



**REVIVER**  
REGENERATIVE AGRICULTURE FOR VOCATIONAL  
EDUCATION EU+AFRICA

REVIVER

# COMPREHENSIVE RESEARCH REPORT

## Regenerative Agriculture EUROPE- AFRICA



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the European Union

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REVIVER

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# I. Introduction

## 1.1. About Regenerative Agriculture

The global community has witnessed significant advancement in technology in the agriculture field through innovation and inventions that facilitate the rise in agriculture productivity, necessitating the increase in farm yields (crops of livestock products) for each area utilized, and the extraction of ecological resources (Dimitri et.al, 2005<sup>1</sup>; Lajoie-O'Malley,2020<sup>2</sup>; Rehman et al, 2016<sup>3</sup>). However, such advancements in the race to meet human needs come with side effects, mostly to the environment, resources utilized, and human health. The World Bank (2021<sup>4</sup>) estimates that 19% - 29% of total greenhouse gas emissions are a result of agriculture intensification (fertilizer application, land intensification), while the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) indicates agriculture intensification (pesticides application, clearing of land for farming and energy resources) is the leading cause of global land-use change and biodiversity loss (IPBES, 2019<sup>5</sup>). Overall, Wageningen University (2023<sup>6</sup>) indicate the large application of conventional agriculture practices (mechanization, land intensification, fertilizer application, pesticide and herbicide intensification in farming) has forced investors to over-utilizer available ecological resources at the expense of their depletion in terms of quality, productivity, extension of micro-organisms that sustains life within the ecosystems.

Such practice, when intensively applied, or consistently practiced by a majority of those engaged in farming practices leaves a medium to long-term impact on; soil quality (susceptible to erosion, depletion in organic matter, salinization resulting from inorganic fertilizer intensification, and rise in soil pathogen), climate (build-up in carbon and nitrogen elements contributing to generation of GHG elements), loss in biodiversity (clearing of vegetations, forests for new farmlands, extraction of fossils for farming nutrients creating bare lands, loss in micro-organisms (intensive use in chemical pesticides)

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<sup>1</sup> Dimitri, C., Effland, A., & Conklin, N. C. (2005). The 20th century transformation of US agriculture and farm policy (No. 1476-2016-120949).

<sup>2</sup> Lajoie-O'Malley, A., Bronson, K., van der Burg, S., & Klerkx, L. (2020). The future (s) of digital agriculture and sustainable food systems: An analysis of high-level policy documents. *Ecosystem Services*, 45, 101183.

<sup>3</sup> Rehman, A., Jingdong, L., Khatoon, R., Hussain, I., & Iqbal, M. S. (2016). Modern agricultural technology adoption its importance, role and usage for the improvement of agriculture. *Life Science Journal*, 14(2), 70-74.

<sup>4</sup> The World Bank, 2021. Climate Smart Agriculture. <https://www.worldbank.org/en/topic/climate-smartagriculture#:~:text=Agriculture%20is%20a%20major%20part,is%20either%20lost%20or%20wasted>

<sup>5</sup> IPBES, 2019. The global assessment report on biodiversity and ecosystem services. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services.

<sup>6</sup> Mark Manshanden, Allard Jellema, Wijnand Sukkel, Wil Hennen, Roel Jongeneel, Carlos Brazao Vieira Alho, Ángel de Miguel Garcia, Lotte de Vos, Floor Geerling-Eiff, 2023. Regenerative Agriculture in Europe; An overview paper on the state of knowledge and innovation in Europe. Wageningen, Wageningen Economic Research, Report 2023-058. 52 pp.; 10 fig.; 5 tab.; 73 ref.

and effects on water access, availability and quality resulting from incursions in vegetative lands, water source or water-catchment areas

Such impacts are deemed not sustainable by international organizations that support a global environment less vulnerable to environmental shocks that affect the productivity and livelihoods of future generations, e.g. The 2015 Paris Climate Agreement, the series of UN Conferences of Parties (COP) on Climate Change, and other continental or regional agreements sensitizing and promoting a sustainable environment. To sustain agricultural activities, Regenerative Agriculture (RegenAg) is brought forward by agricultural and environmental activists as a best practice that can lower the negative effects and generate a positive environmental impact as a result of farming practice (Newton et al, 20207).

From a professional and academic point of view, there isn't an acceptable definition to explain Regenerative Agriculture (Merfield, 20198, Newton et al, 2020), However, reviewing the peer-reviewed academic writings on the matter, Schreefel (20209) explains Regenerative Agriculture as an approach to farming that uses soil conservation as the entry point to regenerate and contribute to multiple provisioning, regulating and supporting services, with the objective that it will enhance not only the environmental, but also the social and economic dimensions of sustainable food production. In general, it is an approach to farming and land management that aims to restore and enhance the health of the ecosystems, improve soil fertility and promote biodiversity. It should be noted that Regenerative Agriculture is slightly different from Organic Farming (Agriculture) in the sense Regenerative Agriculture adopts a holistic philosophical approach to encompass various farming practices that aim at restoring and enhancing ecosystems while Organic Farming adopts a regulated system with specification standards and guidelines for the farming system to be accepted as organic.

Regenerative Agriculture follows key principles that differentiate the farming systems with conventional and organic farming systems and they include;

- a. Maintain Soil Health – Adopt practices that help maintain healthy fertile soils through practices such as cover cropping and minimizing tillage, minimizing chemical application (herbicides)
- b. Encourage Crop diversity – by encouraging the cultivation of diverse crops alternating between seasons, or mixed cropping systems enhance crop resilience against pests and disease attacks, support biodiversity and enrich the soil with nutrients.
- c. Water Management – Optimizing the use of water to maximum efficiency (rainwater harvesting, contour ploughing) enhances the availability and access of water overcoming the impact on plants associated with drought.

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7 Newton, P., N. Civita, L. Frankel-Goldwater, K. Bartel, C. Johns, 2020. What is Regenerative Agriculture? A Review of Scholar and Practitioner Definitions Based on Processes and Outcomes. *Frontiers in Sustainable Food Systems*. 4:577723. Doi: 10.3389/fsufs.2020.577723

8 Merfield C.N., 2019. An analysis and overview of regenerative agriculture. Report number 2-2019. Lincoln, NZ: The BHU Future Farming Centre

9 Schreefel, L., R.P.O. Schulte, I.J.M. de Boer, A. Pas Schrijver, H.H.E. van Zanten, 2020. Regenerative agriculture – the soil base. *Global Food Security*: 26.

- d. Integrated Livestock Keeping – allowing the use of grazed livestock land on a rotational basis for farming allows improvement in soil health and strengthens the symbiotic relation existing between livestock, plants, and micro-organisms in the area
- e. Encourage Agroforestry –integrating trees and shrubs into agriculture landscapes enhances soil structure, and biodiversity and meets farmers' needs
- f. Minimize Application of Industrial Chemicals – Either pesticides, herbicides or use of synthetic (inorganic) fertilizer to allow the flourishing of symbiotic micro-organisms in the ecosystem.
- g. Carbon Sequestration – Enhance practices that promote the natural capture and storage of carbons in the soil, sequentially helping mitigate the emission of carbons as healthy soils act as carbon sinks, helping reduce the amount of carbon dioxide emitted in the air.

## 1.2. The Sensitization and Promotion of Regenerative Agriculture

While Regenerative Agriculture on paper appears as a new concept, the idea and practice have been implemented over time, though not specifically adhering to principles highlighted in the practice itself. Before the agrarian revolution in Europe, farming practices incorporated traditional aspects and practices similar to those of regenerative agriculture. However, the agrarian, and later the industrial revolution in Europe necessitated the intensification of agriculture, through the application of improved farming technologies in small-sized land to attain high yields (Bonny, 2014<sup>10</sup>; Burges et al, 2019<sup>11</sup>). This in return created pressure on the use and eventual depletion of soil, vegetation, water, and beneficial micro-organisms as a result of the intense application of such technologies on farmed land (Pretty et al, 2018<sup>12</sup>). As an alternative to address the increasing detrimental effects of agriculture intensification on the environment, European nations put forward and implemented policies that promote sustainable farming practices. As a result, members of the European Union passed the EU Green Deal and The Farm to Fork Strategy to promote agriculture productivity while minimizing environmental degradation, as stipulated by the EU Common Agriculture Policy (EC 2022<sup>13</sup>).

On the other hand, the agricultural revolution in Africa paints different pictures, as productivity issues from farming do not match the arable land available. Increased sensitization on promoting agriculture sector growth has gone hand with; increasing mechanization, production and supply of conventional farm inputs, access to improved farming technologies, and raising extension

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<sup>10</sup> Bonny Sylvie (2014), Agricultural intensification: definition and controversies as regards biodiversity and food security, Biodiversity, science conference, <https://biodiv2014.sciencesconf.org/47410/> document Last viewed December 20, 2019

<sup>11</sup> Burgess PJ, Harris J, Graves AR, Deeks LK (2019) Regenerative Agriculture: Identifying the Impact; Enabling the Potential. Report for SYSTEMIQ. 17 May 2019. Bedfordshire, UK: Cranfield University.

<sup>12</sup> Pretty J, Benton TG, Bharucha ZP, Dicks LV, Flora CB, Godfray HCJ, Goulson D, Hartley S, Lampkin N, Morris C, Pierzynski G, Prasad PVV, Reganold J, Rockström J, Smith P, Thorne P, Wratten S (2018) Global assessment of agricultural system redesign for sustainable intensification. *Nature Sustainability* 1, 441–446.

<sup>13</sup> EC, 2022. New Common Agricultural Policy: set for 1 January 2023. European Commission. [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_22\\_7639](https://ec.europa.eu/commission/presscorner/detail/en/ip_22_7639)

knowledge on intensive farming etc (AGRA 2018<sup>14</sup>, Lunn-Rockliffe et al, 2020<sup>15</sup>). With the effects that such intensification initiatives bring, African resources are not spared from negative outcomes associated with the depletion of resources.

Africa bears an advantage in the adaption and application of regenerative agriculture. Despite increased funding initiatives to adopt conventional farming systems, the rate of application is still low compared to land available, as on average Africa applies 17kg per hectare of synthetic fertilizer compared to the global average of 135kg per hectare (AGRA, 2019<sup>16</sup>). To a large part, farming practices still apply traditional farming, employing agroforestry, intercropping, and rotational grazing, practices which align with principles of regenerative agriculture. Moreover, there has been a growing interest in promoting regenerative agriculture by NGOs and International organizations supporting regenerative practices as a means to address issues such as soil degradation and climate change.

## 2. About the REVIVER Project

### 2.1. About REVIVER

The Regenerative Agriculture for Vocational Education EU+Africa (REVIVER) is an initiative aimed at revolutionizing agricultural practices across Europe and Sub-Saharan Africa by facilitating capacity building in regenerative agriculture vocational education and training. The project is EU funded, under the Erasmus + Project and is designed to establish a dynamic educational program focusing on regenerative agriculture and eco-sustainability.

### 2.2. The Project Objectives

REVIVER Project brings together organizations from Europe and Sub-Saharan Africa to create a vocational curriculum tailored to the unique geographic and climatic conditions of their regions, which transition from traditional to regenerative agriculture, and thus influence the enhancement of soil quality, food security and climate resilience. The project emphasizes three key dimensions; International Knowledge Sharing: Building a bridge between European expertise in regenerative agriculture and the needs of Sub-Saharan Africa, where such practices are particularly needed.

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<sup>14</sup> AGRA 2018. Africa Agriculture Status Report: Catalyzing Government Capacity to Drive Agricultural Transformation (Issue 6). Nairobi, Kenya: Alliance for a Green Revolution in Africa (AGRA).

<sup>15</sup> Lunn-Rockliffe, S., Davies, M.I., Willman, A., Moore, H.L., McGlade, J.M. and Bent, D. 2020. Farmer Led Regenerative Agriculture for Africa. London, Institute for Global Prosperity.

<sup>16</sup> AGRA. (2019). Feeding Africa's soils: Fertilizers to support Africa's agricultural transformation. Nairobi, Kenya. Alliance for a Green Revolution in Africa (AGRA)



**Vocational Curriculum Development:** Strengthening vocational education and training (VET) services across six participating countries, the project aims to modernize agricultural education and align it with regional needs.

**Labor Market Connection:** Improving employability and entrepreneurial opportunities in the agricultural sector by equipping learners with relevant skills for the green economy. In implementing the stated objectives, the project brings together six organizations from Europe and Sub-Saharan Africa that include;

**Pannonia Consulting (Croatia):** Specializing in business development for young farmers and digital educational tools, Pannonia plays a pivotal role in curriculum development and project management.

**Kua Zone Innovation College Limited (Kenya):** With expertise in digital learning and agribusiness, Kua Zone is instrumental in digitizing the curriculum and fostering cross-border learning.

**University of Education, Winneba (Ghana):** Renowned for its contribution to educational policy and development, UEW will co-lead in curriculum development.

**Outside Media & Knowledge (Germany):** A marketing specialist focusing on inclusive and digital learning strategies, will lead the dissemination and visibility efforts.

**APEX Agribusiness Academy (Tanzania):** Leveraging a vast network in the agri-food sector, AAA will contribute significantly to the project's sustainability networks.

**Learning Library (Estonia):** An edu-tech company proficient in digitalizing learning, they will co-lead in developing e-modules and e-tools.

The REVIVER Project aligns with regional priorities in Ghana, Kenya, and Tanzania, contributing to green growth, environmental sustainability, and climate resilience. By introducing regenerative agriculture practices, the project addresses climate change, and land quality deterioration, and strengthens vocational education in line with EU strategies.

### 2.3. The Research Project Objectives

The Research Project focuses on the Comprehensive Research Process of regenerative Agriculture by observing the Innovative Vocational Curriculum. The objective of the research project is to conduct a comprehensive study on the state of regenerative agriculture in Tanzania. The research will focus on three areas;

Legislation and Governmental Framework (i.e. gather information on existing laws, policies, and strategies related to regenerative agriculture),

Academic and Scientific Perspectives (summarize the current state of scientific knowledge on regenerative agriculture in each country, including research trends, areas of focus, and gaps in existing knowledge),

Implementation in Agriculture centers and farms (i.e. engage with local communities to observe current agricultural practices, awareness of regenerative agriculture, and identify case studies, challenges, and potential opportunities for scaling regenerative agriculture practices).

Online Survey of the General Public (i.e. observe the public's response on regenerative agriculture and factors influencing such awareness and interest.)

Each researcher will produce a comprehensive document summarizing their findings in the respective areas of legislation, academic perspectives, on-the-ground implementation, and public awareness. The final research report to be created by Pannonia Consulting will provide a holistic view of the state of regenerative agriculture in each country, highlighting key insights and recommendations for future actions.

## 3. Regenerative Agriculture in GHANA



### 3.1. Regenerative Agriculture: The Concept

Regenerative agriculture is an approach to farming with the aim to enrich and restore soil health. It uses a variety of approaches to enable farmland continuously adapt and improve, as environmental and climatic conditions change. Regenerative agriculture is different from organic farming and a step above sustainable farming. It utilizes methods that minimize or remove land tillage, encourage cover cropping, prioritize perennial planting, encourage livestock integration into farms etc., to revitalize farmlands.

### 3.2. Legislation and Governmental Frameworks on Regenerative Agriculture in Ghana

Currently in Ghana, there is no specific legal regulation that enforces farmers to adopt regenerative agriculture. However, there are existing laws that promote sustainable farming and support some of the principles of regenerative agriculture. Section 2.1 summarizes some of these laws.

### 3.3. Laws and Regulations

In Ghana the major laws that regulate the use of farm lands are the Environmental Protection Agency (EPA) Act, 1994 (Act 490), the Environmental Assessment Regulations, 1999 (LI 1652), the Plant Protection Regulations, 2012 (L.I 2193) and the Forestry Commission Act, 1999 (Act 571).

### 3.4. Environmental Protection Agency (EPA) Act, 1994 (Act 490)<sup>17</sup>

This law regulates all that pertains to pesticides in Ghana. This includes the importation, exportation, manufacturing, distribution, advertisement, selling and using. Approved pesticides are those that are registered and licenced by the Agency for use in Ghana.

### 3.5. The Environmental Assessment Regulations, 1999 (LI 1652)<sup>18</sup>

This law strictly requires the conduction of environmental impact analyses on every activity including farming that a person undertakes. Therefore, any activity likely to adversely affect the environment must obtain a legal cover so that activities can be carried out in a manner that is environmentally sustainable.

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<sup>17</sup><https://www.epa.gov.gh/ghanalex/acts/Acts/ENVIRONMENTAL%20PROTECTION%20AGENCY%20ACT%201994.pdf>

<sup>18</sup><https://www.fao.org/faolex/results/details/fr/c/LEX-FAOC078169/>

### 3.6. Forestry Commission Act, 1999 (Act 571)<sup>19</sup>

The Forestry commission Act, 1999 (Act 571) is meant to regulate and serve as a legal instrument that protects, manages, and develops forest and wildlife resources.

### 3.7. Policies

The laws and regulation on farmland use in Ghana are mostly promoted by governmental projects and policy instruments. Currently the major policies and projects spearheading the integration of regenerative agricultural principles in farming are the 'Green Ghana project' and the 'Planting for Food and Job'.

### 3.8. Green Ghana Project<sup>20</sup>

The Green Ghana Project is an innovative and 'wild' campaign initiated by the government of Ghana to restore degraded forest and fight against climate change. The implementation strategies are in two phases. The first phase is to plant trees on forest reserves that have already been degraded. The second seeks to plant trees on forest reserves, within farms, around watershed areas, at homes, churches, schools, office vicinity, around roads, etc.

### 3.9. Planting for food and jobs<sup>21</sup>

This flagship campaign is intended to modernize the agriculture sector of the economy so as to improve food security, create employment opportunities and reduce poverty through interventions such as the adoption of certified seeds and fertilizers by farmers. Through this project, farmers will be introduced to greenhouse technology, principles that allow agricultural mechanization and ways to improve food crops.

### 3.10. Support from government

The government over the years provides key support in the following areas regarding the integration of sustainable and regenerative agricultural principles into farming in Ghana;

- 1) Subsidized fertilizer
- 2) Improved seeds
- 3) Provision of Compost
- 4) Provision of Organic Fertilizer
- 5) Supplying free and improved seedling of coconut, oil palm, mango etc.

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<sup>19</sup> <https://www.clientearth.org/media/zq5hz3x4/1999-forestry-commission-act-571-ext-en.pdf>

<sup>20</sup> <https://greenghana.mlnr.gov.gh/>

<sup>21</sup> <https://mofa.gov.gh/site/programmes/pfj>

### 3.11. Academic and Scientific Perspectives of Regenerative Agriculture in Ghana:

According to (Khangura et al., 2023) the main principles of regenerative agriculture are to: (1) minimize soil disturbance, (2) maximize crop diversity, (3) keep the soil covered, (4) maintain living root, (5) Integrate livestock. These principles are practiced to some extent across the length and breadth of Ghana.

In the middle belt of Ghana, farming principles that keep the soil covered are actively being enforced by government policy and NGOs operating in the region. As part of the green Ghana project, farmers are encouraged to implement farming practices that keep the soil covered. In Nkoranza Sabrekyeso Sacred Groove which is about 4,5 ha, harbours a combination of trees and crop fields (Djaney Djagbletey & Adu - Bredu, 2007). Such tree planting programmes have been established to encourage farmers to maintain and restore the grooves with the ultimate purpose to enhance biodiversity and sequester carbon.

In Hyiresu in Kintampo North in Ghana, farmers adopt practices that maximize crop diversity, thanks to Tropenbos, an NGO operating in the region. Farmers are taught to practice agroforestry, and combine different food crops such as cassava, yam beans etc., together with trees such as Mahogany in an attempt to maximize diversity. Another regenerative principle effectively encouraged and practiced in Ghana is No-tillage. This practice was introduced back in 1995 by the Ministry of Food and Agriculture in an attempt to help maintain living roots in the soil and conserve soil water. The significance of this practice as reported in a study conducted by Akowuah, 2010, from farmers that practise no-tillage are improved yield, reduced soil erosion and production cost.

Crop – livestock farming system as a regenerative agriculture approach is also predominantly practised in the northern part of Ghana (Karbo & Agyare, 2002). In this system of farming, crop residues are utilized as feed for livestock, and remains of livestock serves as manure to revitalize the farmland. This type of farming according to the Ghanaian Ministry of Food and Agriculture (MoFA, 2010), accounts for approximately 80% of smallholder farmers, an indication that such practised is widely adopted in Ghana.

A critical look at the regenerative agriculture principles implemented in Ghana reveals that the predominant principle commonly known by farmers is the landscape approach where farmers plant trees on degraded reserve and subsequent cultivation of food crops amongst the trees (Acheampong et al., 2020). In addition, the campaign is heavily centred around the middle belt of the country where there is a transition from forest to savannah regions. Specifically, the Bono region of Ghana which is endowed with fertile soil and majority (72%) of the population engage in farming activities. However, there is still not much information on the scale of farmers into regenerative agriculture, neither is there adequate information on platforms and support, training and incentives for young farmers who are fully adopting sustainable or regenerative agricultural principles in Ghana.

### 3.12. Implementation in Agricultural Centers and Farms:

An interview was conducted to collect data from farmers on current agricultural practices, awareness of regenerative agriculture, and any challenges faced in implementing regenerative methods so as to identify successful case studies, challenges, and potential opportunities for scaling regenerative practices in Ghana.

A sample interviewee section (transcript) with farm practitioner on regenerative agriculture

Interviewer: Yeah, so we are here with Mr Kwame Larteh, who is the farm manager of the University of Education and he's also a practitioner of regenerative agriculture and we would

like to ask him some few questions on his practice as a practitioner of regenerative agriculture. Mr Kwame, you are welcome.

Respondent: Thank you, sir.

Interviewer: So, what motivated you to go into regenerative agriculture?

Respondent: One, I would say love for ecosystem restoration because you can observe that by our farming activities, conventional farming activities has deteriorated our ecosystem, our environment and there is a need to restore ecosystem.

Interviewer: So, can you share with us any challenges or obstacles that you faced during the transition to regenerative agriculture?

Respondent: I think the major challenge I would highlight would be the economic returns in the sense that due to the lack of certification in our system, in our part of the world here, people find it difficult to pay extra or to pay market premium on produce produced from regenerative agriculture.

Interviewer: Can you also describe any innovations or experiments you've implemented on your farm to further advance regenerative agriculture practices?

Respondent: So, I think one we've been practicing mulching, the use of poultry manure and also, we do this crop livestock integration that has been helpful in our quest to practice regenerative agriculture.

Interviewer: So, finally, what advice would you give to farmers considering transitioning into regenerative agriculture practices for the first time?

Respondent: So, my advice would be farmers and practitioners need to understand that we have a mandate to rejuvenate our ecosystem, rejuvenate soil health, and then we all need to do our best to practice regenerative agriculture in the sense that one, it will reduce our cost of production, it will maximize productivity and farmers also need to understand that regenerative agriculture is not something new. It is going back to our old system of farming.

Interviewer: Thank you. Thank you very much Mr. Lathi for your time. Thank you very much sir.

Respondent: You are always welcome.”

