

Environmental Education for Humanization: A Quest to Reconcile Farmers with Nature and Promote Environmental Sustainability in Ebonyi State

OKORIE, CHRISTIAN UZOARU (PH. D)¹, REBECCA E. BASSEY (PH. D)²

^{1,2} *Department of Adult and Non-Formal Education, University of Port Harcourt*
ORCID ID 0000-0003-34867537

Abstract- *Traditional farming practices in Ebonyi State which include deforestation for land expansion, slash and burn and overuse of chemical inputs contribute to the depletion of soil resources and undermine long-term environmental sustainability, one of the main factors behind these unsustainable practices is the growing disconnection between humans and the natural world because farmers place profit before man-nature relationship. The detachment has left a void in the ways that rural farmers engage with and view their surroundings and has also weakens the sense of stewardship that was formerly ingrained in rural farming communities. Thus there is an urgent need for a paradigm shift in contemporary farming practices through educational process that will re-orientate farmers on the need to change their present actions on the environment. This paper explained how environmental education can help rural farmers in Ebonyi State become more humane and adopt sustainable farming methods through adoption of agroecology as an alternative farming approach that can preserve soil health, secure future food supply, support farmers' livelihoods, and combat the adverse effects of climate change. This environmental education programme for farmers has to be provided to farmers through farmer field school.*

Keywords: *Environmental Education, Humanization, Agroecology, Environmental Sustainability, Farmer Filed School*

I. INTRODUCTION

Environmental problems are becoming more and more pressing, with effects being seen almost everywhere in the world. A few signs of the ecological catastrophe we are facing are the current rising global temperatures, melting ice caps, deforestation, and dangerously high pollution levels. The sustainability of human and biological systems is seriously threatened by a number of issues, including pollution, resource depletion, climate change, and biodiversity loss. In addition to endangering the equilibrium of our ecosystems, these problems could have serious repercussions on the welfare and

standard of living of both the living and the dead. The loss of biodiversity raises increasingly serious concerns since it shows how invasive species, pollution, overexploitation, and habitat destruction are accelerating the rate of extinction, endangering both human health and ecosystems. Wide-ranging effects on ecosystem processes may result from species extinction and altered ecological interactions. Approximately one million plant and animal species are currently under threat of extinction, many within a few decades, according to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES, 2019). Global Assessment Report on Biodiversity and Ecosystem Services (IPBES, 2019). In addition to upsetting ecosystems, this loss of biodiversity lowers the provision of ecosystem services such as clean water, air, and rich soil that are essential to human survival.

Climate change is the primary cause of the majority of environmental problems that world is currently facing. The Intergovernmental Panel on Climate Change (IPCC, 2018) noted that during the industrial revolution, there has been an acceleration in the rise in global temperatures, with the last few decades seeing the most of these changes. Sea level rise and ocean acidification are two of the cascade impacts of this temperature rise, together with increasingly frequent and severe weather events including floods, droughts, and wildfires (IPCC, 2018). Ecosystems, food security, human health, and livelihoods are all at risk from these changes, especially in low-income areas where vulnerable groups reside. The IPCC (2001) noted that "although climate change is a global phenomenon, its negative impacts are more severely felt by poor people and poor countries. The adverse effects of climate change are already evident, natural disasters are more frequent and more devastating, and developing countries are more vulnerable." Their increased reliance on natural resources and their poor ability to adapt to climatic

extremes and variability make them increasingly susceptible. The burning of fossil fuels, deforestation, and industrial processes are among the human activities that have contributed to the buildup of greenhouse gases in the atmosphere, which is what causes global warming. According to the Intergovernmental Panel on climatic Change (IPCC) in Okorie (2023), human activity is and will continue to impact our climatic system. Since surface temperatures have risen over the past century, there has been a growing awareness of the effects this has had on biological and physical systems. According to Chidumayo et al. (2011), the poor and vulnerable groups that rely on ecosystem services for survival and a means of subsistence are the ones most impacted by the effects of climate change. They also emphasised the mounting evidence that climate change is having an impact on Africa's forests and forest ecosystems, as well as the national economic activities that depend on vegetation services and the livelihoods of communities that depend on forests. There is an urgent need for a change in how cultures perceive and engage with the environment, as evidence of these changes in the environment grows.

The growing population in Nigeria has led to a greater demand for farmers' produce, particularly rice, cassava (garri), yam, and vegetables in Ebonyi State. As a result, farmers are placing more pressure on natural resources, such as land and forests, which has widened the gap between humans and nature and put the environment and farming communities' livelihoods at risk. Farmers in Ebonyi State who rely primarily on the land and its resources for their livelihoods suffer more from the effects of environmental deterioration. Farmers' actions on the environment through their traditional farming practices, such as deforestation for land expansion, slash and burn, and overuse of chemical inputs, contribute to the depletion of soil and undermine long-term environmental sustainability. The growing disconnection between humans and the natural world is one of the main factors behind these unsustainable practices. The transition to more intensive, contemporary farming practices from more traditional environmentally friendly ones has left a void in the ways that rural farmers engage with and view their surroundings. This detachment weakens the sense of stewardship that was formerly ingrained in rural farming communities in addition to causing harm to the environment. Farmers fail to understand that bush burning, excessive fertilizer application,

continual use of herbicides, and so forth, kill plants and other microorganisms that are essential to human survival and the ecosystem's ability to support itself.

