Digitizing Seed Sector Data in Africa

Lessons Learned from Visualizing Information on Seeds Using Technology in Africa (TASAI-VISTA)

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Acronyms Glossary

DG	Development Gateway: An IREX Venture
DVAT	Data Validation and Analysis Tool
TASAI	The African Seed Access Index

Purpose of the Paper

This is a reflective piece that highlights successes and challenges during the implementation of the Visualizing Information on Seeds Using Technology in Africa (TASAI-VISTA) program as well as the processes followed and the lessons learned. The program was funded by the Bill and Melinda Gates Foundation and implemented by Development Gateway: An IREX Venture (DG) and The African Seed Access Index (TASAI) Inc.

Current state of seed data and TASAI's role

Digital tools generate, store, and process data and can do so faster and with more precision than those operated manually. Importantly, data can be used to identify connections, causations, or to track change, and the more data one has, the more sophisticated the possible analyses.

Seed systems in Africa

A seed system is defined as the set of activities, institutions, and actors involved in the development, use, and distribution of seed to smallholder farmers (Richards et al. 2009;[1] and McGuire 2016[2]). In developing countries, smallholder farmers access seeds through two main seed systems: the **informal** and the **formal systems.** The informal system outweighs the formal one by far in terms of size and reach. According to McGuire and Sperling (2016), in Africa "farmers access 90.2% of their seed from informal systems." Still, the informal system lacks the level of regulation necessary to ensure consistent product quality and traceability. Achieving this is possible in the formal system, defined as a "deliberately constructed system that involves a chain of activities leading to genetically improved products: certified seed of verified varieties."[3] Specifically, the formal seeds system includes: production (breeders), marketing and distribution, regulatory regimes, and quality assurance. In sub-Saharan Africa, formal seed systems

[1] Richards, P., de Bruin-Hoekzema, M., Hughes, S. G., Kudadjie-Freeman, C., Offei, S., Struik, P., & Zannou, A. (2009). "Seed systems for African food security: linking molecular genetic analysis and cultivator knowledge in West Africa." *International journal of technology management*, *45*(1-2), 196-214.
[2] McGuire, S., & Sperling, L. (2016). "Seed systems smallholder farmers use." *Food Security*, *8*, 179-195.
[3] Sperling, L., & Cooper, D. (2003). "Understanding seed systems and strengthening seed security."

face a number of challenges, which in turn threaten food security on the continent. TASAI studies focus on the formal seed system because TASAI's methodology and set of indicators were developed to measure the key aspects of the formal sector.

In Africa, high-quality agricultural data is in short supply. As noted by Kalibata and Mohamedou: "Many low-income countries are limited by gaping holes in agricultural and rural data that could inform planning, budgeting and policy making in this vital sector. The scarcity of high-quality, timely agricultural data is directly complicating countries' plans for economic growth and efforts to reduce poverty."[4] TASAI's aim is to address the existing gap in agricultural data in Africa by providing high-quality, accurate data on the formal seed sectors of African countries.

Launched in 2015, TASAI is an industry research tool that monitors the development and competitiveness of national seed sectors in Africa. TASAI's broad goal is to create, promote, and maintain enabling environments (including institutional, policy, and regulatory realms) for formal seed systems serving smallholder farmers to catalyze inclusive agricultural transformation in Africa.

TASAI accomplishes this goal by collecting high-quality data at the national level, which it shares in the form of reports and presentations that give a detailed picture of the country's seed industry and allows for cross-country comparisons and continent-wide rankings of seed sectors. Specifically, TASAI covers 22 indicators divided into five broad categories: Research and Development, Industry Competitiveness, Policy and Regulations, Institutional Support, and Service to Smallholder Farmers. For each country, TASAI monitors and evaluates the structure, conduct, and performance of seed systems serving smallholder farmers. The intended outcome of the project is improved access to locally adapted, affordable, and high-quality seeds of appropriate varieties by smallholder farmers in sub-Saharan Africa.

Is a complete digital transformation the best approach?