#### A transcript of a sample interview section with a policy maker

Interviewer: I'm here with Mr. Ebenezer Azazu who is the Municipal Director for Agriculture in the Futu Municipality and we would like to make a short interview with him and ask him some few questions on regenerative agriculture from the policy makers perspective. Sir, is there any legislation on regenerative agriculture?

Respondent: Thank you very much. We have a policy that is food and agriculture sector development policy. And in that policy, there is an area that looks at sustainable land management and environment. And we have an action plan that details how we should go about regenerative agriculture.

So if you ask me, there is a policy. It's a FASDP<sup>2</sup>. We have the FASDP<sup>1</sup>, and now we have the FASDP<sup>2</sup>. It's also even under review. So very soon we have the FASDP<sup>3</sup>. But I think all the things that are in it will also continue to address sustainable land management, which is linked to

regenerative agriculture. I believe that FASDP is an acronym for something. Food and Agriculture Sector Development Policy.

Interviewer: So how do you perceive the role of regenerative agriculture in addressing our current environmental challenges?

Respondent: Yes, I think that regenerative agriculture is very, very important. I have been in this sector for a long time and what I have observed over the years has to do with declining soil fertility and it is because of the way we farm in this part of the world. We are doing slash and burn so the organic matter on the soil year by year is being burned. We are doing a lot of practices which don't support regenerative agriculture. So basically, the soil is being destroyed, the organic matter we are not getting it. We are also doing continuous cropping and if you do continuous cropping it means that you are doing mineral mining. So, all the minerals in the soil are being taken away. So, it is very important that we look at regenerative, how to sustain, how to bring back the life of the soil so that we'll be able to get the food that we all want. Because we are looking at food security and if we don't do anything about the soil disease, it means that for some time to come, we'll be in trouble. Over the years, what the governments have done is to bring in fertilizer. You know, fertilizer is quick, but it is not sustainable, and it is even expensive. We subsidized it some years ago, but still, it is expensive. The farmer on his own cannot go buy fertilizer for his farm. So, one of the simplest ways is to use our local technologies, which has to do with regenerative agriculture and I believe if we go that way it will help us to make the soil good, soil fertile and by that we can get more and by that we can talk about food security in our country.

Interviewer: That's good to hear.

Respondent: So, these are the main challenges that we are facing here in terms of regenerative agriculture.

Interviewer: So, if I may ask, how do you plan to engage with the scientific community and the local communities to ensure inclusive and evidence-based policy development for regenerative agriculture?

Respondent: Yes, already we have, we collaborate with research and also the universities. In the central region, we collaborate with the University of Cape Coast and Winneba. I know there is that relationship between us and the University of Education Winneba. So, there is that rapport, that link, and it is there. And I think we want to continue with it so that whatever academia has researched on, which are good, when they bring it to us, we can also disseminate it to our families because they are the end users.

Interviewer: So finally, sir, what lessons can be learned from the past agricultural policies, both successful and unsuccessful, in shaping policies for regenerative agriculture?

Respondent: Yes, I would say over the years. I can cite as far back as 1990, we were doing all these things to regenerate our lands. And those ones were all projects. So, project come, project go. When the project is active, we are able to get target farmers and we are able to roll it out. But once the project ends, then the monitoring and evaluation, everything dies out. So, we are not even able to track and see whether what we introduce is working. So, it is an issue. We have undertaken a lot of projects for sustainable or regenerative agriculture, a lot of them. A lot of them you can talk about. But all of them, at the end of the day because we don't, there's no

funds to continue to project it. It dies. But those days that they were available, you know that they were doing a lot. You can see a lot of successes.

Like, but what I'm saying is after the success, everything, everybody goes to sleep. We do it two years; three years and we stop. But a project that will go for a long time. So, I'm glad to see the University of Education, your approach. And I know that the university will be here for a long time. So, they are outreached. They will be able to get to a lot of farmers on sustainable and continuous basis. I think if you are able to do continuous education and monitoring and demonstrations, I think we will begin to see a lot of results. So that is what I can say.

Interviewer: Thank you very much for your time. Thank you very much for your time. We are very grateful.

### 3.13. Obstacles to the adoption and implementation of regenerative agriculture in Ghana

From the interview section, the major obstacle that respondents highlighted is the lack of economic returns. It was pointed out that due to the lack of certification and checks of farm produce, people find it difficult to pay extra or market premium on foods produced from regenerative agriculture. This takes out the energy from farmers to go through the 'hustle' in engaging and adopting regenerative agricultural principles in their farms.

### 3.14. Regenerative agriculture innovation adopted by farmers

Farmers reported that the most common regenerative practices adopted in their farms are mulching, where poultry manure are used for plant growth. Farmers also practice crop livestock integration.

### 3.15. Governmental support for regenerative agriculture

From the interview section, it was revealed that main government support for farmers is in the provision of subsidized fertilizer which spans from synthetic to organic.

### 3.16. Online Survey for General Public

The analysis below is from a survey conducted to farmers to understand the level of awareness, perception and understanding of regenerative agriculture. The following are the survey which was administered to farmers

1. Please confirm your age range.
2. How much have you heard about agriculture regenerative before today?
3. How interested are you in learning about sustainable farming practices, including regenerative agriculture?
4. How important do you believe sustainable farming practices are for the future of agriculture?
5. Where do you usually get information about farming practices?
6. How often have you implemented sustainable farming practice on your farm?
7. What barriers have you faced in implementing sustainable farming practices?



- 8. How willing are you to change your current farming practices to more sustainable ones?
- 9. Which benefits of sustainable farming are you aware of? (Select all that apply)
- 10. How interested would you be in formal training or education on sustainable farming practices?
- 11. Are you part of any community or network that focuses on sustainable or regenerative agriculture? (Cooperative, European Network for Rural Development (EMRR), National Rural Networks (NRM), etc.)  
If You are part of any community or network that focuses on sustainable or regenerative agriculture, feel free to leave us their contact if it is possible \_\_\_\_\_
- 12. How much knowledge do you have on peers or other farmers who practice regenerative agriculture?
- 13. How economically viable is regenerative farming for young farmers?
- 14. How many market opportunities are there for products obtained from sustainable or regenerative practice in your area?
- 15. Is there sufficient government support for sustainable agriculture in your country?
- 16. What is the most significant challenge in adopting sustainable farming practices?
- 17. What role do you see for technology in facilitating sustainable or regenerative agriculture?
- 18. How significant do you believe the impact of sustainable farming is on combating environmental issues?
- 19. How willing are you planning to incorporate more sustainable or regenerative practice in your farming operation in the future?
- 20. Do you have any suggestions or feedback on how to promote sustainable agriculture among young farmers?

**3.17. Analyses of online farmers survey on regenerative agriculture**

The age distribution of the participants who formed part of the online survey varied from under 20 to over 40 years. Farmers over 40 years represented the majority (50%), followed by those within 30 -39 (35%), then 20 – 29 (10%) and finally under 20 (5%). The trend in age against farming shows a linear progression, that is, fewer younger generations were found in the agricultural sector, and the number increases with age. The observed distribution is typical of the Ghanaian context as fewer youth naturally engage in agricultural activities. Respondents, over 80% indicated that they have very much heard about regenerative agriculture before, whereas 10% indicated they have somewhat heard, and another 10% indicated they have not very much heard about regenerative agriculture. Following this, participants were asked about their interest in learning more about sustainable farming including regenerative agriculture and 95% responded to be very interested, whereas 5% were neutral (Figure 1). This desire may suggest the current drive of farmers to learn and expand their horizon on modern sustainable practices and regenerative agriculture.

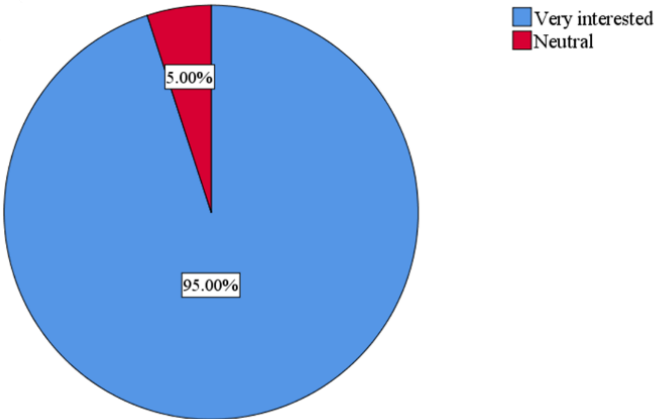


Figure 1: Farmers interest in learning about sustainable farming including regenerative agriculture.

Participants also held a strong belief that sustainable practices are for the future of agriculture as 95% responded it is very important, whereas 5 % were neutral. Although participants have heard about regenerative agriculture before (from responses to survey) and know its significance, it was surprising that the majority do not implement sustainable farming practices on their farms. In a survey question which probed into how often they implement sustainable farming practices on their farm, 75% of their respondents responded ‘Not much often’, 5% did not implement at all, 5% were neutral, 5% somewhat implemented and 10% very often implemented (Figure 2). On the aspect of barriers faced in the implementation of sustainable farming practice, all the participants (100%) responded that cost is the major hindrance.

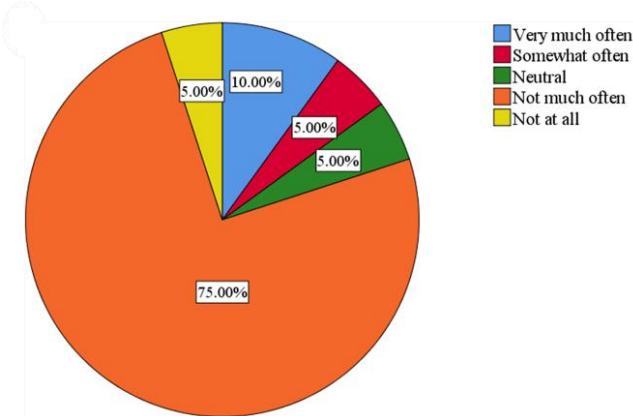


Figure 2: How often farmers implement sustainable farming on their farms.

Other responses gathered from the survey also revealed other sources of barriers that are impeding the implementation of sustainable and regenerative agriculture in Ghana. First, it was observed that the majority of the participants (75%) are not part of any community or network that focuses on sustainable or regenerative agriculture, only 25% responded they belong to one. This makes it very difficult for those farmers to receive the necessary support, training, guidance and intervention to step into sustainable or regenerative agriculture. Second, it was observed that the majority of the participants do not have any immediate peers or other farmers into regenerative agriculture and thus cannot draw strength, motivation and knowledge to enter into the venture. This is clearly observed when majority of the participants representing 65% responded ‘Not very much’ and 5% ‘Not at all’ to knowledge on ‘peers who practice regenerative agriculture’, only 20% and 10% have ‘Somewhat much’ and ‘Very much’ knowledge, respectively, on peers who practice regenerative agriculture. Third, farmers do not perceive the economic viability of farm produce cultivated by sustainable or regenerative approach and thus are not eager to adopt the practices. When farmers were asked about the economic viability of regenerative farming for young farmers, 50% responded it was not viable at all, 25% indicated not very much viable, only 5% and 20% indicated somewhat viable and very viable, respectively. Fourth, the rare or non-existent market opportunity for produce cultivated by sustainable or regenerative farming practice is an impediment for farmers. Majority of the participants (65%) responded that there are not very many market opportunities for products grown from sustainable or regenerative approach, 10% responded not at all, 10% were neutral whereas, 5% and 10% responded somewhat many and very many, respectively. This is very indicative of the Ghanaian market as only a very few, the economically elite place priority on consuming foods that were grown adopting the best farming practices. Fifth, when participants were

asked of the most significant challenge in adopting sustainable farming practices, 80% indicated its financial challenge, other participants representing 15% and 5% also indicated technical know-how and intrinsic motivation, of these, one cannot be underestimated as well.

It was also observed that the majority of the participants representing 75% are willing to change their current farming practices to a more sustainable ones, whereas 10% are somewhat willing, 10% are neutral and 5% are very unwilling. In addition, 95% of the participants are 'very interested' and willing to engage in formal training or education on sustainable farming practices (Figure 3), and 5% are somewhat interested. Participants also see technology to be crucial in sustainable and regenerative agriculture as 65% responded it plays a crucial role and 35 %, a supportive role. The willingness of farmers to change their current practices and the desire for formal education suggest a driving need of farmers for advanced and modern farming practices that holistically serve their farming purpose and addresses the burgeoning issue of soil deterioration caused by unsustainable farming.

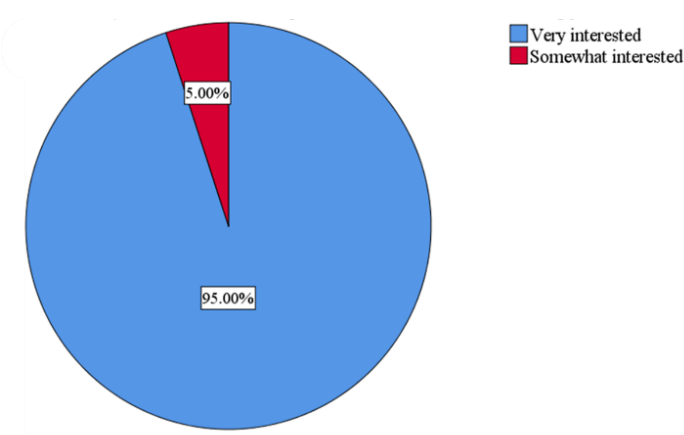


Figure 3: Interest of farmers to be in formal training or education on sustainable farming practices.

The desire to change their current farming practices and interest to be in formal education on sustainable farming practices might be due to the benefits they are aware sustainable farming can bring. When participants were asked about their awareness of benefits of sustainable farming, 80% indicated that it improves soil health, whereas 20% responded that it increase crop yield. Farmers being aware of these benefits is a very good starting point to sell to them sustainable farming including regenerative agriculture.

The following suggestions were made by participants as a way to promote sustainable or regenerative agriculture among young farmers in Ghana;

- 1) Cost of regenerative farming are expensive
- 2) More opportunities for conferences, seminars, workshops, and awareness-raising
- 3) Organize training sessions for them by focusing more on demonstrations.
- 4) Involve young people in climate-smart/sustainable agriculture initiatives.
- 5) Add to Ground-level capacity building directed towards young farmers
- 6) Since today's youth are accustomed to living in a digital age, technology can help promote sustainability.
- 7) Provide a platform that makes it simple for young farmers to find buyers for their goods

### 3.18. Conclusion

The outcome of the comprehensive research on regenerative agriculture in Ghana reveals that there is a growing interest for its adoption and implementation. The principles of regenerative agriculture are already in full force, positioning the country on good grounds for active integration into the agricultural field. The drive towards the implementation of regenerative agriculture by farmers hinges around the foreseen benefits it renders the environment and the economic value it brings to the farmer. Nevertheless, the implementation of regenerative agriculture by farmers in Ghana is not without any challenges. The cost of operation, low level of technology integration, scarcity of support groups, and limited technical know-how are some of the barriers impeding the implementation of regenerative agriculture in Ghana. In the near future, there is the need for extensive formal training of farmers on regenerative agriculture, strong collaboration among academic and non-academic institutions in terms of research and governmental incentives for young farmers in regenerative so as to encourage them and heighten their interest in this emerging field.

## 4. Regenerative Agriculture in KENYA

### 4.1. Executive Summary

This report, offers an overview of regenerative agriculture in Kenya, a practice that represents a paradigm shift in farming towards enhancing ecosystem health, soil fertility, and biodiversity. Through practices such as reduced tillage, cover cropping, diversified crop rotations, and efficient water management, regenerative agriculture not only sustains but also revitalizes agricultural lands, sequesters carbon, and builds resilient farming communities.

Central to the success of regenerative agriculture in Kenya are the diverse stakeholders involved, ranging from grassroots farmers to government agencies, research institutions, NGOs, and the private sector. Each plays a critical role in the adoption and implementation of regenerative practices. Notably, the Kenyan government's active support through various legislative and policy frameworks signifies a strong national commitment to sustainable agriculture, aiming to solidify the sector's substantial contribution to the GDP and fortify the nation's food security amidst the challenges posed by the changing climate.

Survey insights from young Kenyan farmers reveal a robust interest in adopting sustainable farming methods, with a notable majority expressing a keen willingness to learn and apply regenerative agriculture practices. However, this enthusiasm is tempered by significant barriers such as financial constraints, resistance to changing long-standing farming practices, and a lack of accessible, comprehensive information on regenerative agriculture techniques. These challenges underscore the critical need for targeted educational and training programs tailored to empower farmers with the knowledge and skills necessary for successful regenerative agriculture implementation.

The report concludes with a series of targeted recommendations aimed at promoting regenerative agriculture among Kenya's youth and the broader farming community. These include the strategic use of Technical and Vocational Education and Training (TVET) institutions to impart regenerative agriculture knowledge, the incorporation of regenerative agriculture principles into the curricula of agricultural educational institutions, and the active demonstration of the economic viability of sustainable farming as a sustainable business model. Additionally, it emphasizes the importance of leveraging digital technologies to engage young farmers, developing networks to facilitate market access for sustainably produced goods, and establishing practical training centers to serve as incubators for regenerative farming methods.

By adopting these recommendations, the report envisions the creation of a vibrant ecosystem that nurtures the growth of young farmers in sustainable agriculture, ensuring the longevity and prosperity of Kenya's farming sector. This vision extends beyond mere agricultural productivity to encompass environmental sustainability, community resilience, and a holistic approach to land stewardship, laying the groundwork for a sustainable future for Kenya and setting a precedent for regenerative agriculture practices worldwide.

## 4.2. Regenerative Agriculture in the Kenyan Context

Regenerative agriculture in Kenya encompasses holistic farming practices that aim to restore and enhance ecosystem health, soil fertility, and biodiversity while promoting sustainable agricultural production.

Key principles of regenerative agriculture in the Kenyan context include:

1. **Soil Health:** Prioritizing practices that improve soil structure, fertility, and microbial diversity, such as minimal tillage, cover cropping, and composting.
2. **Biodiversity Conservation:** Encouraging diverse crop rotations, intercropping, and agroforestry systems to enhance ecosystem resilience and support beneficial organisms.
3. **Water Management:** Implementing strategies to conserve water resources, such as rainwater harvesting, mulching, and efficient irrigation techniques.
4. **Carbon Sequestration:** Utilizing farming methods that sequester carbon dioxide from the atmosphere into the soil, vegetation, and biomass, thereby mitigating climate change impacts.
5. **Community Engagement:** Fostering collaboration among farmers, communities, researchers, and policymakers to promote knowledge sharing, capacity building, and collective action towards sustainable agriculture.

## 4.3. Key Stakeholders Involved in Promoting or Implementing Regenerative Agriculture Practices

1. **Farmers and Farming Communities:** Smallholder farmers, commercial farmers, and farming cooperatives play a crucial role in adopting and implementing regenerative agriculture practices on their lands.
2. **Government Ministries and Agencies:** The Ministry of Agriculture, Livestock and Fisheries, and Cooperatives, as well as the Ministry of Environment and Forestry, are involved in formulating policies, regulations, and programs related to sustainable agriculture and environmental conservation.
3. **Research Institutions:** Organizations such as the Kenya Agricultural and Livestock Research Organization (KALRO), universities, and agricultural research institutes conduct studies and provide technical assistance on regenerative farming techniques and their adaptation to local conditions.
4. **Non-Governmental Organizations (NGOs):** NGOs focused on agriculture, environmental conservation, and rural development often work directly with farmers to promote regenerative agriculture through training, demonstration plots, and advocacy initiatives.
5. **Private Sector Actors:** Agribusinesses, input suppliers, and food processors may support regenerative agriculture by investing in sustainable supply chains, promoting environmentally friendly practices, and providing market access for sustainably produced goods.
6. **International Development Partners:** Organizations such as the Food and Agriculture Organization (FAO), United Nations Development Programme (UNDP), and international NGOs contribute technical expertise, funding, and policy support to promote sustainable agriculture practices, including regenerative agriculture, in Kenya.

## 4.4. Legislation and Governmental Frameworks on Regenerative Agriculture in Kenya

The Kenyan government recognizes the critical role of agriculture in the economy, contributing directly to 30% of the GDP and indirectly influencing another 27% through linkages to other sectors. This significant contribution is backed by the government's efforts to support sustainable agricultural practices, including regenerative agriculture, to ensure food security and resilience against climate-related challenges.

Several legislative and policy frameworks are in place to support sustainable agricultural development in Kenya. The Vision 2030 blueprint outlines the long-term goals for sustainable development, with specific aims to increase productivity in crops and livestock, introduce efficient land use policies, and improve market access for smallholders.

The Agricultural Sector Growth and Transformation Strategy (ASTGS) for 2019-2029 aligns with Kenya's constitutional and legal frameworks and international commitments to transform the agricultural sector into a vibrant, commercial, and modern entity. This strategy encompasses several flagship projects designed to achieve sustainable development and food security goals.

Moreover, the National Climate Change Action Plan 2018 - 2022 aims to reduce vulnerability to climate impacts and foster a transition to low-emission, sustainable development. Other key policies, such as the Environment and Development Policy, and the Forests Policy, are structured to support sustainable agricultural practices, protect the environment, and ensure biodiversity conservation.

To implement these policies and achieve their intended outcomes, Kenya has established various Acts, such as the Agriculture, Fisheries and Food Authority Act and the Agricultural Finance Corporation Act, providing the legal framework for the promotion and regulation of agriculture, ensuring funding for agricultural development, and guiding research in the sector.

These legislative and policy frameworks demonstrate Kenya's commitment to promoting sustainable agricultural practices, including regenerative agriculture. By integrating these practices with national development plans and strategies, Kenya aims to enhance food security, support economic development, and mitigate the impacts of climate change.

## 4.5. Survey

### **Regenerative agriculture awareness**

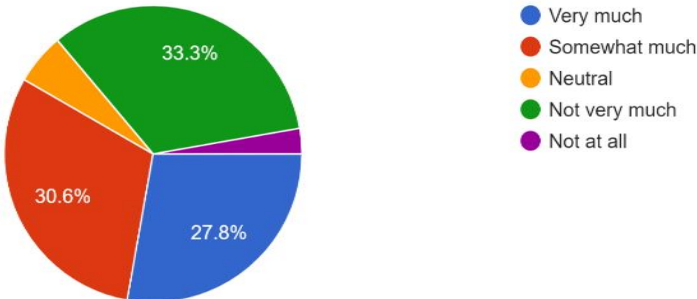
The collective understanding of regenerative agriculture among the 36 farmers interviewed presents a diverse spectrum of awareness. A significant portion, 33.3%, do not have a substantial understanding, indicating they are not well-informed about the principles and practices of regenerative agriculture. An almost equal segment, at 30.6%, has heard about it to some extent, suggesting a basic familiarity that could be further developed. The remaining farmers are split between having heard very much (27.8%) and having no knowledge (8.3%) of regenerative agriculture, pointing to a critical need for educational interventions to enhance their understanding.