Environmental deterioration has been greatly exacerbated by this disconnection between humans and the natural environment, especially in rural farming communities. Farmers in these areas face an even greater difficulty of human-nature disconnections since they have little access to environmental education, which leaves them unprepared to deal with the long-term environmental effects of their actions. If action is not taken, this rising gap will endanger not just the community members' environmental health but also the sustainability of farming practices. Despite having a certain degree of cultural environmental literacy, farmers in Ebonyi State continue to engage in practices that negatively impact the ecosystem because they have little access to environmental education, especially in rural areas where there is a dearth of knowledge about sustainable farming methods. The majority of farmers are not exposed to training or programmes that highlight the value of the interaction between humans and nature, environmental sustainability, and the long-term advantages it offers to both the environment and their means of subsistence. Therefore, the quality of life in these rural communities and agricultural output are still under risk due to environmental degradation. The ramifications of unsustainable practices on our planet are becoming more and more apparent, making it imperative that future generations be prepared to tackle these issues. Environmental education is a key component of this transformation, as it can encourage increased awareness, responsibility, and action towards reducing environmental degradation. By promoting awareness, fostering a sense of responsibility, and encouraging sustainable practices, environmental education plays a crucial role in shaping a more environmentally conscious and resilient society. It equips people with the knowledge, skills, and attitudes needed to comprehend and address these challenges. The key to taking action on climate change is education. Therefore, it is essential to educate rural farmers in Ebonyi State about the environment in order to increase their understanding of the value of biodiversity, the significance of conservation, and the necessity of preserving and restoring ecosystems. This will promote Ebonyi rural farmers' deeper knowledge of the interconnectedness between humans and the natural world and act as a

means of reconciling humans (farmers) and nature and promote environmental sustainability.

Concept of Environmental Education

Environmental education is a process of where people can learn about environmental issues, solve problems, and take action to protect the environment. It is a process meant to raise people's knowledge and comprehension of environmental issues so they may take responsible individual and collective action. In Tbilisi Declaration, environmental education is defined as a learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action, (UNESCO, 2017).

Environmental education in this study is conceptualized from critical transformative point of view that encourages learners to engage in reflective thinking, question dominant environmental narratives, and actively participate in creating solutions that address both ecological and social injustices. Environmental education, from a critical and transformative perspective, transcends the mere transmission of knowledge about the environment. It is a pedagogical approach that seeks to empower individuals to critically examine the socio-political, economic, and cultural structures contributing to environmental degradation and to transform these structures in pursuit of a more sustainable and just world. This view of environmental education encourages learners to engage in reflective thinking, question dominant environmental narratives, and actively participate in creating solutions that address both ecological and social injustices.

In support of this, Tilbury (2020) asserted that environmental education plays a critical role in fostering a sense of stewardship, where individuals feel a responsibility to act in ways that conserve natural resources for future generations, key objective of environmental education is to empower individuals to become agents of change by adopting sustainable practices and advocating for policies that promote environmental protection. Accordingly, Ardoin, Clark & Lelsey, (2013) asserted that the goal of environmental education is to foster an understanding of the interconnections between natural systems and human actions. It emphasizes

awareness of environmental issues such as climate change, pollution, deforestation, and biodiversity loss, enabling individuals to make informed decisions. Ardoin, Clark & Wojcik. (2016), identify the core outcomes of environmental education to include:

1. Improving social and cultural aspects of the human experiences;
2. Having high-quality, meaningful experience in interaction with the (bio) physical environment;
3. Learning necessary skills and competencies;
4. Undertaking pro-environmental behaviours; and
5. Actions to improve environmental health.

With these core outcomes in mind, Braus, Heimlich, Ardoin & Clark. (2022) pointed out that the purpose of environmental education is to move people to action for the tangible benefit of the environment and humanity, and to realize these benefits, people must connect experientially with the environment, learn needed skills, and understand the complicated social and cultural connections between humanity and the natural environment. In relation to this core purpose of environmental education as noted by Ardoin et al., (2016) observed that at foundational level, environmental education:

1. Provide high-quality, meaningful experience in and interaction with the (bio)physical environment, and
2. Improve social and cultural aspects of the human experience.

