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# **TRANSFORMING SCIENTIFIC LANGUAGE INTO MESSAGES FOR THE GENERAL PUBLIC: COMMUNICATION AND DISSEMINATION OF A EUROPEAN R&D PROJECT IN THE FIELD OF FORESTRY**

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## **Abstract**

Between 2017 and 2022, the European R&D project Dendromass4Europe (D4EU) has been carried out. D4EU aimed at establishing sustainable, Short Rotation Coppice (SRC)-based, regional cropping systems with poplars for agricultural dendromass production on marginal land. The dendromass produced in the poplar SRC (ligneous biomass, bark and wood) has been used to develop innovative bio-based materials such as a functionally adapted lightweight board for furniture, eco-fungicidal packaging materials and bark-enriched wood-plastic composites.

Since the project has been funded by the Bio Based Industries Joint Undertaking (BBI JU) under the European Union's Horizon 2020 research and innovation program, the BBI JU's ambitious objectives for a broad project communication and dissemination (C&D) had to be considered. But also, in general, C&D of scientific projects is meanwhile an important part of science communication. In D4EU, a multi-channel approach in connection with a multi-channel relational model for communication has been chosen to meet the demands of a good science communication.

Referring to the experiences made throughout D4EU, this paper gives a brief overlook about the state of the art in strategic planning of communication and dissemination, summarizes some outcomes and results and highlights the lessons learnt. Furthermore, selected issues which occurred during the project C&D will be discussed in the scope of new requirements for science communication e.g., recent models of science communication and public relations.

With regard to higher forest education programmes, the evaluation of D4EU's C&D has proven the high demands for a good communication about forests and forest-related topics on the one hand and indicated that there are often deficits in forestry education in this respect on the other hand. The paper thus aims not only to analyze the status quo, but also to reveal unused potentials and highlight future needs for addressing the topic of communication in higher forest education programmes in order to satisfy the increasing interest of the public in forests and trees.

**Keywords:** Science communication, project communication, dissemination, multi-channel relational model for communication, communication strategy, evaluation, Dendromass4Europe

# 1 Introduction

During the last decades, the amount of communication and the way in which is communicated on topics related to forestry have changed significantly. In the past, scientific knowledge about forests, their growth, functions, management and utilization was often exclusively written for and used by trained forest workers or studied foresters. Due to crucial changes in society and environment (e.g. industrialization, globalization, climate change), the public's interest in forests has increased and their perception of forests has been diversified (Rametsteiner et al., 2009; Farcy et al., 2019). In addition to timber production, the ecological, carbon absorbing and recreational functions of forests are considered highly important by the majority of laypersons in large parts of Europe nowadays (Eisele & Juschka, 2022; Kleinhüchelkotten et al., 2009; Farcy et al., 2019). These developments are also reflected in the communication about forests, which has undergone a massive development: Starting with the diversification of the communication activities (e.g. use of digital and web-based channels, forestry education, production of audio-visual formats) and communicating institutions (e.g. state forestry organizations, forest-related NGOs, universities, companies in the forestry and timber sector) the communication in the field of forestry has been more and more adjusted to the rules of social marketing, public relations, storytelling and even to persuasive communication (Dobler et al., 2016; Matagne & Fastrez, 2019; Fähnrich et al., 2023). However, the wicked situation of an increasing demand for wood in times of bioeconomy on the one hand and the more frequent demands for larger forest areas for nature and climate protection on the other hand has not significantly improved so far. In recent years, scholars of forestry, environmental and science communication therefore search for optimized communication solutions in order to avoid new or solve existing conflicts.

This paper gives a brief overlook about the state of the art in strategic planning of communication and dissemination (C&D), summarizes some evaluation results and highlights the lessons learnt. Furthermore, selected issues which have been occurred during the project C&D will be discussed in the scope of science communication.

## 2 Communication subject and objectives

Between 2017 and 2022, the European Innovation Action – Demonstration (IAD) project Dendromass4Europe (D4EU) has been carried out and led by the Technische Universität Dresden (<https://www.dendromass4europe.eu/>). D4EU aimed at establishing sustainable, Short Rotation Coppice (SRC)-based, regional cropping systems with poplars (*Populus* spp.) for agricultural dendromass production on marginal land or on currently unused agricultural land. The poplar SRC were not only ought to exploit the potential of underutilized land for sustainable production. The poplar dendromass produced (ligneous biomass, bark and wood) has been used to develop four innovative new bio-based materials such as a functionally adapted lightweight board for furniture, eco-fungicidal packaging materials and bark-enriched wood-plastic composites. Thus, D4EU pursued the goal of strengthening the European bioeconomy.

Connected to SRC establishment and operation, efficient harvesting and log storage methods had to be explored and tested. Furthermore, a dedicated monitoring and applied-level research had been implemented to ensure optimal poplar clone selection, plantation growth and quality and production stability. A comprehensive biodiversity monitoring and life cycle assessment validated the expected positive ecological impacts. These manifold objectives of Dendromass4Europe show the complexity of the project, ranging from land acquisition, land (re)utilization with poplar SRC, processing of poplar dendromass into bio-based materials, value chain establishment up to customer-ready products and their market application.

In addition to these content-related goals, the project included a separate work package for communication, dissemination and exploitation. This work package has been responsible for external and internal communication. External communication aimed at

- informing about the project activities and results to different target groups,
- providing knowledge to the general public about how poplars, poplar plantations and poplar dendromass can contribute to a sustainable bioeconomy,
- raising awareness about the need of strong European bio-based industries,
- promoting the new bio-based materials developed by D4EU and their added value for ecology, society and economics,
- and supporting the transition of land use.

The internal communication has been supported by fostering the collaboration and dialogue between the D4EU project partners and by assistance with manifold activities (e.g. provision of key messages and keywords, preparation of publication materials, organization of events).