This distribution of awareness underscores the importance of a tiered educational approach in the REVIVER project's curriculum design. For those well-versed in regenerative agriculture, the curriculum

could offer advanced modules and opportunities for peer-to-peer learning, potentially turning these farmers into advocates and educators within their communities. For the majority who have basic to no prior knowledge, the curriculum must provide a comprehensive introduction to regenerative practices, ensuring that foundational concepts are clearly explained and reinforced with practical examples. Emphasizing the direct benefits of regenerative agriculture that align with the farmers' daily experiences could also serve as a powerful incentive for further engagement and learning. This stratified educational strategy will ensure that all participants, regardless of their starting point, will have the opportunity to deepen their understanding and practical skills in regenerative agriculture, thereby fostering a more resilient and sustainable agricultural community.

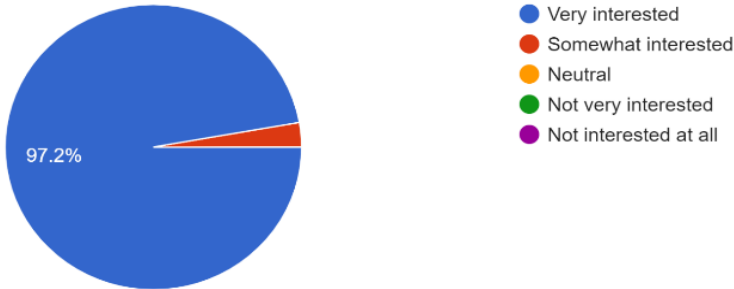
### Interest in learning about sustainable farming practices including regenerative agriculture

How much have you heard about regenerative agriculture before today?  
36 responses



The survey reveals a commendable level of eagerness among the 36 interviewed farmers, with an impressive 97.2% very interested and a slight 2.8% somewhat interested in learning about sustainable farming practices. This overwhelming interest showcases a fertile ground for the introduction and adoption of innovative regenerative agriculture techniques that can elevate sustainable farming practices. As the curriculum is designed, leveraging this intrinsic motivation will be key to delivering a robust educational program that effectively equips farmers with the necessary skills and knowledge to transform their practices and land management philosophies.

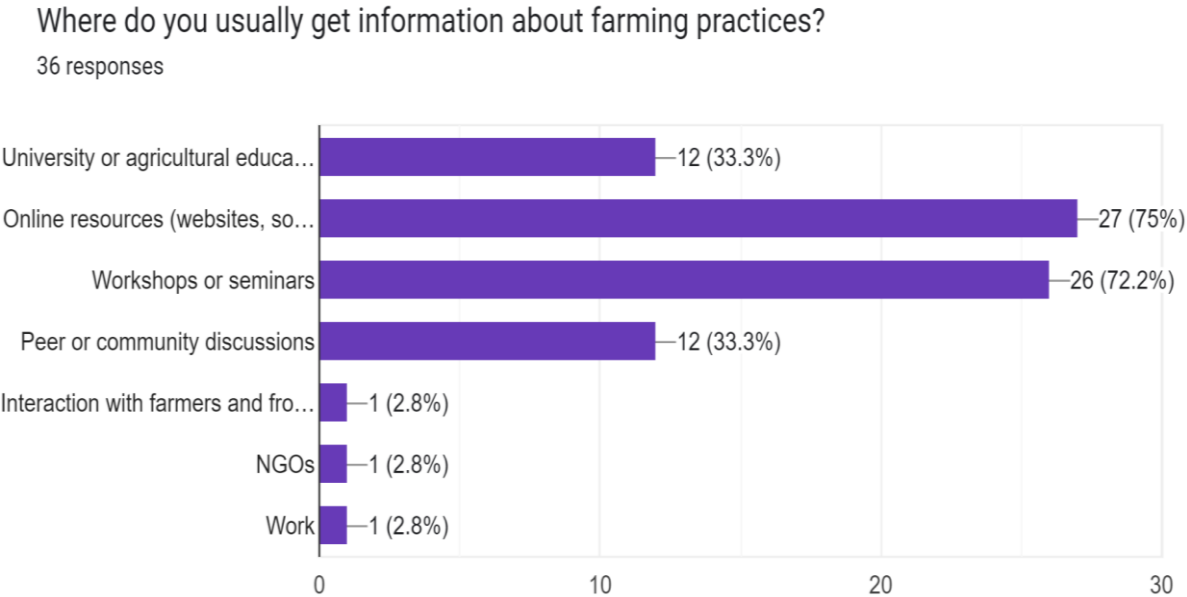
How interested are you in learning about sustainable farming practices, including regenerative agriculture?  
36 responses





Capitalizing on the farmers’ enthusiasm, the REVIVER project can strategically develop a curriculum that incorporates multi-tiered instruction catering to varying levels of prior knowledge. With the majority displaying a high interest, the curriculum should integrate interactive, technology-driven modules and practical, field-based experiences that go beyond the theoretical frameworks. Such an approach will ensure a deeper understanding and retention of sustainable principles and practices, potentially leading to a dynamic shift in the agricultural paradigms of the communities involved. Enthusiasm at such a scale indicates not just the potential for transformative learning but also for these farmers to become ambassadors for regenerative agriculture within their networks, amplifying the impact of the REVIVER project’s initiatives.

**Sources of information about farming practices**

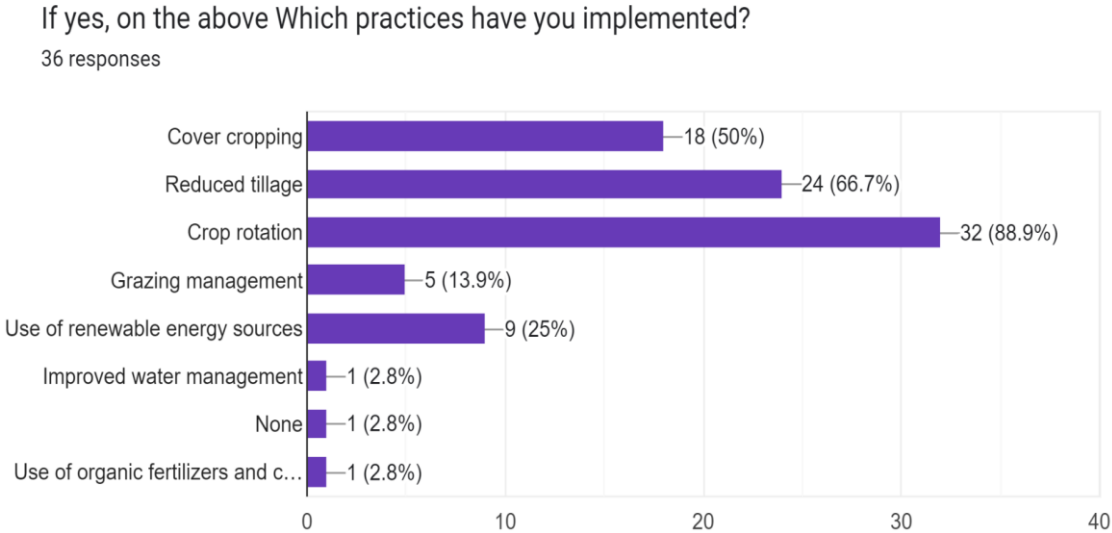


The survey results from 36 farmers, indicates that the predominant source for farming practices is online resources, with a substantial 75% of the respondents relying on websites and social media. This is closely followed by workshops or seminars, with 72.2% of the farmers participating in such events for their information. Traditional and community-based methods of learning, such as university or agricultural education and peer or community discussions, also play a significant role, each accounting for 33.3% of the responses. Other sources like direct interactions with other farmers, NGOs, and workplace settings seem to play a minimal role, each constituting about 2.8% of the source’s farmers rely upon for information.

This data underscores the importance of integrating digital literacy and access into the regenerative agriculture curriculum as envisioned by the REVIVER project. As the majority of farmers are already leveraging online platforms for information, the curriculum should be designed to amplify this channel, offering extensive online resources, interactive e-learning modules, and harnessing social media to engage and educate. Meanwhile, the high attendance in workshops indicates the value of in-person learning and peer engagement. Therefore, supplementing the digital strategy with a schedule of workshops and seminars that facilitate hands-on experiences and peer learning will be crucial. Incorporating these insights into the REVIVER project’s curriculum development will ensure it is aligned

with the farmers' prevailing learning behaviors and preferences, thereby enhancing the effectiveness of the program and encouraging the adoption of sustainable farming practices.

### Sustainable Farming Practices Implemented by Respondents



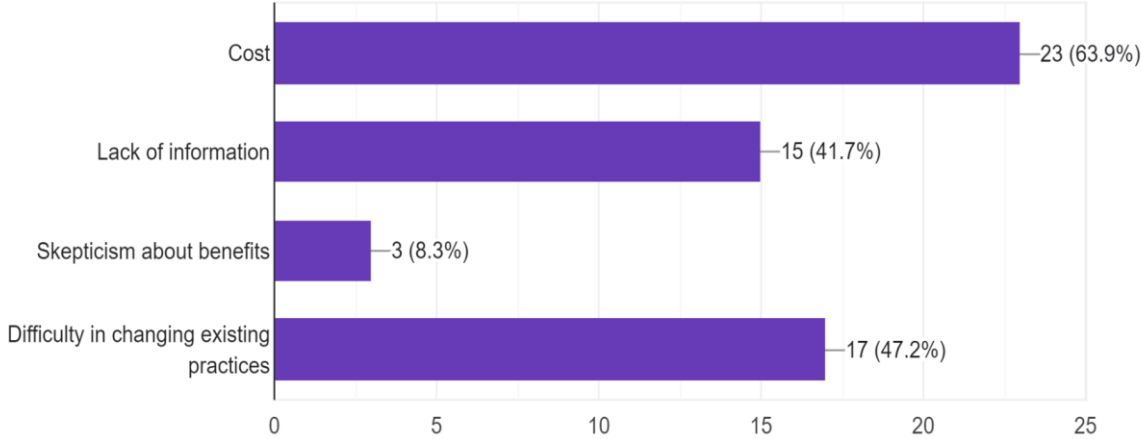
The survey of sustainable farming practices among 36 farmers reveals a promising trend toward the implementation of regenerative agricultural techniques. A significant majority, 88.9%, have adopted crop rotation practices, which is fundamental for soil health and can lead to more sustainable farm management. Reduced tillage is the next most adopted practice at 66.7%, indicating a considerable move towards conservation agriculture principles that minimize soil disturbance. Cover cropping has been implemented by half of the respondents, suggesting an awareness of its benefits for soil protection and enhancement of biodiversity. Notably, the use of renewable energy sources and grazing management are less adopted, with 25% and 13.9% respectively, indicating potential areas for growth and development within the REVIVER project's curriculum.

The insights from this survey are critical for the REVIVER project as they direct the focus areas for curriculum development. The high adoption rate of certain practices indicates a foundation upon which more advanced regenerative techniques can be built. It also highlights the opportunity to enhance understanding and implementation of less-adopted practices, such as renewable energy utilization and grazing management, by providing targeted education and resources. Given that each of these practices contributes to a holistic regenerative agricultural approach, the curriculum must address them comprehensively, ensuring farmers are equipped to implement a full spectrum of sustainable techniques. This alignment with current practices and unmet educational needs will be vital in developing a curriculum that is both relevant and impactful, enabling farmers to meet the challenges of sustainable agriculture head-on.

# Barriers to Adopting Sustainable Farming Practices

What barriers have you faced in implementing sustainable farming practices?

36 responses



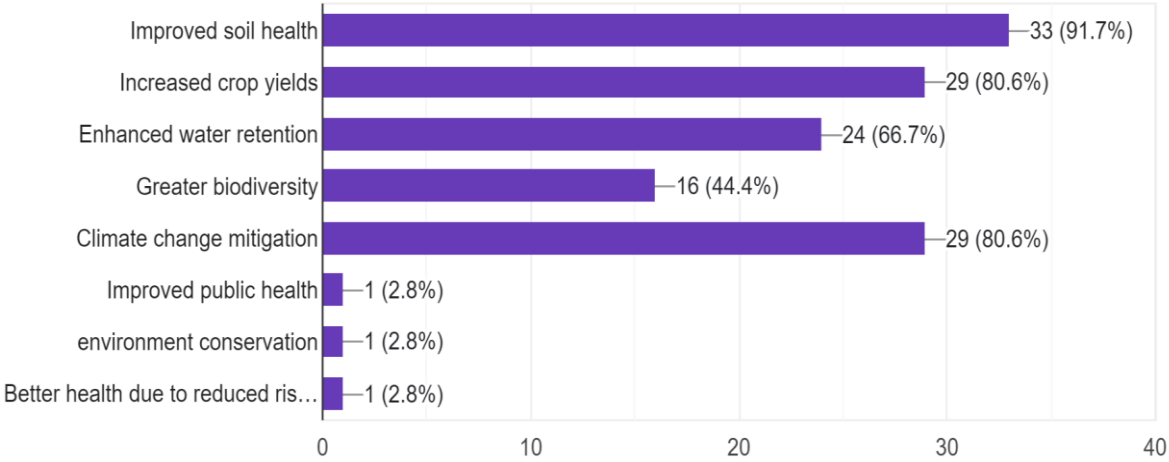
In the collective feedback from 36 farmers on the challenges faced while implementing sustainable farming practices, cost emerges as the predominant barrier, highlighted by 63.9% of respondents. This points to economic constraints as a significant hindrance, indicating that initial investments or perceived lower returns may be discouraging farmers from adopting these practices. The second most cited challenge is the difficulty in changing existing practices, expressed by 47.2% of participants, suggesting that traditions and established farming routines may be deeply ingrained and difficult to alter. Lack of information is another critical barrier, as reported by 41.7% of farmers, reflecting gaps in knowledge or access to information about how to implement sustainable practices effectively. Skepticism about the benefits of such practices appears to be the least of concerns, noted by only 3.8% of the respondents.

The REVIVER project can harness these insights to tailor an innovative regenerative agriculture curriculum that addresses these barriers head-on. Economic concerns could be mitigated by including cost-benefit analyses of sustainable practices, showcasing long-term financial gains, and presenting case studies of successful implementation. To overcome the resistance to changing existing practices, the curriculum could provide transition strategies, highlighting incremental changes that lead to larger shifts in practice. Tackling the information gap would involve detailed instructional materials, possibly in local languages, and leveraging digital platforms for wider reach. Additionally, incorporating testimonials and evidence to counter skepticism could help reinforce the benefits of sustainable farming. Overall, understanding these barriers is crucial for designing a curriculum that not only educates but also supports farmers in overcoming the real challenges they face.

# Perceptions on benefits of Sustainable Farming Practices

Which benefits of sustainable farming are you aware of? (Select all that apply)

36 responses



The survey conducted with 36 farmers regarding their awareness of the benefits of sustainable farming shows a strong recognition of several key advantages. A significant majority are aware of the improved soil health that sustainable practices can deliver, with 91.7% acknowledging this benefit. Both increased crop yields and climate change mitigation are well recognized by 80.6% of the farmers, illustrating an understanding of the direct economic benefits and the environmental importance of sustainable farming. Enhanced water retention is noted by 66.7% of the respondents, while a lower 44.4% are aware of the contribution of sustainable farming to greater biodiversity. Notably, awareness drops significantly for benefits such as improved public health, environment conservation, and better health due to reduced risk of disease, each noted by only 2.8% of the respondents.

This awareness landscape presents a multifaceted opportunity for the REVIVER project's curriculum development. The high level of awareness among farmers regarding certain benefits can be leveraged to create more advanced content in those areas, perhaps focusing on optimizing techniques for soil health and yield improvements. Conversely, the lower awareness of public health and conservation benefits suggests that the curriculum should incorporate fundamental education on these topics. This would broaden farmers' understanding of sustainable farming's comprehensive impacts and may inspire further commitment to regenerative practices. Tailoring the curriculum to both reinforce well-understood benefits and illuminate lesser-known ones will provide farmers with a holistic understanding of sustainable farming, leading to more informed decision-making and advocacy within their communities.

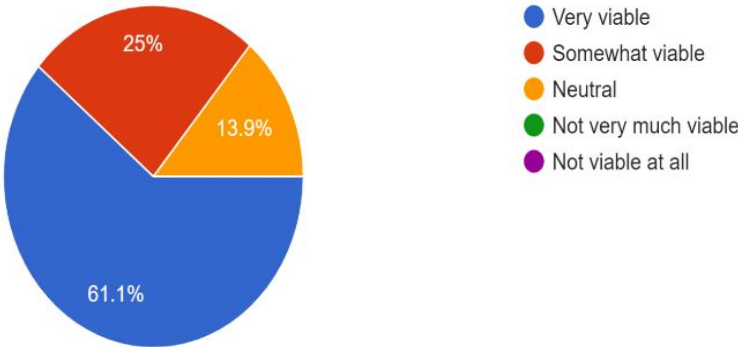
## Perceptions on economic viability of regenerative agriculture

The survey concerning the economic viability of regenerative farming for young farmers indicates a positive outlook among the 36 respondents. A substantial majority, 61.1%, consider it 'Very viable', which reflects a strong belief in the profitability and sustainability of regenerative farming practices among the newer generation of farmers. An additional 25% view it as 'Somewhat viable', adding to the overall favorable perception. However, there is a segment that remains neutral (13.9%), indicating uncertainty or lack of information about the economic outcomes of these practices. This data suggests that while there is a strong belief in the potential of regenerative farming, there is also a need to address the concerns and uncertainties that still exist.

For the REVIVER project, these insights can inform a curriculum that emphasizes the economic benefits and practical financial management of regenerative farming, particularly tailored to young farmers who may be in the early stages of their careers and possibly more open to innovative farming methods. By focusing on the development of business skills, investment strategies, and the economic advantages of sustainable practices, the project can bolster the confidence of the neutral group and enhance the economic acumen of those already convinced. Moreover, integrating real-life success stories and case studies into the curriculum could serve as powerful testimonials to demonstrate the practical viability of regenerative farming. This could ultimately lead to a greater adoption rate and long-term sustainability within the young farming community.

How economically viable is regenerative farming for young farmers?

36 responses



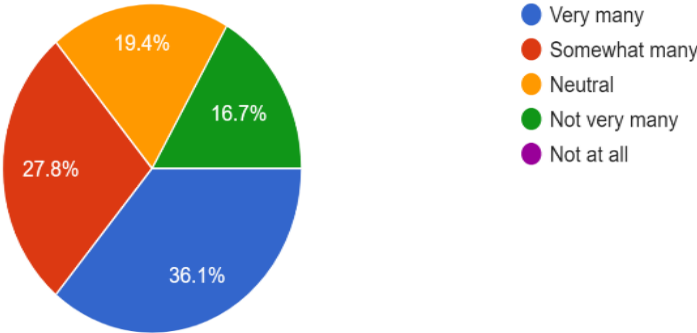
### Market opportunities

The surveyed feedback from 36 farmers on market opportunities for products derived from sustainable or regenerative agriculture paints a picture of moderate optimism. The largest group, at 36.1%, believes there are 'Somewhat many' opportunities, suggesting that while markets exist, there may be room for growth or increased accessibility. Those who perceive 'Very many' opportunities comprise 19.4% of the respondents, which points to a tangible recognition of a favorable market for sustainably sourced products. However, there is a noticeable level of uncertainty, with 27.8% of farmers expressing a neutral stance, indicating either a lack of knowledge about market opportunities or an unpredictability in market conditions. The groups perceiving fewer opportunities ('Not very many' at 16.7% and 'Not at all' at 0%) are the minority, which is encouraging but also highlights areas where market development may be needed.

Understanding these perceptions is critical for the REVIVER project's development of a regenerative agriculture curriculum. It suggests that while there is a base level of market opportunity, the curriculum should include modules on market research, development, and access to empower farmers with the skills to identify and capitalize on these opportunities. Addressing the uncertainty expressed by the neutral group could involve training in market analysis and the development of strategies to build and access new markets. Enhancing farmer confidence through knowledge of market dynamics, consumer trends, and marketing skills will be crucial in equipping them to successfully sell their sustainably produced goods. This approach will ensure that the curriculum does more than just teach farming practices—it will provide a comprehensive skill set that supports the economic viability of sustainable farming.

How many market opportunities are there for products obtained from sustainable or regenerative practice in your area?

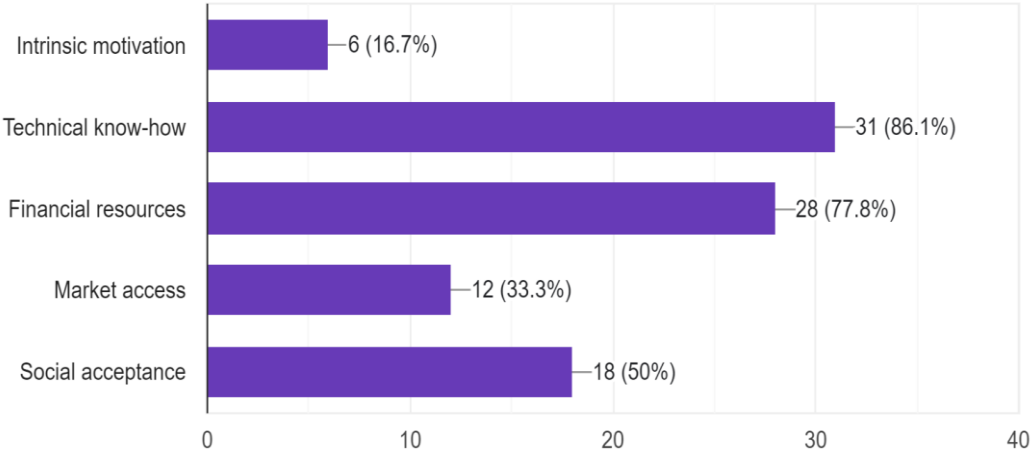
36 responses



### Most significant challenge in adoption sustainable farming practices

What is the most significant challenge in adopting sustainable farming practices?

36 responses



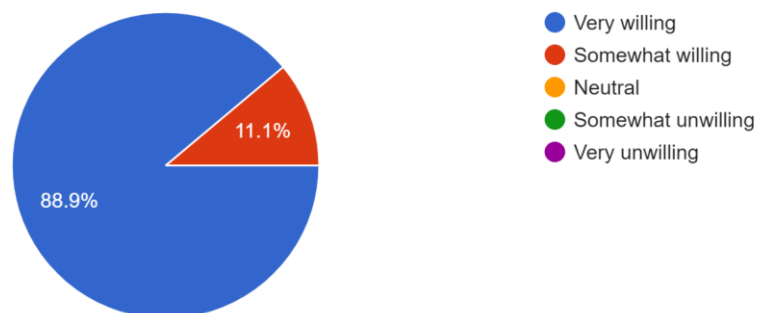
In reviewing the barriers faced by 36 farmers when adopting sustainable farming practices, technical know-how emerges as the leading challenge, highlighted by 86.1% of respondents. This underscores a critical gap in practical knowledge and expertise, which is essential for effectively implementing and managing sustainable farming systems. Close behind is financial resources, noted by 77.8%, indicating that the economic barriers to entry, such as initial investments in sustainable technology or infrastructure, are significant. Social acceptance is also a notable challenge for 50% of the participants, reflecting perhaps a cultural hesitation or lack of community support towards new farming methods. Lesser concerns are market access (33.3%) and intrinsic motivation (16.7%), suggesting that while some farmers are grappling with reaching buyers or finding personal drive, these are not as widespread as technical and financial constraints.