Furthermore, Clark, Heimlich, Ardoin, & Braus. (2020) pointed out that building on these two purpose, environmental education provides learners with the opportunity to:

1. Learn necessary skills and competencies;
2. Undertake pro-environmental behaviors (and change behaviors to be more environmentally friendly); and
3. Act to improve and enhance the quality and health of the environment.

Environmental education (EE) is thus an organized effort to teach how natural environments function, and particularly, how human beings can manage behavior and ecosystems to live sustainably, environmental education is built on principles of environmental sustainability. In view of this, Purvis, Mao & Robinson (2019) averred that we cannot

achieve a healthier environment without also focusing on social equity and shared prosperity

Environmental Sustainability

The foundation of environmental education is sustainability, which includes using the power of knowledge to build a more equitable and sustainable future. Since climate change is having a negative impact on ecosystems and humanity globally, a growing number of people, groups, and organisations are supporting environmental sustainability and giving it top priority. The term "environmental sustainability" describes the prudent use of natural resources to meet present demands without endangering the capacity of future generations to meet their own. It seeks to strike a balance between ecological, economic, and social objectives, such as lowering carbon emissions, supporting renewable energy sources, and guaranteeing fair access to resources. According to Elliot (2013), environmental sustainability includes actions that support ecological balance and environmental health, such as reducing waste, safeguarding biodiversity, and preventing the depletion of resources. According to Cardinale, Duffy, Gonzalez, Hooper, et al. (2012), biodiversity conservation is essential to environmental sustainability. Biodiversity, or the variety of all life forms on Earth, is vital to sustaining the health of ecosystems, and the extinction of a species can upset food chains, lower ecosystem productivity, and erode ecosystem resilience to environmental changes. Díaz, Scattele, Brondizio, Ngo, et al. (2019) argued that maintaining ecosystems that offer crucial functions like pollination, water filtering, and carbon sequestration requires safeguarding biodiversity through conservation initiatives, habitat protection, and pollution reduction. In order to achieve environmental sustainability, resources must be distributed fairly, and environmental injustices that disproportionately harm vulnerable people must be addressed. Due to their proximity to contaminated places, lack of access to clean water, and restricted participation in resource management decision-making processes, marginalised people frequently bear the burden of environmental degradation (Bullard, 2018). Encouraging environmental justice in the context of sustainability guarantees that everyone, irrespective of socioeconomic background, may enjoy a healthy environment and have the chance to engage in sustainable development (Agyeman & Evans, 2019). Amelia (2024) suggested

that environmental sustainability encompasses a wide range of interconnected issues which include:

1. **Climate Change:** The burning of fossil fuels releases greenhouse gases that trap heat in the atmosphere, causing global temperatures to rise. This has far-reaching consequences, including melting glaciers, rising sea levels, and more extreme weather events.
2. **Biodiversity Loss:** Human activities like deforestation, habitat destruction, and pollution are leading to a rapid decline in plant and animal species. This loss of biodiversity disrupts ecosystems and has a cascading effect on the entire planet.
3. **Water Pollution and Scarcity:** Water is essential for life, but pollution from sources like industrial waste and agricultural runoff is making clean water scarce.
4. **Waste Management:** We generate a vast amount of waste every year, much of which ends up in landfills or leaks into the environment. This waste can take hundreds of years to decompose and pollute our air, water, and so

The primary focus of this study is on the practice of controlling farming methods to satisfy farmers' requirements while maintaining the land's (soil) health. A farmer's most valuable resource is their soil, which when in good condition can produce higher yields, improve the environment, and increase resistance to future climate change. Healthy soil is also critical to farming systems since it provides the necessary medium for growing food. In order to maintain or improve water and air quality, support plant and animal health, and function as a vital living system within ecosystem and land use constraints, a soil must be in good health, according to Doran and Zeiss (2000). To Stevens (2018), the current heavy tillage practices used on agricultural areas put soils at risk of significant loss and degradation on a global scale.

In an effort to feed a growing population, agricultural land has undergone extensive tillage, which has severely harmed the health of the soil. Furthermore, if the crucial strategy for preserving the health of the soil is not put in place, further harm is certain given the estimated 8.9 billion people that will inhabit the planet by the year 20250. According to Bach and Wall (2018), soil functions are vital for promoting global sustainability since they include vital elements such as food production, climate considerations,

water quality, pollution remediation, and habitat for both aboveground and underwater biota. According to Sahu, Vasu, Sahu, Lal & Singh (2017), healthy soil inhibits infections, supports biological activity, breaks down organic matter, inactivates harmful substances, and recycles water, energy, and nutrients. Similarly, inappropriate agricultural practices like soil salinisation, acidification, compaction, crusting, nutrient deficiency, decrease in soil biota biodiversity and biomass, water imbalance, and disturbance of elemental cycling lower soil health, according to Jacoby, Peukert, Succurro, Koprivova, and Kopriva (2017). It kills the microorganisms in the soil that help roots attach to the soil, recycle nutrients, break down organic materials, and react swiftly to changes in the soil ecosystem. These microorganisms also serve as precise markers for particular roles in the soil ecosystem. Crop growth, development, and long-term yields can be supported by a sustainable soil ecological system that is established by the functions of the microbial community and its relationship to the soil and plant. In order to improve or restore soil health and support both environmental sustainability and food security, we must humanise our agricultural practices with environmentally friendly agricultural practices.

