

2. ՏԱՏԵՍՈՒԹՅԱՆ ԻՐԱԿԱՆ ՀԱՏՎԱԾԻ ՀԻՄՆԱԽՆԴԻՐՆԵՐ

DEVELOPMENT OF A CIRCULAR ECONOMY STRATEGY AND ROADMAP IN ARMENIA

MERI MANUCHARYAN

Հոդվածը ստացվել է՝ 08.11.25, ուղարկվել է գրախսման՝ 12.11.25, երաշխավորվել է տպագրության՝ 24.12.25

Introduction. The traditional linear economic model, based on continuous resource extraction, production, and waste generation, leads to natural resource depletion, environmental degradation, and climate change. In contrast, the concept of the circular economy, which is defined as a regenerative and restorative system, proposes decoupling economic growth from the use of finite resources¹. It encompasses product design, innovative business models (such as the service-based economy), efficient management of material flows, and elements of the bioeconomy.

The transition to a circular economy is widely regarded as a fundamental prerequisite for sustainable development, particularly for resource-constrained countries such as Armenia². The Republic of Armenia faces a range of challenges related to limited natural resources (especially water resources), increasing volumes of municipal solid waste, the environmental consequences of mining activities, and the growing need for effective industrial waste management^{3,4}. At the same time, the country possesses significant potential stemming from its traditional industrial capacities (including the chemical and metallurgical industries), a rapidly developing information technology sector, organic agriculture, and cultural heritage preservation, all of which can serve as foundations for the adoption of circular economy approaches.

The objective of this study is to analyze international experience in the development and implementation of national circular economy strategies and, based on this analysis, to propose the key directions of an appropriate strategy and roadmap for the Republic of Armenia. The research questions include the following issues:

¹Ellen MacArthur Foundation. (2013). Towards the Circular Economy: Economic and business rationale for an accelerated transition, UK, 98p.

² Manucharyan, M. G. (2025). International experience of the circular economy model: Analysis of successful practices. In Contemporary issues of socio-economic development in the Republic of Armenia (No. 1, pp. 138–150). Institute of Economics named after M. Kotanyan, National Academy of Sciences of the Republic of Armenia. <https://doi.org/10.54503/1829-4324.2025.1-138>

³ Manucharyan M.G., Food security issues in the economic security system of the Republic of Armenia. BIO Web Conf. 2021 Jan; 36: p. 08004. DOI: [10.1051/bioconf/20213608004](https://doi.org/10.1051/bioconf/20213608004)

⁴ Asatryan H, Aleksanyan V, Asatryan S, Manucharyan M., Analyzing commercial grape farm efficiency in Armavir region (Armenia) by using two-stage empirical approach. Statistical Journal of the IAOS. 2024 Feb;40(1):149–160. <https://doi.org/10.3233/sji-230064>

- To present the current legal and institutional framework for the circular economy in Armenia.
- To highlight the priority areas for the circular transition for Armenia.
- To propose policy tools and institutions necessary for the development and implementation of an effective roadmap.

Literature Review. The concept of the circular economy has been examined in numerous academic and applied studies. The Ellen MacArthur Foundation is a key organization that has defined the core principles of the circular economy and highlighted its economic and environmental benefits⁵. In particular, it emphasizes three levels of material circulation: reuse, repair, and recycling.

In their systematic review, Kirchherr, Reike, and Hekkert identified 114 definitions of the circular economy and outlined its main components, including waste elimination, material circulation, and system regenerative capacity⁶. Ghisellini, Cialani, and Ulgiati, in turn, analyzed early experiences of the circular economy transition in the European Union and China, emphasizing the critical role of public policy and business models in enabling this transition⁷.

The European Union (EU) has developed a comprehensive policy framework for the circular economy through the EU Circular Economy Action Plan. These policy documents serve as reference models for national strategies, incorporating guidelines on product eco-design, extended producer responsibility (EPR), and specific initiatives targeting the plastics economy.

The experiences of the Netherlands, Germany, Finland, and other countries demonstrate that the success of national circular economy strategies depends on multi-stakeholder cooperation involving government, business, academia, and civil society, as well as on clearly defined and measurable targets and the effective combination of economic incentives and regulatory instruments⁸.

In the Armenian context, circular economy issues have been partially addressed within studies on sustainable development and waste management (e.g., reports by the Ministry of Environment of the Republic of Armenia, 2020; UNDP Armenia, 2019)⁹.

