

Reconnecting Consumers with Producers: A Mobile App to Promote Ethical Consumption and Local Producer Visibility



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Abstract

This study explores the potential of a mobile platform, Lowal, to influence consumer behavior toward more local and ethically produced food. Addressing the persistent attitude-behavior gap, Lowal integrates geolocation, customizable filters, and a multi-dimensional sustainability rating system covering animal welfare, plant sustainability, climate and energy, and waste and circularity. A mixed-methods evaluation with 21 participants combined think-aloud protocols and a structured questionnaire to assess usability, acceptance, and behavioral impact. Results indicate strong user engagement, particularly with the interactive map and animal welfare ratings, which emerged as the most influential decision factor. Participants valued the app's clarity, transparency, and potential to support decision-making, though improvements in terminology, visual density, and filtering were suggested. The findings highlight how transparency, personalization, and trust-building features in platform design can foster sustainable purchasing behavior while enhancing the visibility of small-scale producers.

Keywords: mobile platform, attitude-behavior gap, multidimensional rating system, behavioral impact, sustainable purchasing behavior

1. Introduction

In a world where consumers increasingly seek local, ethical, and environmentally responsible food options, identifying trustworthy producers remains unnecessarily difficult (Carfora & Cantellani, 2023, p. 3; Tiboni-Oschilewski et al., 2024, p. 5). Despite clear evidence of shifting consumer values (Mouchtaropoulou et al., 2024, p. 2; Del Prete & Samoggia, 2023, p. 9), most individuals lack access to tools that **translate intention into action**, particularly when it comes to evaluating the sustainability and transparency of food sources (Penkert & Gröschel, 2023, p. 1; Sanye Mengual et al., 2024, p. 5). The persistent gap between what consumers express and their actual behavior,

the so-called “**attitude-behavior gap**” (Outdooractive AG & Compass Tourismus Partner eG, 2022, p. 4; Mu et al., 2019, p. 2) - is not due to apathy, but to structural barriers such as information asymmetries (Quinn et al., 2025, p. 1), the **limited visibility of small producers** (HLPE, 2019, p. 25), and the lack of an intuitive digital infrastructure.

Lowal was developed to address precisely these challenges. The mobile platform enables users to discover regional producers and evaluate their practices across **four key dimensions**: animal welfare, plant welfare, climate and energy, and waste and circularity. Within the dimensions of animal and plant welfare, assessments are tailored to specific product categories, such as pigs, chickens,

and cows for animal-based products, or vegetables, fruit, and grains for plant-based goods. Each category is evaluated using a **five-level rating scale** that reflects the quality and sustainability of production practices. These ratings are presented through a structured and intuitive interface. This allows users to interpret complex information fast and make well-informed decisions without requiring technical expertise.

Although awareness of sustainability is growing, many consumers are overwhelmed when trying to find and evaluate sustainable products (Outdooractive AG & Compass Tourismus Partner eG, 2022, p. 11) and still have difficulty obtaining reliable and clearly presented information about how their food is produced (Rossi et al., 2024, p. 3; Quinn et al., 2025, p. 2). Existing digital platforms rarely offer meaningful insights into ecological or ethical practices (Penkert & Gröschel, 2023, p. 2), and **producers often lack the digital visibility** necessary to effectively communicate their values (Höpken, 2022, p. 3). This gap between available information and consumer expectations, who are often in a dilemma between internal (e.g. health) and external (e.g. environment) motives (Nifatova et al., 2025, p. 2), continues to hinder the development of more sustainable and regionally rooted food systems.

This project aims to design and evaluate a **mobile platform that encourages responsible consumption** by making sustainability-related production data visible, accessible, and practically useful. The goal is to support ethically motivated purchasing behaviour while enhancing the visibility and competitiveness of small, local producers. What is at stake here is not merely the development of a digital product, but a

broader inquiry into the extent to which platform design can influence consumer decisions. In order to explore this relationship, the study focuses on direct user interaction with the application and examines how individuals interpret and respond to the presentation of information, decision-support tools, and contextual cues within the app environment.

RQ: How can a mobile platform that visualises multi-dimensional sustainability information influence consumer behavior toward more local and ethically produced food?

2. State-of-the-Art

To address the research question of how a mobile platform can influence consumer behavior, it is essential to consider the current state of research on sustainable consumption. The central challenge lies in the discrepancy between consumers' stated values and their actual purchasing behavior, the so-called **"attitude-behavior gap"** (Outdooractive AG & Compass Tourismus Partner eG, 2022, p. 4; Mu et al., 2019, p. 2). This gap is perpetuated by several factors that a mobile platform like Lowal can directly address.

A primary issue is the **lack of transparent and understandable information**. Consumers face a flood of sustainability labels and vague "green" claims, leading to mistrust and confusion (Sanye Mengual et al., 2024, p. 5) and making it difficult to distinguish genuine sustainability from "greenwashing" (Outdooractive AG & Compass Tourismus Partner eG, 2022, p. 4). Existing digital platforms often fail to provide the necessary transparency about ecological and ethical practices (Penkert & Gröschel, 2023, p. 2). This is particularly relevant as consumers seek

is particularly relevant as consumers seek a direct relationship with producers to gain reassurance regarding the origin, quality, and control of food products (Nicolosi et al., 2019, p. 2). A platform that visualizes detailed and verifiable information about production methods can overcome this information asymmetry and act as a scalable, trustworthy advisor, a role otherwise often filled by the seller on-site (Nicolosi et al., 2019, p. 5).

