Transformation Plan

Regenerative Agriculture

Introducing a strategic framework for prioritizing countries to expand and scale-up the implementation of Regenerative Agriculture practices

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In an era marked by significant environmental challenges, agriculture has a significant contribution to make in terms climate change mitigation and environment restoration. This paper brings to the fore our point of view on how that contribution can materialize sooner. In particular, we’re looking how Regenerative Ag should realize its potential to enhance soil health, biodiversity, and water use efficiency.

NTT DATA’s approach emphasizes collaboration and innovation. We want to support both farmers and Food Value Chain companies in making the transition to regenerative practices by facilitating knowledge exchange, fostering partnerships, and offering technological tools. Our objective is to ensure that stakeholders have the necessary resources and knowledge to succeed.

This, however, is just the beginning. Identifying where the transition can happen fastest is only the first step. Running a farm is a highly variable and volatile business, and having a favorable environment is just one part of the equation. The real challenge lies in creating farm-specific solutions that not only unlock agriculture’s potential to tackle global challenges but also scale up regenerative agriculture. It’s a journey we are committed to undertaking.

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for NTT Data INC GLOBAL

Introduction

In recent times, the global community has experienced an era marked by environmental challenges and a heightened awareness of sustainability issues. In the middle of this evolving landscape, a significant paradigm shift has occurred, with an increasing number of businesses and organizations recognizing the urgent need to adopt more sustainable practices. This shift has been particularly noticeable in the field of agriculture, a sector exposed to the effects of climate change.

The "Regenerative Agriculture transformation plan" by NTT DATA (2024) intends to contribute by bringing clarity and optimization in the answer to these challenges. This plan stands at the forefront of a movement that aims to transform agriculture by maximizing the ecosystem services agriculture already offers, while minimizing negative externalities. It focuses on the concept of Regenerative Agriculture (RegenAg), a set of practices aimed at restoring and enhancing ecological systems, improving biodiversity, and mitigating climate change impacts while also ensuring food security and sustainable livelihoods.[53]

The document outlines a strategic approach, encompassing a range of stakeholders, including platforms, input companies, and Value Chain (VC) players. It explores how various groups can work together and innovate to promote and scale sustainable farming methods. By benchmarking the efforts of VC platforms that provide guidance and collaborative frameworks, input companies that offer essential tools and services, and VC players who play a pivotal role in the agricultural value chain, the report highlights a holistic and integrated approach to sustainability in agriculture.

This study aims to provide a clear and detailed overview of the current state of RegenAg practices, the innovative strategies employed by various stakeholders, and the potential pathways for scaling these practices globally by providing a global comprehensive framework that will guide stakeholders in understanding the complexities and opportunities of transitioning to regenerative agriculture, thereby contributing to a more sustainable and resilient future.

Key findings

Strategic country prioritization

The analysis has showed that USA, Brazil, Mexico, France and South Africa, Nigeria, and Tanzania within the African region, offer the best opportunities to accelerate RegenAg adoption.

Global awareness gap

Many regions worldwide face low consumer awareness of Regenerative Agriculture, calling for comprehensive education campaigns for increased awareness and appreciation.

Financial support as catalyst

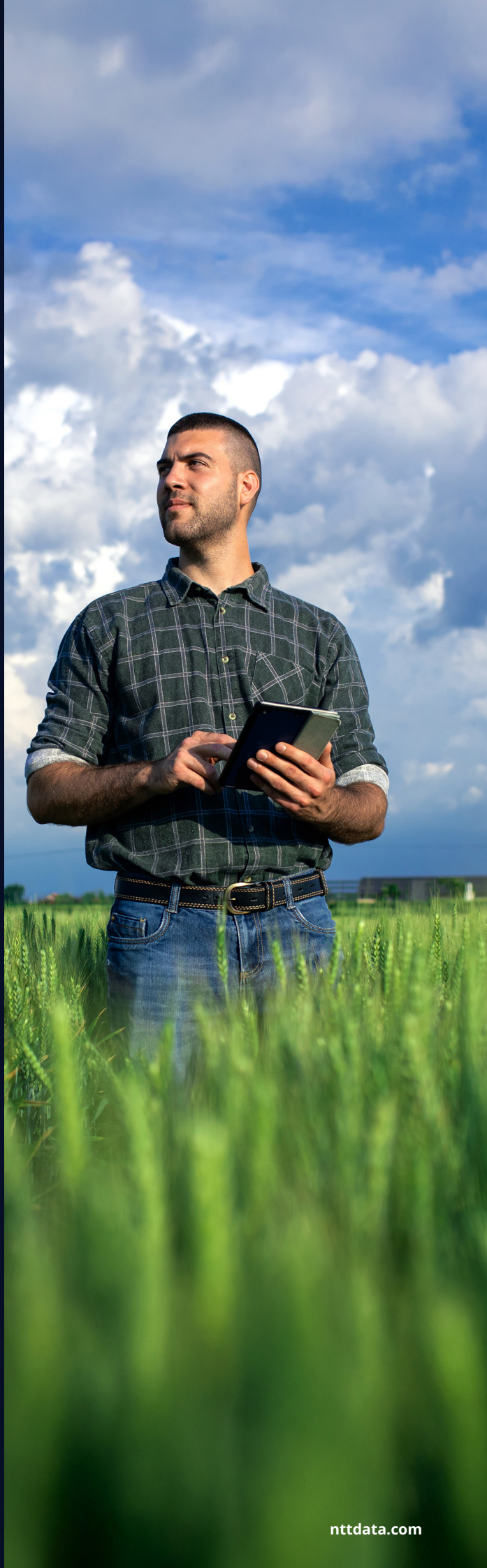
Unlocking targeted financial support emerges as a crucial catalyst for farmers to adopt innovative practices, mitigate financial constraints, and ensure the resilience of the agricultural sector.