⁵ Ellen MacArthur Foundation. (2013). Towards the Circular Economy: Economic and business rationale for an accelerated transition, UK, 98p. Ellen MacArthur Foundation. (2015). Delivering the Circular Economy: A Toolkit for Policymakers, UK, 177p.

⁶ Kirchherr, J., Reike, D., & Hekkert, M. (2017). Conceptualizing the circular economy: An analysis of 114 definitions. *Resources, Conservation and Recycling*, 127, 221-232.

<https://doi.org/10.1016/j.resconrec.2017.09.005>

⁷ Ghisellini, P., Cialani, C., & Ulgiati, S. (2016). A review on circular economy: the expected transition to a balanced interplay of environmental and economic systems. *Journal of Cleaner Production*, 114, 11-32. <https://doi.org/10.1016/j.jclepro.2015.09.007>

⁸ Ghisellini, P., Cialani, C., & Ulgiati, S. (2016). A review on circular economy: the expected transition to a balanced interplay of environmental and economic systems. *Journal of Cleaner Production*, 114, 11-32.

<https://doi.org/10.1016/j.jclepro.2015.09.007>

⁹ UNDP. (2019). National Human Development Report 2018–2019: Armenia.

<https://hdr.undp.org/content/national-human-development-report-2018-2019-armenia>

Ministry of Environment of the Republic of Armenia, <http://env.am/>

However, academic research focusing on the systematic development of a comprehensive circular economy strategy and roadmap remains limited. This article seeks to address this gap by integrating an analysis of international experience with an assessment of Armenia's specific national conditions.

Methodology. This study employs a qualitative-descriptive and analytical research approach. It is based on a comparative analysis of academic literature on the CE, policy documents of international organizations, as well as official materials related to the socio-economic and institutional environment of the RA. By integrating international best practices with national contexts, a synthetic analysis was conducted, resulting in the formulation of applied policy recommendations and the identification of the key directions of a circular economy strategy and roadmap.

Analysis. For Armenia, the transition to a circular economy should be viewed not only as a component of environmental policy but also as a structural direction of economic development. Armenia's economy is characterized by a high dependence on imports, limited natural resources, and a production structure that generates low value added. Under these conditions, circular approaches offer opportunities to:

- reduce the costs of raw material imports,
- extend the life cycle of materials,
- create a domestic market for secondary resources,
- generate new jobs in the recycling, logistics, and repair sectors.

Thus, for Armenia, the circular economy serves as an instrument for enhancing competitiveness and strengthening economic resilience. The necessity of transitioning to a circular economy is further underscored by the growing volume of waste generation and the low level of waste recycling. According to data from the RA Statistical Committee's *Statistical Compendium on the Environment*, recent years have witnessed a steady increase in the volume of municipal solid waste, the majority of which is disposed of in landfills without prior separation or recycling¹⁰.

Moreover, according to an official statement by the Ministry of Environment, approximately 700,000 tons of municipal solid waste are generated annually in the country, the vast majority of which is disposed of in operating or unmanaged landfills. This figure indicates a high level of pressure on the waste management system and insufficient development of recycling infrastructure¹¹.

In the structure of municipal solid waste in Armenia, food and other organic waste constitute a significant share, while their recycling remains highly limited. According to reports by international organizations, the majority of organic waste is disposed of in landfills, as composting and bio-waste treatment systems are still at an early stage of development. Assessments of household waste composition indicate that

¹⁰ Statistical Committee of the Republic of Armenia. (2021). *Environment and natural resources in the Republic of Armenia, 2021: Waste management*. https://armstat.am/file/article/eco_book_2021_10.pdf

¹¹ Ministry of Environment of the Republic of Armenia. (2025, March 18). *Official news release on waste management*. <https://www.env.am/news/waste-18-03-2025>

food and other organic waste together account for approximately 25-30% of the total waste stream, highlighting the substantial presence of organic components¹².

A World Bank study indicates that Armenia's waste management system is characterized by low recycling rates, limited private sector participation, and high investment risks. The report emphasizes that, in the absence of adequate financial and institutional incentives, the adoption of circular business models remains constrained¹³.

Quantitative assessments indicate that increasing the level of organic waste recycling can significantly reduce the volume of waste disposed of in landfills while simultaneously providing a domestic source of compost essential for agriculture. This approach is consistent with the EU's circular economy policy, where the bioeconomy is regarded as a priority area capable of delivering rapid and tangible results¹⁴. From an institutional perspective, a key challenge in Armenia is the absence of a unified system for monitoring progress in the circular economy. By contrast, the EU applies a framework of ten core indicators for assessing circular economy performance, including resource efficiency, recycling rates, and the development of secondary raw material markets¹⁵.

