Development Banking in Ethiopia
Explicating Some Misconceptions

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The Imperatives of Diversifying
Port Access for Ethiopia

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REGENERATIVE AGRICULTURE HOLDS PROMISE FOR ADDRESSING 21ST-CENTURY CHALLENGES: FILLING TWO NEEDS WITH ONE DEED

Background

The world's population is expected to reach 9.2 billion by 2050, resulting in increased demand for food, feed, fiber, and energy. Natural resources used in agricultural production will become scarce, climate change may have a significant impact on agriculture, and environmental and health concerns will rise.

Modern (industrial) agriculture, with its increased use of advanced technologies, has resulted in bountiful harvests, lower food costs, and a reduction in global hunger. However, modern agriculture has a high environmental and social cost, including soil and ecosystem degradation, biodiversity loss, micronutrient loss, decreased dietary diversity, increased freshwater consumption, groundwater contamination, air pollution, and greenhouse gas emissions.

Under the influence of climate change, agriculture's new role should therefore be to double food production and provide more safe and nutritious food while becoming more efficient and leaving a smaller social and environmental footprint. This calls for a holistic approach to agricultural development at the field, farm, landscape, and agri-food system levels in the context of changing realities and a shorter response time to prepare for unforeseen developments. This is where Regenerative Agriculture comes into play- Within the broader framework of sustainable agriculture, regenerative agriculture, which some consider to be the fifth agricultural revolution, is one of the most recent terms that is gaining popularity and acceptance as a major path for global sustainable farming's future. Regenerative agriculture is a holistic approach to agriculture that considers development in its entirety, from the farmscape to the natural environment, as well as all actors, activities, and processes within agri-food systems, all while contributing to economic, environmental, and socio-economic outcomes.

1. What is the big deal about Regenerative Agriculture?

Sustainable agriculture has long been introduced and advanced to reduce the negative impacts of industrial agricultural production. Sustainable development is also at the heart of the United Nations Sustainable Development Goals (SDGs), which aim to meet current needs without jeopardizing future generations' ability to meet their own.

However, given the magnitude of global land and environmental degradation and biodiversity loss exacerbated by climate change, many argue simply sustaining or maintaining the status quo is grossly inadequate. Instead, more actions are required to regenerate natural resources productive capacity, giving rise to the concept of regenerative agriculture, which goes a step further in restoring what has been lost and improving what is currently present. Simply put, regenerative agriculture is a nature-positive food production approach based on a broad set of principles and practices aimed at regenerating and enhancing soils, biodiversity, and ecosystems. As such, regenerative agriculture aims to regenerate soils, improve biodiversity and ecosystem services, reduce external inputs, boost agricultural productivity, develop new value chains, markets, and businesses, and foster ecological, social, and economic resilience while remaining within planetary boundaries and leaving no environmental footprint.

2. Why should Ethiopia transition to Regenerative Agriculture?

Ethiopia has the worst land degradation of any Sub-Saharan African country.Soil erosion, soil fertility decline, soil organic matter loss, acidity, aridity, and salinity, as well as natural environment/ecosystem degradation manifested by deforestation, landslides, and degradation of wetlands and water bodies, are current realities and rampant in Ethiopian landscapes. Much of the country's biodiversity is under constant threat of disappearance due to factors such as unsustainable use of natural resources, deforestation, conversion of natural vegetation to farmland, land degradation, habitat loss and fragmentation, wetland destruction, extensive replacement of local varieties/breeds with improved ones, invasive species, and climate change. This has been exacerbated by the shift to commercial agriculture, where a few input-responsive strategic crops are grown year after year.

As a result, farmers and ecosystems have been subjected to the effects of environmental degradation and climate change, reducing their adaptive capacity and resilience, resulting in a vicious circle of complex problems of



low productivity, food insecurity, and poverty. This is why the country needs to transition to Regenerative Agriculture.

3. Regenerative agriculture is neither a return to subsistence agriculture nor an abandonment of commercial agriculture

Regenerative agriculture practices are not new in the sense that farmers have used most of the principles and practices for millennia. However, due to degraded resource bases and poor practices, subsistence agriculture has not and will not provide sufficient production to enable the country to achieve food security without the support of science-based solutions.Agriculture in the country, on the other hand, is trending toward commercial production, as demonstrated by agricultural commercialization clusters and farmer production clusters.