Education for sustainable practices

Education and training are consistently emphasized across diverse regions. Prioritizing comprehensive programs is seen as essential for equipping farmers with skills crucial for sustainable and productive farming practices.

Innovation for climate resilience

A strong emphasis is placed on nurturing agriculture through research and development investments in cutting-edge technologies. These include carbon capture, anaerobic digesters, and precision technology.



Starting point: a benchmark study

The objective of conducting the benchmark study was to identify common variables across selected organizations and companies in the VC platforms, Input companies, and VC players related to RegenAg. This exercise aimed to classify crucial variables for developing a scalable framework for the successful implementation of RegenAg.

In the first section of the study, we carried out a benchmark across different categories of organizations or companies that form the external context of RegenAg, including SAI (Sustainable Agriculture Initiative Platform), SMI (Sustainable Markets Initiative), OP2B (One Planet Business for Biodiversity) and REGEN10 as VC platforms, Bayer, Yara and Syngenta as Input companies, and McCain, Nestlé, Danone and PepsiCo as VC players.

To conduct this external context analysis, a set of variables were identified across three different categories: principles, practices, and outcomes. The objective was to determine the presence and significance of these variables in each of the organizations and companies selected, allowing us to identify the most important variables to develop a general and scalable framework on how to successfully implement RegenAg.

While each VC platform maintains a distinct emphasis - SMI on farmer finances[50], OP2B on broader elements like biodiversity and social factors[30], SAI on a global framework[40], and REGEN10 on principles and outcomes[36] - the overarching goal remains promoting sustainable agriculture.

Inputs companies adhere to fundamental principles to attain specific outcomes. They utilize frameworks endorsed by VC platforms to devise and implement their unique regenerative agricultural strategies. These strategies center around their own products and implementation of practices, such as Bayer's emphasis on cover crops, Yara's digital tools and biostimulants, and Syngenta's utilization of precision agriculture tools.

VC players implement unique operational framework customized to their individual strategy. Although these frameworks align with impacted areas, principles and outcomes, they are designed and specialized for farmers within their specific sectors. Adapting or expanding these frameworks for other players in a different value chain step could present challenges.

The study highlights how different entities contribute to RegenAg. Platforms offer overarching frameworks and principles, input companies focus on specific products and technologies, and VC players develop specialized operational models.

Strategy: a global comprehensive framework

The study provides a detailed framework that systematically examines key elements of RegenAg, including impacted areas, principles, practices, and outcomes. This comprehensive insight ensures alignment with broader sustainability initiatives and evaluates existing frameworks and industry players in the context of RegenAg.

- The NTT DATA RegenAg framework is built upon four interconnected key variables: principles, practices, outcomes (both short-term and long-term), indicators and metrics.
- These variables respond to impacted areas like climate, soil health, biodiversity, and water, emphasizing the comprehensive nature of the approach.
- The framework places a strong emphasis on environmental principles prioritizing soil health, biodiversity protection, and water use efficiency. These core principles are critical to the success of RegenAg practices.
- The study establishes clear indicators and metrics for measuring outcomes such as reduced greenhouse gas emissions and improved soil health. These tangible benchmarks are essential for evaluating the impact of regenerative practices.
- Farmers are at the center of the framework, highlighting their crucial role in choosing principles, implementing practices, and measuring outcomes. The framework acknowledges the importance of supporting farmers through capabilities (training or education), financial incentives, and access to necessary inputs.

