SCALE UP
community-driven
bioeconomy development

WS2 Training Programme Protocol

Proceedings of the training sessions in WS2
Session #3
07 December 2023

INNOVATIONS AND CHALLENGES IN PRODUCTION AND MOBILISATION OF BIOMASS

The last session of Workstream 2 was held on Thursday, December 07, 2023, from 9:00 am to 12:00 and welcomed 33 participants who delved into Innovations and Challenges in Production and Mobilization of Biomass and proved to be an enriching and collaborative exploration into the multifaceted world of biomass. The session commenced with an insightful warm-up activity, engaging participants in a global reflection on their geographical locations. Three compelling presentations illuminated the diverse challenges and innovative solutions within the realm of biomass, featuring Natalija Burgieva's exploration of innovative soil substrates from food waste, Soazig Perche's examination of challenges in fiber crops production, and Sophie Rabeau Epsztein's discussion on mobilizing producers to meet market demands. The subsequent breakout sessions facilitated collective discussions on key questions, addressing differences in challenges faced at the production level, expectations from the market, and solutions for biomass storage and mobilization at the producer level. As we reflect on the feedback from these discussions, draw insightful conclusions, and contemplate the way forward, we recognize the invaluable contributions of each participant. The knowledge shared and the collaborative spirit demonstrated during this session lay the foundation for a more sustainable and innovative future in biomass production.

BREAK-OUT ROOMS

1. Main crop or by-products, are there differences in the challenges faced at production level?

AUSTRIA AND GERMANY

In Brandenburg, rye is predominantly cultivated and can be considered a main crop. Cereal straw is a significant by-product and is mainly utilized for soil enrichment and bioenergy production. This is particularly favored by farmers who may be less open to adopting new value chains, as it represents a traditional utilization that does not require significant changes.

STRUMICA, NORTH MACEDONIA

The challenges in the production of biobased products stem from significant differences, particularly in the knowledge levels of primary producers. The market serves as the catalyst, driving initial efforts. However, hurdles arise due to insufficient understanding of the potential and market value of main crops or by-products, such as the untapped potential of creating pellets from grape residues. The lack of synergy between the supply and demand of biobased products further complicates the landscape. In addressing the question of whether there are discrepancies in challenges between main crops and by-products, the answer lies in the existing variations and obstacles encountered at the production level.

MAZOVIA, POLAND

In Mazovia break-out room was raised topics related to the use of apple biomass, related challenges and bottlenecks related to the use of biomass. We focused on biomass, i.e. residues

from the production of apple juice, which is currently waste, but in the future, it may constitute a valuable raw material - apple pomace and pruning waste. There are many potential applications for this biomass in the food, cosmetics, renewable energy, and other industries.

Using it for production processes involves overcoming several challenges, including:

- seasonality of apple production
- different quality of apples depending on the weather, diseases and pests
- the need for storage and transportation.

2. Growing and harvesting for biobased value chains: expectations from the market, challenges and opportunities, innovations in production

AUSTRIA AND GERMANY

One notable challenge in Brandenburg is the absence of decentralized processing facilities for straw. Additionally, securing large amounts of biomass proves difficult, as large companies in the construction and paper industries require substantial quantities for industrial processing. At the same time, developing small-scale business models relying on less biomass quantity and producing less is a hurdle due to a lack of necessary financial capacity. Despite the large farm fields in Brandenburg, the lack of infrastructure beyond biogas facilities hinders the efficient utilization of agricultural residues. The technology required for processing remaining digestate and solid materials from the biogas plants is also lacking. Similarities have been identified with the French example of the hemp value chain, presented during the training session, emphasizing the need for persuasive efforts to foster acceptance among farmers.

STRUMICA, NORTH MACEDONIA

The imperative to upscale innovative growing and harvesting methods for biobased value chains is underscored by various factors. There's a potential issue with redirecting agricultural producers towards photovoltaic (PV) energy production, but agri-voltaics emerges as a solution. A negative trend is observed in the market push to convert agricultural land into construction sites. However, there are positive individual examples, such as Agri-Energy cooperatives focusing on biogas electricity production from planted agricultural products. Another strategy involves planting fast-growing trees to meet industrial demands, though challenges may arise, such as the introduction of invasive species. To address the overarching question of expectations, challenges, and opportunities in growing and harvesting for biobased value chains, it becomes essential to also consider the enhancement of legislative frameworks. Furthermore, there's a notable trend toward innovation in production through digitalization of agricultural processes, including the use of remote sensing technology like drones. This not only aims to boost agricultural production but also serves as a preventive measure against open fires and forest fires.

