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Cultivating the Earth: Biblical Insights and Conventional Techniques for Sustainable Crop Production

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Abstract

This paper examines how biblical principles can inform sustainable agricultural practice in response to the growing demand for food systems that are environmentally sound, socially just, and economically viable. It explores the integration of faith-based values with conventional farming techniques to develop holistic solutions for long-term crop production. Drawing on scriptural teachings such as stewardship, rest, equity, diligence, and justice, the study outlines a moral and ethical framework that supports key sustainability goals, including improving soil health, conserving water, promoting biodiversity, and enhancing livelihoods. It reviews existing faith-based agricultural models and aligns them with contemporary environmental strategies, offering a value-based perspective that complements existing frameworks. The paper argues for inclusive and responsible agricultural systems where no group is disadvantaged, and where farm workers, landowners, and communities benefit equitably. It emphasizes the role of faith institutions in fostering land restoration, fair resource distribution, and youth engagement in agriculture as a meaningful and sustainable career path. The study concluded by recommending farmer training rooted in ethical land stewardship and creating structures that uphold both ecological integrity and social justice. Overall, the paper contributes to discussions on sustainable crop production systems by linking biblical ethics with global development priorities.

Keywords: Biblical principles, Conventional Agriculture, Crop production, Sustainability.

Introduction

Sustainable agriculture has become a critical focus in the quest to balance food production with environmental stewardship, resource conservation, and social well-being. As the global population grows and climate patterns change, the challenges faced by modern agriculture intensify. As the global population has grown from 2 billion in 1927 to 8 billion, the rising demand for surplus food to feed the increasing number of people has led to higher reliance on fossil fuel energy.[1]

As global food demand rises, efforts to enhance food security often lead to unsustainable crop production practices that deplete soil health, degrade ecosystems, and contribute to greenhouse gas emissions.[2] Consequently, impacting climate change negatively. The increasing carbon emission devastates all components of the food production system.[3] Components such as soil, water, biodiversity, ecosystems, crop production, and food security are being affected. For example, in Nigeria, food insecurity is significantly increasing. The Nigerian Economic Summit Group reported that the number of people who are not food secured increased from 66.2 million in the first quarter of 2023 to 100 million in the second quarter of 2024.[4] This is primarily caused by conflict, extreme weather,

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1 "UN Chronicle," *Population and Climate Change: Decent Living for All without Compromising Climate Mitigation*, United Nations, last modified April 8, 2024, https://www.un.org/en/population-climate-change-decent-living-all-without-compromising-climate-mitigation

2 N. Arora, "Impact of Climate Change on Agriculture Production and Its Sustainable Solutions," *Environmental Sustainability* 2 (2019): 95–96, https://doi.org/10.1007/s42398-019-0078-w

3 J. Bélanger and D. Pilling, *The State of the World's Biodiversity for Food and Agriculture*, FAO Commission on Genetic Resources for Food and Agriculture Assessments (Rome: FAO, 2019). L. Kumar, N. Chhogyel, T. Gopalakrishnan, M. K. Hasan, S. L. Jayasinghe, C. S. Kariyawasam, B. K. Kogo, and S. Ratnayake, "Climate Change and the Future of Agri-food Production," in *Future Foods: Global Trends, Opportunities, and Sustainability Challenges* (2022), 49–79, https://doi.org/10.1016/B978-0-323-91001-9.00009-8.

4 Nigerian Economic Summit Group (NESG), *NESG Issues a Policy Brief on the Status of Food Security in Nigeria* (Abuja: NESG, 2024).

poor soil quality, poverty, and inflation, all of which negatively impact crop yields and self-sufficiency.[5] Low crop yields resulted in overdependence on food imports.

Addressing food insecurity issues requires innovative strategies and a renewed focus on the sustainability of crop production practices using a holistic approach. It requires a transition to low-carbon and sustainable economies.[6] Hence the need for sustainable crop production practices that will increase food sufficiency, reduce hunger, and improve the welfare of the nation without causing environmental hazards.

The United Nations (UN) Interfaith Statement on climate change highlights the importance of faith traditions to foster "shared moral responsibility for the environment as faith traditions provide new forms of coping mechanisms to deal with environmental challenges confronting humanity through an integrative review and critical analysis.[7] Exploring the biblical principles of sustainability in crop production offers a significant solution to food insecurity and poverty in Nigeria and Africa.

Integrating biblical insight with contemporary, innovative methods will provide a holistic solution to problems that inhibit

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5 V. Bjornlund, H. Bjornlund, and A. F. van Rooyen, "Why Agricultural Production in Sub-Saharan Africa Remains Low Compared to the Rest of the World—A Historical Perspective," *International Journal of Water Resources Development* 36 (2020): S20–S53, https://doi.org/10.1080/07900627.2020.1739512; Food and Agriculture Organization of the United Nations (FAO), International Fund for Agricultural Development (IFAD), United Nations Children's Fund (UNICEF), World Food Programme (WFP), and World Health Organization (WHO), *The State of Food Security and Nutrition in the World 2024: Financing to End Hunger, Food Insecurity and Malnutrition in All Its Forms* (Rome: FAO, 2024), https://doi.org/10.4060/cd1254en; World Bank, *Food Security Update* (Washington, DC: World Bank, 2024).

6 United Nations, "Accelerating Low-Carbon Transition by Developing Countries through Trade," Accessed 1, 2025, https://www.un.org/ohrlls/news/accelerating-low-carbon-transition-developing-countries-through-trade.