This production model, which heavily relies on a few select crops of high yielding varieties in monocultures, as well as increased use of external inputs, may allow the country to achieve short-term productivity gains; however, the gains will not be sustained unless environmental sustainability measures are implemented concurrently.

Based on the foregoing, neither subsistence nor commercial agriculture implemented in isolation can help Ethiopia achieve its dual goals of increased productivity and environmental sustainability. Rather, the country should draw on sustainable elements of subsistence agriculture as well as best practices from commercial agriculture, and then update it by adopting regenerative agriculture practices backed up by scientific knowledge.

4. Regenerative agriculture is situational, it requires landscape and community-level action

In a country like Ethiopia, where agro-ecologies are diverse, farming systems are highly variable at different scales, and soil fertility status varies significantly within short distances, adjusting practices for site-specific soil conditions is critical in adopting regenerative agriculture. As a result, in regenerative agriculture rather than best-bet technologies that work best in a variety of situations, best-fit technologies that are most likely to produce the best results in a specific situation are needed.

Regenerative agriculture, on the other hand, necessitates landscape level planning as well as strong community participation and collaboration to reduce costs by working together while also facilitating cooperation and confidence to invest in collective action, address off-site effects, and manage resource-degrading free-rider actions. This approach also helps in the co- creation and deployment of new knowledge, with a focus on indigenous ecological knowledge and technological innovation.

5. The promises of Regenerative Agriculture

• Helps in soil and water conservation, and improves soil fertility and health

Regenerative agriculture promotes practices such as minimizing mechanical soil disturbance, maintaining permanent soil cover, and integrated soil fertility management, all of which help to protect the soil, improve soil fertility, and improve soil health.

Minimizing mechanical soil disturbance- ***In Ethiopia,*** conventional wisdom on soil tillage has generally been to work the soil as many times as possible through repetitive cross-plowing to bring it to a fine tilth, despite the fact that tillage is known to degrade soil structure. Regenerative agriculture advocates for no or minimal soil tillage or mechanical disturbance in order to reduce soil structure destruction by exposing soil to wind and water erosion, slowing the rate at which organic matter is mineralized and oxidized, and slowing the oxidation of soil carbon. Reduced tillage also increases soil organic matter, resulting in higher soil carbon content as well as increased water and nutrient holding capacity while causing minimal disruption to soil organisms. Besides, it reduces operational costs such as time, energy, and money.

Maintaining permanent soil cover- In Ethiopia, crops are harvested from the ground and crop stubble and residues are removed from the field for fuel wood, livestock feed, and other household uses, resulting in extensive soil mining and leaving the soil bare and exposed to water and wind erosion, as well as sun heat. Regenerative agriculture encourages farmers to armor the soil surfaces by using practices such as mulching, cover crops, and leaving crop residues and stubbles on the field.

Integrated soil fertility management- Depending on the local context, regenerative agriculture recommends limiting, if not eliminating, the use of inorganic fertilizers. However, in Ethiopia, where soil nutrient availability is severely limited and fertilizer use is low, continuing cultivation without external inputs will only degrade the soil and reduce yields, implying that optimal levels of chemical fertilizers are required.

However, chemical fertilizer prices on the international market are skyrocketing, putting smallholder farmers at risk, and when available, improper application of chemical fertilizers can harm the environment as well as human and animal health while also reducing its efficiency. Regenerative agriculture provides solutions by recommending the integrated and efficient use of inorganic fertilizers and organic resources.

• Contributes to increased agro-biodiversity

Adequate diversity is necessary to ensure natural and agricultural ecosystems' long-term resilience to shocks and stable ecosystem functioning, and is central to the principles of regenerative agriculture practices. Regenerative systems advocate for diverse farming systems with an optimal crop/animal combination that fosters synergistic action, allowing the system to support its own soil fertility, natural pest regulation, and crop productivity. As such, through spatial and temporal/seasonal crop arrangement practices, regenerative agriculture promotes both below and above ground agro-biodiversity.

