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2. ՏՆՏԵՍՈՒԹՅԱՆ ԻՐԱԿԱՆ ՀԱՏՎԱԾԻ ՀԻՄՆԱԽՆԴԻՐՆԵՐ

GREEN TRANSITION IN AGRICULTURE: CHALLENGES AND PATHWAYS

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Հոդվածը ստացվել է՝ 05.09.24, ուղարկվել է գրախոսման՝ 27.11.24, երաշխավորվել է տպագրության՝ 13.12.24

Introduction. The processes of globalization and integration in the global economy today demand active policies for sustainable development. Emerging at the end of the 20th century, the "green economy" represents an economic paradigm emphasizing the necessity of reducing the negative impact of human activity on the environment. Instead of focusing solely on economic growth at all costs, the green economy prioritizes sustainable development with minimal environmental risks.

The primary objective of sustainable development is to ensure long-term economic growth, social stability, and ecological balance. This harmony among key components is facilitated through the concept of the green economy, which has recently garnered significant global attention. Given Armenia's limited natural resources, the efficient use of these resources becomes a necessity - a challenge that can be addressed through the development of a green economy. Additionally, studies indicate that environmental efficiency in Armenia's agricultural sector is declining, necessitating the urgent introduction of sustainability practices, with green agriculture offering a clear pathway forward. These factors underline **the relevance of the research** topic. **The aim of this article** is to explore green approaches as a means to achieve sustainable agriculture. **The research objectives are**:

- examining the conventional and green practices,
- identifying pathways for greening agriculture,
- Providing recommendations for transitioning to green agriculture.

Literature Review. In 2008, the world faced a series of crises, including fuel, food, and financial crises. To mitigate the negative impact of economic development on the environment and prevent the financial crisis, the international community sought solutions to achieve societal and economic stability. In this context, the concept of a "green economy" became increasingly prominent at the global level, particularly in developed countries. Simply put, the "green" economy is synonymous with a "sustainable" economy. A green economy primarily focuses on fundamental changes necessary to ensure the sustainability of economic systems. The fields of "ecological economics," "industrial ecology," and "environmental/resource economics" are closely

related to the concept of a "Green Economy." The goal of a green economy is to ensure human well-being and reduce environmental risks over the long term[1].

Recent crises have highlighted the overall instability of the global economic development model. The green economy concept has become one of the strategic priorities for many governments. By making sustainability the driving force of their economies, these countries must be prepared to address the major challenges of the 21st century, ranging from urbanization and resource scarcity to climate change and economic instability. To achieve these goals, the "green" economy must consider circular and inclusive economic growth, human well-being, and social justice, while simultaneously addressing the reduction of ecological risks. The core ideas and principles related to environmental protection are defined at the international level, while specific programs and targeted indicators are developed at the national level.

Currently, tools have been developed globally to assess the value change of natural resource capital. Indicators for evaluating the green economy process may include measures such as greenhouse gas emissions, the volume of pollutants, the amount of generated and recycled waste, investments in ecological programs, and the production of environmentally harmful products potentially damaging to both the environment and humanity. Green finance methodologies are currently established at the international, national, and regional levels[2].

A green economy is one that enhances human well-being and promotes social equity, all while substantially decreasing environmental risks and addressing ecological limitations[3]. This concept emphasizes the need for a systemic transformation in how we produce and consume, particularly in agriculture. The global agricultural sector faces numerous challenges, including climate change, resource depletion, and biodiversity loss. According to the Food and Agriculture Organization (FAO), agricultural productivity must increase by 60% by 2050 to meet the food demands of a growing

[1] Carmen Nadia Clocolu, Integrating Digital Economy And Green Economy: Opportunities For Sustainable Development, Theoretical and Empirical Research In Urban Management, Volume 6, Issue 1/ February, 2011, p. 36-37
https://www.researchgate.net/deref/http%3A%2F%2Fideas.repec.org%2Fcgi-bin%2Fhtsearch%3Fq%3DIntegrating%2BDigital%2BEconomy%2BAnd%2BGreen%2BEconomy%253A%2BOpportunities%2BFor%2BSustainable%2BDevelopment?_tp=eyJjb250ZXh0Ijp7ImZpcnN0UGFnZSI6InB1YmxpY2F0aW9uIiwicGFnZSI6InB1YmxpY2F0aW9uIn19

[2] "On the international experience of developing and implementing the principles, measures, and mechanisms of the 'green' economy, Department of Macroeconomic Policy, 35 pages, p. 3, https://eec.eaeunion.org/upload/medialibrary/b34/Doklad-zelenaya-ekonomika-06.2022.pdf"

[3] UNEP. (2011). Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication. United Nations Environment Programme. Retrieved from https://www.unep.org/

population[4]. The green economy offers a pathway to address these challenges by promoting sustainable practices that enhance productivity and resilience[5].