Humanization of Agricultural Practices for Environmental Sustainability

Conventional farming has been the backbone of our food production for ages but due to quest to meet the increase demand for food by growing population, we've often turned a blind eye to the environmental degradation caused by conventional agriculture practices. Food and Agricultural Organisation (2019), stated that 31% of carbon dioxide emitted into the air came from the way we grow, process, and consume food. Conventional farming practices relies on chemical fertilisers, pesticides, and intensive farming methods, which has jeopardized natural ecosystems and the quality of life for both humans and the ecosystem at large, contributing to environmental degradation, soil erosion, water pollution, and biodiversity loss. The humanization of agricultural practices for environmental sustainability involves rethinking and restructuring farming systems to integrate social, ecological, and economic dimensions, fostering a more holistic approach to food production. This process requires addressing both the environmental impacts of agriculture and the human practices driving these impacts, promoting an ethical relationship between

humans and nature. Davis et al. (2013) stated that to stop environmental degradation and increase food accessibility, agricultural production must use ecological principles and innovative management practices that help conserve soil, water, and biodiversity.

Agroecology according to Iuliano, Cartmill, Davis, Kerr & Perfecto (2021) is well suited to meet these challenges because of its emphasis on applying ecological principles to understand and design better farming systems, as well as engaging with agriculture's broader human context. In collaboration, Altieri and Nicholls (2020) stated that when agroecological principles are adopted, yield enhancement and stability of production are achieved, as well as a series of ecological services such as conservation of agrobiodiversity, soil and water conservation and enhancement, improved biological pest control, etc., regardless of scale or farm size. This was further explained in Altieri and Nicholls (2017) that agroecology provides an essential framework for humanizing agriculture by promoting farming systems that respect biodiversity, minimize environmental harm, and empower local communities. The idea of agroecology is to go beyond the use of alternative practices and to develop agroecosystems with the minimal dependence on high agrochemical and energy inputs, emphasizing complex agricultural systems in which ecological interactions and synergisms between biological components provide the mechanisms for the systems to sponsor their own soil fertility, productivity and crop protection (Altieri and Rosset, 1995). The main focus lies on the reduction or elimination of agrochemical inputs through changes in management to assure adequate plant nutrition and plant protection through organic nutrient sources and integrated pest management, respectively.

Agroecology is a form of sustainable farming practice. Sustainable farmin practices offer a myriad of benefits which include preserving soil health, promoting biodiversity, securing future food supply, combating climate change and supporting farmer's livelihood. The importance of sustainable agricultural practices includes preserving soil health due to incorporation of organic matter into the soil, crop rotation and cover crop farming; promoting soil biodiversity; helps in securing future food supply due to the practice focus on long-term productivity rather than just immediate yields; supports farmers'

livelihood due to reduction in inputs cost and better farm-gate prices; and sustainable farming combats climate change by playing a pivotal role in sequestering carbon, reducing greenhouse gas emissions, and countering the adverse effects of climate change. FAO (2015) developed a comprehensive framework for sustainable agriculture. This framework outlines the five principles of sustainable agriculture which are increase productivity, employment and value addition in food systems; protect and enhance natural resources; improve livelihoods and foster inclusive economic growth; enhance the resilience of people, communities and ecosystems; and adapt governance to new challenges

1. Increase Productivity, Employment and Value Addition in Food Systems: This principle recognises the need to balance the pursuit of increased productivity with the need to protect the environment.
2. Protect and Enhance Natural Resources: This principle counters the intensive use of farm inputs such as water, fertilisers and pesticides which are not environmentally friendly
3. Improve livelihoods and foster inclusive economic growth: This principle calls for gender equality and the provision of necessary resources for smallholder farmers who contribute immensely to global food security and, yet, continue to face significant challenges in accessing land, credit, and markets. FAO thus argues that agriculture can only become sustainable if it provides decent employment conditions to those who practice it in an economically and physically safe, and healthy environment.
4. Enhance the Resilience of People, Communities and Ecosystems: This principle argues that we must help farmers build resilience to inherent challenges, to ensure sustainable food production and supply.
5. Adapt governance to new challenges: This principle stated that "sustainable production" can only be achieved through a collaborative effort between the public and private sectors in an atmosphere of "accountability, equity, transparency and the rule of law". While the two sectors often have different priorities and motivations, there should be a "public good dimension"

to support stakeholders in the agricultural value chain with the resources needed to thrive.

