



TOWARDS A SHARED VISION

Advisory services that work for
smallholders and government in
West Africa's large irrigation schemes

Barbara Adolph

Global Water Initiative (GWI) – The Global Water Initiative in West Africa is part of a global action-research and advocacy programme funded by the Howard G. Buffett Foundation. It is implemented by the International Institute for Environment and Development (IIED) and the International Union for Conservation of Nature (IUCN) in Mali, Guinea, Niger, Burkina Faso and Senegal. We focus on agricultural production linked to large scale irrigation schemes and dams, from local to regional level. Our multi-stakeholder approach seeks to empower smallholder farmers – both men and women – to put them at the centre of policies for efficient water management, food security and secure livelihoods.

IIED – The International Institute for Environment and Development is a policy and action research organisation. We promote sustainable development to improve livelihoods and protect the environments on which these livelihoods are built. We specialise in linking local priorities to global challenges. IIED is based in the United Kingdom and works in Africa, Asia, Latin America, the Middle East and the Pacific, with some of the world's most vulnerable people. We work with them to strengthen their voice in the decision-making arenas that affect them – from village councils to international conventions.

IUCN – The International Union for Conservation of Nature, helps the world find pragmatic solutions to our most pressing environment and development challenges. IUCN's work focuses on valuing and conserving nature, ensuring effective and equitable governance of its use, and deploying nature-based solutions to global challenges in climate, food and development. IUCN supports scientific research, manages field projects all over the world, and brings governments, NGOs, the UN and companies together to develop policy, laws and best practice.



TOWARDS A SHARED VISION

**Advisory services that work for smallholders and
government in West Africa's large irrigation schemes**

Barbara Adolph
September 2016

First edition: International Institute for Environment and Development (United Kingdom) and the International Union for Conservation of Nature (IUCN), Ouagadougou. 2016

ISBN: 978-1-78431-382-1

IIED product code: 12595IIED

Citation: Adolph, B. (2016), Towards a shared vision: Advisory services that work for smallholders and government in West Africa's large irrigation schemes. International Institute for Environment and Development, London, UK and the International Union for Conservation of Nature, Ouagadougou, Burkina Faso.

This report can be downloaded from the IIED website: www.iied.org/pubs

To contact the author, please write to:

Barbara Adolph, International Institute for Environment and Development
80-86 Gray's Inn Road, London WC1X 8NH, UK.

Tel: +44 20 3463 7399

Fax: +44 20 3514 9055

E-mail: barbara.adolph@iied.org

The views expressed in this report are those of the author and do not necessarily represent those of the organisations participating in the Global Water Initiative at a national, regional or global level, or those of the Howard G. Buffett Foundation.

CONTENTS

Abbreviations and acronyms	iii
Acknowledgements	v
Executive summary	vi
Introduction	ix
1 Agricultural advisory services for large-scale irrigation schemes – context and requirements	1
1.1 Regional and national context: AAS policies and irrigation	1
1.2 Agricultural advisory services for farmers in large-scale irrigation schemes	5
2 Linking demand for and supply of agricultural advisory services	11
2.1 Current challenges	11
2.2 What's wanted: the demand for AAS	15
2.3 What's on offer: the supply side of AAS	25
2.4 Linking AAS supply and demand: the need for effective communication and governance systems	32
3 Recommendations	47
3.1 Carry out a participatory assessment of institutional and organisational systems and capacities before development interventions start in large irrigation schemes	47
3.2 Develop and implement comprehensive AAS strategies for irrigation schemes	48
3.3 Develop farmers' organisational capacity to strengthen the demand side of AAS	49
3.4 Create and facilitate a communication space where farmers' organisations, irrigation scheme managing agencies and other agricultural service providers can coordinate and negotiate	51
4 Conclusions	53
Bibliography	55
Annex Action plan format	59

List of figures

Figure 1	Key steps in the action research process	xiv
Figure 2	An agricultural innovation system	4
Figure 3	A typology of AAS for irrigation schemes	8
Figure 4	Geographic and thematic scope of scheme managing agencies	27

List of tables

Table 1	Different producers' needs for AAS in Bagré	18
Table 2	Priorities of two recent AfDB funded projects	23
Table 3	AAS providers around the three schemes studied	26
Table 4	Self-assessment of AAS – priority roles as seen by the scheme managing agencies' agricultural advisors	29
Table 5	Profile of AAS staff at the three <i>offices</i> , 2015	30
Table 6	Farmers' expectations of AAS for the Niandouba / Confluent irrigation system	33
Table 7	Key components / work packages of the action plans developed in the three study sites	42
Table 8	Organisations pledging support to specific components of the Bagré action plan during the June 2015 national workshop	44

List of boxes

Box 1	Brief site descriptions of three large irrigation schemes in West Africa	x
Box 2	A brief history of AAS in West Africa	2
Box 3	AAS for large scale irrigation schemes – what makes them different	6
Box 4	Mandates of the three irrigation scheme managing agencies	8
Box 5	Factors keeping productivity and incomes low for smallholder irrigated rice farming	13
Box 6	Types of smallholder farmers in the three irrigation schemes	15
Box 7	Types of farmer organisations in the three schemes	20
Box 8	Farmers' expectations from AAS – as gathered in focus group discussions	24
Box 9	AAS approaches used by ODRS in Sélingué from inception until now	31
Box 10	Mechanisms for achieving downward accountability	35
Box 11	Institutional mechanisms for farmer-AAS communication in the three study sites	36
Box 12	PRDA – Participatory Rapid Diagnosis and Action Planning	38
Box 13	Visions developed by the AAS working groups for their respective irrigation schemes	40

ABBREVIATIONS AND ACRONYMS

AAS	Agricultural Advisory Services
AfDB	African Development Bank
AKIS	Agricultural Knowledge and Information Systems
ANCAR	Agence nationale de conseil agricole et rural (National Agency for Agricultural and Rural Advisory Services), Senegal
APPIA	Amélioration des performances des périmètres irrigués en Afrique sahélienne (Improving the Performance of Irrigation Systems in the African Sahel)
ARID	Association régionale de l'irrigation et du drainage en Afrique de l'Ouest et du Centre (Regional Association for Irrigation and Drainage for West and Central Africa)
BCB	Banque commerciale du Burkina (Commercial Bank of Burkina)
BNDA	Banque nationale de développement agricole (National Agricultural Development Bank), Mali
CILSS	Comité permanent inter-Etats de lutte contre la sécheresse dans le Sahel (Permanent Interstates Committee for Drought Control in the Sahel)
CMDT	Compagnie malienne pour le développement du textile (Malian Company for Textile Development)
CMS	Crédit mutuel du Sénégal (the Senegalese branch of a major French bank)
CNCAS	Caisse nationale de crédit agricole (National Agricultural Credit Bank), Senegal
COGEMA	Comité de gestion du matériel agricole (Committee for the Management of Agricultural Materials), Anambé, Senegal
CORAF	Conseil ouest- et centre-africain pour la recherche et le développement agricoles (West and Central African Council for Agricultural Research and Development – WECARD)
DPV	Direction de la protection des végétaux (Directorate for Plant Protection), Senegal
DRASA	Direction régionale de l'agriculture et de la sécurité alimentaire (Regional Directorate for Agriculture and Food Security), Burkina Faso
DRDR	Direction régionale du développement rural (Regional Directorate for Rural Development), Senegal
DVRD	Direction de la vulgarisation et de la recherche-développement (Directorate for Extension and Research), Burkina Faso
ECOWAS	Economic Community of West African States
FEPROBA	Fédération des producteurs du bassin de l'Anambé (Federation of Producers of the Anambé Basin), Senegal
FNDASP	Fonds national de développement agro-sylvo-pastoral (National Fund for Agro-Sylvo-Pastoral Development), Senegal
GFRAS	Global Forum for Rural Advisory Services
GWI	Global Water Initiative
IIED	International Institute for Environment and Development
IER	Institut d'économie rurale (Institute for Rural Economy), Mali
INERA	Institut de l'environnement et de recherches agricoles (Institute for Environment and Agricultural Research), Burkina Faso
ISRA	Institut sénégalais de recherche agricole (Senegalese Institute for Agricultural Research), Senegal
IUCN	International Union for Conservation of Nature
MAHRH	Ministère de l'Agriculture, de l'Hydraulique et des Ressources halieutiques (Ministry of Agriculture, Hydrology and Fisheries Resources), Burkina Faso

ODRS	Office de développement rural de Sélingué (Sélingué Rural Development Office), Mali
OHADA	Organisation pour l'harmonisation en Afrique du droit des affaires (Organisation for the Harmonization of Business Law in Africa)
PADERBA	Projet d'appui au développement rural dans le bassin de l'Anambé (Rural Development Support Programme in the Anambé Basin), Senegal
PAPCB	Projet d'appui au pôle de croissance de Bagré (Bagré Growth Pole Support Project), Burkina Faso
PAPSA	Projet d'appui à la productivité et à la sécurité alimentaire (Agricultural Productivity and Food Security Support Project), Burkina Faso
PASAE	Projet d'appui à la sécurité alimentaire et à l'élevage (Food Security and Livestock Production Support Project), Senegal
PRESA / DCI	Projet de renforcement de la sécurité alimentaire par le développement des cultures irriguées (Food Security Consolidation through Development of Irrigation Farming Project), Mali
RAS	Rural Advisory Services
RESCAR-AOC	Réseau des services de conseil agricole et rural d'Afrique de l'Ouest et du Centre (West and Central Africa Network of Agricultural and Rural Advisory Services)
ROPFA	Réseau des organisations paysannes et de producteurs de l'Afrique de l'Ouest (Network of Farmers' and Agricultural Producers' Organisations of West Africa)
SAP	Structural Adjustment Programme
SEDAB	Sahélienne d'entreprise de distribution et d'agrobusiness (Sahelian Corporate Distribution and Agribusiness Company), Burkina Faso
SNCASP	Système national de conseil agro-sylvo-pastoral (National System of Agro-Sylvo-Pastoral Advisory Services, Senegal)
SNVACA	Système national de vulgarisation et d'appui conseil agricole (National System of Agricultural Extension and Advisory Services of Burkina Faso)
SODAGRI	Société de développement agricole et industriel du Sénégal (Senegal Agricultural and Development Agency)
SODEFITEX	Société de développement des fibres textiles (Textile Fibre Development Agency), Senegal
SODEVOL	Société de développement des oléagineux (Oil Crop Development Agency), Senegal
T&V	Training and Visit (system of agricultural extension)
UC	Unit of Account of the African Development Bank
WAAPP	West Africa Agricultural Productivity Programme
WECARD	West and Central African Council for Agricultural Research and Development

ACKNOWLEDGMENTS

The participatory action research process underpinning this report involved farmers and their organisations, irrigation scheme managers, government departments at local and national level, agricultural research organisations, universities, other agricultural service providers and civil society organisations. Many individuals and organisations contributed to the project in one way or another and are still contributing to it by taking forward the emerging conclusions and recommendations.

I am particularly grateful to staff and management of ODRS in Mali, SODAGRI in Senegal and Bagrépôle in Burkina Faso for their ongoing engagement with the process, their openness in questioning the status quo and in reflecting on ways to improve, and their willingness to share information with us throughout the process. Likewise I thank the farmers cultivating land under the three schemes and their representatives – the farmer unions, federations and cooperatives in Sélingué, Anambé and Bagré. Their enthusiastic participation in the process throughout, in particular in the working groups and associated activities, helped us understand what the key challenges are and develop solutions together.

This action research process was carried out in partnership between IIED and IUCN (PACO), and I thank the IUCN team in the three countries for their excellent work in the three study sites that forms the foundation of this synthesis. In particular, Bamadou Cessouma in Mali (working with Younoussa Touré from the University of Mali), Modou Diouf in Senegal (working with Souleymane Cissé from IED Afrique) and Serge Alfred Sedogo (working with Moumini Savadogo from IUCN and Tsuamba Bourguou from ANSD). These colleagues produced the country reports that document the existing agricultural advisory services (AAS) and the self-assessment processes that led to the development of the action plans. They provided useful feedback to the analysis throughout and are still working on institutionalising the action plans in the three sites.

I thank my colleagues Jamie Skinner and Jérôme Koundouno for their critical feedback and suggestions throughout the process. In addition, the following people provided comments on the draft report: Bara Guèye (IED Afrique), Michel Harvard and Guy Faure (CIRAD), Patrice Djamen (RESCAR-AOC), Brent Simpson (FAO / Michigan State University), and Hilmy Sally (IWMI). These comments helped improve the original draft significantly and I am very grateful for the time and effort the reviewers invested.

This participatory action research was funded through the Global Water Initiative programme in West Africa by the Howard G. Buffett Foundation.

EXECUTIVE SUMMARY

This report summarises nearly three years of action research on agricultural advisory services (AAS) for large scale irrigation systems in West Africa, carried out by the Global Water Initiative (GWI-West Africa). It explores the structure, functioning and challenges of agricultural advisory services in three irrigation schemes in the region (Niandouba/Confluent in Senegal, Sélingué in Mali, and Bagré in Burkina Faso). The aim was to draw conclusions on how such services can be improved so they respond better to the demands of different types of farmers. The ultimate objective is to contribute to sustainable livelihoods through better use of the opportunities that irrigation provides.

Rice is an increasingly important staple crop in West Africa. Both national governments and donors continue to invest in irrigation schemes to boost production and reduce dependency on imports. But rice yields have often remained far below those anticipated when the systems were originally designed. This results in low incomes to farmers and pressures on the agencies managing the irrigation systems to improve their performance. Irrigation systems in West Africa have also undergone a transition over the past decades, with farmers increasingly relying on private sector service providers for agricultural credit, inputs, processing and marketing.

In this new scenario, the expected role of AAS is shifting. Rather than being agents of 'technology transfer' that focus on training farmers in researcher-developed technologies, AAS is expected to act as a 'broker', connecting farmers to service providers along the value chain. This is meant to be accompanied by farmers' increasing self-reliance and integration into markets. AAS are thus at the centre of agricultural and rural transformation.

However, an analysis of farmers' livelihoods in the three irrigation systems studied showed that many challenges remain. Smallholder farmers are not a homogenous group, and different types of farmers (depending on household and farm size, assets and sources of income) face different challenges. These include agronomic challenges at field level, problems with water management, access to land, access to and cost of agricultural labour, access to inputs and implements, prices and markets, and institutional and governance issues related in particular to farmers' relationships with the irrigation scheme managers.

Not all farmers are willing and able to focus primarily on irrigated rice production and many balance a diverse portfolio of livelihood strategies, including rainfed farming and non-agricultural activities. This is at odds with the pressures from national governments for irrigation scheme managers to increase rice production and foster the emergence of specialised, highly efficient rice producers. These different priorities mean the relationship between farmers and scheme managers has at times been conflictual, undermining cooperation. Poor relationships are ultimately reflected in the inadequate performance of the schemes overall.

A self-assessment of both farmer organisations and irrigation scheme managers confirmed their very different expectations. But each group recognised challenges, both for themselves and other actors. Farmer organisations recognised the need to:

- Increase accountability and transparency to and communication with members, and improve their internal governance systems in line with regionally agreed standards;
- Improve their capacity to play an effective role in demanding and using AAS from different sources;
- Increase their ability to enforce agreed rules and procedures (such as collection of irrigation fees, adherence with irrigation scheme regulation etc.);
- Pro-actively develop relationships with agricultural service providers rather than rely on the irrigation scheme managing agencies to do this for them at all times; and
- Increase the representation of women and youths.

The irrigation systems managers recognised that

- The AAS they provide is not meeting the needs of all the various types of farmers and has to be better targeted – both in terms of technical contents and advisory approach;
- Communication with Farmer Organisations is sporadic and ad-hoc, and needs to be more regular and effective;
- AAS provided by the scheme managers needs to be better integrated with national AAS strategies and policies (where these exist) and connect with AAS providers outside the irrigation scheme for mutual learning and effective support to farmers' diverse livelihoods; and
- AAS needs to expand beyond advice on agricultural production to cover the whole value chain – starting with advice on agricultural credit and inputs, and providing advice throughout the production process, through to processing, storage and marketing.

As a result of the self-assessments, which highlighted tensions between farmers and scheme managers, both groups agreed to form joint working groups in each site to develop detailed action plans that would address the challenges identified. The GWI-facilitated groups included representatives from different AAS (including national AAS providers, research organisations and NGOs) as well as farmer representatives. Over approximately 6 months, the groups met to identify priority areas and elaborate the steps required to address these, including the roles and responsibilities of various actors. This produced action plans that were validated locally using community meetings and FM radio, and were presented at national level to potential partners and funders. The action plans are still being embedded within institutions as this report is being finalised. Specific actions are being incorporated into new donor-funded initiatives at the three sites, and into the work programmes of farmer organisations and irrigation scheme managers.

The process has been by no means perfect and the long-term impact on agricultural production and farmers' livelihoods is yet to be seen. However, those involved confirm that dramatic changes are emerging in the perceptions and capacities of irrigation scheme managers, farmer organisations and other agricultural service providers, and in their relationships with each other. There is a strong commitment from all actors to implement the action plans through a range of partnerships and mechanisms, and to continue working together.

A number of recommendations for designing and implementing AAS for smallholder farmers in irrigation schemes have emerged from the process. Every scheme is different, and in many cases strong and well-functioning institutions may already be in place. However, the recommendations offer a 'checklist', especially for new irrigation schemes, that should draw investors' attention to the need to assess and, where necessary, develop institutions so they can 'deliver' on their ambitious objectives – because if these recommendations are not met, irrigation investments are likely to underperform. The *Recommendations* section of this report suggests practical actions that various actors (and especially national governments and donors) could take to achieve the following 'top level' recommendations:

- **Carry out a participatory assessment of institutional and organisational systems and capacities before development interventions start in large irrigation schemes.** This could help avoid expensive capital investments in systems that are not 'functioning' and help identify entry points to make institutions perform better.
- **Develop and implement comprehensive AAS strategies for irrigation schemes.** These should clearly outline the roles, responsibilities, structures, strategies and resources for AAS, as well as measures to assess performance against not only national development objectives (e.g. increasing rice production) but also farmers' livelihoods and wellbeing. Strategies should also specify how irrigation scheme AAS will connect with the national AAS system, and how the technical and managerial capacity will be developed and maintained.
- **Develop farmers' organisational capacity to strengthen the 'demand side' of AAS.** This can provide an important lever to ensure AAS stays relevant and performs well.
- **Create and facilitate a communication space where farmers' organisations, irrigation scheme managing agencies and other agricultural service providers can coordinate and negotiate.** Such spaces can help reduce conflicts and increase collaboration between all actors, and provide opportunities to increase transparency and accountability.