### 3 Strategic planning of communication

Communication in and about scientific projects is meanwhile common and there is a bunch of literature about how to do this (e.g. Dow & Taylor, 2008; Morozzi, 2018). However, a number of these guidebooks are still stuck in an old perspective of what the roles of communication sender and recipients are (see 'deficit model' later in that paper) (Freitag, 2016: 28). The addressees are seen as a passive mass whose knowledge deficit must be eliminated by the intensive supply with information (Davies et al., 2009; Bucchi & Trench, 2014; Metcalfe, 2019). It has been discussed a lot, that this view is no longer up to date, where science is seen as a part of society and "increasing intersection and permeability of boundaries between science and society" occur (Bucchi & Trench, 2014: 2). Literature about project communication which are based on the dialog or on participatory models have mainly appeared in recent years - after the start of the D4EU project (SiS.net, 2020; Ahamer, 2022). These scholars not only highlight the two-way communication and the active role of recipients, similarly to publications about science communication. They also consider the special requirements of communicating in and about scientific projects. To give an example, both Ahamer (2022) and SiS.net (2020) cite an illustration of the European Innovation Council and SMEs Executive Agency (EISMEA) on "how to communicate your project" (see *Figure 1*).

Besides the important recommendations to e.g. "link communication to hot topics in society" and to "understand media language and needs" they also explicitly mention that projects have to "build [its] brand" (EISMEA, see *Figure 1*). That means, that the strategic planning of project communication must also take account of promoting the project as a scientific entity. As long as research funding is often based on projects, the visibility of and awareness about the project is crucial for the viability of scientific institutions. Therefore, it is not enough to just tell people about the activities and outcomes of a project and provide project results to specific stakeholders. You also have to promote the project consortium and defend your scientific background, topics and visions in order to be considered by funding organizations in future. Keeping this in mind, the "branding" of D4EU was one important issue during strategic planning of communication. As a part of this, an own Corporate Design (e.g. logo, colors, fonts, style elements, templates) had been defined at the very beginning of the project in order to maximize the recognition value of D4EU.

Following the advice of "think, plan, act strategically" (EISMEA, see *Figure 1*) a communication strategy was set up at the beginning of the project. According to the purpose and rules of project communication planning, which Magezi et al. (2021: 1476) consider "as the process of determining project stakeholders, their information needs and then coming up with a communication approach", the D4EU communication strategy compiled who (sender), why (objectives), what (key messages), how (style and tone), where (communication channel) and to whom (target audiences) communication was to carry out (see Morozzi, 2018: 99). Taking into account the many different project objectives, the formulation of messages is particularly crucial. A didactic reduction and the strong focus on key messages help a lot to avoid getting lost in too many storylines.



Figure 1: Recommendations of the European Innovation Council and SMEs Executive Agency (EISMEA) for strategic planning of project communication. Source: [https://eisma.ec.europa.eu/manage-and-communicate-your-project-grants\\_en](https://eisma.ec.europa.eu/manage-and-communicate-your-project-grants_en)

In the following, we would like to highlight two questions of the D4EU communication strategy: how and to whom.

### 3.1 How: thoughts about intended style and tone of communication

In view of the style and tone of the project communication and dissemination (C&D), we defined it to be factual (as opposed to rely on emotional wording) and positive (as opposed to problem-based). Special emphasis was laid to the avoidance of technical language and scientific jargon. As far as possible, **easy language or plain language** was preferred in order to make the messages more accessible and comprehensible (Hansen-Schirra & Maaß, 2020: 17; Korcz et al., 2022). However, this opened the tightrope walk between scientific precision and complexity on the one hand and popularization on the other (Bell & Turney, 2014; Matagne & Fastrez, 2019). Just to mention one example: Is it better to use 'plantation' instead of 'short rotation coppice'? For sure, the word plantation is more common and thus better comprehensible. However, due to environmental problems caused by intensive plantation farming, the term 'plantation' is often perceived negatively. According to Rowan (1999, cited after Peters, 2014: 75) it would be helpful to explain the scientific term "making the contradiction between everyday knowledge and scientific knowledge explicit". In D4EU, we therefore periodically published articles explaining the two terms and pointing out the differences. In addition, we took advantage of the multi-channel approach (Spent & Gronau, 2022): In linguistically simple texts in which the word 'plantations' was used, we referred or directly linked to more complex texts in D4EU media (e.g. via shoutouts). Thus, we offered a more detailed information to all recipients who were triggered by the word 'plantations'.

### 3.2 To whom: definition and description of the publics<sup>1</sup>

According to the frequently stated requirement of a precise compilation and description of target audiences, the D4EU communication strategy also depicted a number of many target audiences, who must be addressed in order to achieve the manifold communication objectives. Only considering the external publics, the target audiences still were very diverse, ranging from lay people, farmers and landowners, authorities and administration municipalities, politicians and manufacturers, customers, environmental NGOs to scientific communities. Knowing about the issue of target-group-specific communication, we chose a multi-channel approach (Spentst & Gronau, 2022: 415ff). This included for instance a project website, social media accounts, printed materials, panels, press releases, video clips, demonstration events, stakeholder workshops, publications (public press to peer-reviewed), conferences as well as television and radio contributions. **Multi-channel communication** uses both digital and analogue channels, which exist as mutually independent but in a synergetic way and which offer the possibility of an interaction (Spentst & Gronau, 2022: 416). This implies that the same information can be provided via several communication channels, but the wording (and even the scope of information) may differ.

A strategic C&D planning not only lists diverse target groups, it also strives to describe these groups with regard to their socio-demographic features, perceptions, interests and preferred way of getting informed. For this, we applied the **persona method** (Lepzien & Lewerenz, 2017; Schweibenz, 2019). Based on the multiple communication channels and precise target group descriptions we assigned the different audiences to specific communication channels in order to set up a **multi-channel relational model**. The decision was mainly based on what their average prior knowledge is, what kind of information they are interested in and which communication channels a group preferably uses. Hence, literature and surveys analyzing the media consumption of different publics (e.g., SevenOne Media, 2005; GIK, 2018 and 2020) have been an important source for communication planning of D4EU, especially those addressing relevant media for keeping people informed about forests (Kleinhückelkotten et al., 2009; Gaggermeier & Eisele, 2022; Füller & Krüger, 2019). Table 1 summarizes the preferred communication channels for the different expected levels of prior knowledge.

