protect biodiversity and community prosperity around the world, we must apply sustainable practices and demand more responsibility that safeguards biodiversity, wildlife, forests, water, and soil.

Local and international communities, including governments, should transition from being resource users to environmental sponsors by inspiring and empowering farmers and their communities to further adopt more sustainable initiatives that accelerate behavioural solutions to protect biodiversity.

We call upon researchers to evaluate strategies to lessen the menace and implement specific measures toward adapting and mitigating the adverse impact of climate change resilience and reducing greenhouse gas emissions to make our world a better and safer place to live, as the life of biodiversity on earth is the foundation of human existence and well-being.

We remain optimistic government and authorities receiving the Commission's funds of 7 billion to protect biodiversity and improve health around the world will link African nations' future climate change success without further sacrificing biodiversity while creating a well-established economic growth partnership with the EU's rules on global trade motivated by their compulsory certification system.

Here, at the end of the article, you'll carry on with your daily habits or perhaps make a life-changing decision to strategically act in both favourable and unfavourable situations because many fruit tree diversity and forestry opportunities remain untapped, so it's now left for we consumers to stand together to support wild relatives of crops by being more selective in what we consume.

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