

EVALUATION OF AGRITECH COMPANIES' SOCIAL IMPACT: OPPORTUNITIES FOR APPLYING EUROPEAN EXPERIENCE IN UKRAINE

ОЦІНКА СОЦІАЛЬНОГО ВПЛИВУ AGRITECH КОМПАНІЙ: МОЖЛИВОСТІ ДЛЯ ЗАСТОСУВАННЯ ЄВРОПЕЙСЬКОГО ДОСВІДУ В УКРАЇНІ

This article focuses on determining the potential of Ukrainian AgriTech companies in addressing social, economic, and environmental challenges caused by the war. It emphasizes the importance of adopting sustainable business models, drawing from European practices, to mitigate losses estimated at US\$31.5 billion. The article determines that by adopting sustainable business models and focusing on social impact, Ukrainian AgriTech companies can play a crucial role in mitigating these losses and supporting the recovery and resilience of the agricultural sector and the economy. Effective social impact measurement, using tools like GRI, SROI, BIA, and Handbook for Product Social Impact Assessment, is essential for regulatory compliance, informed decision-making, and positive community contributions. Ukrainian AgriTech companies should prioritize measurable impact indicators, such as crop production, job creation, smallholder inclusion, climate resilience, etc., for a sustainable agricultural recovery.

Key words: AgriTech companies, social impact, sustainable development, sustainable business models, social impact indicators.

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У статті підкреслено роль AgriTech компаній у подоланні соціальних, економічних та екологічних наслідків війни в Україні, ґрунтуючись на вимірюванні потенціалу їх соціального впливу. Зазначено, що у світі зберігається гостра проблема сталого розвитку сільського господарства, оскільки за прогнозами ООН до 2050 року населення планети досягне показника 9,7 млрд. Це, в свою чергу, призведе до потреби збільшення виробництва продуктів харчування на 70%. Саме тому, питання сталого розвитку сільського господарства є ключовим у формуванні європейських політик стимулювання економічного розвитку та екологічної безпеки. Незважаючи на те, що Україна є провідним експортером сільськогосподарської продукції, вітчизняний AgriTech ринок залишається менш розвиненим, ніж у країнах ЄС, і лише обмежена кількість аграрних компаній впроваджує інновації. Така невідповідність, а також економічні та соціальні проблеми, викликані війною, підкреслюють потребу у впровадженні AgriTech компаніями сталих бізнес-моделей, орієнтованих на досягнення індикаторів соціального впливу. Адже, за оцінками Світового банку, уряду України, Європейського Союзу та Організації Об'єднаних Націй, збитки, понесені внаслідок воєнних дій, становлять 31,5 млрд. дол. США. Впроваджуючи сталі бізнес-моделі та зосереджуючись на соціальному впливі, українські AgriTech компанії можуть відіграти вирішальну роль у подоланні цих втрат та підтримці стійкого відновлення аграрного сектору. Європейський досвід свідчить про існування відповідної підприємницької екосистеми, включаючи Impact Accelerators, які реалізують програми менторської та фінансової підтримки компаній, орієнтованих на формування соціального впливу. У статті висвітлюється важливість впровадження процесу оцінки соціального впливу для AgriTech компаній в контексті посилення ролі у соціально-економічному розвитку громад та покращення взаємодії з ключовими стейкхолдерами. Опіраючись на європейську практику, у статті запропоновано інструменти та методології, які українські AgriTech компанії можуть застосувати з метою вимірювання власного соціального впливу.

Ключові слова: AgriTech компанії, соціальний вплив, сталий розвиток, сталі бізнес-моделі, індикатори соціального впливу.

