2.1. BioCannDo – Bioeconomy Awareness and Discourse Project

Research and Findings about Consumer Communication in Three Product-Specific Case Studies

Erik Lohse and Martin Behrens

1. Introduction to BioCannDo

Communicators face two challenges when looking at terms and concepts that help to explain the bioeconomy. The first challenge is that consumers are largely unfamiliar with bio-based terminology. What exactly the word »bio-based« means is not clear to most consumers and they might confuse it with other issues (i.e., biodegradability). The definition offered by the CEN (European Committee for Standardization) for bio-based products (EN 16575) is commonly accepted, albeit to a limited degree suitable for consumer communication.[1] The second challenge is that the terms and concepts used to understand the bioeconomy can have more than one meaning and multipliers do not use them consistently. One prominent example is the term »bioplastic«, where bioplastics can be bio-based, biodegradable, or both.

This article deals with the challenges that arise in the field of bioeconomy when communicating to non-experts, consumers specifically. We discuss the findings of the Bioeconomy Awareness and Discourse Project – BioCannDo – which was coordinated by the Agency for Renewable Resources (FNR) and funded by the Bio-Based Industry Joint Undertaking (BCD – 10/2016-09/2019). Two challenges came to the fore during the project: the lack of awareness among consumers and the gap of available, appropriate information to close that gap. While the scientific information is available, material that might actually be used to inform consumers is rare. This project aimed to close this gap for selected areas by providing examples of how we might better communicate with consumers about bio-based products. It provided information about the specific aspects to

1 European Committee for Standardization: »The term bio-based product refers to products wholly or partly derived from biomass, such as plants, trees or animals (the biomass can have undergone physical, chemical or biological treatment).« https://www.cen.eu/work/areas/chemical/biobased/Pages/default.aspx [Accessed 15.05.2021]; Nova institute 2019.

be communicated and the information formats to be used to provide information and which fits consumers' requirements. Communication messages and materials for consumer communication were designed throughout the course of this project. Product- and country-specific case studies were also conducted. The following product groups were examined as case studies: household cleaning products in Germany, insulation materials in the Netherlands and Belgium, and food packaging in Italy.

This article starts by presenting the state of the art of communication studies on bio-based products. It then describes BCD's methodological principles. The communication formats selected during the course of the project are outlined. Following on from this, the main specific and cross-cutting findings and insights are described with regard to consumer communication. This is followed by an outlook, conclusions, and practical recommendations. This article makes a practical contribution to the discussion about the greater inclusion of consumers in the bioeconomy discourse.

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a) State of the Art

The lack of public awareness about bio-based products was already pointed out within the framework of the European Commission's Lead Market Initiative (2008-2011), which fostered the development of the bio-based product sector by exploring demand-site policy measures. (European Commission 2010) There has been increasing activity in the scientific community, shedding light on various aspects of this issue, but the availability of studies dealing with communication in the bioeconomy remains limited. Studies have looked into the public perception of bio-based products and different measures by which to increase awareness among the general public as well as among specific groups such as consumers.

Concerns and wishes about the proper functioning of the bioeconomy among the public can influence public perception; however, since awareness about the bioeconomy and bio-based products is generally low, the influence of what people feel about the bioeconomy is rather limited. (Pfau et al. 2017: 3ff.) The general awareness of the bioeconomy among the public is around 50 %, according to a meta-study on public acceptance conducted by the EU project RoadToBio. (Id.: 11f.) However, specific knowledge about product characteristics is often missing and misconceptions occur among this half. (Blesin/Klein 2017) Common misconceptions include conflating bio-based products as organic (Meeusen et al. 2015), biodegradable, or recyclable. This can lead to incorrect consumption decisions and disappointment. (Pfau et al. 2017: 4; Karachaliou et al. 2017: 16f.).

The public's awareness of bio-based products could be increased by engaging citizens about the transition to a bioeconomy. (Davies et al. 2016) Various studies have looked into those factors that influence the general public's attitudes towards the bioeconomy and bio-based products.