Key challenges of the circular economy transition in Armenia are:

1. Low efficiency of the waste management system: the vast majority of municipal solid waste is disposed of in landfills, while systems for waste separation, recycling, and composting remain underdeveloped. Low recycling rates and insufficient infrastructure constitute one of the primary obstacles to the transition toward a circular economy.

2. Fragmentation of the legislative and institutional framework: Although several legal acts related to environmental protection and waste management are in place, Armenia lacks a comprehensive circular economy strategy and a unified coordinating institution. This limits the effectiveness of policy implementation and cross-sectoral coordination. Armenia has adopted several foundational documents that establish the basis for the circular economy transition, including the Law of the Republic of Armenia "On Waste"¹⁶ and the "Government Program of the Republic of Armenia for

¹² Municipality of Yerevan, ARMENIA: YEREVAN SOLID WASTE PROJECT – ENVIRONMENTAL AND SOCIAL DUE DILIGENCE "ESDD4" ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT 19th May 2015

¹³ World Bank. (2024). Armenia SWM Sector Assessment and Reform Plan: Sector Assessment Report. <https://doi.org/10.1596/42569>

¹⁴ EEA Report 04/2020, Bio-waste in Europe — turning challenges into opportunities, ISBN: 978-92-9480-223-1

¹⁵ European Commission. (2018). Measuring progress towards circular economy in the European Union – Key indicators for a monitoring framework. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52018DC0029>

¹⁶ Republic of Armenia. (2004). Law of the Republic of Armenia on waste (adopted November 24, 2004). <https://www.arlis.am/hy/acts/1722>

2021-2026”¹⁷. However, a dedicated Law on the Circular Economy or an integrated national strategy harmonizing sectoral policies is still absent.

3. Financial constraints and investment risks: The implementation of circular business models requires long-term capital investment. However, limited access to financial instruments, high interest rates, and low private sector engagement hinder the development of such projects¹⁸.

4. Technological and infrastructural limitations: The limited adoption of modern technologies for recycling, composting, and secondary raw material processing reduces opportunities for efficient resource use and constrains the formation of circular value chains¹⁹.

5. Lack of knowledge, skills, and public awareness: Insufficient knowledge and professional competencies related to circular economy principles (at the levels of public administration, business, and society) restrict the adoption and implementation of innovative approaches.

6. Absence of a unified monitoring and data system: Armenia has not yet established a comprehensive system of indicators to assess progress in the circular economy, which complicates the measurement of policy outcomes and comparative analysis. In contrast, the European Union applies a well-defined framework of indicators for monitoring circular economy performance. The implementation of circular economy principles in the Republic of Armenia is shaped by existing socio-economic and environmental conditions, which simultaneously reveal both systemic constraints and development potential. Within the current economic model, resource use remains predominantly linear, resulting in large volumes of waste and reduced efficiency across material life cycles.

The most pronounced challenges within the existing system are observed in the area of waste management, where landfill disposal continues to dominate amid limited recycling and composting capacities. The implementation of extended producer responsibility mechanisms remains at an early stage, and as a result, comprehensive management of product life cycles has not yet been fully ensured. Another manifestation of inefficient resource use is water scarcity, which is particularly acute for the agricultural and industrial sectors and necessitates the adoption of modern approaches to water conservation and the reuse of treated wastewater.

Similar challenges are also observed in the field of energy efficiency. High levels of energy consumption in the construction sector and industrial enterprises lead not only to increased environmental pressure but also to reduced financial efficiency of the

¹⁷ Government of the Republic of Armenia. (2021). Government program of the Republic of Armenia for 2021–2026. <https://www.gov.am/files/docs/4586.pdf>

¹⁸ World Bank. (2024). Armenia SWM sector assessment and reform plan: Sector assessment report. Washington, DC: World Bank. <https://doi.org/10.1596/42569>

¹⁹ European Commission. (2018). Measuring progress towards circular economy in the European Union – Key indicators for a monitoring framework. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52018DC0029>

economy. In addition to material and technical factors, the diffusion of circular approaches is significantly influenced by human capital. Limited knowledge and professional skills related to circular economy principles among businesses and the wider public slow the adoption and implementation of innovative solutions.

At the same time, the structure of Armenia's economy contains several opportunities that may serve as a foundation for circular economy development. The country's industrial heritage, particularly in metallurgy and chemical production, creates potential for the generation of secondary raw materials through the efficient utilization of various types of industrial waste. In the agricultural sector, there are substantial opportunities for the development of the bioeconomy, including agricultural waste composting, biogas production, and the expansion of organic farming.