The purchasing decision is not determined by rational information processing alone but is deeply embedded in a socio-cultural context (Takagi et al., 2024, p. 7). Trust, social interaction, and a sense of community are crucial for the viability of local food systems (Quinn et al., 2025, p. 1; Takagi et al., 2024, p. 12). A purely informational approach, therefore, falls short. Alternative food networks like the REKO network demonstrate how digital platforms can successfully **foster direct, trust-based relationships between producers and consumers**.

REKO, an acronym for "Rejäl Konsumtion" or "Fair Consumption", originated in Finland in 2013 and facilitates a pre-order, direct-to-consumer distribution model (EU Project Cocoreado, 2023, p. 2; REKO RINGS - LOCAL FOOD GROUPS, 2013). The model operates through closed Facebook groups where local producers announce available products, and consumers place orders in the comments. Transactions and product handovers occur at a designated physical location and time, often a car park, where producers distribute goods directly from their vehicles (Farmer E, 2019, 1:10-1:30; Practical Farmers of Iowa, 2021, 5:20-5:45). This system **eliminates intermediaries, reduces food waste, and minimizes costs for producers**, as they only bring what has been pre-sold (Mefferd,

2020). The success of REKO rings, which have expanded across Scandinavia and beyond, is built on creating a "more satisfying culture" around food that counteracts the anonymity of the industrial system (Gruvaeus & Dahlin, 2021, p. 4, 19; REKO-rings, Interreg VB North Sea Region Programme, n.d.). Such networks are based on trust and reciprocity, with purchasing decisions heavily influenced by the reputation of the product and the producer (Nicolosi et al., 2019, p. 3). For a mobile platform, this means it must not only deliver data but also serve as a tool for building trust and strengthening the community to sustainably influence consumer behavior. A new player in Sweden, **Mylla**, is building upon this model by creating a digital marketplace that further streamlines the logistics for both producers and consumers, indicating a trend toward more sophisticated digital solutions in this space (Backingminds, n.d.).

From the producers' perspective, there is often a **discrepancy between their sustainable practices and the perceived willingness of consumers** to pay for them (Quinn et al., 2025, p. 1). Small-scale producers struggle with economic viability because the market does not sufficiently reward their efforts for biodiversity (Quinn et al., 2025, p. 10). They often lack the digital visibility to effectively communicate the value of their work (Höpken, 2022, p. 3). The REKO model shows that simple digital tools can reduce the bureaucratic burden for small businesses and offer them an effective way to build a customer base without the costs of traditional marketing or farmers' markets (EU Project Cocoreado, 2023, p. 4; Gruvaeus & Dahlin, 2021, p. 16).

In summary, the state of the art shows that to overcome the attitude-behavior gap, a

mobile platform must do **more than just display information**. It must visualize complex sustainability information in a way that builds trust and strengthens the social connection to the producer, which is highly valued by consumers. By translating complex production practices into understandable and consumer-relevant attributes such as food safety, origin, and animal welfare (Nicolosi et al., 2019, p. 7), such a platform can effectively close the gap between values and actions.

3. Methodology

3.1 Research design

To address the research question of how a mobile platform can influence consumer behavior, an empirical study was designed to gain an initial assessment of the Lowal app's acceptance, utility, and usability. The research followed a **mixed-methods approach**, combining a Thinking-Aloud test with a standardized questionnaire to capture both qualitative and quantitative data. This methodology was chosen to provide a comprehensive picture of the user experience, linking real-time user interaction with structured post-task reflections. The study was conducted in a university environment, with a sample of 21 students, predominantly female, serving as the test group. This demographic was considered representative of a digitally proficient audience with a potential interest in sustainable consumption.

The procedure was standardized for all participants to ensure the comparability of the results. Each session began with a comprehensive introduction to the purpose and functionality of the Lowal app. Participants

comprehensive **introduction to the purpose and functionality** of the Lowal app. Participants were then provided with a smartphone with the pre-installed prototype to create a realistic usage scenario. The core of the study involved participants completing a set of predefined tasks while being instructed to verbalize their thoughts, actions, and decisions continuously. This Thinking-Aloud method is particularly valuable for revealing users' cognitive processes and identifying fundamental misunderstandings in the interaction design (Nielsen, 1993, p. 195).

Following the interactive task phase, each participant completed a structured questionnaire. This instrument was used to systematically collect subjective perceptions via a **five-point Likert scale**, where participants rated their agreement with various statements. The questions were designed to **quantify the perceived usefulness of the filters, the clarity of the multi-level rating system, and the general intention to use the app**. By combining the qualitative insights from the verbal protocols with the quantitative ratings from the questionnaire, a well-founded and multifaceted basis for understanding user perception was established.

3.2 Implementation

The technical and design implementation of the Lowal application was guided by the overarching goal of promoting sustainability-oriented consumer behavior through digital support. Special emphasis was placed on integrating content-driven sustainability metrics into a user-friendly, visually accessible, and practically applicable mobile application.

