

SCIENCE-POLICY INTERFACES AS A GREEN AGRI-FOOD SYSTEM DEVELOPMENT INCENTIVES

HOVHANNES ASATRYAN
HRACHYA GRIGORYAN

Հոդվածը ստացվել է՝ 15.09.24, ուղարկվել է գրախոսման՝ 20.11.24, երաշխավորվել է տպագրության՝ 13.12.24

Introduction. The importance of the development of their agri-food system for any country is out of the question, and that importance has more layers for Armenia, as a country with scarce natural resources and apparent issues of food security¹. At the same time, current global developments (including global warming, climate change, and its hazards, the unstable political situation in the region, the consequences of the COVID-19 pandemic, and environmental issues) bring us to the need for sustainable economic development and formation of green economy. Both green economy and green agriculture in Armenia have a long way to go and require some preconditions such as the formation of social, political, and economic bases and necessary policy framework. This brings us to the **relevance of the research topic**, which is the imperative of introducing new policy measures and frameworks aimed at promoting green agri-food systems in RA.

The article aims to introduce a new policy framework towards a green economy for Armenia. In the scope of the research aim following objectives were set:

1. Literature review on existing approaches and measures of green economy,
2. The state of green economy in RA,
3. The proposal of policy incentives for green agri-food system development.

Literature review. The concept of a green economy emphasizes sustainable development without degrading the environment. In agriculture, this involves practices that enhance productivity while minimizing ecological impact.

Policy frameworks play a crucial role in shaping agricultural practices towards sustainability. Governments worldwide have implemented various policies to incentivize green practices. According to the Food and Agriculture Organization (FAO), policies that integrate environmental considerations into agricultural planning can lead to more sustainable outcomes². For instance, the European Union's Common Agricultural Policy (CAP) includes measures that reward farmers for adopting environmentally friendly practices, such as organic farming and agroecology³.

1 Manucharyan, M., Food security issues in the economic security system of the Republic of Armenia, BIO Web Conf., 36, 2021, 08004

DOI: <https://doi.org/10.1051/bioconf/20213608004>

2 <https://openknowledge.fao.org/server/api/core/bitstreams/6e2d2772-5976-4671-9e2a-0b2ad87cb646/content>

3 <https://op.europa.eu/en/publication-detail/-/publication/92b9b0d3-9e14-11ec-83e1-01aa75ed71a1/language-en>

Economic incentives are vital for encouraging farmers to adopt sustainable practices. Subsidies, grants, and tax breaks are common tools used to promote green agriculture. A study by Zhang and others highlights that financial incentives can significantly increase the adoption of sustainable practices among farmers⁴. For instance, the implementation of payment for ecosystem services (PES) schemes has been effective in promoting reforestation and biodiversity conservation in agricultural landscapes⁵.

Technological advancements are essential for transitioning to a green economy in agriculture. Innovations such as precision agriculture, biotechnology, and renewable energy sources can enhance productivity while reducing environmental impact. According to a report by the International Food Policy Research Institute⁶, precision agriculture technologies can optimize resource use, leading to lower inputs and reduced greenhouse gas emissions. Furthermore, the adoption of renewable energy in farming operations can decrease reliance on fossil fuels, contributing to a more sustainable agricultural sector⁷.

The social aspects of green economy incentives in agriculture cannot be overlooked. Community engagement and education are critical for the successful implementation of sustainable practices. Research by Pretty et al. (2018) indicates that participatory approaches, where farmers are involved in decision-making processes, lead to higher adoption rates of sustainable practices. Additionally, social networks and farmer cooperatives can facilitate knowledge sharing and resource pooling, further promoting green initiatives⁸.

Despite the potential benefits of green economy incentives, several challenges hinder their widespread adoption. Economic barriers, such as high initial costs for sustainable technologies, can deter farmers from transitioning to greener practices⁹. Additionally, a lack of access to information and training

4 Yongzhe, Ch., Xiaoming; F., Hanqin T., Xutong, W., Zhen, G., Feng, Yu, Shilong, P., Nan, Lv, Naiqing, P., Bojie, Fu, Ecosystem variables including GPP, NPP, ET, LST, et al. in China during 2001~2018 (6.14 GB) [dataset]. PANGAEA, 2021, <https://doi.org/10.1594/PANGAEA.936080>

5 Wunder, S., Revisiting the concept of payments for environmental services. *Ecological Economics*, 117, 2015, 234–243. doi:10.1016/j.ecolecon. 2014.08.016

6 <https://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/136727/filename/136938.pdf>

7 Kumar, J., Majid, M., Renewable energy for sustainable development in India: current status, future prospects, challenges, employment, and investment opportunities. *Energy Sustain Soc* 10, 2, 2020. <https://doi.org/10.1186/s13705-019-0232-1>

8 Berkes, F., Environmental Governance for the Anthropocene? *Social-Ecological Systems, Resilience, and Collaborative Learning*, 9, Article No. 1232. 2017 <https://doi.org/10.3390/su9071232>

9 Garrone, M., Emmers, D., Olper, A., Swinnen, J., Jobs and agricultural policy: Impact of the common agricultural policy on EU agricultural employment. *Food Policy*, 101744. doi:10.1016/j.foodpol.2019.101744

What is the Science-Policy interface?