7 N. Singh, M. Chi Vu, I. Chu, and N. Burton, *Faith Traditions and Sustainability: New Views and Practices for Environmental Protection* (Cham: Springer, 2023), https://doi.org/10.1007/978-3-031-41245-5.

sustainability, while conventional crop cultivation techniques will help optimize crop yields and production efficiency. These perspectives, together, will create a robust, practically effective, and well-rooted framework for sustainable crop production. In light of this, this paper aims to integrate biblical insights with conventional agricultural principles to promote sustainable crop production. Therefore, the objectives of this study are five:

1. To explore ancient biblical principles on sustainability.
2. To discuss the history of sustainability in crop production.
3. To highlight conventional techniques that support sustainability in crop production.
4. To conduct a review of relevant articles on faith-based sustainable practices.
5. To integrate biblical and conventional principles for sustainable crop production and establish a crop production sustainability model using faith-based principles.

Hence, this study analyzes biblical injunctions and other relevant faith-based articles that support sustainable crop production. Contents are juxtaposed, and facts are drawn to support or challenge existing faith-based practices. Existing faith-based and conventional practices are examined through the lens of the Bible to establish holistic crop production practices that support sustainability.

Biblical Principles for Sustainable Crop Production

Respect and Stewardship

Psalm 24:1 declares that everything, both living and nonliving, on the earth belongs to God. This is the foundational truth that God created them all (Genesis 1). Humanity, as part of this creation, is entrusted with the responsibility of managing and caring for everything on the earth. Respect, therefore, flows from the acknowledgment that the earth belongs to God. Any series of activities that abuses, exploits, or degrades the earth (land and water resources) dishonors Him.

Genesis 1:28 exemplifies how a man should take responsibility and care for the Garden of Eden. In Genesis 2:15, God placed Adam in the Garden of Eden to dress and keep it. Dressing means cultivating, caring for, and maintaining the garden to ensure it is fruitful and multiplies. Any activity that causes disorder in the garden should be avoided. Adam's role was to engage in productive, meaningful labor and to care for the environment and its natural resources. Crop cultivation practices and the natural environment must be in harmony. Rather than just exploiting natural resources, production activities should add value to the garden.

Proverbs 13:22 says that a good man leaves an inheritance for his children's children. It highlights the importance of inheritance, not just in wealth but in the stewardship of the land and resources. A long-term vision should guide every farming activity. Land should remain productive for future generations. Inheritance also includes knowledge transfer. Sustainable farming practices should be passed on to future generations to ensure consistent productivity. This way, future generations can improve on existing farming practices and achieve better results.

In essence, there should be thoughtful and active stewardship in both knowledge transfer and the physical domain, as the duty of the present generation is to leave the land in a better state for future generations. Future generations must sustain farming activities to ensure their survival. Countries that fail to produce their own food risk dependence or enslavement by others. Therefore, it is crucial to safeguard resources, share knowledge, and enhance current understanding so that future generations can prosper. The Sabbath year, as described in Leviticus 25:1-7, also offers insight into creation and stewardship. God, as the creator and owner of the land, reaffirms His ownership of the entire universe. He instructed humanity to desist from exploiting His creation and to manage resources responsibly. This is regarded as a service, not for personal gain.

Land rest and Faith

The principle of land rest, explained in Leviticus 25:1-7, allows the land to rest every seventh year to replenish nutrients. No pruning, sowing, or harvesting. The land should be kept as a sabbath unto the LORD. The cyclical seventh-year rest affirms the weekly Sabbath principle articulated in Genesis 2:2–3, in which God rested after the work of creation. The Sabbath Year extends this divine principle to the land. The Sabbath Year highlights rest not only as a human need but also as a means to maintain the orderliness of His creation. This perspective also aligns with the prophetic vision of ecological restoration (Isaiah 11:6–9) and the new-creation narrative (Revelation 21:1–5). It affirms that all creation should participate in divine rest, which symbolizes completeness, renewal, and orderliness. Letting the land lie fallow for an entire year would not seem economical.

However, God assured the Israelites that the sixth year would produce just enough to sustain them through the seventh year and beyond. God's blessing on the sixth year is equated with a three-year harvest (Leviticus 25:21). This verse also shows how God led Israel to trust in His provision. We, as humans, survive by divine blessing, not solely because of our hard labor. This principle encourages believers to place their faith in God rather than rely solely on their own efforts. James 5:7 also highlights the need for patience and trust in God for the early and later rain. The reward for faith is a great harvest (Jeremiah 17:7-8). Beyond this principle, the Sabbath year was a covenant with the Israelites. Obeying this principle signifies their faithfulness to the covenant God had with them, while disobedience led to grave consequences (2 Chronicles 36:20–21).

Justice, Fairness, and Social Equity in Agriculture

The instruction to leave whatever grew naturally during the Sabbath Year for the poor and animals (Leviticus 25:6–7) promotes social equity. The practice enabled marginalized individuals, who may not have had their own land, to access food freely during this period. This shows that God is concerned for the poor. It also

reflects compassion, generosity, and wealth redistribution. In Luke 4:18-19, Jesus echoed the same principle, embodying justice and care for the least in society.

