

## CASE STUDY

### **Developing a knowledge management approach for an agricultural innovation system: the case of the Southern African Bean Research Network (SABRN)**

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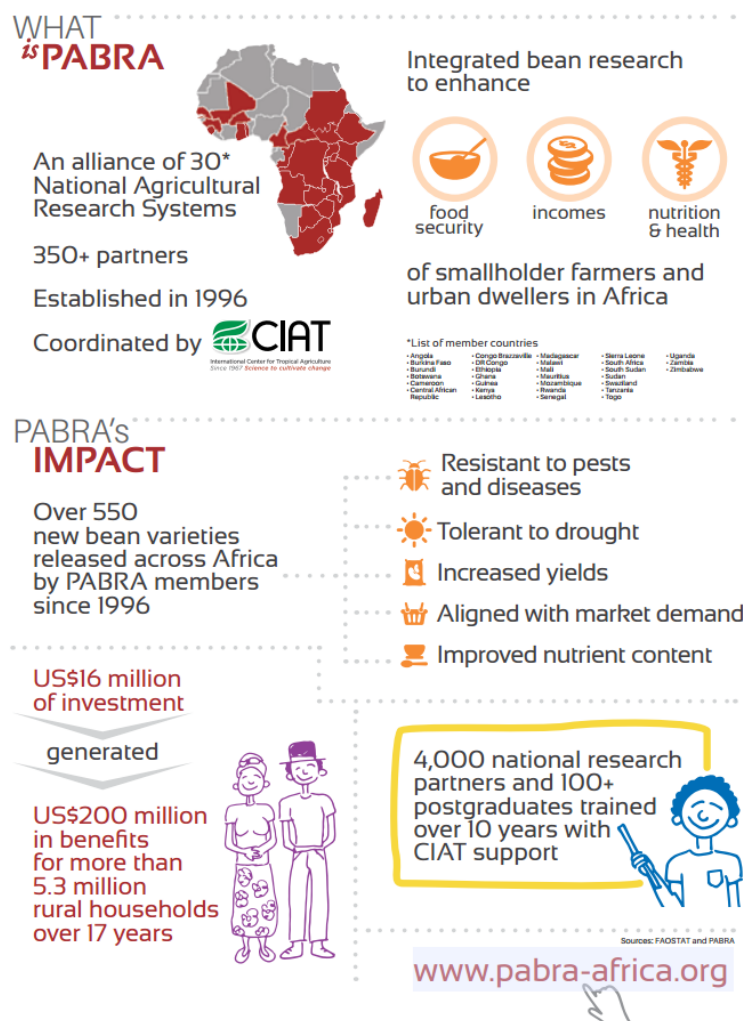
This paper is a case study of a network that combined participatory approaches to propose best suited knowledge management (KM) interventions for its member countries. A five-step exercise used existing elements of the alliance's strategy, a KM survey and a face-to-face participatory validation of the analysis, to identify gaps in current KM approaches and to collectively point to immediate opportunities for improvement. The KM survey, also referred to as a scan, provided a neutral space for reflection. Its conclusions through the workshop process were crucial in confirming the network's strengths and weaknesses specific to KM. Feeding back the results into existing work plans provided concrete opportunities for country members to implement ideas that had been discussed. The approach to and the outputs of this exercise were extrapolated to formulate a theory of change on KM for the alliance.

**Keywords:** knowledge management; mapping; research networks; beans; South Africa

## **Introduction**

Staff from the International Center for Tropical Agriculture (CIAT) in Uganda, and from the Technical Centre for Agricultural and Rural Cooperation (CTA) in the Netherlands have been interested in working together on knowledge management (KM) for many years. In a meeting of the CTA knowledge management program coordinator and the CIAT M&E coordinator for PABRA, the opportunity to partner on a KM activity in one of the bean networks was discussed. CTA had only recently completed an experimentation phase of the KM scan and were on the lookout to scale out the survey. The opportunity arose through the Southern African Bean Research Network (SABRN) – a regional innovation network that promotes bean research and development in Southern Africa. SABRN is one of three similar networks, including 1) SABRN, 2) the Eastern and Central African Bean Research Network (ECABREN), and 3) the Western and Central African Bean Research Network (WECABREN). Together, the networks form the Pan-Africa Bean Research Alliance (PABRA), which has been coordinated by CIAT since 1996,

and is composed of 31 countries, and 350 partners (See Figure 1).



**Figure 1. What is PABRA?**

A CTA-CIAT team comprised of the authors of this paper came together in October 2015 to commission a comprehensive analysis and assessment of KM practices, processes and tools in SABRN. The assessment involved SABRN's 13 member countries. The paper presents a five step process for developing the KM approach, it provides participant's reactions on what worked and what did not work during the process, thereafter we present reflections about the implementation and lastly recommendations for scaling out such an exercise.

## **Five steps to assessing and developing a KM approach for SABRN**

We embarked on a five step procedure to assess the existing KM landscape of the network and to collectively arrive at immediate opportunities for improvement (see Figure 2). First, we carried out an analysis of existing KM elements and outputs in SABRN's strategy documents and work plans. Second, we administered a survey instrument to network members to assess their perceptions of current KM attitudes and practices within the network, as part of a KM Scan process. Third, the KM Scan was validated through group discussions with SABRN members, focusing on our preliminary analysis of the survey, a participatory evaluation and prioritization of actions to address the issues identified. Fourth, we compared the list of priority actions with existing SABRN KM assets and activities, and incorporated new priority actions into SABRN work plans. Fifth, we formulated an overall Theory of Change on KM for SABRN. The remainder of this paper discusses the rationale and results of the five steps in more detail, using information and data management components as an example of activities undertaken at each step of our analysis.

### **1. Be clear about existing KM elements of SABRN**

The team analyzed existing strategic documents of PABRA, which had been recently formulated in the context of major project proposals. In those documents KM forms part of the four strategic pillars of the SABRN network and the broader PABRA alliance: 1) better beans for food security; 2) profitable bean markets; 3) bean-based products for nutritional security; and 4) skills, information and knowledge for an enabling environment. In its day-to-day practice, and under this last objective related to KM SABRN, just as the other networks in the alliance, usually undertakes activities related to institutional capacity building through technical training and mentoring, knowledge exchange and learning, mostly through seasonal and annual face-to-face, local, national and regional events; and information and data management.

Information management in the network consisted of external communications intended to improve PABRA's brand. Members/partners and the public were continuously informed about the research, development and innovations generated within the network and in related fields through the SABRN website, blog posts, and social networking pages, such as PABRA Twitter, Facebook, and Flickr pages. Communication products for a broader audience, such as technical reports, posters, manuals and handbooks that contain information on beans were also made available.

Data management had several components: a research database (<http://database.pabra-africa.org>) that is regularly maintained and updated with content from partners and is organized according to key outcome indicators of PABRA (e.g. breeding, seed systems, integrated crop management).

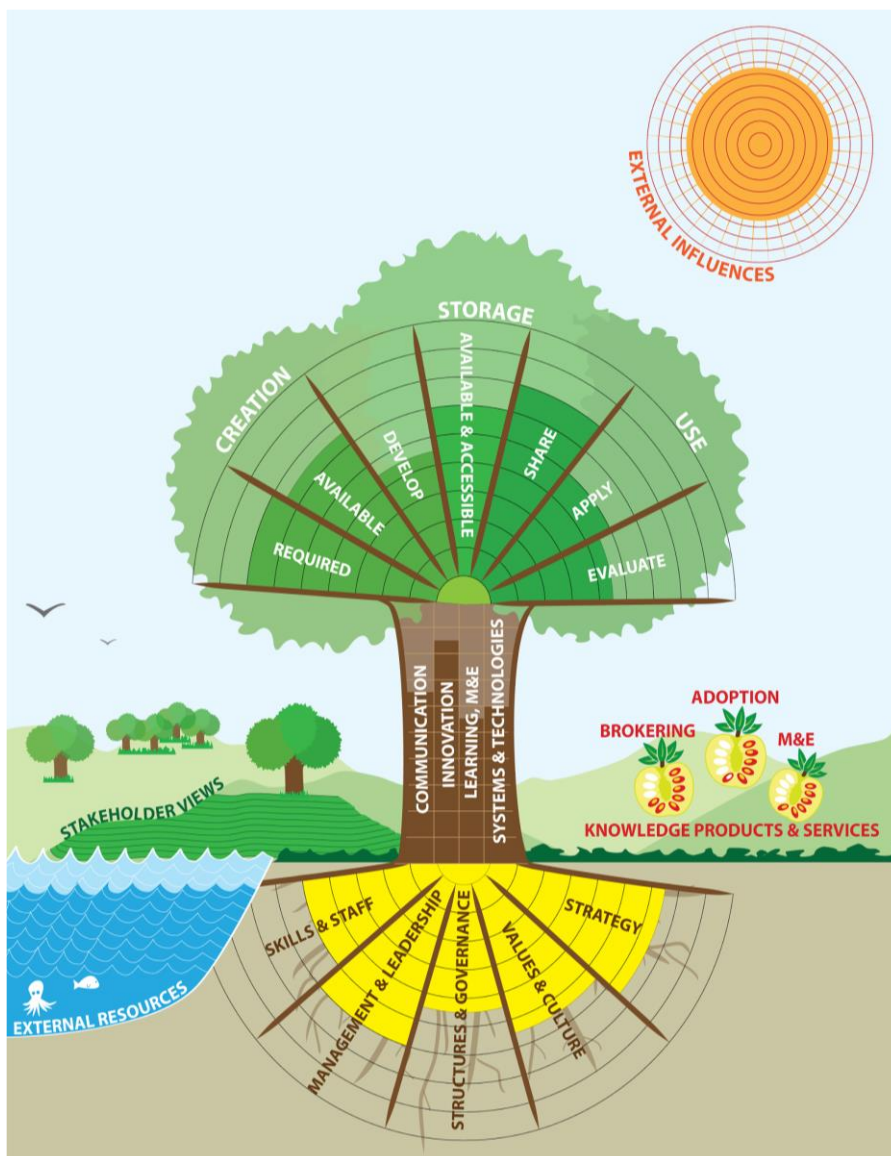
The results of our initial analysis of SABRN's existing KM practices indicated that SABRN would benefit from additional KM products such as online e-repositories of information resources, online collaboration that have proven benefits in similar alliances. It was clear that much could be done to improve KM approaches within the network, in knowledge sharing, data and information management, and in learning between member countries.



**Figure 2. The five steps to developing a KM approach for SABRN**

## 2. A KM Scan with SABRN to identify strengths, weaknesses and opportunities

To conceptualize and understand the KM processes at work in SABRN, we used the Knowledge Ecosystems Framework to conduct a KM Scan. The analogy of a tree (*the 'KM Tree'*) as used by CTA<sup>1</sup> effectively illustrates the Knowledge Ecosystem Framework (Figure 3).



**Figure 3. An illustration of the organizational self-assessment of 22 aspects of KM based on the KM Tree**

The CTA-CIAT team, in collaboration with Co-Capacity (the KM consulting firm which supported CTA with the conceptualization of the KM Tree and the KM Scan), adapted the KM survey also known as scan for use by SABRN members. This involved the administration of the

<sup>1</sup> <http://km4ard.cta.int/the-km-scan/>

questionnaire in order to gather perceptions of SABRN members on their KM practices. The KM Scan was designed to enable organizations and networks to assess 22 different aspects of KM, representing the KM ecosystem of an organization or network. The instrument addresses internal processes as well as stakeholder relations, partnerships and interactions with external factors. Each value proposition was measured using a set of seven questions. In the case of the SABRN, the KM scan followed a stepwise process; it started with administration of an online questionnaire to 23 members of the network. They were SABRN representatives from the SABRN member countries, and comprised of bean team leaders, national researchers from SABRN member countries and scientists from the CIAT backstopping. The data was collected based on an ordinal four-point scale, converted into numerical equivalents and analyzed both globally and by category of respondent.

The scan addressed information and data management with questions in two sections: (i) knowledge creation, and storage, e.g. how the network made an inventory of the available knowledge, how it developed (new) knowledge, and (ii) Availability and accessibility of knowledge, and knowledge sharing within and outside the network.

A section of the survey addressed the systems and information technologies to support SABRN, which refers to the ICT systems, technologies, applications and procedures and rules used to communicate, and store knowledge products and to learn. Below are some examples of the areas that respondents assessed:

- Technologies/systems that support the collaboration process in the network.
- Information management to support the decision-making process.
- Functionality of the network technologies/systems
- User friendly internet environment
- Usage of social media tools for communication and learning
- Functional project management solution
- Existence of policy and action plans for the use of or ICTs

The preliminary results of the survey presented below highlighted the key characteristics of the network in relation to KM. It revealed variations in the perception of the different groups, mainly the researchers from member countries and the backstopping team; the latter often expressed more skeptical views on the network's performance in KM than the former. The scan shed light on many assets that the network has built over time.

The network culture is perceived as trustful, strong in teamwork, with a good acceptance and positive attitude towards change and towards exploring the unknown. For respondents, the network strategy is so clear that members can determine what knowledge is needed for its



implementation. Knowledge is developed productively in formal and informal ways and knowledge creation is a team effort. SABRN members give constructive criticism and project progress is internally shared and discussed.

With relation to innovation, everyone agreed that SABRN members are encouraged to try out new ideas, and to boost their innovation and creativity. Most of the respondents agreed that participation in the SABRN committee was balanced and represented a wide range of stakeholders, and that the SABRN strategy reflected the views of most stakeholders. The network had good connections with research institutes that are of strategic importance and members could apply what they learned from conferences, research and lessons learned.

Everyone agreed that knowledge was freely shared between experts and non experts and that SABRN members had the appropriate skills for translating knowledge into products and services for their beneficiaries. The monitoring and evaluation of all network activities was done in a systematic way. Not only outputs were checked, but the direct and indirect outcomes of the work were checked as well. Most respondents reported that there were feedback loops to regularly monitor beneficiaries' satisfaction.

Further analysis of the results of the survey revealed eight priority areas for improvement, backed by the evaluations made by the stakeholders. Two of these specifically related to data and information management:

*(1) Knowledge creation and storage:*

Most respondents said that SABRN members did not have a good overview of all their digitally stored information. There was some ambiguity as to whether SABRN had a “who is who” database. The national researchers said there was, while half of the bean team leaders disagreed, and more than half of the backstopping team disagreed. However, most people knew who was the most knowledgeable contact on specific subjects, but the backstopping team was less sure. Two-thirds of the respondents said that there was a procedure in place to regularly capture the available knowledge in the network, but the backstopping team almost all disagreed. Many, but not all, respondents felt that SABRN did not suffer from an information overload. Most people agreed that information was stored systematically. About two-thirds of the respondents said that there was someone in SABRN who was responsible for content curation, but both the backstopping team and the bean team leaders were less positive about this. More than half of the respondents said that there were no processes or tools to retain knowledge when someone left the network, although most national researchers say these were in place.

*(2) Systems and information technologies to support SABRN:*

In the aspect of systems and IT, the national researchers were positive while the bean team

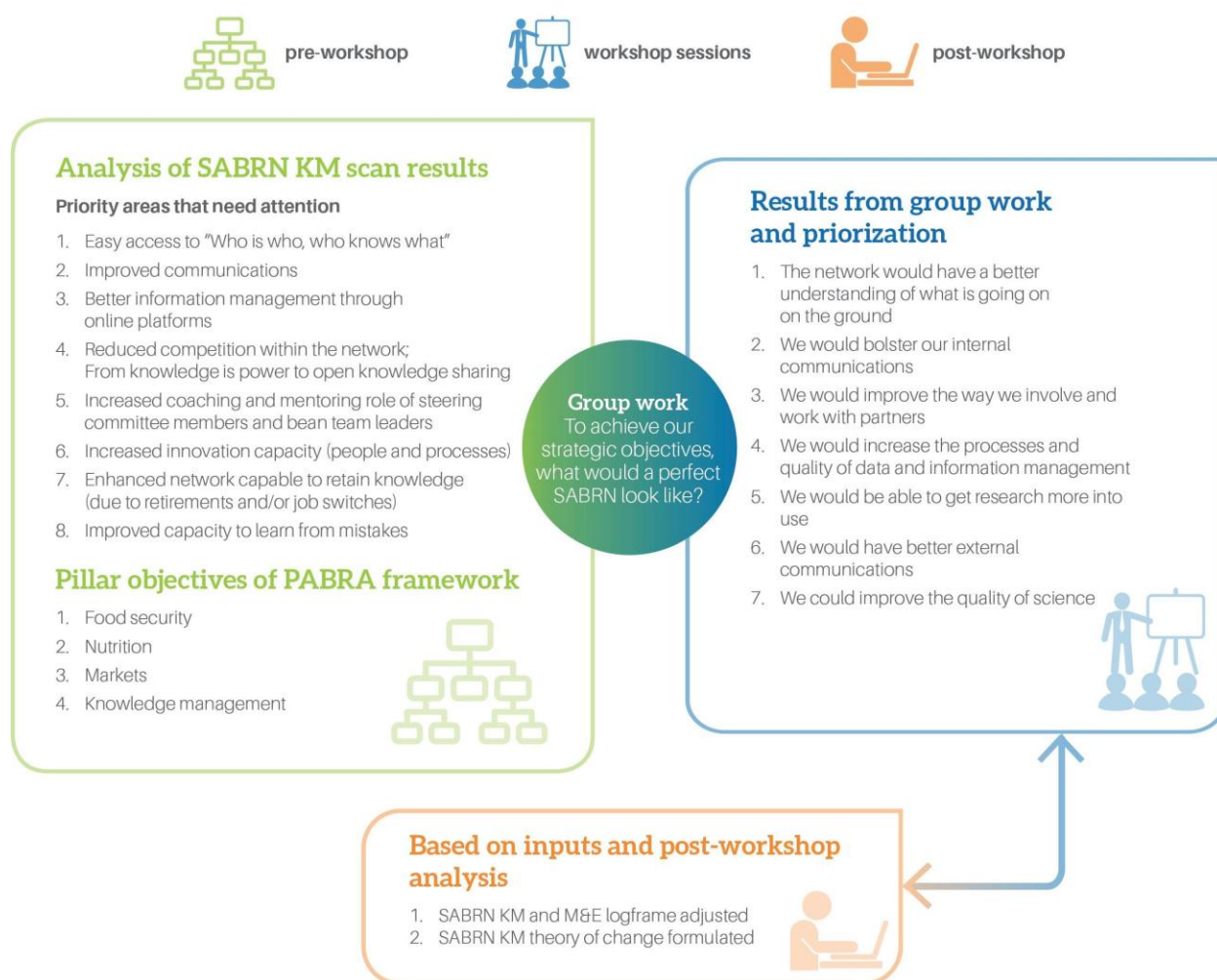
leaders and backstopping team were, again, more negative. Almost everyone agreed that there were technologies and systems in place that supported the collaboration process. Most people also agreed that the network technologies/systems were functional and fully supported them in their work, but the backstopping team was slightly more negative here. About three-quarters of the respondents said that there was a management information system to support the decision-making process, but the backstopping team disagreed. Also, not everyone agreed on whether the SABRN projects were being managed in a functional project management solution, and here both the bean team leaders and the backstopping team were less positive. Many respondents stated that there was an online environment where they could find the information they needed, but again the backstopping team was less positive. More than half of the respondents said that there were no network systems and technologies, or ICT, policy and action plan in place, although the national researchers mostly said there was. There was no overview of all the digitally stored information. Information was not stored systematically and recognizably and therefore was not easy to find. There was little use of shared databases. Expensive mistakes were sometimes made because the required knowledge was not available at the right place and time.

### **3. Validate the scan through participatory evaluation**

In face-to-face workshop sessions held during a SABRN annual meeting which included survey respondents as well as other network members, the CTA-CIAT implementation team guided the participants through the preliminary results of the assessment. We aimed to validate the findings and inform on their interpretation as well as promote ownership of the process and final results. The assessment team had initially planned an exercise based on the four strategic pillars of the network to identify the changes in knowledge, attitudes, and skills (KAS) that were needed in each area and then distill the KM elements that could support this change. However, this did not happen as originally planned as the network coordination team felt that this exercise might yield conflicting results that would be difficult to tackle, such as a suggested revision of the existing log frame and related activities. Instead it was decided to validate the KM Scan through working groups focusing on the question: “To achieve SABRN’s strategic objectives, what would a perfect SABRN look like and what would people do differently?” Participants engaged in in-depth group discussions to explore good practices in KM as these were related to the functioning of the network. The discussion results were then clustered into categories and merged with results from the scan, generating a list of priority areas for consideration (Figure 4). These became the proposed KM good practices for incremental adoption.



## Workshop process to create a KM approach for SABRN



**Figure 4. Workshop process to create a KM approach for SABRN**

When asked: "To achieve SABRN's strategic objectives, what would a perfect SABRN look like and what would people do differently", the group work revealed among others: In a perfect SABRN, we would improve the process and quality of our data and information management. Participants reported the following additional statements:

- Network member's capacity in data management (i.e. data collection, curation, storage, sharing) would be strengthened which would enable network members to provide quality progress data to SABRN
- Network members would add notes to data capture templates for better understanding and analysis by others
- Network members would use electronic forms to capture and report data

- Coordination team could make trial evaluation data accessible on the website for SABRN members, to promote regional release of varieties, help with sharing content, evaluate, and establish how this data would be used
- SABRN could use appropriate information and communication technologies (ICTs) for information and knowledge exchange, to support networking, and for data collection.

#### **4. Integrate the results into existing SABRN work plans**

The next step was to go back to the annual work plans and logframes which served as a starting point of the exercise and to compare the list of priority areas with existing SABRN KM assets and activities. The KM assessment team worked on a *jigsaw puzzle* of information which required the overlaying of the list of prioritized needs into existing annual activity work plans and project log frames. This step in the process localized the list of priority areas and generated a hybrid KM work plan for the network (Figure 5 illustrates the example of data and information management).

Finally, participants selected some KM intervention areas for immediate implementation in a two-year period in 2016 and 2017. These were:

- Annual site visits
- Capacity development in data management
- Capacity development in scientific writing
- Setting up an internal platform for collaboration, information, and data management
- Facilitating knowledge exchange among network members throughout the year
- Pilot project for enhanced data management (e.g. new tools and processes)
- Pilot project for learning approaches among partners (e.g. innovation platforms, learning alliances)

#### **5. Extrapolate a KM Theory of Change for SABRN**

##### *Use of the Theory of Change*

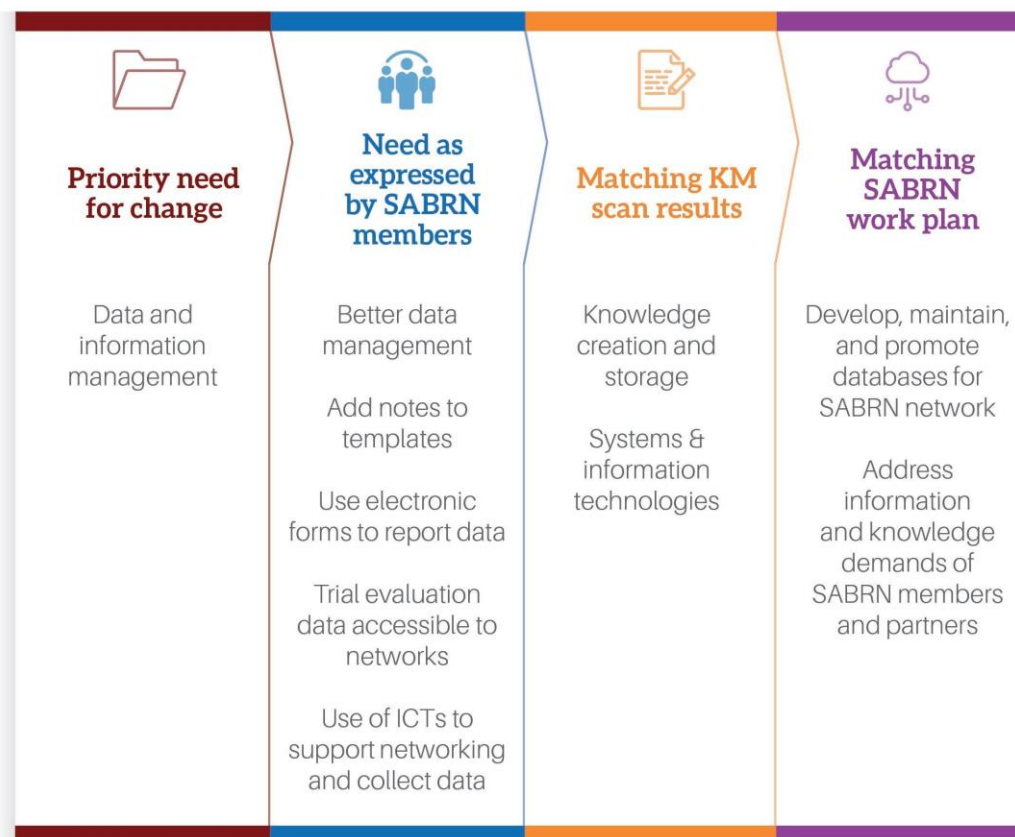
The use of the Theory of Change has been increasing at CIAT as a response to internal considerations to harmonize the baselines for monitoring, evaluating and reporting of major research programs, and improve learning of staff and partners along the project cycle. In this context, CIAT developed a process (Staiger, 2014<sup>2</sup>) through which its research programs and projects could design KM plans according to their impact pathways. CIAT's KM group applied

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<sup>2</sup>Staiger-Rivas, Simone; Alvarez, Sophie; Arana, José Antonio; Howland, Fanny; Cunha, Flavia; Valencia, Brayan; Muñoz, Luis Armando; Feijóo, Karina. 2014. Designing knowledge management interventions in agricultural research for development: methodology, experiences, and lessons learned. International Center for Tropical Agriculture (CIAT). 6p.

concepts of the Theory of Change to projects to identify, design, and implement appropriate KM interventions and derive lessons from them. The model considers seven areas of intervention, three of which relate to data and information management:

**Overlaying the list of priority areas with  
 the scan results and the SABRN work plan:**  
 An example of data and information management

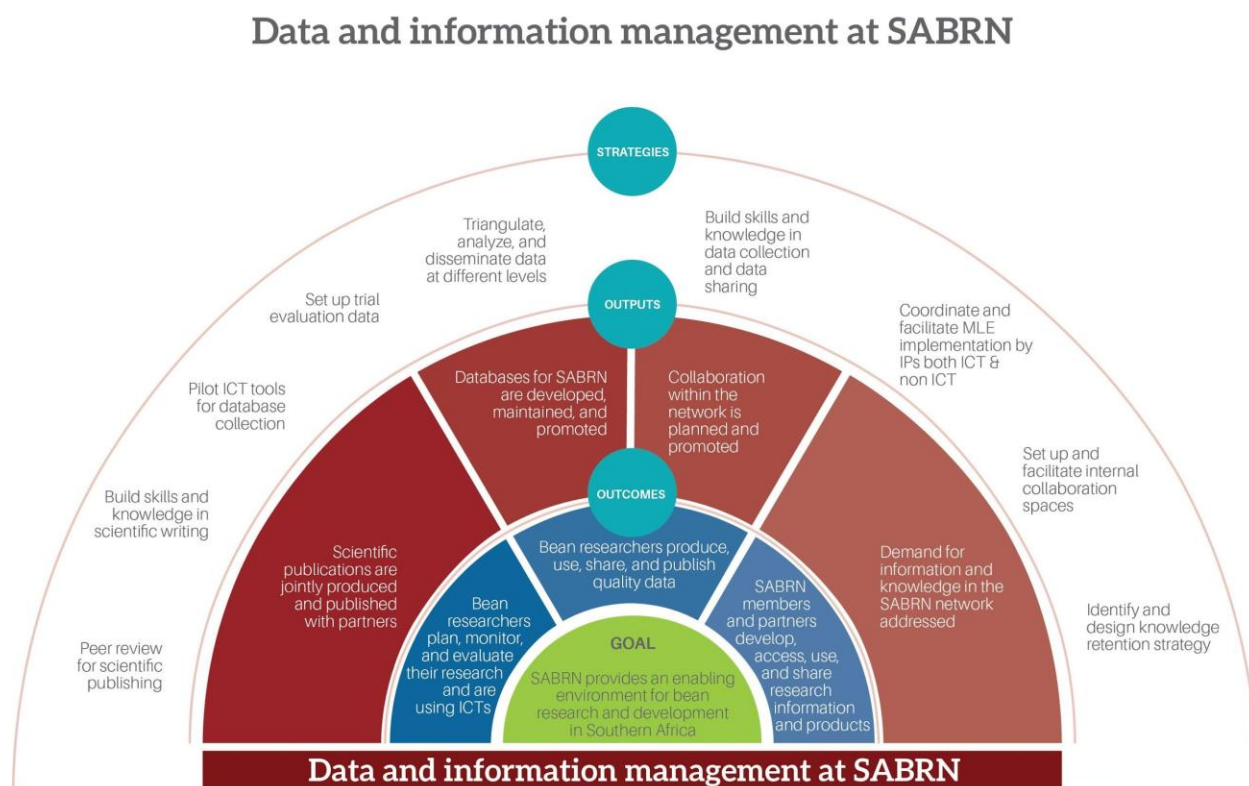


**Figure 5. Hybrid KM work plan: An example of data and information management**

- Management of data and information generated by research: Data and information is made available, accessible and applicable to a wider public audience. By implementing an open-access policy, scientists and partners can use, reproduce, and develop new propositions for data and information.
- Use of ICTs: Implementers of projects use ICTs to compile and share data and information. They develop strategies to include different user groups and address generational issues. The design of those projects focuses first on context, audiences, and content relevance before identifying the best solutions for fruitful knowledge exchange.

PABRA had also been developing a Theory of Change for its networks. It was therefore timely to explore the KM dimension of the existing Theory of Change in the SABRN network specifically in areas such as: incorporating KM principles and practices in member country research agendas; sharing research with partners to strengthen learning and accelerate the use of results; and using ICTs to improve small farmers' access to resources that would help them improve productivity and competitiveness.

The CTA-CIAT implementation team saw the Theory of Change as a key deliverable of the KM strategy and reconstructed it using outputs from the existing log frame and workshop sessions. To present SABRN with a Theory of Change for Knowledge Management that would logically summarize the change process, the team used a graphical approach with segments of concentric circles with arrows linking the segments to depict the logical path from long-term outcomes to intermediate outcomes through to outputs and activities. The different levels in the logic pathway produced a rainbow type diagram. The result was a graphical presentation of the KM strategy for the network that incorporates existing and new areas emerging from the KM scan process. Figure 6 shows the elements of data and information management of the Theory of Change.



**Figure 6. Data and information management at SABRN**

## **After Action Review**

The implementation team took the time to discuss the process afterwards, first with the workshop participants, and then within the team.

### **Participant's reactions on what worked and what didn't during the KM sessions**

The CTA-CIAT implementation team organized a final workshop session exercise where participants were invited to leave a message on a board about the usefulness of the KM sessions; this exercise generated 32 responses. The mainly positive comments related to the opportunity to identify key areas for improvement and explore concrete ways forward. Participants appreciated the interactivity of the process that helped to reflect on what was going on the ground; as one participant put it:

“The whole process was good and impressively useful in helping develop country and regional KM activities. The KM scan as a preliminary evaluation tool gives a realistic and honest picture of where SABRN as a network is with regards to its mandate. The intensity of the group discussions that happened here has created in my opinion a promising atmosphere and platform for SABRN member countries to excel and be more relevant in their activities.”

The comments on improvements were mainly about the KM sessions and scan processes. Participants felt that it was difficult at the beginning to understand what the topic was about and that there was too little time to respond to the questionnaire but they said that the sessions during the workshop helped them to understand the questions in the scan better. As another participant said: “The scan questionnaire was too long, but it was quite useful in bringing out the often underlying unspoken/ unexpressed and silent challenges.”

### **Reflections from the CTA-CIAT implementation team**

In their after-action review, members of the CTA-CIAT implementation team had the following proposals on the process:

“If we were to run the exercise a second time, we agreed that a closer look and discussion of the existing SABRN logical framework would have been essential in handling the workshop session on Theory of Change. We would have pulled out the narrative of the framework and use it as a starting point, to complete it, discuss it, and articulate it with the participants. It is obviously easier to use Theory of Change if no similar approaches have been applied for network planning.”

“The KM Scan was a useful process in establishing a KM baseline, and when it was applied in partnership arrangements, such as a network, it brought about greater



understanding of the potential to get research into use.”

“The interactions in the validation workshops revealed the curiosity and interest that SABRN members had for trying new concepts and ways of working, such as partnerships to create, store and use knowledge while engaged in the core business of developing bean crop related technologies and delivering them to communities and farmers. This interest should be leveraged by SABRNs technical and management teams through pilot initiatives in selected countries.”

## Conclusions

The exercise of formulating a KM approach for SABRN took place at the end of 2015 and the beginning of 2016. The funding for substantial new KM activities within PABRA has only been recently realized. In a global meeting of the PABRA network, we extrapolated the results of the exercise with SABRN to the global PABRA network and established activities that could be led at the coordination level. Among those activities were: the creation of an information repository of recent publications developed with network partners; a detailed variety release database that would meet the technical information needs of breeders and seed traders; an assembly of data and information on trade flows, actor profiles, products, maps, both for sharing internally and for creating visuals for an external audience; and the setup of an internal collaborative platform for PABRA coordination teams and regional networks.

This case study shows how a network combined different participatory approaches and processes to suggest best KM interventions for its member countries. The exercise helped to identify KM gaps in current network frameworks and to collectively point to immediate opportunities for improvement. The KM scan provided a neutral space for reflection. Its conclusions through the workshop process were crucial in confirming the network's strengths and weaknesses in KM. Feeding back the results into existing work plans provided concrete opportunities for country members to implement ideas that had been discussed. The Theory of Change now provides a basis for monitoring and evaluation as well as for continuous discussion of how KM can evolve within the network in the future.

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