EXECUTIVE SUMMARY STAGE IV

"PROTOTYPING SOLUTIONS"

SIMBIO
SOCIAL INNOVATION MANAGEMENT FOR BIOPLASTICS

The fourth stage of the SIMBIO project 'Prototyping solutions' (Figure 1) was aimed at conducting rapid prototyping and testing the most important and urgent solutions of the main problems and barriers to the bio-packaging market development in accordance with the circular economy principles in Poland. The solutions selected for prototyping should serve to increase the share of compostable packaging in the food packaging market, because this type of packaging is currently potentially the most ecological alternative to conventional plastic packaging. To meet the main objective of the 4th stage, the collaboration with and between the key stakeholders of food bio-packaging supply chains has been deepened and advanced.

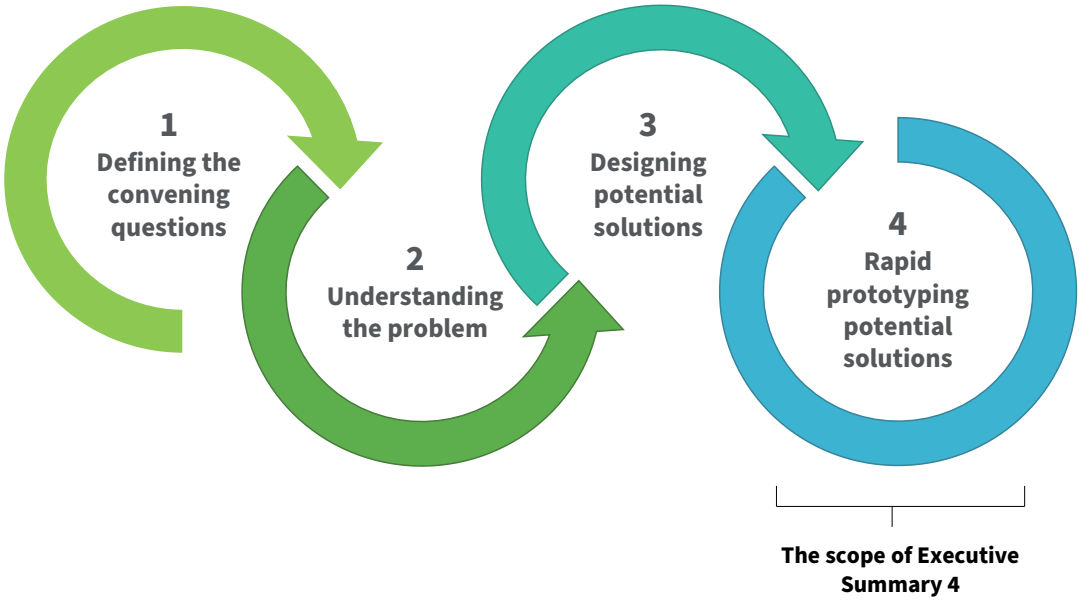

Figure 1. The four stages of the SIMBIO project

In order to successfully implement the 4th stage of the project, the SIMBIO research team conducted several tasks presented in Figure 2. All of the tasks were completed between 01/11/2021 and 30/08/2022. The starting point was a list of potential solutions for the development of bio-packaging supply chains in the circular economy, resulting from the 3rd stage of the project 'Exploring solutions'. Stakeholder representatives selected the highest priority solutions for rapid prototyping. Next, a scenario for the 3rd *Social Innovation Lab* (SIL) workshop, research questions and special diagrams were developed for the effective collaboration with stakeholders. Both external and internal stakeholders of bio-packaging supply chains were invited to participate in the 3rd SIL workshop. A total of 28 stakeholder representatives participated in the meeting: company owners, directors of public institutions, heads of standardisation and certification organisations, company managers, experts, presidents of non-governmental organisations as well as consumers.

The 3rd SIL workshop was focused mainly on the identification and evaluation of solutions with the potential for prototyping in business practice, rapid prototyping and testing of solutions in workshop conditions and the assessment of the feasibility, functionality and potential impact of solutions on the bio-packaging market development in the circular economy. The dialogue of stakeholder representatives during the workshop was organised in two online discussion panels, held on April 22 and then, on June 10, 2022. The panels were sequentially focused on the prototyping of the different solutions, which are the three following social innovations:

- the national strategy for the development of the compostable packaging market,
- industry organisation,
- digital multi-sided B2B platform.

Figure 2. Tasks completed in the 4th stage of the SIMBIO project

The findings and conclusions of the 3rd SIL workshop were enriched by the results of identification of best practices in the field of prototyped solutions and entities working on similar or related projects in other countries around the world. In this way, both the solutions desired by stakeholders for the application in Poland as well as international patterns worth following in the design and improvement of circular bio-packaging supply chains were identified. Furthermore, helpful information was gathered on potential sources of financial and other resources needed at further stages of the solutions' implementation and advancement. The 4th stage concluded with the preparation of the report and dissemination of the research results, closing all research and development tasks in the SIMBIO project. Its important achievement is the knowledge base in the field of the packaging market, the bio-packaging life cycle and supply chain management in the light of the circular economy, including a number of documents presenting conclusions, recommendations as well as theoretical and practical implications.