Gleaning is referenced in Deuteronomy 24:19-21 and Leviticus 19:9-10, where God instructs people to leave parts of their crops for the poor and vulnerable. This act of care and social justice is also highlighted in Matthew 12:1, where people are permitted to enter a farm and pluck ears of corn to eat. Deuteronomy 24:19 states that if you forget a sheaf in the field after harvest, you should not return to retrieve it. It is for the stranger, the orphan, and the widow. Giving to marginalized groups is considered a service to God, and obedience to this command promises fruitfulness. Additionally, do not harvest all the grapes from your vineyard so that God will bless all the work of your hands (24:20).

Diligence & Fruitfulness

God is depicted in scripture as a diligent Creator. In Genesis 1, God meticulously orders creation over six purposeful days, evaluating His work as "good" (Genesis 1:31). His diligence results in beauty, order, and fruitful life. Humanity, created in God's image (Genesis 1:26–28), is therefore formed to mirror this creative diligence by cultivating and managing the earth responsibly.

Diligence in human labor (including farming) is a divine mandate that aligns with God's creative nature. "Whoever watches the wind will not plant; whoever looks at the clouds will not reap." Farmers plant seeds without a guarantee of rain; believers obey God without knowing all the results. This reflects God's faithfulness in rewarding the obedient (Hebrews 11:6). While human beings cannot control all circumstances, they are called to act in faith, trusting God for outcomes. This shows diligence as an act of faith in God's providence. The lazy find nothing at harvest time because they do not sow in the right season (Proverbs 20:4). Until we return to farming and treat it as a business, poverty and food insecurity will be the order of the day (Proverbs 21:5). Diligence requires careful planning and hard work to bring about prosperity.

Diligence also carries eschatological implications. The expectation of "bearing fruit" in Luke 13:6–9 points to ultimate accountability before God at the end of time. Just as the fig tree is evaluated, so will believers be assessed for their faithfulness and fruitfulness (John 15:1–8). Diligence in earthly tasks includes crop production. Physically, we are accountable to humanity for caring for the earth and for replenishing and multiplying it. Therefore, we must be faithful servants, bearing not only spiritual fruit but also physical fruit.

The History of Sustainability in Crop Production

According to the UN, sustainable development is defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It emphasizes the use of traditional knowledge to maintain ecological balance.[8] This concept is hinged on three pillars: economic, social, and environmental. Sustainability focuses on efficient production and prudent stewardship of Earth's resources.[9]

The concept of sustainability is not new. Natural ecosystems sustain life through balanced, regenerative cycles. The regenerative cycle is a circular process whereby nothing is wasted in the ecosystem. For instance, organic matter decomposes to enrich the soil and support new growth of plants. Likewise, predator-prey relationships keep the population of various species in check. Various plant and animal species also work together to maintain the ecosystem. Humans have drawn inspiration from these natural regenerative systems to develop sustainable crop-production

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8 D. R. Saikanth, Supriya, B. V. Singh, A. K. Rai, S. R. Bana, D. S. Sachan, and B. Singh, "Advancing Sustainable Agriculture: A Comprehensive Review for Optimizing Food Production and Environmental Conservation," *International Journal of Plant & Soil Science* 35 (2023), https://doi.org/10.9734/ijpss/2023/v35i163169.

9 J. W. Doran and E. Gregorich, "Sustainable Agriculture: Soil Quality," in *Managing Soils and Terrestrial Systems, 2nd ed., ed. Brian D. Fath and Sven Erik Jorgensen* (Boca Raton: CRC Press, 2020), https://doi.org/10.1201/9780429346255-31.

practices. It begins with ancient practices such as rotational and terraced farming.

Over time, the Industrial Revolution disrupted these practices, prioritizing short-term gains over long-term balance. For instance, the intensive use of fossil fuels and excessive chemical use have led to environmental degradation, resource depletion, and pollution. To address these challenges, the United Nations Conference held in Stockholm in 1972 laid the groundwork for sustainability.

The Stockholm Conference established 26 principles to steer environmental management and development. These principles include conserving renewable and nonrenewable natural resources and protecting wildlife and other natural resources.[10] Modern frameworks, such as the 2015 UN Sustainable Development Goals (SDGs), have been introduced to broaden the scope of sustainability. They aim to eradicate poverty, promote social justice, end hunger, ensure food security and better nutrition, and encourage sustainable agriculture. Additionally, these goals focus on fostering sustainable consumption and production patterns, protecting, restoring, and promoting the sustainable use of terrestrial ecosystems. They emphasize sustainably managing forests, combating desertification, reversing land degradation, halting biodiversity loss, and addressing climate change.[11]

Current global challenges in agriculture, such as climate change, soil degradation, and food security, underscore the need to consistently align crop production systems with the regenerative principles inherent in nature. We therefore need to establish and redesign structures, processes, and lifestyles that align with ancient scriptural principles to foster shared responsibility and solve our problems. Ancient principles respect nature's limits and ensure that we are not merely surviving but flourishing now and for future generations to blossom. This calls for research to examine

[10] Wikipedia, "United Nations Conference on the Human Environment," last modified December 14, 2025, https://en.wikipedia.org/wiki/United_Nations_Conference_on_the_Human_Environment.

[11] United Nations, "The 17 Goals" accessed December 1, 2025, https://sdgs.un.org/goals

scriptural principles related to crop production and to align existing or innovative crop production practices that support the scriptures to improve resilience and sustainability.