One important finding is that if a person is generally drawn towards environmental solutions, then it is likely that they will also have a positive attitude towards bio-

based products. (Pfau et al. 2017: 4) Scherer et al. (2017) concluded that this more positive attitude comes with higher requirements for cultivation and origin of biomass (e.g., the demand to learn more about the material used, biomass origin, and related certificates). Stahl et al. have shown this in a consumer study for bio-based apparel. Environmentally cautious consumers expressed the desire for various requirements that could not necessarily be directly attributed to the final product, such as the proximity to natural ingredients, health consciousness, pollutant free products, fair trade, climate protection, and innovativeness. (Ibid.; Stahl et al. 2021)

Pfau, et al. distinguish between studies that look at associations with bio-based products as value-free connections and negative or positive connotations in their meta-study. Studies list the following associations with bio-based products: that they are made from renewable resources, biodegradable, environmentally friendly, sustainable, possibility to recycle it, that bio-based is also organic, lower carbon footprint, health, and safe to use. Positive connotations include environmentally friendly, reduced dependence on non-renewables, sustainable, economic growth, regionally produced, healthy, and innovative. Negative connotations include competition with food, »greenwashing«, expensive, product quality, monocultures, uncertain environmental impacts, and deforestation. (Pfau et al. 2017: 12f.) How a product is perceived is influenced by a person's attitude towards it; a positive attitude can stimulate a buying decision. (Meeusen et al. 2015: 26ff.) The lack of awareness about bio-based products can hamper market development if the product's unique selling point is that it is bio-based. (Pfau et al. 2017: 4) However, this is frequently not the case and, instead, products are marketed because they have genuine properties or simply have a lower price. Most consumers are somewhat unaffected by the fact that a product is bio-based and, instead, look at characteristics which are more beneficial to them directly. (Ibid.: 4) Expected personal benefits have the highest influence on buying decisions. However, misconceptions about the whole concept can lead to distrust and accusations of »greenwashing« if not all products meet high expectations (e.g., regarding the environmental performance). In addition, ethical concerns can lead to mistrust among consumers. (Ibid.: 4; Sijtsema et al. 2016)

Dammer et al. 2017 observe that almost all consumer research about bio-based products focuses on issues such as environmental benefits. These studies often ignore the view that consumers might simply buy a product for its improved functionalities, without any added environmental benefits. There is a danger in focussing communication and only marketing the environmental benefits, which can serve to side-line bio-based alternatives with improved functionalities without environmental improvements, thereby leading to unachievable expectations among consumers. (Dammer et al. 2017: 206f.) The RoadToBio meta-study concludes that transparent information is key, but that the necessary information and the format it should be presented has not been sufficiently studied. (Pfau et al. 2017: 23)

The Lead Market Initiative and the European Bioeconomy Strategy and related Action Plan (European Commission 2018) point to various market policy measures that improve the availability of information about bio-based products. Tools mentioned include standards and norms, but also certification and labels which can be relied upon to provide information on sustainability or specific product characteristics, such as biodegradability. Public information campaigns were also mentioned.

Consumers complain about a lack of information about the benefits of bio-based products and claim that they would consume more bio-based if the right information were made available. However, this need for product-specific information contradicts the demand for simple statements in other contexts (i.e., labels). (Pfau et al. 2017: 20) An OECD recommendation for the assessment of the sustainability of bio-based products generated a long list of factors that should be considered. These include energy balance, GHG reduction, renewability, anticipated product life, water and solvent use during production, direct and indirect land use for feedstock production, all aspects of end of life, conventional as opposed to alternative bio-based production economics, and impact on human and environmental health. (OECD 2021)

An Environmental Communication Guide for Bio-Based Plastics, published by the association European Bioplastics, lists the following general guidelines for good communication: Make specific, measurable and, consequently, verifiable claims, make distinct claims, omit misleading formulations, be accurate, relevant, and truthful, substantiation is key, make correct comparisons, update your claims and substantiations. (European Bioplastics 2012) This guideline is also backed-up by a United Nations Guideline on sustainability communication. (UNEP 2017)

Rumm et al. (2013) presented study participants with different label options. They showed that participants preferred the term ›renewable resources‹ over ›bio-based‹. They also argued that labels should be specific (e.g., they should give information on specific aspects, such as environmental protection or origin of materials, instead of claiming general sustainability). (Ibid.) Furthermore, any information should come from neutral sources, i.e., a public institution. (Lynch et al. 2017) The EU Open-Bio project argued against a specific label for bio-based products and suggested including bio-based products more expertly in existing sustainability labels. (Dammer 2016) Pfau et al. (2017: 7) concluded that telling a story works better with a label than with a text and that such a label should not be limited to bio-based aspects solely.