These insights inform a critical aspect of curriculum development for the REVIVER project. Addressing the need for technical training is paramount; the curriculum should be robust in providing practical, hands-on learning experiences, detailed guidance on sustainable practices, and problem-solving for common technical issues faced in the field. Financial education, including budget management, accessing funds, and cost-effective sustainable practice, should be integrated. To combat social resistance, modules on community engagement and the social benefits of sustainable farming could foster broader acceptance. By addressing these identified challenges within the curriculum, the REVIVER project can equip farmers not only with the knowledge but also with the tools to navigate the multifaceted landscape of sustainable farming adoption.

## Willingness to incorporate more sustainable farming practices

How willing are you planning to incorporate more sustainable or regenerative practice in your farming operation in the future?

36 responses



The sentiment among the 36 farmers interviewed regarding the integration of sustainable or regenerative practices into their future farming operations is overwhelmingly positive. An impressive 88.9% indicated they are 'Very willing' to adopt such practices, demonstrating a proactive attitude and a readiness to engage with and apply sustainable methods. This level of eagerness presents a fertile ground for the REVIVER project to introduce and expand regenerative practices within Kenyan farming communities. Only a minor 11.1% remain neutral, reflecting either a degree of reservation or the need for more information before making a commitment. There are no indications of unwillingness, which bodes well for the project's objectives.

This feedback is invaluable for shaping the REVIVER project's curriculum; it indicates a readiness to embrace regenerative agriculture practices and suggests that the curriculum can ambitiously aim to equip farmers with advanced techniques and strategies. The enthusiasm reflected in the survey responses implies that the training can extend beyond introductory material to include a comprehensive suite of practices that enhance sustainability and resilience. Moreover, addressing any underlying concerns or questions that contribute to neutrality will be important, ensuring that all participants can confidently and fully engage with the curriculum. The apparent readiness for change opens up avenues for the project to not only educate but also innovate, potentially setting a benchmark for sustainable practices in the region.

## 4.6. Conclusion and Recommendations

### Conclusion

Regenerative agriculture in Kenya is gaining momentum as a sustainable farming practice focused on improving soil health, increasing biodiversity, and enhancing the ecosystem. This approach is crucial in



addressing the challenges posed by climate change, soil degradation, and food security while promoting environmental protection.

#### 4.7. Recommendations on how to promote sustainable agriculture among young farmers

In response to the dynamic challenges faced by young farmers today, the respondents provided key recommendations to promote sustainable and regenerative agricultural practices:

1. **Utilization of Technical and Vocational Education and Training (TVET):** Leverage TVET institutions as key players in imparting practical skills and knowledge on regenerative agriculture to young farmers.
2. **Institutional Curriculum Development:** Incorporate regenerative agriculture modules into the curricula of agricultural institutions, ensuring that future generations of farmers are equipped with sustainable principles from the outset.
3. **Demonstrating Viable Business Potential:** Actively demonstrate through successful case studies that sustainable farming is not just environmentally sound but also a financially viable business venture.
4. **Leveraging Digital Engagement:** Since young farmers are highly digital, promote sustainable practices through the latest technological platforms and innovations, making information and training accessible and engaging
5. **Market and Financial Integration:** Develop a digital and physical platform network to facilitate market access, empowering young farmers to commercialize their sustainable products effectively. This initiative should be coupled with increased financial accessibility, providing the means for these innovative agriculturists to invest in and realize their sustainable visions.
6. **Centers of Practical Excellence:** Establish hands-on, practical training centers designed as incubators of sustainable farming methods. These hubs will function as skill and knowledge catalysts, ensuring that experiential learning is at the forefront of agricultural education.
7. **Fiscal Incentives and Market Assurance:** Implement financial support mechanisms that secure markets for sustainably produced goods, thereby providing stability and encouraging young farmers to commit to eco-friendly agricultural practices.
8. **Cross-Cultural and Experiential Exchange Programs:** Create international and local exchange programs fostering knowledge sharing and cultural understanding of diverse farming techniques, broadening the scope of innovation in sustainable farming practices.
9. **Demonstrative Field Days:** Conduct regular field days with a focus on live demonstrations of sustainable techniques, showcasing the practical and economic viability of regenerative practices.
10. **Continuous Learning and Engagement:** Facilitate ongoing educational events such as workshops, seminars, and conferences that not only raise awareness but also provide the latest insights into sustainable farming advancements.
11. **Climate-Smart Project Participation:** Directly involve the youth in climate-resilient and sustainable agriculture projects, allowing them to contribute meaningfully to the environmental and economic sustainability of their communities.
12. **Group Formation and Project Financing:** Encourage the formation of agricultural youth groups that receive comprehensive training followed by partial or full funding for scalable agricultural projects.

13. **Local Capacity Building Initiatives:** Focus on ground-level capacity building, tailored specifically to the needs and conditions of young farmers, leveraging local resources and expertise.
14. **Inclusion in Current Practice:** Integrate young farmers into the existing agricultural landscape, utilizing the resources at their disposal to showcase the immediate benefits and potential of sustainable practices.

By implementing some of these recommendations, the REVIVER project can create an ecosystem that not only nurtures the growth of young farmers in sustainable agriculture but also ensures the longevity and prosperity of the farming community at large.

## 5. Regenerative Agriculture in Germany

### 5.1. Differentiation between regenerative and organic agriculture

Regenerative agriculture and organic agriculture are two distinct approaches to land management and food production often confused with each other. Regenerative agriculture takes a broader approach, encompassing not only the organic production of food but also the health of ecosystems and the regeneration of natural resources. Organic agriculture, on the other hand, primarily aims to adhere to specific production standards to ensure environmental protection and food safety. Key differences include:

#### **Soil Care**

Regenerative agriculture emphasizes the importance of soil regeneration through practices such as introducing cover crops, mulch, compost, and crop rotation to promote soil health and prevent erosion. Organic agriculture prohibits the use of synthetic fertilizers and pesticides but does not necessarily mandate specific soil regeneration practices.

#### **Standards and certifications**

There are no uniform certifications or standards for regenerative agriculture in Germany. For organic agriculture, in addition to European organic certification, various German certifications such as Naturland, Bioland, and Demeter are offered to ensure that farms adhere to established organic standards.

#### **Innovation**

While regenerative agriculture shows an openness to the use of technology and innovation (provided that the used practices promote ecological health and natural resources), organic agriculture focuses on traditional and natural farming methods.

Organic farming in Germany is growing steadily. By the end of 2022, nearly 37,000 farms were operating organically on over 1.8 million hectares, accounting for approximately 11.2% of Germany's total agricultural land. In comparison, there is not much information available about the prevalence of regenerative agriculture. According to latest estimations, approx. 50,000 hectares are managed according to the principles of regenerative agriculture in Germany, including both organic and conventional farms.

### 5.2. Laws and regulations

Although there are currently no established legal standards for regenerative agriculture in Germany, there are regulations in place (partially at state level) that support regenerative agriculture. These laws aim to promote the sustainable management of agricultural land in Germany, ensure the protection of natural resources, and minimize environmental impacts.

#### **Federal Nature Conservation Act („Bundesnaturschutzgesetz“)**

The Federal Nature Conservation Act in Germany defines the measures necessary for the protection of nature and landscape. It includes regulations focused on the protection of soil, water, animals, plants, and habitats, which are significant for responsible agriculture.

### **Federal Forestry Act („Bundeswaldgesetz“)**

The Federal Forest Act establishes guidelines for sustainable forest management in Germany. It includes regulations for the protection and responsible use of forest soils, as well as support for initiatives aimed at restoring and preserving the ecological functions of forests.

### **Fertilizer Act („Düngegesetz“)**

The Fertilizer Act regulates the use of fertilizers in agriculture and aims to protect water bodies from over-fertilization and pollution. It contains regulations for sustainable fertilization and for preventing environmental contamination from the use of fertilizers.

At EU level, the planned **Nature Restoration Law**, aiming to preserve biodiversity and promote sustainable use of natural resources, could accelerate the transition to regenerative agriculture in Germany and other European countries. If the law goes through, EU member states will be required to restore at least 30% of damaged habitats in water and on land by 2030, 60% by 2040, and ultimately 90% by 2050.

## **5.3. Promotion of regenerative agriculture in Germany**

Various German organizations and initiatives promote and support the practices of regenerative agriculture. At government level, **Bundesanstalt für Landwirtschaft und Ernährung (BLE)** and **Bundesministerium für Ernährung und Landwirtschaft (BMEL)** advocate for sustainable and resource-efficient agriculture and support corresponding projects and programs. German nature conservation associations and organizations such as **Naturschutzbund Deutschland (NABU)** and **Bund für Umwelt und Naturschutz Deutschland (BUND)** are dedicated to nature conservation and sustainable land use, which includes regenerative agriculture. These organizations offer advice and support to farmers interested in transitioning their operations to regenerative agriculture, also funding opportunities are available.

In addition to the ministries and organizations mentioned above, there are also German associations dedicated to regenerative agriculture such as **Soil Alliance e.V.** and **Aufbauende Landwirtschaft e.V.** These associations organize seminars, workshops, and other events to inform farmers and other interested parties about the benefits and practices of regenerative agriculture. Furthermore, you can find German foundations such as the **Finck Stiftung** that focus next to education and training also on valuable research work on the different methods of regenerative agriculture. The goal is to pass on the findings to research, education, nature conservation and society according to the open-source principle.

In the academic realm, students can gain insights into regenerative agriculture by enrolling in programs such as **Oecologicum** (University of Tübingen), **Sustainable Agriculture** (Rhine-Waal University of Applied Sciences and Georg-August University of Göttingen), **Organic Agriculture** (University of Kassel and University of Applied Sciences for Sustainable Development Eberswalde), or **Environmental Protection and Agricultural Food Production** (University of Hohenheim). So far, a program focusing specifically on regenerative agriculture at German universities does not seem to exist.

## 5.4. Future of regenerative agriculture in Germany – an outlook

Nature conservation associations such as NABU show significant concerns about the future of regenerative agriculture in Germany. Despite the potential for this approach to agriculture to chart a new course, there remains a notable absence of regulatory encouragement or support within the food value chain to pursue significant transformations. According to NABU, the consistent trend of German farmers transitioning to organic agriculture is slowing down, despite their increased readiness to adjust to climate change challenges. Meanwhile, although consumers' perceptions regarding the health and environmental aspects of their food choices are changing, they haven't demonstrated a widespread willingness to invest in more sustainably produced food items. NABU does not consider the status quo in Germany sustainable: “Unless agricultural practices and attitudes change, farmers will pass on to future generations a situation in which soils are depleted, yields are uncertain due to a lack of resistance to global warming, and the range of alternatives continues to narrow in the face of unfavorable regulation. The only way to bring about the necessary changes is through widespread adoption of regenerative agriculture – triple win that offers benefits for farmers, other players in the agri-food system, and Germany’s consumers.”<sup>22</sup>

The manifesto that was signed by German and European farmers at the 1<sup>st</sup> Climate Farming Congress in Kirchberg, Germany in 2021 shows a movement that believes in the potential of regenerative agriculture to “solve many of our most urgent and elusive problems simultaneously such as climate change, biodiversity loss, air quality, food system resilience, rural community, public health, etc.”<sup>23</sup> The movement notes that farmers all over Europe have already demonstrated that these solutions exist. Furthermore, it is emphasized that – originating from indigenous cultures – regenerative agriculture has a long history and there is already a lot of embodied knowledge, methods and understanding that farmers can build on. But while best practises exist, unique farming system designs will be needed: “We are not dogmatic about farming practices and systemic approaches, but rather embrace the diversity of pathways towards regenerating in different contexts.”<sup>24</sup>

## Ministries, organizations and associations

[https://www.ble.de/DE/Startseite/startseite\\_node.html](https://www.ble.de/DE/Startseite/startseite_node.html)

[https://www.bmel.de/DE/Home/home\\_node.html](https://www.bmel.de/DE/Home/home_node.html)

<https://www.nabu.de/>

<https://www.bund.net/>

<https://www.soilalliance.org/>

<https://aufbauende-landwirtschaft.de/>

<https://finck-stiftung.org/>

## 5.5. Survey for Farmers Results

This is a comprehensive research report from an online survey conducted by Outside Media & Knowledge in Germany, focusing on regenerative agriculture practices of farmers. We gathered 20

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<sup>22</sup> [https://www.nabu.de/imperia/md/content/nabude/landwirtschaft/230323-the\\_case\\_for\\_regenerative\\_agriculture\\_longversion-engl.pdf](https://www.nabu.de/imperia/md/content/nabude/landwirtschaft/230323-the_case_for_regenerative_agriculture_longversion-engl.pdf)

<sup>23</sup> [https://www.climatefarmers.org/wp-content/uploads/2022/09/Manifesto\\_Regenerative-Agriculture.pdf](https://www.climatefarmers.org/wp-content/uploads/2022/09/Manifesto_Regenerative-Agriculture.pdf)

<sup>24</sup> [https://www.climatefarmers.org/wp-content/uploads/2022/09/Manifesto\\_Regenerative-Agriculture.pdf](https://www.climatefarmers.org/wp-content/uploads/2022/09/Manifesto_Regenerative-Agriculture.pdf)

responses from farmers mainly and several from people who have keen interest in relationship of farmig and climate issues.

In summary, the survey responses shed light on the age demographics of the participants, their general awareness of regenerative agriculture, and the depth of their knowledge on the topic. The results suggest a promising level of interest and awareness, coupled with a clear need for further education and engagement to deepen understanding and foster widespread adoption of regenerative agriculture practices.

We conducted the survey in German language.

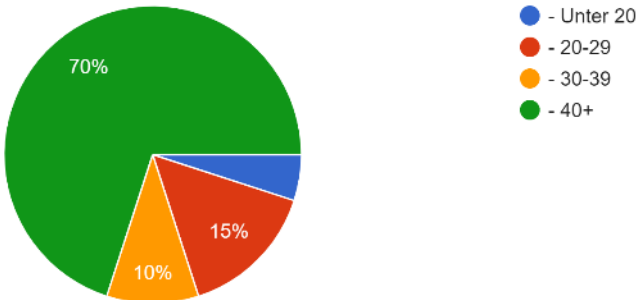
### Age Confirmation

The survey starts by asking the respondents to confirm their age, with options ranging from "Under 20" to "40+".

The majority of respondents (70%) are in the "40+" age group. The distribution then follows with 15% in the "30-39" age group, 10% in the "20-29" age group, and a smaller percentage (the exact number isn't provided but can be inferred as 5% if these are the only options and sum to 100%) under 20.

The age distribution indicates a significant representation of more experienced individuals, potentially reflecting a higher level of engagement and interest in agricultural practices among older demographics. This could suggest the general distribution of age of farmers, or that older farmers are more invested in exploring or have already been exposed to concepts like regenerative agriculture, possibly due to longer-term concerns about sustainability and land management. We cannot however draw these conclusions with certainty, as it could also reflect simply our reach within a given task sample of reaching 20 farmers.

20 responses



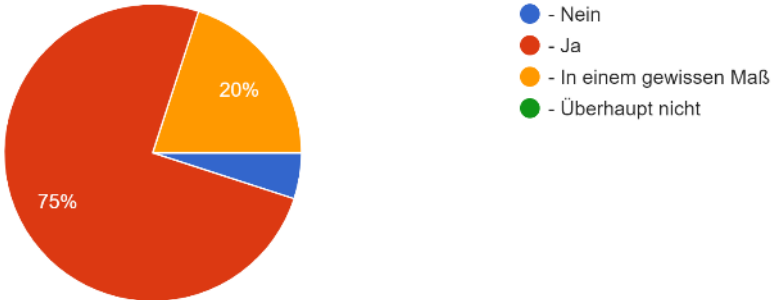
### Awareness of Regenerative Agriculture

Participants were asked if they had heard of regenerative agriculture, with response options ranging from "No" to "Yes," "To some extent," and "Not at all."

A large majority, 75%, have heard of regenerative agriculture, either fully or to some extent, indicating a significant level of awareness among the respondents. Specifically, 20% have not heard about it at all, suggesting there is still a portion of the population that remains uninformed.

The high level of awareness (75%) among the respondents about regenerative agriculture is encouraging for advocates and educators in this field. It highlights an existing foundation of interest and knowledge that can be built upon to further promote regenerative practices. However, the 20% unawareness also underscores the need for continued outreach and education efforts to bridge the gap and engage a broader audience in these sustainable practices.

20 responses



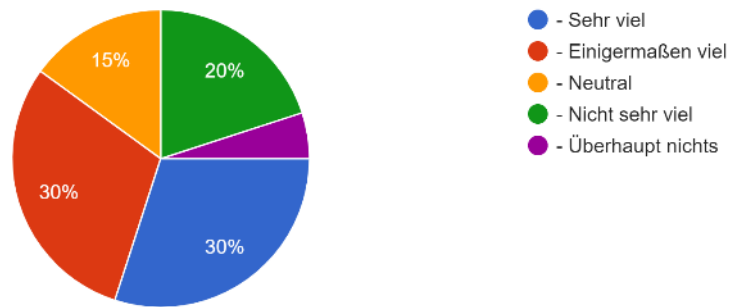
### Depth of Knowledge on Regenerative Agriculture

Respondents were asked about the extent of their knowledge on regenerative agriculture, with options ranging from "A lot" to "Nothing at all."

The responses show a spread across different levels of knowledge. Specifically, 30% of respondents claim to know "A lot," another 30% say they know "Somewhat," indicating a moderate level of understanding. The "Neutral" stance was chosen by 15%, while the rest of the responses are divided among those who know "Not very much"(20%) or "Nothing at all," (5%) with specific percentages not provided but suggesting a smaller proportion.

The distribution of responses indicates a spectrum of familiarity with regenerative agriculture among participants. A notable 60% of respondents report having substantial to moderate knowledge, which is promising for the adoption and advocacy of regenerative practices. However, the existence of a neutral group and those with limited knowledge underscores the need for enhanced educational efforts. Tailored educational programs could help shift the neutral and less informed towards a more comprehensive understanding, potentially leading to wider application of regenerative agriculture practices.

20 responses



### Interest in Learning About Sustainable Agricultural Practices Including Regenerative Agriculture

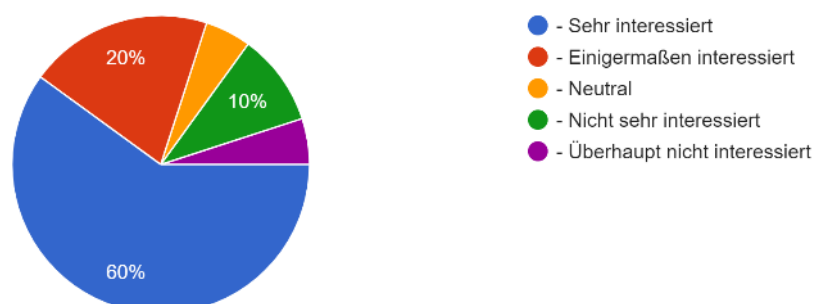
This question sought to gauge the respondents' interest in learning more about sustainable agricultural practices, including regenerative agriculture. The inquiry was structured to understand the level of eagerness among the survey participants to engage with and learn more about these practices.

The responses indicate a strong inclination towards learning more about sustainable practices. A significant 60% of respondents expressed a high level of interest ("Very interested"), followed by 20% who are "Somewhat interested." Only a small fraction showed disinterest, with 10% saying they are "Not very interested" and 5% indicating "Not interested at all." Another 5% of respondents remain neutral, neither expressing explicit interest nor disinterest.

Commentary: The overwhelming interest (80% combined for "Very interested" and "Somewhat interested") in sustainable and regenerative agricultural practices among respondents is a positive sign for the future of agriculture. It suggests a strong potential for the adoption of these practices, as there's a clear desire for knowledge and improvement among the majority. The minimal disinterest shown is typical in broad surveys, reflecting the diverse priorities and circumstances of the agricultural community. However, the high level of enthusiasm for learning more about these practices offers an encouraging outlook for initiatives focused on education and the implementation of sustainable agriculture. This interest can be leveraged by educational programs, workshops, and resources aimed at increasing the adoption of sustainable and regenerative practices within the community.

### Importance of Sustainable Farming Practices for the Future of Agriculture

20 responses



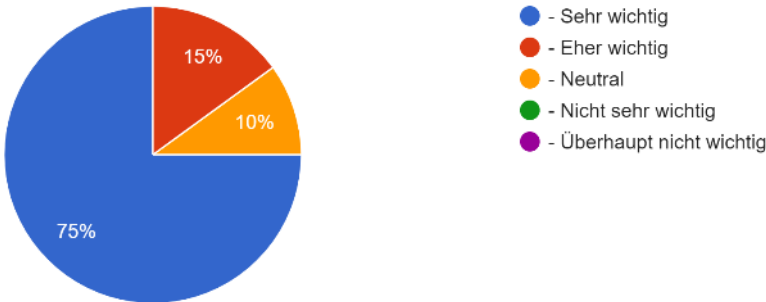


Participants were asked about their perception of the importance of sustainable farming methods for the future of agriculture. This question aimed to understand the priority placed on sustainable practices within the agricultural community and their perceived relevance to the sector's long-term viability and success.

The majority of respondents, a striking 75%, consider sustainable farming practices to be "Very important" for the future of agriculture. A smaller segment, 15%, views these practices as "Somewhat important," indicating a positive but less emphatic stance. Only 10% of respondents took a "Neutral" position, neither strongly endorsing nor dismissing the significance of sustainable methods.

The overwhelming consensus among respondents that sustainable farming practices are crucial for the future of agriculture (90% combined for "Very important" and "Somewhat important") underscores a broad recognition of the challenges facing the sector. This includes concerns over environmental degradation, climate change, and the need for more resilient and sustainable food systems. The strong inclination towards the importance of sustainable practices reflects a widespread understanding among the agricultural community of the necessity to adopt methods that ensure long-term productivity, environmental health, and social equity. These findings highlight a significant opportunity for policy-makers, educators, and industry leaders to support and accelerate the transition towards more sustainable agricultural systems, given the clear interest and recognition of their importance among those directly involved in the field.

20 responses



### Sources of Information on Agricultural Practices

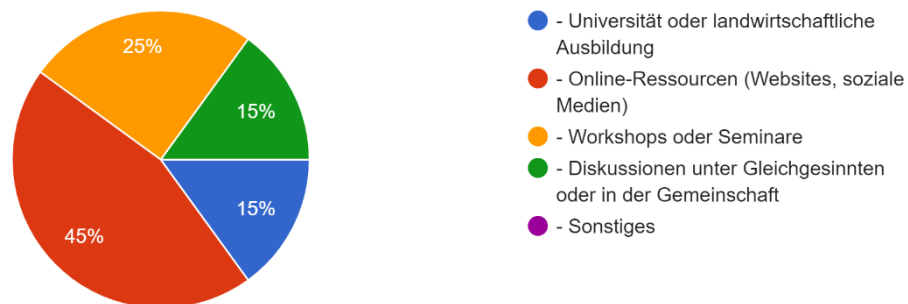
This query aimed to understand where farmers typically gather information regarding agricultural practices. By identifying the main sources of information, the survey seeks insights into the most influential platforms and environments for disseminating knowledge within the agricultural community.

