WASHC Project
c/o IITA-Nigeria
Oyo Road PMB 5320
Ibadan Nigeria
Tel: (+234) 700 800 4482
Ext. 2741

Milestone Report on the ISFM Information and Knowledge sharing products repository of the WASHC Project

6 November 2017

Kwadwo Asiedu and Jeroen Huising

Supporting Soil Health Consortia in West Africa – Facilitating wider uptake of better adapted ISFM practices with visible positive impacts on rural livelihoods

Report number: WASHC2017_072

AGRA Grant no.: 2013 SHP 005

"Supporting Soil Health Consortia in West Africa – Facilitating wider uptake of better adapted ISFM practices with visible positive impacts on rural livelihoods" is a project funded by the Alliance for a Green Revolution in Africa (AGRA). The project is led and coordinated by the International Institute of Tropical Agriculture (IITA), through the Partnership for Development directorate. Soil Health Consortiums are established in 5 countries, with two consortia for Nigeria, one for the northern region and one for the southern region, and are being hosted and led by our partner institutions:

- CSIR-Soil Research Institute (CSIR-SRI), Ghana, coordinated by: Edward Yeboah.
- Institut d'Economie Rurale (IER), Mali, coordinated by: Diakalia Sogodogo.
- Institute for Agricultural Research (IAR), Nigeria, coordinated by: Ishaku Amapu.
- Institute of Agricultural Research and Training (IAR&T), Nigeria, coordinated by: Olufunmilayo Ande.
- Institut de l'Environnement et de Recherches Agricoles (INERA), Burkina Faso, , coordinated by: Michel Sedogo.
- Institut National de la Recherche Agronomique du Niger (INRAN), Niger, coordinated by: Guéro Yadji.

Authors of this report:

Kwadwo Asiedu
Consultant for IITA
K.asiedu2@cgiar.org

E. Jeroen Huising
WASHC project leader, IITA
j.huising@cgiar.org

Contents

1. Introduction

It is the perception that there is a lack of information on, and knowledge of, Integrated Soil Fertility Management (ISFM), or at least that people are not well informed or knowledgeable about ISFM, that stands in the way of wide-scale adoption of ISFM practices, that stood at the basis of AGRA formulating the call for proposals to provide support to the Country Soil Health Consortia to facilitate the wider uptake of better adapted ISFM practices. An important aspect is the collection, development, dissemination (including providing access) to information sharing products (ISPs) and the facilitation of such, is an important component of the WASHC project, which was about providing support to the Country Soil Health Consortiums in West Africa.

In the first year of the WASHC project, each consortium was tasked to conduct a baseline survey, aiming to assess the situation with respect to the level of understanding of ISFM among the various stakeholder groups, and the then current situation on the communication on ISFM and dissemination of ISFM related information products. Or, where do the people from the various stakeholder groups get their information from and how do they access this information. The baseline survey was to provide insight in the bottlenecks with respect to the dissemination of ISFM materials that the project then subsequently should be able to address. For further information see the baseline survey report [WASHC2015_029].

The picture that emerged from the findings of the baseline survey is that there is a lot of confusion about the concept of ISFM. There is a limited understanding of ISFM and the access to information of ISFM is also limited, which may also be caused by the information simply not being available.

From the baseline survey, there were three notable outcomes regarding information sharing and knowledge products:

1. Brochures, demonstrations, field days and posters generally score high as sources of information on ISFM (even for professionals). However, these are used generally to comment on specific technologies and/or aspects of ISFM. As such they may be suited for extension purposes, but are less suited to explain what ISMF is about.
2. A considerable amount of ISFM 'push' communication materials were on specific topics, e.g. on chemical fertilizers or improved varieties, yet less on the concept and principals of ISFM and less on practical guides on how to apply ISFM. The information that is provided needs to be more balanced in terms of topics addressed and more coherent in terms of the message that is conveyed.
3. There were a lot of materials available in different formats, yet not balanced with regards to the various techniques and components of ISFM, moreover it was apparent that most of the available materials are available only in hard copy, and therefor hardly accessible. Hence, it was identified that there is a need to improve the accessibility by making the information electronically available.

The majority of the information sharing materials produced seems to be in the form of 'Technical Notes' (*fiche techniques*); yet there is a need to develop a suite of products covering different aspects and components of ISFM in different formats and for different target audiences. None of the institutes hosting the country soil health consortiums had a centralized location for storing these information products. It was therefore agreed that the each of the CSHC would develop an ISFM information product repository, that should be online accessible (or at least the information on the information products should be online accessible including information on to access these information products). And. This repository should also include new materials to be developed that would address some of the identified information gaps

The project played a facilitating role, which consisted of providing training in the development of these information sharing products, guiding the CSHCs in how to organize the data and how to set

up a repository, including the development of the meta-data sets, and coordinating and guiding the CSHC on which products to develop. Lastly, all associated parties were aware that a lot of research had been done and that knowledge and information products on ISFM had been developed and where available. Thus, the exercise needed to include the collection of existing information materials on relevant ISFM technologies and to make those accessible. At the same time, evidence for technologies promoted in the past might be lacking and some kind of an evaluation would be required, as well as attention to be devoted to gathering that evidence for crops and technologies that have so far been underexposed.

2. Methodology and Approach

The regional coordinating office (RCO) realized the importance of this aspect of the project and understood the facilitating role to be played by the executing institution. The activity to develop a repository for ISFM information sharing products was added to the Project Implementation Plan and included in the annual workplan, where this was originally not the case. This activity included the development of the meta-data standards by the RCO, needed to document these information-sharing products. It further included the collection of existing information sharing materials and establishing the repository. Also, the development of new materials was foreseen and the organizing of a short-term training for the development of information sharing and extension materials was included in the programme of work. The RCO played an active role in stimulating the CHSC to work on these ISPs and by facilitating the priority setting on the ISP to be developed as well as by stimulating closer collaboration between the country programs and exchange of information. Where possible the RCO was actively involved in the writeshops for developing these ISP.

Planning for development of ISFM information and knowledge sharing products

During the 1st Annual Planning and Review meeting the ISPs were not discussed in detail. At that time, the baseline survey still needed to be concluded, which would give insight in what the information gaps are. Nevertheless, the CSHC were instructed to identify the information sharing products they wanted to work on and to include the development of those products in their annual planning for that year.

During the 2nd Annual Planning and Review meeting, a separate session was devoted to the planning for milestone 1.6b: *Develop information sharing products and develop a repository for information sharing products,* because not much progress was made in the year before and it thus became a matter of priority. Thus, the topics for information sharing products for each of the CSHC to work on were identified, discussed and planned for. Seven main topics were identified that all agreed were a priority for information sharing product (ISP) development. The topics ranged from ISFM for healthy production of maize, soybean, cowpea, sorghum and millet, to the information products on 'urban and peri-urban vegetable production', specific information products on organic fertilisers and recommendations for the combined use of inorganic and organic fertilizers. Each topic was divided in sub-topics and CSHSCs indicated which specific topics they wanted to adopt and that they would contribute to its development. The details are presented in Appendix 1. Some of these topics are covered, but for most they represent topics for which information products are still largely lacking.

It is evident that there would be mutual benefit for the consortiums working together, in avoiding duplication of effort. Products that were being developed in one CSHC could be shared and adapted by other CSHC for their own specific needs (e.g., translated into French or English or indeed on similar topics but just altered for local adaptation or site specification). For example, 'a step-wise approach to composting' would be useful to all CSHCs with some little adaptation. Thus, the tasks

were divided between the various CSHCs and it was agreed that the products would be shared among the CSHCs for adaptation and replication. (See report WASHC2016_005 for further information on the discussions held during the 2nd annual planning and review meeting.)

The position papers and policy briefs on ISFM are considered to be part of the information sharing products. These were also discussed in a separate session during the 2nd Annual Planning and Review Meeting. The discussion included the outlining of consortium position papers and policy briefs, which were to be made publically accessible and utilized for advocacy purpose once developed. The requirements for the consortium website were discussed giving clear guidelines on how to improve the visibility of the CSHC, and in this case also serve as the central point for hosting and accessing ISFM technologies.

The discussion further addressed the collection of existing information sharing products, and the development of repositories to host the products and make them accessible.

Training workshops and writeshops on ISFM product development

The first training workshop on ISFM product development was held from 26 -29 November 2014; a three-day information sharing workshop was organized by the West African Soil Health Consortium co-ordinator, Dr E. Jeroen Huising, in collaboration with the Centre for Agriculture and Bioscience International (CABI). The workshop was co-organized by the Ghana Soil Health Consortium hosted by the Soil Research Institute (CSIR-SRI), Kwadaso, Ghana. The workshop saw the participation of, the then, five consortiums, represented by the CSHC coordinator and the person responsible for the extension and delivery in the project. The workshop focussed mainly on the sensitization of the participants on what is needed to develop effective communication and extension materials and what an effective information sharing product would look like, and to help participants to plan and prepare for writeshops in their own country.

The first day was devoted to the concept and principles of ISFM as there was still confusion amongst practitioners. The opening session was facilitated by E. Jeroen Huising; stressing that in the history of soil fertility management emphasis was placed, in first instance, on mineral fertilizer only, subsequently on the use of organic inputs, and only in more recent times on the combined use of these inputs and a more integrated approach to soil fertility management aiming towards a more efficient use of the chemical fertilizers. Dr Huising elaborated on best-bet agronomic principles, as well as the components of ISFM and their interactions with each other and variability between farms and in soil fertility status which necessitates local adaptation of soil fertility management practices, including nutrient input, and which has consequence for the recommendations and the way recommendations are provided to the farmers. recommendations.

The second and third day was devoted to the requirements for good extension and information sharing materials and the process of developing materials. These two days were facilitated by Dr. James Watiti and Dr. Francis Dabire from CABI. The facilitators elaborated on the steps for developing information sharing products which should also be the guidelines for the write shops to be organized:

- Identification of the technology - what do you want to scale up?
- Identification of the main actors - these are the generators, the intermediaries etc.
- Define the key messages - what do you want the farmers to know?
- What do we propose to prepare - what language, text audio, visual?
- Who are those that are going to do the distribution to the stakeholders?
- How is feedback going to be received, or utilized? i.e. the poster, brochure, or the product.

- Find stakeholder representatives that fit the category of the end user and present them with the product - this would help bring the product to the general public as they will facilitate the dissemination.

In the area of extension support materials Dr James Watiti elaborated on the use of flipcharts, video, radio and special interest materials. He presented a chart that explains the usefulness of the information when it is collected and a breakdown of how information is received when it gets to the farmer; while expressing the importance of clarity of language, accuracy of science, and relevance in local context when it comes to the development of extension materials. His ensuing presentation focussed on how to produce end user friendly printed information by outlining clearly some examples on how to develop printed materials/products. This included various necessary components of information and knowledge sharing products that should be taken into consideration. See Appendix 2 for further information.

Dr Watiti advised participants to delve into the development of short videos. In his opinion, making a video was a great challenge since this medium is not so common nor easy to orchestrate, or even to disseminate; yet times have advanced that it is a medium that is becoming more accessible to stakeholders.

The last presentation by Dr James Watiti focused on policy briefs and their effectiveness, as they are aimed at authoritative bodies that have the power to influence decision making. Thus, developing the messages conveyed in policy briefs must be strong, detailed and well documented.

Overall the workshop was very insightful and served as a good introduction to the components that are essential in producing high quality information and knowledge sharing products. This workshop was also a good example and preparation for the consortiums to organizing their own writeshops for product development and each consortium took it upon themselves to host series of their own writeshops to develop ISPs for their won consortium project.

Development of metadata standards for knowledge and information sharing products for the WASHC Project

The meta data set for the information sharing products provides the descriptors that are used to describe the ISPs and defines how to document the ISPs. It provides the data on the ISPs by which we can search for specific information products and it tells us where we can find those products and how we can access it. It is therefore an important instrument as part of the ISP repository. The meta data can be stored in a database which then serves as a catalogue of the ISPs or as a register for the repository.

It was important that parameters were set that would allow us to catalogue knowledge and information sharing products in a uniform manner across the CSHCs. The catalogue should allow for the inclusion of different types of materials, including extension and training materials, and it should apply to both the newly developed products as well as old products that were being collected by the consortiums. The idea is that the CSHC would adopt these metadata standards for their own repository, which would facilitate the exchange of ISPs between the various repositories, or indeed the search for ISP across the various repositories of the CSHCS. It was also assumed that each CSHC would build their own repository and would provide access to the repositories through their own CSHC website.

At the same time the meta-data standards should allow for creating an overview of the materials held in the repository from different perspectives, and should allow for identifying gaps in the information that is available, for example gaps in information on ISFM for specific crops, on information on specific aspects of ISFM or indeed lack of information products in specific languages. This information should guide the CSHC in further development of ISPs. The section on ‘Analysis and

Findings' provides the results of the analyses of the information sharing products contained in the repository. The metadata set should also be consistent with the meta-data sets developed for repositories held by other institutions. For this purpose, we shared the meta data set we developed in an early stage of the project with CABI for the repository that they were developing for the ASHC project.

The meta-data sets we developed for the WASHC project is presented in Appendix 3. This contains recent revisions of the metadata set, after reviewing and testing the meta data set we had developed earlier. Appendix three provides all the descriptors that are being used in the meta data set, and it provides the definition of that descriptor. In the table the descriptor are called 'parameters' and it is also a synonym for 'attribute'. The definition explains what is meant with that particular parameter and it helps the user with the correct interpretation and herewith helps the user in providing the correct data input. The type of data to be entered is also specified. Where applicable value lists are specified to control or govern the data input. A value list contains a list of values that are the only allowed values to be entered. These are also specified in Appendix 3. This is done to improve the consistency of the database. The database is implemented in EXCEL in which the value lists included as drop-down lists from which the user can select the data for entry. In this way typing errors are prevented and naming conventions are maintained. To maintain flexibility of the system, values can be added to the value list, that are provided in a separate worksheet. It is preferred to update the value list, rather than by just typing the new value directly in the cell. We have, however, not protected the cells from 'unlawful' entry. We may want to consider that in later and final versions of the database.

Appendix three also gives the explanation of the values in the value list to assist the user in selecting the correct value to enter. Note that the values in some of the value lists do not have the same quality, or same level of specificity. For example, the descriptor for 'mineral fertilizer use' allows you to enter 'fertilizer type and use' if the ISP contains general information on different types of fertilizer and its use. However, If the ISP contains information specifically on the application methods or application rate than the value 'Application methods & rate' should be selected. If then the ISP contains the specific information on a technique that is known as 'microdosing', this value should be selected. Similarly, if the ISP is specific about the application of micro-nutrients then the value 'micro-nutrients should be selected. The user should select the value that is most specific and that still applies to the ISP in full. If the ISP contains information on both the application of macro – and micronutrients, the 'micro-nutrient' value should not be used but instead the more generic 'application method & rate' (otherwise the person looking for information on application of macro-nutrient would miss out on this specific ISP). A similar approach was adopted for the 'Organic resource use' descriptor for example. For other descriptors, this does not apply. E.g. for 'language' you simply select the language used for that specific ISP. The Appendix three provides instruction for the entry of the data as well as for users of the database.

Alternatively, this could have been resolved through allowing for multiple data values to be entered in one cell. However, from a database technical point of view this is not desired. Similarly, additional descriptors could be defined, but this would increase the number attributes considerable and herewith also the complexity of the database. That was also not considered desirable.

CSHC efforts towards collecting and development of ISFM information and knowledge sharing products

As the first year of the WASHC project focused on improving the understanding of the project objectives, planning for the implementation of project activities, and the harmonisation, and streamlining of these activities, it was over the course of the second year that the consortiums really

initiated structured plans for developing, collection, and dissemination of information products on ISFM technologies.

First Year:

Burkina Faso SHC: In the first year, the consortium reported the collection of 300 leaflets on various ISFM components and the collection of 10 videos on ISFM. Yet at this stage the Burkina Faso SHC had not developed any ISFM information sharing or knowledge products.

Ghana SHC: The consortium reported hosting five training sessions for different target groups (MOFA, Development NGOs, young scientist, the extension services, agro-dealers and scientist) on the synthesis of ISFM information, and one meeting on the development of advocacy products. The Ghana SHC reported to have developed five information sharing products to a draft stage. In this year, the consortium reported the disseminated 200 information products amongst stakeholders on the following topics in order of descending importance: locally accessible fertilizers, adaptation to local conditions, improved germplasm, intercropping of cereals and legumes, conservation agriculture, agro-forestry, rhizobium inoculation and irrigation.

Mali SHC: The consortium trained nine of their stakeholder organizations on the concepts and practices of ISFM; in two separate training workshops, the dissemination of ISFM technology and extension. On ISFM were addressed. The Mali SHC also reported to have spent considerable amounts on the reproduction and distribution of '*fiches techniques*', however without indicating the subject matter covered or the total number concerned. Mali SHC stated the collection of 70 different print-ready information sharing product that are ready for further distribution. The consortium also developed four success stories, three *fiche techniques* and two posters in the first year.

Niger SHC: In the first year of the project the Niger SHC collected and collated 21 information sharing products on ISFM. Yet at this stage the Niger SHC had only developed three *fiche techniques* and a directory of distributors and agricultural Inputs dealers in Niger.

In conclusion, in the first year of the WASHC project each consortium, with exception of the Nigeria SHC, had reported either hosting writeshops/workshops, collecting a host of information and knowledge sharing products and/or developing products; yet when they were requested to share said knowledge products with the regional office, or to provide details on what the products were about, only a fraction of all stated collected products were submitted to the regional office or were provided further information on.

Second Year:

Burkina Faso SHC: By year two of the WASHC project the Burkina Faso SHC had developed products on introduction to the principals of ISFM, on improved seeds, leaflets on specific topics such as *Jatropha* and seed cake production. Towards the end of the second year, the consortium had launched their consortium website, including an online repository for knowledge and information sharing products. However, the online repository contained a security check that prevented free access to the technologies. It was such that the end user needed to request access to the product or technology prior to being granted access; a prerequisite that is considered contra-productive as it required constant attention via surveillance and review of requests, which it seemed was never done. To date there is no confirmation that this approach actually worked. Despite this, the consortium reported the dissemination of its technologies over a course of six months, using various media channels like national television and newspapers, reaching millions of people. Thus far the consortium has collected 460 materials on ISFM covering various formats including leaflets, research papers, MSc and PhD theses, and videos.

Ghana SHC: Though the Ghana SHC had reported the development of five information sharing products in the first year, it was only in the second year of the project that the consortium had finalised the products to a print-ready stage, which included three factsheets, a position paper and a policy brief titled *'Prioritizing Integrated Soil Fertility Management for Increased Agricultural*

Productivity in Ghana'; and a position paper titled *'Integrated Soil Fertility Management in Ghana: challenges and opportunities'*.

Mali SHC: Mali, over the course of the second year of the project, developed a total of nine knowledge products which have been made accessible through their website. The consortium devoted a considerable amount of time during the year towards the conversion of materials from hard-copy format to soft-copy format with the aim to make it publically accessible for further dissemination. The consortium also developed a position paper this year, titled '*Faciliter une plus large diffusion des meilleurs pratiques adaptées de GIFS qui ont un impact positif visible sur le bien être des communautés rurales du Mali*'.

Nigeria (North) SHC: The consortium planned the development of six policy briefs covering the use of farmers as agro-dealers and extension agents, the adaption of ISFM in Nigeria, and addressing credit constraints using the *warrantage* credit system. The writeshops for the policy briefs were subsequently planned for the third year of the project. However, over the course of the second year of the project the Nigeria (North) SHC had only collected a series of training materials, predominantly PowerPoint presentations on ISFM (a total of 16 were collected).

Nigeria (South) SHC: In the southern node of the Nigeria SHC, as they had just come on board, covered a series of themes and topical issues towards the development of their nodal position paper, titled 'Status of Integrated Soil Fertility Management (ISFM) In Southwestern Nigeria'; subsequently A 2-day writeshop was organized to work on the said position paper. The position paper was published in 2017 in *the International Journal of Sustainable Agricultural Research*.

Niger SHC: Over the second year of the consortium project the Niger SHC had their website developed and became online, yet at this stage it did not host any of its developed or collected knowledge and information sharing products, neither did it have a repository of information materials on available technologies. However, the consortium had developed ten *fiche techniques* and one 'Methodological Guide to Demonstrations'. The consortium had also developed a second version of the Directory of Distributors of Agricultural Inputs of Niger, complete with three maps covering six regions of Niger that includes all agro-input dealers. The directory also provides information on where farmers can purchase particular types of inputs. The consortium also developed five posters and eight technical notes on ISFM practices, all in French. The Niger SHC also developed a policy brief titled *'Quelles orientations pour l'amélioration de la productivité des sols au Niger'*; and position paper titled *'Sols et utilisation des intrants agricoles au Niger'.*

The RCO had received only part of those information-sharing products reportedly generated, while the CSHC are aware that they must provide evidence of the outputs that they report as having been generated. This would subsequently be done during the last year of the project.

Third year:

In the third year of project operation, the CSHC planned several writeshops for the development of information material on technologies, including on nutrient substitution values for organic inputs and ISFM as contribution to the OFRA book chapters and the finalisation of some policy briefs and position papers. Another area of focus is the development of the consortium websites, where the repositories were to be hosted and made accessible; including constant content updates which include the development of communication activities, and a workshop with lessons learned on the delivery and dissemination of ISFM technologies. Below is a brief of the developed and collected technologies by each consortium.

The Ghana SHC: The consortium developed four advocacy related products for ISFM and policy recommendation.

The Mali SHC: The consortium hosted a series of writeshops to develop 12 farmer guides, 5 *fiche techniques*, and 5 posters. Over the final year of the project the consortium collected a total of 9 tele-broadcasts.

Nigeria (North) SHC: The consortium developed six policy Briefs titled as follows:

- Advocacy for the use of farmers as agro-dealers for the provision of quality inputs in Nigeria
- Addressing constraints in agricultural credit acquisition in Nigeria using the *warrantage* credit system.
- Advocacy for the use of Integrated Soil Fertility Management practices in soil fertility maintenance in Nigeria.
- Advocacy for inclusion of marketing advisory service for farmers in agricultural development programmes of government.
- Use of farmers as extension agents a solution to the low extension agents-farmer ration in Nigeria.
- Prevention of postharvest grain losses to boost food security in Nigeria.

They also developed five factsheets.

Nigeria (South) SHC: Nigeria South organized writeshops to develop a total of three factsheets and four farmer guides on ISFM and a policy brief titled: *'Policy Brief on adoption of ISFM'.*
Niger SHC: Over the course of the third year the consortium developed 9 fiche techniques, 2 posters and 2 tele-broadcasts. While these technologies were being developed, the consortium collected over 50 information sharing materials, ranging from fiche techniques, posters, radio-broadcasts, and tele-broadcasts.

Overall the consortiums developed and collected complementary information sharing products and made these available through their respective consortium websites. The repositories show information sharing products in different formats, on concepts and different aspects of ISFM, on a wide range of crops and in different languages. The different formats allow to explore different channels for further dissemination of the information to improve the effectiveness of the dissemination. It was also admirable that the consortiums took on board considerations from the regional office, in hosting effective writeshops for the development of high-quality products.

The regional office was represented at some writeshops, but could not attend all the writeshops. And that was also not needed. The regional office still assisted in reviewing the products developed and facilitated the layouting and printing, if requested. This included the guidance on web-based repository development and the provision of templates for the cataloguing of ISFM information sharing products and developing the metadata sets discussed above. The regional office may not have received all collected information products, but it will develop its own repository and submit those information products there. At the same time, we encourage the CSHCs to maintain and further expand their repository aiming to become a true one-stop shop for ISFM information.

See Figure 1 examples of ISP developed during the WASHC project.

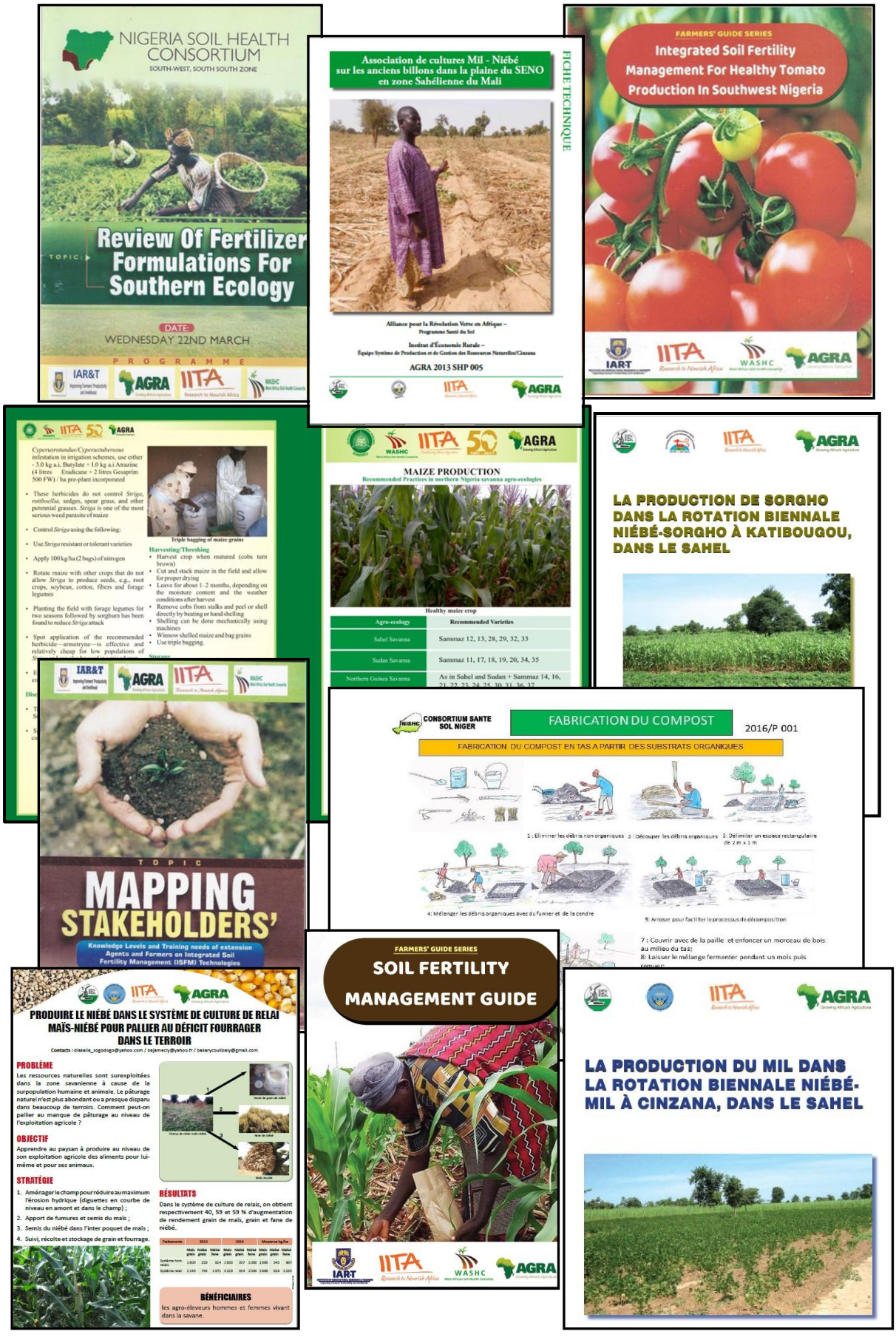


Figure 1 Example of ISP's developed over the course of the WASHC Project

WASHC repository and catalogue development

Following the development of the metadata standards for information and knowledge sharing products the next logical step was the development, and provision, of a framework for collecting and archiving the technologies. Hence, the Regional Coordinating Office developed a Excel template for the categorising of the ISFM information products, based on the metadata standard that was developed, presented in appendix 3. Thus, a template was generated that was sent to all country teams for them to utilize as a means of storing the metadata on the products they had either collected or developed. One of the major/key features of the excel based repository is the inclusion of 'drop-down menu options', which not only simplifies the data entry process, but also standardizes the data and information to be entered. The products that were logged in Excel spreadsheets of the country repositories, were then to be forwarded to the Regional Coordinating Office to be integrated in a wider regional repository, coupled with the soft copies of the developed and collected technologies. However, it was only the Niger SHC that complied with this requirement. The regional office then took advantage of the closing event of the project, to organise something like a fair to give the CSHC the opportunity to present or display the materials they had developed. This worked very well and the countries responded very well to this call and put still some effort in finalizing the products so that they could be presented.

Currently, and for all intended purposes, the repository hosts products that have either been developed or collected by the consortiums of the WASHC project, serving as a consortium-wide repository. We will expand the repository further in with information sharing products that we have collected at the regional office ourselves, to serve as a wider West African ISFM information and knowledge product repository that will be made accessible online through the Soil Health Platform. The products that are currently held in the repository is presented in Appendix 4.

3. Results, Analysis and Findings

In the following sections, we present some statistics on the products being held in the repository. Again, this relates to the products provided by the CSHC only and the results are heavily biased towards the CSHC that provided most of these products, namely Niger CSHC and Mali CSHC.

Distribution of the information products by format

From the repository, the obvious is that the consortiums placed considerable emphasis on the development and collection of technical notes, which is referred to as 'Fiche technique' in the francophone countries in West Africa (a total of 59). Thus, the technical note is the most widely used format for information sharing products. This probably also applies to the English-speaking countries. The technical notes were targeted, in descending order of importance, to farmers, agrodealers, extensionists, development workers, agricultural services providers, women farmers and researchers. Regarding the type of information, out of the elected formats there was a large emphasis on 'instruction' (17 products) and good agronomic practice (16 products) followed by 'best practice' (13 products), 'explanatory' (6) 'recommendations' and 'product information' at 2 products each and 'illustrative' at 1. Out of the 59 *fiche techniques* 18 had a focus on the use of mineral fertilizers, of which 7 products were on fertilizer type and use contain general information on fertilizer and it use, or on the provisioning of fertilizer, or on the use of specific types of fertilizer for specific crops (e.g. the use of NPK15-15-15 and urea for Millet). The latter could also have been categorized as 'application method and rate', of which there are now 5 that deal with the fertilizer of tomato, pepper, onion, sorghum and other. There are 4 technical notes on microdosing specifically. We can also see that from the 18 Technical notes that deal with chemical fertilizer, there are 5 that are on Millet, there is one on sorghum, one on cowpea and the rests on specific vegetable crops. You

can conclude that, if you consider 'technical notes' to be a relevant and important format for delivery of information on the use of chemical fertilizers, there are serious gaps regarding information on the fertilization of specific crops like maize, cassava, sorghum, and others.
There are 19 of the 59 'technical notes' (32%) that deal with use of organic resources in one way or other. Most of them deal with the manure (12 products), while three (3) products deal with the use of crop residue, two (2) products with more generic information and one (1) deals specifically with composting as a technique. Considering that the use of crop residue is an important component of ISFM and one of the technologies that are accessible and applicable to most smallholder farmers, it would deserve more attention from these technical notes.

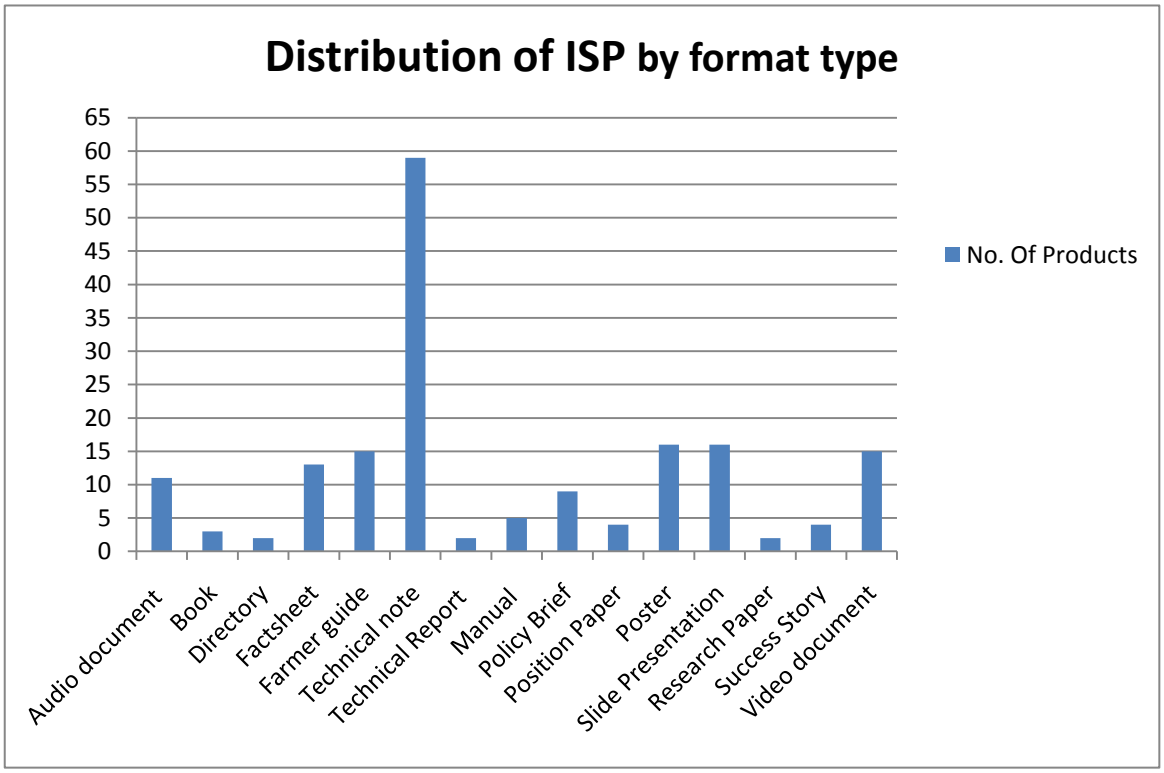


Figure 2 Distribution of information sharing products according to format

With 30% of the technical notes on chemical fertilizer and 32% on the use of organic resources, we see that these two topics, that are the main components of ISFM, are best represented, as one would expect. One the other hand there are only 13 technical notes that deal with variety selection and the use of improved varieties. Again, we see important crops missing, which can be explained that most of these fiche techniques are from Mali and Niger. Nevertheless, there are only two (2) technical notes on millet, and there is one on sorghum, one on cowpea, groundnut, sesame and pepper. Also, we assume these are, also, not the most recent publications, and therefore we conclude that the numbers of technical notes on improved varieties is not adequate and that the information on important crops is lacking.

The second highest format of the products contained in the WASHC repository for information sharing products is that of 'posters' (with a total of 16). A poster is any printed materials, often using larger formats, designed to be put on walls or boards for public display. Posters, in the context agricultural extension, have served as an important cornerstone for communicating information on ISFM practices to especially farmers. It often makes extensive use of pictures, graphs or drawings to convey the information and uses little text. Therefore, It comes as little surprise that it shows up as the second most important format used for ISP in this repository. Again, this result is biased by most of the materials in the repository being sourced from the consortiums from francophone countries, and in these countries, they may be more inclined to use this format as extensions material. All the

posters are either from INRAN, Niger or IER, Mali. Regarding the type of information, most products 'explanatory' in nature (9 products or 56% of all posters), while there were 2 'recommendation' products and 2 illustrative materials (story of a particular farmer, success stories) and one 'instruction' material and one that is about an evaluation of a product or technology. This suite of posters is targeted mainly at farmers (9 products or 56%), with the majority being farmers in general, while there are 2 of the products that are directly developed for 'women farmers'. The rest of the posters targeted researchers, except for 1 that is targeted at development workers (4). Regarding the ISFM component the poster references, the main emphasis is on 'local adaption' and then especially on water conservation/harvesting with 5 products on this topic. Two are on soil conservation and one ISP is on managing saline and sodic soils and one on micronutrients. With local adaptation in the current system of categorisation we refer to agronomic practices that influence the productivity of the soil and crop that are not already covered by the other descriptors of ISFM components (e.g. chemical fertilizer use, organic resource use and other). The emphasis on soil and water conservation and/or harvesting is general across the ISPs that deal with local adaptation. It is surprising that so few ISP are about tillage and land preparation, and on liming. It also seems that there is a preference for specific topics (or components of ISFM) depending on the format of the ISP; e.g. posters seem to be the preferred format of addressing farmers on issues of local adaptation.

Tied in second place of the most used formats is that of 'slide presentations', with the products almost exclusively originating from the Northern Nigerian CSHC. Slide presentation does not seem to be most appropriate or effective format for the extension and dissemination of information on ISFM. The slide presentations seem to reflect those events that were organised for specific occasions in which power point presentations were given targeting the specific audience that was invited for the event. This is exemplified by the relative high number of slide presentations for the youth, which is related to an event for the youth that was organized in the context of the celebration of the international year of the soil (2015). Other slide presentations targeted extension workers (6 products), and these were presented at a training workshop for extension workers. As one would expect most of these slide presentations are explanatory in nature (i.e. 80%).

At the start of the project the consortiums where challenged to venture into video document formatted products as a medium for conveying information on ISFM. The total number of materials in video format, across the consortiums, is 15. These comprise of news broadcasts on consortium activities and advocacy for ISFM in the respective consortium countries, and of sketches and plays on best agricultural practices and promotion of ISFM especially in the light of the fertilizer and financial aspects associated with agriculture. All of these products were developed/collected in the francophone countries, and, therefore, most of the broadcasts are in French, though two of the products are developed in Hausa. Most of these broadcasts were classified as 'explanatory' (that is 5), whereas 4 products are categorized as 'news and reports', three are classified as 'evaluative', two (2) as recommendations and one as illustrative. These materials are targeted mainly at farmers (with 9 products in this category), which includes the 1 targeted at women farmers. Five products target decision makers and 1 targets researchers. This goes to show that television is used to convey messages on the benefits of ISFM to viewers and policies. Regarding the ISFM component, 6 out of the 15 products (40%) contains information on improved better seed.

Tied in third with the 'video document' format is that of 'farmer guides' (totalling at 15 products). The products originated from the Mali CSHC (11) and the Southern Nigeria SHC (4). Mali CSHC developed their entire suite of products in the local language of Bambara and Nigeria South consortium developed theirs in English. The farmers' guides in our definition are like booklets of several pages aimed at guiding famers on specific practices, often well illustrated. It is therefore not a surprise that nine (9) were classified as 'best practice' (9) and the rest (6) as instruction material. One products is targeted at extensionists, while all the remainder targets farmers. With 10 products, a high percentage of these farmers' guides is on the use of mineral fertilizer. Even more are addressing use of organic resources, with six (6) products on composting specifically, four (4) on

manure and three (3) on crop residues. Regarding local adaptation, the majority of the farmers' guides focus on 'planting arrangements' (80%), while there is one product each on tillage, soil conservation and water conservation/ harvesting. Interestingly, most these farmer guides focus on intercropping (53%), while there are three (3) on single crops and 1 on crop rotation. Out of the 15 farmer guides, 4 address cereal – legume systems. Out of this suite of products it is particularly encouraging to see the Malian consortium taking into consideration the local language of their target audience, most of which will be more well versed in the local dialect of Bambara than the colonial language of French.

The next tier of products by format, and number of, is that of Factsheets. This format of product development, like the technical note for the francophone consortiums, factsheets are the predominant opted format for the English-speaking consortiums. A factsheet, or fact file, is a presentation of data and information in a format which emphasizes key points concisely, usually using tables, bullet points and/or headings, printed on a single or two page. There may be some overlap in definition with the '*fiche technique*'. We have 13 factsheets, of which only 1 has been developed by the Niger SHC. The rest of the products were developed by the Northern Nigeria SHC (5 factsheets), the Southern Nigeria SHC (4 factsheets) and the Ghana SHC (3 factsheets). Due to the varying focal topics covered, they are targeted at an array of different audiences and are equally covering various ISFM components. Nevertheless, the products seem to be centred on fertilizers available on national markets, compost preparation and manure handling and storage, and include an introduction to organic fertilizers. There are recommended practices for cowpea, maize and sorghum production; there is a product on erosion control; a product on the identification of common fungi diseases in tomatoes and an introduction to soil fertility management. The one corresponding aspect is that these topics were identified, dating back to the baseline survey and training workshops and discussions on product development, which unanimously expressed that these were priority topics for product development. Nine (9) out of the 13 products (69%), are targeted at farmers; while one is targeted at decision makers, one at extensionists, one at agrodealers and one at researchers.

The sixth ranked suite of products, by format, is 'audio document'. The total number of products in the WASHC repository is 11. Except for 1 product, which was developed in partnership with the Food and Agriculture Organisation (FAO), all the products were developed by the Niger SHC. Out of the 11 products 9 of them are in Hausa, while the remaining 2are in French. This goes to show that in Niger, similarly to the farmer guides developed in Mali, they have considered the common language spoken by the target audience, by choosing the local dialect that is spoken by their farmers. The audio products in Hausa are focused, in descending order of importance, on news and reports (4), explanation of principles and practices (4), illustrative stories (2), and on good agronomic practice (1). The topics covered are microdosing; management of agricultural input shops, location of trusted suppliers and input requirement for the various crops, bulk ordering of agricultural inputs; and the *Warrantage* system in Niger. The first French product is on the use of improved fertilizers and varieties in Niger (an introduction to be broadcast by three radio stations) The second is a transcript of the fifth episode of a regular radio broadcast of a series called 'The Fields'. This episode covers the transfer of technologies as done by a farmers' field school in Niger, consisting of 25 farmers and voluntary learners, providing details on times they meet, cropping cycles, solution to production constraints, and new ISFM and agricultural techniques, while considering the local farmer production capacities. As opposed to having just this one episode available, it would be more effective if the complete set of episodes is made available. However, it is great to see the consortiums reaching out to their respective target audiences using a multitude of communication channels that are best suited to conveying the needed messages across to stakeholders.

Table 1 Summaries of the information sharing products for the remaining categories according to format

Format	No. of products	Summary
Policy Briefs:	**9**	Out of the total Policy briefs developed only the Niger SHC developed theirs in French. The rest of the consortiums developed their policy briefs in English; with 6 being developed by the Northern Nigeria SHC, 1 from the Ghana SHC, 1 from the Nigeria South SHC. The policy briefs are intended for decision makers to advocate ISFM, with exception of 1, which is targeted at farmers. The briefs cover best practices (4), explanation on ISFM and associated subjects (3), good agronomic practice (1). It is good to have these products developed that highlight problems related to the sustainable management of soil fertility and present best bet options towards their solution. The hope is that efforts are taken to ensure that these products reach the decision makers.
Manuals:	**5**	These manuals were all collected by the Niger SHC, and are all in French. Out of the 5 products, 4 are 'explanatory', while 1 provides instructions; 2 are targeted at researches and extensionists each, while 1 is targeted at agrodealers. The products cover 'fertilizer type and use' as well as 'organic resource type and use', and improved seed quality; while one manual covers aspects of manuring specifically.
Position Papers:	**4**	The consortiums that developed position papers include the Ghana SHC, Niger SHC, Mali SHC, and the Southern Nigeria SHC. Out of the four position papers, two are targeted at decision makers, and the other 2 are targeted at researchers. All four of the position papers take their prospective readers through the status of ISFM in their respective countries or regions, the current constraints and aspects that need considerable attention to achieve the strategic goal of improving livelihoods of farmers and lifting communities out of poverty; all through the proper implementation of relevant and adapted ISFM practices.
Success Stories:	**4**	All four of these products were developed by the Mali SHC, and are all in French. They all cover a range of crops that are common in Mali: maize, millet, cowpea, onion, rice and groundnut. The four success stories are targeted at farmers. One product contains information on fertilizer type and use as a mineral fertilizer; 2 contain information on crop rotation and 1 contains insight on intercropping.
Books:	**3**	The three books in this repository were collected by the Niger SHC, and all in French. Two are catalogued as 'instruction' materials, while the third is catalogued as evaluation material. Development workers is the target audience for two books, while researchers are targeted by the third. One of the books is about fertilizer type and use, one books covers a variety of topics and one is about soil conservation and pastoral agricultural systems.
Registry/ Directory:	**2**	Both products were developed by the Niger SHC. As stated earlier in the report they are a series of two directories, a 2015 edition and an updated 2016 edition, containing details and listings of agro-input dealers in Niger, both of which were compiled in French. As such both products are targeted at institutions and organisations that deploy initiatives aiming at improving input distribution and improve access to input by farmers targeting agrodealers.

Research Papers:	**2**	One research paper is on improving onion production and was collected by the Niger SHC. This paper covers different aspects of ISFM, 'fertilizer type and use', 'planting arrangements', intercropping and other. The second research paper was developed in English by the Mali SHC. This research paper targets extensionists, covering aspects of fertilizer type and use, organic resource type and use, mulching and intercropping.

Analysis of the products in the WASHC repository by language

Out of the languages represented by the products in the WASHC information sharing products repository, the dominant language is French (57%); the Niger and Mali SHC's developed and collected more information sharing products than the English-speaking consortiums did (24%). The Malian consortium is also responsible for much of the Hausa products in the repository (at 13%), of which the Niger SHC collected 2. Meanwhile, the Bambara information sharing products where entirely developed by the Mali SHC (5%), and are all farmer guides. The distribution of the ISP by language reflects the commitment of the various consortiums to developing and collection of information products, which may also support the notion that the francophone consortiums place more value on the use of these information sharing products in general. One of the observations is that, if most these products are targeted at farmers, then there should be a considerable amount of the products, and more than currently the case, translated into local dialects to improve access to the information.

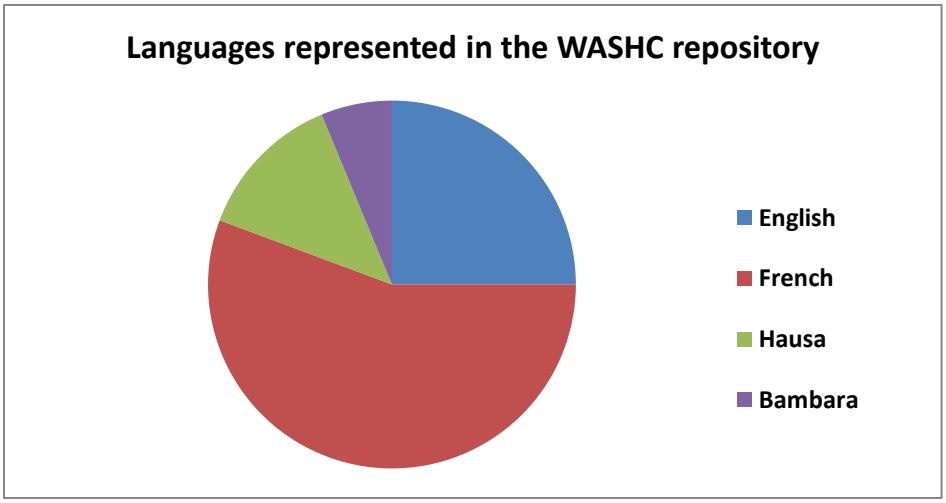


Figure 3 Distribution of information sharing products by language

Analysis of the products in the WASHC repository by crop

In the WASHC repository of information sharing products 43% contain information on the management of a specific crop(s). Products related to millet topped the chart in numbers of crops represented, with a total of 24 products (representing 32%). This includes 1 product specifically on fonio-millet (*Digitaria exilis*) and 1 on pearl-millet. The products containing information on millet are split between the two francophone consortiums of Mali and Niger. Out of these products, 10 are technical notes, 6 are famer guides, 1 factsheet, 3 posters, 2 success stories, 1 research paper and 1 video document. Regarding the language, 17 of the products are in French, 6 in Bambara and 1 in English. Most the products are targeted at farmers (22), including 1 targeted at women farmers, while 2 targeted at researchers and 1 at extensionists. Under the 'mineral fertilizer' component 8 of

the products relate to 'fertilizer type and use', while 2 are specifically on microdosing. Regarding organic resources use, 4 address the use of manure, 4 the use of crop residue, 4 contain information

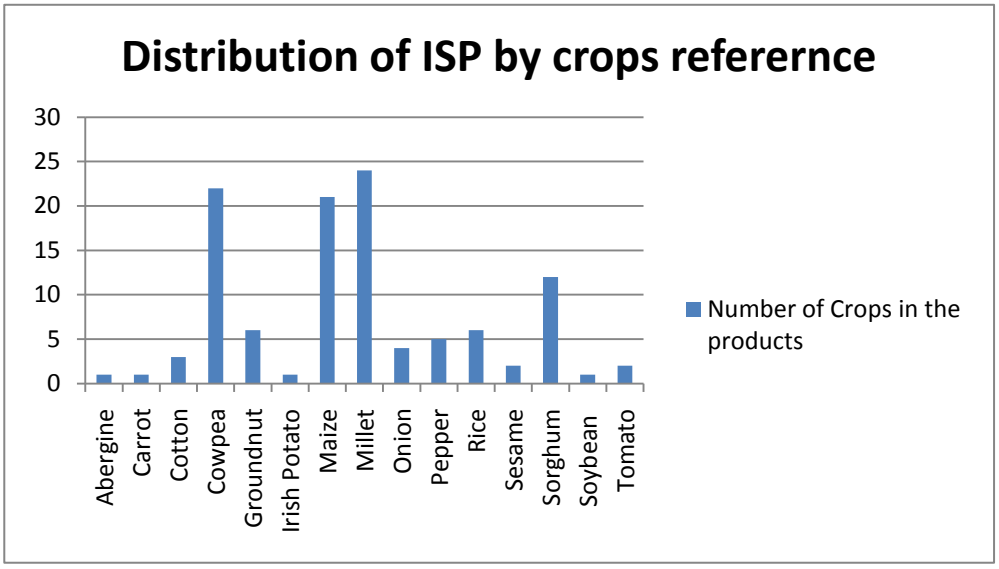


Figure 4 Distribution of ISP by targeted crop

on composting, 2 cover general aspects of 'organic resource type' and 1 is on manure application rate specifically. Five ISP deal with the use of improved seed. Regarding local adaptation there is a dominance of 10 products that focus on the aspect of 'planting'; while 2 are on water conservation / harvesting, 1 on soil conservation and 1 on mulching. Ten (10) of the products deal with intercropping, while eight (8) are on the single cropping of millet and 1 is on crop rotation. All in all the different aspects of millet cultivation seem to be well covered.

The next highest represented crop is cowpea, with a total of 22 products (29% of all products under this category). The products containing information on cowpea are split between the two francophone consortiums of Mali and Niger, except for one product that was developed by the Northern node of the Nigeria SHC. Six (6) products are technical notes; 6 are posters; 3 are success stories; 3 are farmer guides, 1 is a research paper, 1 technical report and 1 factsheet. Out of the 22 products, 18 target farmers, including 1 targeted at women farmers, while the remaining 4 products are targeted at extensionists (1) and researchers (3). Seven (7) products deal with mineral fertilizer use: 4 reference fertilizer type and use, 2 microdosing, and 1 deals with rock phosphate (the only product dealing with rock phosphate in the repository). Eleven (11) out of the 22 products are on organic resource use; 2 included manure, 4 included compost, 3 products cover 'organic resource type and use' and 2 included use of crop residue. Three (3) out of the 22 products 3 contained information on improved (better adapted) seed. Concerning local adaptation, there are seven (7) products on planting, four (4) on water conservation/ harvesting, 1 dealing with use of micronutrients and 1 on mulching. Eight (8) products are on intercropping with cowpea, while four (4) are on cultivating cowpea as single crop. There are still 3 products on crop rotation including cowpea and one (1) on relay cropping.

Maize is the next best covered crop, with 21 products (or 28% of the total products). Once again, most entries in the repository are from French speaking countries, which is surprising considering the relative lesser importance of this crop in t hose countries. Only 4 products originate from Nigeria, from both the northern and southern node. Nineteen (19) products target farmers, while the remaining 2 products target researchers and extensionists. Regarding mineral fertilizer use, the majority (6) of the products are on 'fertilizer type and use' in general, while 1 contains more specific information on 'Application method & rate'. Five (5) products deal with use of manure specifically,

four (4) on compost use and two (2) on the use of crop residue, while there is one product on 'organic resource type and use' in general and one 'application method & rates' in general. Only seven (7) products contain information on improved varieties.

Next in line, but with a considerable reduce number of products, are those dealing with sorghum, with 12 products (or 16% of the total number). One originates from the Northern Nigeria SHC, while all others are from the Niger and Mali CSHC. All products are targeting farmers. Only 3 of the products contain information on mineral fertilizer use, while six (6) products deal with the use of inorganic resources for the cultivation of sorghum (3 on crop residues, 2 on manure and 1 on compost). There is even greater emphasis on improved seed (8 products), of which one is specifically on varieties with improved resistance to pest and diseases. Five (5) products address the planting arrangement. Three 3 products are centered on intercropping, 2 are on sorghum as a 'single crop', while 1 is on crop rotation.

The following suite of products is related to groundnut, of which there are 6, representing 8% of the total collection, again originating from Niger and Mali CSHC. Three products target farmers, one targets women farmers in particular, and 2 target researchers. Three products contain information on mineral fertilizers: 1 on microdosing, 1 on fertilizer type and use, and 1 on application method and rate. There are also three products on organic resource use: 1 on 'organic resource type and use', 1 on crop residues, and 1 on 'application method and rate'. Two products deal with improved seed. AS part of the local adaptation, there are 2 products that focus on micronutrients and 2 products on 'planting'. Two products are on intercropping and one is on crop rotation.

The ensuing crop is that of rice, which is represented by 6 products (that is 8%). The products originate from the Northern Nigeria SHC, Niger (2) and Mali (3 CSHC); three products are targeted at farmers, 2 at researchers and 1 at extensionists; two (2) share content on both mineral fertilizers and use of organic resources. There is one product on micro-nutrients in relation to rice, 1 deals with saline and sodic soils and 1 on soil conservation.

The remaining ISPs deal with vegetable crops and cotton. Pepper, which is a relative important crop for smallholder farmers, has 5 products to its name, all from Niger SHC, all being technical notes. The materials either contain information on 'good agricultural practices' or are instructional targeting either extensionist or farmers. One product contains both on mineral fertilizer use and use of organic resources, while there are 2 products that contain more over-arching information on mineral fertilizer use. Three products are on improved seed, and there is one product on pepper and organic agriculture. One product contains information on planting of pepper, one on soil conservation and one on micro-nutrients.

Onion is represented by four products, 2 are technical notes and 1 a research paper and one is a success story. Two are about good agronomic practices. Three contain an element of mineral fertilizer use and one considers onion as part of a crop rotation.

Sesame and tomato are represented both with 2 products op representation. The product on sesame is about cultural practices and the different varieties of sesame. The products on tomato are about fertilization of tomato and the common fungal diseases and their treatment.

Carrot has only one ISP to its name and, surprisingly, so does soybean. The information provided on growing of carrot relates to mineral fertilizer use, available varieties and to the application of micronutrients. The product on soybean is a video-document targeting farmers and covers the topic of 'Nigerian Consumers and grown crops in Niger and consumer products developed across the Nigerian value-chain'.

There are 3 products on the cotton crop. Two are posters while the third is a farmer's guide in Bambara. Two products deal with the intercropping of cotton with maize. One product provides insight on the use of chemical fertilizer and two products contain information on manure application.

It seems that consortiums from English speaking countries placed more emphasis on products dealing with principles and aspects of ISFM, rather than on the practical application of ISFM for specific crops. The ISPs that address specific crops are targeted predominantly at farmers (i.e. 63% is targeted at farmers). This seems logical maybe, but information on crops would be equally relevant for technicians, extension workers, development workers and researchers, which seems to indicate an information gap. By far most of the products that specifically refer to a crop address the aspect for fertilization, using chemical fertilizer and/or inorganic fertilizers. It raises questions about information being available on plant pest and diseases and ways to prevent and treat these, which may indicate another gap in the information available to farmers. A last observation is the lack of information products on leafy green vegetables, many common fruits, and root and tuber crops, as well as tree crops. As well, crops like tomato, which is a very important crop for many smallholder farmers, is very poorly represented. There are no products on the likes of lettuce, micro-greens and other leafy greens, including nationally consumed greens like 'bitter leaf' in Nigeria. Also, there are no products on common fruits like banana, plantain, watermelon, and fruit trees like cocoa, mango, citrus etc. Cassava and yam are not represented in the repository. This all identifies gaps in the knowledge and information sharing that should be urgently rectified. We have to be careful not to draw unwarranted conclusions as our repository may not adequately represent the information sharing products that are actually available within the countries.

Analysis of the products in the WASHC repository that contain information on inorganic and/or organic resource use

Out of the 176 products in the repository a total of 78 products contain information on the use of mineral fertilizer in one way or the other (44%). Thirty-three (33, of 42%) of these products contain information on 'fertilizer type and use'. This category is meant for information products that do not provide information on a specific type of fertilizers (e.g. straight or compound fertilizers) or that provide specific information on the application rate of either nutrients or fertilizers. The subdivision according to fertilizer type does not seem to be relevant in that none of the products are categorized in either of these categories. At the same, it is surprising that relatively few products classify as providing information on the application rate (6 products or 8%). However, microdosing refers to application rate by definition, and the 9 products should be counted as such. Thus, the results seem to suggest that a lot of emphasis is rightfully placed on the use of chemical fertilizer as a component of ISFM, but that there is little practical information that could serve as direct recommendation to the farmers on fertilizer application rate. It could however be that this information reaches the farmers through other means and channels.

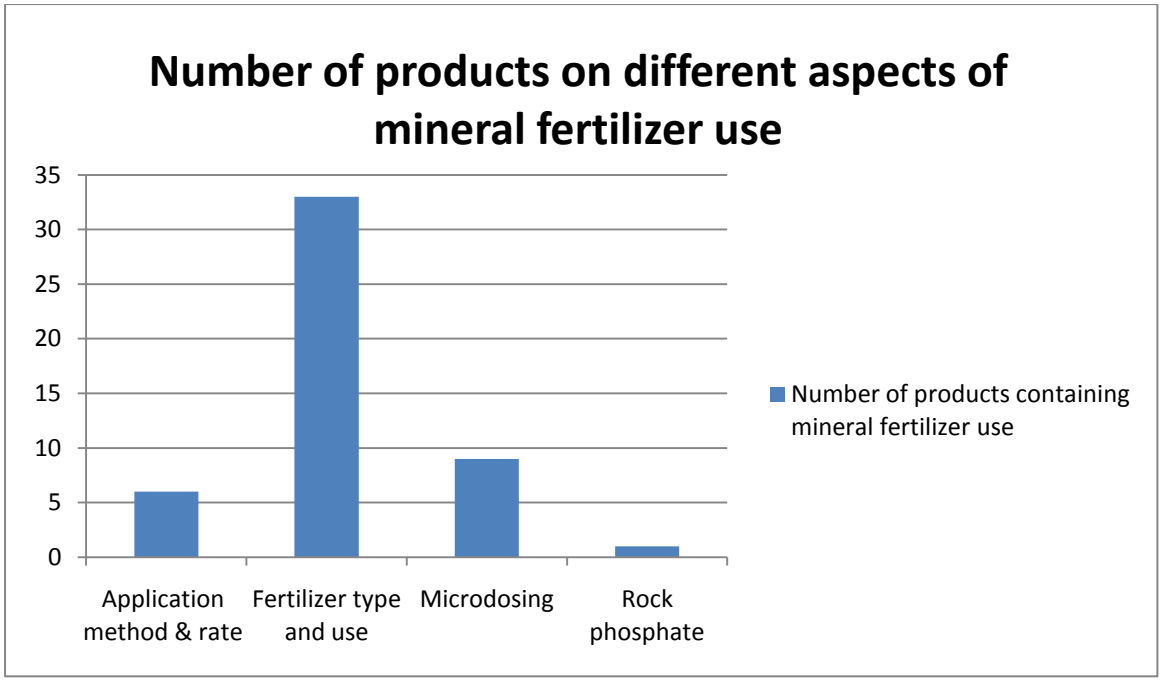


Figure 5 Breakdown of the number of information products on chemical fertilizer use according to type of information

The total of number of products containing information on 'organic resource use' is 52 (or 30% of all the products in the WASHC repository). This is an indication of the importance that is attached to use of organic resources as component of ISFM, but it might even deserve more attention. There are 3 kinds of organic resources covered by products in this repository and these are: compost with 9 products (or 17% of products dealing with organic resource use), crop residue with 8 products (15%), and manure with 23 products (44%). There are two products that deal with instruction on how to make good compost, that should be included. Manure gets most of the attention, which is justified because it is most widely applied. However, use of crop residue should also get its fair share as crop residue is the most widely available resources and extension on the use of crop residue for improving soil fertility vis-à-vis the use as animal feed would be most useful. There are only two products that deal with; manure application rate specifically and one product that deals with application methods and rates more in general. There are 6 products that deal with general aspect of resource type and use or with specific aspects or technologies that are not covered by the other components.

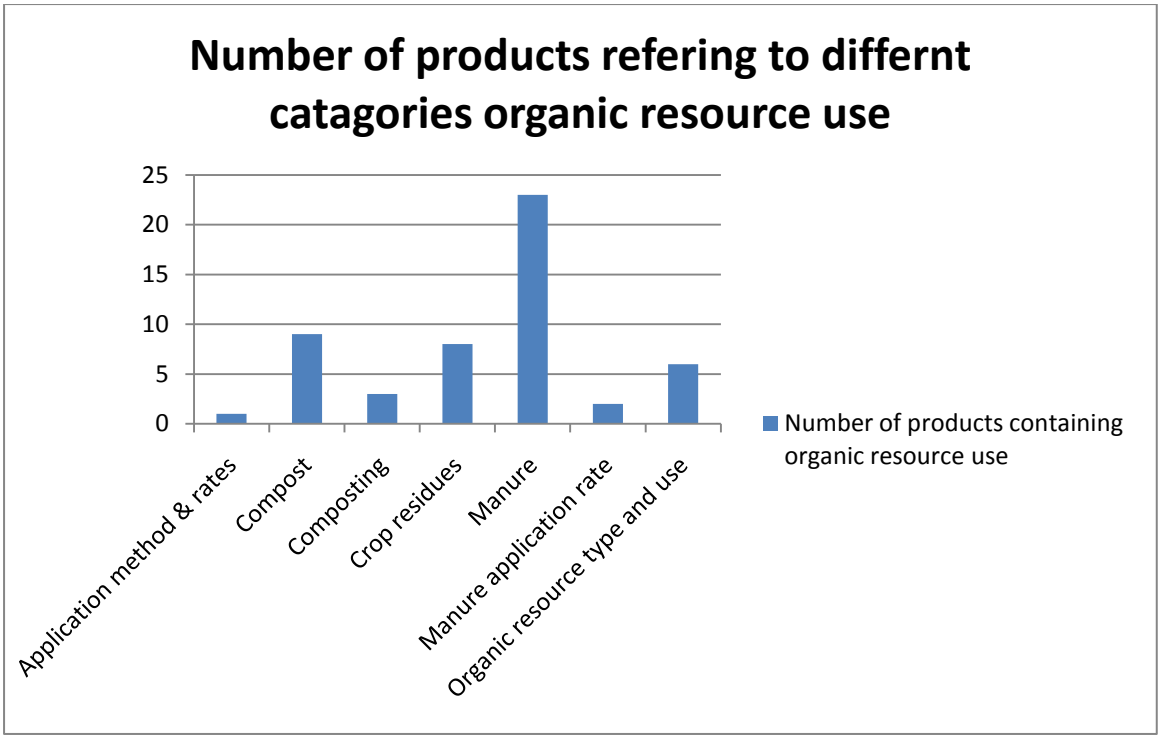


Figure 6 Breakdown in the number of products into the different aspects of organic resource use

As stated above, products that contain information on aspects of mineral fertilizer use is 78, while products on organic fertilizer use are 52. In ISFM the combined use of inorganic and organic fertilizer is advocated because of the synergistic effect. Out of the 130 products, 31 deal with the combined use, which relates to 24% (see Figure 5). Considering the in many cases degraded soil that are being farmed and the generally quite low soil organic carbon percentages the combined use of the inorganic and organic fertilizer would deserve much more attention.

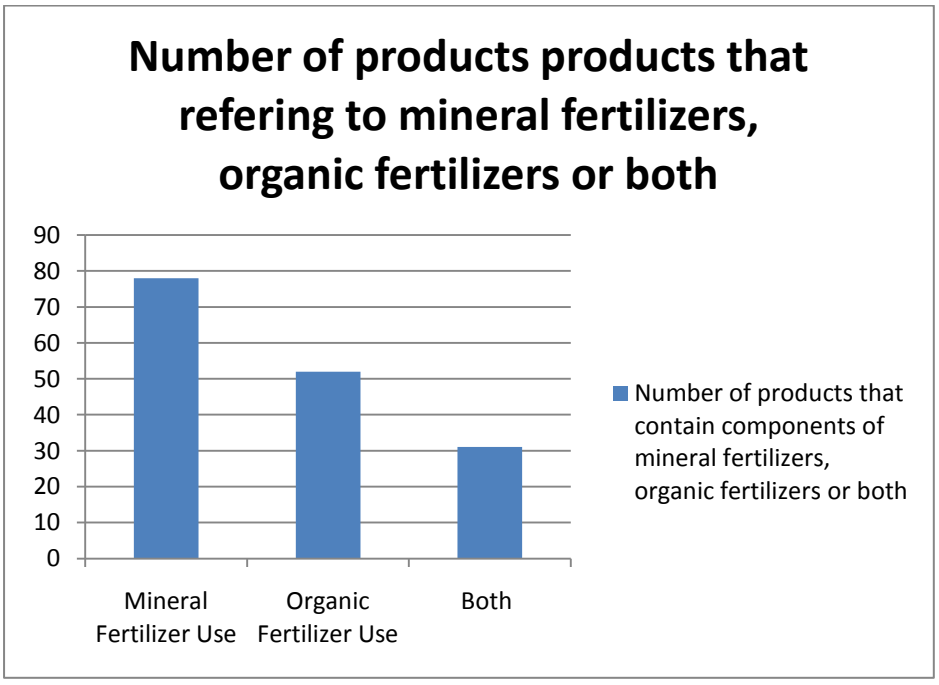


Figure 7 Breakdown in numbers of ISP that provide information on either chemical or organic fertilizer use or on the combined use

4. Conclusion

A considerable amount of ISFM information and knowledge sharing products have been developed and collected by the consortium countries, considering that the inventory of products from Burkina Faso CSHC are not included in this overview. Through this repository, the knowledge and information sharing products are accessible to interested people and parties. This was not always the case in the past. We hope that, with the knowledge and information products on ISFM principles, technologies and practices now available, this will stimulate and help to improve the dissemination of information on ISFM and delivery of ISFM technologies, as well as will help in the advocacy for ISFM and more sustainable land management practices. We call upon the CSHSs and the institutions hosting the CSHC to maintain and even expand the repositories and made the information widely accessible. There is still an inherited need for further sensitization and raising awareness about ISFM. It calls for a two-pronged approach in which information is actively disseminated and provision is made for an information hub where a wide group of stakeholders can get the information they seek.

The conclusion is that, even though the repository contains a large number of information products on a variety of ISFM related topics, it is far from comprehensive in terms of crops that are being covered, or in terms of the various ISFM practices being adequately address, or indeed in terms of the various audiences being targeted with effective communication materials. Also, the quality of the materials should be evaluated and products that are sub-standard removed. This repository was intended as an output of the WASHC project and serves to illustrate how information can be effectively managed (produced, collected and compiled). But it should be considered as just a start and there is scope to expand this initiative at country level and at level of the Country Soil Health Consortium as well as at the sub-regional level. Turning the repository into an effective tool for communication on ISFM requires a carefully strategized approach towards the opening of a dialogue and to foster partnerships with the key players of product development and information providers. The respective institutions need to take their responsibility to make this succeed, now that the project has closed.

The WASHC project was about facilitating the wider uptake of ISFM technologies and practices. Developing a repository of information sharing products and making this accessible online is just one aspect. Generating new information products was intended to fill the major information gaps in the suite of products contained in the repository. However, we never came to set up these repositories in time to evaluate whether all relevant topics were covered and to set priorities for the new products to be generated. So, to some extent, this remains to be done. At the same time the question can be raised whether we have the evidence of the effectiveness of the ISFM technologies and practices that are recommended and whether what is being recommended is indeed relevant and practical for the farmers and other target audiences. Evaluation of these aspects would give feedback on the research gaps and the sharing of data for further analyses beyond the individual trials or projects, which was another aspect of the project. In the end, we want to achieve a change in knowledge, attitude and practice of the farmer and other stakeholders. That requires better insight in the stakeholders' perception and understanding of ISFM, which, to some extent, this initiative has provided. The project certainly has Improved the collaboration between different partner institutions in generating the ISPs and contributed to a more harmonized approach towards dissemination of ISFM technologies. We hope that the partners see the benefit of this collaboration and that this collaboration can be maintained through collaboration in the Country Soil Health Consortia.

Appendix 1: 2nd APRM ISFM topic identification for the development of information sharing materials by the CSHC

Topic No.	Topic elaboration and their respective subsection (s)	Consortium designation
Topic 1:	• Rain fed Cowpea, Sorghum and Millet. ○ Microdosing and the use of local organic recourses (Adaptation issues, management and handling of extension).	• NGSHC (Northern NG) • BFSHC • NISHC • MLSHC

Topic 2:	• Urban and semi-urban agriculture with a focus on vegetables,
	  ○ Use of herbicides and pollution and contamination (Manure).
	  ○ Improve germplasm.
	  ○ Rationalization of inputs and the development of local organic resources.
		• NGSHC
		• BFSHC
		• MLSHC
		• GHSHC
		• NISHC

Topic 3:	• Establishment of monitoring systems of quality inputs.
	  ○ Dissemination of knowledge products on fertilizers.
	  ○ Types of mineral fertilizers available in markets
		• NGSHC
		• BFSHC
		• MLSHC
		• GHSHC
		• NISHC

Topic 4:	• Site specific inorganic and organic fertilizer recommendations for Maize in bench mark soil (local adaptation)	• NGSHC • MLSHC

Topic 5:	• ISFM for healthy maize production
	  ○ Improve maize varieties for different agro ecologies.
	  ○ Soil management practices for optimizing maize production.
		• NGSHC
		• BFSHC
		• MLSHC
		• GHSHC

Topic 6:	• ISFM for healthy Soya bean production.
	  ○ Inoculums handling and application for soybean production.
	  ○ Improved varieties and seed handling.
		• NGSHC
		• GHSHC

Topic 7:	• Organic fertilizers.
	  ○ Simple steps to compost making.
	  ○ Manure handling and storage techniques.
	  ○ Accelerated composting techniques for compost production.
		• NGSHC
		• BFSHC
		• MLSHC
		• GHSHC
		• NISHC

Appendix 2: Considerations for necessary components of information and knowledge sharing development

Component to be considered	Explanation	Further Elaboration
Technology	The type of technology to be used – regarding format.	Examples would be: brochure, leaflet, manual, field-guide etc.
Economic data/ rational economy	The decision that is based on the viability of economic factors, thus making them economically sound.	
Design	The type of design used must be attractive and presentable to the targeted stakeholder group.	
Text	The text should have some pictorial elements to balance the text and also it should be straight to the point through your illustrations.	
Image	The images should be approximate, relevant to the technologies discussed and/or focal points and the images should be fitting with regards to text to image ratio.	
Language	The right type of language should be elected; whichever language chosen should spell out your message well and should take into consideration the target audience.	
Measurement	This component considers the right spectrum of product size for the correct format.	For example, it will not be advisable to develop a leaflet in A0; likewise, it is not best practice to develop a poster to be printed on A6 paper.
Gender	Women should be given much consideration as their male counterparts, as it will only be doing the product or technology a disservice as they are a large component of national agricultural/farming systems. These considerations should be taken into account during the product development stage.	Thus, if there are any specifications that could be included to improve the products accessibility/viability for female farmers it should be included; or indeed it may be worth considering developing products/technologies specifically for female farmers where necessary.
Quality Assurance	There should be some validation from a good source, e.g. a researcher or an appropriate person, scientist and/or practitioner in the field of study.	
Brand	The brand should be in place; this	

	includes the likes of type of product the developers, partners and authors, and of course the lead institution that supported the development of the technology.	
The site- (the materials specificity to a particular site or region)	This focuses on the technologies is appropriation. Simply some products, by design and technology, may be applicable to specific regions or specific sites.	
Video	In considering video formatted technologies there are varying considerations that need to be taken into account. See next column.	• It must have meaningful concept(s). • It must have a good script. • Good time scale should be considered, in that the video doesn't last too long as to lose the audience's attention and should be long enough to convey all needed messages. • Language /translation: which should take into consideration languages that it is recorded in and sub-titles if needed into local dialects • Create visual interest: thus, it should be stimulating for the target audiences – e.g. what would be stimulating for a scientist or practitioner would not carry the same stimulus as what is required of materials for youth or children. • Complement printed materials: This is in line with prospects of developing suites of technologies, such that messages that are contained in the video(s) should also be replicated in tangible material such as leaflets or farmer guides, or indeed posters. • Field test: This is also applicable to most, if not all technologies they must be based on sound science and as such should have undergone trials prior to product development and large-scale dissemination.
Radio	Radio was also a product he discussed at length as it is a medium which is widely used in this era. According to Dr Watiti, it is one of the vastly used means of communicating with stakeholders. However, the	

	information needed to be end user friendly. The message should be based on the listener and also its impact on the lives of the people who fall in the range of that information. As such it follows some of the same considerations as technologies developed in video format.	

Appendix 3: Metadata standards for knowledge and information sharing products

In this appendix, we present the metadata standard for the knowledge and information sharing products (ISPs). The metadata is entered into a database which serves as an inventory of the knowledge products, information and extension materials that are kept in the repository or that are available elsewhere. The database should provide information on where and how the material can be accessed.

Below the meta-data attributes or descriptors are presented that are part of the meta-data sets for the ISPs. Together the descriptors provide comprehensive information on what the ISP is about. The data values to be entered are either free text, or a user specified value, or entry is governed by a value list. The value list contains a list of values that are the only values that are allowed. This is done to improve the consistency with which the data is entered. We have developed an Excel worksheet in which the values are entered by selecting a value from a drop-down list, such that no typing errors are made and again to improve the consistency of the database. In order to maintain flexibility of the system, you can add a value or category to the value list, if you feel that category is missing, rather than by just typing the new value directly in the cell. This is to maintain the integrity of the system. The value lists are presented in a separate worksheet, but in the same workbook, such that you can always access and modify the value lists to suite your own needs. If you want to protect the data base and/or value lists from any unauthorized changes you can protect these worksheets. It is advised that one person is in charge for the institute to maintain the ISP repository and that he or she is the only person who is authorized to make any changes and who will also be responsible for maintaining the quality and integrity of the meta database and who will organize the collection of the ISPs and data entry into the system.

Below the descriptors are presented, together with the value list if applicable. There is an explanation of the descriptor and instructions or guidance is given on the entry of the correct values for each of the descriptors. The value list is designed such that it allows for entry of data at different levels of detail. The more specific the topic, that the ISP addresses is, the more specific the descriptor, or attribute value is that you chose.

The data entry person is not supposed to leave any particular cell or data field empty. If a particular descriptor is not relevant or does not apply, there is the option to enter ‘N/A’, which stands for ‘not applicable’. This is to avoid empty cells and the confusion that may arise on whether the data is missing (and was forgot to enter) or, indeed, whether the descriptor does not apply to the ISP.

Parameter	Definition	Data type and data values (value list)	Explanation and instruction
Title	Name of the knowledge, information or extension material.	Free text	Enter the title of the information sharing product. If there is no clear title you can give it a title that you think is appropriate
Summary	A brief statement or account of the main points of the knowledge, information and/or extension material and/or product.	**F**ree text	Should be a summary of the information contained in the ISP. It should reflect the data captured for the descriptors, but should also contain any relevant keyword that describes the content that is not captured by the various descriptors
Date Published	The date that the knowledge, information and/or extension material and/or product was developed to a print ready standard.	Date	Make sure the language is set in agreement with the system you are using for entering data values.
Type of Product	The format that the knowledge, information and/or extension material and/or product holds as a characteristic of layout, form and style.	**Brochure**	A booklet containing pictures and condensed information about a product or service; one containing descriptive or advertising material, often printed in colour on glossy paper.
		Leaflet	A printed sheet of paper (could be folded appearing to have more pages yet still a single sheet) containing information or advertising about a product or service and usually distributed free.
		Poster	A, usually printed, piece of paper ranging from A3 to A0 in size generally, that is put on a wall or a board for public display. It is posted to present results of research, provide technical details on a technology or practical instruction, or other, generally well-illustrated, making use of graphs, drawings or pictures.
		Booklet	A small, thin book with paper covers, four pages or more, typically giving information on a particular subject, product or provision of information, more detailed than a brochure.

		Research paper	A scientific journal article or substantial piece of academic writing; in which the author(s) conducts independent research into a topic and writes a description of the findings of that research.
		Book	A written, printed or electronic, literary composition work consisting of a number of pages, front and back covers, table of contents and references
		Technical report	A technical report (including scientific reports) is a document that describes the process, progress, or results of technical or scientific research or the state of a technical or scientific research problem. It might also include recommendations and conclusions of the research.
		Technical note	A technical note is a short article giving a brief description of a specific development, technique or procedure, or it may describe a modification of an existing technique, procedure or device applicable to a product, technology and or application (these include francophone 'fiche techniques'.
		Manual	A substantial comprehensive book giving instructions or stepwise information on how to do something, or on how something works; these include products defined as handbooks.
		Audio document	This format covers products that are 'sound' oriented or contained in compressed or uncompressed digital audio format. This also includes transcripts of audio files/recordings/interviews, and radio broadcasts.
		Video document	The recording, reproducing, or broadcasting of moving visual images as documented information, which in most cases will contain audio as well. This includes tele-broadcasts video sketches and or plays.
		News item	Any documented publication that pertains to the news accounts, including newspaper inserts.
		E-publication	Electronic publishing (also referred to as e-publishing or digital publishing or online publishing). We refer here to journal articles, blogs and other electronic media for information that distributed through the internet and accessible online, like electronic newsletters.

		Slide presentation	A slide presentation is a slideshow created using Microsoft PowerPoint or other software. The presentation is a collection of individual slides that contain information on a topic. PowerPoint presentations are used for training and educational purposes. The slides contain information usually in the form of text; often in the form of a bulleted list and sometimes graphics.
		Factsheet	A fact sheet**,** factsheet**,** fact file or (in some industries) one-sheet is a presentation of data and information in a format which emphasizes key points concisely, usually using tables, bullet points and/or headings, on a single printed page.
		Policy brief	A policy brief is a concise summary of a particular issue, the policy options to deal with it, and some recommendations on the best option. It is aimed at government policymakers and others who are interested in formulating or influencing policy.
		Position paper	A position paper is a written account (report or essay) that presents an arguable opinion about an issue. The goal of a position paper is to convince the audience that your opinion is valid and worth listening to; while recommending a necessary course of action on the particular issue
		Directory	A book, catalogue or website listing individuals or organizations alphabetically or thematically with details such as names, addresses, and telephone numbers.
		Success story	A story of a person who rises to fortune, acclaim, or brilliant achievement achieved a goal in agriculture, or even a factual story about someone who has achieved great feats despite unfavourable circumstances.
		Farmer guide	A farmer guide is a product on different ISFM technologies and practices. It is more extensive than a factsheet, as it is more descriptive and prescriptive, in terms of the provision of solutions to on farm issues including information on best bet techniques.
		Infographic	A visual representation of information or data, e.g. as a chart or diagram; illustration that uses graphic elements to present information in a visually striking way.

		Magazine	a periodical publication containing articles and illustrations, often on a particular subject or aimed at a particular readership.
		Comic	A periodical publication containing illustrations via comic strips, intended predominantly for youth.
		Calendar	A chart or series of pages showing the days, weeks, and months of a particular year, or giving particular seasonal information; containing agricultural themes.
		Flip chart	A chart that consists of a series of, generally, large pieces of paper which are attached at the top and which are used to present information on a technology, or a product, to an audience by turning over one piece of paper at a time.
Language	The language or dialect that the knowledge, information and/or extension material and/or product has been developed in..	• **English** • **French** • **Spanish** • **Italian** • **Hausa** • **Bambara** • **Other (Local)**	The user can select 'Other (Local)', if the language is not in the list of permitted values; the user is however encouraged to add the language or dialect the product has been developed in to the value list, such that it becomes a recognised and allowed value for entry.
Target Audience	The particular group that the knowledge, information and/or extension material and/or product is aimed at or designed for; deriving the technologies optimal use.	**Farmers**	Products targeted specifically for a person who farms; person who operates a farm or cultivates land. This is if no distinction is made to a particular group or type of farmer.
		Women farmers	The same definition as 'farmers'; however, this disaggregation is for products specifically, with elements, targeted at women in agriculture.
		Youth and children	Products specifically targeted at the economically/geographically dependent category; for example, in the context of Africa Agriculture we consider people of 30 years to belong to the youth.
		Agrodealers	A agro-dealer will typically operate a small business that provides and sell agricultural inputs to smallholder farmers in the rural areas. The agro-dealer may also play a role in giving extension services to farmers certainly when this is related to the use of agricultural inputs. The agrodealer is linked to major input supply companies. This includes stockist of agricultural inputs.

		Agricultural service providers	These are private organisations that provide various kind of services to farmers; that may be mechanised services (e.g. land preparation), financial services, linking farmers to markets, advisory service and other.
		Development workers'	A development worker is a person who works, generally for an NGO, within a particular farmer community to implement social change and improve the livelihood of farmers within the community and to empower them. It is often through local NGOs that farmers are reached and new technologies are delivered (demonstrated). They may play a role in helping to organize farmers and provide support to farmers groups. This category includes the NGO as a target group.
		Extensionists	These are for products that are targeted at those who advocate the application of scientific research and knowledge to agricultural practices through farmer education – With extensions we generally denote the national agricultural extension services and those that work for these services, generally government employed. (In general those that deliver information to farmers on agricultural practices and inputs)
		Input manufacturers	This target audience relates private companies who specialize in the manufacturing of agricultural inputs (seed companies, fertilizer companies etc.). We include the larger input distributors.
		Researchers	This target audience is for persons who diligently and systematically inquire or investigate a subject in order to discover or revise facts. This target audience includes scientists.
		Decision makers	This is for products who are targeted at persons who makes important decisions at a high level in an organisation or in this context to policy makers/influencers in governments and persons in national agricultural systems.
		Information service providers	This is for organizations that provide agricultural information to farmers, so that farmers can make better decisions in order to take advantage of market opportunities and manage crops, livestock, soil and land management and pest and diseases, through a variety of communication channels.
		Training / education	This is for people who are involved in training and education, generally as part of an organisations who specializes in training and education, in our case related to

		professionals	the field of agriculture.
		Non-specified	This is for products for which the that 'target audience' is not specified or from which it cannot be clearly derived to whom the ISP is targeted.
Crop	The harvestable cultivated plant that is grown on a large scale commercially, for home consumption or other, e.g. cereals, fruits, root and tuber crops, legumes and vegetables, specified by its common name.	• **Aubergine** • **Banana** • **Carrot** • **Cassava** • **Chickpea** • **Climbing bean** • **Common bean** • **Cotton** • **Cowpea** • **Groundnut** • **Irish Potato** • **Maize** • **Millet** • **Onion** • **Pepper** • **Pigeon Pea** • **Rice** • **Sesame** • **Sorghum** • **Soybean** • **Sweet Potato** • **Tomato** • **Yam** • **Other/Specify** • **N/A**	In the value list we included a list of common crops that are grown in the region; however if there are other crops that the product refers to that does not appear in list, or if there is a specific type of a crop, e.g. pearl-millet versus finger millet, that is the subject of the ISP for which it is important to list, then the new category can be added to the value list. You can otherwise just enter the name of the crop and ignore the warning message. There is also the option of 'N/A' If, indeed, the product does not cover any crop in specific.
Type of	The 'type of information' covers the 'for all intended purposes' of	**Instruction**	This covers products on 'how to use' and or 'how to apply' a product, technology or practice. Often a bullet point account or narrative of the steps to be taken in

Information	the knowledge, information and/or extension material and/or product regarding the mode or format by which the message or information on ISFM is conveyed in to the user.		the implementation processor
		Recommendation	This covers products that gives a suggestion or proposal as to the best course of action by an authoritative body. This may be on the on ISFM practices or technologies, on fertilizer application rates and other
		Best practice	This covers information products that describe procedures that are accepted as being correct and most effective. This may relate to anything like how to run a agrodealer shop, how to organize farmers, in disseminating ISFM, etc. All apart from best agronomic practices for which we have a separate category.
		Product information	This covers products that provide information on specific products or different types of products, in the present context relating to agricultural inputs (e.g. inoculants, fertilizer, seed, agrochemicals), equipment or tools or other.
		Explanatory	This covers products that tries to explain for example principles of ISFM or how technologies work, or that provides the reason behind phenomena that have been observed, etc.
		Evaluative	This covers products that provide information on how good or effective a technology or practice is, in terms of yield response, benefit/cost, advantage/disadvantage, or other. Or, contain information on the conditions required for these technologies to be effective. Generally as result of a comparative study in which either results from different treatments or different studies are compared.
		Diagnostic	This covers products that help in identifying problems related to crop production, like identification of crop pest and diseases, nutrient limitations and other, or that that give the result of a diagnostic assessment or general information on frequently occurring problems.
		Illustration (cases, success stories)	This covers products that provide insights in cases (generally related to an individual – farmer- or organisation) that exemplify technologies or approached having been put in practices. In case this has been very successful we refer to these as success stories.

		Good agronomic practice	Information on procedures or practices that are considered to be correct and most effective, with specific reference to agronomic practices. This may relate to any management practice intended to improve crop productivity, e.g. soil fertility, enhance fertilizer use efficiency, enhance water use efficiency, land preparation etc.
		News and reports	This covers products that present newly received or noteworthy information, especially about recent events.
		Registry/ Directory	This covers products that provide listings of individuals or organizations alphabetically or thematically with details such as names, addresses, and telephone numbers and what they do or sell.
		Non-specified	This is for products that their 'type of information' is not specified in the product or it is not clear as to what category it pertains to.
ISFM component: The ISFM component is described by five separate descriptors: The chemical or mineral fertilizer use, the organic resource use, the use of bio-fertilizers, the use of (improved) seed and the local adaptation of ISFM; The descriptors together describe the ISFM practice comprehensively			
Mineral Fertilizer Use	A chemical fertilizer is defined as any inorganic material of wholly or partially synthetic origin that is added to the soil to sustain plant growth. Furthermore, chemical fertilizers may affect plant health; and by definition they are considered "inorganic". This descriptor describes either the type of fertilizer or describes the its use in terms of application methods and rate	**Fertilizer type and use**	This covers any product that contains general information on the type(s) of fertilizer and/or fertilizer use, e.g. it's possible impact on soil condition, without being specific on a particular type of fertilizer or on the application rates. This may relate to information materials providing information on the fertilizer on the market, on the classification of fertilisers, or that provide general information on the workings of the fertilizer, or general information on fertilizer use.
		Straight N, P or K	This is for products that contain information on fertilizer type or products and use, but then specific to straight fertilizer; which are fertilizers that contribute single nutrient to the crop (though it may contain accompanying ions). Straight fertilizer are divided into nitrogen (N), phosphorus (P) and potassium (K) fertilizers, though may also refer to calcium and magnesium fertilizers.
		Compound fertilizer	This is for products that contain information on the type and use of compound fertilizers specifically; They are classified as either two-major nutrients (PK, NP and NK) fertilizer or three-major nutrient fertilizer (NPK) Depending on the method of production, they are considered complex, complex-mixed, or mixed. Compound fertilizers are used for all crops, whereas complex fertilizers are used

			primarily for industrial crops, such as cotton and sugar beets.
		Multi-nutrient	This is for products that contain information on the type and use of multi-nutrient fertilizers; which, in our definition, must contain meso and/or micronutrients besides the N, P or K. There are two types of Multi-nutrient fertilizers. One type, known as a blended fertilizer, is simply a mixture of individual fertilizers. The other type of Multi-nutrient fertilizer is a granular fertilizer where each granule contains the nutrients in the ratio required. The micronutrient may also be added as a coating on the granule.
		Rock phosphate	This is for products that contain information on rock phosphate and its use as a fertilizer for direct application to the soil.
		Application method & rate	This pertains to products that focus more on the application method and application rates of fertilizers in general. If the information product is about specific technologies like microdosing that should be named, or if it provides information on specific nutrients or class or nutrients that should be indicated.
		Microdosing	This is for products that contain information on microdosing, which is a technique that involves the application of small, affordable quantities of fertilizer using a bottle cap/top for example and generally spot applied, either during planting or as a top dressing 3 to 4 weeks after emergence.
		Macronutrients	This is for products that contain information on the application of nutrients that belong to the group of macronutrients (i.e. nitrogen, phosphorous and potassium) that are required by plants or crops in relatively large amounts.
		Mesonutrients	This is for products that contain information specifically on the application of mesonutrients (i.e. magnesium, calcium and sulphur) that are plant nutrients that are required in relatively moderate amounts.
		Micronutrients	This is for products that contain information on application of micronutrients specifically**,** which are nutrients required by crops in small quantities and that occur in nature as spore elements generally. There are about seven micronutrients essential to plant growth and health (boron, chlorine, copper, iron, manganese, molybdenum, and zinc) and the information product might

			address a single element or micronutrients as group.
		N/A	This option should be elected if the product does not contain any information about chemical fertilizer use or application; thus, rendering the product under this category as non-applicable.
Organic resources use	Organic fertilizers are fertilizers derived from animal matter, animal excreta (manure), human excreta, and vegetable matter (e.g. compost and crop residues). Distinction is made between information products that deal with general information on the type and use of organic resources and fertilizers, information on how to produce organic fertilizers and information on the application methods and rates, with different level of detail. The attribute value that provides the most specific information on what the ISP is about should be selected	**Organic resource type and use**	This selection is reserved for products that provide general information on type of organic resource or fertilizer and its use and that do not cover any of the more specific options under this descriptor.
		Crop residues	This is for products that contain information on type and use of crop residue, which are materials left in an agricultural field or orchard after the crop has been harvested. These residues include stalks and stubble (stems), leaves, and seed pods. The residue can be left on the field, ploughed directly into the ground, or burned first.
		Compost	Products that contain general information on type of compost and its use. Compost refers to decayed organic material used as a fertilizer for growing plants.
		Manure	Products that contain information (e.g. overviews) on the different types of manure and its use. Manure refers to excrement, especially of animals, or other refuse used as fertilizer.
		Green manure	Products that contain information specifically on crops or plants that are grown and then intentionally ploughed under to improve the soil as a form of fertilization. The information may be about the green manure in general or about specific crops that are used as green manuring in particular.
		Organic fertilizer production	If the product provides information in general about the production of organic fertilizer (e.g. overviews).
		Manure production	If the product is specifically on manure production, storage and/or handling.
		Composting	If the product is specifically on compost production, storage and or handling.
		Application	This is for products that contain information on the application methods and

		method & rates	rates of organic fertilizers in general or as overview.
		Manure application rate	This is for products that contain information on the application methods and rates for (different types of) manure specifically.
		Compost application rate	This is for products that contain information on the application methods and rates for compost specifically as an organic fertilizer.
		Not specified	This is for products that provide information on the use of organic resources that is not covered under any of the above categories. This may relate for example to the use of plant or tree cuttings or litter that is used as organic resource/fertilizer (e.g. Tephrosia, Calliandra, Tithonia and other
		N/A	This is for products where organic fertilizers or resources are not applicable to the product in contention.
Biofertilizer:	A biofertilizer is a substance which contains efficient strains of microorganisms that colonize plant roots or the rhizosphere and that help the uptake of nutrients by augmenting the availability of the nutrients in a form easily assimilated by plants. It does include microorganisms that promote plant growth through the suppression of plant disease or through the production of phytohormones or other mechanism. Distinction is made according the major categories of biofertilizers. Further distinction of the ISP can be made based on	**Nitrogen fixing bacteria**	This is for products that contain information on products (inoculants) that contain nitrogen fixing bacteria. Further distinction can be made according to the type of bacteria, whether they are symbiotic (e.g. **r**hizobium that form nodules on legume roots) or the free-living nitrogen fixing bacteria (e.g. Azotobacter). Further distinction can be made according to the specific genus or species.
		P mobilizing micro-organisms	This is for products that contain information on products that contain P-mobilizing micro-organisms (fungi) or information on the working of these mycorrhizal fungi. Further distinction can be made, if needed, on type of mycorrhizal fungi and the working or mechanisms by which P is mobilized and made available to the plant. The most well know group is that of the arbuscular mycorrhizal fungi (AMF) which is a type in which the fungus penetrates the cortical cells of the roots of a vascular plant. (Not to be confused with ectomycorrhiza for example))
		P solubilising micro-organisms	This is for ISP that contain information on phosphate solubilizing bacteria (PSB) or fungi, or on products that contains these organisms and it use. These are beneficial micro-organisms capable of solubilizing inorganic phosphorus from insoluble compounds. Further distinction can be made according to whether

	the specific category of biofertilizer that is being addressed		these belong to the bacteria of fungi.
		Plant growth promoters	This is for products that contain information on Plant Growth Promoters, which are substances which improve the overall health growth and development of plants. These substances may be either synthetically produced or obtained from Biological derivatives. Plant Growth Promoters (PGP) are effective in improving the crop, quality and productivity significantly.
		Unspecified	You enter this value if the ISP provides general information on biofertilizers or if it addresses several of the categories in this list, that is if none or several of above categories would apply
		N/A	Enter this value if the ISP does not in any way address biofertilizers as a topic
Improved seed:	Improved seed refers to improved varieties that have been obtained through selection or breeding. It may refer to any planting material of improved varieties and does not need to refer to seed specifically. The term is used in contrast with local varieties, even though these might also be improved. Currently, we only make distinction based on the purpose or specific traits that the new varieties were bred for. However, distinction could be made between the seed production and multiplication, the adoption and use of improved seed or indeed information on the	**Improved quality**	This is for products that refer to varieties that are selected or bred for their improved quality; often referring to improved nutritional quality, but may also refer to improved starch content or other traits that relates to the quality of the product (e.g. for improved shelf live. seeds that are by selection as they are better for local conditions and offer farmers a better chance to harvest lucrative crops.
		Better adapted	This is for products that that refer to seeds that are improved to adapt to local or site conditions. This may refer to soil conditions like low P content or soil acidity for example, but may also related climatic conditions (e.g. climate change) that is 'improved resilience'.
		Improved resistance	This is for products that refer to seeds that are bred or selected for their better resistance to pest and diseases.
		Higher yielding	This is for products that reference the use crop varieties that are bred for their higher yielding characteristics.
		Unspecified / various	This applies for all ISP that deal with improved varieties, but does not fall under any of the above categories. That could either a general treatise on improved varieties that covers several of the categories above, ISP that deal with seed production and seed multiplication explicitly, ISP products that address the adoption and use of improved seed. It might be advisable to add these to the

	characteristics or traits and different types of improved varieties.		value list if too many ISPS on improved seed fall in this category
		N/A	This is for products where improved seed is not applicable to the product in contention.
Local Adaptation:	Local adaptation refers to the adaptation of management practices to local conditions, especially soil and terrain, agro-climatic and economic (farming) conditions and that do not refer to any of the previous categories (i.e. nutrient management, and variety selection should also consider the local conditions, for example, but the ISPs that deal with those aspects are already covered under the previous categories)	**Micronutrients**	This is for products that contain information on the management of micronutrients. This is put under 'local adaptation' because micro-nutrient fertilizers are not readily available and it might therefor not be appropriate to put it under the category of 'chemical fertilizer use'. It is a specific topic that requires specific attention. Micronutrient limitations might not apply everywhere or might not be relevant in all situations and needs to be treated in a manner different from the way we address chemical fertilizer s in general.
		Mulching	This is for products that contain information on mulching, which is the process by which a protective covering, of bark chips, straw, or plastic sheeting, or other, is placed on the surface of the soil around the plants to suppress weed growth, retain soil moisture (or present freezing of roots).
		Tillage	This is for products that contain information on tillage, which is the agricultural preparation of soil by mechanical agitation of various types, such as digging, stirring, and overturning; with all intended purposes of planting. The product may address different aspects of tillage, whether is about depth of tillage, mechanical or manual tillage, different tillage practices and operations or about the various tillage implements. (e.g. Primary tillage such as ploughing tends to produce a rough surface finish, whereas secondary tillage tends to produce a smoother surface finish, such as that required to make a good seedbed for many crops. Harrowing and rototilling often combine primary and secondary tillage into one operation).
		Liming	This is for IS products that contain information on liming, which is the application (to soil) of calcium and magnesium rich materials in various forms, including marl, chalk, limestone or hydrated lime. In acid soils, these materials react as a base and neutralize soil acidity. The ISP may address the various aspects of liming, whether related to different products available on the market, recommendations on application rates, instruction for application, etc.

		Water conservation/ harvesting	This is for IS products that address water management for agricultural crops. This may refer to w**ater** harvesting, which is the collection of runoff for productive purposes, water conservation or to maybe supplemental or small scale irrigation.
		Soil conservation	This is for products that contain information on soil conservation, generally referring to different practices to protect the soil from erosion and other types of deterioration and degradation to maintain soil fertility and productivity.
		Restoration of soil fertility	This is for products that contain information on the restoration of soil fertility. This may refer to information products that describe what soil degradation is and what its causes are, products that inform on the status of soil and land degradation or products that provide information on the methods and technique to rehabilitate/reclaim degraded land and/or to restore soil fertility. This may relate to any practice to improve the physical and chemical conditions of the soil, often based on the use of organic resources, the planting of particular crop or tree species for reclamation of land, use of improved fallow, and other.
		Saline and sodic soils	This is for products that contain information on how to manage saline and / or sodic soils. The presence of salt in the soils reduces the uptake of water by the plant as results of osmotic or ionic stress. At high enough concentrations, it can kill the plant. The presence of Na ions in the sodic soils negatively affects the structure of the soil making them impermeable to water and difficult for plant roots to penetrate. This list ISP that describe saline and/or sodic soils and their effects on plants growth or that describe technique and practices to manage these soils.
		Unspecified / various	This value is entered if none of the above attribute values apply or if the product provides general information on local adaptation or covers several of the above aspects of local adaptation.
		N/A	This is for products for which the label ‘local adaptation’ does not apply.
Cropping Systems	Information and/or extension material and/or product that deals with the crops, the order in	**Single crop**	This is for products that contain information on systems based on cultivating one single crop single or that relate to single crop systems. If the ISP contains specific information on plant spacing and plant densities it should be listed here, because

	which crops are cultivated on a piece of land over fixed period and the management techniques. Distinction is made according to the different cropping systems and may include aspects of crop choice, plant density and crop or plant arrangements amongst others. In as far as the ISP contains information on management practices, like nutrient management, tillage, or other) this should be reflected in the value chosen for that specific descriptor (e.g. 'chemical fertilizer use')		such information is not covered under any of the other descriptors.
		Intercropping	This is for products that contain information on intercropping, which is the cultivation of two or more crops simultaneously on the same field. Intercropping has been propagated from a sustainability aspect, but also has to do with making the most of the limited land one may have for growing several crops, for food security reasons and as risk management strategy. The ISP may describe the various intercropping systems that are practices and/or provide information on the management practices for a specific intercropping system.
		Crop rotation	This is for products that contain information on **c**rop rotation systems. Crop rotation is the practice of growing a series of different types of crops in the same area in subsequent seasons. It is done so that more effective use is made of the nutrients available in the soil and to suppress pest and diseases. It helps to improve the overall productivity of the cropping system.
		Relay cropping	This is for products that contain information on relay cropping, which is the growing of two or more crops on the same field with the planting of the second after the first one has been well established. It makes more efficient use of the available land (increased cropping intensity) and available nutrients (reduce nutrient losses due to leaching).
		Other	This is for products that pertain to cropping systems that cannot be classified as one of the above or that provides information on several of these systems or provides and overview.
		N/A	This is for products where cropping system is not applicable to the product in contention.
Agricultural Systems	The definition of an agricultural system refers to an assemblage of components which are united by some form of interaction and interdependence and which operate within a prescribed boundary to achieve a specified	**Fallow systems**	This is for products that contain information on dryland farming systems that is categorized by leaving the land fallow for some period of time. It is a practice dating from ancient times, to restore the fertilizer of the land. ISPs that deal with improved fallow systems (that plant specific crops or shrubs or trees on the land being left fallow) should be included here.
		Agroforestry	This is for products that contain information on agroforestry or agro-silviculture, which is a land use management system in which trees or shrubs are grown

	agricultural objective (generally the production of crop and livestock). This is not the same as farming system, which relates to a population of individual agricultural systems that have broadly similar resource bases, enterprise patterns, household livelihoods and constraints, and for which similar development strategies and interventions would be appropriate. A separate category could be farming system if that is considered useful.		around or among crops or pastureland. It combines shrubs and trees in agricultural and forestry technologies to create more diverse, productive, profitable, healthy, ecologically sound, and sustainable land-use systems.
		Conservation Agriculture	This is for products that contain information on conservation agriculture, which is a set of soil management practices that minimize the disruption of the soil's structure, composition and natural biodiversity. Despite high variability in the types of crops grown and specific management regimes, all forms of conservation agriculture share three core principles. These include: ○ Maintenance of permanent or semi-permanent soil cover (using either a previous crop residue or specifically growing a cover crop for this purpose); ○ Minimum soil disturbance through tillage (just enough to get the seed into the ground); ○ Regular crop rotations to help combat the various biotic constraints.
		Organic Agriculture	This is for products that contain information on organic agriculture, which is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of external synthetic inputs (chemical fertilizers, pesticides, and other). Any ISP that addressed 'organic agriculture' in its broad definition should be included here.
		Integrated	This is for products that contain information on an integrated agricultural system, which is a farming system where high quality organic food, feed, fibre and renewable energy are produced by using resources such as soil, water, air, and nature as well as regulating factors to farm sustainably and with as little polluting inputs as possible.
		Crop – livestock systems	This is for products that contain information on integrated crop and animal systems, which crop and livestock is produced on farm in an integrated manner so that both complement each other.
		Cereal-legume system	This is for products that contain information which refers to farming systems or cropping systems in which cereals (grains) and legume crops are cultivated in an integrated manner, meaning that these complement each other. Any ISP that

			deals with cereal-legume systems in general or with specific cereal-legume systems should be included here.
		Agropastoral system	This is for products that contain information on agro-pastoral systems including pastoral systems. These are systems that occur in the drier areas where livestock is the main component of the system (in pastoral systems there is no agronomic component) and where livestock is not managed on farm (where they move around with the cattle or livestock).
		Other	This is for products that relate to other agricultural systems that are not included in the current list. E.g. one could think of permaculture for example, but as long as we have no ISPs that covers such system it is not in the list. It can always be added when there is a need. That also applies for other systems.
		N/A	This is for products where 'agricultural systems' are not applicable to the product in contention.
Source	The original source of the knowledge, information or extension material or where it can be sourced from. This is either the name of the institution, the author(s), the publisher or printer, retailer, or website. In all these cases the name is provided	Free text	Name of the instruction, author, website or other.
Link	The hyperlink to the web address where the knowledge, information or extension material is stored and can be accessed.	Free text	
Partners	The institutions that contributed or collaborated, either through funding, supplying the research	Free text	This can be a list of partners, identified by acronym or full name, separated by commas. Enter N/A when the partners are not known or when it is not relevant.

	information or in the development of the information sharing product.		
Authors	The direct person(s) and contributor(s) that are responsible for the development of the knowledge, information and/or extension material and/or product; if not available it falls to the lead institute that conducted and developed the technology.	Free text	Name of the authors of the ISP. Enter N/A if these are not known or when it does not apply
Document reference number	Code by which the document is identified and by which it can be retrieved from the repository.	Free text	At IITA we use our own coding system and convention for naming of the files. In case the document code is known for document held in another repository that code should be provided.

Appendix 4: Catalogue of information sharing products in the WASHC Repository

The table below is an excerpt of the meta database on the Information sharing products contains in the repository, or the catalogue of information sharing products. There are quite a number of descriptors (see Appendix 3) that are not included in this overview, like for example the 'crop'. The full metadata base will be made available online.

Doc. Ref. Number	Title	Date Published	Format	Language	Crop	Type of information	Target Audience	ISFM component	ISFM component	ISFM component	ISFM component	Cropping systems
						Type of Information		Mineral Fertilizer Use	Organic Resource Use	Improved seed	Local Adaptation	Annual crops
WASHC_ISP_001	Répertoire des distributeurs d'intrants agricoles au Niger	01 January 2015	Directory	French	N/A	Registry / Directory	Agrodealers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_002	Répertoire des fournisseurs d'intrants du Niger	01 January 2016	Directory	French	N/A	Registry / Directory	Agrodealers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_003	Demi-lune agricole pour la valorisation des terres marginales	30 May 2015	Technical note	French	N/A	Good Agronomic Practice	Farmers	N/A	Manure	N/A	Water conservation / harvesting	N/A
WASHC_ISP_004	Microdose d'engrais sur le mil (*Pennisetum glaucum*)	06 June 2015	Technical note	French	Millet	Good Agronomic Practice	Farmers	Microdosing	Manure	N/A	N/A	Single crop
WASHC_ISP_005	Microdose d'engrais sur le niébé (*Vigna unguiculata*)	02 March 2015	Technical note	French	Cowpea	Good Agronomic Practice	Farmers	Microdosing	Manure	N/A	N/A	Single crop
WASHC_ISP_006	Aubergine fertilisation	03 July 2016	Technical note	French	Aubergine	Good Agronomic Practice	Farmers	Application method & rate	Manure	N/A	N/A	Single crop
WASHC_ISP_007	Oignon fertilisation	03 July 2016	Technical note	French	Onion	Good Agronomic Practice	Farmers	Application method & rate	Manure	N/A	N/A	Single crop
WASHC_ISP_008	Poivron fertilisation	03 July 2016	Technical note	French	Pepper	Good Agronomic Practice	Farmers	Application method & rate	Manure	N/A	N/A	Single crop

WASHC_ISP_009	Sorgho fertilisation	03 July 2016	Technical note	French	Sorghum	Good Agronomic Practice	Farmers	Application method & rate	Manure	N/A	N/A	Single crop
WASHC_ISP_010	Zaï (TASSA) technique de valorisation des terres dégradées	04 July 2016	Technical note	French	N/A	Good Agronomic Practice	Farmers	N/A	N/A	N/A	Water conservation / harvesting	N/A
WASHC_ISP_011	Tomate fertilisation	03 July 2016	Technical note	French	Tomato	Good Agronomic Practice	Farmers	Application method & rate	Manure	N/A	N/A	Single crop
WASHC_ISP_012	Mil fertilisation avec le NPK 15-15-15 et l'urée	04 July 2016	Technical note	French	Millet	Good Agronomic Practice	Farmers	Fertilizer type and use	Manure	N/A	N/A	Single crop
WASHC_ISP_013	Mil fertilisation avec le DAP et l'urée	04 July 2016	Technical note	French	Millet	Good Agronomic Practice	Farmers	Fertilizer type and use	Manure	N/A	N/A	Single crop
WASHC_ISP_014	Pomme de terre fertilisation	07 July 2016	Technical note	French	Irish potato	Good Agronomic Practice	Farmers	Fertilizer type and use	Manure	N/A	N/A	Single crop
WASHC_ISP_015	Utilisation des engrais et des variérés améliorées	23 October 2016	Audio document	French	N/A	Good Agronomic Practice	Farmers	Fertilizer type and use	Manure	Unspecified / various	Water conservation / harvesting	N/A
WASHC_ISP_016	Fabrication du compost en tas à partir des substrats organiques	17 February 2016	Technical note	French	N/A	Instruction	Farmers	N/A	Composting	N/A	N/A	N/A
WASHC_ISP_017	Microdose d'engrais sur le mil 2016/ P 004	09 August 2016	Technical note	French	Millet	Recommendation	Farmers	Microdosing	Manure application rate	N/A	N/A	Single crop
WASHC_ISP_018	Zaï (TASSA) technique de valorisation des terres dégradées 2016/ P 003	12 January 2015	Technical note	French	N/A	Explanatory	Farmers	N/A	N/A	N/A	Water conservation / harvesting	N/A
WASHC_ISP_019	Module de formation sur la connaissance et l'utilisation des intrants agricoles	07 December 2015	Manual	French	N/A	Explanatory	Extensionists	Fertilizer type and use	Organic resource type and use	Improved quality	N/A	N/A
WASHC_ISP_020	Module de formation sur les dossiers bancables pour les agro-dealers	07 December 2015	Manual	French	N/A	Explanatory	Agrodealers	N/A	N/A	N/A	N/A	N/A

WASHC_ISP_021	Préparation de données sur la gestion intégrée de la fertilité dub sol (GIFS) avec un tableur	19 November 2015	Manual	French	N/A	Explanatory	Researchers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_022	Rudiments sur l'analyse de données GIFS sur R	19 November 2015	Manual	French	N/A	Explanatory	Researchers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_023	Guide méthodologique des démonstration	30 July 2016	Manual	French	N/A	Instruction	Extensionists	N/A	Manure	N/A	N/A	N/A
WASHC_ISP_024	Sols et utilisation des intrants agricoles au Niger	09 February 2016	Position Paper	French	N/A	Evaluation	Decision makers	Fertilizer type and use	Manure	N/A	N/A	N/A
WASHC_ISP_025	Quelles orientations pour l'amélioration de la productivité des sols au Niger	14 February 2016	Policy Brief	French	N/A	Explanatory	Decision makers	Fertilizer type and use	Manure	N/A	Restoration soil fertility	N/A
WASHC_ISP_026	Traitement du bassin versant et du Kori de Youri quels enseignements 5 ans apres la realisation des amenagements	16 September 2012	Technical note	French	N/A	Explanatory	Development workers	N/A	N/A	N/A	Soil conservation	N/A
WASHC_ISP_027	Recuperation de terres - Le site de Guidda pour tirer des enseignements - Note de travail	15 February 2013	Technical note	French	N/A	Illustrative	Development workers	N/A	N/A	N/A	Restoration soil fertility	N/A
WASHC_ISP_028	La gestion viable des espaces nus forestiers ce qu il daut faire et ce qu il ne faut surtout pas faire	05 January 2013	Technical note	French	N/A	Instruction	Development workers	N/A	N/A	N/A	Soil conservation	N/A
WASHC_ISP_029	Etude sur les réalisations des activités d'assistance alimentaire pour la création d'actifs productifs appuyés	12 March 2014	Technical note	French	N/A	Explanatory	Development workers	N/A	N/A	N/A	Restoration soil fertility	N/A

	par le PAM et production d'un recueil des normes techniques et financières Partie 1											
WASHC_ISP_030	Tableau connaissances d'éléments de la GIFS	15 July 2016	Factsheet	French	Millet Cowpea	Explanatory	Researchers	N/A	N/A	N/A	N/A	Intercropping
WASHC_ISP_031	Effect of NPK Micro dose as starter dose on sole sésame, groundnut and cowpea cropping in Sahel	10 April 2016	Poster	English	Groundnut Cowpea Sesame	Evaluation	Researchers	Microdosing	Organic resource type and use	N/A	Micronutrients	Single crop
WASHC_ISP_032	Ounoufa realiser des banquettes entre d anciennes banquettes un risque pour un reboisement reussi	05 May 2014	Technical note	French	N/A	Recommendation	Researchers	N/A	N/A	N/A	Water harvesting	N/A
WASHC_ISP_033	Optimisation des Recommandations des Engrais en Afrique (OFRA)	25 November 2015	Slide presentation	French	Maize Rice Groundnut	Recommendation	Researchers	Application method & rate	Application method & rates	N/A	Micronutrients	Intercropping
WASHC_ISP_034	Application of microdose in an experimental field in N'Dounga (Kollo)	19 November 2015	Video document	Hausa	N/A	Illustrative	Farmers	Microdosing	N/A	N/A	N/A	N/A
WASHC_ISP_035	Sketch on Warrantage in Niger	17 August 2016	Video document	Hausa	N/A	Explanatory	Farmers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_036	News Broadcast on the AGRA Meeting in Niger on Agricultural Production and the role of ISFM	15 February 2015	Video document	French	N/A	News and reports	Decision makers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_037	Introduction to the Niger Soil Health Consortium	03 June 2014	Video document	French	N/A	News and reports	Researchers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_038	Nigerian consumers and grown crops in Niger (Zarma)	26 May 2015	Video document	French	Rice Millet Soybean	Evaluation	Farmers	N/A	N/A	N/A	N/A	N/A

WASHC_ISP_039	Opening the doors of agriculture in Niger	12 September 2015	Video document	French	N/A	Explanatory	Decision makers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_040	Role and place of input shops in the supply of agricultural inputs in Niger	02 December 2010	Video document	French	N/A	Evaluation	Decision makers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_041	Boutique Intrants Zarma	13 December 2016	Audio document	Hausa	N/A	News and reports	Farmers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_042	Microdose Zarma	12 November 2016	Audio document	Hausa	N/A	News and reports	Farmers	Microdosing	N/A	N/A	N/A	N/A
WASHC_ISP_043	Commande Groupee Zarma	05 November 2015	Audio document	Hausa	N/A	News and reports	Farmers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_044	Champ Ecole Zarma	15 December 2016	Audio document	Hausa	N/A	Explanatory	Farmers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_045	Boutique D'intrants	17 December 2016	Audio document	Hausa	N/A	News and reports	Farmers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_046	Champ Ecole	08 November 2016	Audio document	Hausa	N/A	Illustrative	Farmers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_047	Commande Groupee	08 November 2016	Audio document	Hausa	N/A	Illustrative	Farmers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_048	Microdose	10 December 2016	Audio document	Hausa	N/A	Explanatory	Farmers	Microdosing	N/A	N/A	N/A	N/A
WASHC_ISP_049	Warantage	15 November 2016	Audio document	Hausa	N/A	Explanatory	Farmers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_050	Press Covereage of the WASHC 2nd APRM in Niger	19 February 2016	Video document	French	N/A	News and reports	Decision makers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_051	Practical Guide to the Farmer Field School Approach in Niger	13 March 2013	Book	French	N/A	Instruction	Development workers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_052	Gestion Intégrée De L'eau Et Des Nutriments Sur Les Plateaux Latéritiques	19 September 2008	Poster	French	Millet Cowpea	Evaluation	Researchers	N/A	N/A	N/A	Water conservation / harvesting	N/A
WASHC_ISP_053	Exemple de type de sol sur périmètre irrigué de la vallée du fleuve Niger	03 May 2011	Poster	French	N/A	Illustrative	Researchers	N/A	N/A	N/A	Water conservation / harvesting	N/A
WASHC_ISP_054	Digital soil salinity mapping with	25 August 2012	Poster	English	Rice	Instruction	Researchers	N/A	N/A	N/A	Saline an sodic soils	Single crop

	electrical resistivity data in irrigated paddy fields from Niger											
WASHC_ISP_055	Promotion de l'utilisation des engrais par la technologie de la microdose aux poquets	01 October 2010	Poster	French	N/A	Recommendation	Development workers	Microdosing	N/A	N/A	Soil conservation	N/A
WASHC_ISP_056	Improving onion	30 October 1994	Research paper	French	Onion	News and reports	Researchers	Fertilizer type and use	N/A	Unspecified / various	Planting	Single crop
WASHC_ISP_057	Kafa kantin kayan gona	04 July 2012	Technical note	Hausa	N/A	Good agronomic practice	Women farmers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_058	Cinquième épisode : Les champs écoles paysans	29 February 2012	Audio document	French	N/A	Explanatory	Extensionists	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_059	Organes d'une boutique d'intrants	02 July 2015	Technical note	French	N/A	Explanatory	Agrodealers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_060	Don mi ake binciken taki?	09 June 2012	Technical note	Hausa	N/A	Good agronomic practice	Farmers	Fertilizer type and use	N/A	N/A	Soil conservation	N/A
WASHC_ISP_061	Approvisionnement d'engrais	14 June 2012	Technical note	Hausa	N/A	Explanatory	Farmers	Fertilizer type and use	N/A	N/A	N/A	N/A
WASHC_ISP_062	Les boutiques d'intrants agricoles	17 October 2012	Technical note	French	N/A	Best practice	Agrodealers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_063	La commande groupée d'intrants agricoles - un mécanisme d'approvisionnement	22 June 2012	Technical note	French	N/A	Best practice	Agricultural services providers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_064	Le warrantage au Niger	01 June 2012	Technical note	French	N/A	Best practice	Agricultural services providers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_065	Champ école paysan	27 July 2012	Technical report	Hausa	N/A	Explanatory	Extensionists	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_066	Bincike da larwan	16 July 2012	Technical	Hausa	N/A	Best	Agrodealers	N/A	N/A	N/A	N/A	N/A

	katin kayan gona da saye da saidawa		note			practice						
WASHC_ISP_067	Fixation du prix de vente des engrais	05 July 2012	Technical note	French	N/A	Instruction	Agrodealers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_068	Kayyade kuùin saida taki	05 July 2012	Technical note	Hausa	N/A	Instruction	Agrodealers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_069	Guide technique de l'élevage	30 September 2001	Book	French	N/A	Instruction	Researchers	N/A	N/A	N/A	Soil conservation	N/A
WASHC_ISP_070	Fiche Technique - Selection poivron massale	21 August 2000	Technical note	French	Pepper	Instruction	Extensionists	N/A	N/A	Better adapted	Planting	Single crop
WASHC_ISP_071	Fiche Technique - Le repiquage du poivron	21 August 2000	Technical note	French	Pepper	Instruction	Extensionists	N/A	N/A	N/A	N/A	Single crop
WASHC_ISP_072	Fiche Technique - Conduite pépinière poivron	18 December 2011	Technical note	French	Pepper	Instruction	Extensionists	Fertilizer type and use	N/A	Better adapted	Soil conservation	Single crop
WASHC_ISP_073	Rôle du gérant ou de la gérante d'une boutique d'intrants	04 July 2012	Technical note	French	N/A	Best practice	Agrodealers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_074	Contrôle et auto-évaluation d'une boutique d'intrants	17 July 2012	Technical note	French	N/A	Best practice	Agrodealers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_075	Création d'une boutique d'intrants	28 July 2012	Technical note	French	N/A	Instruction	Agrodealers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_076	Champ école paysan	07 March 2016	Technical note	French	N/A	Explanatory	Agrodealers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_077	Caractéristiques, fonctions et activités d'une boutique d'intrants	25 July 2012	Technical note	French	N/A	Best practice	Agrodealers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_078	Fertilisation minérale chez les cultures maraichères	09 January 2014	Technical note	French	Pepper Onion Carrot	Good agronomic practice	Farmers	Fertilizer type and use	N/A	Better adapted	Micronutrients	Single crop
WASHC_ISP_079	Les voyages d'échange d'expériences : Conseils pour en améliorer l'impact	15 December 2012	Technical note	French	N/A	Best practice	Extensionists	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_080	TSIMI DA JINGINA	11 June 2016	Technical note	Hausa	N/A	Best practice	Agricultural services	N/A	N/A	N/A	N/A	N/A

							providers					
WASHC_ISP_081	Masu hannu da shuni na katin kayan gona	01 July 2012	Technical note	Hausa	N/A	Best practice	Women farmers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_082	Tsarin tahiyar da kantin kayan gona	03 July 2012	Technical note	Hausa	N/A	Best practice	Farmers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_083	GA NAKA	18 June 2016	Technical note	Hausa	N/A	Good agronomic practice	Women farmers	Microdosing	N/A	N/A	Soil conservation	N/A
WASHC_ISP_084	Matsayin mai kula da bakin kayan gona	18 June 2016	Technical note	Hausa	N/A	Best practice	Farmers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_085	Nauyin da ya rataya ga kantin kayan gona da saye da saidawa	13 June 2016	Technical note	Hausa	N/A	Best practice	Farmers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_086	Fiche Technique - Variétés de Millet	17 January 2010	Technical note	French	Millet	Product Information	Farmers	N/A	N/A	Better adapted	Planting	N/A
WASHC_ISP_087	Fiche Technique - Variétés de Millet 2	17 January 2010	Technical note	French	Millet	Product Information	Farmers	N/A	N/A	Better adapted	Planting	N/A
WASHC_ISP_088	Techniques Culturales y Variétés de Sésame	20 June 2010	Technical note	French	Sesame	Instruction	Farmers	N/A	N/A	Better adapted	Planting	N/A
WASHC_ISP_089	Techniques Culturales y Variété de Sorgho	10 June 2010	Technical note	French	Sorghum	Instruction	Farmers	N/A	N/A	Better adapted	Planting	N/A
WASHC_ISP_090	Techniques Culturales y Variété de Arachide	22 January 2010	Technical note	French	Groundnut	Instruction	Farmers	N/A	N/A	Better adapted	Planting	N/A
WASHC_ISP_091	Techniques Culturales y Variété de Niébé	28 January 2010	Technical note	French	Cowpea	Instruction	Farmers	N/A	N/A	Better adapted	Planting	N/A
WASHC_ISP_092	Gestion des connaissances et genre	27 April 2015	Poster	French	N/A	Explanatory	Farmers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_093	Gestion des intrants intégrant le genre	27 April 2015	Poster	French	N/A	Explanatory	Farmers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_094	Le cycle de la capitalisation d'expériences	28 April 2015	Poster	French	N/A	Explanatory	Farmers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_095	Problématique du genre dans la gestion des intrants agricoles	02 May 2015	Poster	French	N/A	Explanatory	Farmers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_096	Recueil des fiches techniques en gestion des ressources	31 August 2008	Book	French	N/A	Evaluation	Development workers	Fertilizer type and use	N/A	Unspecified / various	Soil conservation	N/A

	naturelles et de productions agro-sylvo-pastorales											
WASHC_ISP_097	Manure handling and storage	20 May 2016	Factsheet	English	N/A	Instruction	Farmers	N/A	Manure production	N/A	N/A	N/A
WASHC_ISP_098	Steps to composting	20 May 2016	Factsheet	English	N/A	Instruction	Farmers	N/A	Composting	N/A	N/A	N/A
WASHC_ISP_099	Mineral fertilizers on Ghanaian Market	20 May 2016	Factsheet	English	N/A	Product Information	Agrodealers	Fertilizer type and use	N/A	N/A	N/A	N/A
WASHC_ISP_100	Prioritizing Integrated Soil Fertility Management for Increased Agricultural Productivity in Ghana	20 May 2016	Policy brief	English	N/A	Explanatory	Decision makers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_101	Integrated Soil Fertility Management in Ghana	20 May 2016	Position paper	English	N/A	Explanatory	Researchers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_102	Un système alternatif garantissant la sécurité alimentaire et le revenu agricole du foyer dans la zone cotonnière sud du Mali	07 June 2015	Poster	French	Cotton Maize Cowpea	Explanatory	Farmers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_103	Transformation de terres dégradées héritées des parents en ferme de production agricole modèle	09 June 2015	Poster	French	Maize Rice Cowpea	Illustrative	Farmers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_104	Ferme agropastorale de Amadou Dia de Diabougou,commune rurale de Sio (Mopti)	12 August 2016	Success story	French	Maize Onion Cowpea	Illustrative	Farmers	N/A	N/A	N/A	N/A	Crop rotation
WASHC_ISP_105	Exploitation agricole familiale de Saïda Diawara du village de Madina Kouroulamini à Bougouni	14 July 2016	Success story	French	Maize Rice Groundnut	Illustrative	Farmers	N/A	N/A	N/A	N/A	Crop rotation

WASHC_ISP_106	Exploitation agricole familiale de Jean DOUGNON du village de Anakana dans le cercle de Koro (région de Mopti)	18 February 2016	Success story	French	Millet Cowpea	Illustrative	Farmers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_107	La ferme de Brama B. Guindo de Noumoudama dans le cercle de Bankass (région de Mopti)	28 February 2016	Success story	French	Millet Cowpea	Illustrative	Farmers	Fertilizer type and use	N/A	N/A	N/A	Intercropping
WASHC_ISP_108	Association de cultures Mil - Niébé sur les anciens billons dans la plaine du SENO en zone Sahélienne du Mali	19 September 2016	Technical note	French	Millet Cowpea	Evaluation	Farmers	N/A	N/A	N/A	N/A	Intercropping
WASHC_ISP_109	La culture de niébé par les femmes dans le Zaï	15 September 2016	Technical report	French	Cowpea	Evaluation	Farmers	N/A	Compost	N/A	Water conservation / harvesting	Single crop
WASHC_ISP_110	La culture de relais Maïs - Niébé dans la zone de production agricole Mali-sud	21 September 2016	Technical note	French	Maize Cowpea	Evaluation	Farmers	N/A	Organic resource type and use	N/A	N/A	Relay cropping
WASHC_ISP_111	Impact of the Management of Sandy Soil Fertilization Practices on the yield of the Intercropping Pearl Millet-Cowpea and on Farmer Income in the Est Sahelian Zone of Mali	17 July 2016	Research paper	English	Pearl-Millet Cowpea	Evaluation	Extensionists	Fertilizer type and use	Organic resource type and use	N/A	Mulching	Intercropping
WASHC_ISP_112	Strategie de production du mil sur les terres seches et lateritiques au sahel	17 February 2017	Technical note	French	Millet	Instruction	Farmers	N/A	Organic resource type and use	Better adapted	N/A	Single crop
WASHC_ISP_113	Sécuriser la culture du mil dans les zones de production de maïs	17 February 2017	Technical note	French	Millet Maize	Instruction	Farmers	N/A	Crop residues	Unspecified / various	Planting	Intercropping

WASHC_ISP_114	Securiser la production de sorgho dans les zones de culture de mais	17 February 2017	Technical note	French	Maize Sorghum	Instruction	Farmers	N/A	Crop residues	N/A	Planting	Intercropping
WASHC_ISP_115	La production du mil dans la rotation biennale niebe mil a cinzana dans le sahel	17 February 2017	Technical note	French	Millet Cowpea	Instruction	Farmers	N/A	Crop residues	Better adapted	Planting	Crop rotation
WASHC_ISP_116	La production de sorgho dans la rotation biennale niebe-sorgho a katibougou dans le sahel	17 February 2017	Technical note	French	Sorghum Cowpea	Instruction	Farmers	N/A	Crop residues	Better adapted	Planting	Crop rotation
WASHC_ISP_117	Une Stratégie de culture de mil sur les terres sèches en zone sahélienne	07 January 2017	Poster	French	Millet	Recommendation	Farmers	N/A	N/A	N/A	Soil conservation	Single crop
WASHC_ISP_118	Les femmes profitent des terres dénudées pour produire abondamment du niebe destine a la vente	27 January 2017	Poster	French	Cowpea	Explanatory	Women farmers	N/A	Compost	N/A	N/A	Single crop
WASHC_ISP_119	Les paysans profitent de la succession des cultures pour garantir leur autosuffisance alimentaire en mais	28 January 2017	Poster	French	Cotton Maize	Explanatory	Farmers	N/A	Manure	Unspecified / various	Water conservation / harvesting	Intercropping
WASHC_ISP_120	Produire le niebe dans le systeme de culture de relai mais-niebe pour pallier au deficit fourrager dans le terroir	28 January 2017	Poster	French	Maize Cowpea	Explanatory	Farmers	N/A	N/A	N/A	Water conservation / harvesting	Intercropping
WASHC_ISP_121	Les Femmes arrivent a produire du mil sur des terres abandonnees par les hommes	29 January 2017	Poster	French	Millet	Explanatory	Women farmers	N/A	Compost	N/A	Water conservation / harvesting	Intercropping

WASHC_ISP_122	News Broadcast on Sorghum and Maize seed production in Mali	03 January 2017	Video document	French	Sorghum Maize	Recommendation	Farmers	N/A	N/A	Better adapted	N/A	N/A
WASHC_ISP_123	News Broadcast on Groundnut seed production in Mali	26 November 2016	Video document	French	Groundnut	Evaluation	Women farmers	N/A	N/A	Better adapted	N/A	Single crop
WASHC_ISP_124	News Broadcast on Sorghum seed production in Mali	29 June 2016	Video document	French	Maize Sorghum	Explanatory	Farmers	N/A	N/A	Better adapted	N/A	N/A
WASHC_ISP_125	News Broadcast on Sorghum production in Mali (ORTM)	15 April 2016	Video document	French	Sorghum	Explanatory	Farmers	N/A	N/A	Better adapted	N/A	N/A
WASHC_ISP_126	News Broadcast on Sorghum and Maize hybrid seed production	23 August 2016	Video document	French	Sorghum Maize	Explanatory	Farmers	N/A	N/A	Better adapted	N/A	N/A
WASHC_ISP_127	News Broadcast on Hybrid seeds quadrupling Sorghum yields	17 December 2016	Video document	French	Sorghum	Recommendation	Farmers	N/A	N/A	Better adapted	N/A	N/A
WASHC_ISP_128	Conclusion of the Mali Consortium Project and the Future of ISFM and the Consortium in Mali	25 February 2017	Video document	French	N/A	News and reports	Decision makers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_129	Farmer guide on Maize and Millet Intercropping (Kaba ni Sanyô jèkasènè)	25 March 2017	Farmer guide	Bambara	Maize Millet	Instruction	Farmers	N/A	Compost	N/A	Planting	Intercropping
WASHC_ISP_130	Farmer guide on Sorghum and Cowpea Intercropping (Keninge ni sô jèkasènè)	25 March 2017	Farmer guide	Bambara	Sorghum Cowpea	Instruction	Farmers	N/A	Compost	N/A	Planting	Intercropping
WASHC_ISP_131	Best practice for Millet production (Sô gèrègèrè sènèni)	25 March 2017	Farmer guide	Bambara	Millet	Best practice	Farmers	N/A	Compost	N/A	Planting	Single crop
WASHC_ISP_132	Best practice for Millet production	25 March 2017	Farmer guide	Bambara	Millet	Best practice	Farmers	Fertilizer type and	Compost	N/A	Planting	Single crop

	(Keninge gèrègèrè sènèni)							use				
WASHC_ISP_133	Best practice for Maize production (Kaba gèrègèrè sènèni)	25 March 2017	Farmer guide	Bambara	Maize	Best practice	Farmers	Fertilizer type and use	Compost	N/A	Planting	Single crop
WASHC_ISP_134	Farmer guide on Maize and Cowpea Intercropping (Keninge ni sô jèkasènè)	25 March 2017	Farmer guide	Bambara	Maize Cowpea	Best practice	Farmers	Fertilizer type and use	Compost	N/A	Planting	Intercropping
WASHC_ISP_135	Farmer guide on Millet and Cowpea Intercropping (Sanyô ni sô jèkasènè)	25 March 2017	Farmer guide	Bambara	Millet Cowpea	Best practice	Farmers	Fertilizer type and use	Manure	N/A	Planting	Intercropping
WASHC_ISP_136	Farmer guide on Groundnut and Sorghum Intercropping (Tiga ni keninge sènè fôfôli nyôgôn kô)	25 March 2017	Farmer guide	Bambara	Groundnut Sorghum	Best practice	Farmers	Fertilizer type and use	Crop residues	N/A	Planting	Intercropping
WASHC_ISP_137	Farmer guide on Cotton and Maize Intercropping (Kôôri ni kaba sènè fôfôli nyôgôn kô)	26 March 2017	Farmer guide	Bambara	Cotton Maize	Best practice	Farmers	Fertilizer type and use	Manure	N/A	Planting	Intercropping
WASHC_ISP_138	Best practice for Fonio-Millet production (Fini gèrègèrè sènèni)	27 March 2017	Farmer guide	Bambara	Fonio Millet	Best practice	Farmers	Fertilizer type and use	Crop residues	N/A	Planting	Intercropping
WASHC_ISP_139	Best practice for Millet production (Sanyô gèrègèrè sènèni)	27 March 2017	Farmer guide	Bambara	Millet	Best practice	Farmers	Fertilizer type and use	Crop residues	N/A	Planting	Intercropping
WASHC_ISP_140	Faciliter une plus large diffusion des meilleurs pratiques adaptées de GIFS qui ont un impact positif visible sur le bien être des	27 March 2017	Position paper	French	N/A	News and reports	Decision makers	Fertilizer type and use	N/A	N/A	N/A	N/A

	communautés rurales du Mali											
WASHC_ISP_141	Recommended practices for cowpea production in the northern Nigeria savanna agro-ecologies	05 April 2017	Factsheet	English	Cowpea	Recommendation	Farmers	Rock phosphate	N/A	Better adapted	Planting	Single crop
WASHC_ISP_142	Recommended practices for maize production in the northern Nigeria savanna agro-ecologies	05 April 2017	Factsheet	English	Maize	Recommendation	Farmers	Fertilizer type and use	Manure	Better adapted	Planting	Single crop
WASHC_ISP_143	Mineral fertilizers in Northern Nigeria	05 April 2017	Factsheet	English	N/A	Product Information	Farmers	Fertilizer type and use	N/A	N/A	N/A	N/A
WASHC_ISP_144	Advocacy for the use of farmers as agro-dealers for the provision of quality inputs in Nigeria	17 July 2017	Policy brief	English	N/A	Best practice	Decision makers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_145	Addressing constraints in agricultural credit acquisition in Nigeria using the warrantage credit system	17 July 2017	Policy brief	English	N/A	Best practice	Decision makers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_146	Advocacy for the use of Integrated Soil Fertility Management practices in soil fertility mainteinance in Nigeria	17 July 2017	Policy brief	English	N/A	Good agronomic practice	Decision makers	N/A	Organic resource type and use	N/A	N/A	N/A
WASHC_ISP_147	Advocacy for inclusion of marketing advisory service for farmers in agricultural development programmes of	17 July 2017	Policy brief	English	N/A	Best practice	Decision makers	N/A	N/A	N/A	N/A	N/A

	government											
WASHC_ISP_148	Use of farmers as extension agents a solution to the low extension agents-farmer ration in Nigeria	17 July 2017	Policy brief	English	N/A	Best practice	Decision makers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_149	Prevention of postharvest grain losses to boost food security in Nigeria	17 July 2017	Policy brief	English	Maize	Instruction	Farmers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_150	Organic fertilizers what they are, handling and benifits	17 July 2017	Factsheet	English	N/A	Product Information	Decision makers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_151	Recommended practices for sorghum production in northern Nigeria	17 July 2017	Factsheet	English	Sorghum	Recommendation	Farmers	Fertilizer type and use	Manure	Better resistance	N/A	Single crop
WASHC_ISP_152	Extension Teaching Methods for ISFM	12 March 2014	Slide presentation	English	N/A	Explanatory	Extensionists	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_153	Group formation and management	19 May 2014	Slide presentation	English	N/A	Explanatory	Development workers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_154	Development of Extension Training Materials	07 November 2013	Slide presentation	English	N/A	Instruction	Training / education professionals	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_155	Principles of Agricultural Extension Education	19 September 2014	Slide presentation	English	N/A	Explanatory	Training / education professionals	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_156	How to conduct effective field visits and field days	03 February 2014	Slide presentation	English	N/A	Instruction	Development workers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_157	The roles of village extension agents	07 July 2013	Slide presentation	English	N/A	Explanatory	Development workers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_158	Sources and Sourcing for Agricultural Credit	27 August 2014	Slide presentation	English	N/A	Instruction	Development workers	N/A	N/A	N/A	N/A	N/A

WASHC_ISP_159	Reseach-Extension-Farmes-Inputs Linkage System	03 October 2012	Slide presentation	English	N/A	Explanatory	Development workers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_160	The Warrantage Credit System	17 November 2014	Slide presentation	English	N/A	Explanatory	Development workers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_161	Principles of Integrated Soil Fertility Management	16 March 2013	Slide presentation	English	N/A	Explanatory	Extensionists	Fertilizer type and use	N/A	N/A	N/A	N/A
WASHC_ISP_162	Fundamental concepts of soils - their formation, composition and properties	28 February 2013	Slide presentation	English	N/A	Explanatory	Youth	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_163	Nutrient needs of crops and deficiency symptoms	28 February 2013	Slide presentation	English	N/A	Explanatory	Youth	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_164	Basic soil management principles and practices	28 February 2013	Slide presentation	English	N/A	Explanatory	Youth	N/A	Crop residues	N/A	Soil conservation	N/A
WASHC_ISP_165	Basic agronomic principles for sustainable soil and crop productivity	28 February 2013	Slide presentation	English	N/A	Explanatory	Youth	Fertilizer type and use	N/A	Better adapted	Planting	N/A
WASHC_ISP_166	Harvesting, Processing and Storage	28 February 2013	Slide presentation	English	N/A	Explanatory	Youth	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_167	Soil Fertility Management	19 April 2017	Factsheet	English	Rice Maize	Explanatory	Extensionists	Fertilizer type and use	Manure	N/A	Soil conservation	N/A
WASHC_ISP_168	Erosion Control on Farmland	19 April 2017	Factsheet	English	N/A	Explanatory	Farmers	N/A	N/A	N/A	Mulching	Intercropping
WASHC_ISP_169	Common Fungi Diseases of Tomatoes and their control	19 April 2017	Factsheet	English	Tomato	Explanatory	Farmers	N/A	N/A	Better resistance	N/A	Crop rotation
WASHC_ISP_170	Compost preparation	19 April 2017	Factsheet	English	N/A	Instruction	Farmers	N/A	Composting	N/A	Soil conservation	N/A
WASHC_ISP_171	Control of erosion using vertiver grass	19 April 2017	Farmer guide	English	N/A	Instruction	Farmers	N/A	N/A	N/A	Soil conservation	N/A

	hedgerows											
WASHC_ISP_172	Soil fertility management guide	19 April 2017	Farmer guide	English	N/A	Instruction	Extensionists	Fertilizer type and use	Manure	N/A	Tillage	Crop rotation
WASHC_ISP_173	Construction of micro check dam for water harvesting on seasonal streams	19 April 2017	Farmer guide	English	N/A	Instruction	Farmers	N/A	N/A	N/A	Water conservation / harvesting	N/A
WASHC_ISP_174	ISFM for Maize Production	19 April 2017	Farmer guide	English	Maize	Instruction	Farmers	Fertilizer type and use	Manure	Better adapted	Planting	Single crop
WASHC_ISP_175	Status of Integrated Soil Fertility Management (ISFM) In Southwestern Nigeria	19 April 2017	Position paper	English	N/A	News and reports	Researchers	N/A	N/A	N/A	N/A	N/A
WASHC_ISP_176	Advocacy for adoption of ISFM as the panacea for sustainable soil productivity to improve smallholder farmers livelihoods in Southern Nigeria	19 April 2017	Policy brief	English	N/A	Explanatory	Decision makers	N/A	N/A	N/A	N/A	N/A

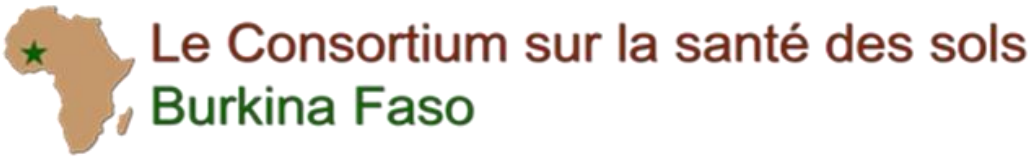
Acknowledgements

The Regional Coordinating Office (RCO) would like to take this opportunity to extend our gratitude to all our partner institutions and coordinators of the partner institutions:

- CSIR-Soil Research Institute (CSIR-SRI), Ghana, coordinated by: Edward Yeboah.
- Institut d'Economie Rurale (IER), Mali, coordinated by: Diakalia Sogodogo.
- Institute for Agricultural Research (IAR), Nigeria, coordinated by: Ishaku Amapu.
- Institute of Agricultural Research and Training (IAR&T), Nigeria, coordinated by: Olufunmilayo Ande.
- Institut de l'Environnement et de Recherches Agricoles (INERA), Burkina Faso, , coordinated by: Michel Sedogo.
- Institut National de la Recherche Agronomique du Niger (INRAN), Niger, coordinated by: Guéro Yadji.

The RCO of the WASHC Project would also like to express its gratitude to its donor organisation Alliance for a Green Revolution in Africa (AGRA) for all its support and contributions over the project; and the host institution, the International Institute of Tropical Agriculture (IITA) as the implementing institution of the project.

Gratitude



The Ghana Soil Health Consortium