The development of high-tech and information technology sectors can further complement these processes by enabling the implementation of smart waste management systems, digital tools for spatial planning, and circular business models. Moreover, cultural traditions rooted in principles of frugality and waste avoidance may facilitate public acceptance of circular economy concepts and contribute to their long-term sustainability.

In this context, the development of a circular economy strategy and roadmap for Armenia becomes not merely a standalone environmental initiative but a comprehensive direction of economic development. The primary objective of the strategy is to ensure a transition toward a circular and low-carbon economy while simultaneously promoting sustainable economic growth, job creation, and the reduction of environmental burdens. Achieving this objective should be grounded in the principles of waste prevention and reduction, maximization and extension of material use, development of secondary resource markets, promotion of innovation and green technologies, and multi-stakeholder cooperation with active engagement of all relevant actors.

The implementation of a circular economy strategy in Armenia requires the clear definition of priorities that reflect both urgent resource management challenges and the structural characteristics of the national economy. In this regard, the first core direction of the roadmap is waste management and the efficient organization of material flows (see Figure 1). Investments are needed in the development of infrastructure for the separation, collection, and recycling of municipal solid waste, establishing a comprehensive chain from source separation to the use of secondary raw materials. At the same time, a priority task is the full implementation of extended producer responsibility schemes in the areas of plastics, electrical and electronic equipment, batteries, and packaging, as well as the establishment of an effective construction waste management system.

The second key direction of the roadmap is the development of industrial symbiosis and energy efficiency. The promotion of industrial symbiosis projects enables the exchange of material and energy flows among enterprises, reducing production costs and mitigating negative environmental impacts. This direction should be integrated with incentives for building thermal insulation programs and the adoption of energy-efficient

technologies in industry, thereby enhancing resource efficiency and reducing the carbon footprint.

The introduction of solutions for the management of agricultural and food waste, such as composting and biogas production, can simultaneously reduce waste volumes and support the use of renewable resources. These measures should be complemented by policies supporting organic and regenerative agriculture, thereby enhancing the sustainability and productivity of the agricultural sector.

Ensuring the circular use of water resources is another important component of the roadmap. Promoting systems for wastewater and rainwater collection and reuse, along with the dissemination of efficient irrigation technologies, can reduce pressure on water resources and improve water-use efficiency across different sectors of the economy. Finally, the transition to a circular economy also requires the promotion of circular design and a culture of sustainable consumption. Encouraging reuse and responsible consumption behavior among consumers, as well as developing product design standards that prioritize durability, repairability, and disassembly, can significantly extend product life cycles and reduce waste generation.

The effective implementation of the roadmap requires the establishment of appropriate institutional and policy instruments. At the legislative level, it is necessary to develop and adopt a dedicated Law on the Circular Economy, which would coordinate policies implemented across different sectors and clearly define areas of responsibility. From an institutional perspective, it would be advisable to establish a national circular economy platform or advisory body to ensure coordinated cooperation among ministries, businesses, academic institutions, and civil society organizations.

Among economic instruments, priority should be given to the introduction of tax incentives and “green” credit programs for circular business models, the full implementation of extended producer responsibility schemes, and the development and enforcement of green public procurement criteria. These measures can generate stable demand for circular products and services.

At the same time, the role of science and education is crucial. It is necessary to finance research and educational programs in the field of the circular economy at universities and vocational training centers to ensure the development of adequate human capital. To enhance information dissemination and public awareness, social awareness campaigns should be conducted, and platforms for experience exchange among businesses should be established.

The implementation of the strategy should take regional specificities into account, differentiating between the socio-economic conditions of Yerevan, regional urban centers, and rural communities. For effective monitoring, it is essential to define clear and time-bound key performance indicators (KPIs), such as recycling rates, volumes of secondary raw material use, and water reuse indicators, and to ensure their regular evaluation and public reporting.