The distribution of responses highlights a diverse range of information sources. A significant portion, 45%, relies on "Online resources (websites, social media)" for information, making it the most popular choice. "Workshops or seminars" follow with 25%, indicating a preference for structured learning environments. Both "Discussions among peers or in the community" and

"University or agricultural education" are equally favored by 15% of respondents, suggesting that traditional and communal learning channels remain important.

The prominence of online resources as the primary source of information for agricultural practices reflects the digital transformation impacting all sectors, including agriculture. The internet's accessibility and the vast array of available content make it an invaluable resource for farmers seeking the latest research, trends, and techniques. The significant reliance on workshops or seminars illustrates a continued appreciation for hands-on learning and the value of direct interaction with experts and peers. The role of formal education and peer discussions highlights the importance of community and foundational knowledge in shaping agricultural practices. This distribution suggests that effective dissemination of information on sustainable agriculture should adopt a multi-channel approach, leveraging online platforms for breadth and workshops or seminars for depth, while still engaging with educational institutions and community networks to ensure a broad and effective reach.

20 responses



## Frequency of Applying Sustainable Farming Methods in Operations

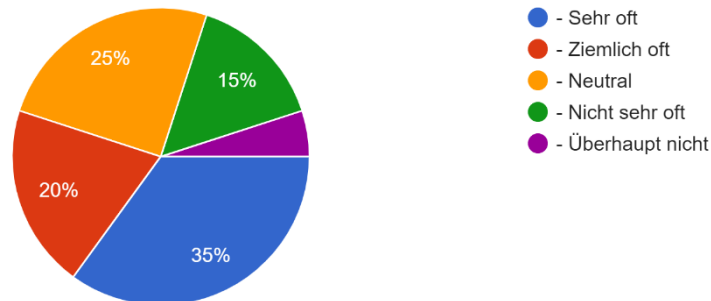
This question explores how frequently respondents implement sustainable farming practices within their operations. It's aimed at assessing the actual application of sustainable methods among farmers, providing insight into how theoretical interest translates into practical action.

The responses indicate a varied level of engagement with sustainable practices. The largest group, 35%, reported using sustainable methods "Very often," suggesting a strong commitment to integrating these practices into their farming operations. Another 20% chose "Quite often," indicating a notable but less consistent application. The "Neutral" response, selected by 25%, might reflect those who are either uncertain about what constitutes a sustainable practice or apply them intermittently. A smaller percentage, 15%, admitted to "Not very often" utilizing these methods, while a minimal 5% have "Not at all" applied sustainable practices in their operations.

The data reveals a promising tilt towards the frequent use of sustainable farming methods, with a combined 55% of respondents indicating they employ these practices "Very often" or "Quite often." This reflects a significant segment of the agricultural community actively engaging in sustainability, likely driven by the recognized importance of these practices for the future of agriculture. The "Neutral" stance suggests there is still a portion of the community that might benefit from further education or resources to better understand or integrate sustainable practices into their operations. The minimal engagement ("Not very often" and "Not at all") from a smaller fraction of the respondents underscores the challenges and barriers that may exist, such as economic constraints, lack of access to resources, or insufficient knowledge. Addressing these barriers through targeted support, education, and incentives

could enhance the adoption of sustainable practices across a broader spectrum of the agricultural sector.

20 responses



## Sustainable Farming Practices Implemented by Respondents

The survey inquired about specific sustainable farming methods adopted by respondents who indicated they had applied sustainable practices in their operations. This question aimed to shed light on the types of sustainable and regenerative practices being utilized, providing insight into the practical approaches towards sustainability in agriculture. The responses varied, showcasing a wide range of techniques, reflecting the diversity and adaptability of sustainable farming methods.

### Implemented Practices:

No-till Farming and Crop Rotation: Respondents mentioned using no-till farming methods post-corn cultivation, alongside crop rotation and cover crops. This approach minimizes soil disturbance, enhances soil health, and improves biodiversity.

Composting and Green Manuring: Regular incorporation of compost and appropriate use of green manure were highlighted. These practices enrich soil fertility and structure, promoting a healthy soil ecosystem.

Controlled Traffic Farming, Deep Soil Loosening, Vitalization: Techniques like controlled traffic farming to reduce soil compaction, alongside deep soil loosening and vitalizations, indicate a focus on preserving soil structure and enhancing its biological activity.

Erosion Control Strips, Agroforestry: Implementing erosion control strips and integrating agroforestry practices demonstrate an approach to combine agricultural productivity with conservation goals.

Underseeding, Compost Tea, Area Composting: Utilizing underseeding to improve soil cover, along with the application of compost tea and area-wide composting, shows an emphasis on maintaining soil health and fertility.

### Additional Noted Practices:

Conservation Agriculture: Embracing the principles of conservation agriculture, including minimal soil disturbance (no-till farming), maintaining soil cover, and practicing crop rotation.

Biological and Eco-friendly Soil Improvement Methods: Adopting biological methods for soil improvement and supporting insects and birds, such as the production and spreading of charcoal, Bokashi, and natural gardening techniques without pesticides.

Avoidance of Chemical Pesticides: A significant emphasis on avoiding chemical pesticides for pest control, favouring biological and mechanical methods instead.

Diverse Cropping Systems and Soil Amendments: Practices include year-round green cover, diverse crop rotation, compost tea, ferments, and controlled decay processes, reflecting a holistic approach to soil health and ecosystem support.

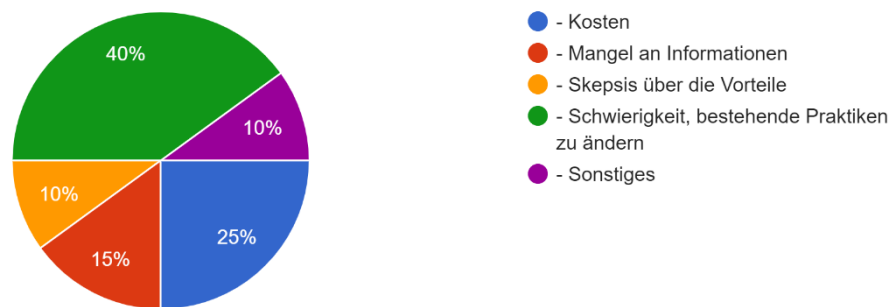
## Obstacles to Adopting Sustainable Farming Practices

The survey inquired about the obstacles encountered by farmers when introducing sustainable agricultural practices, aiming to identify the main challenges inhibiting adoption.

Farmers highlighted difficulty in changing existing practices (40%), costs (25%), lack of information (15%), skepticism about benefits (10%), and other unspecified challenges (10%) as main barriers to adopting sustainable agricultural methods.

The primary challenge is changing established practices, with financial constraints and informational gaps also significant. Addressing these issues through support, education, and demonstrating the benefits of sustainable practices is crucial for encouraging wider adoption.

20 responses



## Readiness and Perceptions of Sustainable Farming Practices

Readiness for Sustainable Transition: The majority of participants indicate a strong willingness to transition to more sustainable farming practices, with a significant number "Very ready" to make such changes. There is a noticeable interest in formal training or education about sustainable agricultural practices, although not all are currently part of a relevant community or network.

Perceived Benefits: Improved soil health, better water retention, increased biodiversity, and mitigating climate change are widely recognized as key benefits of sustainable agriculture. These benefits appear to be well-understood across respondents.

Economic Viability and Market Opportunities: There is a split view on the economic viability of regenerative agriculture for young farmers, with some seeing it as feasible and others neutral or uncertain. Market opportunities for sustainably sourced products are seen as numerous by some, but not all respondents agree.

Support and Challenges: State support for sustainable farming seems lacking, with many reporting little to no assistance. Financial resources are considered the biggest challenge to implementing sustainable practices.

Role of Technology and Impact on Environment: There is a consensus on the crucial role of technology in promoting sustainable or regenerative agriculture. The influence of sustainable farming on combating environmental issues is deemed significant by most respondents.

Future Commitment: Reflecting their recognition of the benefits and importance of sustainable farming, many participants express a high degree of readiness to increase the use of sustainable or regenerative practices in their operations in the future.

## 5.6. Summary Report on Expert Interviews: Perspectives on Regenerative Agriculture in Germany

### Interview 1 with a Bio-Farmer

M.S., an organic farmer, has developed a diverse regenerative farm from inherited family land. His practices include mixed small-scale farming, integrating livestock, crops, and forestry to enhance biodiversity and social community engagement. His approach, deeply rooted in his upbringing, focuses on soil health through organic material application, avoiding heavy machinery, and promoting ecosystem diversity with hedgerows and agroforestry.

He underscores the role of such methods in climate change mitigation and water management, despite challenges in market recognition and financial reward. M.S. identifies the need for long-term commitment and independence from commercial pressures to practice regenerative farming effectively. He observes that regenerative agriculture is still relatively unknown among German farmers and suggests that state support, particularly for CO<sub>2</sub> sequestration, could boost its adoption. He remains hopeful for the future as he sees interest from young farmers, advocating for more flagship projects and state-funded incentives to encourage the transition.

## **Interview 2 with a Food Industry Consultant**

S.K. comes from a background in the food industry and academia, focusing on nutrition system transitions. He provides private consultancy for startups and large retailers on sustainable practices and advises public entities on policy development to promote regenerative agriculture.

S.K. notes that regenerative practices in Germany are currently minimal and vary across different farming types. He emphasizes the benefits in terms of social, economic resilience, nutrient-rich produce, and positive ecological impacts. The challenges, as S.K. sees them, are deeply entrenched ideological paths in science, demographics, economics, and sociology, all resisting change. He remarks that regenerative farming is undervalued in Germany, often seen as a potential greenwashing rather than a grassroots movement. For fostering regenerative agriculture, he proposes a revamp of agricultural ministries, early retirement for certain scientists, and restructuring agricultural consultancy.

S.K. is cautious about the future of regenerative farming, suggesting that it will thrive only in local hubs unless there is a fundamental reevaluation of agricultural work and a societal shift towards active landscape stewardship. He envisions a future where society embraces more time nurturing the environment, possibly within a four-day workweek model.

Lastly, S.K. sees great potential in international exchange, learning from pioneers in diverse regions such as Africa, which can offer valuable lessons in regenerative practices suitable for changing climates and fostering global ecological understanding.

## 6. Regenerative Agriculture in Estonia

### 6.1. Legislation and Governmental Frameworks

Published Legislation on the state of regenerative agriculture in Estonia, organized by the date the bill was passed:

#### **European Union Common Agricultural Policy Implementation Act<sup>25</sup>**

Intervention in line with the agricultural policy of the European Union sets out a plan to develop and ‘implement an action plan of an apiculture body’ (§18), rural development support by way of rural grants (§21), the monitoring, reporting, and evaluation of agricultural processes divided between the European Union and the national common agricultural policy network (§46), and updates to the markets of agricultural products (§71).

#### **Environmental Impact Assessment and Environmental Management System Act<sup>26</sup>**

The act passed in 2023 notes agriculture as an activity with significant environmental impact and prepares mandatory strategic environmental assessment for agriculture (§33).

#### **Rural Development and Agricultural Market Regulation Act<sup>27</sup>**

Implementation of regulations pertaining to the granting of state aid and support for rural development and the agricultural market, as well as the classification of agricultural products into quality classes.

#### **Land Improvement Act<sup>28</sup>**

The Land Improvement Act seeks to implement land improvement systems designed to increase ‘the cultivation value of agricultural and forestry land or to protect the environment’ (§3). The bill includes suggested evaluation and renewal of drainage systems, irrigation systems, and systems for the two-way regulation of the water regime of soils directly impacting the overall status of regenerative agriculture in the country. A number of requirements for land improvement systems are laid out, such as a water regime suitable for the cultivation of crops and a land improvement system which minimizes the risk of nonprofit source pollution (§5). Finally, the foundation of a land improvement association to monitor the progression of systems was recommended (Subchapter 3).

#### **Earth’s Crust Act<sup>29</sup>**

This act notes the consumption and transfer of extracted mineral matter remaining after construction, work to manage land improvement systems, construction of land improvement systems or agricultural work (§96)

#### **Estonia’s National Energy and Climate Plan for 2030<sup>30</sup>**

According to the National Energy and Climate Plan for 2030, greenhouse gas emissions are projected to decrease by 41% in agriculture by 2050 compared to 1990. Half of Estonia’s local authorities and

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<sup>25</sup> <https://www.riigiteataja.ee/en/eli/ee/Riigikogu/act/523012024002/consolide>

<sup>26</sup> <https://www.riigiteataja.ee/en/eli/ee/Riigikogu/act/506102023008/consolide>

<sup>27</sup> <https://www.riigiteataja.ee/en/eli/ee/Riigikogu/act/504102023003/consolide>

<sup>28</sup> <https://www.riigiteataja.ee/en/eli/ee/Riigikogu/act/503072023006/consolide>

<sup>29</sup> <https://www.riigiteataja.ee/en/eli/ee/Riigikogu/act/504072023001/consolide>

<sup>30</sup> [https://commission.europa.eu/system/files/2023-08/Estonia\\_Draft\\_Updated\\_NECP\\_2021-2030\\_en\\_1.pdf](https://commission.europa.eu/system/files/2023-08/Estonia_Draft_Updated_NECP_2021-2030_en_1.pdf)

major cities have energy and climate plans for reducing greenhouse gas emissions, energy savings, and renewable energy.

Reported a total of 106 measures to meet updated targets for greenhouse gas emissions, 8 of which revolve around agriculture and include: organic farming, environmentally friendly practice, improving manure management, investments in energy savings and renewable energy, maintaining carbon stocks in soil, animal welfare, business advice, and farming audits (pg 9). The Estonian Forest Development Plan 2021-2030 seeks to help ensure the sustainability of forest ecosystems, create an economically competitive forest sector, create inclusive forestry (pg 63)

### **European Union Common Agricultural Policy Strategic Plan 2023-2027<sup>31</sup>**

The plan seeks to cover tangible and intangible investments by farmers including six sub-measures:

1. Investments in farm-friendly renewable energy solutions and energy savings.
2. Purchase of precision fertilization sensor systems.
3. Purchase of environmentally sustainable cooling equipment or replacement of cooling equipment for greener ones.
4. Construction of manure and silos storage facilities, covering manure storage facilities and building leak-proof substrates for deep-shaded housing.
5. Investments in manure spreading equipment.
6. Purchase of filters that catch ammonia.

The plan lays out economic support for modernization investments, support for protein crops and legumes, and compliance with the standards for good agriculture and environmental conditions (GAECs). GAECs are related to issues such as: minimum level of maintenance, protection and management of water, soil erosion, soil organic matter, soil structure and are implemented across the EU.

## **6.2. Analysis**

Legal policy with regard to regenerative agriculture has taken a big-picture approach to addressing environmental issues to present. The implementation of associations responsible for the evaluation of land improvement, EU policy, and strategic environmental assessment all note the importance of constant reporting and reconfiguring. From the data and sources provided above, it appears that a holistic approach to regenerative agriculture has been successful, with Estonian farmers complying with EU CAP (Common Agricultural Policy) in order to obtain sector-specific grants and funding.

Notable legislation has remarked that irrigation and the renewal of drainage systems could have an important impact on the overall sustainability of the agriculture sector and state aid has been put in place to encourage development. Commitment to reducing greenhouse gas emissions by 2030 show a willingness to pursue regenerative policies and benefit from the potential economic and social results that this may offer.

Further to this, forestry and wildlife conservation policies show a commitment to sustainable and regenerative practice outside of a strictly agricultural domain.

Overall, regenerative agriculture seems to be a priority of government bodies on a European scale and Estonia in particular, evidenced by strategic planning and legislation to reduce greenhouse emissions by 2030, have shown nationwide commitment to the status of drainage, irrigation, and soil systems, investment in farm-friendly renewable energy resources, manure management, and animal welfare to name but a few areas.

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<sup>31</sup> <https://www.agri.ee/euroopa-liidu-uhise-pollumajanduspoliitika-strateegiakava-2023-2027> and [https://agriculture.ec.europa.eu/document/download/a435881e-d02b-4b98-b718-104b5a30d1cf\\_en?filename=csp-at-a-glance-eu-countries\\_en.pdf](https://agriculture.ec.europa.eu/document/download/a435881e-d02b-4b98-b718-104b5a30d1cf_en?filename=csp-at-a-glance-eu-countries_en.pdf)



A less generalized approach in legislation moving forward, particularly with regard to financial support for farmers and agricultural workers to implement the machinery required for more regenerative farming practices, should be prioritized moving forward. As is made clear by the assessment of scientific material which follows this section.

### 6.3. Academic and Scientific Perspectives

#### Current Research

##### Regenerative Agriculture Estonia<sup>32</sup>

A demonstration given as a seminar at the Summer Days of Estonian Beef Breeders Association 1<sup>st</sup> July 2022 providing examples of regenerative agriculture suitable for both beef cattle and dairy cattle. This demonstration noted the lack of machinery for regenerative agriculture as a potential obstacle to introducing new practices including seed drills for direct sowing, intercropping equipment as well as costs in livestock farming and the CAP support system which over-allocated arable land; regenerative farming practice may penalize farmers. Increases in costs were also brought to the attention of the community.

##### Scenario Analysis, Riet Desmet<sup>33</sup>

Explored the impact of transitioning Estonia's agricultural sector to sustainable practices by comparing economic performance and biodiversity performance. The projections of gross value added per hectare show a strong increase of +120.5% under sustainable management, marking it as a much more profitable endeavor than continuing business as usual. Furthermore, sustainable management is predicted to connect areas of extremely high nature value and thus contribute to a healthier living environment. The report notes that emissions from soils and enteric fermentation of livestock are the major contributors to greenhouse gas emissions in Estonia (50% and 39% respectively) and through regenerative agriculture, could result in a save of 3.3 million tons of CO<sub>2</sub> per year. The report also looks at the socio-economic resilience of medium sized farms, animal welfare, production efficiency, and quality of agricultural products.

##### Holistic Management and Carbon sequestration<sup>34</sup>

Holistic Management focuses on the relationship between resources, people, and financial outcomes, taking into account whole ecosystems and their functional requirements. Results from a system of short-term grazing periods show increases in positive long-term effects on ecosystem services, the sustainability of livestock and wildlife through improved vegetation composition and cover and soil health. The report suggested that grazing strategy has a minimal effect on carbon sequestration and surrounding literature suggests no clear general relationship.

##### Country Report on the Present Environmental Situation in Agriculture, Estonian Agricultural University, Tartu<sup>35</sup>

The paper provides a review of the current situation and developments with regard to agriculture, noting that much more attention must be paid to non-agricultural land use (forestry, sewage disposal,

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<sup>32</sup> <https://hub.bovine-eu.net/carbon-sequestration/demonstration-regenerative-agriculture-estonia>

<sup>33</sup> <https://hub.bovine-eu.net/search/a-targeted-scenario-analysis-future-perspectives-for-sustainable-agriculture-in-estonia>

<sup>34</sup> <https://hub.bovine-eu.net/search/holistic-management-and-carbon-sequestration>

<sup>35</sup> <https://www.fao.org/3/ad238e/ad238e0d.htm>

wildlife preservation). Long term strategy as to sustainable development was passed in 1995 and was implemented to: ensure satisfactory income for farmers, supply Estonian consumers with healthy food, ensure stable employment opportunities, maintain traditional landscapes, and to protect resources.

### **Adaption to Climate Change in Agriculture: Ecosystem Based Options<sup>36</sup>**

Reported that Estonia had only 2% fallow land as of 2016, one of the lowest across all Baltic nations.

Measures were implemented to reduce the share of agricultural land under cereals, which characterized monoculture and unsustainable crop farming, with the share of cereals increasing in Estonia by 6.3%.

### **Estonia EIT Food Report<sup>37</sup>**

A report by the EITFood.eu found that as of 2014, 15.7% of Estonian farmland constituted organic farming, the third highest share of any EU country with a strong emphasis on high nature value.

## **6.4. Implementation**

### **Current Practices and Awareness**

#### **Biofertilizers and Regenerative Farming<sup>38</sup>**

By 2024, all municipalities must collect biowaste separately. Implementation of biofertilizers in Estonia is forefronted by Surya Sudheer, senior specialist in Plant Ecology who seeks to use Arbuscular Mycorrhizal fungi (AM fungi) as inocula for developing biofertilizers. The development of AM fungi biofertilizers will be based on local resources from Estonia.

#### **Comprehensive management of forest and farming landscapes to improve the conservation status of Natura 2000 habitats and species.<sup>39</sup>**

Nation-wide project launched in 2020 which sought to protect and restore Estonian landscapes and ecosystems and to improve the conditions of species and habitats in agricultural lands. The project collaborated with Estonian farmers to reconcile food production, biodiversity, and healthy soils, and to identify agro-ecological techniques for the conditions in Estonia, which will enable the development of more expedient agricultural support schemes in the future. A number of conservation practices in agricultural land were recommended as a result of the scheme (a full list can be found here):<sup>40</sup> converting parts of cultivated land to extensively used pasture, improving ecological conditions of field edges, leaving lackspur patches in winter crop, avoiding fertilizing, ploughing, and poisoning edge areas, turning manure into soil, adjustment of the grazing load by alternating the use of different paddocks, and avoiding farming in areas prone to erosion.

#### **Regenerative Agriculture in Europe<sup>41</sup>**

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<sup>36</sup> Melece, L. and Shena, I., 2020, May. Adaptation to climate change in agriculture: ecosystem based options. In Engineering for Rural Development. Proceedings of the International Scientific Conference (Latvia). Latvia University of Life Sciences and Technologies.

<sup>37</sup> <https://www.eitfood.eu/in-your-area/estonia#:~:text=Out%20of%20957%20510%20ha,includin%2055%2C000%20ha%20of%20farmland>

<sup>38</sup> <https://accelerateestonia.ee/transition-to-regenerative-farming-with-biofertilizers/>

<sup>39</sup> <https://kliimaministerium.ee/en/climate-and-environment-protection/nature-conservation/life-ip-forestfarmland>

<sup>40</sup> <https://heapold.ee/tegevused/>

<sup>41</sup> [https://easac.eu/fileadmin/PDF\\_s/reports\\_statements/Regenerative\\_Agriculture/EASAC\\_RegAgri\\_Web\\_290422.pdf](https://easac.eu/fileadmin/PDF_s/reports_statements/Regenerative_Agriculture/EASAC_RegAgri_Web_290422.pdf)

The report suggests that semi-natural grasslands were impacted by a decrease in livestock numbers after switching from a state to market economy in 1989. For example, 59–94% of the alvar grasslands in Estonia have developed into secondary shrublands and forests as a result of the declining dependence of animal husbandry on such semi-natural vegetation. Having a detrimental impact of biodiversity

Furthermore, regenerative agriculture in its current iteration, does not address larger scales (landscape and regional) despite the fact that several processes, particularly for maintaining biodiversity, are operating at these larger scales. This is a clear weakness of the concept.

### **CAP Network – Opportunities and Challenges<sup>42</sup>**

A hybrid event on regenerative agriculture in 2023 outlined a number of principles for discussion, including: reducing soil disturbance, retaining green cover, retaining living roots, diversification of crops, and integrating livestock into crop rotations.

