Food and Agriculture Organization of the United Nations

Agrifood Systems Technologies and Innovations Outlook (ATIO)

The co-design of the ATIO Knowledge Base
report of the consultation process and outcomes

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Executive summary

The Food and Agriculture Organization of the United Nations (FAO), through its Office of Innovation (OIN), is leading efforts to transform agrifood systems through inclusive, participatory innovation. Guided by the belief that innovation is not only about technology, but also about institutions, partnerships, and communities, FAO is building platforms that bridge across and bring together different actors, global and local, governmental and grassroots, public and private, formal and informal research, in transformative partnerships.

The Agrifood Systems Technologies and Innovations Outlook (ATIO) Knowledge Base (KB) is a key initiative of this vision – a dynamic, partnership-driven platform designed to facilitate access to innovations produced everywhere by actors across the full spectrum of stakeholders to accelerate agrifood system transformation.
Central to the ATIO KB development, is the understanding of the needs and expectations of the prospective users and potential partners: with this aim, FAO organized a number of consultation activities, from surveys to e-discussions to an expert consultation, to co-design the platform and shape its governance. The two e-discussions brought together respectively 12 and 41 contributors, while the 4-day virtual expert consultation gathered 44 experts.

Throughout the consultation process, the discussions focused on four main areas that are crucial to the development of the ATIO KB: use cases to address and expected search experience; innovation description and categorization, governance and partnerships, and partly addressed on its own and partly overlapping with the other areas, the treatment of grassroots innovations and the inclusion of grassroots partners. The key take-aways on these areas can be summarized in the following expectations:

- **Use-case driven:** a strong call was made for a user experience that can address the various use cases described by the participants, catering for different users' needs and search styles possibly through different tailored interfaces, and ensuring adequate content coverage for the content needs of the different personas represented in the consultations.
- **Easy to access, search and navigate:** a common recommendation was also to make the KB accessible (multilingual, mobile-friendly, low-bandwidth-friendly) and easy to navigate, streamlining taxonomy filters and offering both a standalone Google-like search box and an AI-assisted navigation.
- **Agreed taxonomies and rich granular innovation profiles:** contributors stressed the need for flexible, real-world taxonomies, possibly co-managed or agreed with partners, and rich granular innovation profiles that better capture adoption challenges, context information, sustainability aspects, impact dimensions as well as users' experiences and assessment, particularly from gender, youth and small scale producer / grassroots actors' perspectives.
- **Inclusive governance and trust:** stakeholders emphasized the need for transparent, inclusive and equitable partnership frameworks, with FAO acting as a neutral facilitator and "honest broker". Ethical data stewardship, consent, and shared ownership were highlighted as fundamental principles.
- **Embracing the grassroots dimension:** participants were completely on board with the ATIO KB approach of proactively including local, farmer-led innovations. Discussions on governance focused very much on developing trust and incentives for grassroots participation and adequate data governance instruments for the treatment of information on grassroots innovations. Attention was given both to grassroots contributors and grassroots users, recommending features to support last-mile knowledge exchange – such as SMS-based updates and some offline functionalities – to ensure that no community is left behind.

The consultation process demonstrated that building the ATIO KB is not just a technical exercise, but a **collective** movement that through an "ecosystem of connected databases, where the ATIO KB is the connective tissue" – as one participant put it – aims at enabling **more equitable and inclusive innovation ecosystems**. By listening closely to a wide range of voices, FAO and its partners are laying the groundwork for a knowledge platform that **empowers communities, fosters collaboration, and drives transformation** in agrifood systems worldwide.

Background

In support of its Science and Innovation Strategy, the Food and Agriculture Organization of the United Nations (FAO), through its Office of Innovation (OIN), is developing the Agrifood Systems Technologies and Innovations Outlook (ATIO) Knowledge Base (KB) to **strengthen the role of innovation** in agrifood systems transformation.

To ensure that the platform reflects the needs and realities of its diverse users, and to invite potential partners to co-design the platform and explore partnership modalities, FAO organized a number of consultation activities, engaging a broad cross-section of stakeholders across regions and sectors. The ATIO KB is envisioned as a **comprehensive, open-access platform** that will **catalogue agrifood innovations of different types** (technological, social, institutional, policy, financial) including both mainstream and grassroots solutions.

It aims to **bridge gaps in innovation access** and uptake, particularly for smallholder farmers, indigenous communities, and other traditionally underserved actors in low- and middle-income countries. Recognizing that the success of the platform depends on its ability to meet the real needs of users, FAO prioritized an inclusive co-design approach from the earliest stages of development.

The consultation process provided an opportunity to validate and refine critical aspects of the knowledge base's design – such as its interface, taxonomy structure, partnership model, and strategies for integrating grassroots innovations – while also surfacing risks and opportunities that could shape its long-term impact.

Rather than presupposing solutions, the process created an **open, interative space where users could co-create** the foundations of the platform. This method aligned with FAO's vision of innovation as a collaborative and participatory endeavor, where knowledge flows in multiple directions and solutions are shaped by those who will ultimately use them.

The consultation reflected FAO's recognition that a truly transformative innovation platform must not only be technologically sound but also socially legitimate, locally relevant, and globally inclusive. By actively involving diverse actors – especially those with lived experience of the challenges and opportunities in agrifood systems – **the consultation strengthened the credibility, relevance, and sustainability of the ATIO Knowledge Base.**

The insights and recommendations gathered during the consultations now serve as a guiding force in finalizing the platform's development, ensuring that it contributes meaningfully to more resilient, equitable, and sustainable agrifood systems worldwide.

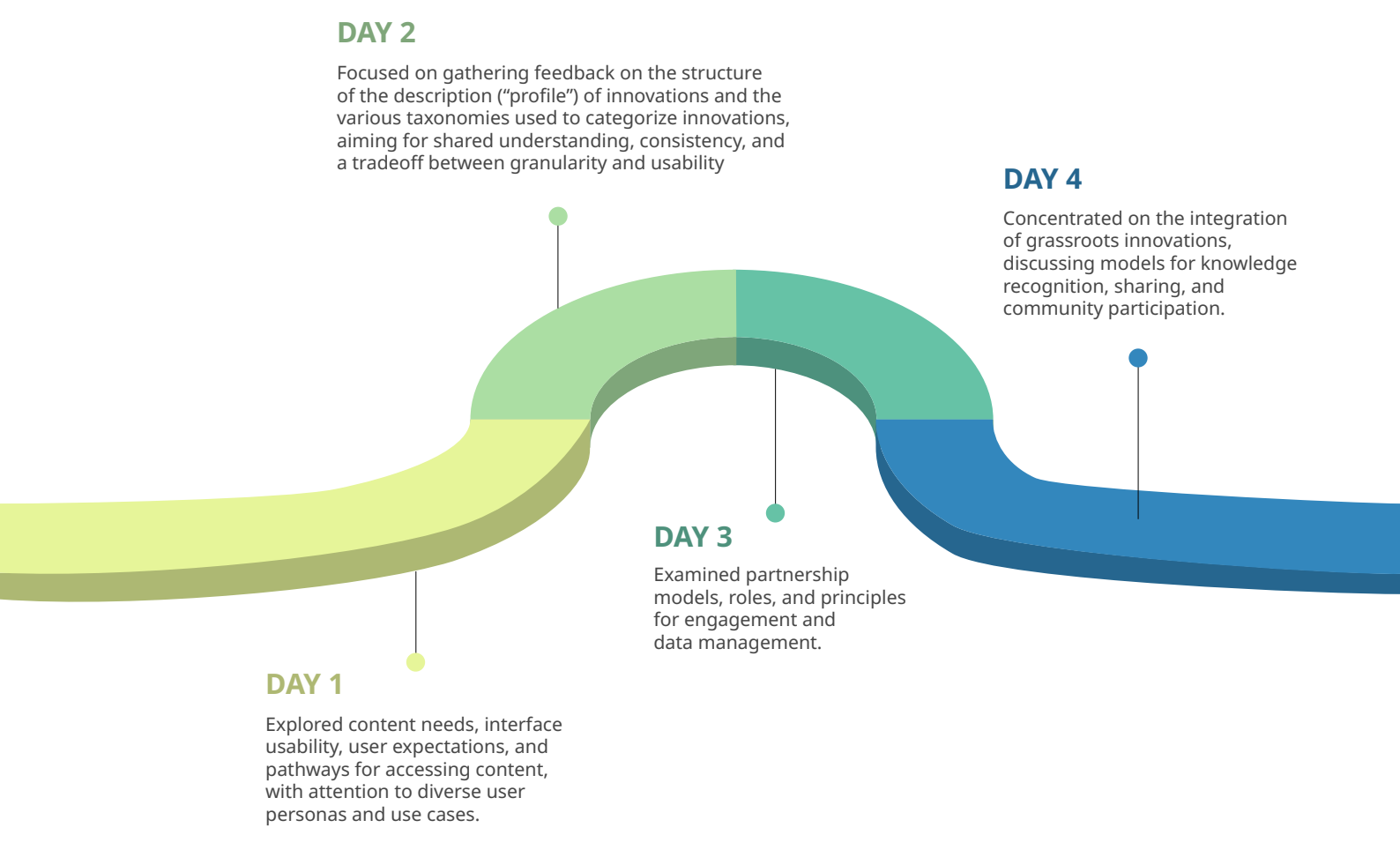
How did we do it?

To strengthen the participatory design of the Agrifood Systems Technologies and Innovations Outlook (ATIO) Knowledge Base, the Food and Agriculture Organization of the United Nations (FAO), through its Office of Innovation (OIN), convened a series of consultation activities:

- A user journey exercise was conducted with 20 participants during the Science and Innovation Forum (SIF) 2024.
- Two e-discussions took place, one on the Digital Agri Hub discussion forum in December 2024 with 12 active participants generating 43 posts and another one on the FAO FSN Forum between December 2024 and January 2025 with 41 contributors.
- A 4-day virtual expert consultation gathering 44 experts happened in March 2025, which was more intense (four 3-hour sessions on Zoom) and helped identify more granular use cases and related information needs.

The e-discussions content can be found at the links above. The expert consultation was more interactive and intense: it was conducted online via the Zoom platform over four half-day sessions. Participants were invited to review preparatory materials, including the ATIO prototype and concept note, to ensure informed and targeted discussions.

Each day of the consultation centered on a key thematic area:



Sessions combined expert briefings, breakout group discussions – including individual work – and plenary dialogues to **facilitate practical and grounded exchanges.**

Throughout the consultation process, special attention was given to fostering an open and collaborative environment, encouraging contributions from participants **across different regions and sectors**.

By engaging stakeholders through structured, focused discussions, the consultation helped ensure that the design and development of the **ATIO Knowledge Base are anchored in real-world experiences, needs, and priorities.**

Use cases and interface

One of the main objectives of the whole consultation process was to gain more knowledge about potential use cases that the ATIO KB has to be able to address (user personas and purposes) and the way these personas search for information (user journeys), as well as receive initial feedback on how the prototype search was performing, or if it was headed in the right direction, in meeting the search needs of these personas.

In the e-discussions, the questions eliciting feedback on use cases were:

> “Given the description of the ATIO KB provided above, how do you think the platform can help you and users like you? What should it do? Describe one or more specific use cases that you wish the KB would address, like “I imagine I would be able to find innovative products that support farmers with access to credit and insurance specifically for one country, and I would be able to see information on their readiness and how they fare against adoptability criteria.”
>
> What do you make of concepts like policy innovation and social innovation? Can you think of examples? Is it useful for you to be able to find such content? In which form do you expect to find them? How would you use them?
>
> ATIO Team ”

In the expert consultation, participants were assigned an individual task to be performed in 40 minutes: they were asked to first write down with which “hat” or under which persona they were going to test the prototype and what exactly they would look for, with which purpose, and then go to the prototype, try to find what they needed, and note down their observations on the search interface, the search criteria, the results, and the information provided with the results, prompted by the instructions in a cheat sheet.

Recommendations

The feedback on use cases is of primary importance for the ATIO KB, in particular for determining the necessary content coverage. Therefore, the first and longer section of this chapter is on use cases and content, and a separate section will be devoted to the interface. For recommendations that overlap between content and interface, if content choices are affected, they are included in the first section.

1. Use cases and content needs

The illustration of the use cases by contributors was of course closely linked to the type of content they expected to find and was therefore very useful to refine the envisaged content coverage and content structure of the KB.
The key recommendation to be taken up from the consultation on use cases is that the KB has to provide the content and the categorizations to satisfy the scenarios described by participants in the various consultations.

The list below summarizes the broad use cases or purposes, and the information needs that were mentioned by stakeholders involved in the consultations. A list of more precise search journeys tested in the expert consultation follows.

By type of actor and user persona

The list below summarizes the general use cases (more specific than purposes but still not detailed use cases) and the information needs that were mentioned by stakeholders involved in the consultations, grouped by type of actor.

A list of more precise search journeys tested in the expert consultation follows.

Researchers

> Identify research gaps, emerging trends, and under-researched areas.

> Seek collaborative research opportunities and partnerships between stakeholders.

> Search for detailed contextual information about successful technology implementations.

> Evaluate the applicability, scalability, and transferability of innovations across different contexts.

> Analyze correlations between factors like inclusivity/co-design and adoption rates.

> Compare costs and benefits between traditional systems and new innovations.

> Select promising technologies for field testing and measuring impact on productivity, water consumption, etc.

> Support evidence-based policy and advocacy with data from the KB.

Policy makers

- Identify and compare technologies based on readiness, contextual appropriateness, scalability, and impact.
- Search for solutions tailored to specific geographic, economic, or cultural contexts (e.G., Climate-resilient farming in arid regions).
- Find sustainable technologies suitable for low-income regions with details on adoption rates and cost-effectiveness.
- Develop policies that promote the adoption of effective innovations based on evidence in the KB.
- Extension agents/officers.
- Identify grassroots innovations tailored to small-scale farmers' needs.
- Search for low-cost, farmer-led solutions with implementation guides and field-tested results.
- Find information shared amongst farmers that can be disseminated to other users.
- Use accessible tools (like SMS services) to find suitable techniques for farmers in areas with limited internet access.

Farmers/farmers' organizations

- Find affordable methods for addressing specific challenges like post-harvest losses.
- Search for practical, step-by-step application guides with clear visuals (diagrams, photos, videos).
- Identify low-cost alternatives for materials and tools.
- Start with general solutions before exploring specific branded options if needed.
- Access technologies appropriate for specific local conditions.

NGOs and development organizations

- Find localized, participatory insights for working directly with farming communities.
- Find metadata on grassroots contexts (resource requirements, literacy levels, gender impacts).
- Identify innovations linked to specific SDGs for alignment with funding priorities.
- Use participatory features to contribute field experiences and learn from other implementations.
- Find innovations that can be implemented through community-based approaches.

Youth and educational institutions

- Access resources that inspire the next generation of agricultural innovators.
- Find innovations that can be demonstrated in educational settings like school demo farms.
- Discover training opportunities and educational content about agricultural innovations.

Investors and big businesses

- Discover scalable innovations with data on market readiness and adoption trends.
- Identify gaps and investment opportunities in the agrifood sector.
- Analyze innovation lifecycle coverage to prioritize research and development efforts.
- Scout for innovations and potential partners for new ventures.
- Find information on bundling innovations for synergies and scaling strategies.
- Assess common challenges to overcome in different scaling contexts.

Private sector incl. SMEs

- Identify innovative products for specific regions and contexts.
- Analyze correlation between design factors and market adoption.
- Access customer-led innovations to incorporate into training programs.
- Identify partnership opportunities and collaborative development potential.

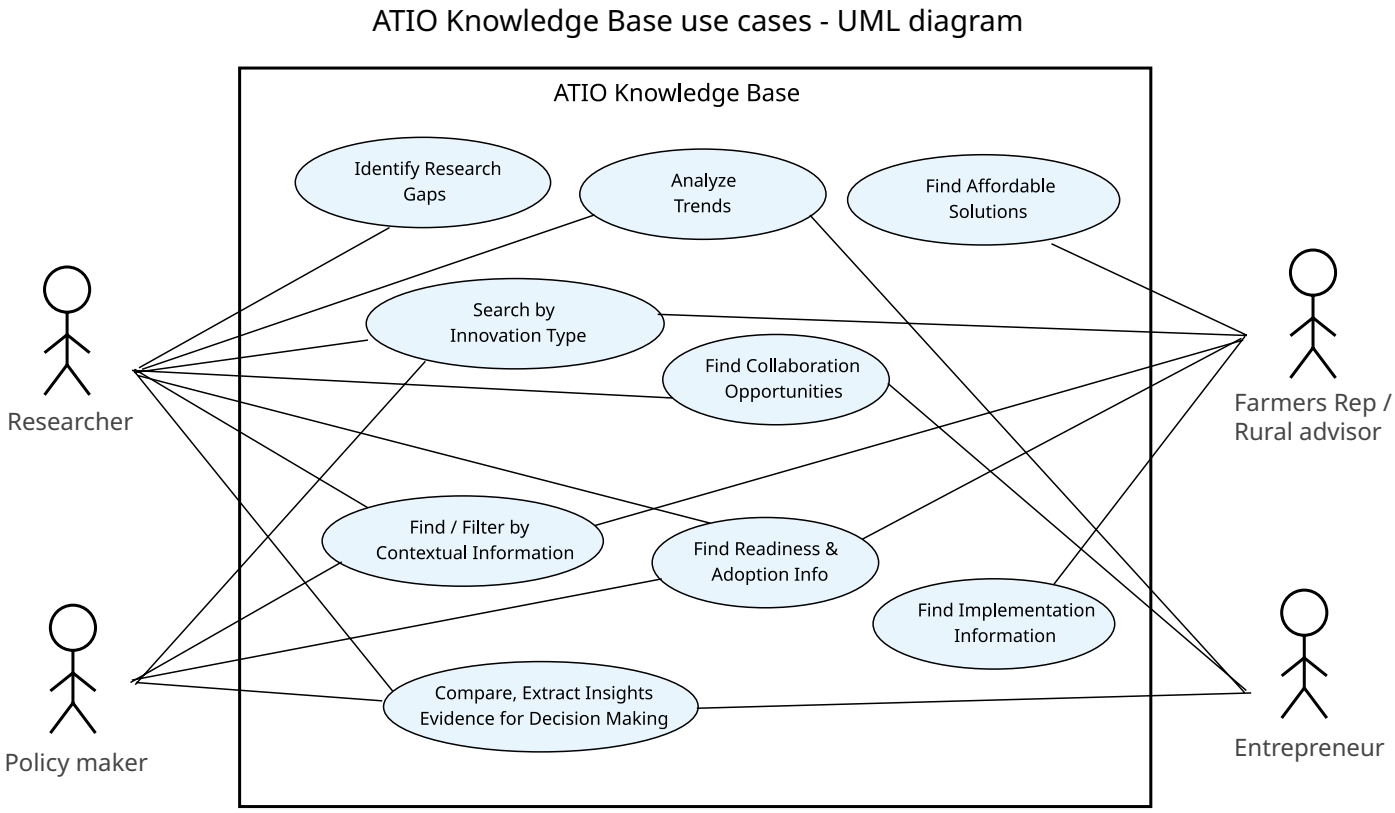


Figure 1. **UML Use Case representation of main use cases, with personas consolidated in 4 groups**
Source: Authors' own elaboration.

Below are some examples of real use cases, actual specific searches performed by participants and related results:

Persona: innovation specialist

Search objective: find information on advising a farmer organization using digital technologies in agriculture and rural areas in Africa, specifically looking for: digital technologies used in Africa, current practices and use cases, policies and regulations, measurement frameworks.

Search experience: the participant found relevant results including: Afrimash Digital Agriculture Platform (Nigeria), digifarm, riceadvice, smart greenhouse monitoring system. They noted the descriptions provided enough general information about digital technologies and innovations, and expressed satisfaction with the ai-enhanced content.

Persona: policy/research advisor

Search objective: create evidence-based brief on technologies, tools, and knowledge to address lagging productivity growth in sub-Saharan Africa while supporting producer livelihoods, climate resilience, and nutrition security.

Search experience: the participant found relevant results but noted they were difficult to digest as "just a very long list of related solutions."

Persona: farmers' representative

Search objective: find information on affordable women-friendly technology or approaches to help small and marginal women farmers reduce drudgery, increase yield sustainably, and make farming more lucrative.

Specific interests: sustainable crop production practices, affordable finance mechanisms for women, climate adaptation and mitigation measures, replicable approaches that can be modified for local contexts.

Search experience: no success. The current content coverage and categorization doesn't satisfy this use case.

Persona: agribusiness/private sector representative

Search objective: identify innovative products suited for specific regions to inform company decision-making for product development, adaptation, positioning, farmer training, and partnerships.

Search experience: the participant found adequate relevant results, particularly in biotechnologies. They noted finding an innovation by their company and appreciated that the tool appeared unbiased in including innovations from large private companies that benefit smallholder farmers.

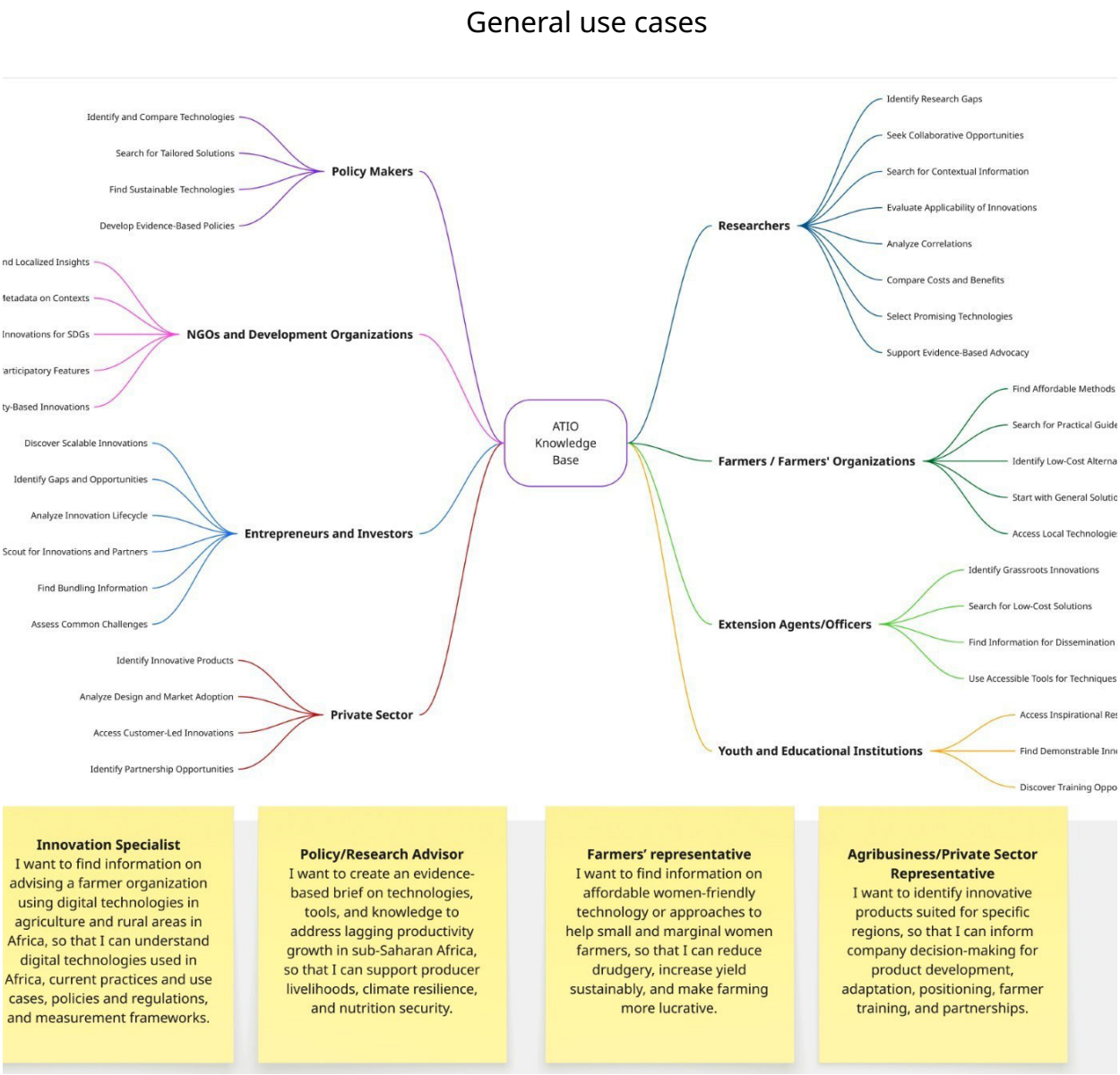


Figure 3. **General use cases and some specific user stories emerged from the consultations**
Source: Authors' own elaboration.

Example of specific searches mentioned by researchers

> **Purpose:** preserving soil health in climate change contexts; search: finding conservation techniques, biofertilizers, monitoring technologies, and adaptive systems.

> **Purpose:** optimizing irrigation in water-scarce environments; search: looking for water efficiency technologies, monitoring systems, and resource management solutions; other search: other search: innovations related to effective water management in arid regions that are ready to use, with data on water usage, crop yields, and other metrics.

> **Purpose:** managing crop diseases and pests; search: finding diagnostic tools, monitoring systems, and integrated management approaches.

> **Purpose:** enhancing crop productivity in specific regions; search: identifying technologies suited to particular geographic and climatic conditions.

Common search patterns and content needs

A key recommendation is to cater for some search patterns and content needs that were common among participants (both Zoom participants who actually documented their search journeys and forum participants who described their expectations):

Geographic and contextual filtering: many participants specifically looked for innovations relevant to particular geographic regions or contexts.

Thematic and technical focus areas: participants searched across diverse thematic areas reflecting their professional interests: the most searched topics were: climate action and adaptation (4 participants), digital agriculture technologies (3 participants), agroecology (3 participants), biotechnology (2 participants), soil health (2 participants), water management (2 participants), natural farming/sustainable practices (2 participants).

Adoption and impact evidence: a significant pattern was the search for evidence and ratings on: adoption levels and factors influencing adoption, quantitative impact data, effectiveness ratings, implementation case studies, behavioral factors affecting uptake. It was mentioned that successful innovations should be measured against social metrics. Some participants suggested Including a 1-5 ranking on effectiveness, or in general adding a star rating system.

Non-technological innovations: the consultation process revealed a strong interest in and value placed on diverse innovation types beyond purely technological solutions. Participants recognized that addressing complex agrifood system challenges requires a complementary mix of technological, social, institutional, and policy innovations. However, the current ATIO KB prototype was perceived as more oriented toward technological innovations, with opportunities to strengthen its coverage and presentation of other innovation types.

Context-specific information: many contributors highlighted the need to provide different types of context-specific information, from physical dimensions like soil type and agroecological zone to socio-economic dimensions like resource requirements, literacy levels, cultural impact...); it was also suggested to include information on behavioral barriers to innovation adoption and statistics on adoption reasons to inform behavioral design teams.

Implementation guidance: several participants (primarily from farmers' organizations and NGOs) expected to find clear guidance on the use or implementation of a solution, including visuals, accompanying manuals or video tutorials.

Collaboration / contact information: many participants looked for contact details for institutions behind innovations and others suggested to flag which institutions are looking for collaborations.

Regarding our specific question on the value of and use cases for social and policy innovations, multiple participants expressed that non-technological innovations (social, institutional, policy) were highly valuable for their work, primarily for the following reasons:

1. **Holistic approach to challenges:** one participant noted that "technology alone doesn't solve problems" and that social and policy innovations are often needed alongside technological solutions.
2. **Context adaptation**: several participants mentioned that social and institutional innovations are crucial for adapting technological solutions to local contexts.
3. **Systemic change:** multiple participants viewed policy innovations as essential for creating enabling environments for other types of innovations to succeed. One participant working on agroecology specifically noted: "Need to have information on policies and regulations in favour of adoption of agroecological practices" to effectively advise farmers.

A number of comments related to the expected form and presentation of the different types of innovations, including additional resources, especially for non-technological innovations:

1. **Case studies with context:** many indicated they wanted detailed case studies showing how social and institutional innovations were implemented, including challenges faced and overcome.
2. **Success metrics:** for social innovations, participants wanted to see clear metrics on impact, including social, economic, and environmental dimensions.
3. **Policy analysis:** for policy innovations, participants expected comprehensive information on the policy development process, implementation mechanisms, and evidence of effectiveness.
4. **Replicability guidance:** several participants mentioned the need for guidance on how social and institutional innovations could be adapted to different contexts.
5. **Process documentation**: improve documentation of the processes involved in social and institutional innovations, not just their outcomes.
6. **For technological innovations:** highlight the differences between solutions of different nature (commercial products, traditional practices, research results...), even adding filters for “branded” and “patented”.

In general, positive feedback was provided on: clarity of titles for innovations, relevance of search results (when found), clarity of innovation profiles with comprehensive descriptions, and generally good results of AI-assisted content enrichment – appreciated for providing context (many participants who specifically commented on AI-enhanced content found it useful and appropriate).

2. User experience and interface design

The feedback on content needs and interface experience often overlapped, like in the case of specific search filters or the way participants expected to see the innovations presented. When the input received was about interface experience but even partially relevant to content coverage or to information that participants expected to find or to dimensions that need to be covered, it was included in the chapter about content needs.

In general, positive feedback was provided on the interface, in particular on the colorful and friendly interface and the easy-to-navigate tagging.

Insights on improving the user experience of the ATIO Knowledge Base emphasized simplicity, customization, and inclusive design. The major recommendations were:

- **Streamlined search filters and chatbot**: participants recommended implementing both filter-based and chatbot search capabilities, allowing users to leverage different approaches based on their needs and expertise level. Suggestions for improvement included expandable / collapsible hierarchical taxonomies, auto-suggestions and predictive text, and in general more intuitive filtering mechanisms.
- **User persona-based search pathways:** designing distinct user pathways based on stakeholder type (policymaker, researcher, farmer, entrepreneur, etc.) was suggested to enhance relevance and ease of use. This could be done through a question to visitors on their first landing on the website or through a search filter ("who is searching?" or "expected main user" filter).
- **Interactive features**: recommendations included adding features for user interaction such as rating systems, commenting capabilities, and mechanisms for users to suggest updates or corrections to innovation records.
- **Improved results display** implement data visualizations to accompany search results; add sorting options (by relevance, evidence level, etc.); Include brief summaries in search results.
- **Reduce text density**: multiple participants noted issues with text density and suggested more visual elements.

Some more punctual recommendations regarding the interface were:

- Ensuring mobile optimization.
- Adding faceted search.
- Implementing AI assistance to interpret and focus search queries.
- Making dropdown lists to show only filters for which there are results, to prevent users from receiving no data
- Making AI-generation more transparent by making "Powered by AI" visible at the top, not at the bottom
- Clarifying "Adoption Level" taxonomy terms, which were found not very intuitive
- Considering metrics like number of visits, innovations watched, and click-through rates as success measures

Challenges

Many of the recommendations above imply issues (like missing functionalities or information), which could be considered challenges but can be solved by making the recommended changes. Some participants instead reflected on some inherent challenges, which can be tackled but will probably remain challenges throughout the deployment and the growth of the platform.

The major ones that were identified are:

- **Coverage:** the use case search exercise showed that the KB, as expected at this stage, doesn't have enough coverage to address a good number of the use cases. The recommendations above have to guide the choice of future data sources to fill the identified gaps. The challenge will remain especially for types of innovations that do not surface easily (grass-roots innovations, social innovations, institutional innovations...) in addition, there is no baseline data on the quantity of information on innovations available at present nor benchmark data on what comprehensive coverage would mean.

- **Quality assurance:** ensuring the accuracy and quality of information, especially for AI-enriched content, requires robust validation mechanisms. The challenge is to be able to ensure quality at the same time as quantity: the expected size of the full-fledged KB will not allow for validation or expert curation of all records, so alternative automated methods are needed, ideally leveraging trained datasets. This was mentioned as a general concern, although participants noted that in the records they found the AI had done a good job.

- **Integration of diverse knowledge systems:** finding ways to respectfully integrate scientific knowledge with traditional and indigenous knowledge systems presents both technical and epistemological challenges. From simple differences in necessary metadata to describe grassroots innovations to the way criteria like readiness and adoptability can be applied to what is meant by "validation", a number of decisions have to be made, negotiated with grassroots actors and made clear on the KB.

- **Contextualization:** non-technological innovations were seen as highly context-dependent, making their presentation in a standardized KB challenging.

- **Balance between complexity and usability**: as much as the filters can be streamlined, the challenges will always be:
  a) to streamline search and browsing while retaining richness and complexity.
  b) to cater for different search styles and preferences. Designing an interface for different use cases is challenging.

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Specific observations relating to the grassroots dimension of the KB

During the expert consultation, an entire separate session was devoted to the specific issues related to managing grassroots innovations, but many of the observations contributed during the other sessions, and in all the other events of the consultation process, also addressed, or were in some way related to, the specificity of treating grassroots innovations or serving grassroots actors and rural communities. These observations came from participants across all stakeholder groups.

According to the many comments made, the KB has to support grassroots actors' use cases along the lines of the following examples:

- Find affordable methods for addressing specific challenges (example given: post-harvest losses). More in general, the KB's coverage and annotations/categorizations need to cover dimensions relevant for grassroots innovations and for grassroots actors, like in the example of the farmers' representative search for "affordable women-friendly technology or approaches to help small and marginal women farmers reduce drudgery, increase yield sustainably, and make farming more lucrative".
- Identify low-cost alternatives for materials and tools.
- Search for practical, step-by-step application guides with clear visuals (diagrams, photos, videos).
- Start with general solutions before exploring specific branded options if needed.
- Access technologies appropriate for specific local conditions.
- Find metadata on grassroots contexts (resource requirements, literacy levels, gender impacts).
- Find localized, participatory insights for working directly with farming communities.
- Use participatory features to contribute field experiences and learn from other implementations.
- Find innovations that can be implemented through community-based approaches.

Content modelling

Another objective of the consultation process was to gather feedback on the ATIO KB content model – the way innovations are described in the system, the key dimensions captured in the innovation "profile," and the taxonomies used for categorization. This feedback is crucial for ensuring the information structure meaningfully represents the complexity of agrifood innovations.

In the e-discussions, questions eliciting feedback on the content model included:

> What dimensions would you consider important to include in the description/profile of an innovation?

> What are your reflections on the concept of "adoptability" of an innovation?

In the expert consultation, participants logged in as content curators to catalog innovations, filling out the innovation "profile" and categorizing the innovation against various taxonomies, noting difficulties and missing terms.

Recommendations

1. Innovation profile structure and key dimensions

Note: several recommendations below overlap with those mentioned in the Use Cases section, particularly regarding contextual information, implementation guidance, and evidence of impact. These aspects are important both from a content need / user search perspective and a content structure perspective. We briefly mention them here and refer readers to the previous chapter for details.

Key dimensions recommended for innovation profiles include:

> Contextual information (geographical, socio-economic, cultural) was especially requested by farmers' organizations, researchers, NGOs.

> Implementation requirements and guidance mainly mentioned by extension agents and farmers.

> Evidence of impact and adoption (mentioned primarily by policy makers, researchers, private sector).

> Cost-benefit information (as above).

> Contact information for innovation providers (mentioned by researchers, entrepreneurs, extension agents).

Evidence of impact and adoption was especially highlighted several times.

As one farmers' organization representative noted: "the measure of success of innovation is increased local employment opportunities, increased women's earning, asset creation on name of women..."

2. Taxonomies and classification systems

The current taxonomy structure received significant feedback. Here as well some observations overlap with those on the interface.

Structural improvements needed:

> The lists of innovation types, use cases are too long and detailed. One may need cascading layers.

Recommendations include:

> Implementing hierarchical taxonomies with parent-child relationships.

> Enabling search within taxonomy terms and multiple selection.

> Developing separate taxonomies for non-technological innovations.

Missing taxonomies:

Several participants suggested additional taxonomies or additional branches in taxonomies or new terms:

> New taxonomies or branches or terms related to: Agroecology and sustainable food systems (farmers' organizations, NGOs), pastoralism, indigenous knowledge (farmers' organizations).

> Another way of classifying innovations: not just by type (the functional domain and mechanism of change) and use case (the purpose), but also the "form" that the innovation takes, its nature or "manifestation": e.g. product, platform, policy, practice / technique, process, etc.

> Specific filter for low- and middle-income (grassroots trust representative).

3. Adoption and readiness assessment

Adoptability framework:

Participants supported including adoptability assessments but suggested refinements:

> 'Adoption Level' taxonomy terms were not intuitive.

> Multiple dimensions should be captured separately.

> Recommended dimensions include comprehensibility, usefulness, accessibility, acceptability, sustainability, and co-development level, with suggestions for incorporating rating systems (e.g. "1 to 5 ranking on effectiveness").

4. Representation of non-technological innovations

Note: this overlaps substantially with the Use Cases section on diverse innovation types. For detailed discussion, please refer to that section.

Participants recommended specialized approaches for documenting:

> Social innovations: focusing on process documentation and community engagement (NGOs, farmers' organizations).

> Institutional innovations: capturing organizational structures and relationships (policy makers, researchers).

> Policy innovations: describing development processes and implementation mechanisms (policy makers).

5. Validation mechanisms

Participants discussed various validation approaches:

> Co-validation: with research organization (farmers' organization).

> Peer reviewers, to validate innovations, like in journals (researcher).

> Participatory validation - Like CETARA-NF or PGS (grassroots trust).

Several cautioned against overly rigid requirements.

Challenges

Key challenges identified include:

> Balancing comprehensive information with usability.

> Representing context-dependent knowledge in standardized formats.

> Integrating diverse knowledge systems with appropriate taxonomies.

> Establishing validation mechanisms that ensure quality without creating barriers.

Specific observations relating to the grassroots dimension of the KB

Note: many recommendations regarding grassroots innovations overlap with the Use Cases section. Here we focus on content model implications.

> Contributions highlighted that the content model must appropriately capture grassroots innovations through.

> Context-rich documentation: document how the innovation is used by the farmer and how it makes their livelihood more sustainable [farmers' organization]; for grassroots innovations, consider the CARE principles.

> Knowledge protection: several participants emphasized the need for information / metadata that help implement protection mechanisms for the knowledge that is shared (e.g. some form of agreement between FAO and grassroots organization, with specific clause on what happens if profits are being made from the innovations [farmers' organization]).

> Support to the documentation process: participants stressed accessible documentation processes, the need to help farmers to share their experiences, facilitate farmers to be able to upload/input information on their innovations.

As one group noted, grassroots innovation documentation should display: "evidence of the learning and solution-finding dynamic that led to the development of each adoptable and adaptable innovation – showing what affects the success and appropriateness of the innovation."

Partnership models and the grassroots innovations challenge

One of the key objectives of the whole consultation process was to deepen the understanding of what kind of partnership model would best support the ATIO Knowledge Base (KB) as an inclusive, federated, and sustainable platform.

In the earlier e-consultations, participants were asked to reflect on:

> What governance challenges could emerge in a federated or crowdsourced knowledge base model?

> What principles and rules should guide data contribution, quality control, and attribution?

> How could the platform balance centralized oversight with decentralized contributions to maintain inclusivity and trust?

During the expert consultation, participants were invited to discuss how different actors could contribute to and manage the knowledge base, what roles and responsibilities would need to be defined, and how engagement mechanisms could be designed to foster trust, transparency, and co-ownership among diverse stakeholders.

The governance session was structured around interactive methods. Participants first reflected on key concepts through brief presentations and plenary dialogue, then engaged in breakout group discussions to explore possible partnerships models and principles in depth. They were encouraged to draw from their organizational experiences with participatory governance models, federated networks, and data stewardship practices. This structure allowed for the surfacing of practical, real-world insights to help shape an open, adaptable, and ethically grounded governance framework for the ATIO Knowledge Base.

Recommendations

The discussion on governance was a critical part of the consultation process, aimed at shaping how the ATIO Knowledge Base (KB) could be managed, trusted, and sustained over time. Participants were invited to share their experiences, concerns, and suggestions regarding governance structures, stakeholder roles, partnership arrangements, and ethical considerations. The session focused particularly on principles for federated management, crowdsourced contributions, and data stewardship. Many of the contributions echoed observations that had been made also in the two online e-discussions.

Below is a summary of the different perspectives and recommendations offered by various stakeholder groups in the different consultations we conducted. It has to be noted that in all segments of the consultation process the discussion on governance and partnerships has seen a lot of contributions concerning the inclusion of grassroots innovations and grassroots partners. Therefore, in this chapter there is no separate chapter on the treatment of grassroots innovations, and that aspect is integral to the discussions on governance.

1. Grassroots organizations and farmer networks

Grassroots actors emphasized the importance of having direct representation in the governance model, beyond mere consultation.

They advocated for:

> Governance/partnership models that ensure community knowledge holders have a voice in decision-making.

> Mechanisms to protect and properly attribute local and indigenous knowledge contributions.

> Transparent processes for validating and showcasing grassroots innovations without appropriation or misrepresentation.

2. Private sector participants

Private sector actors highlighted the need for clear, transparent rules around engagement, to prevent dominance by a few large organizations.

Their key recommendations included:

> Structuring private sector participation through networks or thematic alliances, rather than allowing individual companies undue influence.

> Establishing principles for contributions that prevent commercialization or biased promotion of technologies on the platform.

> Ensuring public-private collaboration without compromising neutrality.

3. Researchers and academic institutions

Academic representatives stressed that governance should maintain high technical credibility and scientific rigor.

They recommended:

> Creating expert advisory groups to guide platform development, taxonomy maintenance, and data quality control.

> Involving universities and research centers as content validators and knowledge partners in a non-commercial capacity.

> Using peer-review inspired mechanisms to vet crowdsourced or federated content submissions.

4. Government and public sector representatives

Public sector stakeholders stressed the importance of aligning the KB governance structure with public mandates for transparency, equity, and accessibility.

They suggested:

> Creating linkages with regional bodies and national innovation systems to build legitimacy.

> Engaging government representatives in advisory roles while maintaining operational independence.

> Establishing governance models that reflect public interest priorities, including data ownership norms and accessibility requirements.

5. Development partners and donors

Development organizations emphasized that governance structures should be geared toward long-term sustainability rather than short-term project cycles.

They recommended:

> Including funders and development agencies in oversight roles, without allowing financial contributors to dictate content priorities.

> Building governance models that incentivize collaboration between international, regional, and community-based actors.

6. Youth and educational stakeholders

Participants representing youth groups and educational institutions underlined the need for intergenerational participation in governance.

Their suggestions included:

- Developing mentorship and entry pathways for young innovators to engage in governance and content validation roles.
- Ensuring that governance processes are open, accessible, and welcoming to early-career professionals and youth networks.

7. FAO's role

Participants broadly agreed that FAO's role should be that of a facilitator and neutral convener.

Specific expectations included:

- Developing mentorship and entry pathways for young innovators to engage in governance and content validation roles.
- Ensuring that governance processes are open, accessible, and welcoming to early-career professionals and youth networks.

Additional aspects

In addition to the main recommendations grouped by type of actor, participants across all stakeholder groups highlighted several complementary aspects that could further strengthen the governance, accessibility, and sustainability of the ATIO Knowledge Base. Many of these additional considerations address issues related to grassroots innovation and the engagement of local actors, and they aim to enhance community engagement, safeguard knowledge integrity, and ensure long-term platform relevance.

1. Partnership models

- Participants recommended a multi-tiered, inclusive governance framework that clearly defines roles, responsibilities, and decision-making processes. Fewer participants advocated for a more informal form of partnership, without formal agreements.
- It is important to devise forms of governance that ensure co-management among partners.
- Partnerships should be sought with existing innovation platforms to coordinate efforts and reduce redundancy.
- Recommend that formal partnerships with grassroots organizations be co-designed with flexibility, allowing for different levels of contribution (content providers, validators, advisors).

2. Incentives and strategies for sustained community engagement

> Establish regular grassroots innovation calls or challenges to encourage continuous contribution.

> Organize knowledge fairs or local innovation showcases linked to the KB to keep communities actively engaged.

> Develop small grant or micro-funding schemes for grassroots innovators who contribute high-quality innovations to the KB.

> Offer visibility incentives: e.g. “Innovation of the Month” features spotlighting grassroots solutions, networking activities with potential funders, FAO certifications.

> Allow users, especially from grassroots groups, to provide ongoing feedback on platform functionality, content relevance, and governance structures.

> Build optional micro-training or onboarding programs for grassroots contributors, helping them document innovations properly and navigate the KB effectively.

> Partner with local organizations to deliver offline training on how to access and use the KB.

3. Data/content governance

> Data governance was a common concern. Transparency, data consent, and ownership were identified as non-negotiable principles, especially in the management of user-submitted data and the safeguarding of sensitive content.

> Develop a data management plan that clarifies who controls data, how it is protected, and how user trust can be maintained.

> Data sharing agreements and data management plans should ensure recognition of ownership, clear provenance documentation, clear policy in case of duplicates from different sources, liability in case of bad data etc.

> Explore models of "knowledge stewardship partnerships" where local organizations manage their own segment or cluster within the KB.

> The governance or the data sharing agreement should define a transparent and simple procedure for contributors to request removal or updating of their content.

> Notwithstanding the concern for data governance issues, participants in general embraced the idea of data aggregation, to a good extent because FAO is perceived as a neutral actor with a mandate to build a single-entry point to distributed knowledge: participants appreciated the idea of an "ecosystem of connected databases, where the ATIO KB is the connective tissue", as one participant put it.

4. Mechanisms for knowledge validation and trust building

> Introduce “community validation” alongside expert validation – innovations could be endorsed both by technical experts and user communities.

> Offer badges or recognition systems for innovations that have high grassroots adoption or peer endorsement.

5. Ethical standards and safeguards

> Ethical data stewardship must be embedded into the platform’s foundation, supported by clear policies on data usage, user control, and permission layers.

> Create ethics guidelines for innovation documentation – making sure contributors know how their knowledge will be shared and under what conditions, especially for grassroots innovations.

Challenges

In addition to providing recommendations on governance structures and roles, participants across all stakeholder groups also flagged several key risks that the ATIO Knowledge Base (KB) must actively manage.

These risks relate to trust, quality assurance, equity, and the long-term sustainability of the platform. Addressing them will be critical to maintaining the credibility and inclusiveness of the ATIO KB over time.

The main risks identified were:

1. Risk of imbalanced representation

Participants warned that if governance structures are not carefully designed, dominant actors – such as large private sector entities, elite research institutions, or international organizations – could overshadow smaller grassroots groups, marginalized communities, and local innovators.

2. Risk of data misuse and misappropriation

Particular concern was raised about how grassroots and indigenous knowledge would be protected. Without clear rules on attribution, consent, and usage rights, there is a risk that data could be extracted and commercialized without benefiting the communities who generated it.

3. Risk of reduced trust and participation

Trust was seen as foundational to the success of the KB. Participants noted that unclear governance processes, lack of transparency in decision-making, or real or perceived favoritism could discourage potential contributors, especially from grassroots and community-based organizations.

4. Risk of content quality degradation

While crowdsourcing and federated models allow for broader participation, participants highlighted the risk that open contribution systems could lead to inconsistent content quality, misinformation, or duplication of efforts if strong validation mechanisms are not established.

5. Risk of platform capture by financial contributors

Development partners and grassroots organizations both cautioned that funding partners must not exert control over platform governance. If financial influence steers the platform's priorities, it could undermine its neutrality, inclusivity, and scientific credibility.

6. Risk of governance rigidity

Several participants emphasized that governance systems must be designed to evolve over time. Overly rigid structures could make it difficult to adapt to new technologies, changing user needs, or shifting policy environments, potentially making the KB obsolete or less relevant.

7. Risk of exclusion of youth and future innovators

Some participants pointed out that without deliberate mechanisms for youth engagement, younger innovators and knowledge holders might remain underrepresented in platform management and decision-making, limiting the future relevance of the platform.

Conclusions

The input received in the three consultations will be the foundation for the next steps in the development of the ATIO KB:

> The increase and fine-tuning of the content coverage, following the indications emerging from the use cases: this will entail identifying new information sources that can fill the gaps. Addressing all content needs will take time and will always be work in progress, but the input received for the definition of the use cases will allow us to prioritize and start from the most urgent needs. In particular, the content needs expressed in the search journey descriptions contributed to the expert consultation will be the target against which to check progress.

> The enrichment of the innovation “profiles", following the suggestions received, primarily providing more information on impact dimensions and local context, in particular grassroots-relevant contexts (resource requirements, literacy levels, gender impacts) considering fagging vetted solutions.

> The improvement of the accessibility level, devising automations to provide content in local languages and/or in adapted form (using visuals and multimedia), and to include more guidance on use or implementation of solutions.

> The fine-tuning of the search interface, based on the most common patterns in the search journeys observed in the consultations and described in this document. In particular, the streamlining of the two major taxonomy filters (types and use cases), a narrowing-down / collapse-expand approach to the search experience, and the addition of a chatbot are the priority enhancements emerging from this use case analysis.

> The fine-tuning of the taxonomies, following the suggestions given by various contributors. The size of the two main taxonomies has been mentioned several times as a possible obstacle to a smooth experience, but at the same time the need to cover additional areas in the use cases was brought up, so the fine-tuning work will focus on devising a way of managing complexity while offering a simplified "view" to the user.

> The initial definition of partnership instruments and data sharing agreements: this work will be conducted in collaboration with the initial partners and will take into consideration all the findings highlighted in this report and the input received in the consultations.

The ATIO KB team is hugely grateful to all those who contributed to the consultation process and are co-designing the system with us.

The list of all contributors is in Appendix 1.

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