Table 1: Level of knowledge of different target audiences and preferred communication channels and tools – the multi-channel relational model of D4EU

Low level of knowledge: General public, consumers	Mid level of knowledge: Politicians, Media, investors	High level of knowledge: Scientists, reviewers
Website	Website	Website (esp. downloads section)
Leaflets, general poster, Roll-ups	Leaflets, general poster, Roll-ups	Scientific publications
Public press	Conferences	Conferences
Social media	Social media	Technical posters
Video clips / YouTube	Video clips / YouTube	Workshops
Exhibitions	Demo events	
TV and Radio spots	Technical posters	

<sup>1</sup> “Publics has become a common term in discussion and study of science in society, indicating in shorthand that the public is diverse, even fragmented. [...] Adopting the plural form was an important part of recognising that generalisations about the public – specifically in terms of its deficits – are very rarely valid, and often seriously misleading (Einsiedel, 2000). Referring to publics has been associated with the proposal of a contextual model of communication, according to which the communicators inform themselves about, and are attentive to, the various understandings, beliefs and attitudes within the public” (Bucchi & Trench, 2014: 6).

## 4 Realization and outcomes of C&D in D4EU

During the five and a half years D4EU was running, there have been hundreds of activities. One can imagine that it would go beyond the scope of this paper to describe all these activities in detail. Thus, only very limited examples of what has been done when and where shall be presented here<sup>2</sup>.

The first half of the project has been especially used to provide information and communication materials such as press releases, leaflets, posters, roll-ups and information panels for local residents and visitors of the poplar SRC, which have been installed at two highly frequented paths along the poplar SRC. Relevant communication channels like a [project website](#) and the social media accounts on Facebook, Twitter and ResearchGate have been launched within the first six months. Of course, all these communication tools have been continuously updated or exceeded if possible.

In the second half of the project (months 31 – 66), special emphasis was laid to the provision of expert knowledge through scientific publications and technical posters and to the production of video clips as communication tools. Furthermore, the focus of C&D has switched from providing dissemination materials to an active communication enabling an open discussion and encouraging dialogue. Due to the Covid19 pandemic, most of these activities were cancelled or had to take place online unfortunately. Many of the planned live or face-to-face events like conferences, stakeholder workshops and scholar colloquiums have not taken place or have been postponed. To nevertheless enable a two-way communication, we intensified our presence on social media and contacts to journalists.

In sum, over 200 C&D activities have been realized by the project consortium. Excluding website and social media, these activities have reached over two million people (see *Table 2*). Website and social media outreach have been excluded because it was impossible to make at least a profound estimation of the number of reached people. Due to strict data protection rules we were not allowed to implement a visitor tracking at the website.

*Table 2: Outreach of the dissemination and communication activities during D4EU runtime according to the numbers counted in the project management table, excluding website and social media accounts.*

Target audience	Number of persons reached
General Public	1,819,055
Scientific Community	90,966
Industry	85,299
Civil Society	35,760
Customers	19,143
Other	18,748
Policy Makers	7,276
Investors	5,613
Media	3,430
<b>All together</b>	<b>2,085,290</b>

The target group we were able to reach most often was the general public (> 1,8 million people, see table 2), mainly due to some well recognized TV and radio spots as well as press articles. With more than 91,000 people, the scientific community ranked second, mainly caused by numerous conference participations and the often-read technical posters. The third largest target audience has been

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<sup>2</sup> For a more detailed report, please see the public deliverables ‘D6.3 Dissemination and Communication Report (M1-M30) and Plan for M31-M60’ as well as ‘D6.4 Dissemination and Communication Report (M31-M66)’, both available in the download section of the D4EU website: <https://www.dendromass4europe.eu/>.

business and industry (> 85,000 people), which have been especially addressed by some of our videos, by the cooperation with communication projects like BioVoices and BioBridges as well as project presentations at fairs and booths.

## 5 Discussion of C&D results

Although much of the important literature about science and project communication and strategic communication planning was published after the project started, most of the tasks have been carried out in line with the now existing guidelines and recommendations.

### 5.1 The scope of models of science communication

Scholarly communication has always been a fundamental characteristic of universities. However, universities – including those offering higher forestry education programmes – today have to expand their communicative function beyond teaching and research. The so-called third mission strives for knowledge provision and competence training for the public (Bucchi & Trench, 2014: 5; Spensst & Gronau, 2022: 412). Higher forestry education thus cannot rely on teaching prospective foresters, it also has an educational mission for society, too. The question arose, how this mission can be fulfilled successfully and how communication should look like in order to make forestry sciences tangible and experienceable. What are the appropriate means, media and activities to ensure that civil societies can understand and interpret research approaches, methods, results and backgrounds and allay fears about technical, medical, and social fields of research? With this regard, the theoretical models of science communication have been discussed, too, and preferences have been changed from the deficit to a participatory model (Davies et al., 2009; Salmon et al., 2017; Metcalfe, 2019).

In the deficit model, “the public was viewed as an empty vessel, an audience waiting to be filled with a collection of authoritative scientific facts” (Davies et al., 2009: 338). Typical objectives of a science communication based on the deficit model include awareness raising, information provision, eradication of superstitions and misconceptions, ensuring public support and funding, increasing trust in science and scientists, improvement of decision-making, changing of behavior and attitudes as well as the promotion of a particular scientific institution or organization (Metcalfe, 2019). Comparing this list with the objectives for C&D of D4EU given above, it can be recognized that all of them have been implemented. Metcalfe (2019) further analyzed in her research, which communication activities are most often used to address these communication objectives. *Table 3* provides a list of those typical communicative means of the deficit model and shows, which of them have also been carried out in D4EU. From this it can be noticed that D4EU has applied almost all typical means of deficit-style communication. This is consistent with the finding of Matagne & Fastrez (2019: 173), that “this model is the one favored by the players in the forestry world”.