### **Regenerative Agriculture in Europe<sup>43</sup>**

An overview of the state of knowledge in Europe. A Eurostat report in this overview notes that as of 2016 Estonia had the highest percentage of zero tillage in Europe, contributing to minimizing soil disturbance. The report also lists a number of target values and indicators for successful regenerative agriculture including healthy soil, sufficient food production, clean environment, rich biodiversity, climate change mitigation, fair income. Development of biodiversity monitoring shows an increased awareness across Europe.

### **eAgronom<sup>44</sup>**

Farm management software in Central and Eastern Europe currently managing over 1,500 farms across a million hectares. Focuses on selling carbon negative crops, ensuring the permanence of soil carbon, and using carbon payments as a transition mechanism for farmers to supplement income.

### **E-College for Regenerative Farming<sup>45</sup>**

Educational platform designed to increase awareness of Baltic regenerative agriculture practices. Focusing on crop safety and yields, soil structure, and productivity.

## **6.5. Analysis**

eAgronom stands out as an incredibly successful case study for implementing regenerative farming practices. As such, farmers are encouraged to adopt carbon negative farming with monetary benefits, and carbon payments as a method of transitioning from traditional methods. The use of transitory support for farmers adapting to regenerative practice should be utilized across the board in order to promote gradual change that adheres to all the target values (including fair income). Such transitional economic support could counteract the issues with necessary machinery discussed earlier by allowing farmers to adapt to constrained financial conditions and help make regenerative farming more scalable. Furthermore, increased awareness of the predicted financial benefits of regenerative agriculture should be prioritized in order to increase smaller farms to adopt practices.

Free educational platforms have been proven to be useful for the dissemination of information regarding a cultural shift towards regenerative agriculture, however, reports on European awareness suggest that policy and public knowledge have been successfully adopted.

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<sup>42</sup> [https://eu-cap-network.ec.europa.eu/events/regenerative-agriculture-opportunities-and-challenges\\_en](https://eu-cap-network.ec.europa.eu/events/regenerative-agriculture-opportunities-and-challenges_en)

<sup>43</sup> <https://edepot.wur.nl/629483>

<sup>44</sup> <https://www.eagronom.com/>

<sup>45</sup> <https://www.bsag.fi/en/the-e-college-for-regenerative-farming/>

Nation-wide projects for the protection of biodiversity, biofertilizers, and food production align with the report’s previous findings on the prioritization of sustainable food sources, as well as consequences outside of agricultural spheres.

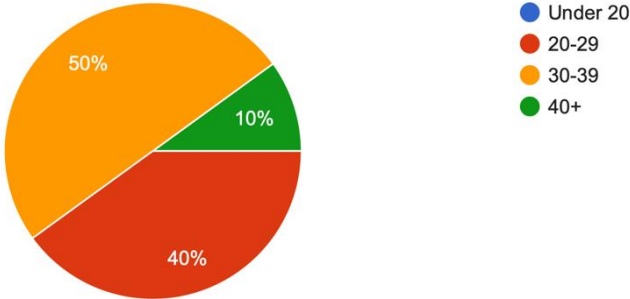
### 6.6. Survey for Farmers Results

Learning Library conducted 20 surveys with young farmers from Estonia.

#### Age distribution

1.) Please confirm your age range

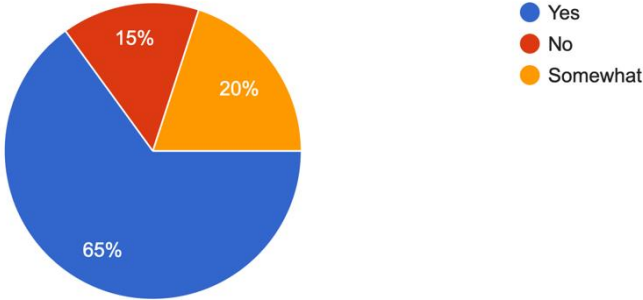
20 responses



#### Previous knowledge about regenerative agriculture

2.) Have you heard of regenerative agriculture before today?

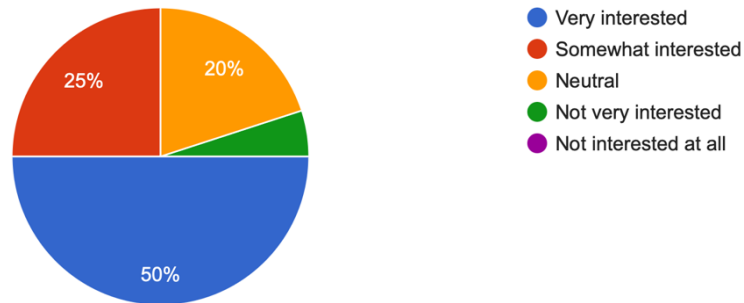
20 responses



Most of the farmers were previously familiar with the concept of regenerative agriculture, 65% of them were fully familiar with the concept, 20% had some basic knowledge about it, while 15% were not familiar with the concept at all.

4.) How interested are you in learning about sustainable farming practices, including regenerative agriculture?

20 responses



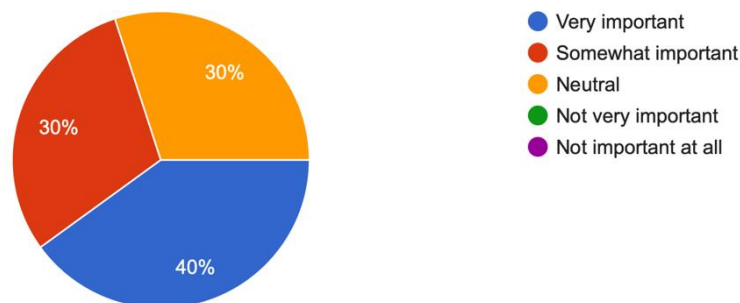
### Interest in implementing sustainable farming practices

Half of the surveyed farmers were very interested in implementing sustainable farming practices in their daily work, 25% were somewhat interested while only 5% (one farmer) were not very interested.

### Importance of sustainable farming practices for the future of agriculture

5.) How important do you believe sustainable farming practices are for the future of agriculture?

20 responses

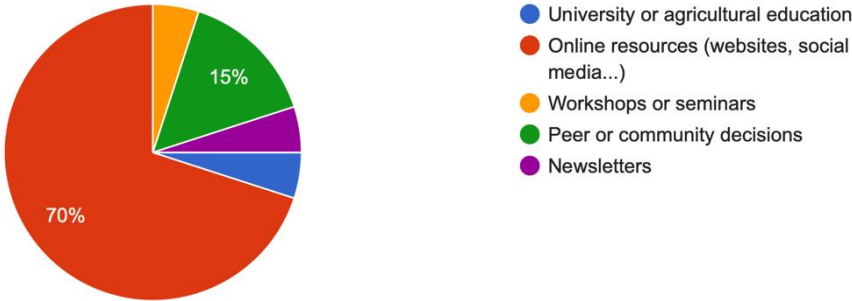


Significantly, there were no farmers who thought that sustainable practices were not important for the future of agriculture, while 40% said that for them it was very important.

### Sources of getting information about farming practices

6.) Where do you usually get information about farming practices?

20 responses

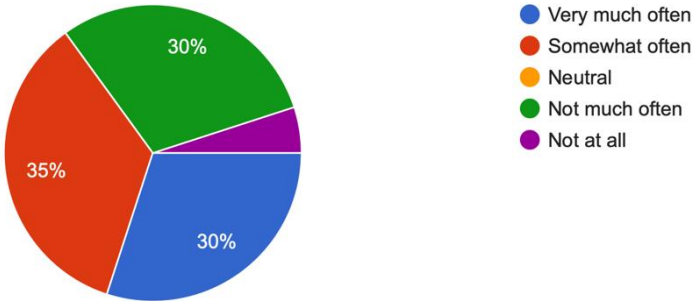


Most of the surveyed farmers are getting educational information and resources from online sources (such as websites, social media, webinars etc.). Then 15% said they are getting it through involvement in peer and community engagements, while the least of farmers are getting their information through formal education (such as universities) or educational seminars.

### Implementation of sustainable farming practices

7.) How often have you implemented sustainable farming practice on your farm?

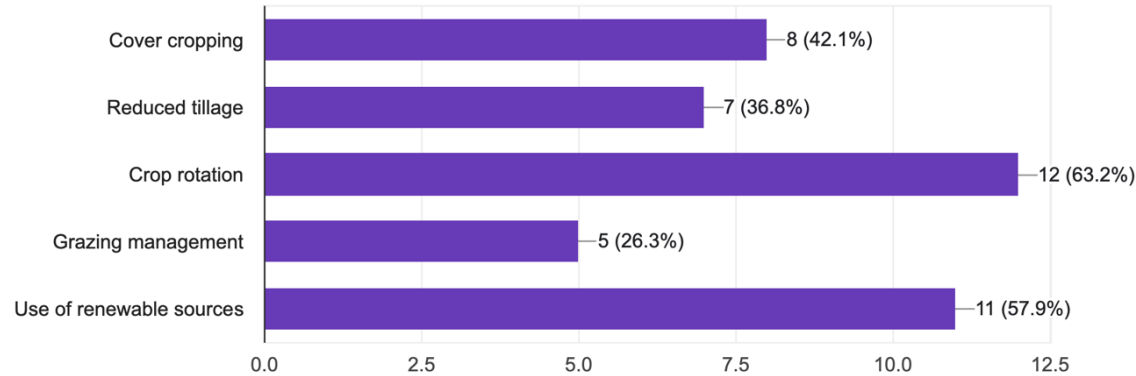
20 responses



Two-thirds of surveyed farmers have already previously implemented some farming practices, such as:

If yes, which practices have you implemented?

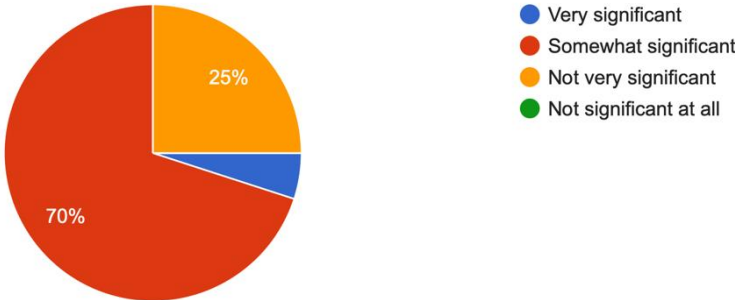
19 responses



### Governmental support in Estonia for sustainable farming practices

16.) Is there sufficient government support for sustainable agriculture in your country?

20 responses



Most of the farmers agreed that there is some support from government supported, but most of them are not aware of procedures or processes needed to get a support.

## 6.7. Summary Report on Expert Interviews: Perspectives on Regenerative Agriculture in Estonia

Thomas has been a nature lover since childhood. He started working on professional market gardens in 2021 in Estonia, near Tallinn. The project Fairgrow was created to promote regenerative practices in agriculture. They created a market garden specialized in vegetables. Today, Thomas is involved in the development of organic market gardens also in Burgundy, France, where he comes from originally. His passion for natural gardening drives him to meet and share experiences with other gardeners all around Europe.



### **Please tell something about yourself and your company**

Thomas is not a gardener by his formal education but has been involved in gardening for his whole life. He is originally from France but moved to Estonia back in 2020 where he started to be involved in professional market gardening. In 2021, together with his colleague and mentor, he started a project with a small market garden located 15 kilometers from the capital of Estonia, Tallinn. It didn't start very professionally from the early beginning and they were mostly focused on selling and delivering small baskets of seasonal vegetables to the customers. In the second year of the work, they have already started selling their products on Tallinn's central market (Keskturg). They were present there three times a week and selling their homegrown vegetables. All their vegetables were chemical-free and based on the principles of living soil agriculture. It means that they were not just growing vegetables but also planting trees and having animals farm, resulting in creating an ecosystem for long-term viability and self-regenerative systems. At the beginning, it took them lot of effort and time to bring the



life back to the soil on their small farm, but now they are getting great results and having improved yields each season. Thomas did not put big investments in buying machinery for his farm but was more concentrated on taking care of and putting personal efforts through education about sustainable farming practices. Thomas said that in his opinion it is very important to develop and create digital resources for young farmers, as he personally attended several face-to-face workshops that helped him, but felt like digitalization would help much more, especially in the Estonian reality.

### **How do you get information about regenerative agriculture?**

For Thomas, the most efficient way to get new knowledge and information was through mentoring by other farmers in Estonia. He is still visiting local farms and seeing practices that they do, and then trying to implement them in his own garden. Thomas is also a part of the network „Climate Farmers in Europe“, which helped him to learn new practices from more than 100 farmers in the whole of Europe. Young farmers in this network exchange questions, information, and knowledge from their experience. Also, Thomas read books about agriculture where he got theoretical knowledge about sustainable practices, but the practice and doing things in his garden helped him much more. In his opinion, formal education is good for learning fundamentals, but practice is still needed to implement knowledge and to further improve. Apart from that, strong motivation and passion are also important, if you have passion, learning is always easier and faster. However, for Thomas peer-to-peer learning and sharing in the community was the most important source of information.

### **Why did you choose sustainable practices?**

For Thomas, the main motivation to do sustainable practices was to save the environment and raise awareness about environmental issues. He also has a formal education background in engineering that helped him through basic knowledge about sustainable practices in general. However, through his formal education, he felt that he couldn't contribute enough. Also, another reason to start implementing sustainable practices for Thomas was that in the city of Tallinn, it was impossible to find markets where fruits and vegetables that were grown locally were sold. Sometimes it was possible to find products from Southern Estonia that have a slightly better climate, but from the Tallinn region, there was absolutely nothing. So it was another reason for Thomas to start working in Tallinn. Thomas is also involved in sharing sustainable practices with other farmers in Estonia and France, trying to help them with marketing and PR services, but also the multiplication of sustainable practices in regular agricultural activities.

### **What are your previous experiences in using social media and digital tools for the promotion of sustainable practices?**

For Thomas and his startup, social media was crucial in the early beginning. They started a Facebook page, Instagram page, and newsletter that engaged 200+ subscribers in the first season. Marketing through Facebook especially worked well because Facebook is still probably the best marketing and selling platform in Estonia, as most of the consumers are using it. Maybe in some other regions of Europe it is becoming outdated, but in Estonia, their Facebook page grew fast through cooperation with local markets that were organizing campaigns and giveaways with fresh fruits and vegetables from the farm as a prize. They also had a campaign where each Monday they were traveling and selling products

on different squares all around Tallinn, so all customers who were busy on weekends could buy also get their products. At the very beginning, they were selling 10-12 baskets per week that was a great start and gave them motivation to continue. In the second year, they have already started cooperation with different restaurants, and finally, in the last two years, they digitalized all the processes and are selling and delivering baskets through the online system and forms on their website.

### **What sustainable practices did you implement in your work so far?**

Thomas mentioned that each year he leaves the roots in the soil, especially for tomatoes, because roots have all microorganisms and there is a lot of life in them filled with carbon and other nutrients, so it stays and decomposes in the soil. Thomas strongly works on creating a circular system where everything is reused and nothing is thrown away. Vegetables and other products that are not being sold are used as food for animals on their farm. In the very first year, they brought a lot of horse manure and covered over the top of the grass as there was no prepared soil for cultivation. They used to put 20-30 cm of manure on top of the grass and let it decompose naturally for weeks, and then planted directly their vegetables. It was possible for all vegetables that are not naturally too much sensitive to nitrogen. Thomas also practices no-dig gardening, where they cover all their beds with straw, woodchips, and other greens to add needed nutrients. Thomas is also implementing the Fermented Forest Litters (FFL) method, originating from South America and Asia originally, it means fermenting leaves and humus from forests nearby, and then making a mix of fermentation with sugars and finally spraying it to the plants as it brings good microorganisms from the environment directly to the garden, creating a common ecosystem.

### **What were the biggest challenges for you so far?**

Definitely the biggest challenge for Thomas so far was the climate and weather in Estonia, especially in Tallinn and Northern Estonia. For example, in the first year, Thomas was really surprised by such low temperatures and snow already in September that destroyed all his planted cucumbers, pumpkins, and other vegetables. Weather throughout the year is very hard to predict and in general farming season is much shorter than in some other parts of Europe. The second big challenge was high inflation followed by huge increases in prices of gas, oil and electricity as all farms all dependent on them. Finally, it was also challenging to compete with prices at the market as there are many big companies and importers who do mass production and for small bio-gardeners such as Thomas it is hard to fight against them and be economically viable. For example, in the first year when they started selling their products on Tallinn Central Market, they were the most expensive, but luckily still had customers who wanted to buy their products. Many people were able to afford those and wanted to support changes by buying food that was made without pesticides or chemicals. Thomas wasn't able to reduce the price as then they wouldn't be sustainable, but still through the support they saw from loyal customers, they managed to survive and stay competitive in the market.

### **Do you think that regenerative agriculture and using sustainable practices is economically viable?**

Thomas thinks that it is possible to be economically viable if you manage to stay less dependent on fluctuations in prices and similar external factors. In general, it is harder to cross the threshold and make big productions if you use regenerative agriculture, but on the other side those farmers are providing value and customers know how to appreciate it. For Thomas and his farm, it was especially important that they achieved cooperation with several restaurants in Tallinn that recognized the quality of their products. In Thomas opinion, over the years there will be a decrease of big-scale food producers, and people in general will be shifting to the small organic producers.

### **Does the government support sustainable practices?**

Thomas didn't use any grants or support at the beginning, but now he is becoming more and more interested. Thomas said that his farm had the luck to become sustainable in the first years, so now it is easier to get some extra help to scale up the production. From 2024 there are more funding and granting opportunities through the Ministry of Agriculture that is supported by the EU on the promotion of regenerative agriculture and Thomas is also planning to apply for subsidies. In his opinion and experience so far, the Estonian support system can sometimes old schooled in the sense that they are asking for a formal education background in agriculture to be eligible for grants, but anyway it is becoming more and more available for all farmers.



## 6.8. Analysis and conclusion:

Trends in scientific research suggest that one priority of regenerative agriculture is providing the nation with access to sustainable, homegrown food. This lines up with historic long-term strategy dating back to 1995 where one main aim of planning was to 'supply Estonian consumers with healthy food'. As such, reports on the adaptation to climate change in the region suggest that the country has an incredibly low percentage of fallow land, and a high percentage of organic farming practices compared to the rest of the European Union.

In addition, cattle farming has become an area of focus with research being carried out on the impacts of holistic management, a process of alternating short-term grazing periods, and carbon sequestration. As a major emitter of greenhouse gases, cattle farming and the sustainability of livestock and wildlife has become a priority with improved vegetation composition, cover and soil health noted as important factors. Demonstrations on such topics suggest that lack of machinery (particularly seed drills and intercropping equipment) poses a serious threat to the implantation of regenerative farming practice and a potential financial penalty for such endeavors suggests that policy needs to be adjusted to accommodate.

Another area which needs to be addressed is the comparatively large number of cereal farms which contribute to monoculture environments and unsustainability. A suggested reevaluation of crop prioritization is necessary to optimize solutions which positively impact soil composition and the regenerative status of fields.

Continued research on biofertilizers could provide a potential solution to the issue of waste management in coming years, with biodiversity researchers from the university of Tartu and schemes by organizations such as Accelerate Estonia playing a large role in their development.

Combined with evidence from the legislative evaluation, it seems that the priority to address greenhouse emissions through a focus on cattle farming is adequately considered. However, suitable alternatives to crop rotation and cereal farming should be considered to meet suggestions from the Land Improvement Act with regard to suitable irrigation and drainage systems.

## 7. Comprehensive Research Process on Regenerative Agriculture in Tanzania



### 7.1. Literature Review on Regenerative Agriculture in Tanzania

#### **Existing Literature on Regenerative Agriculture in Tanzania**

We conduct a systematic search of the literature on regenerative agriculture, specifically in Tanzania. The search aimed at identifying reviewed studies and reports to understand what is known about Regenerative Studies in Tanzania. The searches for literature on regenerative agriculture observed;

- a. Academic Writings and Conference Presentations
- b. Official Reports (Government and International Institutions)
- c. Case Studies (NGOs, Farmer Groups, Lead Farmers)

#### **Academic Literature of Regenerative Agriculture in Tanzania**

The search for literature related to regenerative agriculture in Tanzania involved a search for reviewed academic articles and conference presentations on the subject matter. Related articles were searched in Google Scholar, Web of Science, and Scopus. The search on the search engine platforms involved using the words “Regenerative Agriculture”, “Regenerative Farming”, and “Tanzania”.

The search on the platforms revealed there is scanty literature on studies related to regenerative agriculture when search is done citing Tanzania as a point of reference. However, when the literature search is done by replacing the subject matter with key principles representing regenerative agriculture, several reviewed articles related to Tanzania are observed. Table 3.1. below presents findings on the number of reviewed scholarly articles on Regenerative Agriculture and Its Associated Principles.

**Table 3.1.# of Scholarly Articles Associated with Regenerative Agriculture in Tanzania**

S/No	Regenerative Agriculture Principle	Google Scholar	Web of Science*	Scopus*
1	Regenerative Agriculture	0		
2	Agroforestry	1460		
3	Agroecology	877		
4	Soil Health & Conservation	7420		
5	Carbon Sequestration	1610		
6	Agrochemical Use	674		
7	Crop Diversity	6050		

\* The number of reviewed articles is To be determined, as the search is still ongoing.

Articles on concepts related to principles of regenerative agriculture have been researched by different scholars, with issues on soil health and conservation being researched the most according to Google Scholar. Of the listed review articles, key topics discussed and presented relate to;

- I. Case studies on interventions promoted and their efficacy
- II. Factors influencing the adoption of such interventions
- III. Impact of interventions on the sustainability of environment and resource use
- IV. Challenges encountered in promoting such interventions
- V. The links between the adoption of such interventions and the livelihoods of indigenous
- VI. The links of such intervention with the promotion of Climate Smart Agriculture
- VII. Gender Response to interventions promoted

## 7.2. Official Reports (Government and International Institutions)

There is no official report on regenerative agriculture practices in Tanzania. However, regenerative agriculture practices in Tanzania have been documented by international organizations promoting agriculture investment. Few analyzed reports by international organizations on practices in Tanzania are reported by;

### **Africa Regenerative Agriculture Study Group**

The Africa Regenerative Agriculture Study group (AGRA, The Africa Climate Foundation, CIFORoICRAF, Partnerships for Forests, UNECA) presented a report titled, “Regenerative Agriculture; An Opportunity for Business and Society to Restore Degraded Land in Africa” highlights regenerative agricultural practices and Investment opportunities for such practices in different countries.

In Tanzania, the report reflects on the Successful business model operation of regenerative agriculture where AB InBev Company invests in working to grow resilient crops (Barley, Sorghum, and local tuber

(cassava)) and improve crop management practices to improve yields, quality of products and resilience in agricultural systems of 3000 farmers in Tanzania. The business model emphasizes regenerative agriculture by tracking progress towards achieving soil health impacts using global data platforms.

#### **The Institute for Global Prosperity (IGP)**

The report by IGP on “Farmer Led Regenerative Agriculture for Africa” argues for a call to action to place African farmers at the centre of new regenerative agricultural systems. The report hints at regenerative agriculture practices in Tanzania by citing Chololo Eco Village as a case study.