Nguyen (2023) outlined the key sustainable agriculture practices to include:

1. Crop rotation and diversification that involves growing different types of crops in a sequence on the same land. It breaks pest cycles and increases the soil moisture and fertility. A farmer after harvesting a nutrient-consuming crop like corn, can plant a nitrogen-fixing legume like beans in same piece of land to restore the soil's balance.
2. Organic farming: This is a practice of prioritizing natural methods over synthetic inputs.
3. Conservation tillage: This practice technique keeps water retention and soil disturbance to a minimum. It permits crop leftovers, organic materials, and soil nutrients to stay on fields.
4. Agroforestry: Agroforestry, a multifunctional system that combines agriculture, livestock production, and forestry, is the practice of growing trees or bushes around or amid pastureland or crops. Additionally, agroforestry is in line with the EU's deforestation law, guaranteeing that farming aids in forest protection rather than contributing to deforestation.
5. Sustainable livestock farming: This method guarantees the welfare of the animals, lessens the impact on the environment, and produces healthier output by concentrating on the comprehensive management of animal production techniques.
6. Cover cropping: Planting particular crops that aren't meant to be harvested helps control pests, preserve the soil, and enhance fertility.
7. Biological pest control: This method lessens the need for chemical pesticides by using the natural predator and organism systems to control pests.
8. No-till farming: this technique entails planting new crops without tilling the soil, maintaining soil organic matter and structure.
9. Permaculture: An integrated design concept that minimises waste by simulating natural processes and making sure resources are

used in closed-loop systems such as creating a garden design where plants are irrigated with water from a fish pond and the fish are fed by the plant waste

10. Aquaponics: Fish and plants grow together in a single integrated habitat in this sustainable system that combines hydroponics and conventional aquaculture.
11. Agrobiodiversity: This highlights the significance of genetic diversity in animals and plants to guarantee resistance to pests, illnesses, and climate change, such as growing several types of rice to protect against diseases that might eradicate a single strain.
12. Water management: Water conservation and optimal usage are ensured by effective water use and storage techniques.
13. Waste recycling and composting: By converting organic waste into useful compost, this procedure improves soil quality, lowers the demand for artificial fertilisers, and produces the least amount of waste possible.
14. Polyculture: This involves simultaneously growing several crops in one area, this technique optimises land use, lowers pest problems, and fosters a healthy ecology.

Environmental Education as a Tool for Humanization of Farming Practices Among Rural Farmers in Ebonyi State

The agriculture sector has played an important role in Ebonyi's economy over decades, farmers in this state are known for cultivation of rice (popularly called Abakaliki rice), cassava, yam, cocoyam, vegetables, and so on. The shift in importation of foreign rice to Nigeria home grown rice demand due to bad in importation of rice expanded rice production in particular and in order to meet up with the growing demand of Abakaliki rice, farmers adopt different unfriendly environmental farming practices that has suffered the ecosystem. Unfriendly environmental farming practices is not limited to rice farmers; all other crop farmers engage in unfriendly farming practices that are not sustainable. Farming practices is one of the leading cause of environmental degradation, many farmers adopt techniques that are not environmentally friendly and also not sustainable due to the long run impacts of such practices on the soil, livelihood and the health of the farmers. Creating sustainability in rural farming communities

involves implementing flexible sustainability principles into their farming practices, to embrace eco-friendly techniques, and farmers cultivating a collective mindset focused on the environment.

According to Peterson et al. (2017), a healthy agroecosystems require fewer inputs into the land, allowing farmers to conserve natural resources, limit air and water pollution, decrease the use of herbicides and pesticides, and both retain and enrich soil. This according to Rosa-Schleich et al. (2019) creates a positive feedback loop in which healthy ecosystems support environmentally sustainable farming practices and allow for decreased environmental degradation. Reilly, et al. (2022) observed that due to the interdependent nature of healthy agroecosystems and environmental sustainability, individuals and communities that are both environmentally and agriculturally literate, are necessary for meaningful change. Farmers need to be possess agriculturally literate. Agricultural literacy emphasized the interdependence of agricultural (e.g. food security) and environmental (e.g. climate change) issues to protect environmental sustainability, agricultural economies, and community well-being. Agricultural literacy, according to Frick, Kahler, and Miller in Reilly, et al. (2022) is the ability to understand, think critically about, and communicate key concepts surrounding systems of food and fiber production. Adopting and implementing sustainable farming practices can result to pro-environmental behavior (PEB) among farmers. It is extremely difficult to encourage pro-environmental behaviour (PEB) among farmers in rural areas. In the age of globalisation, farmers in rural communities must embrace pro-environmental behaviour (PEB) in order to increase their eco-friendly endeavours and save the environment. PEB is concerned with the significance of determining and implementing sustainable agricultural methods as well as sustainable solutions to lessen the adverse effects on the environment in rural areas. Developing the PEB among farmers are necessary to achieve a more sustainable future for agriculture.