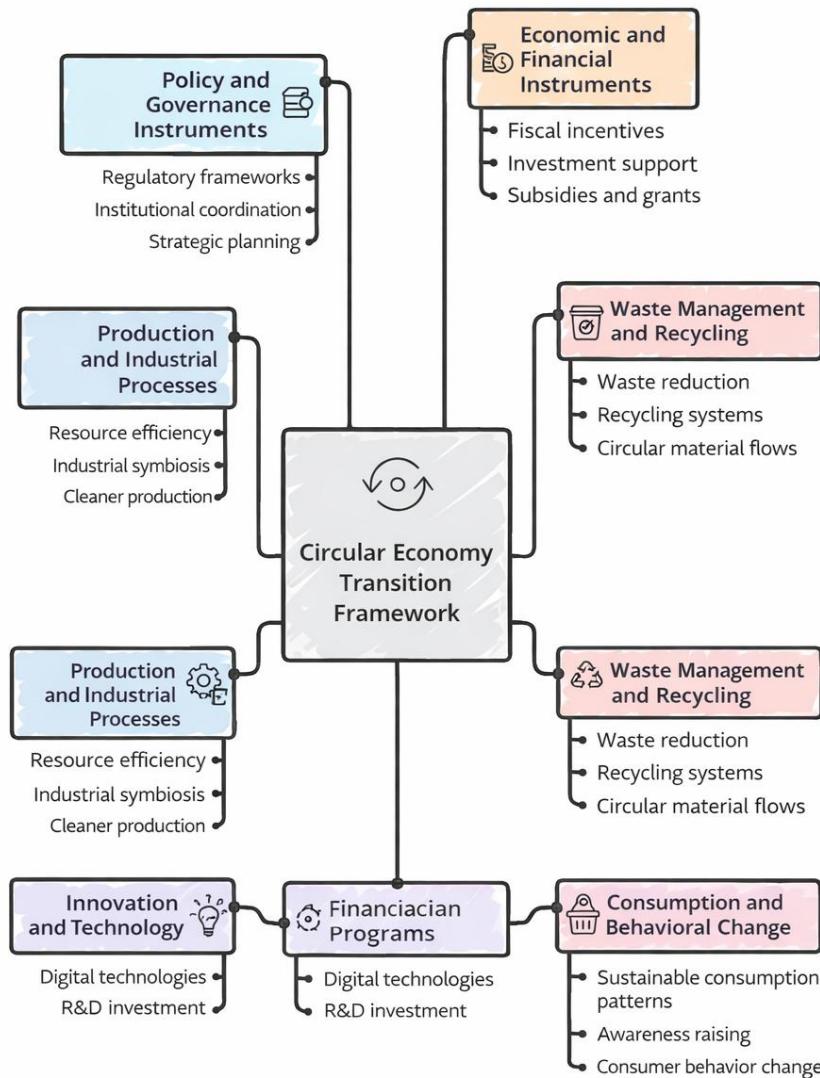


Figure 1. The recommended CE transition framework²⁰

A critical component of the circular economy transition roadmap is the development of waste recycling infrastructure, particularly the establishment and modernization of facilities for municipal solid waste, bio-waste, and construction waste recycling. The availability of such facilities enables the implementation of a comprehensive waste management chain (from source separation to the production of secondary raw materials) significantly reducing the volume of waste disposed of in landfills. International experience demonstrates that investment in waste recycling infrastructure is among the most effective tools for advancing the circular economy, as it simultaneously addresses environmental, economic, and social challenges. The

²⁰ The figure was composed by the author.

development of recycling infrastructure supports the formation of secondary resource markets, job creation, and reduced dependence on imported raw materials, while also creating the necessary conditions for the effective implementation of extended producer responsibility systems.

In the European Union, the development of waste recycling infrastructure is considered a priority, particularly in the areas of bio-waste, plastics, and construction waste. This approach is consistent with the EU Circular Economy Action Plan, which emphasizes the expansion of recycling infrastructure and ensuring its accessibility at the regional level. According to World Bank assessments, the lack of such infrastructure in developing countries, including Armenia, remains one of the key constraints limiting the effectiveness of waste management systems^{21,22}.

Agro-clusters are regarded as an effective organizational model for agriculture, bringing together producers, processors, logistics providers, and service entities within a single territorial or value-chain framework. This approach enables small and medium-sized farms to benefit from economies of scale, reduce production and marketing costs, and improve access to markets.

Studies conducted by international organizations indicate that agro-cluster models contribute to the reduction of post-harvest losses through the shared use of storage, processing, and logistics infrastructure. Moreover, agro-clusters facilitate the localization of value-added stages, thereby increasing producers' incomes and stimulating local processing activities. From this perspective, agro-clusters can also play a significant role in the implementation of circular economy principles, including the collective management of organic waste, the utilization of secondary resources, and the establishment of closed-loop agri-food value chains.

Analyses by the FAO and the OECD emphasize that agro-clusters are particularly effective in developing economies where agriculture is highly fragmented and dominated by small-scale farms. Under such conditions, the cluster-based approach is viewed as a tool not only for enhancing productivity but also for advancing food security and achieving sustainable development objectives²³.