Recognizing, that lots of efforts in deficit-style communication often were not able to reach their goal, critique on this model arose. Researchers became aware, that the “publics’ relations with science were much more complex than the deficit model suggested” (Davies et al. 2009: 338). In line with a constructive perspective on information processing, addressees actively handle scientific information (Freitag, 2016; Matagne & Fastrez, 2019; Farcy et al., 2019). For instance, it must pass the selective filters of individuals which are based on prior knowledge, frames and representations, social aspects as well as personal features and needs (Liebal, 2011). Even if an information has passed the filter, individuals deploy different coping strategies to avoid cognitive dissonances and to create or retain a sound representation of reality (ibid: 31). Thus, publics are far from being empty vessels and scientist realized that communication has to be based on the individuals’ characteristics. That means, that you first should ask about the interests and needs of recipients and that science communication has to accompany the information processing and framing by initiating a dialogue. Davies et al. (2009: 341) take a similar perspective when they say: “Dialogue events can thus be viewed as sites of individual learning through social processes”.



Table 3: Comparison of Communication activities referred to the deficit model of science communication, listed by Metcalfe (2019: 10), and realized C&D activities of D4EU

Communication activities referred to the deficit model of science communication, listed by Metcalfe (2019: 10)	Status, whether this activity has been applied in D4EU
Produce a publication	Yes
Orally present science (one-way communication from someone/ media to audience)	Yes
Use traditional means of mass media – print, TV, radio to engage	Yes
Provide an award to people	No
Put up a display/exhibit	Yes
Have a promotional strategy/campaign	Yes
Use formal educational means to engage	Yes, to a very low extent
Use online means to communicate including website, social media	Yes
Hold some type of event/show/meeting	Yes
Compete for a prize	Yes

According to Metcalfe (2019: 3), science communicators applying the dialogue model are “prepared to engage in a dialogue with the public to help explain the science [...], listen to and consult the public about their perceptions, concerns and needs [...] and acknowledge that the public may have useful knowledge that can help scientific progress and policymaking”. Typical “objectives of dialogue-style communication are to address growing mistrust of science, discover public opinion about contested science [...], gain and use lay knowledge to complete scientific knowledge, debate or discuss scientific/technological issues and acknowledge uncertainties of science, facilitate interdisciplinary approaches by making connections between people, be more accessible and accountable to the public [and to] engage citizens more democratically in science and technology issues, including making decisions and formulating policy” (ibid: 4). Looking at these features and objectives of a dialogue-style communication, D4EU had good intensions and rudiments. Scientists had been prepared and curious for a dialog. We really aimed to discover public opinions and indeed collected “lay” knowledge by surveying the thoughts and positions e.g. of farmers and land owners, of local residents and customers (Ranacher et al., 2021; D4EU Deliverable 3.6 “Customer Survey”). Additionally, communication on social media or at the demo events enabled a two-way communication. We addressed growing mistrust of science e.g. by writing letters of intention to the nature conservancy agency and discussing uncertainties with regard to possible environmental side-effects of poplar SRC. But we did not allow citizens to influence decisions or set agendas. Summarizing what really happened during the project runtime, there has been the intention to get into a dialog, but the feedback was rather scarce and the dialogues mainly short. This might be due to the fact, that there have been only a few communication activities focusing on dialogue as figured out by Metcalfe (2019) (see Table 4). But to a certain extend it also may be a normal experience, that sometimes publics do not participate in dialogs (Metcalfe, 2022). As suggested by Sis.Net (2020: 7), a citizen science task, a science café, participation in science festivals or a more stimulating campaign in online interaction would have been appropriate means to foster feedback from the publics. However, the Covid19 pandemic has nipped thoughts of planning such activities in the bud.

The “participatory model of science communication [...] recognizes and acknowledges various public as being equal with scientists and policymakers in reflecting upon, sharing knowledge about, creating new knowledge (which has also become known as ‘knowledge co-production’) and making decisions about science that affects society” (Metcalfe, 2019: 4). This clearly includes a shift in power from science to public. Communication in the participatory model serves to learn collectively, to produce knowledge and solve problems jointly, to participate in policymaking together with various publics and

to let publics shape the scientific research agendas (ibid). The focus of typical communication activities (e.g. “lay people participate with scientists in an activity” or “lay people collect data or actually do research” (Metcalf, 2019: 10)) no longer lays on communication but more on co-creation or co-production and practical involvement (Sis.Net, 2020: 4; Salmon et al., 2017: 53). In D4EU, neither were these activities intended nor did they happen.

Table 4: Comparison of Communication activities referred to the dialogue model of science communication, listed by Metcalfe (2019: 10), and realized C&D activities of D4EU

Communication activities referred to the dialogue model, listed by Metcalfe (2019: 10)	Application in D4EU
Have an activity that involves people in science/with scientists	No
Give people access to science, scientists, science resources	Yes (e.g. website, open access-publications, demo events)
Train/help develop people’s skills so they can communicate better/participate in science	No (training only for certain scientists within D4EU)
Hold a workshop	No (workshops only for scientist, not for lay people)
Bring people together into a network	Yes
Discuss science or scientific issue	Yes (e.g. on social media, meetings with representatives and stakeholders)
Bring together people from different disciplines or areas to work together	Yes, on the scientific and operational level
Research/find out about people’s opinions and needs to better engage/communicate with	Yes, by scientific and informal surveys

As a conclusion, D4EU mainly referred to the deficit model but included several communication activities which belong to the dialogue model. This is in line with the findings of Metcalfe (2022), that in practice projects often take a pragmatic approach and adopt parts of each model. She also claims, that “there is nothing inherently wrong with deficit-style science communication, especially if we talk about it as ‘transmission-style’, where information is transferred, often in response to publics’ demand” (ibid: 6). Furthermore, “participation needs dissemination and dialogue techniques” (ibid: 5). Communication activities based on the deficit and dialogue model can thus be considered as important preconditions of participation.