MAZOVIA, POLAND

The region is dominated by small orchards and small agricultural producers who have limited financial resources and limited access to qualified human resources. They also do not have the technical resources and the ability to generate innovation that would allow them to develop in this area. A long-term trend is to expect a reduction in production because many people running these businesses are over 40 years old, with no potential successors who would take over the business. In the next 15-20 years, we can expect a significant reduction in this production.

One solution could be to create support instruments for them based on regional development strategies. However, this requires political intervention when designing development priorities.

3. Storage and mobilisation of biomass: bottlenecks and solutions at producer level

AUSTRIA AND GERMANY

In Brandenburg, the issue of storage is not a major concern, as it is typically managed at the farm level. Moreover, an alternative solution to address biomass storage challenges is to engage in agricultural cooperatives that already possess established infrastructure or storage facilities. This collaborative approach not only enhances the efficiency of biomass storage, but also fosters a sense of community and mutual support among farmers in the region.

In conclusion, the discussion focused on the potential of promoting and fostering small-scale bio-based business models and value chains and the importance of regional value creation. This has become even more pronounced in the context of recent crises. However, despite this acknowledgment, the practical implementation of these ideas continues to pose a significant challenge.

STRUMICA, NORTH MACEDONIA

The absence of storage facilities from farm to distribution channels poses a significant challenge in the seamless flow of biomass. Mobilizing biomass faces a serious challenge, with no sustainable solutions implemented thus far. Challenges related to storage and mobilization are individualized for each producer based on their knowledge. Lack of awareness among primary producers about the biomass potential in both market and personal use further complicates the situation. To overcome these hurdles at the producer level, the proposal is to establish more agricultural cooperatives that support robust networking and knowledge sharing. Additionally, the creation of a Knowledge Hub is suggested to connect academia with primary producers, aiming to address the question of storage and mobilization of biomass by identifying bottlenecks and proposing solutions.

MAZOVIA, POLAND

The main bottlenecks are:

- Volume and Bulk Density: Apple pomace has a relatively large volume, and its bulk density can be low. This makes storage, handling, and transportation less efficient, especially when dealing with large quantities.
- Moisture Content: Apple pomace can have a high moisture content, which may lead to issues related to storage stability and potential fermentation. High moisture content can also increase transportation costs.
- Seasonal Availability: The generation of apple pomace is often tied to the seasonal nature of apple harvesting. Producers may face challenges managing large quantities during peak seasons and dealing with reduced quantities during off-seasons.
- Storage Infrastructure: Small and medium-sized producers may lack proper storage infrastructure to handle significant amounts of apple pomace. Insufficient storage facilities can lead to deterioration of the by-product.

- Transportation Costs: The cost of transporting bulk quantities of apple pomace can be a bottleneck, particularly if the distance between the processing facility and potential users or disposal sites is considerable.

The best solution would be to create production on a nearby raw material, but this would be a difficult new investment.

Cross-regional conclusions/learnings

In conclusion, while each region faces unique challenges, commonalities in solutions, such as collaborative models and knowledge-sharing platforms, emerge. The cross-regional exchange of experiences provides valuable insights for fostering sustainable and resilient bio-based value chains.

Commonalities Across Regions:

- *Utilization of Agricultural By-Products*: All regions recognize the significance of agricultural by-products, such as straw, grape residues, and apple pomace, and explore their potential applications in various industries, including bioenergy, food, cosmetics, and renewable energy.
- *Challenges in Value Chain Adoption*: Small agricultural producers in multiple regions face common challenges, including limited financial resources, lack of access to qualified human resources, and difficulties in generating innovations for bio-based value chains.
- *Need for Legislative Enhancement*: Regions emphasize the importance of improving legislative frameworks to support the growth of bio-based value chains. This includes considerations for innovation in production processes, such as the use of digitalization and remote sensing technologies.

Regional Differentiators and Solutions:

- *Austria and Germany*: Challenges include the absence of decentralized processing facilities for straw and the difficulty in securing large amounts of biomass. The suggestion is to explore small-scale business models through agricultural cooperatives, enhancing both efficiency and community support.
- *North Macedonia*: Challenges arise from variations in knowledge levels among primary producers. Proposed solutions involve upscaling innovative growing and harvesting methods, creating Agri-Energy cooperatives, and promoting legislative enhancements. The establishment of a Knowledge Hub is suggested to address storage and mobilization challenges.
- *Poland*: Challenges encompass issues related to volume, bulk density, moisture content, seasonal availability, storage infrastructure, and transportation costs of apple pomace. Solutions involve regional development strategies, political intervention, and addressing bottlenecks through collaboration and knowledge sharing.