Methodology. This article examines the works of various researchers, exploring the approaches and key characteristics of agriculture's green transition. It emphasizes the importance of shifting toward sustainable farming practices and assesses the role of different strategies in contributing to the broader greening of the economy. The study employs systematic and descriptive analysis methods, drawing on data from reputable sources such as the World Bank and EU publications.

Analysis. Traditional agricultural practices are rooted in historical methods, emphasizing simplicity and relying on manual labor, natural fertilizers, and basic tools. While these methods preserve cultural heritage and often align with natural cycles, they can lead to environmental degradation when overused, such as through excessive land exploitation or inefficient resource management (Table 1). In contrast, green agricultural practices prioritize sustainability by incorporating eco-friendly techniques like organic farming, renewable energy, and precision resource management. These approaches aim to enhance soil health, protect biodiversity, and reduce the carbon footprint of farming activities. Traditional methods generally involve lower initial costs but are labor-intensive and vulnerable to climate variability. Green practices, although requiring higher initial investment in sustainable technologies, offer long-term benefits through resource efficiency, competitive yields, and resilience to climate change. Socially, traditional practices sustain rural livelihoods but struggle to meet the demands of modern agriculture, whereas green methods foster community well-being by promoting sustainable employment and reducing chemical exposure. Overall, while traditional agriculture emphasizes cultural and ecological connections, green practices provide a modern framework for achieving productivity and environmental stewardship. Combining elements of both can lead to a balanced and sustainable agricultural system.

Green farming practices have proven highly effective worldwide, addressing agricultural challenges while promoting sustainability. In India, the System of Rice Intensification (SRI) has revolutionized rice farming by increasing yields by 50-100% and reducing water usage by 30-40%, while also lowering methane emissions, making it an eco-friendly alternative to traditional methods[6]. In the United States, no-till farming

[4] FAO. (2017). The Future of Food and Agriculture: Trends and Challenges. Food and Agriculture Organization of the United Nations. Retrieved from http://www.fao.org/3/i6583e/i6583e.pdf

[5] UNEP. (2011). Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication. United Nations Environment Programme. Retrieved from https://www.unep.org/green-economy

[6] Uphoff, N., Kassam, A., & Stoop, W. (2008). **SRI – Achieving More with Less: A New Way of Rice Cultivation**. Agricultural Systems.

has enhanced soil health, reduced erosion, and improved water retention, contributing to long-term agricultural sustainability while also lowering fuel and labor costs[7]. Spain's organic olive farming practices in Andalusia have prioritized biodiversity and soil fertility, enabling farmers to achieve higher incomes through access to premium organic markets[8]. In Kenya, smallholder farmers adopting Integrated Pest Management (IPM) reduced pesticide use by 60%, lowering environmental pollution and improving crop resilience to pests[9]. Israel's pioneering drip irrigation technology has optimized water usage by delivering water directly to plant roots, achieving 30-50% water savings and enabling farming in arid environments.[10]

Table 1

The drawbacks of traditional Agricultural Practices[11]

	Aspect	Traditional Agricultural Practices
1	Resource Usage	Use of synthetic fertilizers: 70-90 kg/ha.
2	Environmental Impact	Soil fertility loss: up to 25% over 10 years.
3	Technology Adoption	Use of mechanization: 30-50% of farms.
4	Crop Yield	Average yield: 4-5 tons/ha for cereal crops.
5	Water Management	Water loss in irrigation: up to 40%.
6	Climate Resilience	Crop loss due to drought: 20-40%.
7	Economic Viability	Production costs: $300-400/ha.
8	Sustainability	Land degradation: 30-40% of agricultural lands in the long term.

Agroforestry systems in Brazil have combined crop cultivation with tree planting, restoring degraded land, enhancing biodiversity, and providing multiple income streams from timber, fruits, and crops[12]. In the Netherlands, crop rotation and cover cropping

[7] Lal, R. (2007). No-Till Farming: Sustainability and Soil Carbon Sequestration. Science, 316(5827), 557-558.