Science-policy interfaces (SPIs) are critical frameworks that facilitate the interaction between scientific research and policy-making processes. They aim to ensure that scientific knowledge informs policy decisions, thereby enhancing the effectiveness and relevance of policies in addressing societal challenges. This literature review explores the evolution, characteristics, challenges, and best practices of SPIs, drawing on a range of academic sources.

The concept of SPIs has evolved significantly over the past few decades. Initially, the relationship between science and policy was characterized by a linear model, where scientific knowledge was expected to flow directly into policy-making. However, this model has been criticized for oversimplifying the complexities of knowledge production and policy formulation¹⁰.

Recent literature emphasizes the need for a more interactive and iterative approach, recognizing that policy-making is influenced by a multitude of factors beyond scientific evidence, including political, social, and economic considerations¹¹. This shift has led to the development of various SPIs, including advisory committees, collaborative research initiatives, and knowledge-brokering organizations.

Studies show that effective SPIs share several key characteristics, specifically:

1. **Inclusivity:** Engaging a diverse range of stakeholders, including scientists, policymakers, practitioners, and the public, is crucial for ensuring that multiple perspectives are considered¹².
2. **Transparency:** Clear communication of scientific findings and the processes through which they are generated fosters trust and credibility among stakeholders¹³.
3. **Timeliness:** SPIs must be responsive to the needs of policymakers, providing relevant scientific information promptly to inform decision-making¹⁴.
4. **Flexibility:** The ability to adapt to changing political and social contexts is essential for the sustainability of SPIs¹⁵.

10 Gibbons, M., (ed.), *The new production of knowledge: the dynamics of science and research in contemporary societies*. Thousand Oaks, Calif.: SAGE Publications. 1994

11 Cash, DW., Clark, WC., Alcock, F., Dickson, NM., Eckley, N., Guston, DH., Jäger, J., Mitchell, RB. Knowledge systems for sustainable development. *Proc Natl Acad Sci U S A*. 2003 Jul 8;100(14):8086-91. doi: 10.1073/pnas.1231332100.

12 Brouwer, R., Martin-Ortega, J., Berbel, J. Spatial Preference Heterogeneity: A Choice Experiment. *Land Economics*, 86(3), 552–568. doi:10.3368/le.86.3.552, 2010

13 Lemos, M., Morehouse, B., The co-production of science and policy in integrated climate assessments. *Global Environmental Change*, 15(1), 57–68. 2005 doi:10.1016/j.gloenvcha.2004.09.004

14 Pielke, Jr., R.A. *The Honest Broker: Making Sense of Science in Policy and Politics*. Cambridge: Cambridge University Press. 2007

15 Bennett, N., Satterfield, T., *Environmental governance: A practical framework to guide design, evaluation, and analysis*. *Conservation Letters*, e12600, 2018. doi:10.1111/conl.12600

Methodology. In the scope of this research article, descriptive, statistical, and scientific-historical-logical methods were implemented. The reports, proceedings, manuals of FAO, and UN, and the works of foreign researchers were the main theoretical and information sources of the research.

Analysis. Despite their importance and widely acknowledged advantages, the implementation of the SPIs' concept faces several challenges:

- Knowledge Gaps: There can be significant gaps between scientific knowledge and policy needs, particularly in rapidly evolving fields such as climate change and public health.
- Communication Barriers: Differences in language and culture between scientists and policymakers can hinder effective communication and understanding¹⁶.
- Political Constraints: Political agendas and power dynamics can influence the extent to which scientific evidence is considered in policy decisions.
- Resource Limitations: SPIs often operate with limited funding and resources, which can restrict their ability to conduct comprehensive research and effectively communicate findings to policymakers.¹⁷
- Time Constraints: Policymakers often work under tight deadlines and may not have the time to fully engage with scientific research, leading to oversimplification or misinterpretation of complex data.
- Differing Objectives: Scientists and policymakers may have different goals; while scientists seek to advance knowledge, policymakers often prioritize immediate societal needs and political feasibility.
- Public Perception and Trust: The public's perception of science and scientists can impact how research is received by policymakers. Mistrust in scientific findings can lead to skepticism about their relevance or applicability.
- Institutional Barriers: Organizational structures within government and research institutions can create silos that prevent effective collaboration and knowledge transfer between scientists and policymakers¹⁸.
- Lack of Incentive: There may be insufficient incentives for scientists to engage with policymakers or for policymakers to seek out scientific expertise, leading to missed opportunities for collaboration¹⁹.