Cross-Cutting Solutions:

- *Agricultural Cooperatives*: The collaborative approach of engaging in agricultural cooperatives is recognized as beneficial in addressing challenges related to storage, biomass mobilization, and efficient value chain development.
- *Knowledge Hubs:* Establishing Knowledge Hubs or platforms that connect academia with primary producers is proposed across regions. This initiative aims to enhance awareness, share knowledge, and collectively address challenges.
- *Legislative Support*: The need for political intervention and legislative enhancements is highlighted across regions to support small producers and facilitate the development of bio-based value chains.

Participant feedback

At the end of the training session, the participants were asked to fill in a short survey to evaluate the training session. In the end, 6 participants responded to the survey, of which 3 from Poland, 2 were from Sweden, and 1 from Macedonia. No participants from Spain, Austria or France responded to the survey. The survey gave the following results:

Quality

The participants were asked to rate the quality of the training session on a scale from 1 (poor) to 4 (excellent). Out of the 6 participants, 2 gave the quality of the session a 4 (excellent), 2 participants responded with a 3, and another 2 participants with a score of 2. On average, the quality of the third training session scored relatively low (average: 3) compared to the previous two sessions (average: 3.7).

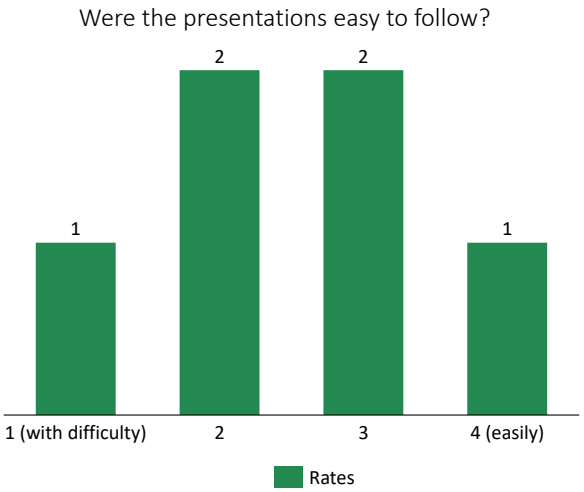
The participants were then asked what went well during the session. The respondents answered that they liked the selection of topics, interesting examples and illustrative images. One of the participants mentioned that it made them think about how to address current challenges. One response said that the first presentation from Macedonia was technically okay.

Next, the participants were asked what could have gone better. Here, multiple participants mentioned problems with the translation. Additionally, multiple participants mentioned that the first speaker had a bad connection and experienced audio quality problems.

Then, the participants were also asked how this second training compared to the first training session. Here, one of the participants mentioned an improved quality, while two participants mentioned that it was very good and at a similar level to the first session.

Understandability

The participants were also asked whether the presentations were easy to follow. They were asked to rate this on a scale from 1(with difficulty) to 4 (easily). Out of the 6 respondents, only 1 gave this a score of 4 (easily), 2 a score of 3, 2 a score of 2 and 1 respondent a score of 1. This score (average: 2.5) is relatively low compared to the previous 2 training sessions (average of 3.6 & 3.8). This could be due to problems with the translation and bad audio quality of the first presentation.

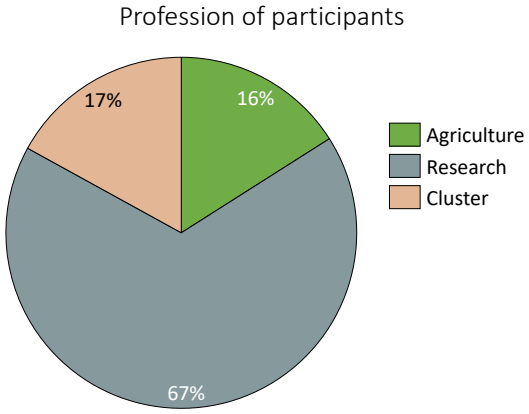


Topics

When asked which topic was most interesting, one of the participants mentioned that they were all equally interesting, and one respondent mentioned the innovations. Additionally, this question got comments saying it is difficult to answer as they could not comprehend most of the contents but that they did like the enthusiasm and approach from Skopje. Another participant mentioned that they did not stick around for anything to get interesting. A comment was also made on the translation technology. The comment mentioned that the speakers should take more breaks after sentences for the software to work properly.

Field of occupation

The survey concluded with an optional question regarding the participant's field of occupation. The participants came from different areas; four from research, one from agriculture, and one from a cluster organisation.



Participants:

If you wish to get in touch with one of the participants from this session, please contact someone in the SCALE-EP consortium.

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