## 5.2 The scope of working with journalists as mediators

As already revealed above, **TV, radio and public press** are still widely used by lay people to obtain information. As a result, even today it should be of high priority for project communication to present a research project in TV, radio or public press. Of course, this also applied for D4EU and we successfully managed to showcase the project in two newscasts in TV and one radio spot. However, these communication channels mainly cannot be entered directly. Instead, you are dependent on (science) journalists, bringing the story out. “Despite the growing importance of direct communication by scientists, scientific organizations and scientific media, journalism is still an important public mediator of scientific expertise” (Peters, 2014: 76). This can become a challenge for C&D in a forest-related project for several reasons, only a few of which are highlighted below.

“Science journalism [...] seeks to hang stories on traditional news pegs, characteristics of real-world processes that are proven audience attention-getters. Among those pegs are characteristics such as timeliness, conflict and novelty” (Dunwoody, 2021: 19). With regard to novelty, journalists tend to wait

until a certain milestone is reached (e.g. publication is out, product is ready) instead of showcasing the long-lasting processes and (scientific) methods on its way. This can be especially challenging in the early stage of a project, where reached milestones are rare. In addition, “[media] coverage of the issue will erupt only when ‘something happens’ in a journalistic sense”, meaning that media coverage depends on the “presence or absence of pegs” (Dunwoody, 2019: 20). For D4EU, this caused a tricky situation. On the one hand, we were able to take advantage of the fact, that forests are a persistent news peg in Europe (Matagne & Fastrez, 2019: 168). On the other hand, in case journalists were interested in D4EU because of the forest-related topic, we first had to explain that short rotation coppices (SRC) are not a forest but an agricultural cropping system in order to be scientifically accurate. Doing so, it has been confirmed that the time resources of journalists are very limited (Peters, 2014: 77) – this time with a positive result. Hence the journalists have spent their time to visit D4EU’s places (e.g. university laboratories, poplar SRC), they decided to not waste this time and produce their story nevertheless. Thus, we would like to repeat the recommendation of EISMEA (see *Figure 1*) to link project communication to hot topics in the society.

As another challenge for C&D, journalists are mostly dependent on the rapid pace of the production infrastructure a content has to pass (Dunwoody, 2021: 19). If the production conditions do not fit at the moment the journalist is interested in the project, the window of opportunity is quickly closed. In D4EU, we have struggled with that point for several times: When the poplars had no green foliage, the journalists did not want to film there and thus the story was not produced. At a later stage of the project, it was very helpful to provide own high-quality takes to journalists for their free use in such situations.

A third challenge with regard to science journalists refers to the question whom journalists select to be the cited expert. Peters (2014) pointed out to some important research results. For instance, “experts representing minority positions are usually over-represented in the coverage, [...] media tend to select expert sources that support their editorial policies [and] media focus on few *visible scientist* [...] (ibid: 76). He further argues that “the main journalistic criterion in the selection is whether a source makes a good story or improves a story” (ibid) and that “journalists prefer scientists who are able and willing to speak crisply and concisely, to answer the questions asked and to explain complicated matters using comparisons and metaphors, and those who draw bold conclusions. Furthermore, journalists prefer scientists with high organizational rank and public reputation and who are, in that sense, media appropriate” (ibid: 77). Lacking an *already visible scientist* within the D4EU consortium, we spent much efforts to at least fulfill the journalist’s preferences for scientists speaking crisply and concisely by preparing requested issues very carefully, as well as for being comprehensible by using plain or easy language. We also tried to foster visibility of some D4EU scholars e.g. by successfully applying as a #BioHeroes – an expert panel in the field of bioeconomy founded by the H2020 communication project [BioBridges](#). Whether these investigations have been successful has not been scientifically evaluated. However, in view of being contacted by journalists repeatedly and more frequently during the course of the project, we assume that it paid off.

### 5.3 The scope of social media

Using social media for C&D of scientific projects like D4EU is a rather new phenomenon. However, since social media have become established communication channels to provide scientific information (one-to-many communication) and discuss scientific topics (many-to-many communication) (Fährnich, 2021; Schäfer, 2017), social media can be seen as an important way of project communication (Schäfer, 2017).

A bunch of literature exists examining the advantages and risks social media offer for science communication. On the positive side, social media enable to provide timely and boundless information, which can be accessed from anywhere, enable interaction and are usually free of charge (Schäfer, 2017: 277). For scientists, being present on social media also enables to participate in the online debates carried out in the accounts of the established mass media (e.g. TV and radio stations,

newspapers). Schäfer (2017: 280) points out, that mass media and their online presences are increasingly important actors, points of reference and crystallization of online science communication in many countries.

On the other hand, social media lack a journalistic quality management and lay people often struggle to distinguish correct from false information (ibid: 288). Meanwhile, there is an increasing amount of fake news and deep fakes circulating in social media and contents can be produced by artificial intelligence (Spent & Gronau, 2022: 426). Furthermore, the platform's algorithms "offer a personalized diet of news" (Fährnich, 2021: 2) and can thus foster fragmentation of publics. Social media platforms are often characterized by an own language and image style and by the use of special features like hashtags, emojis and reels. EISMEA (see *Figure 1*) therefore recommends to get into the media mindset in order to be successful on social media. Connected with the fact that providing information about scientific topics is not restricted to scientists in social media, this can lead to content on online media deviating from the scientific state of affairs (Schäfer, 2017: 281). Schäfer (2017: 282) further states that discussions on social media as well as blogs are often unstructured, polarized and ideologically driven. They include „high numbers of controversial and uncheckable assertions“ and the “tone of content is often ‘uninspiring’, and can in places descend to playground level“ (Gavin, 2010: 469).

Keeping these negative aspects of social media in mind, the question arises how much effort should be spent when communicating and disseminating scientific projects. Of course, this question cannot be answered unequivocally in this paper. Instead, we would like to highlight and discuss some outcomes of the social media work within D4EU.