In light of the complex nature of the seeds system in Africa, converting the data ecosystem to a completely digital version overnight is not realistic. There are nuances related to data availability, collection and calculation methodologies, and discrepancies

[4] Kalibata, A., Mohamedou, E. I. (April 30, 2021). "A lack of basic agricultural data is holding African countries back." Available at: https://qz.com/africa/2001970/a-lack-of-basic-agricultural-data-holds-african-countries-back

in disaggregating, that are better analyzed qualitatively, which leads to the development of semi-digital tools. These tools do not only focus on quantitative analysis, but integrate the human component as well. In this program, the team digitized the following tools:

1. *Survey Tools:* Survey tools have built-in validations and standardization parameters to reduce errors during data collection in the field;
2. *Data validation and analysis tool (DVAT):* DVAT automates the calculation of the respective indicators and provides comparison between survey data and other data for respective data points; and
3. *Dissemination tools (external dashboard):* This dashboard displays data that is generated by the DVAT in the form of charts and maps for TASAI's stakeholders use.

Methodology

This section is twofold. We will share the methodology used by the TASAI team in their country studies and then discuss DG's approach to developing the digital tools for the respective stages.

1A: Country study methodology

At the heart of TASAI's research is the country study: a rigorous assessment of national seed sectors conducted by local research teams under the supervision of the TASAI team. With a focus on four priority grain and legume crops important to food and nutritional security, the study gathers data on the 22 TASAI indicators. This yields a detailed picture of the country's seed industry, which is captured in the TASAI Country Report and presented to a wide range of seed industry stakeholders during the TASAI Dissemination meeting.

Inception Phase

During this phase, there were three main activities:

1. In-person meetings with 20-30 local seed industry stakeholders representing government, private sector, research institutions, and donor agencies;
2. One-on-one meetings with the main institutional stakeholders to explain the purpose, objectives and scope of the TASAI research, receive feedback, and obtain buy-in; and

3. Researcher training during which the research teams in the respective countries are trained and supervised by the TASAI team. This step is important for research team members to understand the goals of the study. More recently, the training has included the use of digital tools to collect data.

Data Collection

Previously, this step was conducted through the use of paper-based surveys by the respective country research team. The surveys were completed manually and scanned copies were shared with TASAI at the end of the data collection process. This presented its own set of challenges. This manual process was error prone; the researcher could accidentally enter the wrong values while in the field and the value would thereafter be entered into an Excel document for further analysis. Because this anomaly could only be noticed at the point when the survey was scanned and shared with the TASAI team (often, at the end of data collection, which usually took months), following up with the key informant was often difficult.

Once the digital tools were completed, improvement in the data collection process was immediately noticeable. The first positive change was that the TASAI team was able to review the incoming data continuously as opposed to only at the end of data collection, allowing TASAI to query the data and fix anomalies right away.

Secondly, the digital tools increased the level of accuracy at the data collection and entry stage of the research. The tools have built-in controls that enable the enumerator to identify and then avoid potential errors in the data. For example, for a number of questions, the answers are selected from a dropdown of options. This prevents enumerators from entering data outside the range of possible responses.

Thirdly, data consistency has been improved. Early in the questionnaire, enumerators select crops that apply to that specific respondent. Subsequent questions then limit responses to that crop selection.

At the same time, it was not possible to completely phase out the paper surveys, because the online tools presented their own challenges. For example, internet connectivity in the field might be limited causing the researcher to only upload their completed questionnaires once they had access to the internet. Another challenge was that the online questionnaires had not been built for small screens. This meant that the

researchers who would have preferred to use their mobile phones for data collection were not able to do so and, thereby, opted to use paper surveys. Further, some researchers were simply more comfortable taking down notes on paper, as opposed to using a digital device.

Data Analysis

Prior to setting up the new digital systems, once the surveys were completed, the researchers entered raw data into an Excel document. The document was shared with the TASAI team, who cleaned the data and analyzed it in the Excel document. While the document had existing formulae to aid in analysis, the process was still largely manual. The new DVAT built by DG also transformed this process, providing significant improvements.

A significant value add of the DVAT is automated indicator calculation. The tool calculates up to 73 sub-indicators (from the 22 indicators). This has tremendously increased the accuracy of the analyzed data. Previously, the process was manual and faced a series of challenges including being error prone and attempting to clean the data while performing the analysis. Offline data cleaning also led to versioning challenges, making it very difficult to understand if any changes were made or how final indicator values were calculated from the raw, uncleaned survey data. DG and TASAI have worked to address the issues of data cleaning with a standardized online survey tool that incorporates data validation and standardization schemes, thereby, freeing the TASAI team to be confident that their analysis will have full traceability and transparency on how the data was cleaned and how TASAI got from the raw survey values to the aggregated analysis.

Another improvement is that the DVAT has built-in data checks, such as automatic comparison to previous data, in order to help the TASAI team to identify outliers.

In the DVAT, different members of the team have different levels of access. The researchers are at the first level. Once the preliminary analysis is conducted by the researchers, they forward the results to the TASAI core team, who then review them. If there are any outliers or inconsistencies, the respective core team member will add a note of query to the researcher, which prompts the researcher to make the necessary changes to the analysis and provide documentation for the changes made to the data.

This greatly reduces the possibility of errors in the final results and provides traceability of changes made to the data through its lifecycle.

Report writing and editing

The report writing and editing part of the TASAI methodology benefited the least from the digitalization, because the reports have many details and nuances that are only possible to capture by human authors and editors. However, the DVAT was able to support the generation of the numerous tables (as many as 30) that are included in the report, which greatly reduced the time it took to create those tables. The process is as follows:

- ➔ The TASAI team prepares a template of the report, including the required sections and useful information about recommended content.
- ➔ The TASAI Data Analyst then populates the report with the necessary tables and charts based on the data submitted by the researchers.
- ➔ The template is sent to the researchers, who use it to draft the first version of the country report.
- ➔ When finished, the report is shared with the TASAI team, where it goes through, on average, 3-4 rounds of rigorous review. When needed, additional information is requested from the researchers.
- ➔ As the last step of the review process, the report is shared with two or three external reviewers (usually country seed experts) who provide input and validate the findings. Once all the edits are made, the report is ready for dissemination. Following dissemination, the final round of edits and corrections are incorporated and the report is published online.

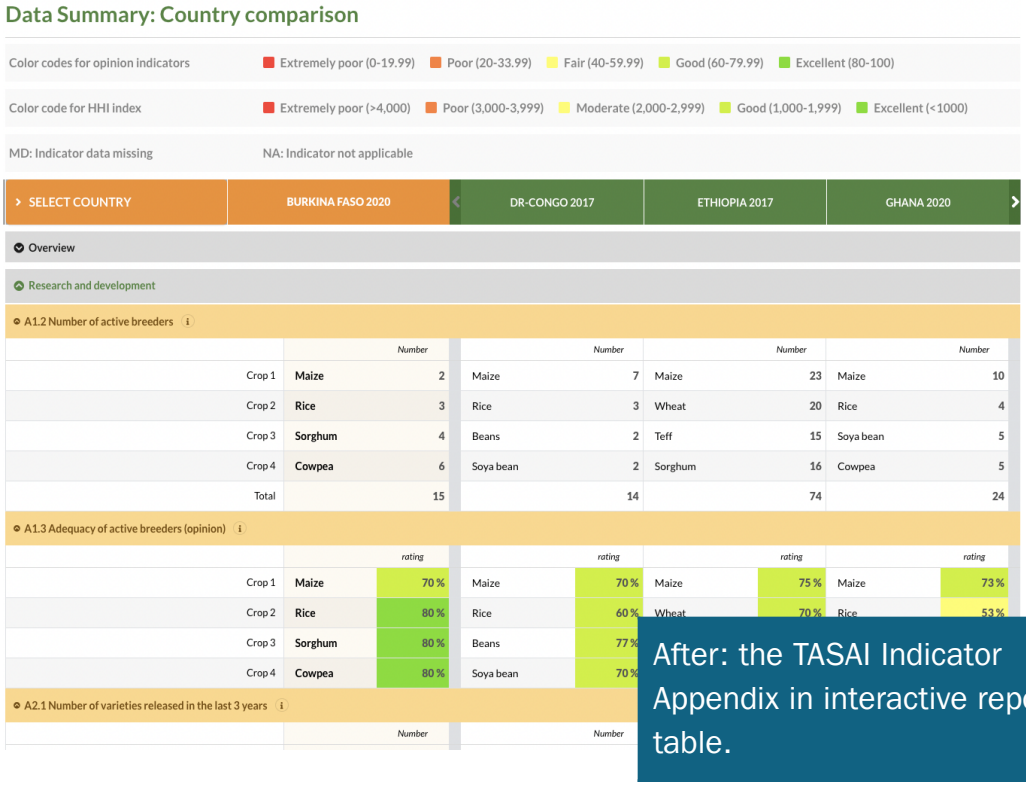
Dissemination

This process includes engaging stakeholders targeted at the inception phase to review and validate the findings from the study. Historically, the process involved in-person meetings with the relevant seed industry stakeholders. At the onset of the COVID-19 pandemic, several meetings were held virtually; however, once the pandemic subsided, the meetings returned to the in-person format, which the team found provided the highest level of engagement. The success of the virtual meetings was dependent on the internet infrastructure of the respective countries in which they were held. This was an example of the limitations of digital transformation. As mentioned above, the team updates the final report based on the input received from stakeholders and publishes it

online. Appropriate logs are then stored in the DVAT so that future TASAI researchers will understand the results of the stakeholder consultation and any changes that were made to the report as a result.

		Country	BURKINA FASO		DR-CONGO	
		Year	2018		2016	
Focus crop 1		Area harvested in hectares	Maize	956,385	Maize	1,506,884
Focus crop 2		Area harvested in hectares	Rice	165,086	Rice	405,074
Focus crop 3		Area harvested in hectares	Sorghum	1,667,193	Beans	459,100
Focus crop 4		Area harvested in hectares	Cowpea	1,254,934	Soya bean	41,206
Number of farming households (million)		Millions		1.7		
Population		Millions		19.2		78.7
Total land area		Millions of hectares		27.4		234.5
Arable land		% of total land area		22%		3%
Ease of Doing Business rank		2019 rank out of 190 countries		151		184
A.	RESEARCH AND DEVELOPMENT					
1	Number of active breeders	Crop 1	Maize	2	Maize	7
		Crop 2	Rice	3	Rice	3
		Crop 3	Sorghum	2	Beans	2
		Crop 4	Cowpea	2	Soya bean	2
		Total		9		14
	Adequacy of breeders (score out of 100)	Crop 1	Maize	80	Maize	60
		Crop 2	Rice	60	Rice	50
		Crop 3	Sorghum	80	Beans	-
		Crop 4	Cowpea	80	Soya bean	-
		Average satisfaction				55
2	Number of varieties released in last three years	Crop 1	Maize	0	Maize	6
		Crop 2				
		Crop 3				
		Crop 4				
		Total				
3	Availability of foundation seed (score out of 100)	Crop 1				
		Crop 2				
		Crop 3				
		Crop 4				
		Average satisfaction				

Before: the TASAI Indicator Appendix in static PDF. Previously this was the only way to visualize in- and cross-country results.



After: the TASAI Indicator Appendix in interactive report table.

Adequacy of seed inspectors

In 2017, the Ministry of Agriculture employed 45 seed inspectors. There were no private seed inspectors working in Burkina Faso. To complement the government seed inspectors, the Ministry has assigned technicians to assist the seed inspectors. The ECOWAS Seed Regulations require seed technicians to work closely with seed producers who do not have the necessary technical capacity in seed production (ECOWAS, 2008). The Ministry intends to train more seed inspectors in 2019.

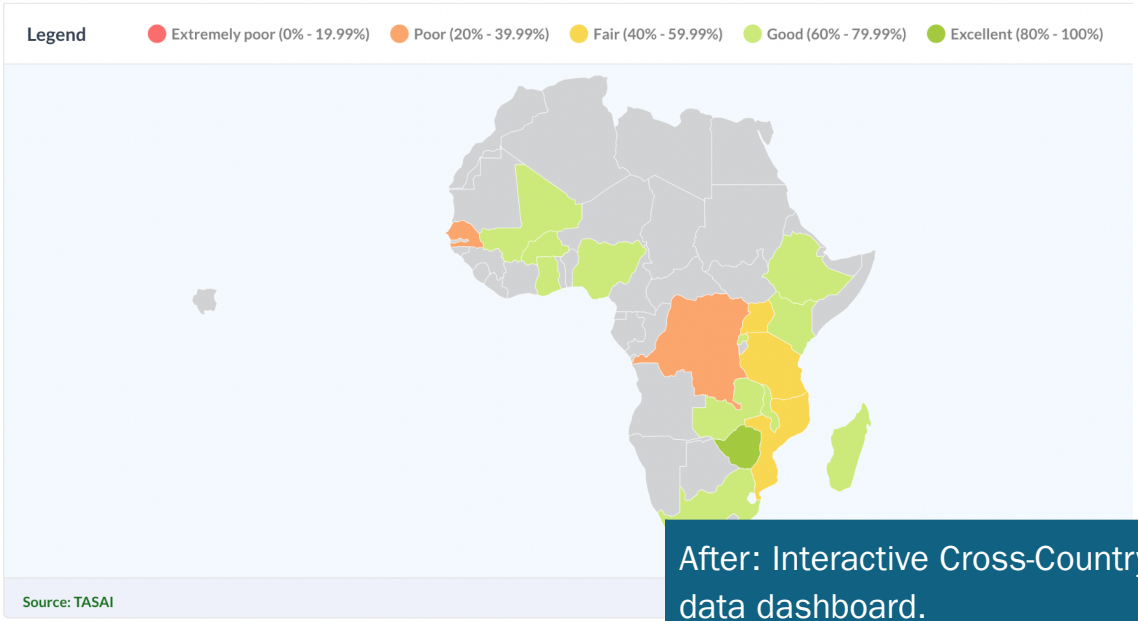
Potential seed inspectors must, at a minimum, hold a diploma in agriculture and are required to attend a seed inspector training provided by INERA. After the training, the inspectors take an oath of office, promising to be impartial in carrying out their duties.

Seed producers are satisfied with the adequacy of seed inspection services in the country, rating this as "good" (78%). The rating is primarily due to the fact that seed inspectors are generally available when their services are requested.

Before: Information on Seed Inspectors contained in Country Brief.

D2. Adequacy of seed inspection services (opinion)

Methods



After: Interactive Cross-Country data dashboard.

With digital transformation, dissemination can extend beyond the country reports to include the online visualization of the different TASAI indicators in the form of charts and maps on the country and cross-country dashboards.

- ➔ A total of 21 sub-indicators were visualized in the country dashboard. This dashboard allows the user to interact with country-specific sub-indicators across TASAI's five thematic areas.
- ➔ The cross-country dashboard, on the other hand, visualized 25 sub-indicators, providing comparison across 17 countries.

The country comparison, known as Data Appendix, was previously only available in PDF form and is now presented as the Data Summary in the TASAI dashboard in a user-accessible format.

1B: Technology methodology

The DG team built a suite of tools to support TASAI's data ecosystem. The tools targeted different aspects of the data lifecycle including collection, validation and analysis, and dissemination. As a result, the tools developed included online data collection tools, data validation and analysis tool, external dashboard, and updated website respectively.

DG employs a user-centric approach, meaning the end users are at the core of development. To this effect, the DG team held a series of working sessions with TASAI to understand their existing tools and internal processes when developing tools for which TASAI were the primary audience. In developing the external dashboard, DG conducted a use case assessment with some of TASAI's most active stakeholders across different countries to ensure the technology responded to their needs as the primary users of that data. As this assessment took place at the height of the COVID-19 pandemic, it was virtual. The assessment revealed the indicators that are mostly used by the different stakeholders and how they are used to inform decision-making, which informed the choice of indicators in the dashboard.

DG built the data collection and validation and analysis tools to streamline and automate TASAI internal processes. The external dashboard and website on the other

hand were built to ensure that the consumers of TASAI information had access to quick and easy to understand information.

These processes were iterative and involved input from the TASAI team at different stages of development, and consequently, their final approval before any of the tools were handed over.

What worked well

1. Use Case Assessment

While the TASAI team had several use cases on how their data is used by the different stakeholders, the team had previously not conducted a process to actively engage these stakeholders to get tangible examples. From the assessment, it was evident that the TASAI work was heavily relied upon and referenced by different stakeholders. It also became clear that while stakeholders relied on the TASAI country reports for information, it was important to supplement the reports with some visualizations that could be accessed easily and quickly on a dashboard.

The outcome of the virtual assessment was enriched by the inclusion of stakeholders from Cote d'Ivoire, Ethiopia, Ghana, Kenya, Malawi, Mali, Nigeria, Rwanda, and Uganda. Had the assessment been in person, we would not have gotten the kind of representation that we did during the assessment due to budget limitations associated with travel.

Use Case:

"Knowing the seed production level in each country is central to our business decision-making, especially when we compare the information across countries. Our strategy is to either produce (seed) in the countries or close to the market. That is because exporting (seed) is expensive and will 'eat' into our margins. A high level of national production will signify that the seed business is growing and that farmers are getting better prices. A country with low production is an opportunity for us." ~Seed Company

Use Case:

"The TASAI status report highlighted that there was a lot of work ongoing in seed sector development in Africa which was not coordinated and harmonized. These findings also

emerged from other reports which created a need to form the African Seed and Biotechnology Partnership Platform where all players can interact and contribute to decision making processes that affect policy development and implementation." ~Donor

2. Use of a dynamic approach

The Data Validation and Analysis Tool presented the team with an opportunity to provide creative solutions to data analysis and validation. Not only can the DVAT analyze the data collected by the online survey tools, it also has the capacity to validate this data against credible secondary and historical data. The tool also provided traceability, interoperability, and access to the data displayed in the country reports and external dashboard. However, to meet the partner's needs, the team could not provide one platform at the outset.

The team needed to understand the nature of the different data, the best platform on which these respective data could be captured and how to link these platforms with each other for optimal use by the TASAI team. It is also important to note that these data were variable year to year and from country to country. It took time and effort to understand the data, mainstream an approach, and ultimately build a tool that provided the desired level of flexibility and functionality. The tool developed in the end was as dynamic as the TASAI methodology itself.

3. Strong engagement between the DG and TASAI team

One of the biggest challenges in technical implementation is sustainability of the tools after development. To ensure the tools would be used post-implementation, the team aimed at getting as much accurate information regarding the use cases of the tools as possible to ensure they remain relevant to real-life use cases. DG held frequent working sessions with TASAI to understand their data, analytical, and reporting processes. These sessions provided useful insights that informed design of the different tools, which were then shared with TASAI for detailed feedback and final approval. Once the approval was given, the DG team would proceed to development and periodically showcase different functionalities of the tools throughout the process. These showcases were important touch points to validate the tools in development were in alignment with ongoing user needs.

4. Platforms used for the respective TASAI tools

4.1 Interoperable platforms

The DG team has over the years built a DG toolkit which is often repurposed and tailored to suit clients' needs. This toolkit was essential as a starting point for the validation and analysis tool against which it was further customized to meet TASAI's needs. This toolkit is vital in ensuring interoperability so that different platforms communicate seamlessly for the user to achieve the desired goals. With the data collection tools built on Kobo and the dashboard on Wordpress, the DG toolkit serves as the conduit between the different platforms.

As part of DGs processes and sustainability measures, we prioritize software platforms that are easy to maintain and use once the handover process is complete.

4.2 Security of the tools

One of the requirements from TASAI was for the platform to be secure with limited vulnerability to security threats such as hacking. With this in mind, the website and dashboards (which are accessible to the public) were built on Wordpress, as the platform has limited plug-ins as well as multiple authentication processes to ensure very limited vulnerability to external threats. Wordpress is also equally easy to maintain with little or no intervention from software developers.

4.3 Open source technologies

DG uses open source technologies when providing digital solutions to its partners and clients. Using open source technologies is one of DG's core values as it provides users the ability to access the code when maintaining the platforms used without relying on the DG team. DVAT and external dashboard are distributed under MIT and Apache 2 licenses respectively. For Business Intelligence, we selected the open source tool Metabase as part of the DVAT and the external dashboard was developed using React and runs inside WordPress, all proven open source technologies. For this project, we use a new WordPress React library developed entirely by DG that is available for any developer free of charge, as we think is important to contribute to the open source community.

5. Training for the respective tools

Upon completion of each tool, the DG team provided comprehensive training to the TASAI team. The TASAI team in turn trained their researchers on relevant tools which

helped to build ownership of the tools. While some researchers still use paper-based surveys in the field, because of the limitations associated with digital transformation, many have adopted online data entry easily.

6. Review of internal TASAI processes

The need to digitize the data ecosystem, together with the prevailing COVID-19 pandemic, presented unique challenges for the TASAI team. Previously, inception meetings were in-person group meetings with most of the relevant country stakeholders in attendance. However, because of restrictions imposed by the pandemic, the team switched to virtual meetings. Moreover, in countries where TASAI already conducted a few rounds of study, it was more efficient to hold targeted one-on-one meetings with key stakeholders (e.g., head of seed services, relevant department in the ministry of agriculture, etc.). In the new TASAI countries, TASAI continues to hold group inception meetings as they are still the most effective way of introducing the tool to a new—and broad—set of stakeholders

The process of data collection is faster as researchers are asked to submit data collected on an ongoing basis. This gives the TASAI team members an opportunity to review the data in real time and query errors right away. Researchers can then follow up with respondents soon after the interview as opposed to months later as was previously the case when data could only be queried after the collection process was complete.

While report writing still remains largely manual, TASAI developed a template to standardize the process. In the past, researchers were responsible for this step, and discrepancies between the data file and the data tables in the document were common. With the new workflow, this type of mistake is virtually eliminated, as data tables can be downloaded from the DVAT into Excel and copied and pasted from there into the report.

What did not work well

1. Lack of streamlined processes caused delays in achieving the desired results

While TASAI had existing processes to ensure that data collected and analyzed was contextualized, the processes were not necessarily the same from country to country and from year to year, the latter in large part because the TASAI methodology expanded and improved over time. While this made for a more rigorous methodology, it sometimes

resulted in inconsistent data across different countries that was not comparable. Although many of these processes were known by team members, they were not fully documented.

An example was the team's internal indicator guide. While there was an indicator guide in place, data availability constraints arose in countries and across years. This meant that the analysis tool development could not start until the team was in full agreement on how the different indicators were calculated and what caveats existed for which countries before implementation could begin. The team realized that data collection, analysis, and validation included not only survey data but also secondary data, country researcher expertise, and stakeholder validation.

Consequently, TASAI extensively reviewed their internal processes and brainstormed with DG on how data collection processes could easily be standardized and digitized across different countries, while still maintaining high levels of flexibility and adaptability to data constraints in-country. The processes of their individual researchers, from survey to analysis, report drafting, and dissemination has been fully digitized, but remains flexible enough to incorporate non-digital elements to help overcome data and interoperability limitations. In essence, without standardization, it would have meant the tool would be less applicable in some countries compared to others.

2. Retrofitting implementation

One of the purposes of the use case assessment is to determine the medium used by different stakeholders when accessing data. During the assessment, users highlighted that they accessed TASAI information through computers and tablets, prompting the design and technical team to customize tool development to the relevant devices. However, when launching the tools TASAI stakeholders indicated a need to access the tools through a mobile phone. This retrofitting is particularly challenging as it requires significantly more resources compared to factoring this into design from the beginning. The DG team showed creativity in accommodating this request late in development through modifications and messages encouraging users to use computers for optimal viewing of the tools.

3. Final feedback from stakeholders

It is always good practice to go back to stakeholders from whom you collected requirements to assess whether the designed tools meet their needs. While we

conducted a use case assessment to learn the priorities and use cases for different stakeholders, resources did not accord us an opportunity to go back to the stakeholders to showcase the dashboard and solicit their feedback. The team, however, showcased the dashboard in different dissemination meetings that took place after the dashboard launch.

Recommendations

1. Before building a digital tool to analyze data, it is imperative that the data is interoperable and ready for digitization. This requires: i) clarity on how indicators are calculated, either digitally or otherwise; ii) agreement on data standardization (to the fullest extent possible); and iii) a clear understanding of where, how, and why adjustments to the data might be made to better reflect reality.
2. Working together to achieve data readiness. This is closely linked to the first recommendation. The data available—and its interoperability—informs the type of tool developed. Having ready data early in the program helps in determining the tool and its respective functionality. If it becomes apparent that data is not ready early in a digitization project, allow room to pivot towards achieving data readiness before continuing development.
3. The design of digital tools should respond to clearly-defined objectives, which emanate from well-understood challenges. Otherwise, a significant amount of effort (and resources) is directed to minor (and sometimes inconsequential) challenges. For the tools to be sustainable, they need to solve the core challenge faced by respective clients and partners.
4. In upcoming tools, the DG team will automatically create tools that are accessible by computers as well as mobile phones. People are increasingly relying on mobile devices, and the seed sector is no exception. Implementing this from the beginning saves resources later in development compared to starting the customization to smartphones months into development.

What Next? Scorecard and Single Score Index

The immediate next step is to assess the efficacy of the suite of tools developed for the TASAI team. While the tools have been tested and some even used in the most recent country studies, the true test of these tools will be in the next cycle of country studies (for the internal tools). With the systems automated to the fullest extent possible, the process has become more efficient and with it come new opportunities to scale up and conduct more country studies in new and existing TASAI countries. With this, and the availability of rich historical data, comes the opportunity to conduct trend analysis and compare data across countries.

Presently, the TASAI data made available through the dashboard and reports is unmodified with the exception of a few indicators where normalization is fairly simple. However, because it is difficult to draw meaningful comparisons between different countries with data that is not normalized, the TASAI team has embarked on developing a scorecard and, as the next step, an index to rank the seed sectors of African countries. This work feeds into the Africa Union Commissions' Biennial Review process, which is ongoing in 2023. After having reviewed their internal systems and processes and digitizing their respective tools, building the index is a natural progression for TASAI. However, before building of the index commences, it is important to assess how well all the digital tools work before adding a different tool altogether.

Developing the index itself will not require the development of new technology, as it will use expert assessments and existing econometric techniques to develop the index scores. Once done, the information will be presented to the public through the Biennial Review Reports. In addition, TASAI will explore if it makes sense to integrate this work as part of the existing dashboard or as a separate (but connected) platform.

Conclusion

Often organizations that are seeking to digitize struggle to balance the need for data interoperability and standardization with the realities of a particular data landscape or the need for more qualitative inputs only humans can provide. The TASAI-VISTA program, however, was a unique case where DG was involved in digital transformation of the entire methodology. This resulted in a more fit-for-purpose digital tool for TASAI,

as it covers end-to-end implementation of both digital and non-digital systems and processes. Importantly, TASAI will no longer just be a reliable source for the most up-to-date seed sector data, but will also be the pinnacle of digital transformation despite data constraints, and encourage the same shift to similar research organizations.

Making international development data easier to gather, use, and understand.

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