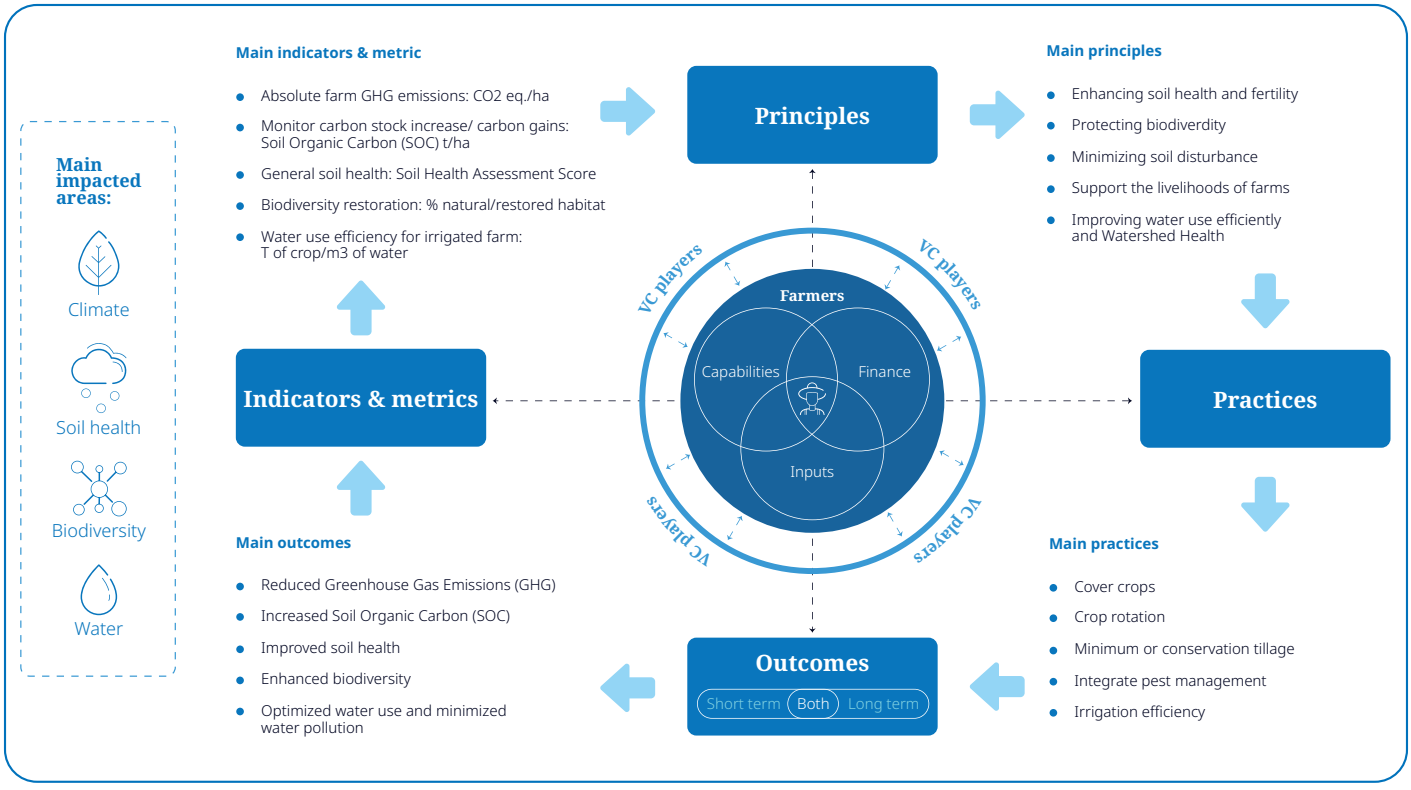


Figure 1. NTT DATA RegenAg framework.

Escalation: country specific analysis and prioritization

What is needed to scale up RegenAg? The journey toward widespread adoption involves fundamental shifts in farming practices, triggered by investments and supported by essential inputs. Recognition and reward from the VC players are critical elements in this transformative process. However, it is crucial to note that these advancements may not occur in countries lacking the necessary potential.

The process of prioritizing countries for Regenerative Agriculture adoption involves assessing two primary variables: potential and readiness.

Potential is evaluated based on the difference between a country's total agricultural area[11] and its area under Conservation Agriculture (CA)[16]. This measure helps identify countries with untapped opportunities for RegenAg adoption. Countries like India, China, Russia, USA, Ukraine, and Pakistan emerge as having the highest potential due to their extensive areas of underutilized cropland.

Readiness, on the other hand, focuses on how prepared a country is in terms of integrating regenerative methods and the extent to which it can expand these practices. The readiness assessment encompasses a comprehensive analysis of capabilities, such as the farmer's capabilities to understand the agricultural productivity, financial aspects including the average farm size for financial access, input availability based on total input tonnage, and the engagement level of VC players in RegenAg activities.