National strategy for the development of the compostable packaging market

The strategy concerns packaging manufactured from biobased biodegradable polymers. These kinds of polymers are in fact the most ecological alternative to fossil-based materials. They are also a source of a real chance to reduce the negative impact on the natural environment of a huge volume of waste packaging generated each year in Poland. Strategy can play a key role both to stabilise the conditions and to dynamise the development of the compostable packaging market at each macro (central government administration) level, meso- (regional and local government administration) and microeconomic (businesses and consumers). The creation of the ecosystem of external and internal stakeholders of a compostable packaging supply chain, who perform their own activities and cooperate in the circular economy, requires a coherent and integrated vision and key strategic goals defined.

Industry organisation

The industry organisation is aimed at a wide range of stakeholders representing the links of the compostable food packaging supply chains, including suppliers of raw materials and bioplastics, packaging producers, packaging distributors, waste management operators, business customers as well as research institutions. The role of the industry organisation is the integration of stakeholders in the compostable packaging market, who work towards jointly defined needs and goals development. The organisation becomes an opportunity to exchange knowledge and experience as well as the elimination of barriers limiting the development of the compostable packaging market. It connects enterprises, becoming one strong entity that works for the benefit of all parties involved, through representative, educational, research and lobbying functions. It also aims to achieve added value through trust-based cooperation in a network of various stakeholders, becoming an impetus to accelerate the development of the compostable packaging market.

Digital multi-sided B2B platform

Two-sided and multilateral technology platforms are not only a tool and a place for creation supply and demand effects, but they are now perceived through the prism of business models, network effects and value creation. Synergic results from the collaboration of different organisations are achieved especially on digital multilateral platforms B2B that gather companies in one place - supply chain participants with diverse scopes and goals of activities. Multilateral platforms that facilitate the interaction or product exchange between two or more groups of participants play a role in the online marketplace. They also facilitate transactions or constitute the basis of innovative activity in developing complementary products. By interactions between enterprises (also between market competitors) on the platform, activities may also be coordinated, undertaking joint projects or cooperation in other areas. The role of a digital multi-sided B2B platform for the development of the compostable packaging market is diverse. Firstly, it can facilitate the interaction and exchange of goods or services between two or more groups participants. Secondly, the platform is for support coordination and the improvement of material flows, information and financial as well as business relationships and processes management. Thirdly, the technology platform can also be perceived as the foundation of innovative activity in creating new, complementary services and products. Moreover, the role of technology platforms is seen as crucial in stimulating, creating and sustaining a successful innovation ecosystem that supports information and communication flows between supply chain participants.

Key recommendations for the future research and development on the compostable packaging market and supply chains in the circular economy

1. Identification and selection of key sectors of the bio-packaging market in Poland and the standardisation of norms and the circular economy nationwide.

2. Adopting a strategic perspective in shaping macroeconomic conditions, including economic and financial, legal, social, environmental and technical and technological conditions, for the long-term development of the circular economy of compostable packaging in Poland in the light of the strategy and plan of the European Green Deal.

3. Achieving coherence and synergy between the strategic directions of the circular economy development of compostable packaging in policies and programs at central, regional and local levels.

4. Supporting and developing business innovativeness of entities involved in the life cycle of compostable packaging and performing various value chain processes at the level of microeconomic - from idea to implementation and market commercialisation, as well as stimulating synergy between the bio-packaging sector and other bioeconomy sectors.

5. Raising awareness and environmental responsibility of the packaging market participants, with particular emphasis on education at all levels and between generations.

6. Investing in the development of human capital, including employees' competences, of entities involved in various types of activities in the circular economy.

7. Strengthening dialogue and cooperation between internal and external stakeholders of compostable packaging supply chains through various forms of activation (clusters, associations, industry organisations or platforms) in a cooperative cycle of co-creating value and open innovation.

8. Stimulating bottom-up initiatives and social participation in activities for the benefit of the circular economy.

9. The use of the latest technologies in order to increase the innovativeness of stakeholders in the field of products offered, performed processes and implemented business models.

10. Managing the risks associated with the specificity of compostable packaging supply chains, on the one hand, minimising the risks associated with rising resource prices or failure to meet the sustainable development requirements, and on the other - taking advantage of opportunities to increase economic, social and environmental effects.

PROJECT OVERVIEW

Title: New Frontiers in Social Innovation Research: Social Innovation Management for BIOPlastics

Acronym: SIMBIO

Keywords: social innovation, circular economy, bioplastic, packaging, supply chain

Project aim: developing social innovations to meet the challenges of using bioplastic packaging in food supply chains, based on the circular economy principles

PROGRAM

Trans-Atlantic Platform: Social Innovation Call

FUNDING INSTITUTION IN POLAND

The National Centre for Research and Development

Contract number: T-AP SI/SIMBIO/1/2020

Duration: 01.09.2020 - 31.12.2022

PROJECT PARTNERS IN POLAND

SGH Warsaw School of Economics
Project manager:
dr hab. Barbara Ocicka, prof. SGH
barbara.ocicka@sgh.waw.pl
Project team:
dr Aneta Pluta-Zaremba
dr Jolanta Turek

University of Lodz
Project manager:
dr Grażyna Kędzia (Wieteska)
grazyna.wieteska@uni.lodz.pl
Project team:
dr Beata Wieteska-Rosiak
dr Marta Raźniewska
mgr Jakub Brzeziński

INTERNATIONAL PROJECT CONSORTIUM

Coventry University (United Kingdom)
Federal University of São Carlos (Brazil)
Simon Fraser University (Canada)

PROJECT WEBSITE

www.simbioresearch.com