Being present with D4EU on social media was rather time consuming. Most time has been spent for preparation of posts, covering the whole process from topic selection, wording, image selection and editing, tagging and – in some cases – scheduling the posts. However, this conclusion also takes into account that social media work not only consists of preparing, posting and sharing information but also of screening the newsfeeds, answering comments and direct messages and managing followers. This finding is in line with literature discussing the change of roles and perspectives which scientists occupy in social media (Fährnich, 2021: 3; Spent & Gronau, 2022: 420). Science communication in social media is characterized by blurring lines between the roles as sender and audience. Scientists are now both producer and consumer of news. Seriously analyzing this reciprocal news management, it must be acknowledged that this receiver role has also influenced C&D work within D4EU. For instance, it has affected news selection (e.g. when some hot topic occurred) and wording (e.g. in case of retweets or post sharing). With this regard, the dedicated social media strategy was most helpful in order to not getting lost in ad-hoc communication. The strategy forced us back on spreading our key messages and focusing on all relevant target audiences.

The outreach of D4EU's Twitter account was much better than the success on Facebook in terms of followers and reads<sup>3</sup>. The missing community within the D4EU consortium on Facebook sharing our posts might have been a relevant factor. However, this also applied for Twitter at the beginning of D4EU and here, the outreach was more satisfactory. We assume two reasons for that. First, much more other actors (e.g. other BBI-funded projects, politicians, scientists, NGOs, industrial stakeholders) relevant in the scientific fields of D4EU have been active on Twitter compared to Facebook. Thus, networking and setting up a kind of community or interest group was easier and resulted in more shares of posts. Second, since hashtags play an important role on Twitter while are rarely used on Facebook, the use of hot-topic-hashtags increased outreach significantly.

In view of the different models of science communication and with regard to the vision of encouraging a shift from deficit to dialogue model, the Facebook account was not very successful. Of course, there have been some interactions such as following us, giving likes and sharing of posts. Spent & Gronau (2022: 415) interpret these actions as engagement of the public. However, our posts were rarely

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<sup>3</sup> Maximum number of followers on Facebook = 148 and on Twitter = 401. Maximum Outreach of a single post on Facebook = 552, on Twitter = 5691.

commented. Even posts asking for visitors' opinions went largely un-commented. Thus, we were not able to establish a dialogue. The communication mainly stayed one-way. On Twitter, our posts often have caused our profile to be visited. In addition, about half of all our own posts were retweeted or cited. Thus, the amount of interaction on Twitter was much higher and so was the engagement of the public. However, commented tweets as first step to a many-to-many communication and direct messages opening a one-to-one dialogue on Twitter have been rare. Summarizing the communication on Twitter, it can be stated that there was not really a dialogue but at least a two-way communication.

A discussion about outreach in social media should also consider the fact that there are millions of news items every minute and addressees are forced to avoid an information fatigue. Thus, forestry-related topics such as the issues of D4EU compete with other topics for a place in media (Kleinhüchelkotten et al., 2009: 82). A common strategy to maximize the chance of being heard is to produce and multiply “shorter messages that have lost the detail needed to form a context of interpretation” (Matagne & Fastrez, 2019: 174). In D4EU, there has been the conscious decision to sparsely use such superficial messages, because we did not want to perceive our publics as an empty vessel which is not able to make sense of scientific information. Where popularized messages were used, the posts usually included a link (e.g., to longer texts at D4EU website) or shoutout to nonetheless explore the statement in more detail and to make contents checkable. Another strategy to circumvent the audience's avoidance mechanisms is to produce messages that primarily aim to evoke emotion and consternation. Often, these messages are characterized by persuasive communication, negative events and crisis and by suggestive questions designed to arouse curiosity (Rogan & Hammer, 1995: 558; Kleinhüchelkotten et al., 2019: 82; Matagne & Fastrez, 2019; Liebrecht et al., 2019). Following our own experiences in education and communication as well as the recommendation of Matagne & Fastrez (2019: 177), that forestry communication should “consider alternatives to persuasive communication [...] (i.e., communication that recognizes the active role of audiences in the coconstruction of the meaning of media messages)”, we focused on an informational and deliberative tone of communication – also in social media. Furthermore, we did not support the widespread practice of using negative sensations for our own news due to the wish to avoid depressing messages. In view with our communication strategy, we rather wanted to use an inspiring, motivating and empowering tone of communication and stress an “educational approach to communication” (Matagne & Fastrez, 2019: 177).

In retrospect, our conscious decisions to sparsely adopt common marketing-based strategies of maximizing communication outreach might have been one reason why the numbers of followers and reads of D4EU's social media accounts aren't that high. It is a pity that the social media work of D4EU was not able to significantly contribute to creating dialogue. However, and in view of the pros and cons of online communication, we managed to avoid typical pitfalls of social media and followed recent recommendations how a good forestry communication should be carried out. And aside of the discussion of efforts spent and outreach realized, the social media fulfilled the purpose it was meant for: to provide insights into science-in-the-making and on project results for those audiences which we would have left out without using social media.

## 6 Outlook

Browsing through the lessons learnt in D4EU and reviewing recent literature about science communication in general and forestry communication in particular, there seems to be no easy answer to the question, how to communicate and disseminate forest-related topics in the best way. The issue already starts with the definition of ‘best’. When ‘best’ is meant in terms of creating as much outreach as possible, then the applied multi-channel approach is surely a good option. Spent & Gronau (2022) even go one step beyond by recommending the shift from multi- to omni-channel communication. While the used digital and analogue channels are still independent from each other in multi-channel communication, the channels are more intertwined in omni-channel communication. Similar to the concept of omni-channel marketing, an omni-channel communication is ought to enable user

experience across devices and media. When dealing with forest-related topics, publics must be able to switch from one medium to another as simply as if it were one. From our point of view, it would be highly interesting to discuss and test how omni-channel communication can be applied in the field of forestry.