Formulation of the problem. AgriTech companies have the potential to generate significant social impact through their innovative technologies and solutions. These companies are revolutionizing the agricultural sector by leveraging advanced technologies such as artificial intelligence, big data analytics, the Internet of Things, and robotics to improve productivity, efficiency, and sustainability in farming practices. By digitizing and automating various processes in the agriculture value chain, AgriTech companies are able to enhance crop yields, optimize resource allocation, minimize inputs, and reduce environmental impact. Furthermore, adopting AgriTech solutions can have a positive social impact by addressing critical challenges faced by the agriculture industry. For example, remote sensing technologies and satellite

imagery can help farmers monitor and manage their crops more effectively, enabling them to detect early signs of disease or nutrient deficiencies and promptly mitigate losses. Also, AgriTech companies can contribute to food security by improving supply chain efficiency and reducing post-harvest losses. However, in Ukraine, the issue of measuring the social impact of AgriTech companies is less acute than in the European practice.

Analysis of recent research and publications. Measuring and evaluating social impact has been gaining importance over the years. There has been a growing interest among scientists in determining the impact of a business activity or decision on society and the environment. Such authors as W. Alomoto, A. Niñerola and L. Pié provided an exhaustive

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analysis of the literature about the tools for measuring social impact and their evolution over the last 50 years [1]. In his article, S. Lazzarini discussed alternative methods to assess impact and suggested novel research avenues to inform the debate on measuring impact and how these practices can help organizations blend social and economic goals [2]. D. Iannaci considers that organizations should prioritize the needs of their stakeholders in reporting practices, as this approach enhances accountability, transparency, stakeholder engagement, and the communication of values and social impact, ultimately contributing to the common good [3]. No less detailed attention should be paid to the works of such scholars as A. Tharani, L. Brandstetter, O. Lehner, T. Bergmann, H. Utikal, G. Serafeim, M. Hutchins, J. Richter, M. Henry, J. Sutherland. Ukrainian researchers do not distinguish the concept of the social impact of organizations. Mostly, only corporate social responsibility (CSR) is the object of research. However, social impact focuses on the specific outcomes and effects of an organization's actions on society. At the same time, CSR is a broader concept encompassing a company's commitment to ethical, sustainable, and socially responsible practices. While both are important in promoting positive change, social impact tends to be more quantifiable and outcome-driven. This problem emphasizes the relevance of the study presented in this article.

Formulation of the goals of the article. This article aims to emphasize the significant potential of the social impact of AgriTech companies by proposing tools for measuring it using European practice.

Presenting main material. In the global context, innovations in the agricultural sector are considered the main driver of solving the problems of sustainable development. According to the UN forecasts, the world's population will have grown to 9.7 billion by 2050. In order to feed such people, it is necessary to increase the current production of food products to 70%. Therefore, only in 2021 AgriTech and FoodTech startups attract more than 51.7 billion dollars, 80% more than in 2020 [4].

In addition, there are significant changes in the policy regulating the development of the agrarian sector in European countries. In particular, the European Green Course (European Green Deal), Strategy «from farm to fork» (Farm that Fork, F2F) and Biodiversity Conservation Strategies (Biodiversity strategies) predict the achievement of the following goals: reduction of nutrient loss by 50% and use of chemical fertilizers by 20%; reducing the use of chemical pesticides by 50%; reducing the use of antimicrobial drugs by 50%; increasing the area of organic farming to 25% of all agricultural land in use [5].

At the same time, despite Ukraine's leading position among exporters of agricultural products,

the AgriTech market in our country remains less developed than in the EU and the USA. The share of Ukrainian agricultural companies that implement innovations does not exceed 10% [6].

As of September 2023, there were 86 AgriTech startups in Ukraine at various stages of development [7], the classification of which is presented in Figure 1.

Given the challenges and threats to the development of Ukraine's agricultural sector caused by the war, using sustainable business models (SBMs) for AgriTech companies is becoming critical. According to estimates of the World Bank, the Government of Ukraine, the European Union, and the United Nations, war losses include the foregone farm income due to lower/forgone production volume (e.g., unharvested crops), lower farm gate prices (due to export logistic disruptions), higher additional farm production costs (e.g., fertilizers and fuel, the cost of affected land recultivation after survey, clearance and land-release, and the halt of fishing operations). The losses add up to US \$31.5 billion [8].

By combining sustainable business models with a focus on social impact, AgriTech companies can contribute significantly to mitigating the losses and challenges faced by Ukraine's agricultural sector due to the war, ultimately supporting the sector's recovery and resilience (Table 1).

At the same time, it should be noted that Ukrainian AgriTech companies need to learn how to implement sustainable business models and measure and report on their social impact to stakeholders. The European experience shows the existence of an appropriate entrepreneurial ecosystem, which includes organizations that serve as an agent or brokers in the innovation process and can support sustainable entrepreneurs through various generic and customized activities such as forecasting and road mapping, information gathering and dissemination, fostering networking and partnerships, prototyping and piloting, technical consulting, resource mobilization, commercialization, and branding and legitimation [9].

In European countries, such an entrepreneurial ecosystem is formed by Impact Accelerators. For example, G-Accelerator – is a Program supporting next-generation entrepreneurs with Innovative and Triple impact ideas. That means companies who care about improving the world and society through sustainable business models that are socially, economically, and environmentally responsible [10]. .wave is a solution oriented accelerator program championing sustainable start-ups in the Central-Eastern Europe region [11]. WorldStartup, as a global entrepreneurship platform, offers a variety of support and innovation programs for ambitious, impact-driven changemakers [12]. Every year, dozens of competitions for participation in Impact Accelerator programs are announced in Europe.

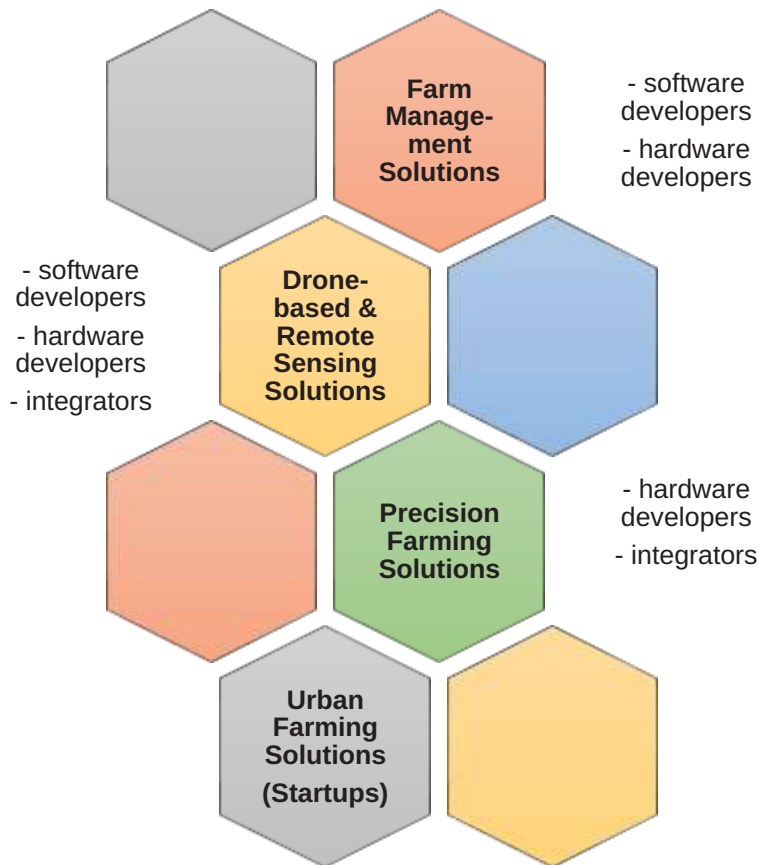


Figure 1. Types of AgriTech companies operating on the market of Ukraine [6]

A fundamental goal of such programs is to train participants to measure impact metrics to assess their business's social and sustainability performance. Social impact assessment is a critical process for AgriTech companies and startups, as it helps them understand and quantify the effects of their activities on society, the environment, and the economy. This process allows AgriTech companies to meet regulatory requirements and make more informed business decisions, improve their reputation, and contribute positively to the communities and industries they serve (Figure 2).

Based on European practice, AgriTech companies can use different social impact measurement tools and methodologies:

- The Global Reporting Initiative (GRI) set of standards for sustainability reporting, covering various social, environmental, and economic topics: Emissions, Climate adaptation and resilience, Biodiversity, Natural ecosystem conversion, Soil health, Pesticides use, Water and effluents, Waste, Food security, Food safety, Animal health and welfare, Local communities, Land and resource rights, Rights of indigenous peoples, Non-discrimination and equal opportunity, Forced or compulsory labor, Child labor, Freedom of association and collective bargaining, Occupational health and safety, Employment

practices, Living income and living wage, Economic inclusion, Supply chain traceability, Public policy, Anti-competitive behavior, Anti-corruption [15].

- The Social Return on Investment (SROI) – is a tool that can be employed by AgriTech companies to evaluate the potential risks and opportunities associated with the impact of their products and services on various stakeholders. These stakeholders encompass employees, suppliers, customers, the environment, and the local communities they operate in [16, p. 11]. However, measuring SROI is a rather laborious and expensive procedure that requires the involvement of specialists in this area. Therefore, this methodology is not appropriate at the early stages of the company's life cycle.

- B Impact Assessment (BIA) – this online impact measurement tool is free and all-encompassing, catering to various businesses and activities. It is interactive and offers a thorough assessment examining a business's impact on all its stakeholders, including employees, suppliers, the local community, and the environment. Moreover, it collects valuable insights on the best approaches to a business's mission, measurement techniques, and governance practices [17].

- The Handbook for Product Social Impact Assessment – represents a practical methodology

Possible social impact of AgriTech companies with a sustainable business model in the context of solving the problems of agricultural sector development caused by the war

Direction	Social impact
Increasing the productivity of agricultural producers	Sustainable AgriTech solutions can enhance productivity by optimizing resource allocation, promoting efficient farming practices, and mitigating the impact of disrupted supply chains
Improving the efficiency of resource use in farming	AgriTech innovations can minimize resource wastage, such as water and fertilizers, reducing additional production costs and environmental impact
Supply chain optimization	AgriTech solutions can improve supply chain logistics, reducing delays and ensuring farm produce reaches markets at fair prices despite export disruptions
PROVIDING information support	AgriTech companies can provide farmers with critical information, such as market prices and weather forecasts, enabling them to make informed decisions that maximize their income
Implementation of sustainable development practices for the agricultural sector	AgriTech companies can promote sustainable and environmentally friendly farming practices, contributing to long-term agricultural resilience and reducing the need for costly inputs
Cooperation with international, partners, investors and donors	AgriTech companies can establish sustainable and effective partnerships with international companies and grant-making organizations to access the resources and expertise needed to address complex challenges in the agricultural sector (e.g., mine clearance) caused by war.
Soil health management	AgriTech solutions can assist farmers in maintaining and improving soil health, which is essential for long-term agricultural sustainability and resilience against the adverse effects of war-related disruptions
Implementation of precision farming practices	Precision agriculture technologies can optimize resource use by applying inputs like fertilizers and pesticides precisely where needed, reducing costs and environmental impact
Empowering smallholders and family farms	AgriTech solutions can empower small-scale and family farmers by providing them affordable access to technology and knowledge, ensuring they can continue farming effectively during difficult times.