- When evaluating capabilities, farmer education plays a crucial role in enhancing agricultural productivity and promoting sustainable development in rural communities. By equipping farmers with knowledge and skills, they can make informed decisions, adopt innovative practices, and effectively manage their agricultural activities resulting in improving productivity. To measure farmer productivity, reflecting farmers' skill levels, we relied on the Yield Gap measurement[16]. The Yield Gap refers to the difference between the actual agricultural yield and the potential yield that could be achieved under optimal farming conditions. The narrower the Yield Gap, the higher the farm productivity, signaling an important access to agricultural education and training. The results shows that richer nations, such as those in Europe and North America, have the resources to provide more education and training to their population. Conversely, less economically and technologically developed countries like African Countries or India have a high yield gap, indicating lower productivity, which can be attributed to a lack of education, training and access to adequate tools.
- In the financial aspect, larger farms are perceived to have better access to finance[04]. The analysis incorporates factors such as crop area by farm size, crop production, and food production, leading to the identification of countries like the U.K., Slovakia, USA, France, Uruguay, and Luxembourg as having superior access to agricultural finance[11].
- Input availability is directly linked to a country's crop production levels[47]. Nations with higher production have greater access to necessary agricultural inputs. This correlation places countries like China, India, Brazil, the U.S., Indonesia, and Russia in the forefront for input accessibility.
- The involvement of VC players is crucial in determining a country's level of adoption of RegenAg. A comprehensive analysis on VC players has been conducted, emphasizing the importance of understanding their sourcing practices and initiatives. The results show that countries such as USA, Brazil, the U.K., Mexico, India, and France are notable for their significant engagement in Regenerative Agriculture.

These results will be combined to determine how the combination of potential and readiness synergistically yields the best opportunities for RegenAg implementation.

Methodology

To prioritize countries, we assessed 133 nations globally by analyzing two key variables: potential, measured as the absolute difference between total agricultural area and regenerative agriculture area, and readiness, which includes capabilities, finance, inputs, and VC player engagement. Countries are ranked on a scale from 1 to 10 for both potential and readiness. The readiness score is determined through a weighted average considering financial access, input availability, capabilities, and VC engagement (based on data from 100 initiatives by 11 VC players). Further details on the analysis breakdown by variable and category are provided below.

Figure 2.
Top countries with highest potential.

Figure 3.
Top countries with highest capabilities.

Figure 4.
Top countries for access to finance.

Figure 5.
Top countries for access to input.

Figure 6.
Top countries for VC players.

Strategic approach: prioritizing global and African adoption of RegenAg

The applied methodology relies on a prioritization matrix classifying countries according to two axes. The vertical axis representing the potential and the horizontal the readiness of each country. Four levels within this matrix have been identified: 'Top priorities' for countries with extensive croplands and readiness of their farmers, 'Investments' for those with high potential but low readiness, 'Complements' for countries ready but with less cropland, and 'Light Touch' for countries with lower potential and readiness yet still important for RegenAg efforts.

Figure 7. Global countries prioritization.

The analysis has been performed twice using the same matrix. The first, and more general, has been carried out on a global basis, considering the results of all countries, and positioning those with a high level of adoption of regenerative agriculture. The second has been made to give a specific focus on the African continent. This allows for a more targeted adaptation of strategies and recommendations, taking into account the unique challenges that African nations may face compared to other regions.