16 Weiss, C., The Many Meanings of Research Utilization. *Public Administration Review*, 39, 1979:426-431. <https://doi.org/10.2307/3109916>

17 Fischer, F., *Citizens, Experts, and the Environment: The Politics of Local Knowledge*. Durham & London: Duke University Press. 2000, <https://doi.org/10.1215/9780822380283>

18 Weiss, C., The Many Meanings of Research Utilization. *Public Administration Review*, 39, 1979, 426-431. <https://doi.org/10.2307/3109916>

19 Fischer, F., *Citizens, Experts, and the Environment: The Politics of Local Knowledge*. Durham & London: Duke University Press. 2000, <https://doi.org/10.1215/9780822380283>

- **Evolving Nature of Science:** The dynamic and sometimes uncertain nature of scientific knowledge can make it challenging for policymakers to rely on research findings, especially when decisions need to be made quickly.

Eliminating these barriers requires efforts from both the scientific community and policymakers to foster better communication, collaboration, and understanding of each other's needs and constraints.

SPIs and green agriculture

Science-Policy Interfaces (SPIs) in green agriculture refers to the collaborative frameworks and processes that facilitate the interaction between scientific research and policy-making to promote sustainable agricultural practices. These interfaces aim to bridge the gap between scientific knowledge and policy decisions, ensuring that agricultural policies are informed by the latest research and innovations in sustainability. Key aspects of Science-Policy Interfaces in green agriculture include:

- **Knowledge Exchange:** SPIs facilitate the transfer of knowledge from researchers to policymakers and vice versa. This can involve workshops, conferences, and publications that summarize scientific findings relevant to agricultural practices.
- **Stakeholder Engagement:** Effective SPIs involve various stakeholders, including farmers, agricultural scientists, policymakers, NGOs, and the private sector. Engaging these groups ensures that diverse perspectives are considered in policy development.
- **Evidence-Based Policy:** SPIs promote the use of scientific evidence in policy formulation. This means that agricultural policies are based on data and research findings that demonstrate the effectiveness of green practices, such as organic farming, agroecology, and sustainable land management.
- **Adaptive Management:** SPIs support adaptive management approaches, where policies are continuously updated based on new scientific insights and changing environmental conditions. This flexibility is crucial for addressing the dynamic challenges of agriculture and climate change.
- **Capacity Building:** SPIs often include training and capacity-building initiatives to enhance the understanding of sustainable practices among policymakers and practitioners. This helps ensure that policies are not only informed by science but are also practical and implementable.
- **Monitoring and Evaluation:** SPIs can help establish frameworks for monitoring and evaluating the impacts of agricultural policies on sustainability outcomes. This feedback loop is essential for refining policies and practices over time.
- **Interdisciplinary Collaboration:** Green agriculture often requires insights from various disciplines, including ecology, economics, social sciences, and technology. SPIs encourage interdisciplinary collaboration to develop holistic solutions to agricultural challenges.

There are some notable success stories demonstrating the impact of SPI's. First and foremost, examples are the European Common Agricultural Policy (CAP) Greening Measures, which incentivized practices like crop diversification, grassland preservation,

and ecological focus areas, implemented on over 70% of EU farmland by 2020. These measures brought the reduction of greenhouse gas emissions and improved biodiversity²⁰. Another example is the Alliance for a Green Revolution in Africa (AGRA), which used SPIs to promote soil fertility improvements and sustainable farming in Africa. Policies in Ethiopia and Rwanda scaled up ISFM practices, doubling maize yields and rejuvenating degraded soils thus Improving smallholder livelihoods and soil health²¹. In India the India's System of Rice Intensification (SRI) was implemented. SRI is a water-efficient and high-yield farming method, the implementation of which resulted to reduction of water use by 30–40% and yield increases of up to 50%²².

Overall, it can be concluded that Science-Policy Interfaces play a crucial role in promoting sustainable practices in green agriculture that can enhance food security, protect environmental protection, and also touch the social dimension by supporting rural livelihoods.