The LIFT Project shed light on several projects which used story telling. Stories can combine facts with emotions and values while connecting to individual experience. They are a strong communication tool to get complex messages across. Various formats were used to do this, among them social media, exhibitions, and street activities. The Project concluded that targeted messages are important, should be simple, concrete, and applicable to real life, but also based on scientific facts. The LIFT guidance documents further provided aspirational principles, which aim to show the complete sustainability picture (all three dimensions: economic, environmental, and social), to strive for action-oriented communication. Examples include encouraging consumers to change their behaviour, to communicate in a diverse and multi-channel way, to support collaboration to increase credibility, and to provide information which allows consumers to make comparisons between similar products. (LIFT Project 2020)

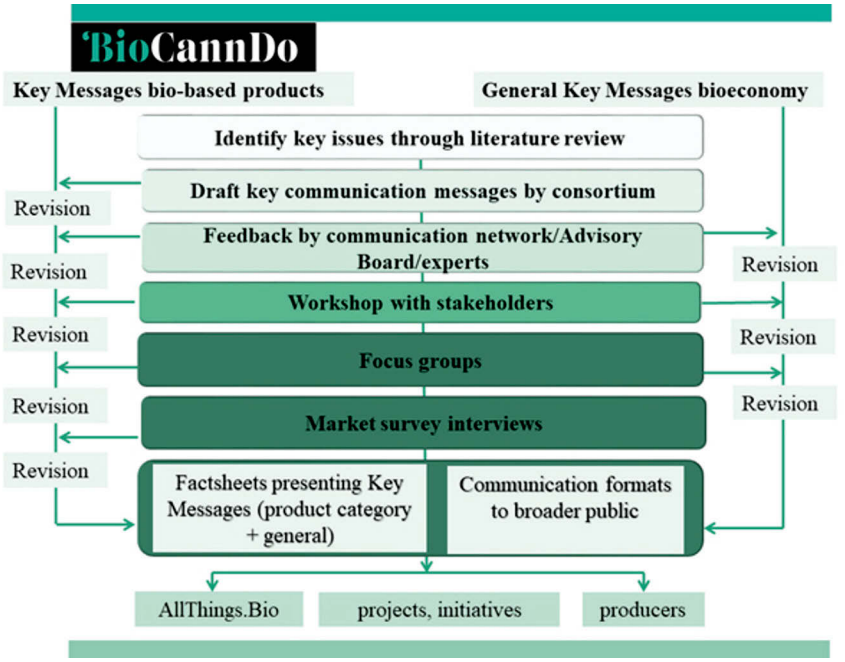
BCD combined the various findings presented above to develop product-specific communication messages for consumers and presented them in various hands-on communication formats and tools.

b) BioCannDo Case Study Approach

The BCD case studies were centred around the development of key communication messages and four sets of key messages were developed: three product-specific sets of key messages for household cleaning products, insulation materials and food packaging, and a set of general bioeconomy key messages. The section that follows describes these case studies' approach and the process of key message development.

All activities within the case studies were developed in close collaboration with stakeholders, consumers, and experts from the field using a 6-step methodology (Fig. 1). The key messages were revised and fine-tuned after each step. Three workshops/webinars were organised in Germany, the Netherlands, and Italy with over 30 experts from the respective product fields. BCD has organised a total of nine consumer focus groups in three European countries (Germany, Belgium, and Italy) with a total of 60 participants. Market survey interviews were conducted at three consumer fairs in Germany and Italy with a total of 420 respondents. (BioCannDo 2017; 2018a; 2018b; 2019b)

Figure 1: BCD case study approach



Key messages function as bite-sized statements that articulate what you do, why you do it, how you are different, and what value you or your products bring to your stakeholders. They are designed for communicators and multipliers.

During the examination of the case studies, it became clear that the expectations surrounding the BCD's key messages and their scope were very different. The differences between experts and consumers are not surprising, but there are also significant

differences within the expert groups in terms of expectations about scope, language, and the messages' level of detail. Therefore, it has been proven useful to prepare the messages at three different levels of detail to cover different information needs:

Table 1: Structure of key messages

Level	Description
1st level	key message (representing the topic e.g., functionality, environment, health);
2nd level	specifying message for each topic;
3rd level	background information with explanation and further sources.