Conclusions and Policy Recommendations. The transition to a circular economy in Armenia represents not only an environmental necessity but also a strategic

²¹ European Commission (2020) Communication from the commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. A new Circular Economy Action Plan <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52020DC0098>

²² World Bank. (2024). Armenia SWM sector assessment and reform plan: Sector assessment report. <https://doi.org/10.1596/42569>

²³ FAO. (2019). The State of Food and Agriculture: Moving forward on food loss and waste reduction. Rome: Food and Agriculture Organization of the United Nations.

<https://www.fao.org/3/ca6030en/ca6030en.pdf>

FAO. (2009). Agro-industries for development. Rome: <https://www.fao.org/docrep/017/i3125e/i3125e00.pdf>

opportunity for economic development and enhanced national competitiveness. International experience demonstrates that successful circular transitions are contingent upon a clear, comprehensive, and multi-stakeholder strategy, anchored in a long-term and coherent roadmap. For Armenia, key priorities should include a fundamental reform of the waste management system, the promotion of industrial symbiosis, and the development of the bioeconomy. Strengthening the legislation, introducing targeted economic incentives, and raising public and business awareness are essential prerequisites for an effective transition. Future research may focus on the development of detailed sector-specific action plans (e.g., agriculture, construction, textiles), as well as on the quantitative assessment of the economic and social impacts of the circular economy transition.

Within the framework of the study, the following policy measures are proposed:

- Establishment of waste processing facilities, increasing the recycling rate of organic waste by 20% by 2028, thereby reducing landfill volumes and supplying agriculture with essential compost.

- Implementation of a Green Public Procurement (GPP) program, ensuring that at least 10% of public procurement expenditures are allocated to goods and services compliant with circular economy criteria (e.g., recycled materials, energy efficiency, locally produced agricultural goods). This measure would create a stable market for circular products, stimulate domestic producers, and reduce the public sector's carbon footprint.

- Creation of up to five agro-clusters, integrating approximately 500 small and medium-sized farms. By 2028, this initiative is expected to reduce food losses by 15%, increase farmers' incomes through collective marketing and processing, and enhance national food security.

- Introduction of financial incentives for circular businesses, through a joint program between the Central Bank of Armenia and the Government, launching a "Circular Economy Transition" credit line with interest rates capped at 6% and maturities of up to seven years. This initiative could support the transition of more than 200 enterprises to circular business models, generate up to 1,500 new jobs, and reduce dependence on imported raw materials. Currently, loans for green technologies in Armenia carry interest rates of 12–18%, compared to 3–5% in comparable EU programs, which significantly constrains investment.

- Development of a national portal called "Circular Economy Monitoring Portal of Armenia", initially tracking four key indicators: (1) material reuse rate, (2) organic waste recycling, (3) share of green public procurement, and (4) number of enterprises adopting circular business models. Presently, Armenia lacks a unified system of circular economy indicators, whereas the EU applies a framework of ten core indicators covering resource efficiency, waste management, and secondary raw material markets.

- Establishment of a "Center for the Transfer of International Best Practices in the Circular Economy", facilitating cooperation among research institutions, state

bodies, and international organizations. The Center would design pilot projects and cluster-based models addressing Armenia's priority challenges.

- Introduction of preferential treatment in public procurement for products manufactured by circular economy enterprises and labeled with an “eco-preference” certification. Additionally, a two-year corporate profit tax adjustment for newly established circular enterprises is proposed to shorten capital payback periods. These scenarios could also inform graduated tax incentives linked to recycled waste volumes, as well as stricter environmental standards and mandatory waste management requirements.
- Adoption of state-subsidized and co-financing programs to support circular economy initiatives, fostering public-private partnerships and enabling joint state-business implementation models. These measures may stimulate innovation, facilitate the adoption of new technologies with public support, and reduce the volume of non-recyclable waste.