The state of green agriculture policy in RA

In April 2021 the Republic of Armenia approved the national-level action plan (2021-2023) of green economy principles under the Paris Agreement. These principles are compatible with the Sustainable Development Goals, which are reflected in the social and economic development goals of the RA. Regarding the green economy policy in RA, a reference was made in the RA Government Plan (2021-2026). In particular, it states the following²³: «The primary goal of forming a green economy is ensuring the economy's readiness for the new, low-carbon energy reality. It will be necessary to apply a comprehensive program of measures, targeting the following directions:

- Continuously reduce the role of natural gas in electricity production, replacing it with renewable and alternative energy sources.
- To adapt and bring the electricity distribution infrastructure to a ready state following the increase in demand and the change in structure,
- Contribute to replacing natural gas with electricity in daily life (use electricity while cooking and purchasing electric heating systems).

Considering RA's limited natural resources, the second goal of forming a green economy will be the more efficient use of natural resources in the economic cycle.»

20 European Commission. Evaluation of the impact of the CAP greening measures. 2020 https://agriculture.ec.europa.eu/system/files/2019-12/ext-eval-payment-practices-climate-leaflet_2017_en_0.pdf.

21 AGRA. Africa Agriculture Status Report 2016: Progress towards Agricultural Transformation in Africa. Source: <https://agra.org/wp-content/uploads/2017/09/aasr-report-2016-press0409201601.pdf>

22 Uphoff, N., The System of Rice Intensification: An Alternate Civil Society Innovation. TATuP - Zeitschrift für Technikfolgenabschätzung in Theorie Und Praxis, 20(2), 2011, 45–52. <https://doi.org/10.14512/tatup.20.2.45>

23 RA Government, the official web page of The Ministry of Economy. Source: <https://mineconomy.am/media/16887/4586.pdf>

Green economy and sustainable development are addressed in the Government Plan 2021-2026 with a separate point dedicated to them²⁴. In particular, that point states that the share of emissions of the "Energy" sector (as a result of the burning of fuels for energy production, transmission, and consumption, including transport) in the structure of carbon emissions of RA is about 70%, one of the key components of which is electricity production. More than 90% of households use natural gas for heating and cooking, and more than 80% of private cars use natural gas as fuel. Therefore, gas-fired heating and cooking systems must be replaced by electricity-consuming systems, increasing passenger transportation prices for public and private vehicle users, which will lead to an increase in the competitiveness of cars using electric motors. To maintain the competitiveness of energy-intensive industrial enterprises, it will be necessary to make a transition to technological processes that use electricity, which will increase the demand for electrical energy. The RA Government plans to develop a strategy for the development of a green and sustainable economy, which should reflect the direction of the development of the green and sustainable economy and the scope of planned actions, as well as the mechanisms for the promotion of the green economy and the realization of the long-term goals of sustainable development. As of March 30, 2024, the strategy has not yet been approved by the Government, but in 2023 the draft version of the strategy was put up for public discussion, signaling the existence of a finished version of the strategy²⁵.

Several initiatives have been implemented by the RA Government that fit within the green economy. Particularly, in 2019 Tax Code was updated with additions, that exempt the import of large, medium, and small electric motor vehicles from VAT taxation. According to the new additions in the law on "Trade and Services", from January 1, 2022, the sale of 50-micron-thick polyethylene bags, as well as their free provision in trade facilities, mobile trade points, etc, is prohibited. The ban does not apply to bags intended for weighing and bags produced from secondary raw materials.

According to the RA law on Energy, the following activities are not subject to licensing.

- the production, transportation, and distribution of thermal energy exclusively for own needs,
- thermal energy production, transportation, and distribution, if the installed capacity of these systems does not exceed 5.8 MW,
- the production of solar power plants with a capacity of up to 150 kW (inclusive),

State policy regarding green growth promotion is put into action through state support programs. Several agricultural support programs have been put into action by

24 «Green Growth for SMEs in Armenia», Report. Source:

https://api.icarmenia.am/public/uploads/helpfull_researches/1663844529849.pdf, pages 90-93:

25 The unified website for publication of drafts of legal acts. Source: <https://www.e-draft.am/projects/6062>

the RA Government, which also have an emphasis on green principles, as the recipients of support must make the transition to intensive agriculture by applying drip irrigation, building "smart farms", greenhouses, etc. In addition, there is a state support program for agriculture machinery leasing, that subsidizes farm owners to purchase machinery and equipment worth up to 1 billion AMD.

Regarding the development of the green economy, the "Green Growth in Armenia for SMEs" program was introduced and is in operation. In the scope of the program, a detailed analysis of the Armenian economy was carried out, paying special attention to 10 growing sectors (agriculture, tourism, industry, energy, construction, transport, forestry, trade, and IT) where relevant green growth targets have been set for businesses²⁶. There are no green goals and targets in "the SME development strategy of Armenia, 2020-2024". In this regard, the Investment Council of Armenia has conducted data analysis and sought ways to integrate the green growth strategic directions of the country's SMEs into the development agenda, including the use of green technologies, which will ultimately lead to the "Green Transition" of other businesses. SMEs will play an important role in achieving Armenia's "green transition", becoming the first adopters of new green technologies and innovations in various sectors of the economy, as a more flexible and adaptable business compared to large businesses.