Crop Production Practices that Support Sustainable Crop Production

Crop production practices that support resilience and sustainability include substituting synthetic fertilizers and pesticides with organic farming systems that use biopesticides, biofertilizers, pest-resistant crop varieties, and high-yield crop varieties. Adopting water-conservation practices, such as mulching and irrigation, enables year-round crop cultivation in areas with inconsistent rainfall. Sustainable production also involves management practices like composting, crop rotation, minimal tillage, cover cropping, agroforestry, mixed cropping, mixed farming, and precision farming. Agroforestry and polyculture help preserve soil flora and fauna, protect and conserve various species, their habitats, and ecosystems. In modern times, reducing fossil fuel use through renewable energy, such as solar, can lower greenhouse gas emissions. To promote resilience in crop production under climate variability, drought-resistant crop varieties should be used.

While the aforementioned crop production practices ensure environmental sustainability, they also increase crop yields and farmers' incomes. To ensure social and economic sustainability, the agrifood value chain, education, and cooperative farming systems should be developed. These systems enable farmers to leverage technology, improve access to credit, and ensure the adoption of sound crop production practices.

Principles of Conventional Techniques in Crop Production: Merits and Demerits

The principles of conventional farming techniques are rooted in practices that enable farmers to increase productivity. While conventional farming techniques rely heavily on modern technologies, synthetic inputs, and mechanized processes, they

also have disadvantages. Below are the key principles that define conventional crop production, highlighting both its merits and demerits:

1. There is a heavy reliance on inputs such as chemical fertilizers, pesticides, and herbicides, as well as on irrigation. Farmers use these inputs to improve crop yields, manage weeds, pests, and diseases, and ensure consistent production and productivity. Examples include the use of synthetic nitrogen fertilizers to boost crop growth. However, intensive use of these chemicals may lead to water pollution, soil degradation, and health risks.
2. The practice of cultivating a single crop variety across large areas is prevalent today. This helps to simplify planting, harvesting, and pest management. The demerit of this practice is that it increases vulnerability to pests, diseases, and soil degradation.
3. Conventional farming technique involves the use of machinery for planting, cultivating, irrigating, and harvesting crops. The use of machinery helps reduce labor costs and time while improving production efficiency. However, these machineries rely heavily on fossil fuels, which contribute to greenhouse gas emissions and climate change. Additionally, using these machines requires substantial investment. This places a heavy burden on peasant farmers, thereby limiting their productivity.
4. This technique uses large-scale irrigation systems to ensure crops receive the water they need for year-round cultivation. This helps to maintain high productivity, especially in arid and semi-arid regions. The challenge, however, is the overuse of water resources, which can lead to depletion and salinization.
5. The use of genetically modified crops helps to resist pests, tolerate herbicides, and increase yield. For instance, cotton can be modified to resist bollworms. The increasing concern, however, is the ethical, ecological, and health considerations.

6. The conventional technique is a standardized practice that ensures there's uniformity in procedure. For example, fertilizer/pesticide application rates and standard plant spacing help ensure predictable outcomes and efficiency in crop production.
7. In conventional farming, farmers focus on producing economically viable crops with high market demand and profitability. For example, prioritizing cash crops like cotton, sugarcane, or soybeans over food crops to increase profitability.
8. Farmers engage in continuous cultivation to maximize land use and produce multiple harvests annually. With minimal fallow periods, farmers intensively cultivate their farmland to increase profit. This practice, however, leads to nutrient depletion and soil fatigue.

The challenges of conventional farming techniques, therefore, necessitate adopting sustainable crop production practices such as organic farming, agroforestry, mulching, organic composting, backyard farming, and solar hydroponics. These practices will pave the way for resilient and eco-friendly food systems.

Bridging Principles and Conventional Techniques

Principle of Land Rest, Property rights and Care for the Poor

Leviticus 25: 8-22 describes hallowing the fiftieth year and proclaiming liberty throughout the land. At Jubilee, every man is instructed to return to his family, restore people's possessions, and neither sow nor reap on their farmlands throughout the period. In Exodus 23:10-11, land is allowed to regain its fertility after 6 years of cultivation, and in the 7th year, the land should rest. Also, whatever grows naturally should be left for the less privileged, and the remainder for wild animals. The emphasis is on land rest for recovery and on care for the poor and animals. In modern agriculture, the principle of land rest inspires practices such as crop rotation, which allows the land to recover naturally and protects soil health. It prevents long-term land exploitation and ensures

sustainability. It underscores the need to manage and use natural resources responsibly.

The Ethics of Land Use and Tenure Security in Leviticus 25:23-24 places a restraint on the use of the earth's resources. Sojourners do not have permanent land rights, meaning that land cannot be inherited or owned by strangers or sojourners in perpetuity. Land is to be returned to the owner in the year of Jubilee after it has been sold and occupied for a specified number of years. Land can be redeemed by the owner or any of his kin at any point in time. If the owner cannot repurchase it, the land will be restored to the owner at Jubilee by default. In ancient times, these laws were enacted to prevent land grabbing and to protect people's inheritance. All lands are secured except for buildings in walled cities, which sojourners can permanently inherit if not redeemed within a year. By virtue of permanent ownership by families, investment can be made in the land to preserve it because they have unrestricted access to the land. Therefore, they are encouraged to manage it wisely. In modern times, it implies that secured tenure may encourage users to use land resources wisely. Land rest, property rights, tenure, and fairness are the core principles governing the people. These principles help to maintain social equity in the distribution, management, and sustainability of the land.