• Improves total farm productivity and profitability

Regenerative agriculture, as a systems approach to food production, values outcomes from ecosystem service enhancement, increased biodiversity, and soil regeneration, in contrast to conventional agriculture, which measures success primarily in terms of commodity output. It is founded on a more comprehensive understanding of ecosystem services, and increases total farm productivity by reducing agricultural input use and improving resource use efficiency. Total yields per unit area from multiple interacting crop and animal species are frequently higher than yields from monocultures. Aside from increased yields, mixed-species production increases food diversity and nutrition, resulting in healthier diets and more resilient farms. Livestock integration through the holistic livestock management principle, which prevents overgrazing by limiting grazing duration and rotating animals through a series of paddocks, can help improve system productivity and mitigate negative effects. Greater resource efficiency, on the other hand, helps to boost productivity, conserve biodiversity, and improve ecosystem services

• Improves ecosystem services

Ecosystem services are the direct and indirect benefits that natural systems provide to humans, such as provisioning, regulating, cultural, and supporting services.By enhancing on-farm ecosystem services regenerative agriculture practices contribute to the generation of off-farm goods and services for the general public, and they serve as the foundation of critical ecosystem services such as soil, water, and climate regulation. Overall, regenerative agriculture practices boost biodiversity, sequester carbon, reduce greenhouse gas emissions, and mitigate climate-related effects like drought and flooding.

Sasakawa Africa Association's Approach to Regenerative Agriculture

• Regenerative agriculture practices for agro-ecological productivity, sustainability and resilience

The SAA's approach to RA draws on best practices from both subsistence agriculture and emerging commercial agriculture production practices. It combines approaches to increase crop productivity, improve input efficiency, reduce post-harvest losses, as well as improve soil fertility, agro-biodiversity, and ecosystem services. To that end, SAA employs two well-established and complementary practices that do not necessitate sophisticated technology: Conservation Agriculture (CA) and Integrated Soil Fertility Management (ISFM).

Along the lines of CA, the organization promotes practices such as reduced tillage, including the use of "Berken Maresha" to reduce tillage frequency, soil covers, and increased agro-biodiversity. It encourages crop residue to be left on the field for mulching and cover crops to be grown to reduce the amount of time the soil is left bare or exposed.

SAA promotes spatial and temporal crop diversification practices in effort to enhance agro-biodiversity. As a result, cereals and pulses are intercropped, cereal crops are grown alongside leguminous trees and shrubs (agroforestry), and cereals and pulses are rotated over a longer period of time. SAA also promotes permagardening, which encourages women in homesteads to engage in agriculture that mimics nature by growing diverse crops and combining efficient water use, local fertilization methods, indigenous knowledge, and own labor to meet nutritional and economic needs, as well as gender empowerment.

To improve soil fertility and health, SAA promotes the wise and efficient use of inorganic fertilizers and recycled organic resources, as well as their optimal combinations. As a result, SAA promotes the use of organic sources such as compost, vermicompost, manure, farm yard manure, green manure, bio-fertilizers, and other soil conditioning activities such as liming acidic soils and breaking hardpans, and in addition to using diverse local cultivars, improved germplasm that is productive, nutrient-responsive, climate-resilient, and tolerant to biotic and abiotic stresses.

SAA also fosters livelihoods and ecosystem resilience by establishing climate-smart villages, where climate-resilient crops, water-efficient technologies, climate-smart practices, and other initiatives are promoted to achieve the triple goals of increased productivity, climate adaptation, and mitigation. Beyond the farm, SAA encourages communities to coordinate and synergize their efforts on public goods at the landscape level, such as watershed development, soil and water conservation, tree planting, forest management, water development, free animal grazing control, etc., in order to improve agro-ecosystem and natural ecosystem interaction.

In order to optimally integrate livestock in the crop production system, SAA prioritizes high biomass crop varieties and incorporates forage crops in intercrops, bunds, hedges, alleys, etc. Furthermore, it teaches farmers how to develop fodder banks, controlled rotational grazing, and a cut-and-carry system, as well as feed conservation practices, and it mobilizes communities to take collective action to stop free grazing.

• Regenerative agriculture practices for economic, and social well-being

Regenerative agriculture should contribute to the achievement of the triple objectives of environmental, economic, and social well-being. As a result, in addition to production and agro-ecological and environmental interventions, SAA employs regenerative agriculture across the agricultural value chain/agri-food systems to address economic and social concerns holistically.

Summary

In a nutshell, regenerative agriculture is concerned with soil restoration, biodiversity enhancement, climate resilience, increased and stable production, and the development of a holistic ecosystem and ecosystem services.As such, regenerative agriculture appears to be a promising path for overcoming 21st century challenges and advancing sustainable agriculture development.