Key messages provide the takeaway headline of an issue that is intended to be communicated. Key messages, despite their general character, can help to create a basic understanding of bio-based products and help raise awareness. They can, and should, be tailored to a certain communication activity and target group.

c) Examples of BioCannDo Communication Materials and Formats

A dedicated communication and engagement strategy has been designed around the targets' potential information needs and key messages. This strategy was implemented through a combination of formats and channels in order to raise awareness and to reach out to consumers and multipliers. This was undertaken by packaging contents into a variety of communication and engagement formats: journalistic articles, web videos, storytelling resources, facts or myths posts, popular science quizzes, or problem-solving posts. These formats were distributed via the AllThingsBio infohub which acted as an information broker of resources about bio-based products. The website (http://www.allthings.bio) facilitated access to trustworthy resources and to clear and scientifically sound messages about bio-based products that could be easily understood by the general public. (BioCannDo 2019a)

A few examples of communication formats and materials are listed below:

- www.allthings.bio: BCD infohub facilitating access to journalistic articles, materials, and formats;
- The BCD experience: »Let's talk about bio-based products: Final publication with 10 recommendations for communicators and multipliers«: http://www.allthings.bio/wp-content/uploads/2019/06/BCD-Final-publication-WEB.pdf;
- Short series of social media videos explaining different bio-based products (e.g., soap, toys, straws, lipstick): https://www.youtube.com/playlist?list=PLSTmtfw-s6X1_sE6rFz-4sXjE31L4M3IW;
- BCD factsheets with key messages about household cleaning products, insulation materials, and food packaging: https://www.allthings.bio/insights-from-biocannd o/;

- Seven things to know about the bioeconomy: https://www.allthings.bio/insights-from-biocanndo/;
- BCD factsheets on communication topics, engagement formats and bioeconomy exhibitions: https://www.allthings.bio/insights-from-biocanndo/.

2. Discussion of Main Findings

a) Main Communication Topics: Focus on and Highlight Advantages, Positive Impacts, and Innovative Functionalities

The bio-based nature of the product itself is not a selling point (see also Pfau et al. 2017: 4). The reasons to buy bio-based products are a combination of better product properties, personal benefits, and environmental/altruistic arguments. These aspects can be considered as the main communication topics. Communication about bio-based products should, therefore, always be »benefit-oriented«. Explaining functionality, performance, and the benefits of bio-based products creates an awareness and acceptance among consumers. The key question is why consumers should personally care about a bio-based product. What do consumers need or desire and what do bio-based products offer to serve this need/desire? The BCD case studies have shown that detergents must have at least the same cleaning effect as conventional products and, ideally, be healthier for the user. Bio-based insulation materials are expected to provide the same thermal insulation, durability, and safety. In the case of food packaging, consumers have clear expectations regarding environmentally-friendly disposal.

This does not mean that environmental issues or questions about the raw material base are not important, but they are one consideration among others. It can be part of a communication strategy to address the environmentally conscious niche market and to inform the public that a product is bio-based and what impact this has. The importance of environmental issues may also vary between different product groups. However, the fact that a product is made from plants or animal-based raw materials is not a decisive argument for the majority of consumers. (See also Dammer et al. 2017: 206f.)

Some further information requirements have been identified in addition to these main communication topics. These include personal economic information (price, availability, value for money), information about resources (ingredients, raw materials, organic, toxicity), and information about disposal (recyclability, biodegradability, compostability). BCD also found a number of topics that turned out to be less important. These include innovativeness, biomass cropping issues, and ethical issues (competition with food, genetic modification). (BioCannDo 2019b)

b) Avoid Misleading Statements and Raising Unrealistically High Expectations

In general, consumers have a high appreciation and (unrealistically) high expectation of climate- and waste-related environmental benefits (e.g., reduced greenhouse gas emissions, environmental-friendly disposal, biodegradability, and recyclability) as well as health benefits (e.g., better indoor climate, skin protection, less allergies). Some of

the BCD surveys' respondents had expectations regarding the social impact (e.g., fairer trade, better working conditions, less burden of pollutants on animals, and greater biodiversity). These expectations, and resulting misunderstandings, can lead to disappointment, negative consumption experiences, a negative reputation of bio-based products, and consequently to fewer repurchases. For example, many people associate biodegradability with the term »bio-based«, which is not always the case. Misunderstandings can also arise when it is unclear to buyers if the products are completely or only partially bio-based. (EEA 2018) Communication about bio-based needs to consider these limitations and exclusions. Communication should always be very clear about the actual environmental performance and product characteristics. Appropriate labels or certificates could go a long way to providing transparency and better understanding. If a product is only partly bio-based, then it is helpful to indicate the bio-based share and to clarify whether or not synthetic ingredients (e.g., melamine in bamboo dishes) are used.

