HOW VERDENE REVIVED ITSELF

-Aadityaamlan Panda

In 1855, Chief Seattle, a leader and luminary of the Suquamish people, “purportedly” (as Jerry L. Clarke describes[\*](https://www.archives.gov/publications/prologue/1985/spring/chief-seattle.html)) wrote a letter to the fourteenth President of the United States, Mr. Pierce. He stated, “*Man did not weave the web of life, he is merely a strand in it. Whatever he does to the web, he does to himself”*. And his wisdom resonated profoundly a century later when the depletion of tropical forests in Africa marked the genesis of the concept of “desertification”. And soon the leaders of the world began to realise, that man must take steps immediately to reverse this steady destruction. Can we reverse this? If yes, how?

Land degradation can be defined as the decline of biological activity and economic productivity of land over time due to the direct or indirect involvement of humans as well as nature. It precedes desertification. The United Nations Convention to Combat Desertification defines desertification as the “degradation of land in arid, semi-arid and dry sub-humid areas” due to several factors like climatic variations and human activities. The primary concern is that the topsoil once eroded requires quite a few millennia to recover, leaving behind the scope for further depletion. Human activities including poor pasturing, improper irrigation and deforestation activities are recognised as the key contributors. However, natural calamities like drought and flood are neither behind. According to the World Meteorological Organisation, drought is defined as a “slow on-set phenomenon marked by a prolonged dry period in natural climate cycle caused by a lack of rainfall”. Both natural and anthropogenic factors serve as the cause of droughts. Given this interplay, can we say that droughts imply and are implied by desertification?

On the eve of World Environment Day, 2024, we, the people of the Earth along with our brothers and sisters in Verdene, pledge to work collectively towards “accelerating land restoration, improving drought resilience, and combating desertification”. Hence, the essay explores the themes of World Environment Day through the lens of Verdene, a fictional village in the Sahel region, Ethiopia, Africa. Once a verdant utopia with abundant greenery, Verdene became a victim of prolonged droughts and environmental mismanagement, which slowly transformed it into a near desert. How did this happen at all?

Verdene, a land with a rich cultural heritage was once a prosperous part of the historical Solomonic empire. Around the seventeenth century A.D., the first drought occurred following a cholera epidemic that had spread like wildfire over the century. This drought-like situation began to recur every hundred years owing to the significant temporal variations of rainfall. But around the last quarter of the twentieth century, the situation worsened when El Nino emerged as the forebearer of droughts, causing severe dry spells and large-scale land degradation frequently in the village.

In the latter half of the twentieth century, Verdene underwent a population surge, leading to increased demand for food and fuel. Consequently, the people of Verdene started to expand their livestock reserves and biofuels became the primary source of energy in every household. Thus, the village lost a significant portion of its verdant cover in a few decades. With the expectation of a higher income, some farmers began planting cash crops. Some crops like peanuts, harm the soil structure and capacity of holding water. Verdene counted for some parts of the Ethiopian montane forests. Sections of these forests were brought down due to urbanisation while the rest became prey to rapid deforestation in a rush to meet the energy demand. Eventually, the erstwhile prosperous land set out on the path of becoming an absolute desert.

The degradation of land comes with a price. The land has become more susceptible to wind erosion. This is visible from the increased exposure of subsoil over the years. Birds like Eurasian skylarks have altered their migratory routes. They seldom come to the village due to the depletion of their stopover habitats. Liben Lark, a bird whose voice was not uncommon, can be hardly heard now. Organic carbon levels in the soil have dwindled drastically. The average temperatures have been constantly over the thirty-fifth mark on the Celsius scale, leading to reduced crop yields and a decrease in overall agricultural productivity, forcing many villagers to migrate far away from their native lands to the southern region of Ethiopia. The people who stay are affected by respiratory diseases, due to increased erosion by wind, as well as infectious diseases such as Tuberculosis, HIV//AIDS and malaria as the increased temperature creates an ambience conducive enough for the perpetuation of the respective pathogens.

People in the Sahel region, Africa live around twenty years less than several European nations, while maternal mortality rates are reported to be a hundred times higher. Sahel region accounts for 43% of the world’s deaths due to terrorism. Violent attacks on healthcare facilities and an increasing number of cholera and yellow fever cases have racked the region over the years. The number of people requiring life-saving assistance has increased by over twenty-five per cent in the last few years. The situation in the Sahel region is of serious concern and requires urgent action as the aggravating El-Nino-induced drought conditions, coupled with the increasing terrorist activity are intervening with the basic amenities of life in the face of desertification. Can something be done for them?

Not only Verdene or the Sahel region but the entire world requires immediate action. As per the data dashboard of the United Nations Convention to Combat Desertification, 1.52 billion ha of land has been reported as degraded. This accounts for an alarming 15.5% of the total land reported and is increasing steadily at the rate of 4% every four years. Moreover, out of the 98 drought-prone countries, 15 have suffered extreme droughts. Demographic studies stun the world further, revealing that 1.2 billion people have been directly exposed to land degradation while 1.84 billion have been affected by droughts. This has further been mapped into poverty, unveiling the trend that countries with a higher proportion of degraded land have higher percentages of populations below the poverty line. Similar trends are observed in biodiversity loss. The interconnectedness between lack of water access and land degradation is even more startling.