INTRODUCTION

In West Africa, rice has become the major staple food, not only for urban consumers. Over the past three decades, rice has surpassed consumption of all other cereals in the region. In 2012, rice consumption in West Africa was 15.7 million tonnes compared with millet at 15.5 million tonnes, maize at 15.2 million tonnes, and sorghum at 11.1 million tonnes (Fofana *et al.* 2014). The region, however, depends on rice imports to meet between 40 and 60 per cent of domestic demands. This high level of dependency exposes the region to price fluctuations in the global market, as experienced during the 2007 food price crisis. Raising domestic rice production is therefore increasingly prioritised by governments through rice development strategies and the regional economic community ECOWAS. Expanding irrigated agriculture plays an important role in achieving the region's ambitious goals (UMOA, CEDEAO and NEPAD 2015). The 2013 *Dakar Declaration on Irrigation* calls for irrigated areas to expand from 400,000 hectares to 1,000,000 hectares by 2020, at an estimated total cost of more than seven billion U.S. dollars¹.

Most rice in West Africa is produced by smallholder farmers, with a large proportion coming from rain-fed farming in valley bottoms and flood plains with hardly any water control. But large scale rice production via dams and other types of large irrigation schemes (generally defined as over 3,000 ha) is becoming an increasingly important component in the regional rice economy. There are plans for 39 new dams in the region to meet the ambitious targets of national and regional rice policies – as well as hydropower needs (Skinner *et al.* 2009). The rationale underpinning these investments draws heavily on a narrative of increasing resilience to climate change through secure irrigation. However, the rates of return to alternative investments in resilience building measures are not normally explored in detail. They could include farmer-managed small scale irrigation, improved rainfed farming practices or improved veterinary services and market access for pastoralists. The political economy dimension of irrigation can be significant, as developing a large irrigation scheme can be politically valuable and prestigious. Construction of these schemes is likely to be funded out of a combination of loans from international development banks and national government contributions. In order to justify these investments, agricultural productivity in the newly-irrigated areas will need to be high to enable farmers to sell significant surpluses, thus helping reduce dependency on rice imports nationally.

However, in the past irrigation systems have not always led to high productivity. Research undertaken by the Global Water Initiative (GWI) since 2013 shows that rice production has so far been lower than anticipated during the planning and design stages of three large dam irrigation schemes in West Africa (see Box 1 for brief site descriptions). There are significant inefficiencies and weaknesses associated with these schemes, which raise questions about whether alternative investments (such as those noted above) would not have provided better returns. But since large scale irrigation schemes are a reality, our research advocates for adequate support for smallholder farmers under these schemes to enable them to sustainably improve their agricultural practices, productivity and livelihoods.

1. http://www.icid.org/decl_dakar.html

BOX 1

Brief site descriptions of three large irrigation schemes in West Africa

Bagré (Burkina Faso)

The Bagré reservoir, which has a capacity of 1.7million m³, was built between 1989 and 1993. The amount of land it could potentially irrigate is estimated at 29,900 ha and its catchment area is estimated at 25,000 ha.

By the end of 2013, 2,447

ha of land had been opened up and allocated to smallholders. A total of 1,673 families, settled in 16 farmers' villages, cultivate the irrigated land.

Traditional agriculture is the mainstay of the area and is chiefly used to help meet local people's subsistence needs. The main crops are cereals, groundnut, cotton, black-eyed pea, soya bean, sesame and bambara groundnuts (*Vigna subterranea*). Cattle rearing is a major activity and is concentrated in three main pastoral zones.

Bagrépôle took over the project management of Bagré from the MOB (Maîtrise d'ouvrage de Bagré – MOB) in 2011, when the Bagrépôle project (funded by the World Bank) was launched.

Niandouba/Confluent (Senegal)

The Niandouba/Confluent dams were built in the Anambé basin, situated in Haute-Casamance, in the Kolda region of Senegal. The basin covers an area of 1,100 km² and includes seven rural communities. An estimated 112,000 people live here, with a relatively low density of 34 inhabitants/ km².

Traditional extensive agro-pastoral farming is practised, raising cereal crops (sorghum, maize, rice and *fonio*) and cash crops (cotton and groundnuts). The introduction of irrigated agriculture has brought changes in these production systems (some more important than others) and a growing emphasis on irrigated cultivation.

The Senegal Agricultural and Industrial Development Company (Société de développement agricole et industriel du Sénégal – SODAGRI) was set up in 1974 to develop rice cultivation in order to reduce the country's cereal deficit. The Niandouba dam was built between 1996 and 1999, and has a water storage capacity of 90 million m³. Today, with new land development, SODAGRI has been able to meet the target of developing 5,000 ha of irrigated land, although only around 3,000 ha is fully exploited.



Credit: Jérôme Koundouno



Credit: Barbara Adolph

Sélingué (Mali)

The Sélingué dam was built at the end of the 1970s. The objectives were to generate electricity (at the beginning of the 1980s, hydropower provided more than 75 per cent of Mali's electricity supply compared with about 15 per cent now),

to develop agriculture by opening over 20,000 ha of plains for irrigation (only 2,124 ha of which have been developed) and to help make the River Niger more navigable from Koulikoro, downstream from Bamako. The two irrigated perimeter areas covered by the study are Sélingué (gravitational) and Maninkoura (pumped), of 1,030 and 1,094 ha respectively. We refer to them just as Sélingué in this report.

These areas are farmed for rice and bananas and also used for market gardening. In Sélingué 1,943 people hold land plots and in Maninkoura the number is 1,168 (231 and 69 respectively are women). The Sélingué Rural Development Office (Office de développement rural de Sélingué – ODRS) is responsible for managing the scheme.

Source: Adapted from Ouédraogo and Sedogo (2014) for Bagré, Hathie *et al.* (2013) for Niandouba, and Kergna *et al.* (2013) for Sélingué.



Credit: Moustapha Diallo

The research was developed in three distinct phases. In the first, initial livelihoods studies² undertaken by the Global Water Initiative (GWI) in 2012-13 showed that smallholder paddy yields per season averaged around 5.5 t/ha for Bagré, Sélingué and Niandouba/Confluent, ranging from 2 – 8 t/ha. The different categories of farmers producing rice and (to a lesser extent) other crops under the irrigation scheme faced a range series of challenges in accessing land (both irrigated and rainfed), agricultural inputs and credit, technologies and markets, and water management. The studies highlighted the different perspectives of farmers and irrigation scheme managing agencies, with most farmers pursuing diversified livelihood strategies (of which irrigated rice is just one component, albeit an important one), whilst scheme managers envisage specialised 'professional' rice farmers who manage all production aspects optimally so as to maximise the returns to investment in infrastructure and services (see Guèye (2014) for a synthesis of key findings from the three studies undertaken in Mali, Burkina and Senegal). They also showed that there is much scope for improving the relationship between farmers and scheme managers through better governance systems, enhanced consultation and communication mechanisms, and strengthening of capacities at different levels (Guèye, 2014).

Agricultural Advisory Services (AAS) could potentially play a central support role for improving farmers livelihood systems. As elaborated in more detail in Section 1.1, AAS are increasingly expected to offer farmers support along the whole value chain, rather than only focusing on the knowledge and technology angles of agricultural production. Some advisors are now expected to act as facilitators and intermediaries that link

2. See Ouédraogo and Sedogo (2014) for Bagré, Hathie *et al.* (2013) for Niandouba, and Kergna *et al.* (2013) for Sélingué.



Credit: Mike Goldwater

A motorbike mechanic in Sélingué, Mali. He also owns some rainfed land which is cultivated by someone else while he works as a mechanic.

farmers to different service providers and institutions, whilst also supporting farmers' organisational development. In this report, AAS is used in this wider sense, even if in practice individual advisors are not always fulfilling the role of an effective intermediary.

The second phase of the research therefore aimed to identify and address the specific strengths and weaknesses of AAS in this wider role within the three schemes. GWI facilitated self-assessments (in consultation with all stakeholders): by farmers and their organisations on the one hand, and the scheme managing agencies on the other. This was complemented by a contextual analysis of agricultural advisory strategies and mechanisms at national level³. The findings were presented and discussed at a regional workshop in Bamako in June 2014 (GWI, 2014), which identified further entry points for making AAS under large scale irrigation schemes more effective and responsive to farmers' needs. In parallel to the regional workshop, three national workshops were held with farmer organisations from different irrigation systems, scheme managing agencies and other stakeholders to identify opportunities to improve AAS. These were facilitated by Inter-réseaux⁴.

In a third phase of research, the self-assessments and subsequent working sessions led to the formation of working groups for each scheme. These working groups were tasked with developing action plans that outline the different steps required to address the challenges identified, and with agreeing roles and responsibilities for their implementation. This process is described in more detail in section 2.4.

3. See Cissé and Diouf (2015), Sedogo and Bourgois (2015), Cessouma and Touré (2015) for the three site reports.

4. <http://www.inter-reseaux.org/>



A farmer discussing rice production issues with agricultural advisors and trainees in Sélingué, Mali.

The different steps of the GWI action research process, from early 2013 to mid-2015, are shown in Figure 1. The process was an iterative one. Findings from each step were validated by stakeholders (usually in the form of a steering committee for the specific piece of research – e.g. a particular study, and via national or regional workshops). The next phase of the research was developed with inputs from these stakeholders. This process helped keep the research relevant for the expected users, in particular national level decision makers.

The current report draws out the main learning and conclusions from activities under Phase 2 and 3 (with Phase 1 having being synthesised in the report by Guèye, 2014). Whilst the three irrigation schemes studied are not necessarily representative for the whole range of schemes in the region, a number of generic issues have been identified and confirmed during the national and regional workshops. The report will make reference to experiences elsewhere, but is not a review of the existing literature on West African irrigation schemes.

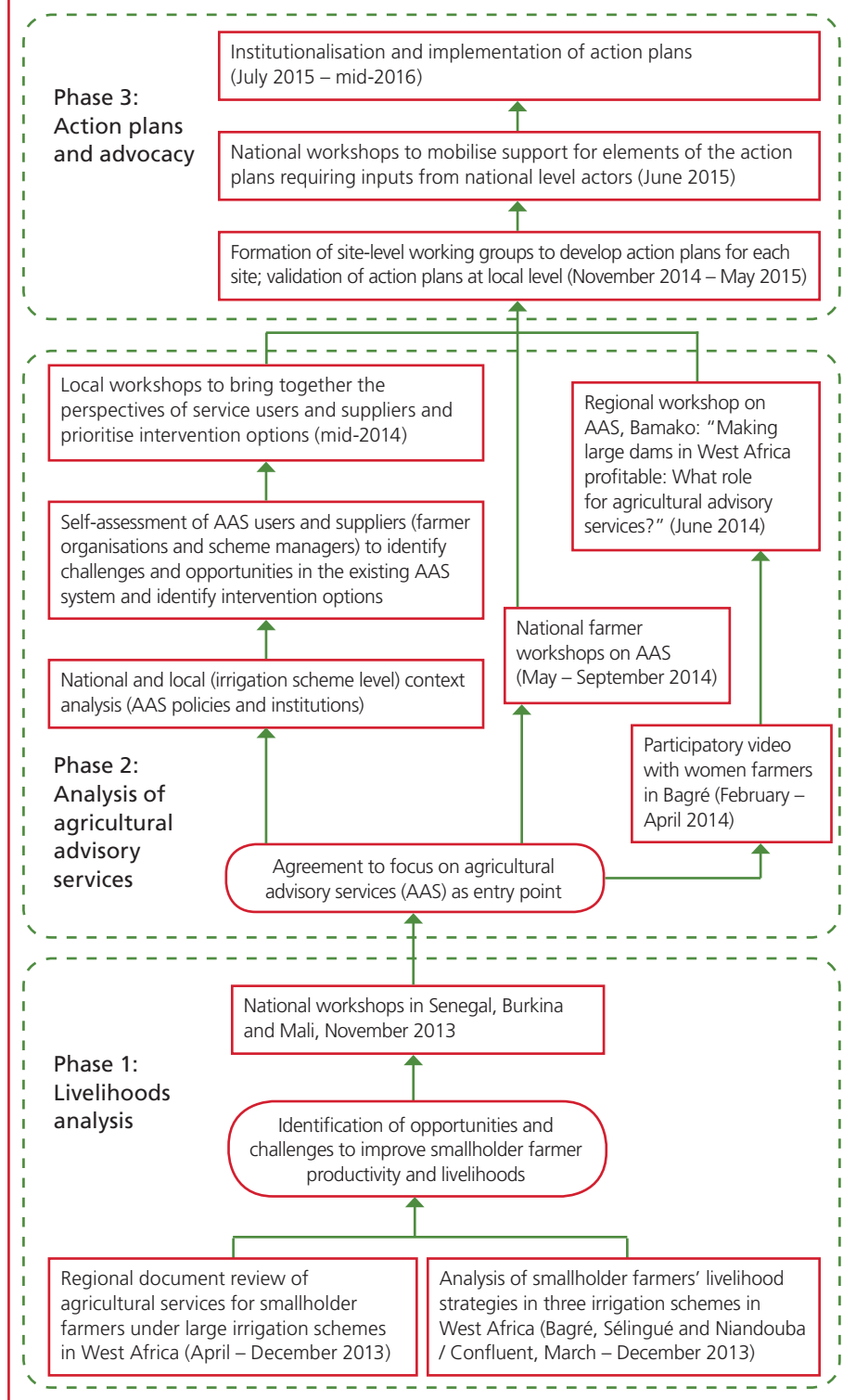
The key topics addressed are:

- The institutional mechanisms needed to enable the diverse types of smallholder farmers cultivating land irrigated by large irrigation dams to sustainably increase and diversify production and incomes, reduce risk and meet other livelihood outcomes.
- The specific role AAS play within this institutional setup, the governance mechanisms required and the 'levers' for improvements – from both a service 'demand' and 'supply' perspective.

Experience from the three schemes is already informing AAS design in Niger, as well as policies. It also informs the regional programmes of ECOWAS, river basin organisations, and the Permanent Interstate Committee for Drought in the Sahel (CILSS).

FIGURE 1

Key steps in the action research process





AGRICULTURAL ADVISORY SERVICES FOR LARGE-SCALE IRRIGATION SCHEMES – CONTEXT AND REQUIREMENTS

1.1 REGIONAL AND NATIONAL CONTEXT: AAS POLICIES AND IRRIGATION

West Africa has a long history of agricultural development interventions, starting with support to plantation and export agriculture during the colonial and post-colonial period. Most recently, a drive for pluralistic and innovation-oriented systems of agricultural research and development has sought to support increases in agricultural productivity and improvements in rural livelihoods. These are meant to contribute to food security and poverty reduction in both rural and urban areas.

AAS offer important support to farmers. However, the underlying paradigm for AAS has changed significantly in the decades since independence, and this development has altered the structures and strategies in existence today. The development of AAS is reflected in changes of terminology – whilst the term ‘agricultural extension’ implies a standard package of improved practices and technologies is being ‘extended’ to farmers’ fields via a one-way ‘transfer of technology’ approach, the more recently coined term ‘agricultural and rural advisory services’ implies a more interactive, farmer-focused and customised approach. A recent article by the Director General of ANCAR, the Senegalese Agency for Agricultural and Rural Advisory Services, describes the main stages of AAS development in West Africa in the 50 years since independence, and is summarised in Box 2.

So there has been a gradual shift in the role of AAS providers, from being state-run one-stop shops that provided farmers with inputs, supervised production and a sure outlet for their produce (particularly for cash crops), to that of a facilitator and intermediary, who needs to be able to communicate effectively with farmers, their organisations, and a range of actors within an agricultural innovation system (Figure 2). This shift requires a range of individual and organisational capacities as outlined in the ‘New Extensionist’ profile developed by GFRAS, the Global Forum for Rural Advisory Services (Sulaiman and Davis, 2012).

BOX 2

A brief history of AAS in West Africa

1960s – Independences and new states

This phase was characterised by a paternalistic attitude towards the ‘peasantry’, whereby the state would cater for all aspects of production – in particular for export crops such as cotton and groundnuts. Traditional farming systems were seen as backward, requiring transfer of blueprint technologies in a fairly top-down manner, with little attention to the different needs, aspirations and knowledge systems of farmers – who were treated as passive recipients. During this time large development agencies and marketing boards were formed in the region, as well as the first agricultural cooperatives.

1970s – Sahelian food crisis and rethinking of the role of farmers

The state-run AAS that were weakly linked to research and markets were starting to show their limitations in increasing agricultural production. The gradual realisation that smallholder farmers are able to increase productivity if technologies are adapted to their needs favoured the development of new forms of farmer mobilisation. The “training and visit” system of extension (T&V) was introduced by the World Bank during this period.

1980s – Structural adjustment

T&V was heavily promoted in West Africa, but remained a standardised and top-down approach with little adaptability to the needs of complex smallholder farming systems. It did not recognise the value of farmers’ own knowledge and was financially not sustainable (Anderson *et al.* 2006). The subsequent World Bank-induced “structural adjustment” programmes (SAPs) required public sector reforms and a disengagement of the state from a number of functions, including AAS. This resulted in a near-dismantling of public sector agricultural extension agencies such as SODEVA in Senegal. The expectation was that other actors, including both the private sector and civil society, would fill the gap.

Early / mid-1990s – Initial experiments with pluralistic service provision

Faced with economic and financial crises, West African states agreed, under the auspices of the IMF, to re-organise their economies and devalue the Franc CFA in 1994. But, except for some export crops such as cotton, SAPs left many countries in the region with inadequate services for smallholder farmers. The vacuum left by the withdrawal of the state was not immediately filled by a suitable mix of AAS providers. The 1990s were thus a period of uncertainty once it was realised that the private sector and the profession were poorly prepared to take over the new agricultural policy frameworks entrusted to them. The 1990s also saw the emergence of new actors and approaches, including increasingly well organised farmer organisations, and the gradual development of ICTs as an important component of Agricultural Knowledge and Information Systems (AKIS). A new vision of AAS emerged gradually, based on diverse methodological approaches and a plurality of private and public actors.

Late 1990s – Decentralisation and revival of the smallholder farmer movement

These years marked a turning point in agricultural policies, which now aimed to support a private agricultural sector, whilst the state focused on its regulatory functions. Multi-functional family farms were recognised as the main engines of agricultural growth, and farmer organisational development became a priority to better link farmers to other development actors. ROPPA, the Network of Farmers’ and Agricultural Producers’ Organisations of West Africa, was formed in 2000. The farmer was finally placed at the heart of AAS systems, and it was recognised that services must be customised to different user groups. A flurry of participatory approaches to AAS and agricultural research were developed, piloted and rolled out in the region (e.g. Osborn, 1995).

2000s – Emergence of new agricultural policies in the region

These take on board the learning from previous decades and are increasingly based on pluralistic AAS delivery, with the state (often with donor support) focusing on support to smallholder food production, whilst specialised AAS are available via the private sector input suppliers to those who can afford external inputs (primarily market-oriented farmers). Farmers are increasingly seen as ‘clients’ of advisory services with the competence and power to take informed decisions, and AAS providers are expected to respond to their specific needs and demands. This requires new methodological approaches as well as the increasing use of ICTs, in particular mobile phones.

Source: Summarised from Mboup and Anouilh (2014).

It requires significant investment and political will to ensure that agricultural innovation systems function so that both farmers’ livelihoods and urban food security are secured. The agricultural sector’s importance for food security, poverty reduction and economic growth is generally recognised in West Africa and is reflected in relatively high levels of agricultural investments. Several countries (Burkina Faso, Mali, Niger and Senegal) are meeting their commitments under the Maputo Declaration signed in 2003⁵, of spending at least 10 per cent of national budgets on agriculture. However, this does not necessarily translate into investments in agricultural research and advisory services, or in farmer organisational development. By 2012, no country in West Africa had met the target of allocating at least 1 per cent of agricultural GDP to agricultural research and development (R&D), as pledged by African Union leaders in 2006, who intended to build on momentum from the Maputo Declaration (One.org and 40chances, 2013).

Recently, the region has made some progress in developing institutional frameworks for AAS that can provide the basis for investment by different actors, including the private sector, the state, farmer organisations and NGOs. Nevertheless, of the three countries where the study schemes are located, only Burkina Faso has a formal national AAS strategy in place: the SNVACA – the National System of Agricultural Extension and Advisory Services (see MAHRH, 2010), which was under review as this report was being finalised. Senegal has developed the SNCASP (National System of Agro-Sylvo-Pastoral Advisory Services), but no policy documents have so far been developed to guide its implementation. Interventions under SNCASP are expected to be funded via a competitive system managed by FNDASP (Fonds national de développement agro-sylvo-pastoral), a national development fund, which will identify and contract service providers⁶. Mali is currently developing an AAS strategy.

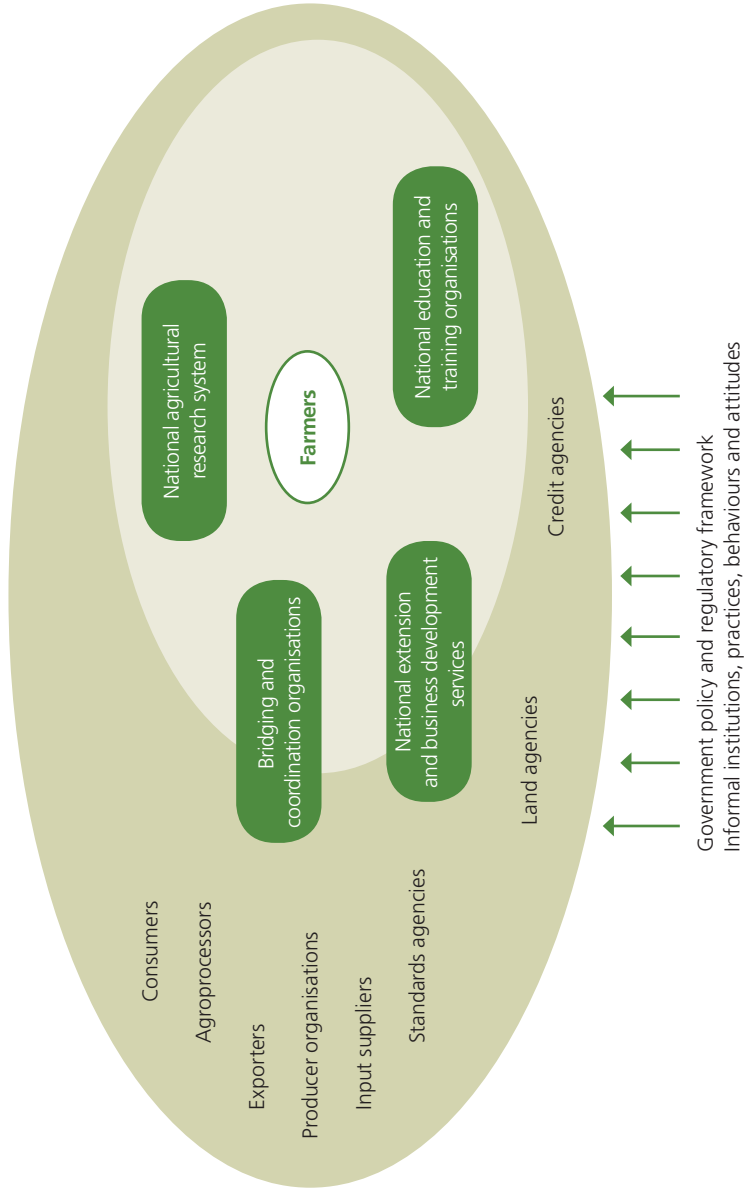
Policy makers clearly consider irrigation an important enabler to increase agricultural productivity in the region. Burkina Faso’s SNVACA identifies irrigated rice as an important agricultural production system, but does not elaborate how AAS for irrigated systems should differ from those for rainfed farming. All three countries in this study have national strategies for developing rice cultivation (Ministère de l’Agriculture, Senegal 2009; Ministère de l’Agriculture, Mali 2009 and MAHRH Burkina Faso 2011). These highlight the role of irrigation as well as the availability of other production factors (in particular secure land tenure, good water management, access to agricultural implements and machinery, and access to inputs, credit and technology). But the strategies do not outline how access to these production factors and to other elements of an ‘enabling environment’ will be assured for the different types of smallholder

5. www.nepad.org/fr/resource/au-2003-maputo-declaration-agriculture-and-food-security

6. The FNDASP (National Fund for Agro-Sylvo-Pastoral Development), see <http://fndasp.sn/>

FIGURE 2

An agricultural innovation system



Source: Sulaiman and Davis, 2012.

farmers cultivating rice. They do not specify what types of institutions and governance mechanisms are needed for this, nor do they elaborate the key role of AAS in ensuring that other service providers (input suppliers, traders, providers of credit etc.) have functioning linkages to farmers and their organisations.

There is currently no coherent regional framework for AAS that could guide national policy making and support sharing of good practice between countries. RESCAR-AOC, the West and Central Africa Network of Agricultural and Rural Advisory Services, is working towards such a framework, as agreed during its formalisation workshop in February 2015 (RESCAR-AOC, 2015). At that workshop, GWI presented AAS for farmers in large scale irrigation schemes as an example of the 'Rural Advisory Services Gap', wherein AAS / RAS policies and practices lag behind those in other production systems or sub-sectors. There is potential to address this gap through regional dialogue and learning from case studies and pilot initiatives. One mechanism for sub-regional collaboration to increase agricultural productivity is the WAAPP (West African Agricultural Productivity Programme)⁷, which aims to generate and disseminate improved technologies to increase agricultural productivity, while promoting regional integration as an instrument for shared growth and poverty reduction in West Africa. WAAPP is implemented by CORAF/WECARD, the West and Central African Council for Agricultural Research and Development, whose mission is to achieve *"Sustainable improvements to the competitiveness, productivity and markets of the agricultural system in West and Central Africa by meeting the key demands of the sub-regional research system as expressed by target groups"* (CORAF/WECARD, 2007). AAS is considered to be part of the research and innovation system, and WECARD has assisted in the start-up of the RESCAR-AOC network.

To summarise, a lot has happened to AAS in West Africa over the past decades, and the emerging structures and systems are more dynamic, pluralistic and responsive to farmers' needs than their predecessors. However, much remains to be done to ensure that the needs and requirements of different types of farmers in different farming systems – including those under large-scale irrigation – are catered for. This requires moving from the generalist intentions expressed in national AAS and rice production policies into concrete actions that work on the ground, backed up by functioning institutions and governance systems to ensure effectiveness and sustainability. These need to include effective feedback mechanisms for continuous improvement and downward accountability.

1.2 AGRICULTURAL ADVISORY SERVICES FOR FARMERS IN LARGE-SCALE IRRIGATION SCHEMES

Several inter-related requirements distinguish large scale irrigation systems from dryland farming systems, and these have implications for designing and implementing rural advisory services (Box 3). Considering that all large irrigation schemes in West Africa have designated AAS systems that differ from those outside the schemes in virtually all dimensions (levels and source of investment, mandate and role of advisors, level of specialisation, governance and reporting systems etc.), it is surprising that national rice production and AAS strategies in the region have so little to say about AAS systems for irrigation schemes.

Because of the framework condition requirements outlined in Box 3, AAS for irrigation systems are often better funded and equipped than their 'rainfed' counterparts. But on the downside, some of them seem to have been by-passed by the reforms processes

7. See http://www.coraf.org/documents/fiches_projets/West_Africa_Agricultural_Productivity_Program.pdf and <https://www.waapp-ppaao.org/> for details about the programme.

BOX 3

AAS for large scale irrigation schemes – what makes them different

Farmers do not control all means of production

Large irrigation systems are normally built by the government with loans and / or grants from international development banks and other funders. People owning or using the land before construction are usually re-settled and compensated. After construction, the irrigation infrastructure and the land belong to the government. Government agencies control land usage and allocate irrigated plots and water to farmers, who must follow a range of rules (for example only grow rice, transplant, use specific varieties, irrigate at a set time, and pay irrigation service fees). *Offices* police the rules. These are government agencies such as the Office de Niger⁸ (formed in 1932) managing the irrigation scheme near Ségou in Mali or ONAHA in Niger (formed in 1978). They can expel farmers from irrigated plots if rules are not followed and are also the main ASS agents. Their advice and the links they provide to other service providers should help farmers follow the rules. But this situation creates a power imbalance, whereby farmers depend on the *offices* for access to factors of production and are therefore in a weak position to challenge poor performance or even corruption.

Irrigated systems have high external input and technology requirements

Intensive rice production, as practiced under large scale irrigation schemes in West Africa, has developed to require⁹ external inputs, in particular improved seed, inorganic fertiliser, pesticides and herbicides. It requires knowledge about, and experience in, irrigation water management and canal maintenance. It also requires high levels of labour (in particular for transplanting and weeding). AAS should help farmers learn this completely new production system (as compared with traditional rainfed farming and pastoralist systems). AAS must also link farmers to other service providers along the value chain, in particular providers of credits, inputs, transport and markets, who are all essential if farmers are to benefit from irrigation.

The need for high returns provides a strong justification for investments in AAS

Irrigation schemes are planned and returns to investment are calculated based on an assumption of rice yields obtained from irrigated land (and power generated, in the case of dual-purpose dams). This puts pressure on scheme managing agencies to achieve target production figures, even though GWI's research (Kaboré and Bazin, 2014; Hathie, 2015) shows that average yields fall far below those assumed during planning. This need for high returns means there is a strong justification for investments in AAS. Farmer/advisor ratios are much lower in irrigation schemes than in rainfed farming: only 135 – 300 farmers per *office* advisor (even without taking other types of AAS providers such as farmer organisations and NGOs into account), as compared with several thousand farmers per advisor in rainfed systems.

Technical requirements of irrigation systems reinforce compliance

Irrigation systems require a certain level of collective action and compliance. Invasive weeds will easily cross from one field to the next when not controlled, and a poorly maintained channel will affect downstream users. Developing a feasible irrigation schedule may well require that all farmers grow rice and irrigate at an agreed time, leaving few options for experimentation, innovation and diversification. These challenges justify to some extent the strict application of the 'rule book' (*cahier de charge*) by the *offices*.

8. Morabito (1977)

9. There are alternatives such as SRI (System of Rice Intensification) which uses agroecological intensification practices. SRI is actively promoted in parts of Mali and Senegal, but is generally more labour and knowledge intensive than conventional methods of rice production, which depend on high levels of external inputs.

that changed other AAS organisations. Irrigation scheme managing agencies often keep a strong almost-monopoly grip on service delivery, using few if any of the more recently developed farmer-led approaches.

However, this does not have to be the case – in irrigation schemes such as the Sorou in Burkina Faso and the Vallée du Fleuve in Senegal AAS are managed at least partly by farmer organisations. The APPIA project developed a useful typology of AAS for irrigation systems in West Africa, based on two criteria (ARID, 2004):

1. **Who takes the initiative for advisory services?** Who assesses the needs of farmers, defines the organisation of advisory services, proposes the methodology and intervention tools, recruits advisors, and determines the amount of contributions or the cost of services?
2. **Who implements the advice and how?** Who advises? What is the support system for irrigators on the ground?

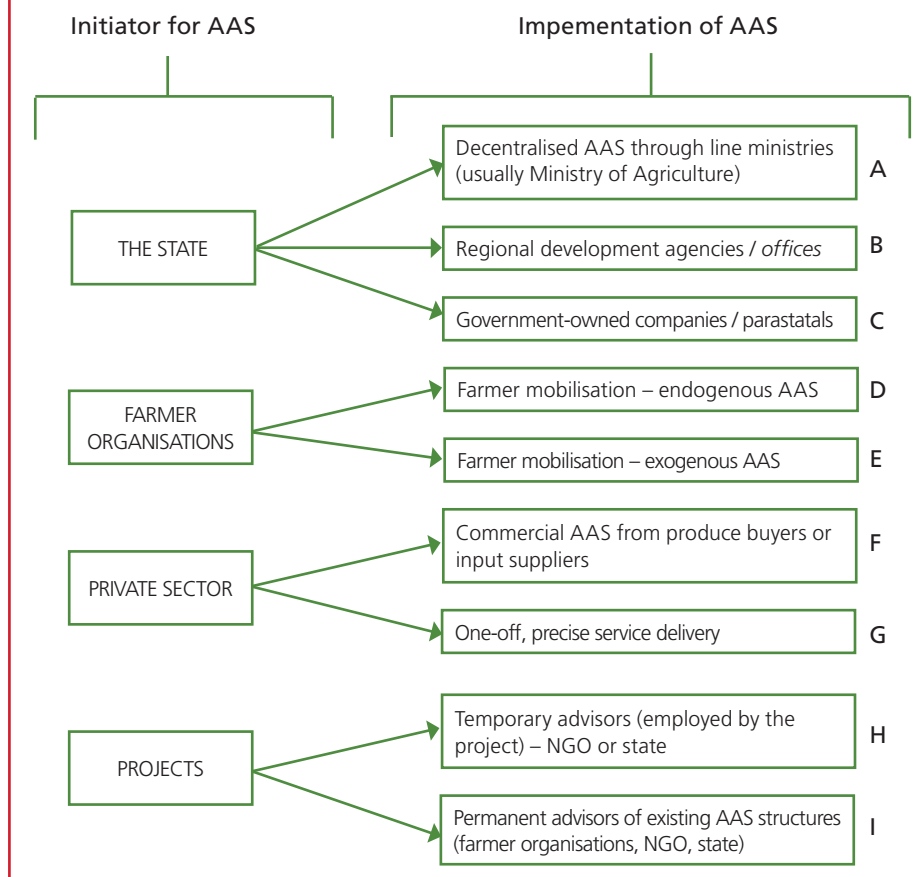
Based on these two criteria, APPIA came up with eight different types of AAS systems for irrigation in the Sahel (see Figure 3), with several types often combined in the same system. The schemes in Mali (Sélingué) and Senegal (Niandouba / Confluent) belong to category B, while Bagrépôle¹⁰ in Burkina Faso belongs to category C (state-owned, but operate as independent economic entities along private sector principles, without direct government interference). In addition, there have been category H and I AAS in the three schemes – e.g. under FAO-funded farmer field school projects promoting integrated pest management. Section 2.3.1. provides more detail about the types of AAS in the three study schemes.

Large irrigation schemes in West Africa are normally managed by regional development agencies or through *offices* (type B in the typology shown in Figure 3), who provide AAS for irrigated land instead of or in addition to the mainstream national AAS system implemented through line ministries (type A). The state is disengaged, giving the private sector a stronger role in agricultural input supply, credit and marketing. But since rice is a priority crop for national food security, the irrigated rice sector is still heavily influenced by state interventions. Fertiliser subsidies continue to operate for all three schemes studied by this project, and the scheme managing agencies directly engage with service providers (such as agricultural banks) to support their farmers' access to inputs and credit.¹¹

The Structural Adjustment Policies of the 1980s and 90s have left their marks on the *offices*. Whilst their mandate initially included input supply, credit and marketing, they focus increasingly on creating the enabling environment for agricultural production and rural development (in terms of infrastructure and institutions, e.g. quality control of inputs, coordination between development actors, resolution of conflicts between different natural resource users), in partnership with other actors. In practice, this means that, whilst the *lettres de mission* of the *offices* often include quantitative production targets, such as SODAGRI's target of 32,000 tonnes of rice per year (Ministère de l'Agriculture, République du Sénégal 2010), they do not necessarily have the resources and mandates to directly intervene at the production level. The challenges emerging from this setup will be discussed in more detail in Section 2.

10. <http://bagrepole.com/>

11. For example in Anambé, Senegal, SODAGRI negotiated with the National Agricultural Credit Bank (CNCAS) to provide loans to farmers in their operating area.

FIGURE 3**A typology of AAS for irrigation schemes**

Source: Adapted from ARID (2004).

BOX 4**Mandates of the three irrigation scheme managing agencies**

SODAGRI (Senegal Agricultural and Industrial Development Agency / Société de développement agricole et industriel du Sénégal): SODAGRI's vocation is to drive agricultural, livestock and inland fisheries development and environmental conservation. The three main objectives are (1) to improve and secure the productive base; (2) to increase production and productivity, and (3) to make pilot activities more effective (Ministère de l'Agriculture, République du Sénégal, 2010).

ODRS (Sélingué Rural Development Office / Office de développement rural de Sélingué): ODRS is responsible, under the national rural development policy, for proposing and executing all integrated development projects and programmes helping promote rural areas (Ministère du développement rural, République du Mali, Office de Développement rural de Sélingué 2013).

Bagrépôle (Société de développement Intégré du Pôle de Croissance de Bagré / Integrated development society of the Bagré growth pole): Bagrépôle's objective is to contribute to increased economic activity in the Project Area, so increasing private investment, employment, and agricultural production.



Credit: Mike Goldwater

The Sélingué representative of a fertiliser company with sacks of urea – a general fertiliser used on irrigated rice and maize.

To summarise, AAS for large irrigation schemes fall somewhat 'between the cracks'. National and rural food security and AAS policies and strategies do not address the specific needs of farmers working irrigated land. On the other hand, the agencies responsible for large irrigation schemes manage a range of other aspects, besides AAS. They do not necessarily have the human and institutional expertise and capacity to provide effective AAS for the different types of farmers cultivating irrigated plots. They are also not particularly well connected to other types of AAS providers, such as farmer organisations, NGOs and the private sector, nor to national AAS systems and institutions. The latter tend not to operate in irrigated areas both because they are overstretched (and thus prefer to concentrate their efforts in rainfed areas where no other state agency operates), and because of occasional clashes with the *offices* about areas of responsibility. There are also conflicts of interest between the 'compliance' function of the *offices* and the 'facilitation and support' function required of effective AAS. Outside irrigation schemes, AAS have often moved towards farmer-led, pluralistic systems. The separate funding and management of AAS for irrigation schemes seem to have shielded them to some extent from these innovations. It is time to catch up.



LINKING DEMAND FOR AND SUPPLY OF AGRICULTURAL ADVISORY SERVICES

2.1 CURRENT CHALLENGES

Rice yields in the three irrigation schemes studied by GWI are generally below the levels estimated when the schemes were planned. For example, a feasibility study of 1,500 ha irrigated by the Bagré dam undertaken in 1998 assumed a yield of 6t/ha per season, whereas yields were closer to 4.5t/ha in that part of the scheme. Considering that the schemes have been in operation for well over a decade, and farmers themselves say that they now master the knowledge and skills needed for irrigated rice production, this is a fairly poor performance.

At the same time, many farmers say that they struggle earning an adequate income from irrigated rice farming, and can only make ends meet by undertaking a wide range of other activities, including rainfed cultivation, pastoralism, artisanal mining, other non-farm rural employment, and by migrating seasonally to other parts of the country or even overseas¹². In Bagré, some of the women farmers participating in a video exercise in early 2014 said that they were actually worse off now than they had been before moving to Bagré. So what is going wrong?

A number of interrelated factors are responsible for low productivity and incomes. They can be re-grouped under the headings shown in Box 5, based on GWI's livelihood analysis undertaken for the three study schemes in 2012/13. This analysis involved key informant interviews, focus groups discussions with different types of farmers, and individual household mapping. The points raised largely confirm experience from other irrigation systems in the region, in particular the Office du Niger in Mali and the Senegal River Valley.

12. The diverse livelihood strategies used by farmers in the three schemes are described in detail by Hathie *et al.* (2013) for Anambé, Kergna *et al.* (2013) for Sélingué, and Ouédraogo and Sedogo (2014) for Bagré. Guèye (2014) presents an analysis across the three sites.



Credit: Mike Goldwater

A young tailor in Sélingué, Mali who also owns a plot of irrigated land. He works in the field from 7am until noon every day and then works in his shop until 6pm.

The challenges manifest themselves not just in relatively low yields and incomes, but also in the difficult and at times confrontational relationship between irrigation scheme managing agencies and farmer organisations. These often accuse each other of failures (in providing services, following regulations, farming 'seriously' etc.) rather than reflecting on ways to improve their own performance. It is because of this stalemate that GWI decided to focus on the institutional and governance aspects of the schemes, with the aim of reviewing and ultimately improving the way institutions function. Stakeholder feedback during the numerous project workshops confirmed that, ultimately, addressing all other challenges down to plot level operations depends on functioning and accountable institutions and governance systems that allow all actors to effectively negotiate the rules of the game, whilst increasing capacities and performance. AAS are meant to be at the heart of these institutional dynamics, because they play a key role in linking different actors in the agricultural innovation system and clarifying the roles and responsibilities of each (see Figure 2).

The following sections will consider the role of AAS from two perspectives: the 'demand side', i.e. different categories of farmers and their organisations, and the 'supply side', i.e. the institutions and processes supporting farmers along the value chain and in farmer organisational development. Although this analysis is based on the three study irrigation schemes, it raises issues that may well be relevant for other large schemes in the region, as their history and functioning generally followed a similar pathway.

BOX 5

Factors keeping productivity and incomes low for smallholder irrigated rice farming

Agronomic challenges at field level

Farmers report problems with invasive weeds, various pests and diseases, poor germination of seed, and declining soil fertility. These challenges are common in irrigated rice systems, and there are solutions to each of them – but implementing these requires knowledge and inputs.

Water management

All three schemes studied face challenges with plot-level water management due to poor maintenance of primary and secondary canals and pump stations (by the *offices*) and tertiary canals (by farmers). Both poor drainage and poor maintenance of canals result in sub-optimal water levels in parts of the scheme, affecting yields.

Access to land

Irrigated plots in the three schemes range from 0.25ha to over 50ha (in parts of Niandouba), with most households cultivating between 0.5 and 1 ha. This average size may initially have been appropriate for farmers who often had very little or no experience in rice cultivation, and relatively small households. But over the decades, households have increased in size, and farmers have learnt how to cultivate rice under irrigation. Yet plot size has remained the same. Now many families cannot even meet their household requirements for rice from their plots, let alone sell a surplus. Women and youths are keen to cultivate irrigated plots, but with very few plots being vacated each year, and no significant expansion of the area under irrigation, opportunities are few. At the same time, access to rainfed land is limited around Bagré and Sélingué, and in particular for migrants from other parts of the country who settled near the dam. With agricultural opportunities diminishing, many seek alternative income sources. See also the extensive work done by GWI on land tenure in irrigation schemes: <http://www.gwiwestafrica.org/en/sharing-benefits>.

Access to and cost of agricultural labour

Rice cultivation, other farm operations and off-farm rural and urban employment compete for labour. With rice productivity low, returns to labour are also low. The growth of the non-farm rural employment sector around the schemes (including trade, transportation and processing) provides opportunities for young people to earn an income, often with better returns and physically less challenging conditions than work in the paddy fields.

Access to inputs and implements

Although the *offices* have recently made efforts to ensure that quality seed and fertiliser are available on time, there have been bottlenecks in the past that reduced yields. Agricultural implements and machinery are not always available when required, delaying land preparation and planting, which in turn reduces labour productivity and yields.

Prices and markets

Even when inputs are available on time, their high costs, combined with low market prices for paddy, result in low incomes to farmers – or even losses (see Hathie *et al.* 2013 for examples). The low profitability of rice production reinforces many farmers' desire and need to invest labour and resources in alternative livelihoods (agricultural or non-agricultural). Guèye (2015) outlined the clashes in perspectives between family farmers aiming to reduce risk through diversification, and agricultural policies intending to promote specialised producers of mono-culture rice.

Access to timely and appropriate information, knowledge and experiences

All the above aspects of the rice value chain require information and knowledge amongst those involved. There are large knowledge gaps in existing schemes, both among farmers and those supporting them. While farmers know the 'basics' of rice farming and many are very skilled in managing their resources, farmers need information about prices for inputs and produce; knowledge about a range of new agronomic and crop management aspects; and the capacity to manage their own farm enterprise as well as collective institutions such as farmer organisations. Service providers, including AAS provided by the irrigation scheme managing agencies, require a good understanding and knowledge of the latest agricultural technologies as well as of farmers' own innovations and practices. They also need the skill and experience to effectively communicate with farmers and other service providers (including of agricultural research), and to support development of farmers' organisations.

Institutional and governance issues

These affect all the seven categories above in various ways. Non-transparent allocation of irrigated plots and poor accountability for the use of irrigation fees undermines farmers' trust in the *offices* and their willingness to pay irrigation fees and comply with *office* regulations. Insecure and inflexible land tenure arrangements make farmers less willing to invest in plots (by for example, improving long-term soil fertility, levelling land and maintaining canals) and often result in informal / illegal arrangements with no oversight by cooperatives or unions (e.g. in complying with the rule book). Poorly organised farmer organisations with unaccountable leaders are unable to articulate farmers' demands and do not provide the required counterbalance to the all-powerful *office* – section 2.2 will elaborate on this. Poorly functioning institutions restrict information and knowledge exchange – especially when farmers' needs are not adequately articulated, or when farmers and other stakeholders are not consulted about important developments (e.g. about new project interventions, or changes to rules and regulations). Ineffective governance systems and lack of accountability affect all parts of the system (e.g. when the different types of farmers and other stakeholder groups are not represented in key decision making fora, or when there is insufficient transparency about decisions and budgets).



An exercise in participatory video by women farmers in Bagré, Burkina Faso.

Credit: Barbara Adolph

2.2 WHAT'S WANTED: THE DEMAND FOR AAS

2.2.1 Different producers' needs

Most of the literature on large irrigation schemes differentiates between smallholder family farmers and (medium to large scale) agribusinesses, but the reality is much more complicated. An analysis of smallholder farmer livelihood strategies in the three sites¹³ undertaken by GWI showed that farmers differ significantly in terms of their origin, family size and composition, sources of income, access to and control over productive assets (land, livestock, implements etc.) and, consequently, in their chosen livelihood strategies. The studies made an attempt to develop typologies of farmers for each site, acknowledging that such groupings are always approximate. Two overlapping categorisation systems emerged: by origin and by assets and livelihood strategy, as explained in Box 6.

BOX 6

Types of smallholder farmers in the three irrigation schemes

A **first typology** uses the origin of farmers as the main criterion. Where some farmers were re-settled to make way for the construction of an irrigation scheme, three categories usually emerge:

- a. Those who were resettled (because their villages and agricultural lands – both for crop cultivation and grazing – were displaced by the new infrastructure);
- b. Those who live near the schemes but whose villages and lands were not affected – often these villages host the resettled farmers from category (a);
- c. The 'migrants' who moved to the area after the scheme was built. Arguably, the term 'migrant' may not fully reflect the diversity of those moving to irrigation schemes. Generally one thinks of migrants as people who are forced to move from their home because of harsh conditions, whereas migrants moving to irrigation schemes may have resources and be seizing an opportunity. Migrants constitute a very diverse category – ranging from drought refugees to retired army personnel and civil servants.

This typology has advantages, because it creates distinct categories, often with distinct livelihood strategies. For example, category (b) farmers tend to still be very active in other agricultural activities, as they are the traditional land owners in the area. They tend to keep livestock and have access to rainfed land and pastures. Category (c) often does not have secure access to land outside the irrigation scheme, in particular when they arrived 'late', i.e. at a time when the area around the scheme has already become an agglomeration and growth zone, resulting in higher demand and competition for land. But some of them may have a regular source of non-farm income in the form of pensions or remittances, or they may choose to specialise in rice cultivation as a business activity. Category (a) households received irrigated plots as compensation for the land lost due to the scheme construction, but may have since lost these plots if they have been unable to comply with the *cahier de charges* or 'rule book' that sets out the obligations of the plot holder and the *office*¹⁴.

The **second typology**, which partially overlaps with the first, uses households' assets and level of diversification as the main grouping criteria, irrespective of the origin of the household. The resulting categories are:

13. Hathie *et al.* (2013), Kergna *et al.* (2013), Ouédraogo and Sedogo (2014) and Guèye (2014).

14. For example, in Sélingué, several re-settled households lost the irrigated plot allocated to them when paddy transplanting was introduced by ODRS, as they were unable to comply with this new technology.

- i. Diversified households with adequate assets;
- ii. Diversified households with few assets;
- iii. Monoculture rice with few assets;
- iv. Monoculture rice / specialisation with adequate assets.

Category (i) are farmers who are relatively well off (and often were so before the scheme was built), with large and well equipped rainfed farms, livestock, sufficient family labour, high levels of social capital and a highly diversified livelihood strategy, including remittances from migrants and non-farm rural employment. Category (ii) differs from (i) in the level of assets – (ii) may be smaller / younger households with fewer adult members who can earn, and more limited access to land and other productive assets. Categories (iii) and (iv) both focus on rice, but category (iii) does so not out of choice but need – these are often resettled or migrant farmers who have little or no rainfed land and no livestock. The irrigated plot is therefore their only productive asset and they rely on agricultural labour and seasonal migration to supplement incomes. Category (iv) are those farmers who specialise in rice farming – for example in Burkina, rice seed producers generally belong to this category and often hire land from other farmers on an informal basis. In Niandouba, a few local businessmen operate large areas (up to 50 ha) using their own farm machinery, which they also hire out to others. Whilst this category is by far the smallest – less than three per cent of producers – they best-fit the managing agencies' visions and government policies for rice self-sufficiency through irrigation.

In addition to these two typologies, one could also differentiate farmers by gender and age, with women and youths occupying a relatively small proportion of irrigated plots¹⁵. This imbalance is because, when irrigated plots were initially allocated, it was done on a household basis with the senior man considered to be the head of the household and the plot registered under his name. At that stage very few women and no youths received plots. A few widows who received small areas for horticulture were the exception. As women became more experienced in rice cultivation, their interest in having their own plots increased, and it is now general practice to allocate at least 15 per cent of new plots to women and youths – individually or as cooperatives / groups¹⁶.

The interests and needs of the different types of smallholder rice farmers described above are clearly different. Take their technological requirements as an example. As more than half of them engage in a range of activities besides rice farming, they require AAS for these different enterprises, including for rainfed crops (maize, millet, sorghum, groundnuts, beans, Bambara nuts, sesame, cotton etc.), livestock production (cattle, goats, sheep, chicken) and fisheries. Even those who produce mostly or only rice have different requirements depending on their asset base. For example, mechanical tillage is too expensive for some, who prefer to use manual labour. Others can afford to hire a tractor. Some pest and disease control methods are very labour intensive, so are only used by farmers who are willing and able to mobilise this labour. Using compost and

15. In Niandouba / Confluent, about 30 per cent of irrigated plots are cultivated by women, but the proportion of 'official' female plot holders is lower. In Sélingué, 16.5 per cent of all the irrigated plots have been allocated to women, including about 34 per cent of the vegetable plots. In Bagré, women received 20 per cent of the irrigated plots in the recently opened 1,500 ha, but none under earlier allocations. A 30 per cent quota for women is envisaged for Bagré in the future. Source: Personal communication from SODAGRI, ODRS and Bagrépôle via GWI country coordinators.

16. Personal communication from SODAGRI, ODRS and Bagrépôle via GWI country coordinators

manure for soil fertility management is only practical for farmers with livestock and transport. Meanwhile, seed producers have specific advisory requirements as they need to meet high quality standards.

Further, advice for the appropriate 'business model' needs to be adapted to farmers' circumstances. Most farmers will produce little surplus and therefore may want to sell via their cooperative or to local traders. By contrast, some of the larger producers may well be able to organise their own transport to more lucrative markets, e.g. in the capital cities. Smaller producers may not be eligible for certain types of loans, but may be entitled to other types of support, in particular input subsidies. Again, seed producers have specific needs as their market is different from that of grain producers.

There is also a social dimension to farmers' requirements. Literacy levels, experience with irrigated and rainfed farming, and social capital or 'standing' in the community vary tremendously, with direct effects on farmers' ability to mobilise and use key resources for production. New migrants may find it difficult to hire agricultural labour during peak times. Women and youths face particular challenges in mobilising resources (including credit, land and labour) and therefore require specific strategies and support.

To give an example, Table 1 summarises the needs of different groups interviewed from Bagré, Burkina Faso. It demonstrates the importance of customised AAS for different types of farmers, as elaborated in section 2.3. Note that most farmers do not perceive input supply, processing and marketing to be part of AAS mandate – which reflects farmers' experience to date with AAS. However, farmers would like AAS to play these roles (as shown in Box 8).

2.2.2 Articulating farmers' needs: the role of farmer organisations

Farmer organisations (FOs) are important for helping members access inputs and credit – and often this is the first function a farmer would mention when asked about his / her reason for joining a cooperative. In West Africa, FO membership is usually required for access to subsidised fertiliser. However, FOs are also important in articulating their members' needs to other parties (including irrigation scheme managing agencies, development projects, agri-processors and traders, input and credit providers) and being an intermediary in negotiations between their members and these parties. They coordinate and communicate activities in the irrigated areas, such as following up on the payment of irrigation fees and on compliance with the 'rule books'. They are also the main interface (via national FOs) with decision makers at national and regional level. Last, but not least, they develop capacity, supporting their members in becoming more professional, successful farmers who are more able to adhere to the agreed rules, regulations, roles and responsibilities.

At all the three schemes studied there are a number of different farmer organisational and institutional arrangements in place, with varying degrees of functionality. The history and supporting policy framework of these arrangements varies between schemes and countries, creating a multitude of structures (which are summarised in Box 7).

TABLE 1**Different producers' needs for AAS in Bagré**

(adapted from Sedogo and Bourgou 2015)

Value chain	Farmer union	Manual producers	Producers with machinery
Organisation of producers	Hold planning meetings for each cropping season to provide information about farm operations and for monitoring; keep a record of people who respect the operations; keep a sanction register of offenders; support farmer organisations and their cohesion.	Establish a specific 'rehabilitation' plan for this group of vulnerable producers; establish a specific funding mechanism to help them gradually improve their situation.	Assign to each village an agricultural advisor who accompanies producers and their group.
Input supply	Farmers believe that this falls outside the scope of AAS, but AAS should provide technical advice to producers on fertiliser quality and type (depending on soil type) and on dosage and application of fertilisers and pesticides. They should also keep track of input stocks.	Organise and accompany producers to develop strategies for accessing inputs.	Farmers believe that this falls outside the AAS mandate.
Production	Ensure compliance with the cropping calendar and the rule book; undertake regular monitoring (in particular of pests and diseases); be responsive to farmers' needs and advise them e.g. on pest and disease management; follow up with irrigation committees and farmers on maintenance of infrastructure.	Visit each farm at least once for each agricultural operation, also to identify un-used plots; facilitate access to tractors and implements, consider lack of tillage equipment when designing the water schedule, as manual producers cannot meet the same schedule as those who have equipment, from whom they expect support.	The AAS must ensure strict compliance with the agricultural calendar, monitor all production stages and provide advice to farmers on request.
Harvest and storage	Determine the maturity level of the rice to trigger harvesting, weigh the rice and calculate the expenses in order to determine the credit repayment amounts, advise on drying to manage moisture issues	Test the level of moisture in rice and give the OK to bag before weighing, advise on drying to avoid buyers rejecting the rice due to high humidity levels.	Monitor the rice crop to confirm its maturity and then ask producers to harvest; do follow-up visits during the drying stage to provide advice on drying.
Processing	Farmers believe that this falls outside the AAS mandate.	Farmers believe that this falls outside the AAS mandate.	Farmers believe that this falls outside the AAS mandate.
Marketing	Farmers believe that this falls outside the AAS mandate. The AAS may just help in doing the farm accounts and advise on pricing of rice.	Farmers believe that this falls outside the AAS mandate.	Farmers believe that this falls outside the AAS mandate.

Producers with recently allocated plots	Woman-headed households	Seed producers
Support farmer groups (voluntarily formed groups of about 10 farmers) to obtain a legal / official status.	Help put an end to disagreements and create cohesion in farmer groups, which are currently not functioning.	Organise study and business tours; Ensure access to a consolidated production site (currently the production plots are scattered).
Assist producers in developing a start-up fund for covering production expenses; organise producers to support their access to implements / machinery and inputs.	Help women access agricultural loans and inputs.	None, because the seed producers master the cropping cycle and have the resources they need.
Continuously train and re-train new beneficiaries on the rice production cycle, help them get loans for equipment, inputs and labour.	Train women in various aspects of crop production, water management and irrigation infrastructure maintenance. AAS should be available locally to advise women farmers on a daily basis and help resolve conflicts between farmers, for example in relation to the irrigation schedule.	Introduce new technologies.
As for producers with machinery.	Assist women farmers in accessing transport for taking rice to the drying areas, train women in rice drying techniques, visit them regularly.	
Farmers believe that this falls outside the AAS mandate.	Help women with credit to buy the rice and undertake parboiling.	Advise on choosing and using the best equipment for sorting and grading.
Farmers believe that this falls outside AAS mandate, but AAS can still help groups to organise themselves well to group production and negotiate a good price.	Farmers believe that this falls outside the AAS mandate.	Control seed quality and supply, provide packaging materials on time, undertake certification as soon as possible to enable sales and deliveries before the start of the rainy season.

BOX 7

Types of farmer organisations in the three schemes

Farmer organisations can be of different size and geographic scope – e.g. small groups or cooperatives, usually comprised of neighbours or family members; intermediary groups (such as larger cooperatives or water management unions); and apex organisations (farmer unions or federations regrouping all farmers benefiting from the scheme).

GIE (*Groupements d'intérêt économique* / Economic interest group) and small cooperatives

These are the smallest 'formal' units and often consist of members of just one extended family, or of a neighbourhood group. They are normally registered with local authorities, which entitles members to receive loans from micro-finance institutions or subsidised inputs. Their origins vary, with many starting up when irrigated plots were originally allocated under the schemes. Subsequently, new groups may form either because of specific project interventions (such as support to women's rice parboiling cooperatives from NGOs such as OXFAM) or to exploit specific opportunities (such as for banana producers in Sélingué). Groups tend to have between 10 and 30 members, who generally have some level of affinity and social capital. In Anambé (Niandouba and Confluent dams), there are 264 GIE, with 3643 members as of May 2014 (Cissé and Diouf 2015). In Sélingué (and the adjacent Maninkoura scheme) there are 65 cooperative societies, most of which are affiliated with one of the two agricultural unions.

Large, village-based organisations

In some locations, such as Bagré, scheme managing agencies formed larger village-based organisations in a fairly top-down manner. In Bagré, organisations were set up for each of the 16 newly-formed villages established after the irrigation scheme's construction. These villages were a mix of migrants, local and resettled farmers. To start with, there were about 100 households in each village with each of the households being a member of the organisation, but over time families have split up and new migrants have arrived, so that in reality the cooperatives are now larger. The main challenge with such large and externally-initiated organisations is that there is very little social cohesion and it is difficult to mobilise such a large number of people for any type of collective action.

Water user association and *unions hydrauliques* (hydraulic unions)

These are based on sub-sectors within the irrigation scheme and generally re-group farmers whose plots receive water from the same secondary canal. In Anambé there are four such unions, each re-grouping between 42 and 93 GIE (and 460 to 1500 members). In Sélingué there are much smaller irrigation-based organisations, whereby each sub-section of irrigated land has a '*chef de casier*' (section chief) who is responsible for water allocation and reporting any problems with irrigation infrastructure to the *office*. In Bagré there were initially farmer irrigation committees, but now the irrigation schedule is directly managed by the Bagrépôle agents.

Scheme-level farmer unions or federations

All three schemes have unions that represent the interests of the different cooperatives. In Bagré, there are in fact three different unions: The Rice Producer Union, the Seed Producer Union, and the women's Rice Parboiling Union. In Sélingué there are three unions. One covers the part of the scheme that is under pump irrigation (Maninkoura). The two others cover most of the Sélingué site – but some cooperatives are not members of any union. In Niandouba there are four unions, covering different parts of the irrigated area that belong to a farmer federation. At this level farmer organisations are most powerful (if well managed), because they constitute a strong interest group that negotiates on behalf of its members and can influence decisions.

Donor or government supported projects and programmes have often tried to improve the functioning of FOs, through capacity development initiatives including developing both technical and managerial skills. In each *office* there is a designated staff member to support FOs. Despite these efforts, there are serious capacity gaps in almost all the organisations the project worked with. Challenges can be grouped into the following broad overlapping categories:

- **Poor levels of communication, transparency and accountability.** This appears to be one of the most common problems of FOs, and a major contributing factor to poor performance. There are clearly logistical challenges for FO leaders contacting or communicating with a group of dispersed members, many of whom are illiterate. However, these obstacles are becoming less problematic with the spread of mobile phones and local FM radio stations. The behavioural dimension of communication appears to be more significant, with office holders (presidents / chairperson / secretaries) of FOs often not informing members about relevant events or developments, and not reporting on decisions taken. Focus group discussions with farmers (as part of the GWI action research) recorded lack of trust in FO leaders and insufficient transparency and accountability as the most commonly mentioned challenges. FO members specifically complained about important information not reaching members and about unilateral decisions taken by FO leaders that ignored members' wishes or failed to consult with them.
- **Inappropriate structure, governance systems and non-adherence to agreed procedures.** FOs have shortcomings in the organisational structure and governance systems of FOs, with poorly defined roles and responsibilities of office holders and insufficient systems in place to ensure that members' interests are adequately represented. In all three schemes, the presidents of the farmers' unions / federation stayed in power years beyond the period stipulated in the FO's statutes – this was only rectified in Bagré and Anambé in response to outside interventions¹⁷.
- **Low capacity and / or will to overcome social and ethical divisions.** FOs are sometimes formed along ethnicity or political affiliation, which can reinforce existing divisions between farmers if not appropriately managed at a higher organisational level. For example, in Sélingué there are two 'competing' farmer unions (rather than one union or a federation for all farmers cultivating land under the scheme) and this has weakened farmers' bargaining power with other actors, notably the scheme managing agency ODRS. Where social or ethical divisions exist within a group, this can also lead to conflicts and poor functioning, in particular if some groups monopolise leadership positions.
- **Low levels of literacy and limited ability and capacity of members to challenge FO leaders.** Literacy levels are low and there is a culture in which most farmers do not challenge their leaders, who tend to be better-off, better educated and well connected individuals. As a result, the 'demand side of governance' is not really working effectively and FO members don't ask for more transparency and accountability and better overall performance.
- **Lack of experience in negotiating with external players.** With agricultural services in the liberalised economies of West Africa (Box 2) being largely supplied by the private sector, it is becoming increasingly important that FO can negotiate

17. In the case of FEPROBA, the Federation of Producers of the Anambé Basin, this was via VECO, a Belgium NGO providing organisational development support to FEPROBA as part of an FAO project introducing farmer field schools. In Bagré, non-conformity of the Rice Producers' Union with OHADA laws (the system of business laws and implementing institutions adopted by 17 West and Central African countries), resulted in farmers being unable to access bank loans for inputs in 2015-16. The union is currently undergoing a GWI-supported re-structuring process to ensure conformity with the law.

on behalf of their members – e.g. to agree on terms and conditions for agricultural credit, input prices, hiring of machinery, transport and marketing costs, etc. However, the FO in the three study sites have very little experience with and knowledge about how to conduct such negotiations and still largely rely on the support of the *offices*. There have been recent improvements, but there is still a long way to go and until then FOs and their members are still dependent of external support – something that is not sustainable in the long term.

- **Weak representation of women and youths.** While there are some GIE or cooperatives exclusively for women and youths, these groups are systematically underrepresented at the apex body level (farmer unions or federations). Hence their interests and concerns are rarely discussed or addressed, unless there are specific gendered project interventions directly targeting these groups.

These challenges are not unique to irrigation systems – indeed they are very common to FOs in much of Sub-Saharan Africa. The solutions are also not unique. They include concerted organisational development programmes, followed by more ‘hands-off’ accompanying support to FOs. The person power for such support is, in principle, available – all the *offices* have designated staff to support FOs. However, these staff may lack the expertise, tools and resources to support bottom-up reforms of FOs. There appears to be a lack of interest from governments and donors to prioritise farmer organisational development beyond *ad-hoc* formation and training of groups around specific programme interventions. At national level there may well be (donor and government supported) farmer fora or networks in place¹⁸, but these do not normally provide hands-on support to local farmer organisations. They may also experience similar governance challenges and hence not be in a good position to advise their members.

A number of previous agricultural development projects supporting agricultural production under the three studied schemes (e.g. the Rural Development Support Programme in the Anambé Basin of Senegal – PADERBA – or the Agricultural Productivity and Food Security Support Project in Burkina Faso – PAPSA) included a capacity development component for FOs. However, there has not been a concerted effort to provide demand-led comprehensive support to FOs with an emphasis on institutional and governance issues. Even the most recent AfDB supported projects¹⁹ in Sélingué and Bagré focus on the technical and commercial skills of FOs for value chain development and the formation of new FOs for women and youths, rather than on ensuring effective governance, accountability and communication within FOs (see Table 2). Without accountable and functioning FOs, it is doubtful that these projects’ ambitious objectives will be achieved, and it remains likely that the high investments in infrastructure development will continue to underperform on expected rates of return.

2.2.3 What farmers want from agricultural advisory services

Focus group discussions with farmers and FOs in the three irrigation schemes provide an interesting picture of the type of advisory services that different types of farmers expect. These high expectations are far removed from the capacity of the FOs, which are currently not able to provide any AAS to members.

18. The CNCR (Cadre National de concertation et de coopération des ruraux) in Senegal, CNOP (National Confederation of FOs) and APCAM (Assemblée Permanente des Chambres d’Agricultures au Mali), in Mali, CPF (Confédération paysannes du Faso) in Burkina Faso, as well as ROPPA at the regional level.

19. PRESA / DCI – Project for Food Security Consolidation through Development of Irrigation Farming (Projet de renforcement de la sécurité alimentaire par le développement des cultures irriguées) in Sélingué and PAPCB – Bagré Growth Pole Support Project (Projet d’appui au pôle de croissance de Bagré)

TABLE 2**Priorities of two recent AfDB funded projects**

Characteristic	PRESA / DCI (Sélingué, Mali)	PAPCB (Bagré, Burkina Faso)
Project goal	Sustainable increase in agricultural output and productivity through efficient management of irrigation infrastructure and development of value chains for growth-oriented crop sectors	Contribute to strong and shared economic growth and to food and nutritional security
Project start and end dates	February 2014 – December 2019	April 2015 – April 2020
Total project budget	39.3 million UC	26 million UC
Project components		
Component A: Agricultural infrastructure development	59%	78.6%
Component B: Value chain development	34.5% (includes a component on capacity building, such as training of FOs in technical and financial management, establishment of water management and irrigation network maintenance committees, and equipment for AAS)	14.7% (includes some support for FO restructuring)
Component C: Project management	6.5%	6.7%

While different types of farmers have specific needs (as shown in Table 1), there is agreement on the general requirements set out in Box 8. Arguably, farmers' expectations are rather ambitious, especially given that public sector support for AAS is rather low and governments are looking for private sector involvement, e.g. through public-private-partnerships. Farmers still expect the government to provide AAS at no cost to themselves. Indeed, they have limited capacity to pay for AAS, as for other agricultural inputs. Again this is a challenge for AAS overall and not just for irrigated systems. Poorer farmers are often unable to afford knowledge services that may bring only longer term benefit (such as advice on how to improve soil fertility or reduce weeds).

In Bagré, the irrigation fees farmers pay nominally include funding for AAS. But this fee-component constitutes a very small budget and farmers do not have any say in how it is spent. Governance systems and communication mechanisms that enable farmers to influence the AAS agenda are discussed in section 2.4.

To summarise, farmer organisations are generally weak and not in a good position to articulate the needs of their different types of members to service providers and other actors. There have been investments in farmer organisational capacity in the past, but much of this has been piecemeal, focusing on specific technical or farm enterprise skills, rather than organisational capacity and accountability to members. Without such investments, the demand side is unlikely to provide effective pressure for improved AAS.

BOX 8

Farmers' expectations of AAS – as gathered in focus group discussions

AAS roles

- AAS should include advice along the value chain for all elements of the farming system (irrigated rice, other irrigated crops, rainfed rice, other rainfed crops, livestock production, agroforestry, soil and water conservation, aquaculture etc.).
- AAS should be actively involved in the re-organisation, organisational development and capacity building of farmer organisations.
- AAS should also have a role in enforcing the rules defined and accepted by all stakeholders (such as compliance with the cropping calendar, mandatory participation in maintenance of canals, participation in group meetings). In the long term most farmers would like farmer organisations themselves to play this role – but currently their capacities are too low to do so.
- Farmers also want AAS to provide a platform for dialogue between the different actors, including scheme managers, input and credit providers etc.
- In all three sites farmers complained about AAS playing a monitoring and control function with very little technical support to farmers. For example in Anambé, farmers complained that they only ever see advisors when they record what parts of the irrigated area has been cultivated or harvested (for their own reports to the Ministry of Agriculture). Farmers would like AAS to prioritise their role of advising and supporting farmers rather than spend most of their time in the field with data collection.

AAS approaches and behaviour

- All farmers interviewed want AAS to be accessible, with agents regularly 'on the ground' so that farmers can approach them easily. Similarly, they would like agents to be responsive and react quickly when problems are reported (e.g. pest attacks or weed infestation).
- While farmers believe that a group approach is most appropriate for training and capacity development, they would still like to be able to draw on AAS on an individual and ad hoc basis, whenever they need support.
- Farmers would like advisors to be highly motivated and keen to work as partners in a way that respects farmers' own experience and knowledge. This requires good communication skills by advisors, who should be able to speak the local language, to listen carefully and to communicate effectively with both women and men, young and old, educated and illiterate farmers. Advisors should be able to customise their advice to different farmers' requirements.

AAS contents

- Farmers expect AAS providers to have up-to-date technical knowledge and thus the ability to bring something new to the table. In all three sites some farmers felt that they actually knew more about rice farming than the advisors, based on their own experience and advice from input suppliers and other sources. In particular, farmers want to have access to subject matter experts who have in-depth knowledge of specific aspects, such as pest and diseases, soil fertility management, storage and processing, etc. Advisors should therefore be in regular contact with research organisations to learn about new technologies and approaches.
- Advisors should also have a good understanding and knowledge of the local area and its particular environmental, social, political and cultural makeup, so that their advice is suitable to the specific context. This includes knowledge of the other development actors in the area and the types of services they may be able to provide to farmers.

Sources: Cissé and Diouf (2015), Sedogo and Bourgo (2015), Cessouma and Touré (2015).

2.3 WHAT'S ON OFFER: THE SUPPLY SIDE OF AAS

2.3.1 Agricultural advisory and associated services on offer

The GWI-facilitated self-analysis of farmers and service providers showed that different types of farmers are accessing and using different agricultural services, including knowledge services, from a range of service providers. These include:

- The *offices* or scheme managing agencies, who provide AAS to farmers (either individually or to groups) and link farmers to other service providers;
- The Departments of Agriculture operating in the respective administrative area where the schemes are located – usually with staff mandated to provide AAS to all farmers in the area and often with support from donor-funded agricultural and rural development projects or programmes;
- Micro-finance institutions and banks (governmental, private sector or NGOs) providing loans for inputs and implements;
- Private sector input dealers selling agro-chemicals (in particular seed, inorganic fertiliser, herbicides and pesticides) – mostly as individual cash transactions, except for fertiliser which is also sold via government subsidy systems to agricultural cooperatives;
- Private entrepreneurial businesses of various sizes hiring out agricultural machinery and implements for land preparation (tractors), harvesting and processing;
- NGOs providing different types of support services to farmers on a project basis;
- Farmer organisations / cooperatives or groups providing processing services – in particular women's parboiling cooperatives;
- Private or public FM radio stations that provide information to farmers e.g. on prices and market opportunities, and sometimes run project-supported agricultural programmes or listening clubs for farmers;
- Agro-traders (governmental or private) buying produce (in particular rice) from individual farmers or from cooperatives.

Liberalisation of the region's national economies means there are now fewer services provided directly by government agencies and the AAS system is slowly becoming more pluralistic, with different service providers catering for different needs. However, so far the *offices* and the departments of agriculture are still struggling to effectively link farmers to different types of service providers. They also struggle to regulate or oversee these services, i.e. to ensure that they operate legally, safely and in the interest of farmers (e.g. offering fairly-priced services with transparent contractual terms) and in the interest of wider society (e.g. in terms of environmental sustainability and food safety). Furthermore, there are still large gaps in AAS's capacity to respond to the needs of poorer farmers with fewer resources, in particular when these farmers are also less literate.

Table 3 shows the different service providers around the three schemes studied by GWI. The main providers of knowledge services remain the scheme managing agencies. These are also the only organisations with field staff that provide farmers cultivating land under the irrigation scheme with advice on the ground (as staff from the Department of Agriculture do not normally provide advice on irrigated farming).

TABLE 3**AAS providers around the three schemes studied**

Category	Bagré	Sélingué	Niandouba / Confluent
Scheme managing agencies (and their roles)	Bagrépôle – management of the irrigated area and provision of AAS to farmers	ODRS – management of the irrigated area and provision of AAS to farmers	SODAGRI – management of the irrigated area and provision of AAS to farmers
Services managed by the farmers' unions	Currently no services provided	No services provided	COGEMA (Comité de gestion du matériel agricole) – manages the agricultural machinery park
Ministry of Agriculture	DRASA (Direction régionale de l'agriculture et de la sécurité alimentaire)	Le service local de l'agriculture (local agricultural services provided by the ministry)	DRDR (Direction régionale du développement Rural)
	DVRD (Direction de la vulgarisation et de la recherche-développement)		DPV (Direction de la protection des végétaux) – provides advice to SODAGRI on plant protection
			ANCAR (for advice on crops other than those grown under the irrigation scheme)
Agricultural research	INERA, Africa Rice – provide technical advice to Bagrépôle	IER – provide technical advice to ODRS	ISRA and Africa Rice provide technical advice to SODAGRI
NGOs	Sahel Farming – rice value chain development	Currently no NGOs are operating with rice producers	VECO (Vredeseilanden) – supported re-structuring of farmer union
Agricultural (micro) finance	Coris Bank, BCB, Première Agence de micro-finance, Caisse Populaire	BNDA (Banque nationale de développement agricole)	CMS, CNCAS – provision of agricultural loans
Private sector / PPP	FAS Bagré (Fonds d'appui aux services de Bagrépôle) – support to farmer organisation initiatives – for up to 80 per cent of total costs	Toguna Agro-industrie and YAARA – fertiliser suppliers	SEDAB (La Sahélienne d'entreprise de distribution et d'agrobusiness) – supply of seed and fertiliser to hydraulic unions
			SODEVOL (Société de développement des oléagineux) – contract farming of oil seed crops
Parastatal	SOFITEX (Société burkinabè des fibres textiles) – AAS and input supply for cotton producers	CMDT (Compagnie Malienne pour le développement du textile) – AAS and input supply for cotton producers	SODEFITEX (Société de développement des fibres textiles) – AAS and input supply for cotton producers

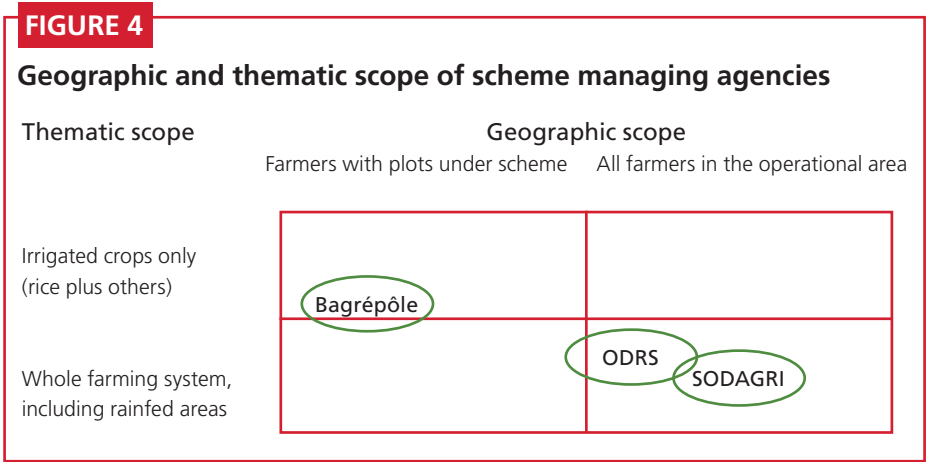
Source: personal communication from GWI coordinators.

2.3.2 Irrigation scheme managing agencies’ mandate, roles and strategies for AAS

The mandates of the three scheme managing agencies vary, and this significantly affects the scope of AAS provided. Bagrèpôle has a clear mandate to develop the area irrigated by Bagré dam, working only with those farmers and agri-businesses who have been allocated a plot of irrigated land in the scheme. This includes all aspects of irrigated farming, but also developing fisheries and livestock farming (agro-silvo-pastoral systems). In contrast, both ODRS and SODAGRI have a regional development mandate, with the area irrigated by the dam being only one component. In practice, both agencies spend most of their resources (in terms of staff time and operational costs) on the land irrigated by the dams (including on infrastructure maintenance and water management, as well as on specific support to those farmers and their organisations cultivating irrigated plots). However, their mandate includes providing AAS to a wider geographical area. In the case of SODAGRI, this is the Anambé plateau (to be extended in the near future to an area covering most of the Southern part of Senegal with an area of around 300,000 ha), and in the case of ODRS an area of about 440,000 ha covering 19 municipalities in two administrative regions. See Figure 4 for a mapping of the agencies’ mandate along the two dimensions of geographic and thematic scope.

The agencies have specific targets, generally formulated around agricultural production (in particular rice), area under cultivation, and – in the case of Bagrèpôle – around attracting investors, agribusiness, service providers and creating employment. They are accountable to the government (and, for specific projects, to funders) and budget allocations are dependent on performance. Farmers contribute either nothing at all (in the case of SODAGRI) or very little (via irrigation fees in the case of Bagrèpôle and ODRS) to the agencies’ operational budgets.

Currently, only Bagrèpôle has a strategy for AAS (Bagrèpôle 2013). This is based on Burkina Faso’s national agricultural extension strategy (SNVACA) (MAHRH, 2010). It focuses strongly on developing those farms that also have irrigated plots, but at least nominally uses a farming systems perspective. The strategy includes many innovative elements that are based on good practice for AAS, such as participatory diagnoses of constraints and opportunities, effective linkages with agricultural research institutions, and enhanced Monitoring, Evaluation and Learning (MEL). It also stipulates



that farmers can themselves submit requests for services to AAS providers. However, certain elements are missing from the strategy:

- There are no accountability mechanisms to ensure that requests for services, if submitted, are followed up and dealt with. There are not even clear communication channels between farmers and their organisations on the one hand, and AAS providers on the other.
- The strategy confirms AAS's key role in enforcing the rule book (*cahier de charge*) and the cropping calendar, but this is not very compatible with the facilitating and accompanying roles also identified for AAS.
- The strategy emphasises AAS as services that support farmers along the value chain, but this role is poorly described, leaving it open to a wide range of interpretations. For example, the strategy says that the AAS provider should 'support producers in accessing inputs', but does not specify what this support may entail.

It is encouraging that AAS's 'facilitating role' is clearly reflected in the Bagrêpôle strategy, but so far the strategy has not been fully operationalised due to limited organisational and human capacity both among Bagrêpôle advisors and among farmers and their organisations. However, the actual existence of a strategy is arguably already a first step towards a more focused and effective AAS.

Neither SODAGRI nor ODRS have AAS strategies in place. Their approach is oriented by the '*lettre de mission*' with the government. This specifies the scope of their work but says very little about how to achieve the objectives set out. In the absence of strategies, their AAS approach has been strongly influenced by various projects (for example farmer field schools introduced by FAO). However, as the approaches promoted by FAO and others require substantial operational funds and capacity development, they have not been continued beyond the duration of the projects.

In 2014, focus groups discussions (between GWI staff and AAS providers from the three scheme managing agencies) attempted to identify how the providers themselves see their role (the discussions did not necessarily imply that they are fulfilling this role). The outcome is shown in Table 4. Section 2.4.3 provides a fuller discussion on this 'self evaluation' (and similar analyses by farmers and their organisations). Interestingly, there are significant differences between the three agencies. Whilst AAS providers from all three agencies see their main role as providing technical advice to farmers on agricultural production matters, there is also a strong emphasis in Bagrê and Sélingué on supervision, monitoring and rule enforcement, whereas AAS providers in Niandouba / Confluent emphasise their facilitating and supporting role. Farmer organisational development is not a high priority for AAS in any of the three sites, possibly because there are designated staff for this function with the agencies. Whilst there is general agreement that AAS has a role to play in supporting farmers in accessing inputs and marketing, subsequent discussions showed that AAS staff feel less competent in fulfilling this role (as compared with their 'traditional' production-oriented role).

2.3.3 Structures and capacities of AAS offered by the scheme managing agencies

ODRS, SODAGRI and MOB (the predecessor of Bagrêpôle) are government agencies under the Ministry of Agriculture. They are organised in a hierarchical way, with

TABLE 4**Self-assessment of AAS – priority roles as seen by the scheme managing agencies' agricultural advisors**

Role	Number of times mentioned (by those present at meeting)*		
	Bagré (12)	Sélingué (15)	Niandouba / Confluent (11)
Technical advisory support (arranging demonstrations, accompany producers throughout the crop production cycle, advising producers on new production technologies and on input use)	16	15	15
Supervising and monitoring (ensuring that rules are followed)	8	14	0
Organising producers (supporting farmer organisations)	8	2	2
Supporting farmers in accessing agricultural inputs and equipment	6	6	0
Planning the cropping calendar	6	0	0
Training farmers	6	11	3
General facilitation, communication, understanding and addressing farmers' constraints	0	0	7
Helping farmers to achieve increased food security, yields and incomes and / or to be more autonomous	3	3	6
Maintaining the irrigated areas	3	0	0
Supporting marketing / offering business support / supporting farm accounts	5	0	0
Allocating irrigated plots	0	1	0

Source: meetings with AAS staff of Bagrépôle (02/12/2013), SODAGRI (27/02/2014) and ODRS (03/03/2014).

*Note: because answers given were subsequently grouped into the 11 categories presented here for the sake of comparison, the number of times mentioned can be higher than the number of participants in the meeting (e.g. if several people mentioned different types of technical advisory support).

upwards accountability of staff (who are effectively civil servants). When MOB was transformed into Bagrépôle, it became a parastatal company, but its structure remained essentially unchanged. However, there have been significant investments in strategy and leadership development as well as other aspects of organisational development under the World Bank-funded Bagré growth pole project.

Each of the three agencies studied had designated departments for AAS and farmer organisational development. These are both key components to ensuring that farmers' needs for agricultural services and knowledge are met (and so ensuring they can increase productivity, incomes and secure sustainable livelihoods). However, there are significant differences in the resourcing and capacities of these departments and their staff, which are strongly dependent on donor funded projects or programmes that provide training, transport and communication facilities as well as other field operations costs (e.g. for experiments or demonstrations).

TABLE 5**Profile of AAS staff at the three offices, 2015**

Characteristics	Bagrèpôle	ODRS	SODAGRI
Total number of AAS staff	10*	42	16
AAS staff allocated to the irrigated areas	10	16	5
Total number of households with irrigated plots	3,080	2,622	3,643
Irrigated households per AAS staff working in irrigated areas	308	164	729
Total area under irrigation	4,880	2,294	5,000
Ha of irrigated area** per AAS staff	480	143	1,000
Average age of AAS staff	50 years	40 years	33 years
Average years of experience of AAS staff	20 years	15 years	19 years
Number of motorbikes available to AAS staff	10	21	16
Number of PCs / laptop available to AAS staff***	2	10	12

* Plus 5 marketing technicians from Sahel Farming (temporary project staff).

** This refers to the area that can be irrigated – normally only a proportion of this would de facto be irrigated and cultivated during a given season, depending on the state of water management infrastructure and farmers' ability to mobilise resources to cultivate.

*** This includes personal laptops / PCs.

In terms of expertise and experience, AAS staff in all three sites are generalists. All staff support farmers with irrigated plots and are expected to be able to deal with agronomic issues such as planting dates and spacing, soil fertility and water management, pest and disease control, access to inputs and markets, infrastructure maintenance etc. There are no subject matter specialists who can provide technical backstopping on specific issues. AAS agents generally developed a broad knowledge of the whole rice cropping cycle over time, but are often not able to deal with specific challenges, such as new pests and diseases, advising on ways to reduce fertiliser dosage, or on new varieties.

All three agencies are currently receiving project support for infrastructure rehabilitation and value chain development (Table 2). SODAGRI received support from the World Bank funded project PASAEL, which included some support to AAS (equipment and training), and potentially some support to AAS strategy development. However, such support is inevitably ad hoc and does not address long term professional and career development aspects for AAS staff. Nor does it provide sustainable solutions to the various operational and institutional challenges and shortcomings perceived by AAS staff and farmers (section 2.3.6).

2.3.4 AAS approaches and methods used

All three sites have gone through several phases of AAS, largely as a result of changes in donor priorities and strategies. Box 9 shows the case of ODRS in Sélingué, which has gone through four fairly distinct phases.

2.3.5 Coordination and communication between knowledge services

AAS, by their very nature, depend on communication. AAS providers need to effectively communicate with farmers and their groups, with other service providers serving 'their' farmers along the value chain (in particular input and credit providers, agri-processors and buyers), and with different types of agricultural knowledge services (especially

BOX 9

AAS approaches used by ODRS in Sélingué from inception until now

- **Broadcast method:** the villages in the area were divided between AAS staff, who would often visit producers both on the irrigation scheme and in the villages. There was a permanent monitoring of farmers with frequent interactions. AAS would interact mostly with individual farmers, not via farmer groups.
- Under the National Programme for Agricultural Extension (PNVA) (*bolonanitru foro*) or **training and visit** approach, each AAS staff was responsible for a number of villages, where farmer groups were created around demonstration plots. The AAS staff regularly visited these sites and trained farmers. There was a regular and uniform schedule of activities and training that was the same for all farmers.
- **Farmer field schools for integrated pest management:** these are based on experiential learning, where farmers themselves identify themes. Farmers learn by observation and experimentation, using their own knowledge. The AAS staff member is there to support the learning, together with lead farmers / facilitators from amongst the farmers. Some of these activities are still ongoing in Sélingué, where an FAO programme introduced farmer field schools.
- **Joint committees** are advisory and decision making bodies made up of scheme managing agency staff and farmers' representatives. They agree the cropping calendars and also develop a framework for planning and deliberating the overall management of the perimeter. This framework, whilst useful in principle, is not well viewed by most producers because there is little or no communication about the issues to be discussed and decided.

Sources: Cessouma and Touré 2015.

agricultural research organisations). The role of AAS as an intermediary between the different service providers farmers need has been emphasised earlier. This mediation role requires institutional mechanisms that enable quick and effective communication. It also needs AAS providers who are willing and able to take on a facilitation and brokering role.

However, in practice there are surprisingly few formal or informal mechanisms for coordination and communication. The hierarchical nature of the scheme managing agencies, combined with shortages in transport and communication equipment, means that in practice most AAS do not communicate regularly with other stakeholders. Linkages to research organisations happen when there is a MoU with the scheme managing agency, but there appear to be very few if any informal contacts between individual AAS' staff and researchers. This may also be related to the differences in status between researchers and AAS' agents, with the former not generally considering themselves to be service providers for farmers and therefore not needing to respond to requests for advice. Likewise, GWI found very few institutional linkages between the scheme managing agencies' AAS and other 'mainstream' AAS in the country. For example, in Senegal²⁰ ANCAR has only recently had more detailed interactions with SODAGRI as a result of the 'working group' process (see section 2.4.4). There is clearly much scope for improvement.

20. FNDASP has now been given the mandate to foster coordination among AAS providers in Senegal.

2.3.6 Meeting farmers' demands

Farmers in all three sites have a fairly clear idea of what they would like from AAS providers – they have been in contact with advisors over many years, and have seen their behaviour and performance. Many agricultural advisors themselves hold a plot of irrigated land (either in their own name or from someone else via an informal arrangement), and hence their abilities as farmers are well known. The general opinion of farmers in all three sites is that they expect a lot more from agricultural advisors than they currently receive. Having themselves grown rice or other crops on their irrigated plots for many years, farmers believe that they have a lot of knowledge and experience, and their expectation is that agricultural advisors should be a few steps ahead of them, with knowledge of new farming methods and varieties, and ways of using expensive inputs in a more economical way. Farmers were very critical of the relatively shallow knowledge amongst advisors, who at times have neither an in-depth understand of the local context and culture (coming from other parts of the country), nor the advantage of close links with cutting edge research and technology. Farmers also expect advisors to be more pro-active in playing their intermediary role of linking producers to other service providers, in particular suppliers of agricultural credit, inputs and implements.

However, farmers' expectations are also limited by their own experiences with AAS so far and their understanding of AAS' role, as defined by existing institutional mechanisms. Farmers may well have additional needs that did not emerge during the exercise.

2.4 LINKING AAS SUPPLY AND DEMAND: THE NEED FOR EFFECTIVE COMMUNICATION AND GOVERNANCE SYSTEMS

2.4.1 The rationale for linking demand and supply

In a market based system, the market itself provides the link between demand and supply of goods and services via pricing mechanisms. In a competitive market, the unit price for a particular good, service or asset will vary until it settles at a point where the quantity demanded (at the current price) will equal the quantity supplied (at the current price), resulting in an economic equilibrium for price and quantity transacted. Customers or service users' demand for a service will be influenced by their satisfaction with the service received in the past, the availability of alternatives, and hence their willingness to pay for a particular service. In a liberalised economy with transparent markets and a range of alternative providers, a service provider would only be able to continue selling services if people are willing to pay for them, which would in turn depend on the seller's ability to meet potential clients' demands and expectations.

This is of course a very simplified summary of market mechanisms for agricultural services, which in reality are much more complex. However, the point is that, in the context of large irrigation systems in West Africa, pricing mechanisms don't always work because:

- The market is not competitive – there is only a very limited number of service providers, or in some cases only one.
- It is not the 'consumer' or 'user' of services who pays – most of the services are subsidised both by the state and by development finance (e.g. via government-run services or via NGOs that are funded by international aid).

TABLE 6**Farmers' expectations of AAS for the Niandouba / Confluent irrigation system**

What farmers say an 'ideal' AAS looks like	Characteristics of the AAS provided by SODAGRI in relation to farmers' criteria
A service accessible to farmers with available and motivated agricultural advisors: access to the AAS should be easy for producers, who often face technical difficulties during the production cycle (weeds, insect pests, water management, etc.).	Agricultural advisors are rarely in the perimeters and producers are often forced to travel to the office of SODAGRI to meet them. Some agricultural advisors do not seem to be motivated. Instead of providing technical assistance to farmers, they only collect data on production (area ploughed, sown and harvested, yield per hectare, etc.)
Innovative AAS with developments in knowledge and technologies: the service offered must continually evolve based on new technologies to enable producers to benefit from improved knowledge, practices and yields.	Agricultural advisors have no training plan or capacity building programme. They have conveyed practically the same agricultural technologies to producers for more than 15 years. There is no permanent link with research, except in connection with specific donor-funded projects.
A competent and versatile team: agricultural advisors must have good basic training, and the skills of the team must be able to respond to all the requests of producers (rice, vegetables, rainfed crops, livestock, etc.)	Out of 12 agricultural advisors, nine have the required level (BEP level + 3) and have either been training in horticulture or are agricultural technicians. In the opinion of most agricultural producers, advisors are not well equipped nor motivated enough to support producers in developing micro-projects.
Good communication skills with farmers: advisors should have mastery of the local language and good listening skills. A good understanding of the local context of the intervention area is necessary for a good agricultural advisor.	According to farmers, more than half of the agricultural advisors do not have a good knowledge of the state of the irrigated plots (plots with weeds, bad levelling, functionality of the irrigation network, etc.).
A good understanding of local stakeholders (service providers, NGOs, projects and programmes) and their links with producers: knowledge of the actors in the area and their working relationship with producers is an asset for an agricultural advisor, so he / she can steer producers to these service providers if needed.	Agricultural advisors seem to have a good knowledge of other service providers, but do not always make enough effort to play a role of linking these with producers. Communication does not work well between the different categories of actors and producers believe that SODAGRI does not make enough effort to defend the interests of the area at the higher level (e.g. in Dakar).

Source: Cissé and Diouf 2015.

- Because of the above, service users cannot directly influence the quality of the services provided – they can only choose not to use them. At the same time, there is no incentive for service providers to improve service quality or relevance because they are not paid by their own users.
- Those (development agencies, government etc.) who are paying the services providers have not set up a mechanism for accountability that gives farmers the opportunity to articulate their views on the content, relevance and quality of the services they are receiving.

This does not mean that markets for agricultural services do not exist around the irrigation schemes. There is a large number of private entrepreneurs providing post-harvest services (transport, storage, processing) as well as agricultural implements and machinery for land preparation, harvesting, threshing etc. The agricultural labour market is also based on a free exchange of services, with some groups (for example, those women providing transplanting labour to farmers) bargaining hard and collectively for good wages. Agriculture is now often competing with other non-farm rural employment opportunities, such as artisanal mining, driving labour costs up. In other cases service providers may be few and far between. For example, there are fewer than five individuals hiring out tractors in Niandouba / Confluent.

However, AAS are still provided almost exclusively by the public sector agencies managing the irrigation schemes, with farmers either not contributing to the costs of the service, or only via the '*redevance*' (irrigation fee) levied per unit area and season.

AAS are not that dissimilar from public sector agricultural research for development (AR4D) insofar as there is limited 'downward' accountability to farmers. For some time now there have been attempts to make such research more accountable and responsive to farmers' needs, and to work in partnership with farmers not only in undertaking research, but also in defining the research agenda (see for example Merrill-Sands and Collion, 1994).

Arguably, accountability and responsiveness of AAS cannot be fully achieved without farmers contributing significantly to AAS' costs. Service providers will always feel that they need to respond to those who pay their salaries and determine their career progression. Rarely are these the same people whom they are meant to serve. But there is a range of institutional mechanisms that can nevertheless improve the feedback loops between service users and service providers, and give farmer organisations and their members a voice in reviewing AAS. A key component of such mechanisms are strong farmers' organisations that can identify and analyse their members' AAS needs (including those of women, youths and resource-poor farmers) and articulate these demands coherently to AAS decision makers. Experience from West Africa (and elsewhere) has shown that farmer organisations can play this role, provided they receive some organisational development support and management training. Case studies in Burkina Faso, Cameroon, Ghana, Kenya, Nigeria, Senegal, The Gambia, and Uganda have identified a range of institutional mechanisms that can make agricultural research and advisory services more accountable to farmer organisations (see Hussein (2001) for examples and Box 10). There is also an extensive literature in French on the irrigated areas of the Senegal River Valley, and the Office du Niger.

In summary, institutional mechanisms are required for effective links between demand for and supply of AAS. These mechanisms should enable farmers' representatives to have timely and equitable communication with service providers, and to influence decisions. Such mechanisms can take different shapes in terms of objectives, membership, frequency of interaction, legal status etc.

BOX 10

Mechanisms for achieving downward accountability

Attempts to make agricultural services 'downwardly accountable' to their users have involved establishing diverse mechanisms that tie providers to end users, notably:

- Establishing contractual or collaborative links with civil society organisations (including local and national farmers' organisations) (e.g. in Burkina Faso; Senegal);
- Strengthening the capacities of community-based organisations and farmers' organisations (e.g. in Cameroon and The Gambia);
- Creating incentives for the private sector to fund research and extension activities (e.g. in Ghana and Uganda);
- Promoting participatory methodologies (e.g. PRA – Participatory Rural Appraisal) in needs assessment, planning and implementation (in most of the study countries), and (but less commonly used so far) in monitoring and evaluation;
- Inviting farmer representatives to participate in research and extension coordinating and decision making bodies (in Ghana and The Gambia);
- Creating linkages between service providers and decentralised elected local authorities (in Ghana and Uganda);
- Establishing competitive research and technology partnership funds (in Uganda and Kenya).

Source: Adapted from Hussein (2001).

2.4.2 Existing communication and negotiation mechanisms between AAS and farmers

During phase 2 of the project, GWI undertook an analysis of the existing institutional mechanisms that link farmers and AAS providers in the three irrigation schemes. The aim was to understand the scope of influence that farmers currently have, and identify gaps and opportunities for improvement. It looked for structures and systems that allow:

- The scheme managing agencies to regularly and effectively communicate with farmers;
- Farmer organisations to articulate their members' needs (in terms of AAS) to the agencies and other service providers;
- Joint identification of challenges and constraints, as well as disagreements, and opportunities to work together to overcome these through negotiation;
- A systematic and participatory process of priority setting and planning for each agricultural season as well as for the irrigation scheme overall;
- Coordination of activities between the different AAS service providers operating in and around the irrigation scheme.

None of the three schemes had structures or systems in place to address all of these needs. Where mechanisms had been put in place at some stage, these were often not sufficiently inclusive (e.g. they generally did not include women, youths and poorer farmers), were not sufficiently democratic (office holders were generally not elected but were self-appointed, without accountability to their peers) and were ineffective in arriving at decisions that address farmers' concerns and in ensuring that these decisions are followed through. Box 11 shows the institutional mechanisms that are currently in place for negotiation and coordination between farmers and AAS (these do not include the actual face-to-face meetings and training sessions on technical / agronomic matters between individual or groups of farmers and AAS).

BOX 11

Institutional mechanisms for farmer-AAS communication in the three study sites

Sélingué

- ODRS, the irrigation scheme managing agency, in principle holds **planning meetings** with the two farmers' cooperatives at the start of each agricultural season. The objective of these meetings is to set the agricultural calendar as well as some elements of 'instruction' (what farmers should do to get a good crop – such as timely land preparation and planting, use of inputs etc.).
- The **CLE (Comité local de l'eau / local water committee)** is responsible for the general management of the water from the dam, but is not directly involved in decisions about the irrigation scheme. It is made up of representatives from farmers, the irrigation scheme manager, and local government. So far the CLE has not had much involvement in issues around agricultural water supply. Even though CLEs are a legal requirement for irrigation infrastructure in Mali, there are currently no provisions at national level to provide financial or technical support to the committees. They thus depend on contributions from members (5,000 FCFA per year) and projects operating in the area. Most farmers are not aware of the CLE's role, since it meets irregularly and does not produce minutes of meetings. Discussions with farmers in Sélingué concluded that the CLE should play a much stronger role in ensuring agricultural water supply to all plots and in holding the dam and irrigation scheme managing agencies to account, in particular in relation to infrastructure maintenance service contracts.
- The **Comité paritaire** is a consultative mechanism responsible for using irrigation fees rationally. It is made up of eight representatives of ODRS and eight farmers' representatives. It is meant to meet monthly, but only met three times in 2015 and no minutes of the meetings were circulated.
- There are currently no mechanisms to bring together the different AAS service providers in the area.

Bagré

- Similar to ODRS, Bagrépôle organises **meetings to plan the agricultural season** with the chairmen of the 16 villages under the scheme and the farmers' union leaders.
- In addition, Bagrépôle and the rice farmers' union are meant to meet every three months, but due to governance issues in the rice farmers' union, these meetings have not been held regularly.
- There are currently no mechanisms to bring together the different AAS service providers in the area.

Niandouba / Confluent

- SODAGRI organises seasonal planning meetings with the leaders of the farmer union FEPROBA.
- In addition, SODAGRI and FEPROBA have met nearly twice a months since the restructuring of FEPROBA in 2012-15, which brought a change of leadership and increased professionalism among farmers' representatives.
- There are currently no mechanisms to bring together the different AAS service providers in the area.

Clearly, the existing institutional mechanisms do not effectively link the demand for and supply of AAS. Nor do they ensure that all AAS actors coordinate their activities.

2.4.3 Self-evaluation of farmer organisations and irrigation system managers

Admitting that something is not working the way it should, and seeking to understand why without blaming others requires a certain level of confidence, trust and maturity. The livelihoods analysis in 2013 showed that farmers, their organisations and the irrigation scheme managers were not on the best of terms. All sides were mistrustful and blamed others. It was therefore agreed to conduct self-assessments, separately with the different groups, in order to analyse the strength and weakness of each, their expectations and visions for the future, and their perceptions of opportunities to jointly work towards improvements. Discussions with stakeholders at site level decided that safe spaces were needed for each group to undertake this analysis on their own first, followed by meetings to bring everyone together.

A series of facilitated meetings were held in each scheme in late 2013 / early 2014, following this generic sequence:

- i. Initial discussions with AAS staff of the scheme managing agency, focusing on their vision, understanding of their role, strengths and weaknesses, and suggestions for mediating actions.
- ii. A series of meetings with different groups of farmers, generally along existing organisational lines (cooperatives / unions / federations) so as to have relatively homogeneous groups of farmers who knew each other. These meetings focused on farmers' visions and aspirations, their expectations from AAS, but also their own assessment of the performance of their organisations (and any gaps in this).
- iii. A meeting with the scheme managing agency and its staff, to deepen the initial analysis under i. and to identify specific challenges and opportunities that need addressing.
- iv. A joint meeting by both stakeholder groups (farmers and AAS providers) to compare and contrast perceptions and agree on a course of action to address the challenges identified.

Some of the issues identified during these sessions have been discussed in sections 2.2 and 2.3 above, in particular in Table 1 and Table 4. The significance of this process lies not only in the information it generated about expectations, capacities, aspirations, opportunities and challenges, but also in the changed attitudes and behaviours that resulted from it. Feedback from participating farmers and government staff confirmed that the process has contributed significantly to improving the relationship between service providers and producers, by bringing many previously un-said concerns into the open, and thus creating opportunities to addressing them jointly. The process paved the way for a joint definition of specific objectives, actions and roles / responsibilities.

Whilst no such process had been tried previously in the three study sites, there have been other attempts to undertake a participatory analysis of irrigation systems by both farmers and service providers. Box 12 outlines the Participatory Rapid Diagnosis and Action Planning (PRDA) approach, which includes developing action plans – the next

step in the process. However, PRDA has been mostly applied in smaller, farmer-managed irrigation schemes, where government agencies as scheme managers play no role or a very minor role. Farmer organisations in these schemes tend to have more advanced organisational and technical capacities than those in the three GWI study sites.

BOX 12

PRDA – Participatory Rapid Diagnosis and Action Planning

Participatory Rapid Diagnosis and Action Planning (PRDA) is an approach for assessing and improving the performance of agricultural water management together with farmers. It consists of making an initial diagnosis, and then designing an action plan to improve performance, for example by:

- Strengthening farmer organisations in charge of irrigation management;
- Improving operation and maintenance of irrigation systems;
- Increasing farmers' access to agricultural inputs, credit and market;
- Improving extension and business support services – these could include farmer managed services such as the “*centres de prestation de services au Faranfasi so*” (Office du Niger, Mali);
- Intervening institutionally and organisationally, to secure farmers' access to and sustainable management of, natural resources such as land and water; and
- Introducing locally adapted improved irrigated agricultural technologies.

Since the 1990s, reforms in Africa's irrigation sector have invariably had as their centrepiece moves to transfer management of public irrigation systems to farmer organisations, such as water user associations (WUAs), combined with downsizing or withdrawing the government's role in operation and maintenance, fee collection and conflict resolution. Over the same period, irrigation development has been increasingly led by farmers taking advantage of market opportunities and the availability of low-cost irrigation pumps. In many African countries, informal irrigation development exceeds formal, public irrigation development in terms of both area of irrigated land and number of farmers.

In this context, PRDA needs to help empower farmers and their organisations move towards taking full responsibility for their irrigation systems. PRDA also calls for demand-led extension services provided by governments, such as institutional/organisational strengthening services, innovations, financial and technical support and capacity building.

The participatory approach of PRDA is meant to promote integration and sharing of expertise and experience among farmers and technical experts. In this way, PRDA can be used to establish effective partnerships between farmers and extension services. Such partnerships can shift AAS from an approach based on disseminating ready-made 'one size fits all' technology packages to one where locally-adapted technology options are designed to farmers' needs, interests and capacity. In other words, PRDA is a tool to start delivering extension services that are farmer-focused and innovation-led.

Source: Adapted from Lempérière et al. (2014)

2.4.4 Participatory development of action plans for each site

Whilst the self-assessment process provided useful insights and entry points for interventions, changed awareness and attitudes and helped mobilise stakeholders around a common objective, it did not develop the specific actions required to bring about change on the ground.

Therefore, participating stakeholders at each site agreed to form a working group of representatives from all key AAS actors. The working groups' task was to develop detailed action plans, based on the challenges and opportunities identified during the self-assessment, that outline specific activities, and say who needs to carry these out. The action plans were then validated via village meetings and FM radio programmes at site level, and were then discussed by a wider group of stakeholders at national workshops in all three countries.

The purpose of the action plans was to provide a clear programme of activities agreed by all that could also be used for accountability (because responsibilities for actions were assigned to individuals) and for fund raising. Their modular nature meant different actors could support different components, depending on their priorities, resources and capacities. The Groups identified three sources of funding for implementing actions:

1. Existing / available budgets – in particular for staff time within the irrigation scheme managing organisation, voluntary time contributions from farmers' organisations and existing operational budgets of the participating organisations.
2. Approved or probable budgets, such as project funding (for example, all three dams are receiving support for infrastructure rehabilitation and associated value chain work – see Table 2). The action plans can inform components of projects, where these are in line with action plan priorities. For example, in Bagré, rice value chain development is a priority area in the action plan and is also a component of the PAPCB project.
3. Funding to be mobilised using the action plans – from local or national governments, from development finance or the private sector. In this case, the action plans can be used to show to potential funders that participatory planning has already been done and that activities have been clearly defined and agreed, thus meeting the requirements of most donors.

The working groups varied from site to site, depending on local priorities and organisational set-up, but always included representatives from the following organisations (with the first two making up the 'core' of the working group):

- Farmers' organisations – generally 4-6 persons, including at least one woman;
- Irrigation scheme managers, including at least two agricultural advisors and one manager;
- Other organisations involved in AAS (who might vary from session to session, depending on the themes discussed) including agricultural research organisations, national agricultural advisory services agencies (operating largely outside the irrigation schemes, but often with a country-wide mandate), credit agencies, and others; and
- A facilitator²¹.

21. In the case of the pilots described here, the facilitator was a GWI project staff member. However, this role could be played by anyone who has good facilitation skills, a good understanding of the local context and the trust of all parties.

The Terms of Reference for the working groups included:

- Developing a shared vision for the irrigation scheme that could guide the action plan development;
- Reviewing and prioritising the objectives and intervention options identified during the self-assessment process; and
- Developing, for each prioritised objective, a detailed action plan specifying who would do what, when, with what resources. A format was agreed for this purpose (see Annex 1), which basically followed a project planning logic (with objectives, outputs, activities and indicators), to make it possible to use the action plans as the basis for project interventions.

The working group process involved 4 – 6 sessions. The emerging visions are shown in Box 13 and the resulting action plan components in Table 7. Because these have been participatory processes that are externally facilitated, but are owned and driven by local stakeholders, there are significant differences in the scope of the visions and the way in which they have been formulated. The vision developed by the working group in Senegal (Niandouba / Confluent) is focused on the service delivery side, i.e. the capacities, responsiveness and integrity of the AAS. In Bagré, the emphasis is on producers and their capacities, with the AAS implicit as a mechanisms for building these. In Sélingué, food security and incomes are emphasised as the ultimate goals, requiring a collaboration between both the supply and demand side of AAS.

BOX 13

Visions developed by the AAS working groups for their respective irrigation schemes

Sélingué

“Food security is ensured in the intervention area of ODRS, where incomes of producers are sufficient to meet their needs and improve their resilience to climate change. Producers, researchers and ODRS collaborate and communicate properly and regularly. **Producers’ organisations** are well structured and are functioning

normally. Respect of the scheme management rules, developed in a participatory manner, allows for better water management and conflict reduction in the scheme. The **agricultural advisory services** are competent, with adequate means and meet the expectations of producers, who are becoming professionals. Households are well equipped and have irrigated plots, based on their capacities. Specific support to women and youths contributes to their empowerment and to reducing the exodus to artisanal mines.”