In Ebonyi State, farmers engage in a number of unfriendly environmental farming practices, such as applying pesticides and fertilisers, using chemicals such as herbicides (such as atrazine) throughout the entire farming process, and slash and burn farming practice. It is commonly known that excessive chemical use has negative health impacts on

applicators, consumers, field workers, and applicators. There have also been documented negative effects on agro-biodiversity and ecological processes like pollination, soil fertility, and naturally occurring pest suppression. There is a common problem of chemical pollution of ground water from fertiliser, pesticides, and herbicides seeping into supplies of drinking water. One effective strategy for helping rural farmers humanise their farming methods is agricultural literacy which is a form of environmental education. It has a big impact on changing farming practices, especially in rural areas where conventional techniques can occasionally worsen the environment. With a humanised approach to farming, agricultural literacy supports sustainable farming practices, raises environmental awareness, and equips farmers with the information and skills necessary for ethical and ecologically acceptable farming activities. This humane strategy ensures long-term sustainability for farmers and the environment by striking a balance between the requirement for agricultural productivity and the preservation of natural ecosystems. Aligning farming methods with sustainable environmental stewardship while upholding the farmers' cultural and social surroundings is known as "humanisation in farming practices." Farmers can be given the information they need to make decisions that strike a balance between productivity and environmental preservation by incorporating EE into rural farming systems.

Approach to Humanization of Rural Farming Practices for Environmental Sustainability

Humanization of farming practices is strategy that aims to redirect agricultural operations toward upholding ecological integrity and human dignity. Instead of concentrating only on productivity, it entails incorporating ethical, social, cultural, and environmental factors into farming systems. The concept stems from the understanding that rural farmers are not just food producers but also environmental stewards, and their actions have a big impact on how long natural resources can be sustained (Altieri, 2018). In Ebonyi state, farmers are still practicing different unfriendly farming practices that are not humanized farming practices, most of their farming are not respecting ecological integrity. It is worthy of note that rural farmers are not just producers of food but also custodians of the environment whose practices is expected to significantly influence the sustainability of the natural environment. However, to promote this

culture of environmental sustainability, rural farmers in Ebonyi State need to adopt humanized farming practices that harmonizes agricultural productivity with environmental stewardship and social equity. Farmers are to be exposed to education with critical skills for sustainability of the environment through participatory training such as farmers field school.

Farmers Field School

Farmers field school is where farmers will be exposed to different environmentally friendly ways of farming. Farmer field schools is EE programme that empower farmers to create a safer working environment for themselves and their families. It is critical in helping rural farmers understand the broader implications of their farming practices on the environment, by becoming aware of negative health effects and ways to reduce chemical applications (herbicide, pesticide and fertilizer). Farmers through field school are trained on how to adopt sustainable farming methods such as agroforestry, organic farming, crop rotation, and reduced pesticide that reduce environmental impact while improving soil health and biodiversity. According to Moglia et al. (2020), farmers who engage in EE are more likely to incorporate sustainable techniques, which leads to improved long-term yields and reduced degradation of ecosystems. This humanization process shifts the focus from short-term gains to long-term ecological and economic sustainability. Murage et al. (2015) emphasized that environmental education programmes targeting rural communities increase farmers' knowledge of ecological processes and equip them with the tools to mitigate negative environmental impacts.

Farmers field school will align farming with environmental ethics, promoting the humanization of agricultural activities which farmers. This participatory hand on farmer field school approach, will serve as a capacity-building tool, empowering farmers with the knowledge and skills needed to implement environmentally sound practices. By incorporating education on topics such as climate change, water conservation, and soil management, farmer field school approach will transform farmers from passive land users into active stewards of the environment. This transformation humanizes farming by acknowledging the complex interdependencies between humans, agriculture, and nature. However, to achieve and maintain a high quality farmer field schools in Ebonyi State,

extension agents and farmers need to be extensively trained as facilitators and train the trainers think tank. Furthermore, Humanized farming places a strong emphasis on inclusive, participatory methods that enable farmers to have a say in decision-making. To develop context-specific solutions, it is necessary to integrate contemporary agricultural advancements with indigenous knowledge, values, and experiences in the farmer field school project. In addition to giving farmers more authority, this integration ensures that farming practices respect regional ecological conditions, thereby reducing degradation and fostering resilience (Pretty, 2020). This is in support of Méndez et al., (2017) view that using crop rotation, agroforestry systems, and organic fertilizers can all help to increase soil fertility, protect water resources, and preserve biodiversity while lowering dependency on dangerous agrochemicals (Méndez et al., 2017). Also ethical treatment of the environment is encouraged by humanized farming. Through farmer field school approach, farmers will be urged to adopt stewardship values by viewing themselves as co-existing partners with nature, instead of using the land for temporary financial gain. This change in thinking as observed by Gliessman (2016), encourages farming businesses to employ techniques like conservation tillage, integrated pest management, and renewable energy, all of which lessen their environmental impact while guaranteeing sustained productivity