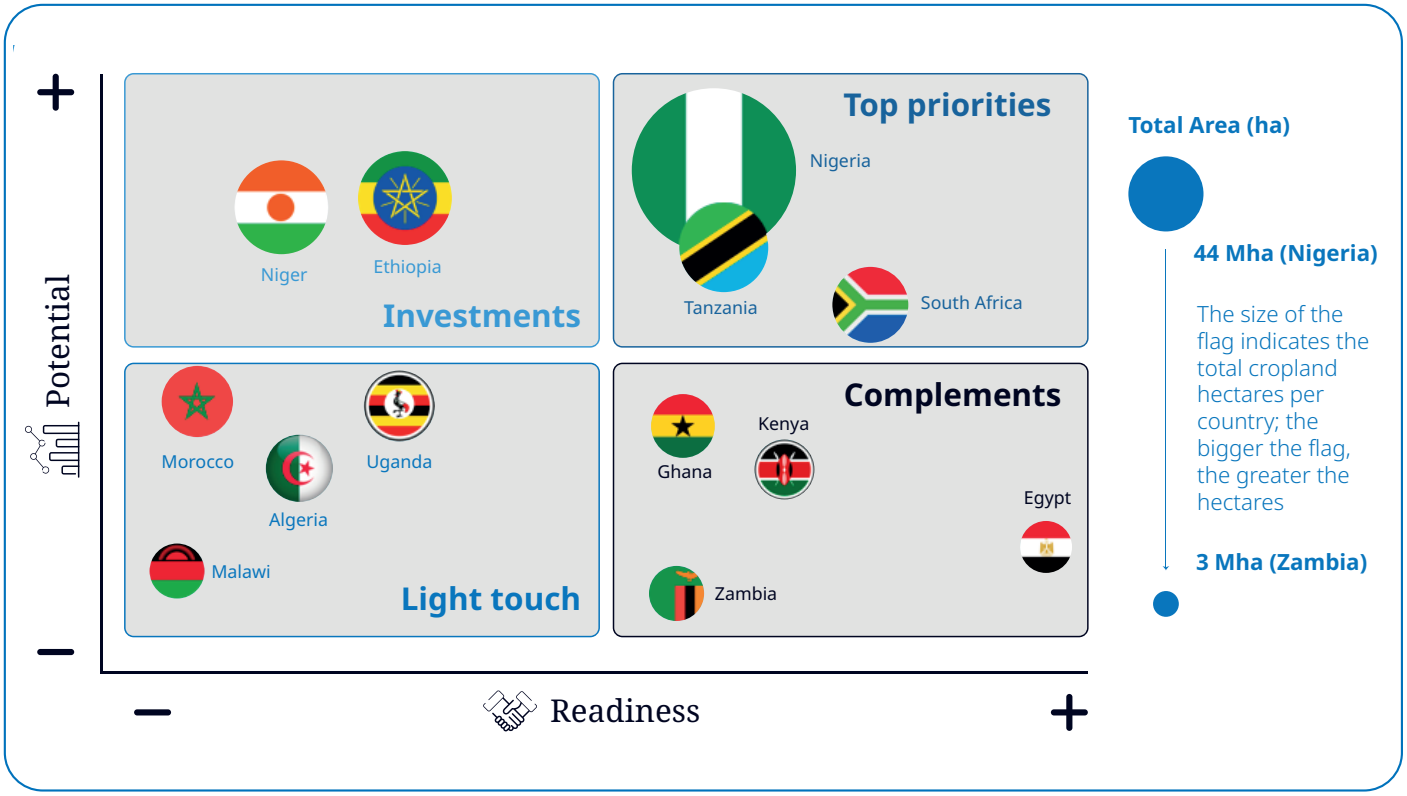


Figure 8. African countries prioritization.

Tailored recommendation

Specific recommendations have been made for worldwide countries according to their level of adoption and their category (top priorities, investments, complements, light touch). A deep dive has been conducted on the African continent, which provides specific recommendations for the countries that are part of it.

Top priorities

Globally

USA, Brazil, Mexico and France are the countries with the greatest potential for scaling up and implementing Regenerative Agriculture practices, thanks to their extensive croplands and the readiness of their farmers.

Workforce Development Farmers in USA require adequate technical support and resources for a successful transition. In Brazil, despite the current focus on large-scale commercial agribusiness, redirecting attention and resources toward supporting SHF is essential for a successful transition[26]. In Mexico, addressing the financial barrier is crucial, particularly for small-scale farmers, fostering a more accessible pathway to regenerative agricultural practices[31]. Finally, in selected French regions, a socio-economic challenge arises due to the anticipated retirements of many farmers in the next decade (50% of farmers expected to retire within the next 10y). Initiatives like the “Livelihoods Soils of Brittany” are crucial in addressing this issue by supporting the younger generation of farmers[20].

These countries need to improve education, training, and financial support to assist farmers in transitioning to regenerative agriculture practices. Also, to develop strong value chain relationships and increase awareness within the agricultural sector to support regenerative farming.

African continent

South Africa, Nigeria and Tanzania as the leading adopters of Regenerative Agriculture in Africa, should concentrate on enhancing the resilience of their crops and agricultural land through climate-smart and regenerative practices. Additionally, they should prioritize promoting land restoration alongside community development through education initiatives[38,51].

Investments

Globally

China and India are countries that have high potential but currently lack a significant level of readiness.

In China, it is imperative to facilitate meaningful collaboration between the public and private sectors, leveraging collective resources and influence. This synergy is crucial for driving widespread adoption of RegenAg practices, promoting sustainable agricultural development, and advancing environmental conservation. India faces a knowledge gap, especially among its 86% of smallholder farmers with limited resources. Addressing this gap is vital, and the country should empower small farmers by investing in research and development to create tailored regenerative practices suitable for local conditions. Additionally, India can benefit from enhancing farmer education initiatives[54].

Thus, to enhance their agricultural sectors, both nations should focus on improving farmer education and financial support, fostering partnerships between the public and private sectors, and encouraging corporate engagement in RegenAg.

African continent

Ethiopia and Niger could prioritize advancing agricultural resilience: Ethiopia might focus on enhancing education and training to promote regenerative practices that restore soil health. Similarly, Niger could address climate resilience by equipping farmers with drought-resistant seeds and introducing innovative farming techniques[60].

Light touch

Globally

Spain, Germany and Poland are countries presenting a noticeable readiness for scaling up Regenerative Agriculture but have less potential in terms of croplands (ha).