If someone interprets the ‘best’ way of communication in terms of impact, meaning whether communication enabled understanding of the complex topic of forests and forestry, learning and the change of attitudes and behavior in a positive way, Farcy et al. (2019) and Matagne & Fastrez (2019) point out to the need of profound skills in communication. This begins with an understanding of different forest frames. When communicating, forestry professionals must consider, that “the public does not think about and perceive forests like them” (Matagne & Fastrez, 2019: 180). In addition, good communication requires skills in many areas such as knowledge about communication channels, storytelling, linguistic means, perception, education, networking, branding, marketing, graphic design – just to mention a few. Therefore, we advocate that higher forestry education should lay high emphasis on addressing and enabling communicative skills of students.

Study programmes should provide knowledge about how forests are perceived by different audiences e.g. by introducing the topics of forest frames and framings. Furthermore, forestry students should learn about the different stakeholders and interest groups of forests, wooded landscapes and forest industries in order to better address them via specific communication channels or trigger them with their preferred interests. Already students must recognize that wording matters a lot. Therefore, basic knowledge about different communication models and approaches, including the shift from deficit to dialogue and participation models which enables the involvement of laypeople and specific target groups, is crucial. With regard to the words of the Center for International Forestry Research (CIFOR), forestry students should understand that forestry is not simply about trees; it is also about people and their needs that are satisfied by the trees. Taking into account recent forest damages and dieback caused by climate change, future study programmes should offer theoretical and practical approaches of how to inform, involve, collaborate and empower society for a sustainable forest management and restoration.

## 7 Literature

- Ahamer G. (2022): Interactive Workbook on Science Communication. In: Encyclopedia of Data Science and Machine Learning, Edition: 1, Chapter 37, Publisher: IGI. DOI: [10.4018/978-1-7998-9220-5.ch037](https://doi.org/10.4018/978-1-7998-9220-5.ch037)
- Bell A. & Turney J. (2014): Popular science books – From public education to science bestsellers. In: Bucchi, M., & Trench, B. (Eds.). (2014). Routledge Handbook of Public Communication of Science and Technology: Second edition (2nd ed.). p. 15-26
- Bio-based Industries Joint Undertaking (2019): FAQs for coordinators, Version 2.3. online available at: <https://www.cbe.europa.eu/bbi-ju-funded-projects>
- Bucchi M. & Trench B. (Eds.). (2014). Routledge Handbook of Public Communication of Science and Technology: Second edition (2nd ed.). Routledge: London. <https://doi.org/10.4324/9780203483794>
- Bucchi M. & Trench B. (Eds.). (2021). Routledge Handbook of Public Communication of Science and Technology: Third edition (3rd ed.). Routledge: London. <https://doi.org/10.4324/9781003039242>
- Davies S., McCallie E., Simonsson E., Lehr J. L., & Duensing S. (2009). Discussing dialogue: perspectives on the value of science dialogue events that do not inform policy. Public Understanding of Science, 18(3), 338–353. <https://doi.org/10.1177/0963662507079760>
- Dobler G., Suda M., Seidl G. (2016): Wortwechsel im Blätterwald – Erzählstrukturen für eine wirksame Öffentlichkeitsarbeit. BoD: Norderstedt
- Dow W. & Taylor B. (2008): Projekt management communications bible. Wiley: Indianapolis
- Dunwoody S. (2021): Science journalism. In: Bucchi M. & Trench B. (Eds.). (2021). Routledge Handbook of Public Communication of Science and Technology: Third edition (3rd ed.). Routledge: London. <https://doi.org/10.4324/9781003039242> p. 15-26
- Eisele H. & Juschka J. (2022): Wald bewirtschaften? Ja? Nein? – Und wie? In: LWF aktuell 1/2022, 4-7
- European Innovation Council and SMEs Executive Agency (EISMEA) (n.y.): Manage and communicate your project (Grants). Online: [https://eisma.ec.europa.eu/manage-and-communicate-your-project-grants\\_en](https://eisma.ec.europa.eu/manage-and-communicate-your-project-grants_en)
- European Research Executive Agency (REA) (2022): Towards clearer and more accessible science communication. Online: [https://rea.ec.europa.eu/news/towards-clearer-and-more-accessible-science-communication-2022-01-12-0\\_en](https://rea.ec.europa.eu/news/towards-clearer-and-more-accessible-science-communication-2022-01-12-0_en)
- Fährlich B. (2021): Conceptualizing science communication in flux — a framework for analyzing science communication in a digital media environment JCOM 20(03), Y02. <https://doi.org/10.22323/2.20030402>
- Fährlich, B., Weitkamp, E., & Kupper, J. F. (2023): Exploring ‘quality’ in science communication online: Expert thoughts on how to assess and promote science communication quality in digital media contexts. Public Understanding of Science, 0(0). <https://doi.org/10.1177/09636625221148054>
- Farcy C., Nail S., Matagne J., Granet A.-M., Baudry O. & Rametsteiner E. (2019): Towards a Social Representation of Forests by Western Urbanized Societies. In: Farcy C., De Arano I.M., Rojas-Briales E. (Eds.): Forestry in the Midst of Global Change. CRC Press: Boca Raton, London, New York. 77 - 99
- Freitag M. (2016): Kommunikation im Projektmanagement – Aufgabenfelder und Funktionen der Projektkommunikation. Springer Fachmedien: Wiesbaden. <https://doi.org/10.1007/978-3-658-12073-3>