II. CONCLUSION

In conclusion, to curb the long run environmental, social, and economic challenges associated with present conventional farming practices in Ebonyi State, farmers are required to be exposed to sustainable farming practice with humanization potentials for environmental sustainability and one effective strategy for helping rural farmers humanise their farming methods is agricultural literacy which is a form of environmental education. The approach of promoting this humanized farming practice among rural farmers is engaging farmers through farmer field school

III. SUGGESTIONS

1. The study suggested that farmers field school should be provided to all categories of farmers in Ebonyi State

2. The environmental education content for farmers should take into cognizance their indigenous farming methods that promotes nature-human relationship

REFERENCES

- [1] Agyeman, J., & Evans, B. (2019). *Just sustainabilities: Development in an unequal world*. Earthscan.
- [2] Altieri, M. A. and Nicholls, C.I. (2020). *Agroecology and the Search for a Truly Sustainable Agriculture: Basic Textbooks for Environmental Training: United Nations Environment Programme Environmental Training Network for Latin America and the Caribbean*
- [3] Altieri, M. A., C. I. Nicholls, and R. Montalba. (2017). Technological approaches to sustainable agriculture at a crossroads: An agroecological perspective. *Sustainability* 9:349
- [4] Amelia, R. (2024). Environmental Sustainability: Definition, policy, examples, and more. Assessed online from: <https://www.lythouse.com/blog/environmental-sustainability-definition-policy-examples-and-more>
- [5] Ardoin, N. M., Clark, C. R., & Wojcik, D. J. (2016). Looking toward the blue sky: Environmental education researchers' experience, influences, and aspirations. *Applied Environmental Education & Communication*, 15(1), 75–89. <https://doi.org/10.1080/1533015X.2016.1141725>
- [6] Ardoin, N. M., Clark, C., & Kelsey, E. (2013). An exploration of future trends in environmental education research. *Environmental Education Research*, 19(4), 499-520.
- [7] Asafu-Adjaye, J., Chaloupka, M., & Fraser, A. (2019). Environmental education and adaptive capacity among rural farmers in developing countries. *Journal of Agricultural Sustainability*, 14(2), 114-130.
- [8] Bach, E.M.; Wall, D.H. (2018). Trends in Global Biodiversity: Soil Biota and Processes. In *The Encyclopedia of the Anthropocene*; DellaSala Dominick, A., Goldstein Michael, I., Eds.; Elsevier: Oxford, UK, 3., 125–130.