Spain needs to expand regenerative practices to combat desertification[43], Germany must realign subsidies, many German farmers may be indeed hesitant to invest in new methods due to perceived financial risks and the lack of necessary capital. The current agricultural subsidies should be realigned to support multifunctional land use, a core aspect of regenerative farming[01]. Poland requires a comprehensive transition strategy that mitigates economic risks and provides financial incentives and education for regenerative agriculture.

These countries need to focus on increasing their yield, among other variables, to facilitate the transition to regenerative agriculture.

African continent

In Malawi, Uganda, Algeria, and Morocco, it is recommended to focus on environmental mitigation through restoration projects, empower smallholder farmers with targeted education and training, boosting regenerative agriculture with environmentally positive practices and incentives, and enhancing farmer knowledge with education programs and collaborative research[34,45,49].

Complements

Globally

Romania, UK, Argentina, Vietnam, and Canada are the countries where the potential is lower due to their limitations in cropland areas, and whose readiness is not as developed due to socio-economic challenges. Despite these constraints, they present compelling opportunities for focus and exploration in scaling up regenerative agriculture practices.

In Romania, investing in robust educational programs tailored to farmers' specific needs is crucial. Prioritizing comprehensive training initiatives can equip the agricultural workforce with the knowledge and skills necessary for driving increased productivity[18,48]. Similarly, in the UK, addressing low awareness levels among consumers about RegenAg through comprehensive education campaigns is essential to boost awareness and appreciation for regenerative practices. Argentina should collaborate with experts, VC players, and institutions to provide tailored training, ensuring continuous learning and innovation to enhance crop yields and sustainable farm productivity. In Vietnam, investing in comprehensive education and training programs is vital to equip farmers with essential skills and knowledge for efficient and productive farming practices. For Canada, allocating resources to initiatives like carbon capture, feed additives, anaerobic digesters, and precision technology is recommended. Mobilizing finance and enacting supportive policies can empower farmers, potentially reducing up to 40% of the projected 2050 emissions[52].

Concluding, Romania and the UK are encouraged to prioritize educational initiatives for enhanced agricultural productivity. Argentina and Vietnam should invest in specialized training and innovation for sustainable practices, while Canada should nurture its agricultural sector through support for young farmers and investments in R&D for sustainable technologies. These efforts collectively contribute to the possibilities of scaling up regenerative agriculture.

African continent

Kenya and Ghana should address climate challenges by restoring degraded soils, reviving land for RegenAg and managing water to boost smallholder productivity[27,32]. Similarly, Egypt could focus on advancing regenerative production through crop rotation and water management, while Zambia might support farmers in adopting regenerative practices.

Conclusions

The Regenerative Agriculture transformation plan has successfully outlined key focus areas and tailored strategies for various countries. The next step in this transformative journey involves exploring additional advantages and implementing country-specific recommendations.

For countries globally viewed 'Top Priorities', the challenges are multifaceted, encompassing issues such as insufficient access to finance, education, and training. Additionally, there is a need to address weak links in agricultural value chains players and upgrade farm-to-market infrastructure. The primary objective is to fortify these areas, fostering a more efficient and regenerative agricultural sector.

The NTT DATA RegenAg framework, with its emphasis on soil health, biodiversity protection, and water use efficiency, aligns with the broader goals of sustainability and ecological stewardship. The defined indicators and metrics provide a tangible means of measuring the success of regenerative practices, from reduced greenhouse gas emissions to improved soil health.

The country prioritization framework, utilizing variables of potential and readiness, demonstrates a thoughtful and systematic approach to identify nations with untapped opportunities for adopting conservation agriculture. The recommended focus on the United States, Brazil, Mexico, France, South Africa, Nigeria, and Tanzania reflects a balanced strategy considering both developed and emerging agricultural landscapes.

In essence, NTT DATA RegenAg framework offers a pathway towards a more sustainable and resilient agricultural future. By combining a global perspective with regional specificity, the framework encourages targeted efforts in countries where the potential for positive impact is greatest, contributing to the collective goal of advancing regenerative practices on a global scale.

Bibliography

In addition to the references directly cited in this work, additional sources consulted throughout the research process have been included to provide broader context and enhance the depth of the analysis.