The main directions of strategic development proposed by the program are the following: resource efficiency, circular economy integration, natural capital conservation, technology and innovation to support green research, innovation and technology transfer, and ensuring gender equality in the labor market. Based on the analysis and data collection on the scope of the project, targeted recommendations for businesses on the principles and features of "Green Business Models" were developed for the local businesses²⁷.

It can be concluded that certain steps are being taken at the state level in the direction of having a low-carbon environment and reducing natural gas dependency, which is one of the cornerstones of the formation of a green economy. In general, the implementation experience of green growth and development policies in the last decades allows us to identify the following main obstacles to their development and application:

- Existing prerequisites for policy development related to public administration, institutional establishment, and capabilities, requirements related to the participation of public administration financing bodies, and integration in the budget.
- Accounting of the costs of implementation and application of policies and the possibilities of its financing.

26 RA Government, the official web page of The Ministry of Economy. Source: <https://www.mineconomy.am/page/2356>

27 Green Growth for SMEs in Armenia: recommended business models. Source: <https://icarmenia.am/en/news/Green%20Growth%20for%20SMEs%20in%20Armenia:%20recommended%20business%20models>

- Establishment of evaluation mechanisms for policy monitoring, and feedback provision, including availability of quantitative targets and indicators.
- An integrated approach to strategic planning and policy development and integration of various economic instruments²⁸.

Scientific novelty. SPI's are well-known and effective state policy incentives. Their integration into state policymaking is a promising step for Armenia, especially in the scope of the greening of the economy. Green practices are relatively new and their integration into agri-food systems requires carefully detailed and monitored state intervention. The scientific novelty of the study is the introduction of SPI as a critical policy tool on the path of green agriculture.

Conclusion. Green agriculture promotion through SPIs involves bridging the gap between scientific research and policy-making to foster sustainable agricultural practices. Here are some recommendations for effectively promoting green agriculture:

- Form collaboration platforms: forming panels that include scientists, policymakers, farmers, and industry representatives to ensure diverse perspectives in decision-making. These panels can guide research priorities and policy development. Collaboration platforms can also be manifested through events that bring together researchers, policymakers, and practitioners to discuss recent scientific advancements and policy needs in green agriculture like workshops and conferences.
- Strengthen data sharing and research integration: creation of centralized databases that pile up research findings, best practices, and case studies on green agriculture. Ensure these databases are accessible to all the stakeholders (both scientists and policymakers). The researchers must be encouraged to focus on applied research that addresses specific policy questions and practical challenges faced by farmers. The research agendas must be aligned with policy goals and agricultural needs.
- Strengthen the policy support of green technologies: Implementation of policies that provide financial incentives (subsidies or tax credits) for the adoption of sustainable agricultural technologies and practices.
- Improve Knowledge Transfer through the promotion of the agriculture extension services: Improvement of the agricultural extension system will lead to the dissemination of knowledge about green practices to farmers. On the path of that knowledge transfer improvement integrate green agriculture topics into educational curriculums from schools to universities. Promote learning opportunities for farmers and agricultural professionals.
- Foster Public-Private Partnerships: Engage private companies in developing and scaling up green agricultural technologies. Public-private partnerships can

28 "Green Economy Guide", Volume 3: "Exploring Green Economy Policies and International Experience in the Field of National Strategies", Department of Sustainable Development, United Nations. The source:
<https://sustainabledevelopment.un.org/content/documents/738GE%20Publication.pdf>, pages 27-28.

accelerate innovation and adoption. Encourage companies to invest in sustainable agricultural practices as part of their Corporate Social Responsibility (CSR). This can include supporting research, funding pilot projects, or providing technical support.

- **Implement Evidence-Based Policies:** Base agricultural policies on robust scientific evidence and data. Ensure that policy decisions are informed by the latest research and best practices in green agriculture. Establish mechanisms for monitoring and evaluating the effectiveness of green agriculture policies. Use this feedback to refine and improve policy approaches.

- **Promote Farmer Involvement and Stakeholder Engagement:** involving farmers in the policy-making process to ensure that policies are practical and address real-world challenges. Conduct surveys and focus groups to gather input from the farming community. Strengthen farmer organizations and networks that promote green agriculture. These groups can serve as platforms for sharing knowledge and advocating for supportive policies.