- [9] Braus, J.A, Heimlich, J.E., Ardoin, N.M. & Clark, C.R. (2022): Building bridges, not walls: exploring the environmental education ecosystem, *Applied Environmental Education & Communication*, DOI: 10.1080/1533015X.2022.2115226.
- [10] Bullard, R. D. (2018). *Dumping in Dixie: Race, class, and environmental quality*. Westview Press.
- [11] Caitlin Reilly, Kathryn Stevenson, Wendy Warner, Travis Park, Whitney Knollenberg, Danielle Lawson, Sara Brune & Carla Barbieri (2022). Agricultural and environmental education: a call for meaningful collaboration in a U.S. context, *Environmental Education Research*, 28:9, 1410-1422, DOI: 10.1080/13504622.2022.2040431.
- [12] Cardinale, B. J., Duffy, J. E., Gonzalez, A., Hooper, D. U., Perrings, C., Venail, P., ... & Naeem, S. (2012). Biodiversity loss and its impact on humanity. *Nature*, 486(7401), 59-67.
- [13] Chidumayo, E., Okali, D., Kowero, G. and Larwanou, M. (2011). Climate change and African forest and wildlife resources forum, Nairobi.
- [14] Clark, C. R., Heimlich, J. E., Ardoin, N. M., & Braus, J. (2020). Using a Delphi study to clarify the landscape and core outcomes in environmental education. *Environmental Education Research*, 26(3), 381–399. <https://doi.org/10.1080/13504622.2020.1727859>
- [15] Díaz, S., Settele, J., Brondízio, E. S., Ngo, H. T., Agard, J., Arneth, A., ... & Zayas, C. N. (2019). Pervasive human-driven decline of life on Earth points to the need for transformative change. *Science*, 366(6471), 1327-1336.
- [16] Doran, J.W.; Zeiss, M.R. Soil health and sustainability (2000) Managing the biotic component of soil quality. *Appl. Soil Ecol.*, 15, 3–11. [Google Scholar] [CrossRef] [Green Version]
- [17] Elliott, J. A. (2013). *An introduction to sustainable development*. Routledge.
- [18] FAO (2019). Sustainable food and agriculture. Assessed online from: <https://www.fao.org/sustainability/background/en/>
- [19] Frick, M., A. Kahler, and W. Miller. 1991. "A Definition and the Concepts of Agricultural Literacy." *Journal of Agricultural Education* 32 (2): 49–57. doi:10.5032/jae.1991.02049
- [20] Gadotti, M. (2011). Adult education as a human right: The Latin American context and the ecopedagogic perspective. *International Review of Education*, 57(1), 9-25. doi:10.1007/s11159-011-9205-0
- [21] Gliessman, S. R. (2016). *Agroecology: A global movement for food security and sovereignty*. CRC Press.
- [22] IPBES. (2019). Global assessment report on biodiversity and ecosystem services. IPBES Secretariat.
- [23] IPCC. (2018). Global warming of 1.5°C: An IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels.
- [24] Iuliano, B., A. D. Cartmill, S. C. Davis, A. C. Kerr, and I. Perfecto. (2021). Human Dimensions: Agroecology for Just and Sustainable Food Systems. *Bull Ecol Soc Am* 102(3):e01871. <https://doi.org/10.1002/bes2.1871>
- [25] Jacoby, R.; Peukert, M.; Succurro, A.; Koprivova, A.; Kopriva, S. (2017). The role of soil microorganisms in plant mineral nutrition-current knowledge and future directions. *Front. Plant Sci*, 8, 1617.
- [26] Jiang M., Hu X., Chunga J., Lin Z., Fei R. (2020). Does the popularization of agricultural mechanization improve energy-environment performance in China's agricultural sector? *Journal of Cleaner Production*, 276, 124, 2020
- [27] Leskovar, D.; Othman, Y.; Dong, X. (2016). Strip tillage improves soil biological activity, fruit yield and sugar content of triploid watermelon. *Soil Tillage Res.*, 163, 266–273.
- [28] Méndez, V. E., Bacon, C. M., & Cohen, R. (2017). Agroecology as a transdisciplinary, participatory, and action-oriented approach. *Agroecology and Sustainable Food Systems*, 41(7), 723–739.
- [29] Moglia, M., Cook, S., & Tapsuwan, S. (2020). Promoting sustainable farming through environmental education: A case study of rural agricultural communities. *Environmental Development*, 34, 100497.
- [30] Murage, A., Amudavi, D., Obare, G., & Wekesa, E. (2015). The role of environmental education in enhancing sustainable farming practices among smallholder farmers in Kenya. *African Journal of Environmental Science and Technology*, 9(3), 211-219.
- [31] Nguyen, R. (2023). 4 Sustainable Agriculture Practices That Benefit the Planet. Assessed

- online from <https://regenx.ag/blog/sustainable-agriculture-practices/>
- [32] Okorie, C. U. (2023). Promoting Climate Change Awareness among Coastal Communities through Ecoliteracy. *International Journal of Research - GRANTHAALAYAH*, 11(3), 172–181. doi: 10.29121/granthaalayahv11.i3.2023.5080.
 - [33] Peterson, E. E., S. A. Cunningham, M. Thomas, S. Collings, G. D. Bonnett, and B. Harch. 2017. “An AssessmentFramework for Measuring Agroecosystem Health.” *Ecological Indicators* 79: 265–275. doi:10.1016/j.ecolind.2017.04.002
 - [34] Poore, J., and T. Nemecek. 2018. “Reducing Food’s Environmental Impacts Through Producers and Consumers.” *Science* 360 (6392): 987–992. doi:10.1126/science.aag0216.
 - [35] Pretty, J. (2020). *Sustainable agriculture: Building resilience in a changing world*. Earthscan.
 - [36] Purvis, B., Mao, Y., & Robinson, D. (2019). Three pillars of sustainability: In search of conceptual origins. *Sustainability Science*, 14(3), 681–695. <https://doi.org/10.1007/s11625-018-0627-5>.
 - [37] Rosa-Schleich, J., J. Loos, o. Mußhoff, and T. Tschardtke. 2019. “Ecological-Economic Trade-offs of DiversifiedFarming Systems – A Review.” *Ecological Economics* 160: 251–263. doi:10.1016/j.ecolecon.2019.03.002.
 - [38] Sahu, N.; Vasu, D.; Sahu, A.; Lal, N.; Singh, S.K. (2017). Strength of Microbes in Nutrient Cycling: A Key to Soil Health. In *Agriculturally Important Microbes for Sustainable Agriculture*; Meena, V., Mishra, P., Bisht, J., Pattanayak, A., Eds.; Springer: Singapore, pp. 69–86.
 - [39] Sahu, P.; Singh, D.; Prabha, R.; Meena, K.; Abhilash, P. (2019). Connecting microbial capabilities with the soil and plant health: Options for agricultural sustainability. *Ecol. Indic.* 2019, 105, 601–612.
 - [40] Tilbury, D. (2020). Learning to connect the dots: Education for sustainability. *Sustainability*, 12(10), 412.
 - [41] UNESCO. (2017). Education for sustainable development goals: Learning objectives