REFERENCES

1. Asatryan H, Aleksanyan V, Asatryan S, Manucharyan M., Analyzing commercial grape farm efficiency in Armavir region (Armenia) by using two-stage empirical approach. Statistical Journal of the IAOS. 2024 Feb;40(1):149–160. <https://doi.org/10.3233/sji-230064>
2. Ellen MacArthur Foundation. (2013). Towards the circular economy: Economic and business rationale for an accelerated transition. Ellen MacArthur Foundation.
3. Ellen MacArthur Foundation. (2015). Delivering the circular economy: A toolkit for policymakers. Ellen MacArthur Foundation.
4. European Commission. (2018). Measuring progress towards circular economy in the European Union: Key indicators for a monitoring framework. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52018DC0029>
5. European Commission. (2020). A new circular economy action plan: For a cleaner and more competitive Europe. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0098>
6. European Environment Agency. (2020). Bio-waste in Europe: Turning challenges into opportunities (EEA Report No. 04/2020). <https://www.eea.europa.eu>
7. Food and Agriculture Organization of the United Nations. (2019). The state of food and agriculture: Moving forward on food loss and waste reduction. FAO. <https://www.fao.org/3/ca6030en/ca6030en.pdf>
8. Food and Agriculture Organization of the United Nations. (2009). Agro-industries for development. FAO. <https://www.fao.org/docrep/017/i3125e/i3125e00.pdf>
9. Ghisellini, P., Cialani, C., & Ulgiati, S. (2016). A review on circular economy: The expected transition to a balanced interplay of environmental and economic systems. Journal of Cleaner Production, 114, 11–32. <https://doi.org/10.1016/j.jclepro.2015.09.007>

10. Government of the Republic of Armenia. (2021). Government programm of the Republic of Armenia for 2021–2026. <https://www.gov.am/files/docs/4586.pdf>
11. Kirchherr, J., Reike, D., & Hekkert, M. (2017). Conceptualizing the circular economy: An analysis of 114 definitions. *Resources, Conservation and Recycling*, 127, 221–232. <https://doi.org/10.1016/j.resconrec.2017.09.005>
12. Manucharyan, M. G. (2025). International experience of the circular economy model: Analysis of successful practices. In *Contemporary issues of socio-economic development in the Republic of Armenia* (No. 1, pp. 138–150). Institute of Economics named after M. Kotanyan, National Academy of Sciences of the Republic of Armenia. <https://doi.org/10.54503/1829-4324.2025.1-138>
13. Manucharyan, M. G. (2021). Food security issues in the economic security system of the Republic of Armenia. *BIO Web of Conferences*, 36, Article 08004. <https://doi.org/10.1051/bioconf/20213608004>
14. Ministry of Environment of the Republic of Armenia. (n.d.). Official website. <https://www.env.am>
15. Ministry of Environment of the Republic of Armenia. (2025). Official news release on waste management. <https://www.env.am/news/waste-18-03-2025>
16. Municipality of Yerevan. (2015). Yerevan solid waste project: Environmental and social impact assessment (ESDD4).
17. Republic of Armenia. (2004). Law of the Republic of Armenia on waste. <https://www.arlis.am/hy/acts/1722>
18. Statistical Committee of the Republic of Armenia. (2021). Environment and natural resources in the Republic of Armenia: Waste management. https://armstat.am/file/article/eco_book_2021_10.pdf
19. United Nations Development Programme. (2019). National human development report 2018–2019: Armenia. <https://hdr.undp.org/content/national-human-development-report-2018-2019-armenia>
20. World Bank. (2024). Armenia solid waste management sector assessment and reform plan: Sector assessment report. <https://doi.org/10.1596/42569>

ՇՐՋԱՆԱՁԵՎ ՏՏՏԵՍՈՒԹՅԱՆ ՌԱԶՄԱՎԱՐՈՒԹՅԱՆ ԵՎ ՃԱՆԱՊԱՐՀԱՅԻՆ ՔԱՐՏԵԶԻ ՄՇԱԿՈՒՄԸ ՀԱՅԱՍՏԱՆՈՒՄ

ՄԵՐԻ ՄԱՆՈՒՅԱՐՅԱՆ

Համառոտագիր

Շրջանաձև տնտեսությունը ժամանակակից տնտեսական մոդել է, որն ուղղված է արտադրության և սպառման գծային համակարգի վերափոխմանը՝ դեպի փակ օղակների, նյութերի վերօգտագործման, վերանորոգման և վերամշակման միջոցով արժեքի պահպանման և թափոնների նվազեցման: Այս հոդվածն ուսումնասիրում է շրջանաձև տնտեսության միջազգային փորձը, ազգային ռազմավարությունների և ճանապարհային քարտեզների մշակման սկզբունքները՝ կենտրոնանալով Հայաստանի Հանրապետության համար համապատասխան ռազմավարության և գործնական քայլերի ձևավորման վրա:

Հետազոտության նպատակն է վերլուծել շրջանաձև տնտեսության ազգային ռազմավարությունների մշակման և իրականացման միջազգային փորձը, ինչպես նաև ներկայացնել գիտական հիմնավորված առաջարկներ՝ ուղղված ՀՀ-ում շրջանաձև տնտեսության անցման արդյունավետ կառավարմանը և կայուն զարգացման նպատակների հասնելուն:

Հետազոտական հարցերը ներառում են հետևյալ խնդիրները:

- Ներկայացնել Հայաստանի ներկայիս իրավական և ինստիտուցիոնալ շրջանակը շրջանաձև տնտեսության համատեքստում:

- Ընդգծել Հայաստանի համար շրջանաձև անցման առաջնահերթ ոլորտները:

- Առաջարկել քաղաքական գործիքներ և հաստատություններ, որոնք անհրաժեշտ են արդյունավետ ճանապարհային քարտեզի մշակման և իրականացման համար:

Ուսումնասիրությունը ներառում է Հայաստանի հիմնախնդիրների վերլուծությունը (սահմանափակ բնական պաշարներ, թափոնների կառավարման համակարգի թերություններ, ինչպես նաև արդյունաբերական և գյուղատնտեսական ոլորտներում առկա ներուժը), առաջարկում է քաղաքականության ուղղություններ, ինստիտուցիոնալ մեխանիզմներ և առաջնահերթություններ պարունակող ճանապարհային քարտեզ:

Բանալի քառեր. Շրջանաձև տնտեսություն, կայուն զարգացում, ազգային ռազմավարություն, ճանապարհային քարտեզ, թափոնների կառավարում, ուսուրսների արդյունավետություն:

РАЗРАБОТКА СТРАТЕГИИ И ДОРОЖНОЙ КАРТЫ РАЗВИТИЯ ЦИРКУЛЯРНОЙ ЭКОНОМИКИ В АРМЕНИИ

МЕРИ МАNUЧАРЯН

Аннотация

Циркулярная экономика — это современная экономическая модель, направленная на преобразование линейной системы производства и потребления в замкнутые циклы, сохранение ценности и сокращение отходов за счет повторного использования, ремонта и переработки материалов. В данной статье рассматривается международный опыт в области экономики замкнутого цикла, принципы разработки национальных стратегий и дорожных карт, с акцентом на формирование соответствующей стратегии и практических шагов для Республики Армения.

Цель исследования — проанализировать международный опыт разработки и внедрения национальных стратегий в области циркулярной экономики, а также представить научно обоснованные предложения, направленные на эффективное управление переходом к циркулярной экономике в Республике Армения и достижение целей устойчивого развития. В число исследовательских вопросов входят следующие:

- Представить существующую правовую и институциональную базу Армении в контексте циркулярной экономики.
- Выделить приоритетные направления перехода к циркулярной экономике в Армении.

- Предложить политические инструменты и институты, необходимые для разработки и реализации эффективной дорожной карты.

В исследовании проанализированы ключевые проблемы Армении (ограниченные природные ресурсы, недостатки системы управления отходами, а также потенциал промышленного и сельскохозяйственного секторов) и предложена дорожная карта, содержащая направления политики, институциональные механизмы и приоритеты.

Ключевые слова: циркулярная экономика, устойчивое развитие, национальная стратегия, дорожная карта, управление отходами, ресурсоэффективность.

DEVELOPMENT OF A CIRCULAR ECONOMY STRATEGY AND ROADMAP IN ARMENIA

MERI MANUCHARYAN

Abstract

The circular economy (CE) represents a contemporary economic model aimed at transforming the traditional linear system of production and consumption into closed-loop processes that preserve value and minimize waste through reuse, repair, and recycling. This article examines international experience in the development of circular economy policies, with particular attention to the principles underlying national strategies and roadmaps, and focuses on the formulation of an appropriate strategy and practical implementation measures for Armenia.

The main objective of the study is to analyze international best practices in the design and implementation of national CE and to develop scientifically grounded policy recommendations to support an effective transition to a circular economy in Armenia and the achievement of sustainable development goals. The research questions include the following issues:

- To present the current legal and institutional framework for the circular economy in Armenia.
- To highlight the priority areas for the circular transition for Armenia.
- To propose policy tools and institutions necessary for the development and implementation of an effective roadmap.

The article examines Armenia's key structural challenges, including limited natural resources, deficiencies in the waste management system, and the existing potential of the industrial and agricultural sectors. Based on this assessment, the study proposes a national circular economy roadmap outlining priority policy directions, institutional mechanisms, and implementation measures.

Keywords: circular economy, sustainable development, national strategy, roadmap, waste management, resource efficiency.