Promoting green agriculture through effective SPIs requires a comprehensive approach that integrates research, policy, and practical implementation. By fostering collaboration, improving data sharing, supporting innovation, and involving stakeholders, policymakers can create an enabling environment for sustainable agricultural practices. This approach not only enhances environmental sustainability but also supports long-term agricultural productivity and resilience.

REFERENCES

1. AGRA (2016). Africa Agriculture Status Report 2016: Progress towards Agricultural Transformation in Africa. <https://agra.org/wp-content/uploads/2017/09/aasr-report-2016-press0409201601.pdf>
2. Bennett, N., Satterfield, T., Environmental governance: A practical framework to guide design, evaluation, and analysis. *Conservation Letters*, e12600. 2018, doi:10.1111/conl.12600
3. Berkes, F., Environmental Governance for the Anthropocene? Social-Ecological Systems, Resilience, and Collaborative Learning. *Sustainability*, 9, Article No. 1232. 2017, <https://doi.org/10.3390/su9071232>
4. Brouwer, R., Martin-Ortega, J., Berbel, J., Spatial Preference Heterogeneity: A Choice Experiment. *Land Economics*, 86(3), 2010, 552–568. doi:10.3368/le.86.3.552
5. Cash, DW., Clark, WC., Alcock, F., Dickson, NM., Eckley, N., Guston, DH., Jäger, J., Mitchell, RB. Knowledge systems for sustainable development. *Proc Natl Acad Sci U S A*. 2003 Jul 8;100(14):8086-91. doi: 10.1073/pnas.1231332100.
6. Yongzhe, Ch., Xiaoming; F., Hanqin T., Xutong, W., Zhen, G., Feng, Yu, Shilong, P., Nan, Lv, Naiqing, P., Bojie, Fu, Ecosystem variables including GPP, NPP, ET, LST,

- et al. in China during 2001~2018 (6.14 GB) [dataset]. PANGAEA, 2021, <https://doi.org/10.1594/PANGAEA.936080>
7. European Commission. Evaluation of the impact of the CAP greening measures. 2020, https://agriculture.ec.europa.eu/system/files/2019-12/ext-eval-payment-practices-climate-leaflet_2017_en_0.pdf
 8. Fischer, F., Citizens, Experts, and the Environment: The Politics of Local Knowledge. Durham & London: Duke University Press. 2000, <https://doi.org/10.1215/9780822380283>
 9. Garrone, M., Emmers, D., Olper, A., Swinnen, J., Jobs and agricultural policy: Impact of the common agricultural policy on EU agricultural employment. Food Policy, 101744. doi:10.1016/j.foodpol.2019.101744
 10. Gibbons, M., (ed.), The new production of knowledge: the dynamics of science and research in contemporary societies. Thousand Oaks, Calif.: SAGE Publications. 1994
 11. "Green Economy Guide", Volume 3: "Exploring Green Economy Policies and International Experience in the Field of National Strategies", Department of Sustainable Development, United Nations. The source: <https://sustainabledevelopment.un.org/content/documents/738GE%20Publication.pdf>, pages 27-28.
 12. «Green Growth for SMEs in Armenia", Report. Source: https://api.icarmenia.am/public/uploads/helpfull_researches/1663844529849.pdf, pages 90-93:
 13. Green Growth for SMEs in Armenia: recommended business models. Source: <https://icarmenia.am/en/news/Green%20Growth%20for%20SMEs%20in%20Armenia:%20recommended%20business%20models>
 14. <https://openknowledge.fao.org/server/api/core/bitstreams/6e2d2772-5976-4671-9e2a-0b2ad87cb646/content>
 15. <https://op.europa.eu/en/publication-detail/-/publication/92b9b0d3-9e14-11ec-83e1-01aa75ed71a1/language-en>
 16. Kumar, J., Majid, M., Renewable energy for sustainable development in India: current status, future prospects, challenges, employment, and investment opportunities. Energy Sustain Soc 10, 2, 2020. <https://doi.org/10.1186/s13705-019-0232-1>
 17. Lemos, M., Morehouse, B., The co-production of science and policy in integrated climate assessments. Global Environmental Change, 15(1), 2005, 57–68. doi:10.1016/j.gloenvcha.2004.09.004
 18. Manucharyan, M., Food security issues in the economic security system of the Republic of Armenia, BIO Web Conf., 36, 2021, 08004 <https://doi.org/10.1051/bioconf/20213608004>
 19. Pielke, Jr, R.A. The Honest Broker: Making Sense of Science in Policy and Politics. Cambridge: Cambridge University Press. 2007