[8] IFOAM (International Federation of Organic Agriculture Movements). (2018). **The World of Organic Agriculture – Statistics and Emerging Trends**.

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International Food Policy Research Institute (IFPRI) (2021). Agricultural Productivity and Sustainable Resource Use in Central Asia, IFPRI, p. 22-24.

[12] Nair, P. K. R. (2012). Agroforestry Systems and Environmental Benefits. Journal of Forestry, 110(7), 319-328.

practices have improved soil fertility, reduced nutrient runoff, and enhanced agricultural sustainability[13]. Finally, vertical farming in Singapore has utilized hydroponic systems and LED lighting to achieve up to 95% water savings, meeting urban food security needs with minimal environmental impact[14]. These diverse examples illustrate the potential of green farming practices to simultaneously enhance productivity, conserve resources, and protect ecosystems.

The implementation of green and sustainable agriculture includes:

- Organic farming,
- Sustainable soil management aimed at climate protection,
- Preservation of genetic resources of crops and animals,
- Protection of forested areas and creation of new ones.

Organic agriculture has emerged as a leading alternative to conventional farming systems, emphasizing sustainability, ecological balance, and environmental health. It serves as a pivotal approach to achieving green agriculture, a concept that aligns farming practices with principles of environmental preservation and resource conservation. Organic farming prohibits the use of synthetic pesticides, fertilizers, and genetically modified organisms (GMOs), reducing chemical pollution and soil degradation[15]. Practices such as composting, crop rotation, and cover cropping enhance soil fertility and microbial diversity, promoting carbon sequestration[16]. Organic farms prioritize diverse crop rotations and habitat preservation, fostering resilience against pests and climate variability[17]. Thanks to its principles Organic farming provides several environmental benefits[18] such as reduced Greenhouse Gas Emissions, Water Conservation, Pollinator Protection[19], etc. Despite its environmental and expected social benefits, some drawbacks hinder the implementation of organic farming. Those drawbacks include[20]:

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[13] Pimentel, D., Hepperly, P., Hanson, J., Douds, D., & Seidel, R. (2005). Environmental, Energetic, and Economic Comparisons of Organic and Conventional Farming Systems. BioScience, 55(7), 573-582.

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[15] IFOAM. (2020). "Principles of Organic Agriculture." International Federation of Organic Agriculture Movements.

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[19] Potts, S. G., et al. (2010). "Global pollinator declines: trends, impacts, and drivers." Trends in Ecology & Evolution, 25(6), 345-353.

[20] Seufert, V., Ramankutty, N., & Foley, J. A. (2012). "Comparing the yields of organic and conventional agriculture." Nature, 485(7397), 229-232.

- Organic farming often produces lower yields compared to conventional methods, raising concerns about its ability to meet global food demand (Seufert et al., 2012).
- Labor-intensive practices and certification processes can make organic products less accessible to consumers.
- Farmers transitioning from conventional to organic systems face financial and technical challenges.

Organic agriculture offers a viable pathway to achieving green agriculture by promoting practices that prioritize environmental health, biodiversity, and sustainability. While challenges remain, strategic investments in research, policy frameworks, and consumer education can accelerate the transition toward a greener, more sustainable agricultural system.

Sustainable land management (SLM) is another approach to green transition. It involves integrated practices that balance ecological, economic, and social goals, making it a cornerstone for climate protection. SLM encompasses strategies that protect land resources while enhancing resilience to climate impacts. SLM includes:

- Soil Conservation: Techniques like contour farming, terracing, and no-till farming prevent soil erosion and degradation, reducing carbon loss from soils.
- Water Resource Management: Efficient irrigation systems and rainwater harvesting optimize water use, protecting ecosystems from overextraction.
- Agroforestry: Integrating trees into agricultural systems enhances carbon sequestration, biodiversity, and microclimate regulation.
- Sustainable Grazing Practices: Rotational grazing and controlled stocking rates prevent overgrazing, maintaining soil health and vegetation cover.

Practices such as afforestation, reforestation, and agroforestry increase carbon storage in biomass and soils, offsetting greenhouse gas (GHG) emissions. Improved land management reduces emissions from deforestation, land degradation, and agricultural practices. By improving soil fertility and water retention, SLM makes ecosystems more resilient to extreme weather events, a growing concern under climate change. Sustainable land management is a powerful tool for mitigating climate change and enhancing land resilience. By promoting carbon sequestration, reducing emissions, and improving ecosystem health, SLM offers a pathway to sustainable development and climate protection.