The Chololo Eco Village is a participatory multi-disciplinary project aimed at making the Chololo area more sustainable (environmentally and economically) through an uptake of agroecological production activities. Before the intervention, Chololo village was affected by unpredictable weather patterns, depleting groundwater supply, and deforestation related to the search for farm large and wood energy. Intervention made was centred in a participatory manner linking ecological skills and technologies to agriculture, soil management, livestock grazing, water resource management, and sustainable forestry and energy extraction. The project has managed to impact the community by raising the community’s average household income by 18%, doubling crop yield from 37.5% - to 70% with resilient harvest attained the most during dry seasons, and increasing in community’s land planted with new trees.

#### **The GIZ, HELVETAS and Laudes Foundation**

The organization presents a strategy document titled Financing an Ecosystem Restoration Business Model – Regenerative Production Landscapes in Tanzania. They propose creating a business model for a regenerative production landscape that safeguards natural resources, biodiversity and endangered species while strengthening local populations’ resilience to climate change. The project area covers Manyara and Morogoro regions, semi-arid regions with a high degree of land degradation and deforestation, and aims to achieve a regenerative productive landscape by sensitizing organic cotton farming, conserving wildlife land and protecting biodiversity hotspots.

### **7.3. Case Studies (NGOs, Farmer Groups, Lead Farmers)**

There exists a handful of organizations involved in the implementation of projects related to sustainable agriculture in Tanzania. A few organizations with information made public on their ongoing projects are summarized in Table 3.2. below, showing the organization, project implemented and key objectives to be achieved by the project



**Table 3.2. Case Study of Projects on/Related to Regenerative Agriculture in Tanzania**

S/No	Organization	Project/Program Objectives
	Sustainable Agriculture Tanzania (SAT) <a href="https://www.kilimo.org/what-we-do/our-projects">https://www.kilimo.org/what-we-do/our-projects</a>	<ul style="list-style-type: none"> <li>• Farmer Centered Agroecology Research (FCAR) A platform that produces solutions for small-scale farmers practising agroecological farming methods</li> <li>• Sustainable Farm Management, Agroecology, and Permaculture for Congregations (SAPCS) A project designed to create a “community of practice” in agroecology and permaculture among the congregations and the sisters (nuns) involved in farming activities</li> <li>• Building Resilience Through Agroforestry (SCARF) an innovative initiative with aims to bolster the resilience of rural communities in Tanzania in the face of escalating threats, including extreme weather events, and gradual climatic changes, by leveraging forestry as the key adaptative strategy</li> </ul>
	renature <a href="https://www.renature.co/projects/ambakofi-tanzania/">https://www.renature.co/projects/ambakofi-tanzania/</a>	<ul style="list-style-type: none"> <li>• Ambakofi Project aims to introduce regenerative agroforestry practices to improve biodiversity and restore deforested land in the Chalinze district, Coast Region</li> </ul>
	Partnership in Transformation <a href="https://www.leverist.de/en/app/opportunities/ein-regeneratives-okosystem-fur-die-baumwollproduktion-in-tansania-sucht-partner">https://www.leverist.de/en/app/opportunities/ein-regeneratives-okosystem-fur-die-baumwollproduktion-in-tansania-sucht-partner</a>	<ul style="list-style-type: none"> <li>• A Regenerative Cotton Production Ecosystem A programme that aims to create a regenerative cotton production landscape which safeguards natural resources, biodiversity and endangered species.</li> </ul>
	Floresta Tanzania <a href="https://www.floresta.co.tz">https://www.floresta.co.tz</a>	<ul style="list-style-type: none"> <li>• Promote land and community healing through training in sustainable agricultural practices, including agroforestry, agroecology, organic farming, conservation agriculture, soil health and conservation, biodiversity and ecosystem management</li> </ul>

## 7.4. TVET Practice in Tanzania

### **Technical and Vocational Education Training Practice in Tanzania**

The Tanzania vocational education training is overseen by the Vocational Education and Training Authority (VETA), a state agency established in 1994 by the Vocational Education and Training (VET) Act, 1994 entrusted to control, coordinate, supervise and improve on the provision of quality vocational education and training. VETA runs training programs of short and long-term durations in 13 different sectors of Agriculture and Food Processing, Automotive, Civil and Building Engineering, Clothing, Leather and Textile, Commercial Services and Business Support, Cosmetology, Electrical, Mechanical, Transport, Mining, Printing, Hospitality & Tourism & Performing Art.

However, in 1997, The National Council for Technical Education (NACTE) was established by the National Council for Technical Education Act, 1997 with the task of providing a legal framework for the council to coordinate the provision of technical education and training and establish efficient national qualifications that ensure graduates from technical institutions are of high quality and respond to the changing needs as well as technological innovation in the world. However, in 2021, the technical and vocational setup in Tanzania was reformed following miscellaneous amendments of the NACTE Act, 1997, by integrating NACTE and VETA activities into a single agency called National Council for Technical and Vocational Education and Training (NACTEVET) as passed and mandated by the Tanzania Parliament Act, Cap 129 of 2021. NACTEVET's objective is to coordinate and regulate the provision of technical and vocational education and training.

Technical and vocational education training institutions in Tanzania are managed either by the Government, Private/Partnership entities or NGOs. There has been an increase in non-state-owned TVET institutions offering different programs for prospective technicians to enrol

### **Agriculture Technical and Vocational Training in Tanzania**

Skills employed in agriculture activities are largely traditional and informally acquired, passed from generations through household labour employment practices during farming seasons. Among the reasons for the challenges in attaining productivity growth in the agriculture sector is the skills gap

among individuals involved in agriculture (AGRA46, 2015; Sanginga, 201547; Nade, 201948). Hence the need to further strengthen technical education training in agriculture was deemed necessary, and thus TET and TVET colleges began extending programs that impart skills on different skills in agricultural activities.

By 2023, a total of 21 Agricultural Training institutes were registered and accredited by NACTE to offer certificate and diploma programs in agriculture. Of the registered training institutions, 14 are public colleges (MOA, 202449, NACTEVET 202450). Table 4.1. presents a summary of students enrolled and graduated in different agriculture programs over 3 years from 2018-2020.

**Table 4.1. # of Enrolled And Graduate Students in Agriculture Programs from 2018-2020**

Institution	2017/18			2018/19			2019/20		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
<b>Enrolled</b>									
<b>Public</b>	3,277	1,994	5,221	3,575	2,351	5,926	4,433	3,128	7,561
<b>Private</b>	1,198	928	2,126	1,061	818	1,879	1,212	952	2,164
<b>Total</b>	4,475	2,922	7,347	4,636	3,169	7,805	5,645	4,080	9,725
<b>Graduates</b>									
<b>Public</b>	2,930	1,765	4,695	3,171	2,107	5,278	2,005	1,312	3,317
<b>Private</b>	957	771	1,728	878	697	1,575	420	329	749
<b>Total</b>	3,887	2,536	6,423	4,049	2,804	6,853	2,425	1,641	4,066

Source: URT, 2021<sup>51</sup>)

Public colleges have had a higher number of admissions and enrollment of students taking agriculture-related programs compared to their counterparts. With time, the number of enrollments has been increasing, though the number of those graduating is slightly declining over time. Enrollment based on sex has been dominated by male compared to female students, attributed to the programs being science-based, with countrywide statistics showing a low rate of female students in science-related courses.

### **A-TVET and Program Curriculums extended**

<sup>46</sup> Alliance for a Green Revolution in Africa (AGRA). (2015). *Africa Agriculture Status Report: Youth in Agriculture in Sub-Saharan Africa*. Nairobi, Kenya. Issue No. 3. 229pp

<sup>47</sup> Sanginga, N. Lohento K. and Mayenga, D. (2015). Youth in Agribusiness within an African Agricultural Transformation Agenda. Dakar Senegal. 24pp

<sup>48</sup> Nade, P (2019), *Influence of Agricultural Training on Youth Farm Entrepreneurial Self efficacy: A Study of Folk Development Colleges in Tanzania*; Huria Journal vol. 26(2)

<sup>49</sup> MOA (2024), List Of Agricultural Training Institute, <https://www.kilimo.go.tz/institutes> accessed on 15/02/2024

<sup>50</sup> NACTE (2024), Registered and Accredited Institutions, <https://nactvet.go.tz/registered-institutions> accessed on 15/02/2024

<sup>51</sup> URT (2021), TVET Indicators Report, Ministry of Education, Science and Technology

A review by NACTEVET and MATI indicates almost all colleges offer certificate and diploma programs. According to NACTEVET (2024), accredited programs delivered by training institutes on programs related to agriculture include;

- a. Land use Planning (Ordinary Diploma)
- b. Irrigation (Ordinary Diploma)
- c. Agriculture Production (Basic Technical Certificate and Ordinary Diploma)
- d. Food Production and Nutrition (Ordinary Diploma)
- e. Agro-mechanization (Ordinary Diploma)
- f. Crop Production (Ordinary Diploma)
- g. Horticulture (Ordinary Diploma)

A Skills Mapping report by NACTE indicates of the programs offered by TVET institutions (combining TET, VET and A-TVET), programs under agriculture activities can be classified as follows, with each program presented in Table 4.2 indicating the number of students graduates from 2014-2019;

**Table 4.2. Number Of Student Graduates In Different Programs Between 2014-2019**

Programme	2014/15	2015/16	2016/17	2017/18	2018/19	Total
<b>General Agriculture</b>	3,265	3,440	2,461	2,153	2,203	13,522
<b>Animal Health and Production</b>	2,238	2,448	2,111	2,306	2,566	11,669
<b>Forestry</b>	450	574	705	836	825	3,390
<b>Fisheries Science and Technology</b>	313	251	236	171	193	1,164
<b>Fisheries M'gmnt and Technology</b>	289	219	210	175	154	1,047
<b>Aquaculture Technology</b>	123	150	230	205	250	958
<b>Community Development</b>	-	419	175	81	193	868
<b>Agribusiness</b>	135	190	95	135	160	715
<b>Horticulture</b>	39	45	114	138	171	507
<b>Beekeeping</b>	75	73	56	133	146	483
<b>Agro-Mechanization</b>	84	86	78	46	23	317
<b>Irrigation</b>	43	45	43	29	28	188
<b>Food Production</b>	30	25	25	66	18	164
<b>Range M'gmnt and Tsetse Control</b>	24	55	19	0	14	112
<b>Food Production and Nutrition</b>	34	26	19	0	11	90
<b>Science and Laboratory Technology</b>	0	0	0	0	14	14
<b>Leather Products Technology</b>	0	0	0	0	0	3

Source: URT (2020)

The majority of graduating students enrolled in agriculture programs were linked to direct food and animal production (General agriculture and Animal health and production). The high number is attributed to the need for scholars to add more skills and knowledge on top of what they already possess from their experiences and engagement in farming and livestock-keeping activities.

However, It should be noticed that several programs linked to other ecological resource utilization are offered by TVET institutions, including Forestry and beekeeping, Water management (irrigation and aquaculture) and technologies. It thus indicates attempts by TVET institutions to provide the labour market with skilful individuals with knowledge on issues of sustainable environmental management, ensuring that available resources cannot be extracted or utilized to the extent of causing detrimental effects to the ecology.

We observe the absence of training programs on sustainable agriculture, and regenerative agriculture in particular. While there are a few contents related to principles of regenerative agriculture being shared as part of courses delivered, they do not suffice the full delivery of curriculum on regenerative agriculture practice. Hence a need to fill this huge gap in knowledge of regenerative agriculture is essential to make such knowledge be adopted by young graduating scholars and use them as agents to extend such knowledge to the public.

## 7.5. Legislative and Institutional Policies Supporting Regenerative Agriculture

### **Institutional, Setup on Regenerative Agriculture in Tanzania**

Administratively, there isn't a designated office that coordinates and oversees regenerative agriculture in Tanzania. Likewise, assessing aspects related to sustainable farming, and ecology management, no designated institution or office manages and oversees such practices. The closest existing office there is at the ministerial level is a desk office in the Ministry of Agriculture that coordinates issues related to agroecology and organic farming in Tanzania. Such setup contributes to the slow pace of knowledge dissemination and activity implementation countrywide as information and practice on regenerative agriculture within the confinement of the ministry is only limited to a handful of people managing the desk.

However, some components related to the principles of regenerative agriculture are overseen by the following institutions.

**Table 5.1. Institutions Overseeing Principles on Regenerative Agriculture in Tanzania**

S/No	Institution	Arrangements
1	Ministry of Agriculture	Desk Coordinating aspects of agroecology
2	Ministry of Livestock and Fisheries	Department coordinating aspects of agroforestry
3	Ministry of Natural Resources and Tourism	Department linking forestry with cross-cutting sectors
4	Tanzania Agriculture Research Institute (TARI)	Engage in research associated with sustainable agriculture
5	Ministry of Agriculture Training Institute (MATI)	advance knowledge and awareness of farming practices with few principles linked to sustainable agriculture
6	Sokoine University of Agriculture (SUA)	A State university overseeing agroecology research via the Agroecology Hub in Tanzania (AEHT)

### **Policy and Strategic Framework on Regenerative Agriculture in Tanzania**

A review of national policies, strategies, and institutional setups that address regenerative agriculture in Tanzania was done. It also involved the identification of existing obstacles, gaps, and challenges inhibiting the promotion and spread of regenerative agriculture knowledge in the country.

Apart from the analysis of whether policies and strategies on regenerative agriculture exist, an in-depth desk review of other national policies and strategies concerning regenerative agriculture was done to observe if contents or principles on regenerative agriculture were articulated within the policies and strategies. The review of other national policies and strategies included;

- a. The National Agriculture Policy (2013)
- b. National Environment Policy (2021)
- c. National Livestock Policy (2006)
- d. National Forest Policy (1998)
- e. National Water Policy (2002)
- f. The National Strategy for Growth and Reduction of Poverty
- g. The National Five-Year Development Plan (2022-2026)
- h. The Agriculture Sector Development Plan II (2015 – 2024)
- i. The Livestock Sector Transformation Plan (2023-2027)

The review of existing national policies, strategies, and plans indicates there isn't a single policy, strategy, or plan that explicitly explains or indicates regenerative agriculture practices in the country. Whether by mentioning the concept, or making citation of its key principles, regenerative agriculture

appears to be a new agriculture concept within the framework of national policies and strategies. However, within the reviewed documents, there are existing policy statements that have contents that reflect principles related to regenerative agriculture practices. Such statements indirectly relate to regenerative agriculture as they cover issues related to livelihood practices, ecology management, natural resource preservation, and environmental sustainability.

The review of national policy and strategies, and how related they are to regenerative agriculture is presented in Table 5.2. which indicates the policy reviewed, its main policy objective, and how related it is to regenerative agriculture.

**Table 5.2. Reviewed National Policies and Strategies Related to Regenerative Agriculture in Tanzania**

S/No	National Policy/Strategy	Policy/Strategy Objectives	Association to Regenerative Agriculture
<b>National Policies</b>			
1	The National Agriculture Policy (2013)	Aims to develop a competitive and profitable agricultural industry that improves the Livelihood of Tanzanians and alleviates poverty	The policy does not explicitly mention regenerative agriculture but integrates elements of regenerative agriculture under cross-cutting issues, aiming to promote agricultural practices that sustain the environment, including upscaling activities like conservation agriculture and agro-forestry to enhance carbon storage capacity, and promoting public awareness of sustainable environmental conservation and crop husbandry practices.
2	The National Livestock Policy (2006)	Aims to develop a competitive sector	Advocates for the promotion and use of indigenous knowledge and skills in production. Advocates for organic livestock keeping, promoting organically produced livestock products
3	The National Environment Policy (2021)	Aims to enhance sound management and natural resources	The policy talks about the conservation of natural resources Highlights on management and protection of the ecosystem
4	The National Forest Policy (1998)	Aims to ensure a sustainable supply of forest resources	Highlights the links and coordination with other economic sectors Emphasis on the use of practices that promote the protection of biodiversity Signifies the importance of regulating and protecting water catchment areas
5	The National Water Policy (2002)	Aims to ensure effective management of water	Indicates the importance of having water management systems that

S/No	National Policy/Strategy	Policy/Strategy Objectives	Association to Regenerative Agriculture
		resources for development purposes	protect the environment, ecology and biodiversity Emphasizes participatory design and management of water resources
<b>National Strategies &amp; Plans</b>			
1	National Strategy for Growth & Reduction of Poverty	Aims to reduce poverty through enhanced economic growth	Advocates for environmental management, conservation and efficient resource management to enhance productivity
2	National Five-Year Development Plan (2016-2021) & (2022-2026)	Medium-term plans aimed to complement Tanzania Vision 2025	Targets to increase productivity through efficient and sustainable use of natural resources
3	Agriculture Sector Development Program II (2015 – 2024)	Aims to transform the sector towards attaining higher productivity from agricultural activities	The program highlights aspects of sustainable farming
4	Livestock Sector Transformation Plan (2023 – 2027)	Aims to increase the productivity of the livestock sector	Targets efficient use of land for grazing and quality pasture Plans for proper management of water resources for livestock feeding
5	National Ecological Organic Agriculture (2023-2030)	Aims to promote organics agriculture	Advocates for practices such as conservation agriculture, agroforestry, and agroecology, including techniques like minimum tillage, mixed cropping, and the use of organic fertilizers and mulching



## 8. Regenerative Agriculture in Croatia

### 8.1. Differentiation between regenerative, eco and organic agriculture

The differentiation between regenerative, organic, and eco (ecological) agriculture is essential to understanding their unique principles, practices, and goals within the broader context of sustainable farming. Each of these agricultural approaches contributes to sustainable development, yet they emphasize different aspects of farming and environmental stewardship.

#### Regenerative Agriculture

Regenerative agriculture is a holistic approach to farming that focuses on the restoration and rejuvenation of farm land. Its primary goal is not just to sustain, but to actively improve soil health, water management, biodiversity, and ecosystem services. This approach encompasses a variety of practices designed to rebuild organic soil matter, enhance the water cycle, support biodiversity, and increase resilience to climate change. Regenerative agriculture seeks to transform and regenerate the land, making it more fertile and productive than before, thereby creating ecosystems that can sustain and renew themselves. Practices often include cover cropping, no-till or minimal tillage, diversified crop rotations, and integrated livestock management.

#### Organic Agriculture

Organic agriculture strictly avoids the use of synthetic chemicals, genetically modified organisms (GMOs), and emphasizes soil fertility and biological diversity. The focus is on maintaining ecological balance and conserving biodiversity, using practices that minimize pollution and environmental impact. Organic farming systems rely on crop rotations, organic fertilizers (such as compost), biological pest control, and mechanical cultivation to maintain soil productivity and control pests and diseases. While organic agriculture seeks to sustain the health of ecosystems, its regulations mainly focus on the inputs used in farming rather than on actively improving or regenerating the land.

#### Eco (Ecological) Agriculture

Eco or ecological agriculture is a broad term that encompasses farming practices aimed at preserving environmental health while producing food. Like regenerative agriculture, it focuses on the sustainability and resilience of the agroecosystem but with a broader emphasis on the relationship between farming practices and ecological processes. Ecological agriculture seeks to optimize the health and productivity of interdependent communities of plants, animals, humans, and the environment. It integrates some principles of organic farming, such as the non-use of synthetic chemicals, but also incorporates a wider set of practices aimed at enhancing ecosystem services, such as biodiversity conservation, water resource management, and carbon sequestration.

#### Croatia

The Republic of Croatia achieved a growth in Gross Domestic Product (hereinafter referred to as GDP) in 2022. According to the data from the Croatian Bureau of Statistics (hereinafter referred to as CBS), the GDP was realistically higher by 6.3% compared to the previous year, 2021. Croatia achieved a higher GDP growth rate than most European Union member states. The growth in Gross Value Added (hereinafter referred to as GVA) was recorded in most activities. The share of agriculture in Croatia's GDP in 2022 amounted to about 2.53%. This means that agriculture contributed relatively little to the

overall economic activity in Croatia. In the production of most agricultural products, Croatia typically participates with less than 1% of the European Union's production. Exceptions include soy, for which Croatia's share in EU production is 7.7%, and corn, where Croatia participates with 3.5% in the EU's production.<sup>52</sup>

In the context of Croatia, the distinctions between regenerative, organic, and ecological (eko) agriculture reflect both global principles and local adaptations shaped by the country's unique environmental, cultural, and regulatory landscapes. Croatia's diverse climates, from Mediterranean along the coast to continental in the interior, provide a rich backdrop for various sustainable agricultural practices. The country's entry into the European Union in 2013 has further influenced its agricultural policies and practices, aligning them with EU standards and regulations.

While regenerative, organic, and ecological agriculture each have distinct definitions and practices globally, their application in Croatia reflects a blend of international principles and local adaptations. The increasing interest in sustainable agriculture in Croatia, driven by environmental concerns, market demand, and EU integration, presents an opportunity for further development and adoption of these practices. The success of regenerative agriculture in Croatia will depend on continued support from both the government and the EU, increased awareness and education among farmers and consumers, and the development of infrastructure and markets for sustainable agricultural products.

## 8.2. Laws and regulations

While the term "regenerative agriculture" is not explicitly used in Croatian legislation, the concept falls under several existing laws and regulations aimed at sustainable agricultural practices.<sup>53</sup>

### **Law on Agriculture (Zakon o poljoprivredi)<sup>54</sup>:**

- Defines the objectives and measures of agricultural policy in Croatia.
- Promotes environmentally friendly practices, including:
  - Soil conservation and improvement: Encourages techniques like crop rotation, cover cropping, and reduced tillage to maintain soil health and fertility.
  - Biodiversity preservation: Supports practices that promote biodiversity within agricultural landscapes, such as maintaining habitats for beneficial insects and pollinators.
  - Nutrient management: Promotes responsible use of fertilizers to minimize environmental impact.

### **Law on Agricultural Land (Zakon o poljoprivrednom zemljištu)<sup>55</sup>:**

- Regulates the management and use of agricultural land.
- Encourages practices that prevent land degradation and maintain its long-term productivity.

**Regulation on the implementation of cross-compliance in accordance with Regulation (EU) No. 1305/2013 of the European Parliament and of the Council on support for rural development from the European Agricultural Fund for Rural Development (Pravilnik o provedbi obveze usklađenosti**

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<sup>52</sup> <https://poljoprivreda.gov.hr/poljoprivreda-u-brojkama-97/97>

<sup>53</sup> [https://mingor.gov.hr/UserDocsImages/NASLOVNE%20FOTOGRAFIJE%20I%20KORI%C5%A0TENI%20LOGOTIP%20OVI/doc/information\\_on\\_lulucf\\_actions\\_in\\_accordance\\_with\\_article\\_10\\_of\\_decision\\_5292013eu.pdf](https://mingor.gov.hr/UserDocsImages/NASLOVNE%20FOTOGRAFIJE%20I%20KORI%C5%A0TENI%20LOGOTIP%20OVI/doc/information_on_lulucf_actions_in_accordance_with_article_10_of_decision_5292013eu.pdf)

<sup>54</sup> <https://www.zakon.hr/z/232/Zakon-o-poljoprivredi>

<sup>55</sup> <https://www.zakon.hr/z/133/Zakon-o-poljoprivrednom-zemlji%C5%A1tu>

**sukladno Uredbi (EU) br. 1305/2013 Europskog parlamenta i Vijeća o podršci ruralnom razvoju iz Europskog poljoprivrednog fonda za ruralni razvoj)<sup>56</sup>:**

Implements EU regulations promoting good agricultural and environmental practices (GAEC) within the framework of rural development support. These practices overlap with principles of regenerative agriculture, such as maintaining permanent grassland, protecting soil from erosion, and preserving habitats.