Resource Conservation: Preserving the ecosystem

Deuteronomy 22:6-7 addresses the preservation of the ecosystem. It ensures species are not driven to extinction through exploitation. It supports biodiversity conservation by preventing actions that could threaten species' survival. People are permitted to take the young birds, not the dam. Genesis 1 demonstrates God's wisdom and intentionality in creating diverse species of plants, animals, fish, and birds to serve distinct purposes. He created the night, day, waters, firmament, dry land, sea, grass, herbs, trees, moving creatures and man. These varieties contribute to the ecosystem as a whole. It also suggests an inherent value of preserving God's creation and the completeness of the cycle. Everything that God created interacts with each other. Both living and nonliving things

are interconnected, and none exist in isolation. All things interact with each other within an environment.

The scriptural guidance on the responsible use of natural resources, such as water and soil, can be seen (in Isaiah 55:10-11 and Jeremiah 4:3) respectively. Isaiah 55:10 highlights the importance of rain and snow in watering the earth so seeds can grow and multiply. Also, soil health should be managed (Jeremiah 4:3). It talks about the fallow ground- an arable land that has regained its fertility after resting for a period of time by rotation. Thorns and weeds that grew during the fallow period are destroyed before cultivation. The potential benefit of fallowing is to reduce weeding for many years after the fallow period and to increase crop yield. After repeated cultivation, the practice(fallowing) is repeated, and the renewal cycle continues.

Lessons from Parables and Scriptures Related to Farming

Parable of the Sower

The Parable of the Sower (in Matthew 13:4-8) underscores the importance of soil health, preparation, and planting in good soil for fruitful growth.

> *"And when he sowed, some seeds fell by the way side, and the fowls came and devoured them up: some fell upon stony places, where they had not much earth: and forthwith they sprung up, because they had no deepness of earth: and when the sun was up, they were scorched; and because they had no root, they withered away. And some fell among thorns, and the thorns sprang up, and choked them, but other fell into good ground and brought forth fruit, some a hundredfold, some sixtyfold, some thirtyfold".*

The unfruitful vineyard in Isaiah 5:1-2 emphasizes crop protection, land preparation (fertile land), and planting with viable seed. Planting using the "choicest vine" denotes using the best of seed varieties (high-yielding varieties, pest or disease-resistant varieties). Vine processing is also established to prevent post-

harvest losses. Therefore, farmers should prepare adequately and be well informed about production, preservation, and processing techniques that promote sustainability and reduce waste. Whatever will bear no fruit should be uprooted and destroyed. He wants us to bear fruit, our crops to bear fruit and multiply. Fruitfulness can be established only when knowledge exists, and that knowledge is put to good use. It translates into good results.

The Ploughman

The ploughman in Isaiah 28:23-29 emphasizes land preparation, cultivation, productivity, and increasing knowledge of innovative ways of crop production. It shows a high level of precision planting. The wheat, barley, and rye are planted in their appointed space to maximize the potential of the land. All farm activities are well planned and managed in a mixed cropping system. It provides farmers with benefits such as pest and disease control, increased productivity, and greater food production. The verses of scripture display expertise and discretion, from ploughing to breaking clods of ground to planting, harvesting, and processing. In verse 27, *"For the fitches are not threshed with a threshing instrument, neither is a cartwheel turned about upon the cummin; but the fitches are beaten out with a staff, and the cummin with a rod".*

The Sluggard and His Vineyard

In Proverbs 24:30-34, a slothful man, void of understanding, will have weeds all grown over the field and its protective wall broken down. The end of such a man is poverty.

Every farmer should demonstrate foresight, be active in caring for the land (by planting, weeding, irrigating, and maintaining soil fertility), be timely during planting and harvesting, control pests and diseases, and protect the farm (with fences, drainage systems, and irrigation). In summary, farming requires consistency and vigilance. As such, all farmers should be proactive, diligent, and wise to stay productive and sustainable.

Review of Faith-based Sustainable Practices

Faith-based sustainability practices in agriculture have shown promise in addressing environmental and social challenges. Studies in Kenya, Senegal, and the Philippines demonstrate how religious organizations integrate faith convictions with sustainable farming approaches.[12] While these organizations often employ biblical farm practices that emphasize long-term sustainability and community involvement,[12] they have their own shortcomings. One of these organizations is "Farming God's Way (FGW)". It uses faith-based Conservation Agriculture (CA) method, and has spread throughout Sub-Saharan Africa, improving food security and soil productivity.[13] Farming God's Way (FGW) employs certain CA principles, such as no-tillage, mulching, and crop rotation. Research shows that the FGW method increased labor demands on women, who were primarily responsible for weeding, whereas it reduced labor demands on men, who were not involved in tillage. Nonetheless, farmers claim that this approach connects their faith to their vocation, transforms their farming practices, and positively influences their adoption of faith-based CA. In contrast, other researchers have contested the claim that faith changes mindsets and its role.[13]

Both farmers and program managers, as well as other literature, also argued that faith, biophysical, and socioeconomic benefits influenced the adoption of their method. Farmers adopting FGW practices vary with agro-ecological, socio-economic conditions, and faith. Thus, the impact of faith-based CA practices varies