01 Benjamin, S., & Krämer, S. (2023, March 23). BCG Global.
https://www.bcg.com/publications/2023/regenerative-agriculture-benefits-germany-beyond

02 Bugas, J., Conant, H., & Hoo, S. (2023, August 15). BCGGlobal.
https://www.bcg.com/publications/2023/regenerative-agriculture-profitability-us-farmers

03 Crossland, I. (2022, July 29) Sustainable Food Trust - A global voice for sustainable food and health.
https://sustainablefoodtrust.org/news-views/regenerative-farming-southern-spain/

04 DELVAUX, P.A., GOMEZ Y PALOMA, S., & RIESGO, L (2020, October 9).
https://www.science.org/doi/10.1126/sciadv.abb8235

05 Dev, L. (2021, 11 21). Grounded.
https://grounded.co.za/thinking-big-and-starting-small-with-regenerative-farmers-in-zambia/

06 Earthworm. (n.d.). Earthworm.
https://earthworm.org/news-stories/living-soils-france

07 EIT Food. (n.d.). EITFood.
https://www.eitfood.eu/news/regenerative-agriculture-revolution-in-poland-farmers-who-care-and-take-action

08 Ellen Macarthur Foundation. (2021, June 18). Ellen Macarthur Foundation.
https://www.ellenmacarthurfoundation.org/articles/regenerative-agriculture

09 FAO. (n.d.). fao.org.
https://www.fao.org/global-soil-partnership/areas-of-work/soil-fertility/en/

10 Faostat. (2023). Faostat.
https://www.fao.org/faostat/es/

11 FAOSTAT. (n.d.). fao.org.
https://www.fao.org/faostat/es/#data

12 Food Manufacturing. (2022, June 14). Food Manufacturing.
https://www.foodmanufacturing.com/facility/news/22275720/mexican-government-prods-farmers-to-grow-more-food

Bibliography

13 Forum for the Future. (n.d.). Forum for the Future.
https://www.forumforthefuture.org/growing-our-future-uk

14 Global, B. (2023, December 20). Bayer Global.
https://www.bayer.com/en/sustainability/sustainability-reports

15 GYGA. (2022). yieldgap.org.
https://www.yieldgap.org/

16 Kassam, A. (2022, February). ca-global.net.
https://www.ca-global.net/ca-stat

17 Lago Olveira, S., El-Areed, S., Moreira, M., & Gonzalez Garcia, S. (2023, 09 1). Science of The Total Environment.
https://www.sciencedirect.com/science/article/pii/S004896972302956X?via%3Dihub

18 Lê Khương, N. (2020, September 11). Journal of Economics and Development.
https://www.emerald.com/insight/content/doi/10.1108/jed-05-2020-0052/full/pdf?title=economic-role-of-education-in-agriculture-evidence-from-rural-vietnam

19 Lech, M. (2020, June 16). Farm & Food 4.0.
https://www.farm-and-food.com/en/regenerative-agriculture-in-germany/

20 Livelihoods Funds. (2021, April 12). Livelihoods Funds.
https://livelihoods.eu/for-soil-biodiversity-and-the-farmers/

21 Lowder, S.K., Skoet, J. ,& Raney, T. (2015, October). sciencedirect.com.
https://www.sciencedirect.com/science/article/pii/S0305750X15002703

22 Martins, F., Atleo, T., Mbazima, G., & Israelit, S. (2021, December 02). BAIN & COMPANY.
https://www.bain.com/insights/helping-farmers-shift-to-regenerative-agriculture/#:~:text=Combined%20with%20business%20analysis%20by,corn%2C%20wheat%2C%20and%20soy

23 McPherson, M. (2020, October 23). East Asia Forum.
https://www.eastasiaforum.org/2019/08/29/raising-agricultural-productivity-in-vietnam-isnt-rocket-science/

24 Ministerie van Landbouw, N.e. (2023, June 2). EUROPE: ROMANIA | Agrospecials.
https://magazines.rijksoverheid.nl/lnv/agrospecials/2023/01/romania

Bibliography

25 Mousumi, M. (2023, June 15). Research Gate.
https://www.researchgate.net/publication/371575878_Role_of_Research_and_Development_RD_in_Indian_Agriculture

26 Nation Institute of Food and Agriculture. (n.d.). Nation Institute of Food and Agriculture.
https://www.nifa.usda.gov/topics/workforce-development

27 Nature-based Solutions Initiative. (n.d.). Nature-based Solutions Initiative.
https://www.naturebasedsolutionsinitiative.org/news/farmer-managed-natural-regeneration-in-ghana#:~:text=Climate%20change%2C%20land%20clearing%20and,rural%20populations%20in%20this%20region

28 Nichepom. (2022, November 8). Niche Agriculture.
https://www.nicheagriculture.com/agriculture-news-latest-updates-methods-on-agriculture-farming-niche/

29 NRDC. (2021, November 29). nrdc.org.
https://www.nrdc.org/stories/regenerative-agriculture-101#what-is

30 OP2B. (2021). www.wbcsd.org.
https://www.wbcsd.org/resources/op2bs-framework-for-regenerative-agriculture/

31 Paco P. (2022, August 22). Regeneration International.
https://regenerationinternational.org/2022/08/22/regenerative-agriculture-in-mexico-boosts-yields-while-restoring-nature/