20. The unified website for publication of drafts of legal acts. Source; <https://www.e-draft.am/projects/6062>
21. RA Government, the official web page of The Ministry of Economy. Source: <https://www.mineconomy.am/page/2356>
22. Uphoff, N., The System of Rice Intensification: An Alternate Civil Society Innovation. *TATuP - Zeitschrift für Technikfolgenabschätzung in Theorie Und Praxis*, 20(2), 2011, 45–52. <https://doi.org/10.14512/tatup.20.2.45>
23. Weiss, C., The Many Meanings of Research Utilization. *Public Administration Review*, 39, 1979, 426-431. <https://doi.org/10.2307/3109916> Wunder, S., 2015. Revisiting the concept of payments for environmental services. *Ecological Economics*, 117, 234–243. doi:10.1016/j.ecolecon.2014.08.016,
24. <https://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/136727/filename/136938.pdf>

SCIENCE-POLICY INTERFACES AS A GREEN AGRI-FOOD SYSTEM DEVELOPMENT INCENTIVES

HOVHANNES ASATRYAN
HRACHYA GRIGORYAN

Abstract

Current global developments (including global warming, climate change, and its hazards, the unstable political situation in the region, the consequences of the COVID-19 pandemic, and environmental issues) bring us to the need for sustainable economic development and the formation of a green economy. Both green economy and green agriculture in Armenia have a long way to go and require some preconditions such as the formation of social, political, and economic bases and necessary policy framework. This brings us to **the relevance of the research topic**, which is the imperative of introducing new policy measures and frameworks aimed at promoting green agri-food systems in RA. **The article** aims to introduce a new policy framework for the green economy in Armenia. In the scope of the research aim following objectives were set:

1. Literature review on existing approaches and measures of green economy,
2. The state of green economy in RA,
3. The proposal of policy incentives for green agri-food system development.

In the scope of this research article, descriptive, statistical, and scientific-historical-logical methods were implemented.

Science-policy interfaces (SPIs) are well-known and effective state policy incentives. Their integration into state policymaking is a promising step for Armenia, especially in the scope of the greening of the economy. Green practices are relatively new and their integration into the agri-food system requires carefully detailed and

monitored state intervention. **The scientific novelty** of the study is the introduction of SPI as a critical policy tool on the path of green agriculture.

Promoting green agriculture through effective SPIs requires a comprehensive approach that integrates research, policy, and practical implementation. By fostering collaboration, improving data sharing, supporting innovation, and involving stakeholders, policymakers can create an enabling environment for sustainable agricultural practices. This approach not only enhances environmental sustainability but also supports long-term agricultural productivity and resilience.

Keywords. agri-food systems, Science-policy interfaces (SPIs), green economy, sustainable development, state policy, policymaking

НАУЧНО-ПОЛИТИЧЕСКИЕ ИНТЕРФЕЙСЫ КАК СТИМУЛЫ РАЗВИТИЯ ЗЕЛЕННОЙ АГРОПРОДОВОЛЬСТВЕННОЙ СИСТЕМЫ

ОГАННЕС АСАТРЯН
ГРАЧЬЯ ГРИГОРЯН

Аннотация

Текущие глобальные события (включая глобальное потепление, изменение климата и его опасности, нестабильную политическую ситуацию в регионе, последствия пандемии COVID-19 и экологические проблемы) подводят нас к необходимости устойчивого экономического развития и формирования зеленой экономики. Как зеленой экономике, так и зеленому сельскому хозяйству в Армении предстоит пройти долгий путь, и оба требуют некоторых предпосылок, таких как формирование социальных, политических и экономических основ и необходимых политических рамок. Это подводит нас к актуальности темы исследования, которая является императивом внедрения новых мер политики и рамок, направленных на продвижение зеленых агропродовольственных систем в РА. Целью статьи является представление новых политических рамок для зеленой экономики в Армении. В рамках цели исследования были поставлены следующие задачи:

1. Обзор литературы по существующим подходам и мерам зеленой экономики,
2. Состояние зеленой экономики в РА,
3. Предложение политических стимулов для развития зеленой агропродовольственной системы.

В рамках данной исследовательской статьи были реализованы описательные, статистические и научно-историко-логические методы.

Научно-политические интерфейсы (SPI) являются хорошо известными и эффективными государственными политическими стимулами. Их интеграция в государственную политику является многообещающим шагом для Армении, особенно в сфере экологизации экономики. Зеленые практики являются

относительно новыми, и их интеграция в агропродовольственную систему требует тщательного, детального и контролируемого государственного вмешательства. Научная новизна исследования заключается во введении SPI в качестве важнейшего инструмента политики на пути зеленого сельского хозяйства.