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[12] J. M. Moyer, "Faith-Based Sustainability in Practice: Case Studies from Kenya," *Journal for the Study of Religion, Nature and Culture* 9 (2015): 42–67, https://doi.org/10.1558/JSRNC.V9I1.17758; L. L. Cochrane, "Land Degradation, Faith-Based Organizations, and Sustainability in Senegal," *Culture, Agriculture, Food and Environment* 35 (2013): 112–124, https://doi.org/10.1111/CUAG.12015; M. A. Eusebio, "Spirituality and Business Sustainability," *Journal of Management for Global Sustainability 6, no. 1* (2018), 67 – 98 https://doi.org/10.13185/JM2018.06104

[13] H. Spaling and K. Vander Kooy, "Farming God's Way: Agronomy and Faith Contested," *Agriculture and Human Values* 36 (2019): 411–426, https://doi.org/10.1007/s10460-019-09925-2

among farmers.[14] In contrast to CA principles, FGW endorses only solo cropping (one crop in a field at a time) and not intercropping (two or more crops in a field at a time), assuming that crops compete.[15] Although yields for the same crop (maize) are often higher under solo than intercropping, the total yield of two crops (maize and beans) is generally greater than that of a solo crop.[16] FGW uses biblical metaphors such as God doesn't plow, God's blanket, and the Garden of Eden. Through faith-based networks, FGW has spread throughout Sub-Saharan Africa as an intervention to improve food security, adapt to climate change, and restore soil productivity among poor farming households.[17]

Given FGW's unique potential to advance sustainability in agricultural communities, its farm practices should embrace gender equity in labor. Women should not be disadvantaged; rather, there should be a balance. Other practices, such as intercropping, should be adopted, as organic inputs can supply nutrients to enhance crop growth. With the use of compost or other organic inputs, intercropping will yield a total increase in output and also reduce pest infestation.

The summary of Spaling and Kooy's research on the benefits of practicing faith-based CA (FGW) and the claims made by FGW farmers and program managers is shown in the table below.

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[14] Moyer, "Faith-Based Sustainability in Practice: Case Studies from Kenya," 42–67; Cochrane, "Land Degradation, Faith-Based Organizations, and Sustainability in Senegal," 112–124; Eusebio, "Spirituality and Business Sustainability," 67 – 98.

[15] Spaling and Vander Kooy, "Farming God's Way: Agronomy and Faith Contested," 411–426.

[16] Eusebio, "Spirituality and Business Sustainability," 67 – 98.

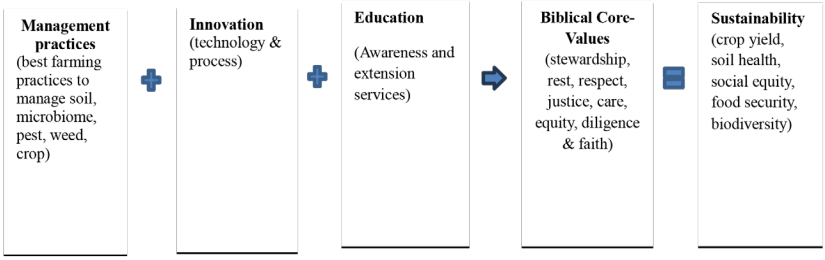
[17] Spaling and Vander Kooy, "Farming God's Way: Agronomy and Faith Contested," 411–426.

Table 1: Claims made by Farming God's Way

CLAIMS	FGW Farmers	CA literature	Program Managers	Reasons
Soil moisture is increased through no tillage. mulching improves infiltration, increasing water availability especially in dryland areas and during drought	Accepted	Accepted	Accepted	Consensus for drier zones. It also varies with soil type
Soil fertility is enhanced. Break-down of mulch adds organic matter to the soil and crop rotation using legumes supplies nutrients.	Accepted	Contested	Accepted	Contested by soil type and availability, competition and proximity of organic inputs
Weed control is improved. Weeds are managed by mulching, crop rotation, and timely weeding.	Accepted	Contested	Contested	Contested during transition to FGW, especially for the first year and reduces with time
Labor demand is increased for women (weeding), and reduced for men (no tillage) especially during the transition from conventional farming to FGW	Contested	Accepted	Accepted	Contested by women farmers during peak times like planting &harvesting
Helps to adapt to climate change by improving soil moisture, adapting to inconsistent rainfall and increased frequency of drought.	Accepted	Accepted	Accepted	Consensus for erratic rainfall zones
Improvement on household food security through increased yield, increased income and reduced drought & disease.	Accepted	Contested	Accepted	Contested for higher stable yields. Good farm management practices such as adequate fertilization & timely planting is more important than factors that differentiates CA & conventional practices
Farmers are incentivized to adopt FGW not only because of biophysical and socio-economic benefits but also because of religious belief.	Contested	Contested	Contested	Contested. It varies with agro-ecological, socio-economic conditions, and faith
Faith changes beliefs, mindsets, and connect spirituality to livelihood.	Accepted	Contested	Contested	Contested for mindset change and role of faith vs agronomy. More agronomic research based on science and rationality is needed to resolve the conflict.