Misleading claims should be avoided. Using a bio-based plastic, such as PLA in an office stapler or plastic toy, and claiming that PLA is biodegradable (under industrial composting conditions) is a correct claim for the PLA used. However, this is misleading in combination with the end-product. Firstly, it might contain a mixture of materials, not all of which are biodegradable. Secondly, even if all of the materials are biodegradable, composting is usually neither a sensible nor a realistic disposal route at present.

c) Give Clear Guidance to Consumers on the Disposal of Bio-Based Products

We observed that the communication from manufacturers on biodegradability and composting did not always correspond to the local disposal reality throughout the course of the BCD project. (BioCannDo 2019c) This applied, for example, to the use of compostable plastic bags to collect organic waste. Many composting plants reject any type of plastic bags in organic waste streams, even compostable ones, given that the processing poses technical challenges. In Germany, some waste management companies even actively campaign against households throwing compostable plastics in the organic waste bin.[2] Thus, local and regional disposal companies strongly influence the image and use of compostable and bio-based products. (Umweltbundesamt 2018)

Consumers appreciate clear and helpful guidance about the disposal of bio-based products. It is not advisable to state that a product is biodegradable if no corresponding waste management infrastructure is in place. The disposal of bio-based products is a suitable communication topic to be linked to the concept of a circular bioeconomy. Communication needs to address aspects such as re-use and the recycling of materials and products. It might prove very helpful to involve local waste management companies and municipalities in future activities to allow for discussions to take place about the advantages and disadvantages of biodegradable plastics in current waste streams. This might also help to establish a strategic partnership with important multipliers.

2 Another example from the USA: The Battle Between Oregon Composters and the Biodegradable Products Institute, https://bioplasticsnews.com/2019/04/26/the-battle-between-oregon-composters-and-the-biodegradable-products-institute/[Accessed 12.06.2022].

d) Labels are Appreciated for their Ease of Use, but are Expensive, Manifold, and not Always Transparent

Information about bio-based products is often not easily accessible for consumers. Many consumers see labels as an important factor in their decision to buy a product, even though there is a certain level of confusion and mistrust surrounding labels. The importance of labels differed largely between the three BCD case studies. They are very important for cleaning products and that is why the BCD key messages are strongly linked to labels. Labels are also seen as being very important with regard to food packaging, but no labels are available for this product group. More research is needed to evaluate if and how the benefits of introducing such a label might outweigh the costs. In the short term, it seems most relevant to provide consumers with clear information about the benefits and instructions about the disposal of food packaging materials. On the other end of the spectrum of importance, labels only play a minor role in insulation materials, due to the fact that professionals are the intermediary between the product and consumers. Adapting existing labels for use with bio-based products seems a realistic approach. However, this would require strong support from business and industrial stakeholders who need to actively follow related criteria revision processes. (InnProBio 2018; Open-Bio project 2013-2016)

The need for clear guidance has also been expressed by BCD survey participants. The overwhelming majority prefers direct identification that does not require additional effort for their part, such as searching for information online, scanning QR codes, or that is done remotely through television advertisements or videos; in short, consumers want to get the information where the product is, ideally on the product itself. (See also Rumm et al. 2013)

1. Conclusion

The involvement of consumers and experts enabled the project to develop and evaluate substantiated key messages. It has become clear that the concept of key messages also has some limitations. The messages cannot reflect every aspect of a product category. In addition, key messages need to be adapted to the context in which they are used. The BCD has not only shown which focal points communication about certain products should reflect, but also what this means for bio-based products in general.

This project has provided several recommendations for other communicators and has tested and developed different communication materials and formats.

The task at hand is to build upon these findings and to implement them in practice. The continuation and further development of dialogue and communication activities will remain an important task to communicating the importance of a transformation from a fossil-based society to a bio-based one. In this regard, clarity, transparency, and orientation towards the requirements of citizens and consumers alike are important guiding principles for future communication and outreach activities.

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