Содействие зеленому сельскому хозяйству посредством эффективных SPI требует комплексного подхода, который объединяет исследования, политику и практическую реализацию. Содействуя сотрудничеству, улучшая обмен данными, поддерживая инновации и вовлекая все заинтересованные стороны, политики могут создать благоприятную среду для развития зеленой экономики.

Ключевые слова. агропродовольственные системы, научно-политические интерфейсы (SPI), зеленая экономика, устойчивое развитие, государственная политика, разработка политики

ԳԻՏՈՒԹՅՈՒՆ-ՔԱՂԱՔԱԿԱՆՈՒԹՅՈՒՆ ԻՆՏԵՐՖԵՅՍԻՆԸ ՈՐՈՒՄ ԿԱՆԱԶ ԱԳՐՈՊԱՐԵՆԱՅԻՆ ՀԱՄԱԿԱՐԳԻ ԶԱՐԳԱՑՄԱՆ ԽԹԱՆՆԵՐ

ՀՈՎՀԱՆՆԵՍ ԱՍԱՏՐՅԱՆ ՀՐԱՉՅԱ ԳՐԻԳՈՐՅԱՆ

Համառոտագիր

Ներկայիս գլոբալ զարգացումները (գլոբալ տաքացումը, կլիմայի փոփոխությունները և դրանով պայմանավորված վտանգները, տարածաշրջանում անկայուն քաղաքական իրավիճակը, COVID-19 համավարակի հետևանքները և բնապահպանական հիմնախնդիրները) բերում են կայուն տնտեսական զարգացման և կանաչ տնտեսության ձևավորման անհրաժեշտությունը: Ե՛վ կանաչ տնտեսությունը, և՛ կանաչ գյուղատնտեսությունը Հայաստանում երկար ճանապարհ ունեն անցնելու ու պահանջում են որոշակի սոցիալական, քաղաքական և տնտեսական նախադրյալներ ու պետական համապատասխան քաղաքականություն: ՀՀ-ում կանաչ ագրոպարենային համակարգի խթանմանն ուղղված քաղաքականության, միջոցառումների ներդրման հրամայականով էլ պայմանավորված է **հետազոտության թեմայի արդիականությունը: Հոդվածի նպատակն է ներկայացնել** Հայաստանում կանաչ տնտեսության խթանման քաղաքականության նոր մոտեցումներ, որի շրջանակներում դրվել են հետևյալ խնդիրները.

1. Կանաչ տնտեսության ձևավորմանն ուղղված մոտեցումների և միջոցառումների գրականության վերլուծություն,

2. ՀՀ-ում կանաչ տնտեսության վիճակի վերլուծություն,

3. Կանաչ ագրոպարենային համակարգի զարգացման քաղաքականությանը ուղղված առաջարկությունների ներկայացում:

Հետազոտության շրջանակներում կիրառվել են նկարագրական, վիճակագրական և պատմական-տրամաբանական հետազոտության մեթոդներ:

Գիտություն-քաղաքականություն ինտերֆեյսները (SPIs) հանրահայտ և արդյունավետ պետական քաղաքականության գործիքներ են: Դանց ինտեգրումը պետական քաղաքականության մշակման գործընթացում խոստումնալից քայլ է Հայաստանի համար, հատկապես կանաչ տնտեսության ձևավորման ճանապարհին: Կանաչ տնտեսության մոտեցումները համեմատաբար նոր են, և դրանց ինտեգրումը ագրոպարենային համակարգին պահանջում է մանրակրկիտ և վերահսկվող պետական միջամտություն: Հետազոտության **գիտական նորույթը** Գիտություն-քաղաքականություն ինտերֆեյսների ներդրումն է՝ որպես կանաչ գյուղատնտեսության ձևավորման ճանապարհին քաղաքականության կարևոր գործիք:

Կանաչ գյուղատնտեսության խթանումը արդյունավետ Գիտություն-քաղաքականություն ինտերֆեյսների միջոցով պահանջում է համապարփակ մոտեցում, որը մեկտեղում է գիտական հետազոտությունը, պետական քաղաքականությունը և գործնական իրականացումը: Խթանելով համագործակցությունը, բարելավելով տվյալների փոխանակումը, աջակցելով նորարարությանը և ներգրավելով բոլոր շահագրգիռ կողմերին՝ քաղաքականություն մշակողները կարող են ստեղծել բարենպաստ միջավայր կանաչ տնտեսության զարգացման համար:

Բանալի բառեր: Ագրոպարենային համակարգ, Գիտություն-քաղաքականություն ինտերֆեյսներ, կանաչ տնտեսություն, կայուն զարգացում, պետական քաղաքականություն, քաղաքականության մշակում: