UDC 330.3+338.24:656.02

Klymchuk M.
Prof., Doctor of Economic Sciences,
Professor at the Department of Supply Chain Management,
University of Manitoba,
Canada
ORCID: 0000-0001-8979-1029;
Kukharuk A.
Assoc. prof., PhD in Economics,
Department of International Economics,
National Technical University of Ukraine
"Igor Sikorsky Polytechnic Institute",
Kyiv, Ukraine
ORCID: 0000-0002-2792-4137

SUSTAINABILITY AND RESILIENCE IN SUPPLY CHAIN MANAGEMENT

Modern society is developing in the context of significant economic, political, social, and environmental transformations. The millennium problems, which scientists from all over the world are trying to comprehend at least (if not solve), remain the determining levers of tactical and strategic choices in the work of manufacturing, transportation, construction, and other vital sectors of the global economy. The issue of finding effective solutions to strengthen sustainable development and sustainability of business process participants in order to maintain quantitative and qualitative indicators and performance in the face of constant change is becoming more relevant.

The sustainability problem is particularly acute for economies operating in the face of the most severe factors, such as natural disasters and wars. In particular, an important scientific and applied task is to ensure the sustainability of supply chain management (SCM) of Ukrainian enterprises that have been operating in war conditions since 2014 and for which the establishment of supplies is becoming a challenge every day, especially since February 2022. As noted in the materials (Alicke et al, 2022), as a result of the deployment of a full-scale war of the Russian Federation against Ukraine, five main sectors will experience the greatest shocks - agricultural products, chemicals, manufacturing, metals, and oil and gas.

Supply chain management has acquired relevance in a global corporate and competitive environment (Silvestre, 2015). Academia, industry, and government have looked for ways of jointly improving economic performance and systems sustainability (Diabat et al., 2013). One way of seeing this is that environmental and social issues are linked to industrial processes carried out in supply chains (SC). The challenge is to implement alternatives to the activities in SC, fostering significant changes in the economic, environmental, and social dimensions, thus allowing success in long-term development of SCs(Luthra et al., 2017). One of these areas is the research of supply chains in Sustainable Aviation Fuel.

Sustainability (economic, environmental, and social) is pivotal to the success of existing and emerging SAF supply chains, production systems, and value propositions. From the perspective of feedstock innovation, all three parameters play important roles that cannot be ignored. Economics drive the feedstock supply chain, whether for cultivated feedstocks or collected residuals and waste streams. Compensating feedstock producers for dedicated feedstocks resulting in environmental benefits will be important for widespread adoption. From an environmental perspective, there is a strong need to develop an understanding of how biomass production and waste collection for use as a biofuel feedstock impacts air, water, soil, and biodiversit (SAF Grand Challenge Roadmap, 2022).

Another concept that is more relevant today for supply chain management in Ukraine is *resilience,* which in accordance with (Brende and Sternfels, 2022) may be explained as the ability to deal with adversity, withstand shocks, and continuously adapt and accelerate as disruptions and crises arise over time. Given the meaningful interrelationship of the concepts of sustainability and resilience (Fig. 1), we can determine that the implementation of the principles of resilience run the transition from understanding the need for sustainable development to the use of specific actions.

For instance, rebuilding destroyed airports, together with strategic road and rail connections, must be the immediate priority to reconnect Ukraine with the world once the country's airspace reopens for civil aviation. Ukraine's government aims to build or rebuild five international airports after the conflict and restore passenger traffic to the 2021 level of 16.2 million passengers. As airport infrastructure usually takes a long time to build, it is important that the investment plans are turned into action as swiftly as possible once it is safe to do so (Transport policy, 2022). The majority of the time now, fossil fuels are used by airlines to power their planes. By overcoming this dependence as soon as feasible, aviation will be less vulnerable to global crises that increase oil prices, as is now the case as a result of the conflict in Ukraine. In addition, ensuring aviation's energy security by moving away from fossil fuels offers a win-win solution for the equally pressing need to reduce CO2 emissions. The technical and economic challenges are significant and will take a lot of work to overcome.

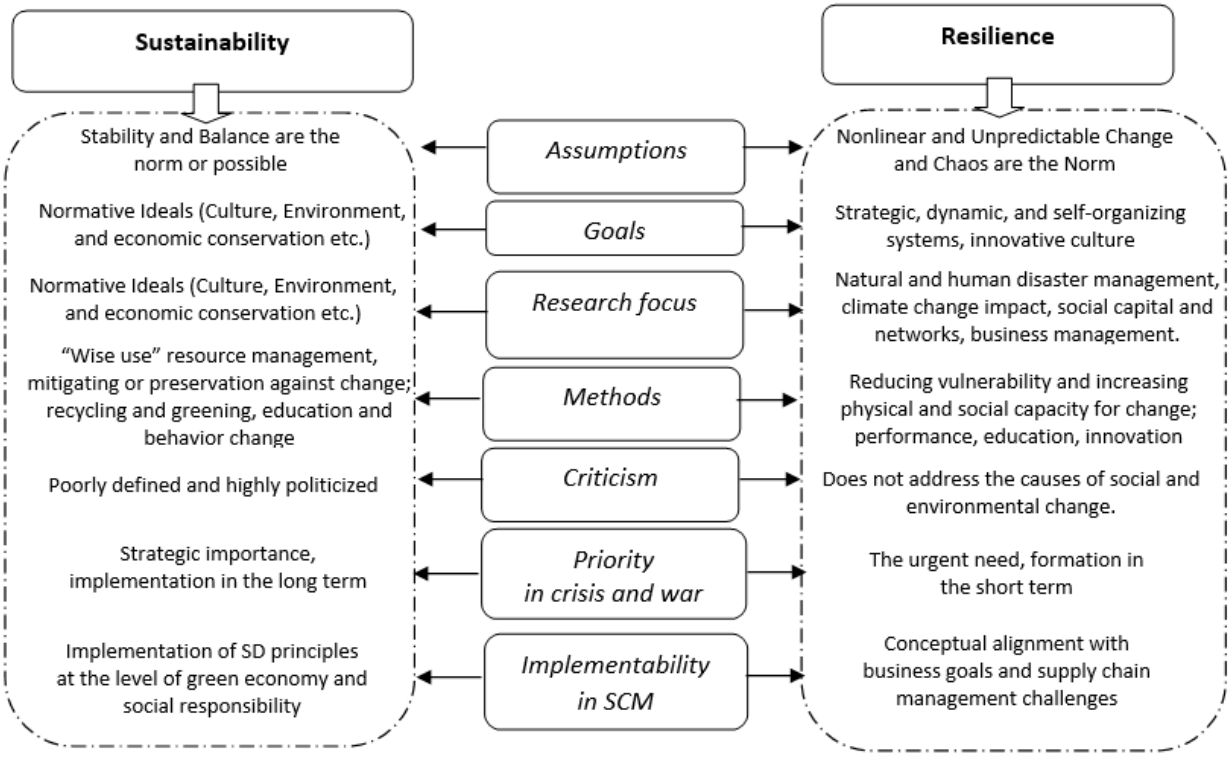

Figure 1 – Difference between Sustainability and Resilience in the context of SCM
Source: developed by authors based on (Lew et al., 2016)

A necessary condition for the transition from concept to real actions in the direction of building an effective supply chain management system is focusing on specific measures that can be implemented in the short term at enterprises that, for example, have undergone relocation or lost a significant part of logistics routes in the occupied territories. The measures of the first priority should be the following: provision of flexible management of stocks; organization of operational transportation management; use of flexible automated transportation management systems.

References:

1. Alicke K., Bayazit C., Beckhoff T., Foster T., and Mysore M., "Supply chains: To build resilience, manage proactively" McKinsey & Company, 2022, retrieved from: https://www.mckinsey.com/capabilities/operations/our-insights/supply-chains-to-build-resilience-manage-proactively#/ (date of application: 02.04.2023)
2. Silvestre B. S., "Sustainable supply chain management in emerging economies: Environmental turbulence, institutional voids and sustainability trajectories", International Journal of Production Economics, vol. 167, pp. 156-169, 2015. http://dx.doi.org/10.1016/j.ijpe.2015.05.025 (date of application: 02.04.2023)
3. Diabat A., Abdallah T., Al-Refaie A., Svetinovic D., and Govindan K., "Strategic closed-loop facility location problem with carbon market trading", IEEE Transactions on Engineering Management, vol. 60, no. 2, pp. 398- 408, 2013. https://doi.org/10.1109/TEM.2012.2211105
4. Luthra S., Govindan K., Kannan D., Mangla S. K., and Garg C. P., "An integrated framework for sustainable supplier selection and evaluation in supply chains", Journal of Cleaner Production, vol. 140, pp. 1686-1698, 2017. http://dx.doi.org/10.1016/j.jclepro.2016.09.078 (date of application: 02.04.2023)
5. SAF Grand Challenge Roadmap. Flight Plan for Sustainable Aviation Fuel (2022). Prepared by the U.S. Department of Energy, U.S. Department of Transportation, and U.S. Department of Agriculture, in collaboration with the U.S. Environmental Protection Agency. biomassboard.gov.
6. Bende B. and Sternfels B., "Resilience for sustainable, inclusive growth", McKinsey & Company, 2022, retrieved from: https://www.mckinsey.com/capabilities/risk-and-resilience/our-insights/resilience-for-sustainable-inclusive-growth.
7. Transport Policy Responses to the War in Ukraine (2022) No. 3. OECD/ITF. https://www.itf-oecd.org/sites/default/files/docs/ukraine-impacts-aviation.pdf. (date of application: 02.04.2023)
8. Lew, A.A., Ng., P.T., Ni, C-C., and Wu, T-C. Community Sustainability and Resilience:Similarities, Differences and Indicators. Tourism Geographies, 2016, 18(1): 18-27. 10.1080/14616688.2015.1122664.