System architecture and technological foundation

The Lowal app was developed natively for the iOS operating system, using Swift as the primary programming language. This approach ensured maximum performance, robust system integration, and a consistent user experience within the Apple ecosystem. Native development also allowed for seamless integration of location-based services, which are essential for the app's map-based navigation.

In the current prototype phase, all data is stored locally and based on simulated producer and product datasets. These demo datasets reflect typical characteristics of regional agricultural practices and enable realistic testing of the user interface.

Core functionalities of the application

The app combines several central functional elements that work together to form a user-centered platform for sustainable food discovery. The main point of entry is an interactive, location-based map that displays nearby producers and visualizes their sustainability profiles using a combination of icons and rating levels (see Fig. 1). Each producer tile includes multiple sustainability indicators, providing users with an immediate overview of ecological and ethical standards.

By tapping a tile, users access the detailed profile of a given producer. This includes information about available products, opening hours, certifications (e.g., organic, pasture-raised), and the producer's sustainability ratings across all four index categories (see Fig. 2). This detailed view complements the overview on the map by

providing structured, comparable data that supports transparent and informed decision-making.

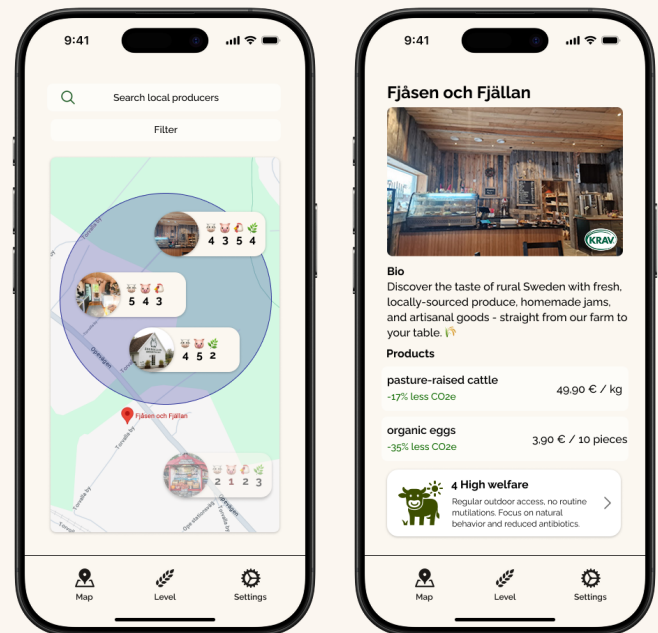


Fig. 1: Interactive map and detailed view of a local producer in Jämtland

A distinctive feature of Lowal is the integration of a multi-dimensional, icon-based 5-level rating system designed to assess four core aspects of sustainable food production:

- 1. Animal Welfare** (differentiated by species: cows, pigs, chickens), based on factors such as outdoor access, medication use, housing conditions, and behavioral enrichment.
- 2. Plant Sustainability** (covering vegetables, fruits, and grains), taking into account pesticide use, soil health, crop diversity, and regenerative practices.
- 3. Energy & Climate**, including renewable energy usage, CO₂ compensation, and climate protection efforts.

4. Waste & Circularity, focusing on waste reduction, recycling systems, and material reuse.

Each category is visualized with a specific symbol, color-coded scale (ranging from red to green), and a numeric level (1 to 5). This design ensures that complex agricultural realities are translated into understandable, comparable indicators that do not require expert knowledge to interpret (see Fig. 2).



Fig. 2: Plant- and cow welfare levels and detailed view of the fourth level

Another core component is the app's robust filtering system, which allows users to search by product type (e.g., vegetables, dairy, meat), certifications (e.g., organic, free-range), or sustainability level (e.g., only show producers with Level 5 in "Waste & Circularity"). This functionality supports personalized navigation and helps users align their purchasing decisions with their individual values and preferences.

UX/UI design principles

The visual design and interaction logic of the app are inspired by Scandinavian minimalism, emphasizing clarity, simplicity, and functional aesthetics. The user interface is kept deliberately light and clean, featuring generous use of white space, contrast-rich icons, and a clear sans-serif typography. The navigation is flat and intuitive, with a fixed bottom bar allowing direct access to the app's main areas: All visual elements follow a consistent design language to support intuitive orientation and recognition.

Particular attention was paid to designing an interface that is accessible even to users with low technical affinity. This is especially relevant in rural areas, where digital literacy cannot always be assumed. As such, Lowal aims to ensure inclusivity and ease of use across demographic boundaries.

3.3 Evaluation

Regionality and Sustainability in Grocery Shopping

In order to assess the usability, acceptance, and perceived utility of the Lowal application, a comprehensive usability test was conducted, combining a structured Likert-scale-based questionnaire with a qualitative Thinking-Aloud protocol. The objective was to evaluate not only interface-related aspects but also the **broader behavioral and attitudinal resonance** of the application with users. As a foundational step, participants' general attitudes toward regionality and sustainability in the context of grocery shopping were assessed, in order to contextualize their subsequent evaluations of the app. The majority of

respondents rated sustainability as "important" (n = 9) or "very important" (n = 2), while only one person considered it "rather unimportant." This emphasizes the central role of sustainability as a purchasing criterion for many consumers and supports the relevance of sustainability-oriented information systems such as the Lowal app. When asked about specific purchasing criteria, participants typically selected between two and four aspects, with animal welfare, regional origin, and environmental sustainability being the most frequently mentioned. Criteria such as packaging or fair trade were mentioned less frequently. This suggests that consumption decisions are primarily guided by ethical and ecological values, with animal welfare and regional origin playing particularly prominent roles.