Source: proposed by the authors

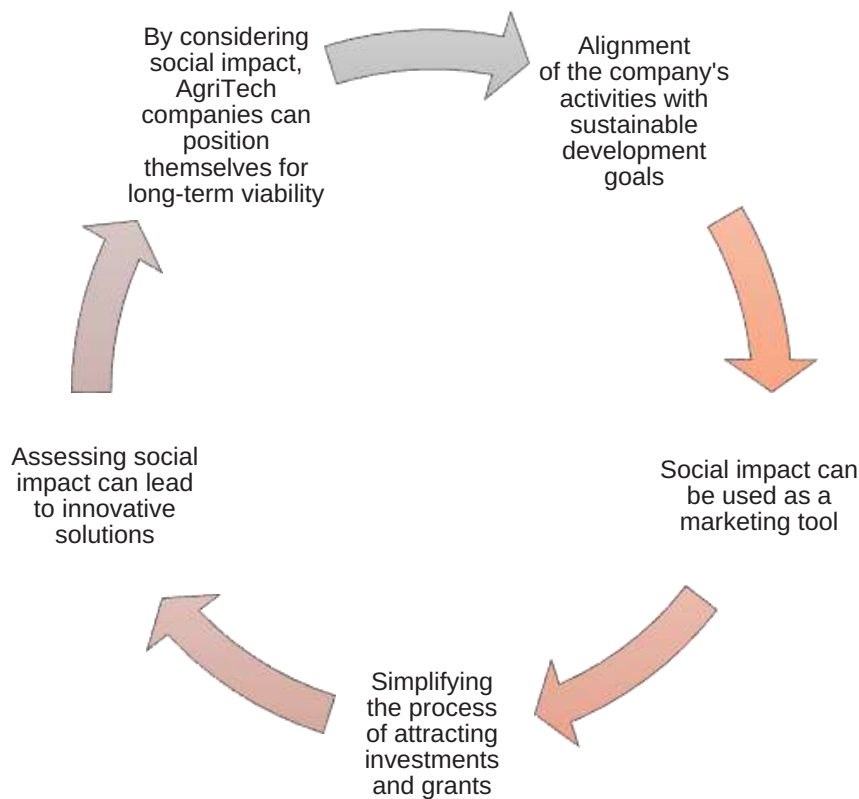


Figure 2. Main benefits of social impact assessment for AgriTech companies

Source: Compiled and supplemented by the authors based on [13; 14]

developed through a rigorous two-year collaborative effort involving prominent European industry leaders and sustainability experts. It is a pioneering approach for evaluating a product's social impact across its entire life cycle. What makes this methodology unique is its rigorous testing and endorsement by significant businesses, who have applied it in real-world scenarios through six diverse pilot projects. According to the methodology, the impact assessment method aggregates performance indicators into social topic scores, stakeholder scores, and the total score [18].

Nevertheless, despite the existence of a wide range of tools and methodologies, Ukrainian AgriTech companies should start with the practice of identifying social impact indicators: the percentage increase in crop production resulting from AgriTech solutions, contributing to food security and economic recovery, the number of new job opportunities created in rural areas due to AgriTech adoption, aiding economic recovery and social stability, the percentage of smallholder farmers gaining access to AgriTech tools and services, promoting social equity and economic inclusion, the percentage of war-affected agricultural areas that are being revitalized with the help of AgriTech, aiding economic recovery and environmental restoration, the improvements in farms' ability to adapt to changing weather patterns and climate conditions, enhancing agricultural resilience in a post-war environment etc.

Conclusions and suggestions. The war in Ukraine has resulted in significant losses in social and economic terms. The mining of agricultural areas, reduction of export-import operations, and lack of labor are significant factors in developing new approaches to the social responsibility policy of Ukrainian businesses. AgriTech companies in Ukraine hold tremendous potential to address the multifaceted challenges stemming from the war. These companies can serve as pivotal players in improving food security, generating employment opportunities, and advancing sustainable agricultural practices, ultimately contributing to the nation's recovery and resilience. To embark on this transformative journey, Ukrainian AgriTech companies should prioritize the development of sustainable business models. These models should be designed to strike a balance between profitability and the achievement of social, economic, and environmental objectives. Social impact measurement is pivotal. Ukrainian AgriTech companies must invest in the systematic measurement and reporting of their social impact. This entails identifying and tracking critical social impact indicators, such as crop production increases, job creation, and the inclusion of smallholder farmers, while continuously assessing their progress. Moreover, Ukrainian AgriTech companies should collaborate with governmental bodies, non-governmental organizations, and international

partners. Such alliances can foster a supportive ecosystem for sustainable agriculture, enabling shared efforts to address challenges and amplify positive sector impact.