Sustainable land management is linked to another green agriculture approach which is the conservation of genetic resources in crops and animals. The letter is critical for ensuring food security, biodiversity, and climate resilience. Genetic resources provide the building blocks for breeding programs that enhance productivity, disease resistance, and adaptability to environmental changes. Diverse genetic resources allow breeders to develop high-yielding, pest-resistant, and climate-resilient crop and livestock varieties which helps to solve the issue of food security. Conserving genetic diversity ensures the availability of traits necessary to adapt to changing climate conditions, such as drought

tolerance and heat resistance[21]. Besides its environmental implications the conservation of genetic resources in crops and animals. Also has a social-cultural aspect in it: many traditional crop and livestock varieties hold cultural significance and are tied to local diets and farming practices[22]. The conservation of genetic resources in crops and animals is provided by the following methods:

- Seed Banks: Facilities like the Svalbard Global Seed Vault store seeds from diverse crop varieties for future use[23].
- Cryopreservation: Animal genetic materials, such as semen, embryos, and DNA, are preserved in liquid nitrogen for breeding programs[24].
- Botanical and Zoological Gardens: Living collections of rare species contribute to ex-situ conservation efforts.
- On-Farm Conservation: Traditional farming systems maintain the genetic diversity of crops and livestock in their natural environment[25].
- Protected Areas: Designated areas preserve wild relatives of crops and livestock, which are critical for introducing beneficial traits into domesticated species[26].
- Farmers and researchers collaborate to develop varieties suited to local conditions, maintaining genetic diversity while enhancing productivity.
- Initiatives like the Global Plan of Action for Plant Genetic Resources
- and DAD-IS (Domestic Animal Diversity Information System) facilitate the collection and sharing of genetic information globally[27].

Successful examples of this approach are Svalbard Global Seed Vault in Norway (houses over a million seed samples, serving as a global backup for crop genetic resources), India's National Bureau of Animal Genetic Resources (works to conserve indigenous livestock breeds, which are better adapted to local conditions), Andean Potatoes in Peru (indigenous communities maintain a vast diversity of potato varieties, critical for food security and climate adaptation in the Andes). The conservation of genetic resources for crops and animals is essential for building resilient and sustainable food systems. By safeguarding biodiversity and enabling adaptation to environmental challenges, these resources contribute significantly to global food security and ecological

[21] Jarvis, A., et al. (2015). "Crop wild relatives and climate change." Agronomy for Sustainable Development, 35(1), 291-309.
[22] Harlan, J. R. (1992). Crops and Man. American Society of Agronomy.
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balance. Strengthened policies, innovative technologies, and community involvement are key to ensuring their preservation for future generations.

Preservation of Forest Areas and Creation of New Ones play vital environmental roles and are an important part of transitioning to a green economy. Forests play an essential role in maintaining global ecological balance. They serve as carbon sinks, support biodiversity, regulate water cycles, and provide livelihoods for millions. However, deforestation and forest degradation remain pressing global challenges, contributing significantly to climate change and biodiversity loss. The dual approach of preserving existing forests and creating new ones offers a sustainable pathway to mitigate these challenges. Forests sequester vast amounts of carbon, with tropical forests alone absorbing around 15% of annual global carbon emissions. Forests are home to 80% of terrestrial species, making their preservation critical for maintaining global biodiversity[28]. Forests influence local and global hydrological cycles, preventing soil erosion and maintaining water quality[29]. Benefits of Forest Preservation and Creation

1. Carbon Sequestration: New forests and preserved ones can collectively offset billions of tons of CO_2 annually, contributing to global climate goals[30].
2. Enhanced Biodiversity: Restoring degraded forests can reestablish habitats for threatened species.
3. Economic Opportunities: Sustainable forestry, ecotourism, and non-timber forest products provide income-generating opportunities.
4. Ecosystem Services: Forests improve air and water quality, prevent soil erosion, and provide climate regulation at both local and global scales.

Preserving existing forests and creating new ones are essential for combating climate change, safeguarding biodiversity, and supporting sustainable development. While challenges such as deforestation drivers and resource conflicts persist, targeted strategies like sustainable forest management, reforestation programs, and policy integration can drive success. Collaborative global efforts and local community participation are crucial to achieving these goals.