**Organic Farming Regulation (Pravilnik o ekološkoj poljoprivredi)<sup>57</sup>:**

Though not directly related to regenerative agriculture, it provides a framework for organic production methods, which share many similarities with regenerative practices.

**The Law on Soil Protection (Official Gazette 71/18)<sup>58</sup>:**

Aims to protect and improve the quality of Croatian soils and promote the sustainable use of land. It defines soil conservation measures and introduces the concept of "soil health," which includes various indicators such as organic matter content, nutrient balance, soil structure, and biodiversity.

**The Rural Development Programme 2023-2027 (Official Gazette 78/23)<sup>59</sup>:**

Includes a dedicated chapter on "Eco-schemes" that incentivize farmers to adopt regenerative agricultural practices, such as cover cropping, crop rotation with legumes, and integrated pest management. The program also supports the preservation and restoration of biodiversity and landscape features.

**Agriculture Strategy until 2030 (Official Gazette 26/2022)<sup>60</sup>:**

According to information from the "Agriculture Strategy until 2030"(Official Gazette 26/2022), the term "regenerative agriculture" is not explicitly mentioned. However, some elements of regenerative agriculture are implicitly present within various implementation mechanisms of the strategy. For example:

- Promoting organic agriculture includes practices in line with regenerative agriculture, such as replacing conventional means with biological alternatives, using local genetic resources, diversification techniques, improved crop rotation, regenerative management of meadows and pastures, and the conservation and restoration of habitats and ecosystems.
- Sustainable management of natural resources also has certain aspects of regenerative agriculture, such as supporting environmentally and climate-friendly practices, reducing the use of mineral fertilizers and pesticides, and improving health and animal welfare.

Although the term "regenerative agriculture" is not explicitly stated, the strategy encompasses several key principles that are aligned with the idea of regenerative agriculture, focusing on sustainable practices, ecological production, and the protection of natural resources.

**National Action Plan for the Development of Organic Agriculture 2023-2030<sup>61</sup>:**

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<sup>56</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32013R1305>

<sup>57</sup> [https://narodne-novine.nn.hr/clanci/sluzbeni/2016\\_03\\_19\\_571.html](https://narodne-novine.nn.hr/clanci/sluzbeni/2016_03_19_571.html)

<sup>58</sup> [https://narodne-novine.nn.hr/clanci/sluzbeni/2013\\_06\\_80\\_1659.html](https://narodne-novine.nn.hr/clanci/sluzbeni/2013_06_80_1659.html)

<sup>59</sup> <https://nrm.hr/zpp-2023-2027/>

<sup>60</sup> [https://narodne-novine.nn.hr/clanci/sluzbeni/2022\\_03\\_26\\_325.html](https://narodne-novine.nn.hr/clanci/sluzbeni/2022_03_26_325.html)

<sup>61</sup> [https://poljoprivreda.gov.hr/UserDocsImages/dokumenti/pristup\\_info/zakoni\\_propisi/zakoni\\_poljoprivreda/ekoloska/NAP%202023-2030\\_compressed.pdf](https://poljoprivreda.gov.hr/UserDocsImages/dokumenti/pristup_info/zakoni_propisi/zakoni_poljoprivreda/ekoloska/NAP%202023-2030_compressed.pdf)

Does not explicitly mention the term "regenerative agriculture." However, it focuses extensively on the development of organic agriculture in Croatia, emphasizing sustainable practices and environmental protection. The plan outlines strategies for increasing organic production, enhancing the value chain, and supporting activities in research and development. It also aims to contribute to reducing greenhouse gas emissions, preserving biodiversity, soil, water, and air from agricultural pollution. This approach aligns with several principles of regenerative agriculture, focusing on ecological sustainability and the protection of natural resources.

### 8.3. Governmental Frameworks

**The Ministry of Agriculture** is the central government body responsible for agricultural policy and the implementation of relevant legislation. The Ministry's Department of Sustainable Agriculture and Forestry plays a key role in promoting regenerative agriculture in Croatia.

**The Croatian Chamber of Agriculture** is a non-government organization that represents the interests of Croatian farmers. The HPK has been actively engaged in advocating for the adoption of regenerative agricultural practices and encouraging farmers to participate in the eco-schemes of the Rural Development Programme.

**The Agency for Agriculture Land** is responsible for managing and maintaining agricultural land owned by the state. The AA has been working on developing guidelines and recommendations for regenerative agriculture practices on state-owned land.

#### ***Support for Regenerative Agriculture***

The Croatian government provides various forms of support for farmers who adopt regenerative agricultural practices, including:

- Financial incentives through the eco-schemes of the Rural Development Programme<sup>62</sup>.
- Technical and advisory services provided by the Ministry of Agriculture and the Croatian Chamber of Agriculture<sup>63</sup>.
- Training and education opportunities organized by various organizations, including the Ministry of Agriculture, the Croatian Chamber of Agriculture, and agricultural research institutions.

The adoption of regenerative agriculture in Croatia faces several challenges, including:

- Lack of knowledge and awareness among farmers about the benefits and practices of regenerative agriculture.
- Lack of financial incentives that are specifically targeted at regenerative agriculture practices.
- The perception that regenerative agriculture is more labor-intensive and less profitable than conventional agriculture.

Despite these challenges, there is a growing interest in regenerative agriculture in Croatia, and the government is committed to supporting its adoption. The Croatian Chamber of Agriculture has been actively promoting regenerative agriculture through conferences, workshops, and training programs. The Ministry of Agriculture is also exploring ways to further promote regenerative agriculture practices, such as developing comprehensive guidelines and providing additional financial incentives. Overall, regenerative agriculture has the potential to play a significant role in the future of Croatian agriculture, contributing to improved soil health, increased biodiversity, and enhanced resilience to climate change. The government's support for regenerative agriculture and the growing interest among farmers

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<sup>62</sup> <https://nrm.hr/zpp-2023-2027/>

<sup>63</sup> <https://komora.hr/>

suggest that Croatia is well-positioned to transition towards a more sustainable and environmentally friendly agricultural system.

## 8.4. Implementation in Agricultural Centers and Farms

In examining the adoption and challenges associated with regenerative agriculture within Croatia, this analysis draws upon qualitative data obtained from focused interviews with members of the "Živa zemlja" association, including individual farmers Višnja Soldatović, Blanka Sremac, Ruža Bašić, and Mirjana Latinović, as well as insights from the ZMAG (Green Network of Activist Groups) initiatives. These narratives provide a foundational understanding of the practical application, perceived benefits, and encountered obstacles of regenerative agricultural practices at a grassroots level in the Croatian context.

### ***Practical Application and Perceived Benefits***

The testimonies from the "Živa zemlja" members and ZMAG highlight a rich tradition of sustainable agricultural practices, albeit under various terminologies, predating the formal introduction of

regenerative agriculture concepts. The practitioners' commitment to soil restoration, biodiversity enhancement, and sustainable food production systems is evident in their adoption of crop rotation, mulching, polyculture, and other agroecological practices. These methods have not only resulted in improved soil health and increased biodiversity on their farms but have also illustrated the potential for regenerative agriculture to contribute to environmental sustainability and food security.

Economically, the shift towards regenerative practices is perceived as a strategic investment in the long-term viability of agricultural operations. The interviewees note a growing market demand for sustainably produced products, which allows for premium pricing and a sustainable income, albeit recognizing that significant financial gains are not immediate but accrue over time due to enhanced ecosystem services and product quality.

### ***Challenges and Barriers***

The transition from conventional to regenerative agricultural practices is fraught with challenges, as highlighted by the interviewees. These include a lack of formal institutional support, financial and bureaucratic hurdles associated with certification, and the costs of transitioning. Furthermore, a cultural and educational gap exists, with resistance or skepticism towards new methods from the broader agricultural community, underscoring the need for increased awareness and education on the benefits and practicalities of regenerative practices.

### ***Government Support and Policy Implications***

While there has been an acknowledgment of improved support for sustainable practices, partly influenced by Croatia's EU membership, interviewees advocate for more systematic, accessible, and supportive policies specifically tailored to regenerative agriculture. This necessitates a policy framework that not only encourages the adoption of regenerative practices but also provides financial incentives, technical support, and educational resources to facilitate this transition.

### ***Technological Integration and Future Directions***

The potential for technology to enhance the efficiency and sustainability of regenerative practices is recognized yet underexplored. Innovations in machinery, drones, and other agricultural technologies

could support more precise, less invasive farming techniques, contributing to the broader objectives of regenerative agriculture.

**Conclusion**

The adoption of regenerative agriculture in Croatia, as evidenced by grassroots initiatives and individual practitioners, demonstrates a promising yet challenging path towards sustainable agricultural practices. The experiences of the "Živa zemlja" association and ZMAG offer valuable case studies for understanding the potential impacts, benefits, and obstacles of implementing regenerative agriculture. For the widespread adoption and successful implementation of these practices, a concerted effort involving enhanced educational initiatives, supportive government policies, and the integration of technology is crucial. Such efforts will not only address the immediate challenges faced by practitioners but also pave the way for a more sustainable, resilient, and productive agricultural system in Croatia and beyond.





## 8.5. Online Survey for General Public

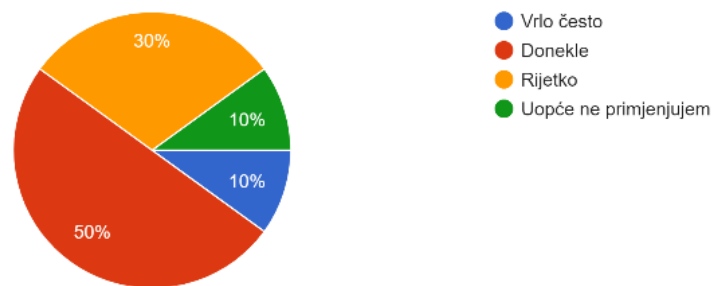
In this chapter of our research, we conducted an online survey to assess the general public's awareness, perceptions, and understanding of regenerative agriculture. This survey was crafted using Google Forms, ensuring accessibility and broad participation. Our questions aimed to capture a range of responses, from basic awareness to in-depth understanding of regenerative agriculture principles and practices. We distributed the survey through various channels, including social media, community forums, and other relevant online platforms, targeting a diverse audience to secure a representative sample. This approach facilitated the collection of responses from a wide demographic, encompassing different ages, backgrounds, and regions. Upon gathering the data, we embarked on a thorough analysis of the responses. This analysis enabled us to identify current levels of awareness and interest in regenerative agriculture, alongside factors influencing public perception and engagement.

In the survey, a total of 32 participants took part, although a smaller number of participants responded to individual questions than the total number. The questions in the survey are generally related to the identification and understanding of the adoption of regenerative agriculture principles among the target group. The questions posed to participants, along with basic information about the age of the respondents, suggestions, and feedback, are listed below:

- Have you heard of regenerative policy before?
- How familiar were you with the concept of regenerative agriculture?
- How interested are you in learning about sustainable agricultural practices, including regenerative agriculture?
- How important do you think sustainable agricultural practices are for the future of agriculture?
- Where do you usually get information about agricultural practices?
- How often do you apply sustainable agricultural practices on your farms? What practices are these?
- What obstacles have you encountered when implementing sustainable agricultural practices?
- How willing are you to change your current agricultural practices to more sustainable ones?
- What benefits of sustainable agriculture do you know?
- How interested would you be in formal training or education about sustainable agricultural practices?
- Are you part of any community or network focusing on sustainable or regenerative agriculture? (Cooperative, European Network for Rural Development (ENRD), National Rural Networks (NRN), etc.)
- How economically sustainable is regenerative agriculture for young farmers?
- How many market opportunities exist for products obtained from sustainable or regenerative practices in your area?
- Is there sufficient government support for sustainable agriculture in your country?
- What is the biggest challenge in adopting sustainable agricultural practices?

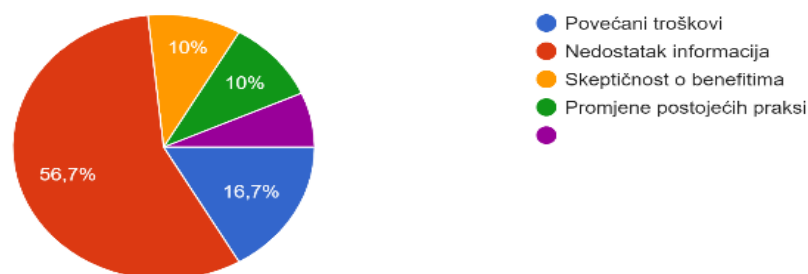
- What role does technology play in enabling sustainable or regenerative agriculture?
- How significant do you think the impact of sustainable agriculture is on addressing environmental challenges?
- How willing are you to incorporate more sustainable or regenerative practices into your agricultural business in the future?

The age group of respondents ranges from 20 to 40+ years. Regarding their prior knowledge of regenerative agriculture, of the 32 respondents who answered this question, 13 respondents (40.6%) are familiar with the concept of regenerative agriculture, 6 respondents (18.8%) are somewhat familiar with the concept, and 13 respondents (40.6%) are not very familiar or not familiar at all with the concept. Similarly, when talking about the knowledge of the concept of regenerative agriculture, we got similar results. When it comes to the interest of respondents in learning about sustainable agricultural practices, including regenerative agriculture, of the 32 respondents, 21 of them, or (68.7%), are very interested or somewhat interested. 6 respondents (18.8%) are neutral regarding their interest, and 6 respondents (18.8%) are not very interested or not interested at all. On the other hand, the majority of the 32 respondents who provided an answer, 31 of them (96.9%) consider sustainable agricultural practices to be important or somewhat important for the future of agriculture. Of the 30 respondents who offered an answer to the question of how often they apply sustainable agricultural practices on their farm, 15 respondents (50%) use them to some extent, 9 respondents (30%) use them rarely, 3 respondents (10%) do not use them at all, and the same percentage applies to those who very often use them.



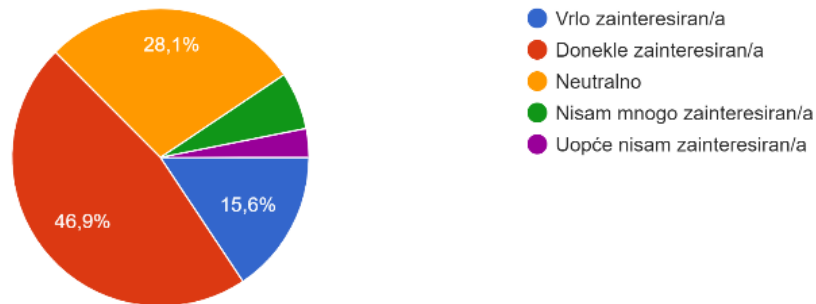
Twenty-eight respondents offered answers about the practices they use on their farms, thus 12 of them (42.9%) use crop rotation, 5 (17.9%) use reduced tillage, and the same percentage uses cover cropping. Others use renewable energy sources (7.1%), grazing management (3.6%), and other practices (10.7%).

When implementing sustainable agricultural practices, out of 30 respondents, 17 of them (56.7%) encountered barriers due to a lack of information, 5 respondents (16.7%) encountered the barrier of increased costs, 3 respondents (10%) encountered the barrier of changing existing practices, and the same percentage encountered skepticism about the benefits.

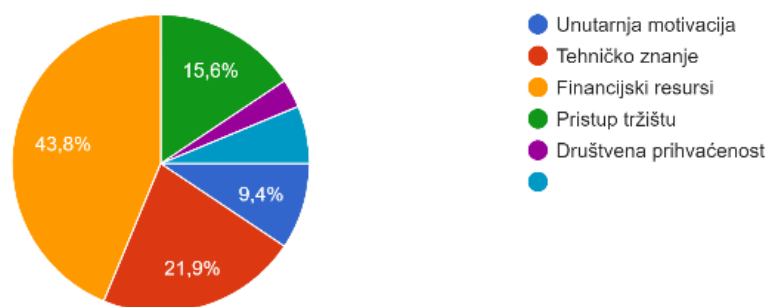




Respondents showed relatively good knowledge in the area of the benefits of sustainable agriculture. Eighteen of them (56.3%) cited improved soil health as a benefit, and the same percentage mentioned increased crop yields. Sixteen respondents (50%) mentioned greater biodiversity, 11 respondents (34.4%) mentioned increased water retention, and 9 (28.1%) mentioned the mitigation of climate change. Respondents reacted quite positively to the question of formal training and education on sustainable agricultural practices. Twenty of them (62.5%) are very interested or somewhat interested, while 9 (28.1%) are neutral. Three respondents or 9.4% are not at all interested in the question of training and education.



Regarding sustainability, 19 respondents (59.4%) consider regenerative agriculture for the young to be somewhat sustainable or very sustainable. As for government support, respondents varied widely in their answers to this question. Thus, 5 respondents or 15.6% stated that support exists and is somewhat significant, while 1 respondent, accounting for 9.1%, stated there is very significant support from the government. Nine respondents or 28.1% are neutral, while the rest are mostly dissatisfied with government support. As the biggest challenge in adopting sustainable agricultural practices, respondents cited: Financial resources (43.8%), technical knowledge (21.9%), market access (15.6%), internal motivation (9.4%), social acceptance (3.1%), and other (6.3%).



Regarding the role of technology in enabling sustainable and regenerative agriculture, out of 32 respondents, 13 (40.6%) believe it plays a supporting role, 11 (34.4%) assert that it plays a key role, while 7 (21.9%) see technology as having a limiting role, and 1 (3.1%) believes it has no role. A similar result can be seen regarding the impact of sustainable agriculture on addressing environmental challenges.

When talking about the future and the incorporation of more sustainable or regenerative practices into the agricultural business of respondents, 21 respondents (65.1%) are very willing or moderately willing to do the aforementioned, 9 (28.1%) are neutral, and two (6.3%) are moderately unwilling.

As suggestions for feedback on how to promote sustainable agriculture among young farmers, respondents listed promotion through:

- Media and the internet
- Meetings and education
- State assistance for the purchase of machinery and maintenance grants for payments
- Stimulation through economic instruments

The survey reveals several key conclusions about the perception of regenerative agriculture among young farmers. Most respondents were not previously familiar with the concept of regenerative agriculture, but there is a significant interest in learning about sustainable agricultural practices, including regenerative agriculture, since almost all respondents consider sustainable agricultural practices important or somewhat important for the future of agriculture. For this reason, they have shown a willingness to incorporate more sustainable or regenerative practices into their agricultural business in the future.

Despite significant interest, many respondents rarely or never apply sustainable agricultural practices on their farms. Financial resources, a lack of information, and changing existing practices represent the main barriers. Therefore, it is very important to conduct formal training or education on sustainable agricultural practices.

Financial resources, technical knowledge, and market access have been identified as the main challenges in adopting sustainable agricultural practices. Although most respondents see a positive role of technology in supporting sustainable agriculture, some also express concerns about technological limitations. Government support plays a significant role here, with which most respondents are not completely satisfied.

These conclusions indicate the need for further efforts in promoting and supporting sustainable agricultural practices among young farmers, with an emphasis on education, access to resources, and government support.

## 8.6. Conclusion

The comprehensive analysis of regenerative agriculture in Croatia highlights a sector on the cusp of significant transformation. The findings illuminate a burgeoning interest among Croatian farmers and agricultural professionals in sustainable farming techniques that promise to enhance soil health, biodiversity, and ecosystem resilience. However, the research also uncovers systemic barriers, including limited access to resources, knowledge gaps, and policy constraints that hinder widespread adoption.

A notable emphasis is placed on the need for collaborative efforts between the government, educational institutions, and the private sector to foster a supportive environment for regenerative practices. The potential benefits of such a transition are profound, encompassing not only environmental restoration but also economic vitality and community well-being.

As Croatia stands at this pivotal juncture, the research suggests a strategic embrace of regenerative agriculture could position the country as a leader in sustainable farming within the European Union. The conclusion calls for a multi-faceted approach that integrates policy reform, educational outreach, and investment in research and development to overcome current obstacles and fully realize the promise of regenerative agriculture in Croatia.

## 9. Final remarks

This in-depth research underscores a significant global movement towards regenerative agriculture as a cornerstone for sustainable growth in the agricultural domain. This comprehensive research conducted across various regions highlights a growing global shift towards regenerative agriculture as a key element for achieving sustainable agricultural development. This shift marks both a resurgence of traditional farming practices and the embrace of cutting-edge methods aimed at revitalizing ecosystems, enhancing soil health, and promoting biodiversity. The exploration of regenerative agriculture practices in countries like Ghana, Kenya, Germany, Tanzania, Estonia, and Croatia has unveiled a rich tapestry of approaches, each tailored to the distinct challenges and opportunities within these regions.

Tanzania's engagement with regenerative practices, particularly through literature reviews and case studies, emphasizes the value of grounding these methods in robust scientific research and indigenous knowledge. This approach underscores the potential for regenerative agriculture to be a catalyst for sustainable development, tailored to the specific ecological and social contexts of the region.

In Estonia, the alignment of regenerative agriculture with legislative frameworks showcases the pivotal role of policy in advancing environmental stewardship and agricultural innovation. Estonia's initiatives exemplify how government support can amplify the impact of regenerative practices, fostering a landscape where agriculture contributes positively to the environment.

Croatia offers a nuanced perspective on regenerative agriculture, distinguishing it from eco and organic farming. This differentiation aids in the broader understanding and adoption of regenerative practices, highlighting the importance of clear definitions and standards in promoting sustainable agriculture.

Germany's integration of regenerative principles within its well-established organic farming sector provides a model for how advanced economies can lead in environmental conservation and agricultural innovation. Germany's example demonstrates the compatibility of economic viability with sustainable farming practices, setting a benchmark for others to follow.

Kenya's focus on empowering young farmers through education and market access initiatives highlights the vital role of the youth in agriculture's future. By fostering an environment that supports innovation and sustainable practices, Kenya is investing in the next generation of farmers who will carry forward the principles of regenerative agriculture.

Ghana presents a model of community engagement and legislative support as foundations for a holistic approach to regenerative agriculture. By prioritizing policy frameworks that encourage sustainable practices, Ghana is paving the way for a future where agriculture not only feeds populations but also heals the planet.

Research findings contribute to a global agenda and narrative that champions regenerative agriculture as a multifaceted solution to the pressing challenges of our time. By embracing these practices, the agricultural sector can address issues of climate change, soil erosion, and biodiversity loss and enhance food security, economic stability, and social equity across communities. To advance regenerative agriculture effectively, it is crucial to strengthen policy frameworks that support regenerative practices and recognize their benefits, develop and disseminate educational resources and training programs tailored to different regions and farming contexts, enhance market access for products grown using regenerative practices, and thereby creating economic incentives for farmers.

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