REFERENCES:

1. W. Alomoto, A. Niñerola, L. Pié (2022). Social Impact Assessment: A Systematic Review of Literature. *Social Indicators Research: An International and Interdisciplinary Journal for Quality-of-Life Measurement*. Springer. Vol. 161(1). P. 225–250.
2. S. G. Lazzarini (2018). The measurement of social impact and opportunities for research in business administration. *RAUSP Management Journal*. Vol. 53. Iss. 1. P. 134–137.
3. D. Iannaci (2020). Reporting tools for social enterprises: between impact measurement and stakeholder needs. *European Journal of Social Impact and Circular Economy*. Vol. 1. No. 1b. P. 1–18. Available at: <https://ojs.unito.it/index.php/ejsice/article/view/4486/4262>
4. Fostering Agritech Innovation Learnings From Cultiv@Te: UNDP'S Global Innovation Initiative For Sustainable Agriculture. Available at: <https://www.undp.org/sites/g/files/zskgke326/files/2022-07/UNDP-Cultiv%40te-FinalReport-June2022-compressed.pdf>
5. S. Noleppa. HFFA Research GmbH Ettore Capri. Opera Research. Executive Summary. Achieving global food security without compromising free trade or agricultural productivity: a global perspective on the EU's Green Deal and the role of innovation for sustainable agriculture. Available at: <https://operaresearch.eu/achieving-global-food-security-without-compromising-free-trade-or-agricultural-productivity-a-global-perspective-on-the-eus-green-deal-and-the-role-of-innovation-for-sustainable-agriculture>
6. Ukrainian Agritech Industry Guide. Available at: http://agritech.unit.city/guide/f98ewf9fewfw/AgriTech_Industry_guide_ua.pdf
7. Tracxn Technologies. Research company. Official website. Available at: <https://tracxn.com/explore/AgriTech-Startups-in-Ukraine>
8. The World Bank, the Government of Ukraine, the European Union, the United Nations. Ukraine rapid damage and needs assessment. February 2022 – February 2023. Available at: <https://documents1.worldbank.org/curated/en/099184503212328877/pdf/P1801740d1177f03c0ab180057556615497.pdf>
9. Bergmann T., Utikal H. (2021). How to Support Start-Ups in Developing a Sustainable Business Model: The Case of an European Social Impact Accelerator. *Sustainability*. № 13(6): 3337. Available at: <https://www.mdpi.com/2071-1050/13/6/3337>
10. G-Accelerator Impact Call 2023. Available at: <https://www.global-business-school.org/landing/g-accelerator-eng>
11. .wave. An Accelerator Program. Available at: <https://waveacceleration.com>
12. WorldStartup. A global entrepreneurship platform. Available at: <https://impactprosper.com/impact-accelerators-in-europe/>

13. Interim Impact Evaluation of the Agri-Tech Catalyst. Phase 1 – Final Report. BEIS Research Paper Number 2020/023. Available at: <https://assets.publishing.service.gov.uk/media/5f0851b4e90e0712c7aa02cc/agritech-catalyst-phase-1-report.pdf>

14. A. Asthana, T. Brennan, D. Eickholt, J. Levene. How agtech start-ups can survive a capital drought. Available at: <https://www.mckinsey.com/industries/agriculture/our-insights/how-agtech-startups-can-survive-a-capital-drought>

15. The Global Reporting Initiative (GRI). Official website. Available at: <https://totalenergies.com/sustainability/reports-and-indicators/reporting-standards/gri>

16. A guide to Social Return on Investment. Available at: <http://www.socialvaluelab.org.uk/wp-content/uploads/2016/09/SROI-a-guide-to-social-return-on-investment.pdf>

17. The B Impact Assessment. Net4SocialImpact.eu platform, created within the framework of the Interreg Central Europe project CE RESPONSIBLE. Available at: <https://net4socialimpact.eu/resource/the-b-impact-assessment>

18. Fontes J., Gaasbeek A., Goedkoop M., Contreras S., Evitts S. (2016). Handbook for Product Social Impact Assessment 3.0. Available at: https://www.researchgate.net/publication/312802992_Handbook_for_Product_Social_Impact_Assessment_30

БІБЛІОГРАФІЧНИЙ СПИСОК:

1. W. Alomoto, A. Niñerola, L. Pié. Social Impact Assessment: A Systematic Review of Literature. *Social Indicators Research: An International and Interdisciplinary Journal for Quality-of-Life Measurement*. 2022. Springer. Vol. 161(1). P. 225–250.