- Füller & Krüger (2019): Bevölkerungsbefragung in Sachsen zum Thema Wald. Online verfügbar: <https://www.medien-service.sachsen.de/medien/news/236942> [last check: 03.01.2023]
- Gaggermeier A. & Eisele H. (2022): Wie informieren wir uns über den Wald? In: LWF aktuell 6/2022, pp. 14-16
- Gavin N. T. (2010): Pressure Group Direct Action on Climate Change: The Role of the Media and the Web in Britain—A Case Study. *The British Journal of Politics and International Relations*, 12(3), 459–475. <https://doi.org/10.1111/j.1467-856X.2010.00411.x>
- GIK – Gesellschaft für integrierte Kommunikationsforschung, best for planning (2018): Mediennutzung. Online: <https://gik.media/gikinsights/>
- GIK – Gesellschaft für integrierte Kommunikationsforschung, best for planning (2020): Berichtsband. Online: <https://gik.media/produkt/b4p-2020-berichtsband-digitales-dokument/>
- Hansen-Schirra, S. & Maaß, C. (2020): Easy Language - Plain Language - Easy Language Plus: Perspectives on Comprehensibility and Stigmatisation. In: *Easy Language Research: Text and User Perspectives*. Frank&Timme: Berlin
- Kleinhüchelkotten S., Calmbach M., Glahe J., Neitzke H.-P., Stöcker R., Wippermann C. & Wippermann K. (2009): Kommunikation für eine nachhaltige Waldwirtschaft. Forschungsverband Mensch & Wald, M&W-Bericht 09/01, Hannover
- Korczyk, N.; Janeczko, E.; Kobyłka, A (2022): The Use of Simple Language in Informal Forest Education as a Key to the Correct Interpretation of Sustainable Forest Management—The Experience of Poland. *Int. J. Environ. Res. Public Health* 2022, 19, 5493. <https://doi.org/10.3390/ijerph19095493>
- Lepzien J. & Lewerenz M. (2017): Persona Methode. Eine Illustrierung von Bildungsbedarfen. In: Team der Wissenschaftlichen Weiterbildung der Universität Rostock: Weiterbildungsmanagement professionalisieren. Rostock: Universität Rostock, S. 22-31. Online: <https://www.uni-rostock.de/storages/uni-rostock/UniHome/Weiterbildung/KOSMOS/Persona.pdf>
- Liebal S. (2011): Waldpädagogik: Theoretische Grundlagen, Bildungskonzept für die Schulpraxis, Wirkungen – Eine Fallstudie an der Grundschule Mohorn (Sachsen). Remagen: Verlag Kessel
- Liebrecht C., Hustinx L. & van Mulken M. (2019): The Relative Power of Negativity: The Influence of Language Intensity on Perceived Strength. *Journal of Language and Social Psychology*, 38(2), 170–193. <https://doi.org/10.1177/0261927X18808562>
- Magezi A., Abaho E. & Kokooza J. B. (2021): Effective Project Communication and Successful Consortia Engagements. In: *International Journal of Innovative Science and Research Technology*, vol. 6, issue 6, pp. 1474-1483
- Matagne J. & Fastrez, P. (2019): Communicating to Support the Comprehension of Forest-Related Issues by Nonexpert Audiences. In: Farcy C., De Arano I.M., Rojas-Briales E. (Eds.): *Forestry in the Midst of Global Change*. CRC Press: Boca Raton, London, New York. 167 - 182
- Metcalf J. (2019): Comparing science communication theory with practice: An assessment and critique using Australian data. *Public Understanding of Science*, 28(4), 382–400. <https://doi.org/10.1177/0963662518821022>
- Metcalf J. (2022). 'Science communication: a messy conundrum of practice, research and theory'. *JCOM* 21 (07), C07. <https://doi.org/10.22323/2.21070307>
- Morozzi D. (2018): Projektkommunikation – Ein Handbuch für die Praxis. Vdf Hochschulverlag AG: Zürich



Peters H. P. (2014): Scientists as public experts – Expectations and responsibilities. In: Bucchi, M., & Trench, B. (Eds.). (2014). Routledge Handbook of Public Communication of Science and Technology: Second edition (2nd ed.). Routledge. <https://doi.org/10.4324/9780203483794>. p. 70-82

Rametsteiner E., Eichler L., Berg J. (2009): Shaping forest communication in the European Union: public perceptions of forests and forestry. Final Report for the European Commission – DG Agriculture and Rural Development. Rotterdam

Ranacher L., Pollakova B., Schwarzbauer P., Liebal S., Weber N., Hesser F. (2021): Farmers' Willingness to Adopt Short Rotation Plantations on Marginal Lands: Qualitative Study About Incentives and Barriers in Slovakia. *Bioenerg. Res.* 14, 357–373 (2021). <https://doi.org/10.1007/s12155-020-10240-6>

Rogan, R. G. & M. R. Hammer (1995): Assessing Message Affect in Crisis Negotiations. An Exploratory Study. In: *Human Communication Research*. Vol. 21 No. 4. S.553-574.

Salmon R.A., Priestley R.K. & Goven J. (2017): The reflexive scientist: an approach to transforming public engagement. *J Environ Stud Sci* 7, 53–68. <https://doi.org/10.1007/s13412-015-0274-4>

Schäfer, M.S. (2017). *Wissenschaftskommunikation Online*. In: Bonfadelli, H., Fähnrich, B., Lüthje, C., Milde, J., Rhomberg, M., Schäfer, M. (eds) *Forschungsfeld Wissenschaftskommunikation*. Springer VS, Wiesbaden. [https://doi.org/10.1007/978-3-658-12898-2\\_15](https://doi.org/10.1007/978-3-658-12898-2_15)

Schweibenz W. (2019): The personas method: a tool for communicating data from visitor studies. *Museologica Brunensia*. vol. 7, iss. 1, pp. 5-18. DOI: [10.5817/MuB2018-1-1](https://doi.org/10.5817/MuB2018-1-1)

SevenOne Media (2005): *TimeBudget 12*. 1999-2005

SiS.net (2020): *Science Communication – Policy Brief*. Online: <https://wbc-rti.info/object/document/20215/attach/Policy-Brief-SCIENCE-COMMUNICATION-FINAL.pdf>

Spent, E., Gronau, S. (2022): Transformationen in der Wissenschaftskommunikation – Online- und Offline-Channel im Wandel. In: Butzer-Strothmann, K. (eds) *Integriertes Online- und Offline-Channel-Marketing*. Springer Gabler, Wiesbaden. [https://doi.org/10.1007/978-3-658-38048-9\\_20](https://doi.org/10.1007/978-3-658-38048-9_20)