Agriculture has been the primary source of procuring food for ages untold. Farming dates back to the predynastic period, when crops such as wheat and barley were grown along with flax and papyrus. Then how can this life-sustaining practice be blamed for causing poverty and promoting land degradation? The issue arose when man forgot that the rate of land replenishment is quite slow. The need of the hour is to adopt sustainable agronomics practices that not only aim to improve soil health but also help in increasing crop yield. The optimum amount of tillage required can be determined to minimise soil disturbance and erosion. Soil-enriching legumes like peas, soybeans and clover can be rotated scientifically with exhaustive crops like rice or wheat. This maintains soil fertility and breaks disease and pest cycles. Agroforestry, another useful method, involves the intentional planting of trees along with crops. Trees act as natural carbon dioxide filters and help increase soil carbon.  The microclimate created by their shade can help improve the yields of shade-tolerant plants. And most importantly, they serve as the barriers to the agents of erosion.

But when it comes to drought, scarcity of water has the upper hand. Fresh water accounts for 3% of the earth’s water, but 2.5% is locked in glaciers, ice caps, atmosphere or at unfathomable depths, leaving behind only 0.5% on the surface. Irrigation serves as a major source of freshwater depletion due to evaporation and runoff. So, how can we improvise our irrigation method? Micro irrigation techniques, the drip and sprinkler irrigation systems come up with a solution. In a sprinkler irrigation system, water is sprayed onto plants in the demeanour of pseudo rain. A better solution concerning water conservation is provided by the drip irrigation system where water is directly transmitted to the roots of the plant through an extensive network of pipes and cisterns and poured in the form of drops. This minimises the wastage of water, especially in arid and semi-arid regions, where the availability of water is limited. We cannot rely solely on rivers to fulfil our daily water needs. Rain is a renewable source of fresh water, which can be harvested on rooftops of houses. This water can be directed to tanks, pits, aquifers, or reservoirs, serving daily household needs as well as replenishing groundwater reserves. Another promising method for replenishing groundwater comes with the idea of recharging natural groundwater supplies using man-made structures like infiltration basins, trenches, dams, or injection wells. “Aquifer storage and recovery” is a technique that allows to recover the recharged groundwater for future use.

*Kebede Alemayehu*, a middle-aged teacher in Verdene turns to a local youth NGO, *Verdene Selamawit* to organise a movement towards rainwater harvesting and efficient irrigation techniques. One of the first projects undertaken is the digging of *Bouli* at the convergence points of runoff water at the bottom of the slope. They serve as crucial resources for livestock and will help in recharging the groundwater during droughts. But this method is quite localised. Hence, the villagers decide to join hands in realising the labour-intensive task of building Demi-lunes during the dry season, to capture water and organic matter during the rainy months. These pits will help in reducing the risk of crop failure and might increase agricultural productivity by improving soil structure and water infiltration. Meanwhile, *Tigist Tadesse*, a scholar in plant sciences, has returned from the University of Cambridge to her paternal home in Verdene. She decides to revolutionise the agricultural practices in her village, starting from the farms of *Tesfaye Tadesse*, her father. She sends soil samples from her farm to SGS, Ethiopia and based on the reports, she starts preparing a financial basket for the regulated use of organic and chemical fertilisers. She begins with conservation tillage followed by cover cropping. As the nutrient profile improves, she shifts to crop rotation to improve the yield of crops. She enhances the business by cultivating the uncultivated regions of the farm, creating employment for many. In regions more prone to erosions, she goes for strip cropping. But her visions are far from what she has achieved. She decides to plant shade-tolerant crops on the peripheries of the land, mostly overgrown by tall trees, demonstrating to the villagers how wonderful agroforestry is. She plants more trees in the field to heighten her efforts in the next ten years.

Adopted in 1994, The United Nations Convention to Combat Desertification (UNCCD) links environment and development to sustainable land management. It aims to combat desertification and mitigate the effects of drought through national action programmes. The first Conference of the Parties (COP) took place in Rome, Italy in 1997. COP15 held in Abidjan, Cote d’Ivoire in 2022, made the declarations of gender equality for successful land restoration. The call issued by Heads of State and Government aims to boost long-term environmental sustainability. It called upon the world to prioritise drought preparedness and resilience. The sixteenth term of COP is scheduled to be held in Riyadh in December 2024 and aims to develop solutions towards the mitigation of droughts and combating desertification In the Rio+20 conference held in 2012, UNCCD introduced the concept of Land Degradation Neutrality, which aims to preserve land resource base by ensuring no net loss of healthy and productive land.