Source: Spaling and Kooy, 2019

Figure 1: Model for crop production sustainability: applying biblical principles



Source: Author

Biblical Principles form the foundation for these three components (farm management, technology & processes, education). The Biblical principles of faith foster trust, resilience, and gratitude, forming the spiritual core of farming practices. Care reflects God's love for creation, motivating farmers to protect the environment and respect community needs. Respect stems from the acknowledgment that the earth belongs to God. Any series of crop production activities that abuses, exploits, or degrades the earth dishonors Him. Justice ensures equitable distribution of resources and opportunities, addressing systemic inequities in farming communities. Stewardship highlights responsibility for the earth, motivating sustainable practices that balance human needs with environmental care. Land rest encourages alignment with natural cycles, allowing ecosystems to recover and flourish. Equity promotes inclusiveness and fairness, ensuring no one is left behind in the pursuit of agricultural sustainability. Diligence promotes smart work, ensuring that resources are optimized and fruitfulness abounds.

Management Practices

Figure 1 is a holistic approach to ensure sustainability in crop production. One key component is farm management practices that help manage soil, pests, weeds, the microbiome, and crops. These include agroforestry, cover cropping, organic composting,

mixed cropping, crop rotation, organic farming, minimum tillage, irrigation, mulching, the use of High-yield Varieties (HYVs), drought-resistant varieties, intercropping, biological control agents, biofertilizers, biopesticides, polyculture, and hydroponics (solar-powered). Agroforestry combines trees, shrubs, crops, and, in some cases, livestock on the same land. These trees provide shade, improve soil structure through their root systems, and serve as windbreaks. Some crops fix nitrogen, enriching the soil. Agroforestry reduces erosion by stabilizing soil, enhances biodiversity by providing habitats for insects and other animals, and improves microclimates, thereby making farming systems more resilient to extreme weather. Cover cropping involves growing cover crops such as clover, rye, or legumes between main crops or during fallow periods. Cover crops act as a living mulch, suppressing weeds and protecting soil. Legumes fix nitrogen naturally to fertilize soil, prevent erosion, improve water infiltration, and support beneficial soil microorganisms.

Organic composting involves decomposing organic materials such as crop residues, manure, and food waste to produce compost. Microbes decompose organic matter and release nutrients into the soil. Organic compost enhances soil fertility and organic matter; boosts soil microbial activity, improving plant health, and reduces agricultural and household waste. Mixed cropping involves growing two or more crops simultaneously on the same plot. The crops are intentionally selected to complement each other. For instance, combining shallow-rooted and deep-rooted plants to optimize resource use (sunlight, water, nutrients), enhance food diversity and yield, and reduce the spread of pests and diseases by breaking cycles. Crop rotation alternates different crops on the same land over successive seasons. These crops have distinct nutrient demands, pest associations, and root systems. These practices prevent nutrient depletion by alternating crop types; disrupt pest and weed life cycles; and improve soil structure and fertility. In organic farming, farmers avoid synthetic chemicals and focus on natural processes and inputs. Alternatively, they employ compost, crop rotation, and biological pest control rather than synthetic inputs. This farming method protects soil health and

microbial balance; enhances biodiversity and ecological balance; and reduces environmental pollution.

Minimum tillage ensures minimal soil disturbance by reducing plowing and tilling. Seeds are directly planted into undisturbed soil, often with crop residues left as mulch. This helps reduce erosion and water loss, preserve soil structure and organic matter, and encourages beneficial soil organisms. Irrigation is a system for supplying water to crops using drip, sprinkler, or flood irrigation. This system ensures that water is applied at optimal levels to meet crop needs and maintain consistent growth. It increases productivity, especially in arid regions; prevents water stress and drought-related crop failures, and allows for year-round farming. Mulching involves covering the soil with organic or inorganic materials such as straw, leaves, or plastic sheets. Mulch retains moisture, adds organic matter as it decomposes, suppresses weeds, and regulates soil temperature. Using High-Yield Varieties (HYVs) involves planting crop varieties bred for increased productivity. These HYVs are engineered or selectively bred to produce more per plant, often requiring optimal inputs. HYVs significantly boost food production, reduce the land area required for farming, and increase resilience to certain diseases. Drought-Resistant Varieties entail breeding crops or genetically modifying crops to thrive with minimal water. These plants have traits such as deep roots or reduced water loss through their leaves. These varieties ensure food security in water-scarce regions, reduce irrigation needs, and enhance climate resilience.

Intercropping involves growing two or more crops in the same field in a planned spatial arrangement. These crops are selected based on complementary traits, such as one eliminating pest or one fixing nitrogen. Intercropping enhances biodiversity and ecosystem balance and naturally reduces pest populations. Biological Control Agents are natural predators, parasites, or pathogens that control pests. These predators (e.g., ladybugs) feed on pests, or pathogens (e.g., Bacillus thuringiensis) that infect and kill them. It reduces the use of chemical pesticides and protects beneficial insects and biodiversity. This is a sustainable pest management strategy. Bio-

fertilizers are living microorganisms that enhance soil nutrients, such as Rhizobium for nitrogen fixation. These microbes colonize plant roots, thereby making nutrients such as nitrogen and phosphorus available. This management strategy increases soil fertility naturally; reduces the need for synthetic fertilizers; and supports long-term soil health. Biopesticides are natural or biological substances used to manage pests. They are derived from plants, bacteria, or minerals and target specific pests without harming non-target organisms. They are environmentally friendly and biodegradable. Safer for humans and wildlife than synthetic.