32 Paul, T. (2023). reNature.
https://www.renature.co/articles/insights-on-kenya/

33 Phillips, J. M. (n.d.). Farmer Education and Farmer Efficiency: A Meta-Analysis

34 Plant With Purpose. (n.d.).
https://plantwithpurpose.org/country/malawi/

35 Rainforest Alliance. (2020, September 21). rainforest-alliance.org.
https://www.rainforest-alliance.org/resource-item/integrated-pest-management-and-natural-farming-solutions-white-paper/

36 Regen10. (2023, December). regen10.org.
https://regen10.org/wp-content/uploads/sites/19/2023/09/Regen10-Statement_2023.pdf

Bibliography

37 Regeneration International. (2021, February 3). regenerationinternational.org.
https://regenerationinternational.org/why-regenerative-agriculture/

38 reNature Foundation. (2023, April 5). reNature.
https://www.renature.co/projects/ambakofi-tanzania/

39 Ricciardi, V. (2018, June). sciencedirect.com.
https://www.sciencedirect.com/science/article/pii/S235234091830708X

40 SAI Platform. (2023, September). saiplatform.org.
https://saiplatform.org/wp-content/uploads/2023/09/sai-platform_-regenerating-together_september-2023-1.pdf

41 Sattva Consulting. (2023, March 3). Sattva Consulting.
https://www.sattva.co.in/quick-read/are-corporates-the-key-to-unlocking-the-promise-of-regenerative-agriculture/

42 Scherer, G. (2022, April 5). Mongabay Environmental News.
https://news.mongabay.com/2022/03/brazils-agroforestry-farmers-report-many-benefits-but-challenges-remain/

43 Scherer, G. (2023, October 17). Mongabay Environmental News.
https://news.mongabay.com/2023/10/battling-desertification-bringing-soil-back-to-life-in-semiarid-spain/

44 Sheykin, H. (2023, November 13). finmodelslab.com.
https://finmodelslab.com/blogs/kpi-metrics/regenerative-agriculture-farming-kpi-metrics?utm_source=relinking&utm_

45 Shona.co. (n.d.). Shona.co.
https://www.shona.co/regenerating-agriculture-in-uganda/

46 Soil Capital Farming. (n.d.). Soil Capital Farming.
https://www.soilcapitalfarming.ag/projects/regenerative-transition-strategies-in-argentina

47 Statista. (2023, November 20). statista.com.
https://www.statista.com/statistics/1287852/global-consumption-fertilizer-by-country/

48 Sterie, C., & Petre, I. (2023, December 9). Sustainability.
https://www.statista.com/statistics/1287852/global-consumption-fertilizer-by-country/

Bibliography

49 Sustainable Food Trust. (2015, April 10). Sustainable Food Trust.
https://sustainablefoodtrust.org/news-views/moroccan-agriculture-a-divided-system/

---

50 Sustainable Markets Initiative. (2023). Sustainable Markets Initiative.
https://www.sustainable-markets.org/taskforces/agribusiness-task-force/

---

51 Terhile, U. (2023, September 11). Planet Foward.
https://planetforward.org/story/regenerative-agriculture-nigeria/

---

52 The Canadian Press. (2022, November 7). Financialpost.
https://financialpost.com/pmn/commodities-business-pmn/agriculture-commodities-business-pmn/canadas-farmers-need-tech-investment-

---

53 The Rockefeller Foundation. (2023, December 11). The Rockefeller Foundation.
https://www.rockefellerfoundation.org/initiative/regenerative-agriculture/

---

54 Toby, I. (2021, October 18). Producers Stories.
https://producersmarket.com/blog/how-natural-farming-empowers-through-education/

---

55 UNITRANS. (2023, March 30). unitransafrica.com.
https://www.unitransafrica.com/the-importance-of-water-management-for-commercial-agriculture/

---

56 UNITRANS Agricultural Works. (2023, September 5). unitransafrica.com.
https://www.unitransafrica.com/a-look-at-regenerative-agriculture-and-efficient-water-management/medium=referral&utm_

---

57 U.S.ID. (2013, February). usaid.gov.
https://pdf.usaid.gov/pdf_docs/PA00J7PB.pdf

---

58 Western Communications. Western University. (2023, December 20). Western News.
https://news.westernu.ca/2023/12/expert-insight-canadas-agricultural-policies-need-to-better-serve-local-farmers/

---

59 World Bank. (2022). World Bank.
https://climateknowledgeportal.worldbank.org/sites/default/files/2019-06/CSA%20_Profile_Zambia.pdf

---

60 World Bank Group. (2023, April 4). World Bank.
https://www.worldbank.org/en/news/feature/2021/10/20/this-is-how-niger-is-battling-climate-change

---

61 World Economic Forum. (2023, September 12). The European Sting-Critical News & Insightson European Politics, Economy, Foreign Affairs, Business & Technology - europeansting.com.
https://europeansting.com/2023/09/12/unlocking-the-potential-of-regenerative-agriculture-through-public-private-synergies/

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DnA Advisory Services

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