Going forward, the Sasakawa Africa Association aspires to lead and decisively deliver on Ethiopian agriculture's transition to regenerative agriculture-based food production, and to usher in the transformation of the country's food systems. SAA

Key Outcomes

- Improve soil health
- Foster biodiversity
- Promote economic resilience

Sasakawa Africa Association

Headquartered in Tokyo, Japan, SAA, is an international non-governmental organization (NGO) with operations in Ethiopia, Uganda, Nigeria, and Mali. The Ethiopian SAA program (popularly used to be known Sasakawa Global 2000) began services in 1993. It is widely credited for laying the foundation for Ethiopia's National Agricultural Extension Services in the mid-1990s, and igniting a crop production revolution particularly in maize and wheat. It has enhanced the skills of agricultural extension agents by upgrading their education levels through its mid-career training program.

SAA interventions have evolved over time in response to host countries' agricultural policies, strategies, and demands, beginning with a focus on crop production enhancement in the early 1990s and expanding to include post-harvest management, agro-processing and markets, and the entire crop value chains. In 2021, its course shifted dramatically.

Cognizant of the new role agriculture in producing adequate, safe, and nutritious food under the influence of climate change and dwindling natural resources and contributing to meeting social welfare, public and environmental health goals, SAA prioritized a sustainable, regenerative, and resilient agriculture that is nutrition-sensitive and market-oriented in its new five-year strategy spanning 2021 to 2025. SAA is currently leading the way in fully implementing regenerative agriculture on the ground to restore soil fertility and health, increase agro-biodiversity, and improve agro-ecosystem services. By doing so, and guided by its motto "Walking with the Farmer," SAA envisions to see Ethiopia and the rest of Africa fulfill the dream and aspirations of building resilient and sustainable food systems.

SAA educates farmers on how to approach farming as a business and increase productivity to maximize profits. It fosters producers' agency and control over their products, and direct consumer engagement to capture the value of regenerative products. It also facilitates producers' access to market information and structured input-output market linkage to buyers, allowing products to be produced responsibly, product safety and quality to be tracked and better prices to be negotiated.

SAA assists youth and women in creating green jobs by engaging in agricultural input and product trading, agro-processing and value addition, farm machinery provision, and alternative complementary livelihood opportunities. It promotes Nutrition-Sensitive Agriculture to combat malnutrition and micronutrient deficiencies. It incorporates nutrient-dense crops (biofortified crops, pulse crops, indigenous vegetables, and local super grains like millets) as well as animal foods into diversification programs. It promotes hygienic and healthy food preparation, local food processing and value addition; and diet diversification. It also works to reduce harvest and post-harvest losses by promoting improved harvesting, threshing, and transportation technologies, as well as storage facilities.

SAA works to build human and social capital, social cohesion, and collective action in order for communities to own and redesign regenerative agriculture on their own terms for maximum return and a transformative impact on entire landscapes and communities. It engages people from all walks of life. Men, women, boys, girls, children, the poor and marginalized, and people with special needs are addressed and benefited along the value chain.

Fentahun Mengistu TIRUNEH (PhD) Country Director, SAA

Dr. Fentahun Mengistu is the Country Director of the Sasakawa Africa Association. He held the position since August 2018. Dr Fentahun earned his B.Sc. degree in Plant Sciences from Haramaya University, MSc in Horticulture from Indian Agricultural Research Institute, India, and PhD from Boku University, Austria.

Dr. Fentahun has over 32 years of experience as a researcher, development expert, and leader in Ethiopian agricultural research and development. He began his career at the Ethiopian Science and Technology Commission as an entomological researcher in 1989. For 12 years since 1995, along the research position he held, Dr. Fentahun had served as Director of the Adet Agricultural Research Center, Director General of the Amhara Region Agricultural Research Institute (ARARI), and the Director General of the Ethiopian Institute of Agricultural Research (EIAR). He had also worked as a Senior Agronomist for a US-based Tufts University based in Ethiopia.

He worked as a senior researcher on grain and horticultural crops breeding & agronomy, nutrition, crop protection, agro-biodiversity, soil microbiology, climate change, and regenerative agriculture. Dr. Fentahun authored and co-authored over 60 articles in peer reviews publications. He has served on a number of high-level governance and advisory boards in Ethiopia and the rest of Africa. He has also taught postgraduate students and provided advisory services. At the moment, he is a fellow of the prestigious Ethiopian Academy of Sciences.