Polyculture involves cultivating multiple crops or species in the same space. It mimics natural ecosystems by planting a variety of crops together. This helps to prevent pest outbreaks by increasing diversity and supports soil health through diverse root systems. Hydroponics (Solar-Powered) entails growing plants without soil. It uses nutrient-rich water solutions powered by solar energy. Plants are placed in a water solution, and solar power powers the pumps and lighting. This will help save water and space. It also enables farming in non-arable areas (e.g., urban and desert environments) and reduces dependence on fossil fuels. Backyard farming, also known as urban or home gardening, refers to the practice of growing fruits, vegetables, herbs, or raising small livestock in a residential backyard. It uses limited space, often emphasizes organic farming methods, and provides a reliable supply of fresh, diverse crops tailored to household needs.

Management practices, when used independently or in combination, provide sustainable and environmentally friendly solutions for managing soil, pests, and weeds, and for enhancing crop productivity, while conserving resources and protecting the environment. The component of managing soil, microbiome, pest, weed, and crop also emphasizes the implementation of sustainable practices that only align with biblical values. Management practices should be practiced through the lens of biblical principles.

1. Faith and diligence: Farmers are encouraged to cultivate crops with faith that God will bless their efforts while practicing the management strategy. Despite unpredictable

weather conditions, farmers should trust in divine provision. There is no ideal planting condition; therefore, timely plowing, planting, and weeding are necessary to maintain productivity.

2. Stewardship: Farmers should regard themselves as caretakers of God's creation and ensure that the land remains productive and healthy. Farmers should manage soil responsibly by applying compost, practicing crop rotation, and avoiding practices that degrade the soil. This reflects the biblical call to "dress and keep" the land (Genesis 2:15). Lastly, integrated pest management also emphasizes care for creation by minimizing chemical use and encouraging natural pest control methods.
3. Land Rest: Based on Leviticus 25:4, letting the land rest (fallow periods) allows soil to regenerate, improve biodiversity, and ensure long-term productivity. Periodic fallow systems should be adopted to enable land recovery or practice organic farming for soil restoration.
4. Respect: If the earth belongs to God, farmers will express their respect by practicing sustainable crop production techniques that will maintain biodiversity and ecosystem balance. This includes contour plowing, no-till farming, buffer zone maintenance, and diverse crop systems.
5. Justice: Farmers should ensure the equitable distribution of resources, such as land and water, to all community members, embodying biblical justice. This will contribute to long-term economic welfare by enhancing land productivity and reducing costs associated with unsustainable practices.

Technology and Processes

This component integrates appropriate technological advancements and farming processes that align with the principles of care, stewardship, justice, diligence, and fruitfulness.

1. Care: The use of eco-friendly technologies like solar-powered irrigation reduces environmental harm and is renewable. Additionally, water conservation techniques such as drip irrigation and rainwater harvesting reduce water wastage, improve crop productivity, and protect natural resources.
2. Stewardship: Precision tools such as soil sensors and drones enable efficient use of inputs, reducing waste and environmental impact while maximizing yield. Additionally, minimal tillage minimizes soil disturbance, preserves soil structure, and reduces erosion.
3. Justice and Equity: Smallholder farmers, who are often marginalized, should have access to affordable tools and resources for farming. Additionally, if machinery is affordable and suitable for small farms, there will be an equitable distribution of benefits across all scales of farming. This will promote food security through higher yields and foster economic welfare for all farmers.

Education (Awareness and Capacity Building)

Education is critical to ensure farmers understand and adopt sustainable practices rooted in biblical principles.

1. Faith: Use faith-based platforms to teach farmers about their responsibility to care for the earth and others.
2. Stewardship: Provide hands-on training in sustainable practices such as composting, mulching, and natural pest control, and encourage farmers to teach and learn from one another, thereby fostering community growth and innovation.
3. Justice and Equity: Extension programs should prioritize marginalized groups, such as women and small-scale farmers, to ensure equal access to knowledge. Communities should be involved through workshops that encourage collective problem-solving and resource sharing. This will

lead to the widespread adoption of sustainable practices, culminating in improved economic welfare.

By integrating biblical core values into all three components (management, innovation, and education), there will be improved soil health, increased crop yield, enhanced biodiversity, increased economic welfare, and food security.

Summary and Conclusion

Sustainable crop production is crucial for meeting the country's increasing food needs. The biblical principles of stewardship, rest, care, respect, justice, fairness, equity, diligence & faith all form the foundation of crop production practices that every farmer should practice. All farm management practices should be evaluated through the lens of these principles to sustainably enhance soil health, manage water resources, protect ecosystems, promote social and gender equity, enhance natural pest control, promote land tenure security, and ensure economic viability for present and future generations.

All these biblical principles address the key components of sustainable crop production. It encourages respect for creation, protects communities (especially vulnerable groups such as women, youth, and the poor), and fosters a healthy, sustainable ecosystem. This way, farmers can cultivate crops in ways that are productive and responsible, honoring God's creation in the present and future. There is therefore a need to encourage the agricultural sector, faith-based institutions, and farm owners to:

1. embrace stewardship-based principles to ensure the health of the land for generations to come.
2. promote and adopt land restoration practices to maintain its productivity.
3. ensure fair resource distribution, including capacity building, input subsidies, and equal land rights. This strategy will support peasant farmers, promote food security, and enhance social stability. It should be the topmost priority for policymakers.

4. treat all farm workers fairly and support them to establish their farms. That way, more jobs will be created.
5. subsidize technologies like irrigation, precision farming, and hydroponics for easy adoption, climate change mitigation, and increased crop yield.
6. train young people to produce their food and treat agriculture as a business.