Interactive Map of Local Producers

A central element of the Lowal application is the **interactive map** that visualizes local producers and enriches this information with additional sustainability indicators. The evaluation of this feature focused on clarity, visual structure, and user intention. Results from the Thinking-Aloud test indicate that the majority of participants found the information presentation on the map to be clear, helpful, and visually appealing. The combination of icons, color gradients, and thematic categories was frequently highlighted positively. One participant noted: "You can immediately see which farm has which level. It seems very clear." The use of color gradations was repeatedly described as intuitive, allowing for quick visual orientation, particularly in comparison to conventional platforms: "It's structured like a traffic light. The colors are intuitive; you immediately understand what it means."

Furthermore, the map function was perceived as action-guiding. Over 80% of the participants indicated they would use it to help them choose sustainable producers.

The visual structure was generally described as consistent and easy to learn. The recurring symbols and standardized presentation of sustainability levels facilitated orientation. Multiple participants favorably compared it to well-known mapping services such as Google Maps: "The app works similarly to Google Maps. You're familiar with it, so it's intuitive to use."

However, **areas for improvement** were also identified. Some users mentioned that when multiple information layers were active, such as when displaying several producers or categories simultaneously, the interface could appear visually overloaded: "If too many icons are shown at once, it gets confusing - especially on a mobile phone." These observations led to repeated suggestions for filter functionalities that would allow users to refine the map display based on criteria such as price or dietary preferences. One participant remarked: "A filter for vegetarian products would be great. Then I'd immediately see what's relevant for me." In addition, the importance of improved icon placement was raised, as overlapping symbols were perceived as impairing orientation in areas with high producer density: "When the symbols overlap, it's difficult. You can't tell what's being displayed." In sum, the interactive map demonstrated a high level of acceptance among participants in terms of both information density and practical applicability.

It was understood by users as a central control element within the app that significantly

supports conscious and sustainable purchasing decisions. The function not only serves an informative role but also fulfills a behaviorally relevant purpose and is of particular importance in situations such as changes in location, targeted product searches, or specific dietary needs: "If I'm in a new city, I'd use the map to quickly find a suitable farm shop." is stated by a participant. Despite its overall high acceptance, the evaluation results clearly indicate that the map's complexity and visual density should be further developed through, for instance, further filter options, adaptive display behavior depending on zoom level, and contextual help functions. The map can therefore be considered a key structural element of the application that not only facilitates orientation but actively contributes to promoting sustainable consumer behavior in everyday life.

Overview of Sustainability Levels

With regard to the level overview, evaluating both the perceived meaningfulness of each sustainability category and their influence on purchasing decisions, the quantitative analysis of the Likert-scale responses revealed **particularly strong approval for the animal welfare level**. As visualized in Figure 3, the animal welfare level received by far the most selections in the "very useful" category. Similarly positive assessments were recorded for the plant sustainability and waste/resource levels. Only the energy and climate protection level was rated somewhat more cautiously, receiving more neutral or slightly negative assessments. These quantitative findings were corroborated by the qualitative comments. The animal welfare level was frequently described as "well explained," "comprehensible," and "relevant

to purchasing decisions." One test person emphasized: "People want to buy products with better animal treatment," while another praised the visual representation: "Structured like a traffic light. The colors are very intuitive." Overall, there was high acceptance of the level system, not only due to the substantive relevance but also because of the visual clarity and the familiarity of the five-step scale, which resembles known food labeling systems.

Regarding the **influence of levels on actual purchase intention** (see Figure 4), the animal welfare level again proved most impactful: the majority of participants indicated that they would "definitely" or "probably" orient their purchases accordingly. A frequently cited justification was that "animal welfare is already a factor in my buying decisions" and that "the app makes this visible." The plant sustainability level was also largely viewed as useful, although with slightly less intensity. Many comments affirmed its fundamental relevance but noted that "the differences between products are hard to grasp" or that "animal welfare feels more emotionally important." Nevertheless, several participants indicated that they would "choose the product with the higher plant level if all else is equal." The energy and climate level received more differentiated feedback. While some respondents classified it as a "valuable added benefit," others questioned its relevance, citing "limited capacities of small producers" or a "lack of visible impact."

However, the **visual representation** was mostly evaluated positively: "The system is great. You can see whether a farm uses solar energy, for instance." In this category, the level was less frequently reported as a clear decision factor, often accompanied by

statements like “depends on the price” or “will be considered if visible.” The waste and resource efficiency level was the most variably rated. Some participants emphasized its importance with remarks such as “packaging is a big issue for me,” while others described it as “not decisive” or “a nice-to-have.” This heterogeneity is also reflected in the wider distribution of scale responses.

Producer Detail View

The producer detail view constitutes a further central feature of the application, offering users **detailed information on individual farm shops**, including product categories, sustainability levels and visual descriptors of the producers. The evaluation aimed to assess the clarity, relevance, and user impact of this function. The qualitative analysis of the interviews revealed that most participants perceived the detail view as extremely helpful and central to the app's value proposition. Many users emphasized the richness and structured presentation

of the information, which allowed them to make more informed decisions. As one participant put it: “You can instantly see what a farm offers and how it performs on animal welfare or energy. It seems very clear and time-saving.” The combination of symbols and explanatory text was frequently highlighted as particularly useful: “The classifications are easy to understand and logically structured. I also like that I can incorporate this into my purchase decisions.” A recurring theme was the enhanced transparency that the detail view provides. Compared to conventional in-store shopping, many users felt that the app offered more **clarity and trustworthiness**: “In supermarkets, you often don't know what's really behind a label - with this, I see directly how animals are kept or whether solar power is used.” The perceived relevance of the feature for sustainable purchasing decisions was also repeatedly emphasized, with users stating that the information displayed could directly influence their behavior: “If I see that a farm is especially animal-friendly or pays attention to packaging, I'd rather shop

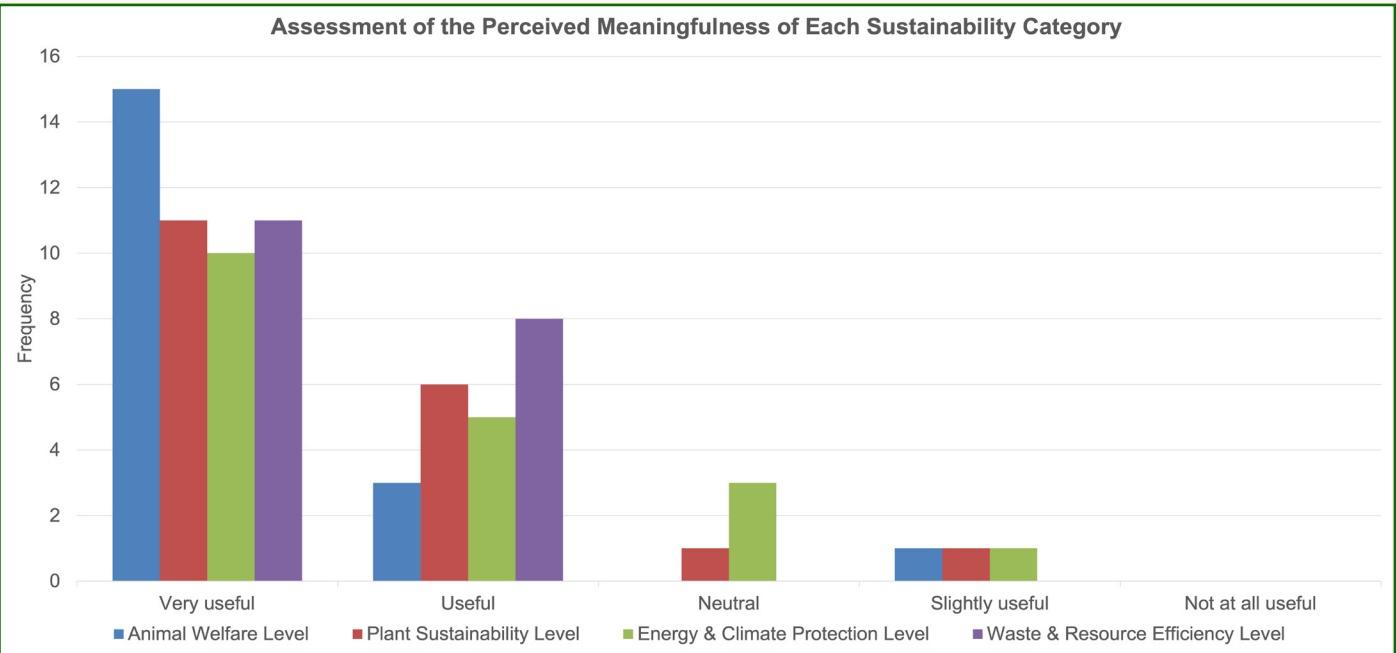


Fig. 3: Assessment of the Perceived Meaningfulness of Each Sustainability Category

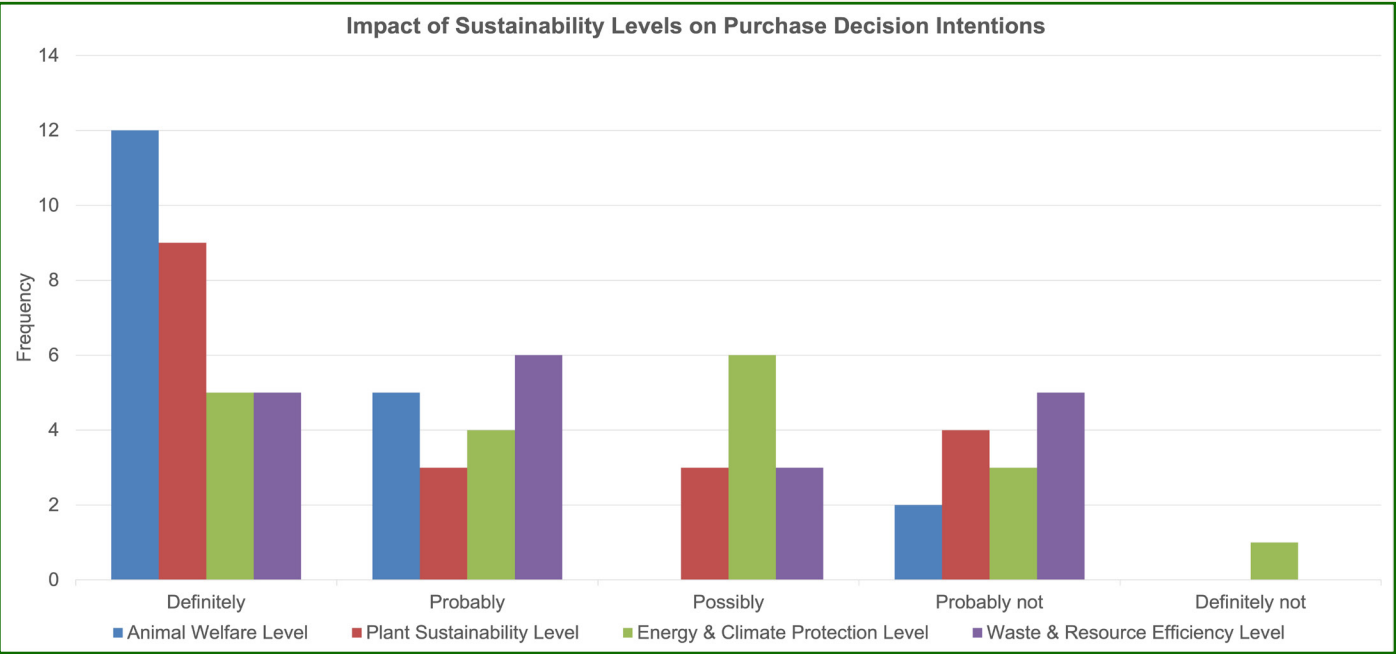


Fig. 4: Impact of Sustainability Levels on Purchase Decision Intentions

there." Several participants also reflected on their own stance toward sustainability: "I care about animal welfare and would align my behavior accordingly - if it's presented clearly, it has a real impact on me." Others underscored the importance of circular economy practices: "Circularity is very important to me - if that's displayed, it's a bonus in my decision-making."

Critical feedback focused primarily on **visual overload at high information density**. Some users noted: "The icons are good, but when too many are displayed simultaneously, it becomes overwhelming - especially on small screens." Others stressed the need for additional contextual explanations: "I'm not quite sure what sustainable plants actually means - there should be more explanations." One participant remarked: "If the scores are close, like 4 and 5, then factors like distance or price become more important for me." Overall, the detail view functions as a crucial decision-support element and significantly contributes to both

the acceptance and perceived utility of the application. By combining objective criteria, visual representation, and clearly defined sustainability levels, it enables users to make more reflective and informed consumption choices. The results suggest that the detail view should be further developed through optimized visual simplification, responsive design, contextual help features (e.g., tooltips), and optional personalization of the information display to ensure usability across diverse user groups.

Overall Impression and Behavioral Impact

Participants' assessments of the app's **alignment with their daily life** ranged from "very good" (n = 9) to "rather poor" (n = 2), with many explanations revealing concrete situations in which the application could be integrated. High ratings were frequently associated with the possibility of planning farm shop visits in advance, combining several locations in a single trip, or quickly checking product offerings before leaving

home. Some participants noted the benefit of using the app during holidays or when changing residence, as it would help identify regional producers unfamiliar to them. Others highlighted that, while they already shop regionally, the app would simplify the search for specific products and prevent unnecessary trips. Moderate ratings of "good" (n = 4) and "partially" (n = 7) were often linked to factors such as only occasional personal responsibility for grocery shopping, relying on parents or partners for most purchases, or habitual use of familiar navigation tools like Google Maps, which set a high bar for ease of use. In these cases, the app was still seen as practical, but its application in everyday life was described as situational, depending on available time and the motivation to seek out regional shops. Lower ratings such as "rather poor" were tied to persistent supermarket shopping habits and price considerations, with students in particular pointing to limited budgets as a barrier to acting on the app's recommendations. The perceived meaningfulness of the content received predominantly "very useful" ratings (n = 17), with participants emphasising the structured presentation, intuitive navigation, and comprehensive coverage of relevant information. Recurrent remarks included that farm shop locations and product offerings are often difficult to find elsewhere, and that the app addressed this gap by centralising information in a single interface.

Transparency regarding shop criteria, such as sustainability standards or production methods, was noted as particularly valuable for informed decision-making. "Useful" ratings (n = 4) similarly recognised these benefits but sometimes framed them in a broader context, suggesting that the app could further support sustainable

shopping through added features like product comparison functions or filtering by category. Neutral ratings (n = 2) described the content as solid but indicated that its utility might increase with more advanced functionalities. When asked about the app's potential to influence purchasing behaviour, the majority reported a "very strong" (n = 9) or "rather strong" (n = 8) anticipated effect, with explanations frequently referring to a shift from supermarkets to farm shops, facilitated by increased awareness of local availability and the ability to plan purchases more efficiently. Several participants pointed out that visual mapping of nearby providers and sustainability attributes would make it easier to choose local over conventional options, while "partial" influence ratings (n = 6) came mainly from respondents who already purchase a significant share of their groceries locally and would therefore use the app more as a tool for optimisation than as a driver of behavioural change.

Regarding **intention to use the app**, "definitely" (n = 9) and "probably" (n = 9) ratings dominated, with participants describing concrete use cases such as planning weekly shopping routes, coordinating with family members, or identifying new farm shops while travelling. Some also mentioned they would install the app immediately if it were free of charge, while "possibly" responses (n = 3) were conditional on smooth technical implementation and personal integration into routines. The single "rather not" rating reflected doubts about regularly choosing more expensive regional options despite recognising the app's utility.

4. Discussion

This study set out to answer the research question: How can a mobile platform that visualises multi-dimensional sustainability information influence consumer behavior toward more local and ethically produced food?

The evaluation results of the Lowal application show that such a platform can positively **shape purchasing decisions by lowering key barriers** associated with the attitude-behavior gap. By presenting complex sustainability data in a clear, visually intuitive, and contextually framed manner, Lowal enables consumers to make informed choices without requiring specialist knowledge.

Animal welfare emerged as the most emotionally resonant dimension, exerting the strongest influence on purchase intentions. This aligns with the literature, which emphasizes the strong link between emotionally charged sustainability aspects and actual consumer behavior (Nicolosi et al., 2019, pp. 2–3). The other sustainability categories, plant sustainability, energy and climate, and waste and circularity, were also considered relevant, though with varying degrees of priority. This diversity of preferences underscores the value of customizable filters, enabling the platform to address individual consumer priorities.

Qualitative feedback revealed that users perceive Lowal not only as an information source but as a **decision-support tool** that can guide them toward more sustainable and regional purchases. Transparency, clarity, and the ability to compare producers directly were seen as key strengths, helping

to address the mistrust and information asymmetry often associated with existing sustainability labels. At the same time, user feedback identified areas for refinement, including reducing visual density, clarifying terminology (e.g., “plant sustainability”), and improving map marker clustering to enhance navigation.

By directly **connecting producers and consumers**, Lowal also addresses the low visibility of small, regional farms, offering them a digital space to present their practices in a way that builds trust. This dual benefit of empowering consumers to act on their values and giving small producers a stronger market presence suggests that platform design can indeed be a critical lever for promoting ethical consumption.

In conclusion, the findings indicate that a mobile platform like Lowal can influence consumer behavior toward more local and ethically produced food by combining transparency, personalization, and trust-building design elements. The emotional salience of certain sustainability dimensions, especially animal welfare, can be leveraged to bridge the gap between intention and action, provided that the user experience remains intuitive, engaging, and adaptable to different consumer needs.

5. Summary and Outlook

This study examined the design, implementation, and evaluation of Lowal, a mobile application developed to promote sustainable consumption by making multi-dimensional sustainability information about local food producers transparent, accessible, and actionable. It addresses the attitude-behavior gap - the discrepancy between

consumers' ethical intentions and their actual purchasing decisions - by tackling barriers such as limited access to reliable data, low visibility for small-scale producers, and the complexity of existing labels.

Lowal combines a location-based interactive map, detailed producer profiles, customizable filters, and a proprietary 5-level index system assessing four sustainability dimensions: animal welfare, plant sustainability, energy & climate and waste & circularity. Each is visualized with intuitive icons, color-coded scales and numeric ratings, enabling non-expert users to make informed comparisons. A mixed-methods evaluation with 19 participants, using think-aloud testing and a structured questionnaire, showed strong engagement, with animal welfare ratings exerting the greatest influence on purchasing intentions. Participants valued the app's clarity and transparency, but identified areas for improvement, including more concise terminology, reduced visual density, and better map marker clustering. These results highlight the importance of balancing information richness with cognitive simplicity.

Building on these findings, further development will focus on integrating data from producers, regional networks, and sustainability registries to enhance reliability and credibility. User feedback will guide refinements in category definitions and usability, supported by adaptive visualizations and context-sensitive help features. The sustainability index may be expanded to include additional dimensions such as biodiversity and social equity, in collaboration with academic and industry partners.

By scaling to new regions and adapting to diverse cultural and regulatory contexts, Lowal can position itself as a leading tool for bridging the attitude-behavior gap, fostering transparency and trust, and strengthening locally rooted, ethical food systems.

References

- Backingminds. (n.d.). Mylla. Backingminds. Retrieved 7 August 2025, from <https://www.backingminds.com/mylla>
- Carfora, V., & Catellani, P. (2023). Psychosocial drivers influencing local food purchasing: Beyond availability, the importance of trust in farmers. *Frontiers in Nutrition*, 10, 1204732. <https://doi.org/10.3389/fnut.2023.1204732>
- Del Prete, M., & Samoggia, A. (2023). Does fairness matter? Consumers' perception of fairness in the agro-food chain. *Frontiers in Sustainable Food Systems*, 7, 1116319. <https://doi.org/10.3389/fsufs.2023.1116319>
- EU Project Cocoreado. (2023). Reko Ring / Finland. Get inspired! A roadmap to replicate knowledge and experience about fair food supply chains. https://cocoreado.eu/wp-content/uploads/2023/07/COCOREADO_Roadmap-1_14-REKO-web.pdf
- Farmer E (Director). (2019, October 4). What is REKO? They Buy Food From The Trunk Of Your Car! [Video recording]. <https://www.youtube.com/watch?v=Oe6rHuJhimc>
- Gruvaeus, A., & Dahlin, J. (2021). Revitalization of Food in Sweden - A Closer Look at the REKO Network. *Sustainability*, 13(18), 10471. <https://doi.org/10.3390/su131810471>

HLPE. (2019). Agroecological and other innovative approaches for sustainable agriculture and food systems that enhance food security and nutrition. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security. <https://agritrop.cirad.fr/604473/1/604473.pdf>

Höpken, W. (2022). Analyse der Akzeptanz unterschiedlicher Darstellungsformen nachhaltiger Angebote in touristischen Online-Plattformen (A/B-Test). https://forschung.rwu.de/sites/forschung/files/2022-04/Analyse_der_Akzeptanz_nachhaltiger_Angebote.pdf

Mefferd, A. (2020). REKO Ring: A new way to pre-sell online [SubHub Site]. Growing for Market. Com. <https://growingformarket.com/articles/reko-ring-new-way-presell-online>

Mouchtaropoulou, E., Mallidis, I., Giannaki, M., Koukaras, K., Früh, S., Ettinger, T., Benmehaia, A. M., Kacem, A., Achour, L., Detzel, A., Gianotti, A., Samoggia, A., Ayfantopoulou, G., & Argiriou, A. (2024). Consumer willingness to pay for fair and sustainable foods: Who profits in the agri-food chain? *Frontiers in Sustainable Food Systems*, 8, 1504985. <https://doi.org/10.3389/fsufs.2024.1504985>

Mu, W., Spaargaren, G., & Oude Lansink, A. (2019). Mobile Apps for Green Food Practices and the Role for Consumers: A Case Study on Dining Out Practices with Chinese and Dutch Young Consumers. *Sustainability*, 11(5), 1275. <https://doi.org/10.3390/su11051275>

Nicolosi, A., Laganà, V. R., Laven, D., Marcianò, C., & Skoglund, W. (2019). Consumer Habits of Local Food: Perspectives from Northern Sweden. *Sustainability*, 11(23), 6715. <https://doi.org/10.3390/su11236715>

doi.org/10.3390/su11236715

Nielsen, J. (1993). *Usability engineering*. Academic Press.

Nifatova, O., Bliumska-Danko, K., Charreire-Petit, S., & Danko, Y. (2025). Packaging of organic food - The dilemma of consumers' internal and external motives. *Frontiers in Sustainability*, 6, 1513954. <https://doi.org/10.3389/frsus.2025.1513954>

Outdooractive AG & Compass Tourismus Partner eG. (2022). ESKINAT - Entwicklung eines Strategiekonzepts zur Verbesserung der Verfügbarkeit glaubwürdiger Informationen über nachhaltige Angebote im Tourismus.

Penkert, L., & Gröschel, C. (2023). Increasing sustainable user behavior in digital products through transparent sustainability information. *Mensch Und Computer* 2023, 359-363. <https://doi.org/10.1145/3603555.3608573>

Practical Farmers of Iowa (Director). (2021, March 5). REKO Rings: A Direct-Market Model from Scandinavia- 2021 Virtual Annual Conference [Video recording]. <https://www.youtube.com/watch?v=RFH2KEREndo>

Quinn, C., Allen, K., Quinn, J., Razo, A., Andersen, S., & Brown, H. (2025). Cultivating connections: A comparison of food producer and consumer values and implications for the viability of local food networks. *Agriculture and Human Values*. <https://doi.org/10.1007/s10460-025-10749-6>

REKO RINGS - LOCAL FOOD GROUPS. (2013, August 13). <https://www.interregeurope.eu/good-practices/reko-rings-local-food-groups>

REKO-rings, Interreg VB North Sea Region Programme. (n.d.). Retrieved 7 August 2025, from <https://northsearegion.eu/reframe/online-resource-centre/regional-organization-in-a-cooperative-structure/reko-rings/index.html>

Rossi, E. S., Cacchiarelli, L., Severini, S., & Sorrentino, A. (2024). Consumers preferences and social sustainability: A discrete choice experiment on 'Quality Agricultural Work' ethical label in the Italian fruit sector. *Agricultural and Food Economics*, 12(1), 14. <https://doi.org/10.1186/s40100-024-00307-9>

Sanyé Mengual, E., Boschiero, M., Leite, J., Casonato, C., Fiorese, G., Mancini, L., Sinkko, T., Wollgast, J., Listorti, G., & Sala, S. (2024). Sustainability labelling in the EU food sector: Current status and coverage of sustainability aspects. Publications Office of the European Union. <https://data.europa.eu/doi/10.2760/90191>

Takagi, S., Numazawa, Y., Katsube, K., Omukai, W., Saijo, M., & Ohashi, T. (2024). Theorizing the socio-cultural dynamics of consumer decision-making for participation in community-supported agriculture. *Agricultural and Food Economics*, 12(1), 22. <https://doi.org/10.1186/s40100-024-00318-6>

Tiboni-Oschilewski, O., Abarca, M., Santa Rosa Pierre, F., Rosi, A., Biasini, B., Menozzi, D., & Scazzina, F. (2024). Strengths and weaknesses of food eco-labeling: A review. *Frontiers in Nutrition*, 11, 1381135. <https://doi.org/10.3389/fnut.2024.1381135>