Scientific novelty. The scientific novelty of the study lies in its exploration of globally successful green agricultural practices and their tailored application to resource-constrained contexts for sustainable development of agriculture. The study introduces a holistic approach to aligning agriculture with green economy principles. This approach positions sustainable agriculture as a critical driver for improving productivity while reducing environmental impact.

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[28] FAO. (2020). "Global Forest Resources Assessment 2020." Food and Agriculture Organization of the United Nations.

[29] Ellison, D., et al. (2017). "Trees, forests, and water: Cool insights for a hot world." Global Environmental Change, 43, 51-61.

[30] Griscom, B. W., et al. (2017). "Natural climate solutions." Proceedings of the National Academy of Sciences, 114(44), 11645-11650.

Conclusion. The green economy is a crucial prerequisite for the sustainable development of innovative agriculture. By embracing sustainable practices and technologies, the agricultural sector can enhance productivity, ensure food security, and protect the environment. Continued investment in research, policy support, and education is essential to facilitate this transition (Figure 1). Taking into account the research findings the following recommendations were made for the Green Agriculture transition:

- Development Strategies: Develop and implement national and regional strategies aimed at fostering the green economy, including innovative approaches in the agricultural sector. Build collaboration between and society public, and private, sectors for the implementation of joint programs.

- Technological Innovations: Apply approaches that incorporate advanced technologies such as sensors, artificial intelligence, and data analytics to enhance the efficiency of agricultural processes. Research innovative agricultural technologies that can reduce resource consumption.

- Sustainable Agricultural Practices: Support organic farming, which minimizes the use of chemical fertilizers and pesticides. Create opportunities for farmers to adopt sustainable agricultural methods, such as crop diversification and environmental conservation.

- Education and Knowledge Sharing: Organize educational programs and workshops aimed at providing farmers with information about the green economy and sustainable agriculture. Establish information platforms where farmers can share experiences and best practices.

- Financial Support: Governments and international organizations should provide financial support to farms transitioning to green economy principles. Create loan programs and subsidies that encourage sustainable agricultural projects.

- Environmental Protection: Develop government policies aimed at preserving natural resources and protecting the environment. Establish ecological monitoring systems to assess the environmental impact of agricultural activities.

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Abstract

The transition to a green economy is essential for ensuring the sustainable development of agriculture, particularly in the face of challenges like climate change, resource depletion, and declining environmental efficiency. **The relevance** of the research lies in addressing the pressing need for sustainable agricultural practices, particularly in resource-constrained contexts. **The purpose of the article** is to explore pathways for greening agriculture through the adoption of innovative and sustainable practices aligned with green economy principles.

The methodology employed includes systematic and descriptive analysis of secondary data from global organizations like the World Bank, FAO, and EU publications, alongside case studies of successful green agricultural practices worldwide.

The scientific novelty of the study lies in its exploration of globally successful green agricultural practices and their tailored application to resource-constrained contexts for sustainable development of agriculture. The study introduces a holistic approach to aligning agriculture with green economy principles. This approach positions sustainable agriculture as a critical driver for improving productivity while reducing environmental impact.

The main findings highlight that transitioning to green agriculture improves productivity, enhances climate resilience, and reduces ecological footprints. Notable practices such as organic farming, sustainable land management, genetic resource conservation, and forest preservation have demonstrated success in addressing agricultural challenges globally and nationally.

Keywords. Green economy, green transition, sustainable development, agriculture, organic farming, экология, климат, продуктивность.

ԿԱՆԱՉ ԱՆՑՈՒՄԸ ԳՅՈՒՂԱՏՆՏԵՍՈՒԹՅՈՒՆՈՒՄ. ՄԱՐՏԱՀՐԱՎԵՐՆԵՐ ԵՎ ՈՒՂԻՆԵՐ

ՄԵՐԻ ՄԱՆՈՒՉԱՐՅԱՆ

Համառոտագիր

Անցումը կանաչ տնտեսության կարևոր նշանակություն ունի գյուղատնտեսության կայուն զարգացման ապահովման համար, հատկապես ներկայիս այնպիսի մարտահրավերների պայմաններում, ինչպիսիք են կլիմայական փոփոխությունները, ռեսուրսների անխնա սպառումը և շրջակա միջավայրի անարդյունավետ օգտագործումը: **Հետազոտության արդիականությունը** պայմանավորված է կայուն գյուղատնտեսության մոտեցումների ներդրման նհրաժեշտությամբ՝ հատկապես սահմանափակ ռեսուրսների պայմաններում: **Հոդվածի նպատակը** գյուղատնտեսության «կանաչացման» ուղիների ուսումնասիրությունն է՝ նորարարական և կայուն մոտեցումների ներդրման միջոցով, որոնք համապատասխանում են կանաչ տնտեսության սկզբունքներին:

Օգտագործված մեթոդաբանությունը ներառում է Համաշխարհային բանկի, FAO-ի և ԵՄ-ի հրապարակումներից ստացված երկրորդական տվյալների համակարգված և նկարագրական վերլուծությունը, ինչպես նաև կանաչ գյուղատնտեսական հաջողված մոտեցումների համաշխարհային փորձի ուսումնասիրություն:

Հետազոտության գիտական նորույթը կայանում է կանաչ գյուղատնտեսական մոտեցումների հաջողված գլոբալ ուսումնասիրության և դրանց կիրառման մեջ: Հոդվածը ներկայացնում է գյուղատնտեսության և կանաչ տնտեսության սկզբունքների համադրման ամբողջական մոտեցում, որը գյուղատնտեսության կայուն զարգացումը դիրքավորում է որպես արտադրողականության բարելավման և շրջակա միջավայրի ազդեցության նվազեցման կարևոր գործոն:

Ստացված հիմնական արդյունքները ցույց են տալիս, որ գյուղատնտեսության կանաչ անցումը բարելավում է արտադրողականությունը, բարձրացնում կլիմայի փոփոխություններին հարմարվողականությունը և նվազեցնում էկոլոգիական հետքը: Հայտնի մոտեցումներ, ինչպիսիք են օրգանական գյուղատնտեսությունը, հողային ռեսուրսների կայուն կառավարումը, գենետիկական ռեսուրսների պահպանությունը և անտառների պաշտպանությունը, արդյունավետորեն հաղթահարում են գյուղատնտեսական մարտահրավերները ինչպես համաշխարհային, այնպես էլ ազգային մակարդակներում:

Բանալի բառեր: Կանաչ տնտեսություն, կանաչ անցում, կայուն զարգացում, գյուղատնտեսություն, օրգանական գյուղատնտեսություն, էկոլոգիա, կլիմա, արտադրողականություն

ЗЕЛЕНЫЙ ПЕРЕХОД В СЕЛЬСКОМ ХОЗЯЙСТВЕ: ВЫЗОВЫ И ПУТИ

МЕРИ МАНУЧАРЯН

Аннотация

Переход к зеленой экономике необходим для обеспечения устойчивого развития сельского хозяйства, особенно в условиях таких вызовов, как изменение климата, истощение ресурсов и снижение экологической эффективности. **Актуальность** исследования заключается в решении острой необходимости внедрения устойчивых сельскохозяйственных практик, особенно в условиях ограниченных ресурсов. **Цель статьи** - исследовать пути "зеленого" перехода в сельское хозяйство через внедрение инновационных и устойчивых практик соответствующих принципам зеленой экономики.

Используемая методология включает системный и описательный анализ вторичных данных из мировых организаций, таких как Всемирный банк, ФАО и публикации ЕС, а также изучение успешных "зеленых" сельскохозяйственных практик в мировом масштабе.

Научная новизна исследования заключается в изучении успешных глобальных практик зеленого сельского хозяйства и их адаптации к условиям ограниченных ресурсов для устойчивого развития сельского хозяйства. В статье представлен комплексный подход к объединению принципов сельского хозяйства и зеленой экономики, который позиционирует устойчивое развитие сельского хозяйства как важный фактор повышения производительности и снижения воздействия на окружающую среду.

Основные результаты исследования показывают, что переход к "зеленому" сельскому хозяйству улучшает производительность, повышает устойчивость к изменениям климата и снижает экологический след. Признанные подходы, такие как органическое земледелие, устойчивое управление земельными ресурсами, сохранение генетических ресурсов и защита лесов, эффективно решают проблемы сельского хозяйства как на глобальном, так и на национальном уровне.

Ключевые слова. Зеленая экономика, зеленый переход, устойчивое развитие, сельское хозяйство, органическое сельское хозяйство, экология, климат, продуктивность.