2. S. G. Lazzarini. The measurement of social impact and opportunities for research in business administration. *RAUSP Management Journal*. 2018. Vol. 53. Iss. 1. Pp. 134–137.

3. D. Iannaci. Reporting tools for social enterprises: between impact measurement and stakeholder needs. *European Journal of Social Impact and Circular Economy*. 2020. Vol. 1. No. 1b. P. 1–18. URL: <https://ojs.unito.it/index.php/ejsice/article/view/4486/4262>

4. Fostering Agritech Innovation Learnings From Cultiv@Te: UNDP'S Global Innovation Initiative For Sustainable Agriculture. URL: <https://www.undp.org/sites/g/files/zskgke326/files/2022-07/UNDP-Cultiv%40te-Final-Report-June2022-compressed.pdf>

5. S. Noleppa. HFFA Research GmbH Ettore Capri. Opera Research. Executive Summary. Achieving global food security without compromising free trade or agricultural productivity: a global perspective on the EU's Green Deal and the role of innovation for sustainable agriculture. URL: <https://operaresearch.eu/>

achieving-global-food-security-without-compromising-free-trade-or-agricultural-productivity-a-global-perspective-on-the-eus-green-deal-and-the-role-of-innovation-for-sustainable-agriculture

6. Ukrainian Agritech Industry Guide. URL: http://agritech.unit.city/guide/f98ewf9fewfw/AgriTech_Industry_guide_ua.pdf

7. Tracxn Technologies. Research company. Official website. URL: <https://tracxn.com/explore/AgriTech-Startups-in-Ukraine>

8. Ukraine rapid damage and needs assessment. February 2022 – February 2023. The World Bank, the Government of Ukraine, the European Union, the United Nations. URL: <https://documents1.worldbank.org/curated/en/099184503212328877/pdf/P1801740d1177f03c0ab180057556615497.pdf>

9. Bergmann T., Utikal H. How to Support Start-Ups in Developing a Sustainable Business Model: The Case of an European Social Impact Accelerator. *Sustainability*. 2021. #13(6):3337. URL: <https://www.mdpi.com/2071-1050/13/6/3337>.

10. G-Accelerator Impact Call 2023. URL: <https://www.global-business-school.org/landing/g-accelerator-eng>.

11. .wave. An Accelerator Program. URL: <https://waveacceleration.com/>.

12. WorldStartup. A global entrepreneurship platform. URL: <https://impactprosper.com/impact-accelerators-in-europe/>.

13. Interim Impact Evaluation of the Agri-Tech Catalyst. Phase 1 – Final Report. BEIS Research Paper Number 2020/023. URL: <https://assets.publishing.service.gov.uk/media/5f0851b4e90e0712c7aa02cc/agritech-catalyst-phase-1-report.pdf>

14. A. Asthana, T. Brennan, D. Eickholt, J. Levene. How agtech start-ups can survive a capital drought. URL: <https://www.mckinsey.com/industries/agriculture/our-insights/how-agtech-startups-can-survive-a-capital-drought>

15. The Global Reporting Initiative (GRI). Official website. URL: <https://totalenergies.com/sustainability/reports-and-indicators/reporting-standards/gri>

16. A guide to Social Return on Investment. URL: <http://www.socialvaluelab.org.uk/wp-content/uploads/2016/09/SROI-a-guide-to-social-return-on-investment.pdf>

17. The B Impact Assessment. Net4SocialImpact.eu platform, created within the framework of the Interreg Central Europe project CE RESPONSIBLE. URL: <https://net4socialimpact.eu/resource/the-b-impact-assessment/>

18. Fontes J., Gaasbeek A., Goedkoop M., Contreras S., Evitts S. Handbook for Product Social Impact Assessment 3.0. 2016. URL: https://www.researchgate.net/publication/312802992_Handbook_for_Product_Social_Impact_Assessment_30