Several other global initiatives have come up with the allied goal of preventing desertification and improving drought resilience. Sustainable Development Goal 15.3 strives to achieve a land degradation-neutral world by 2030. Another global effort, the Bonn Challenge aimed to bring one hundred and fifty million hectares of degraded and deforested landscapes into restoration by 2020 and exceed twice in the following ten years. Hosted and launched by Germany and the International Union for Conservation in Nature (IUCN) in Bonn, it is based on the Forest Landscape Restoration Approach. Another initiative launched by the United Nations Development Programme (UNDP), the Integrated Drylands Development Programme (IDDP) aims to promote sustainable land use practices and combat desertification in dryland areas. India is not behind in combating Desertification and land degradation within and outside its territory. A nation, highly committed to UNCCD and SDG, it intends to achieve land degradation-neutral status by 2030. The National Action Plan to Combat Desertification (NAPCD) was launched in 2010. It aims to address the primary causes of desertification in the country and promote sustainable land utilisation beneficial to both man and the environment. Under the surveillance of the Department of Land Resources and Ministry of Rural Development, the Integrated Watershed Management Programme, amalgamated with Pradhan Mantri Krishi Sinchayee Yojana, aims at restoring degraded natural resources, promoting water harvesting, recharging groundwater etc. The Desert Development Programme, launched in 1977, aims to minimise the effects of drought and restore the natural resource base of the identified desert area.

*Tigist* has great visions. She does not want her ambitions to be restricted to the boundaries of her farm. She determines to resolve the root cause of the issue of deforestation. Without a thought, she contacts her college friend, *Jeff Adams*, a Germany-based renowned renewable energy scientist and investor, who was involved in a large-scale solar farm project near Addis Ababa. She asks *Haile Selassie*, local researcher, and founder of *Verdene Selamawit*, to prepare a schematic report on the sunlight exposure in Verdene. Jeff integrates this with feasibility studies to secure initial funding from his former affiliate and named entrepreneur, *Marcus Strauss*, who had transformed a parched land in the Somali region into a self-empowered community in terms of solar energy. *Strauss* arrives for site inspection and is satisfied. Then *Jeff* moves on to apply for the Global Environment Facility and African Development Bank’s Desert to Power Initiative. He starts with a phased approach, starting with smaller installations to power essential services such as schools, clinics, and water pumps, and covers the entire village gradually. He trains the local workers to assist in the installation and maintenance of the project thus creating employment opportunities. Meanwhile, Marcus lends a helping hand by tapping into the African Renewable Energy Fund and International Solar Alliance’s Solar Risk Mitigation Initiative. His company SolarFuture Inc. collaborates with Ethiopian Electric Power Corporation to ensure the integration of the solar farm into the national grid, thus generating additional income. Thus, Verdene learns how to be dependent on solar energy to meet the daily energy requirements.

But the best effort comes from the side of the youth NGO when *Haile* organises workshops and seminars to educate local communities about the Great Green Wall Initiative and its rapid pace in Ethiopia. He emphasises the importance of long-term sustainability and encourages villagers to actively participate in this. He contacts *Tigist* and tells her that she can realise her dreams about village-long agroforestry. She joins hands with him and helps design and oversee the planting of trees and other vegetation, ensuring that the right species are chosen to thrive in the local environment. With the help of *Verdene Selamawit,* she integrates trees into agricultural landscapes, enriching both biodiversity and agricultural productivity. Meanwhile, *Haile* seeks help from *Asenath Al-Maghrabi*, an Egypt-based developer to help establish a monitoring and evaluation framework. She agrees to collaborate. Her team enables the framework to track the progress of restoration efforts, access the health and growth of planted trees, and measure the impact on soil quality, water retention, and local climate conditions. Then *Haile* moves to international organisations like the Green Climate Fund and the government of Ethiopia to support the efforts put forward by the villagers. This improves crop yield as well as provides scope for eco-tourism. Hence additional sources of income and employment are created for the residents of Verdene. With minute efforts, the villagers transform the landscape of Verdene, almost acquiring the utopia that had faded over time.

In a world where land degradation threatens our very existence, the call-to-action echoes through the ages, from Chief Seattle's poignant words to the urgent pleas of today's leaders. Desertification, A genesis of our neglect of the natural web of life, casts a grey shadow over our planet's future, leaving behind impoverished landscapes and incapacitated communities. But hope emerges amidst the desolation. By embracing sustainable agricultural practices, harnessing renewable energy, and nurturing biodiversity, we can pave the path towards rejuvenation. From the semi-arid plains of Africa to the verdant fields of Asia, initiatives to combat desertification and restore the balance of our ecosystems, have been in full command. Through international collaboration and grassroots activism, we can force the tide of land degradation to recede and build a future secure enough for every strand of life to survive.

According to Wangari Maathai,” The fight against desertification is a dynamic and ongoing challenge that demands our collective action”. On the eve of this World Environment Day, as we stand on the verge of change, let us unite in our commitment to protect and preserve our precious planet. Together, we can write a novel chapter in the history of the earth—one of resilience, restoration, and reconciliation for generations to come.

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