Bagré

"Producers, having become aware of their responsibilities, have restored cohesion and trust between themselves. They have established **well organised competent structures** that efficiently manage their assets and the assets of the irrigation scheme. They have acquired skills and capacities for self-promotion that allow them to develop beneficial partnerships. They manage their farms profitably and sustainably."



Niandouba / Confluent

"An **agricultural advisory service** that has the means and expertise in diverse fields, is at the disposal of actors and works on their self-promotion and empowerment, in the spirit of respect for gender equity, good governance and environmental protection."



Similarly, the work packages developed by each group differ in content and in the way they are presented (Table 7). All three sites included 'capacity development of farmers' organisations', two included 'capacity reinforcement' or 'responsiveness of AAS', and all three included improvement of communication and consultation between AAS suppliers and users.

Such differences are to be expected in a participatory planning process owned by participants, and not steered in a particular direction by GWI.

Most planning processes for donor-funded projects on rural services, institutions or infrastructure need to comply with the donor's organisational systems and processes. These do not necessarily allow local voices to be influential in the final outcome. GWI was able to act as an 'honest broker' without a vested interest, as the project aims to develop, test and promote institutional processes and policy changes rather than specific development interventions.

TABLE 7**Key components / work packages of the action plans developed in the three study sites**

Component	Bagré	Sélingué	Niandouba / Confluent
Capacity development (farmer organisations and AAS providers) – technical and institutional	Improve the performance of producer organisations	Farmer organisations are well structured and respond to the expectations of producers	Reinforcement of capacity (of both farmers and service providers)
		AAS respond to producers' needs	Good governance
Communication, consultation	Improve communication	A communication system links the different AAS actors	Consultation, communication and advocacy
Rice value chain	Improve the rice value chain (production, processing and marketing)		
Irrigation management	Improve the management of the irrigation infrastructure and of water		
M&E	Help smallholders respect and take 'ownership' of the rules agreed for their irrigation plots		Planning and M&E
Natural resource management			Natural resource management
Access to credit			Financing system / agricultural credit
Women and youths		Women and young people are effectively empowered	

Sources: SODAGRI and FEPROBA (2015), ODRS *et al.* (2015), Bagrépôle (2015).

Arguably, not all components identified were strictly related to the demand for and supply of agricultural advisory service. Some concerned non-technical dimensions of the value chain such as credit, and aspects of irrigation management and infrastructure maintenance. However, all actors agreed that AAS, in its wider sense (as defined in 1.2), is at the centre of a functioning irrigation system due to its role in developing farmers' organisational development and in linking farmers to other services.

The Action Plans were presented during national workshops in all three countries in June 2015 (GWI, 2015a, b, c and d). These sought to identify partnerships that could help implement plan components. Table 4 shows what support participating organisations pledged during the workshop, and shows a particular interest in rice value chain development (an area receiving a lot of support from donors and governments). Bagrépôle offered some support on water management and the 'rule book' (*cahier de*

charge), but unfortunately none of the other organisations offered specific support on either of these two important components. The challenge here is that they are both very specific to irrigation systems and generic AAS providers are less equipped to easily support them. However, discussions with stakeholders in Burkina Faso are continuing and more commitment may well materialise over time.

Feedback from participants confirmed that workshops helped put the theme of 'AAS for large scale irrigation' firmly on the radar for national actors and that they raised awareness about the important role participatory communication, planning and negotiation mechanisms can play in effectively linking the demand for and supply of AAS (GWI, 2015a, b, c and d). The workshops also helped forge links between different actors who do not routinely communicate and coordinate activities. In particular they helped link organisations, programmes and projects working on AAS and agricultural value chains overall with those who work primarily on irrigation schemes, including aspects of AAS for these schemes.

2.4.5 Institutionalisation of action plans

The plans themselves serve as a framework for interventions and actions that are expected to lead to improvements in AAS, in overall agricultural services and ultimately to improvements in farmers' productivity, incomes and food security. The process of developing the plans through working groups has helped those participating to reach a new level of capacity and collaboration (see also section 2.4.6 below). However, the working groups were initiated and facilitated by the project and would not necessarily be sustained beyond it. GWI therefore started to work with stakeholders at the three irrigations schemes to explore ways of developing a sustainable mechanism and space for:

- Regular communication about all aspects of the irrigation scheme (including not only AAS, but other services such as credit, marketing etc.);
- Coordination of AAS activities between the various actors, including the irrigation scheme managing agency, government agencies providing AAS in the area, any projects and programmes, and private service providers;
- Monitoring the action plan's implementation and updating the plan if and when required;
- Attracting funders (government, private sector, donors) to support elements of the action plan;
- Keeping the wider constituency (in particular farmers and farmer groups, including women and youths) informed about progress of the action plan and consulting them on key decisions in a timely and effective way (e.g. by using local FM radio stations).

Such an institutional mechanism needs to be inclusive, accountable to its constituents, with members selected or elected in a transparent manner, with clearly agreed Terms of Reference. Currently there is no such mechanism in place in the three sites studied by GWI. Its installation and continuity would require not just motivated individuals, but also some financial support (in particular for participants' transport, and possibly compensation for farmers who have lost wages by participating).

TABLE 8

Organisations pledging support to specific components of the Bagré action plan during the June 2015 national workshop

Organisations	Components						Type of support
	1. Farmer orgs	2. Rule book *	3. Water mgt	4. AAS	5. Communication	6. Rice value chain	
Bagrèpôle – irrigation scheme manager	✓	✓	✓			✓	Training, management systems, recruitment of additional AAS staff, construction of rice drying points and stores
International NGOs (OXFAM, SNV)	✓			✓		✓	Exchange visits, study tours, advocacy for agricultural investments, training, advice on processing
RESCAR-AOC (West and Central African regional agricultural advisory network)				✓		✓	Training of AAS, institutional development, Monitoring and evaluation of AAS, innovation platforms
Farmer networks (Confédération Paysanne du Faso / Réseau des Organisations Paysannes et Producteurs de l'Afrique de l'Ouest)	✓					✓	Sharing of management tools, advocacy for locally produced rice, facilitation services
Consultants (Ingénierie et Conseil en Développement d'Entreprise) & Sahel Farming	✓					✓	Provision of inputs, support to farm operations
DOPAIR (Directorate of Farmer Organisation and Support to Rural Institutions)	✓					✓	Development of farmer organisations, legal training
DGPER (Directorate for Promotion of the Rural Economy)				✓		✓	Training in farming as a business and processing, rice quality control
DGADI (Directorate of Irrigation Development)	✓						Training in water management and infrastructure maintenance
DVRD (Directorate of Agricultural Research, Development and Outreach)				✓			Development of an AAS manual, profile of AAS, training
UPRVS (Sourou Valley Farmers' Union)	✓					✓	Share experience with water management
INERA (Institute for Environment and Agricultural Research)						✓	Transfer of technology: improved varieties and agronomic practices
RVCC (Cereal Commercialisation Monitoring Network)						✓	Exchange between value chain actors, advocacy for cereal marketing
GIZ / PDA (Program for Agricultural Development)				✓		✓	Farmer business schools, competitive African rice initiative

Source: GWI (2015a) *The rule book is the 'cahier de charge'— the agreement signed by farmers and dam managing agencies that specifies the roles and responsibilities of each party.

Such mechanisms would ensure some level of continuity in the implementation and monitoring of the agreed actions. However, there are also a number of explicit actions that have already been agreed by working group members to advance the action plan. For example, irrigation system managing organisations have included a number of agreed actions in their annual work programmes and activities. In Bagré it was agreed to review the job description of AAS staff in line with the suggestions made in the action plan and to use this revised job description for future recruitment.

In addition, both irrigation system managers and farmers have started to advocate for elements of the action plans to be included in donor-funded development interventions. Having been developed in a participatory manner, using a fairly rigorous and inclusive process (more so than most conventional project planning processes that tend to rely on short-term external consultants), these actions provide a solid basis for future investments or project interventions.

2.4.6 Strengths and weaknesses of the process

The process of developing the action plans has been useful in its own right, leading to changes in attitude and behaviour amongst participants (especially representatives from farmers' organisations and irrigation scheme managers). In particular:

- It has changed the relationships between these actors, with farmers now having a much stronger voice in negotiations as well as a stronger sense of responsibility. Trust was significantly increased between farmer organisations and irrigation scheme managing agencies.
- The themes discussed and actions developed were deemed highly relevant by all actors involved – priorities were agreed by participants and this motivated everyone to engage and contribute.
- The actions in the plans are realistic and feasible with some external support. They build on local priorities, but also local capacities and knowledge. In many cases it was farmers who came up with the most creative ideas and solutions.
- A secure space was created where, with neutral facilitation, different stakeholders could exchange views, disagree and negotiate without any repercussions for their careers or any of the benefits they may receive. A number of topics that had hitherto been a taboo (for example questions of financial accountability) were debated and improvement to systems and processes were elaborated.
- The process developed not only farmers' capacities, but also those of other actors. Through the discussion and negotiation process, new opportunities were identified (for example, opportunities for collaborative research between research organisations, farmer unions / federations and the irrigation scheme managing agencies). Intelligence on forthcoming programmes and projects was shared.
- In Bagré and Anambé, rural FM radio was used to keep the wider farming community in the irrigation system informed about the process and outcomes of the discussions and to ask for contributions / inputs. This proved to be a cost-effective way of ensuring accountability to the wider constituency and participation of those who were unable to attend the meetings.

However, the process was in no way ideal and a number of challenges were identified through reflections during working group meetings and the national workshops:

- Women and youths were not sufficiently represented. Partly, this was because, in the schemes studied, there were very few female and youth plot holders, and they were not generally organised in producer organisations. This may change in the future, with the intention to assign at least 30 per cent of newly developed irrigated plots to women and youths (in Sélingué and Bagré).
- The process was time consuming, in particular for farmers who had to come to the *offices* of the irrigation system managers or the farmer union / federation. At the same time, more and longer working group sessions would have enabled a more detailed elaboration of the action plans, which still had some gaps and inconsistencies even in their 'final' versions.
- It relied on external support, for example to pay for preparation of sessions, facilitation, documentation, transport expenses and meals for participants – expenses that, in the longer term, can probably not easily be borne by the irrigation managing agencies.
- Some participants raised concerns about multiplication of institutional mechanisms for coordination and communication between actors, resulting in high transaction costs.
- Despite careful facilitation, there was at times a tendency for some individuals (often the technical staff rather than farmers) to dominate discussions.
- At times some linguistic difficulties (where facilitators did not speak all local languages) slowed down the process.

Despite these challenges, all participants agreed that the working group process has resulted in significant improvements in relationships between participants and in tackling some long overdue challenges. The action plans include all elements required to turn around service delivery to farmers and prepare the way for long term improvements in productivity, sustainability and incomes.



RECOMMENDATIONS

Developing functioning institutions that are robust, accountable, representative and efficient, whilst also having the capacity and flexibility to evolve over time to meet new challenges, is not a small task. It requires financial investments and expertise for participatory diagnostics and planning, for capacity development, for some operational and logistical support (such as transport and materials), for consultations and dialogue, and for participatory monitoring and evaluation. Today, no serious development professional would deny the need for institutional development as an integral component of any development interventions, but it is not always obvious what scale, scope and principles are the most appropriate for different types of irrigation schemes. The option selected will usually be strongly influenced by the existing situation on the ground, in particular the organisational and institutional capacity already available amongst key actors, which may be a result of previous interventions. The overall local, national and regional context will also play a role, as it determines the institutional and policy landscape within which the scheme operates, and the support that local institutions may be able to receive beyond the support from a specific project intervention.

This section presents recommendations by task and target group, including recommendations for donors and development partners developing or rehabilitating irrigation schemes, for departments of national governments, for national farmer organisations, and for national research organisations. Some of these overlap or are mutually supportive.

3.1 CARRY OUT A PARTICIPATORY ASSESSMENT OF INSTITUTIONAL AND ORGANISATIONAL SYSTEMS AND CAPACITIES BEFORE DEVELOPMENT INTERVENTIONS START IN LARGE IRRIGATION SCHEMES

Target group: Donors and investors, national government agencies involved in planning and designing development interventions for large-scale irrigation schemes, such as OMVG, Autorité du Niger, etc.

Each irrigation scheme is different. Some schemes have had past investments in institutional development, in some cases with a certain level of farmer involvement. Whether these investments have led to sustainable, performing AAS systems – both from the supply and from the demand side – depends on a range of location-specific factors. Institutional assessments, including of the governance systems and of the key actors' organisational capacities (e.g. of the irrigation scheme managing agencies, farmer organisations, local government, and service providers along the value chain), are becoming a formal requirement of most large-scale infrastructure development or rehabilitation programme. However, these assessments often lack the depth and detail required to identify performance issues and address these through targeted interventions. Moreover, each new intervention commissions its own, short term external assessment of institutions, rather than building on knowledge accumulated over time.

- We therefore recommend that investors and development agencies carry out detailed participatory institutional assessments that build on previous work, and put these assessments into the public domain for future reference.

The assessments should include organisational capacities and performance of key actors (in particular irrigation scheme managers, farmer organisations and AAS providers), including strategy, leadership, management systems, governance mechanisms, communication and coordination mechanisms, and monitoring and evaluation mechanisms. The results should be discussed with all local actors to identify weaknesses that need addressing in order for the planned intervention to go ahead. Where significant shortcomings are identified, the planned intervention should include steps to address these.

There are a large range of institutional assessment tools available in the literature, including some that are specifically for the irrigation sector (see for example van der Schans and Lempérière 2006). Many donors have developed tools for institutional assessment that can be adapted to cover the key parameters required.

3.2 DEVELOP AND IMPLEMENT COMPREHENSIVE AAS STRATEGIES FOR IRRIGATION SCHEMES

Target group: Irrigation scheme managing agencies, with support from donors and investors, and from national AAS actors (usually Ministries of agriculture, but also NGOs and farmer organisations) and RESCAR-AOC

None of the three irrigation schemes studied had an explicit AAS strategy²². This means that there were no clearly agreed objectives or performance indicators and no clarity about what AAS is meant to provide and what it is not. Yet national AAS strategies are now under development with support from donors, and with guidance and support from the West and Central African network for AAS (RESCAR-AOC). There is an urgent need to ensure that these national strategies include the specific requirements of AAS for large scale irrigation systems, and that strategies for specific irrigation systems are well integrated and compliant with national AAS strategies. Specifically, AAS strategies for irrigation systems need to:

- Recognise the reality of pluralistic AAS by ensuring that the activities and objectives of all AAS providers are well coordinated and aligned, including public, private and not-for-profit actors (projects / NGOs);

22. Bagrépôle developed a rudimentary AAS manual, which provides some guidance, but no operational details.

- Explicitly acknowledge the needs of different types of farmers cultivating irrigated plots, and provide mechanisms for providing all types of farmers with the advice they need;
- Include advisory needs along the value chain, from input supply to marketing, and not just for production – this requires that the strategy defines the role of different service providers, including private ones;
- Be compliant and coherent with national agricultural policy and AAS strategies and integrate, where appropriate, tried and tested methods from other farming systems in the country (such as farmer field schools, farmer-to-farmer extension, use of ICTs and rural radio, training of expert farmers, use of participatory planning processes, management advice for family farms (Faure *et al.* 2015) etc.);
- Include strategies for ongoing and institutionalised collaboration with actors from the national agricultural research system, including collaborative research, farmer participatory research, innovation platforms around key irrigated crops such as rice, etc.;
- Make provisions for experiential learning and use of farmers' own knowledge (rather than transfer-of-technology approaches that promote blue print packages);
- Ensure that women and youth producers are targeted, if necessary by developing specific methods and approaches to work with these groups;
- Specify governance systems for AAS whereby farmers and other service users have a say in agenda setting and performance assessment;
- Specify how continuous professional development of AAS staff will happen (including in response to feedback from service users) via formal and informal training, and options for career progression;
- Make provisions for continuous adaptation and innovation in response to farmers' feedback so as to learn from others' experiences (e.g. via national AAS platforms²³).

There is an ever increasing body of literature²⁴ available on AAS strategy development, including specific aspects such as ICTs and participatory planning. Unfortunately, so far there has been very limited concerted effort to develop appropriate AAS strategies for irrigation schemes, even at sites such as Bagré or Sélingué that have seen substantial investments in irrigation infrastructure.

3.3 DEVELOP FARMERS' ORGANISATIONAL CAPACITY TO STRENGTHEN THE DEMAND SIDE OF AAS

Target group: Irrigation scheme managing agencies, with support from national farmer organisations and from donors and investors

Supply side mechanisms alone are unlikely to result in sustainable systems and processes for AAS. So farmer organisational development needs to receive significantly more support than it has done hitherto in order to enable farmers to demand and evaluate the services they receive. Farmers' organisational development is generally part of the mandate of the irrigation scheme managing agencies, but no coherent strategy or work programme exists for this in the three study sites. Recent donor investments in the

23. GWI supported the start-up of the Malian AAS platform in 2015-16.

24. See for example GFRAS – the "New Extensionist" (<http://www.g-fras.org/en/activities/the-new-extensionist.html>) and the 2011 CTA conference on "Innovation in extension and advisory services" (<http://www.cta.int/en/article/2014-01-30/innovation-in-extension-and-advisory-services-international-conference-proceedings.html>)

three sites included the formation of new farmer groups (in particular for women and youths) and some technical training to farmers on specific commodities and aspects of the value chain. But they did not include organisational development support to ensure good governance and management of farmer organisations.

- Investments in farmer organisational development need to be stepped up significantly if farmers are to play a key role, not just as passive recipients of services, but as active players who shape the services they receive and are increasingly able to provide services to their members.
- The institutional assessment recommended under 3.1. should provide an indication for capacity gaps that need to be addressed.

In particular, farmers' organisations need to be able to:

- Elect or select their leaders in a fair and transparent way, respecting their own organisational statutes, and hold leaders to account;
- Represent all categories of farmers, including women and youth;
- Analyse the needs of the different types of members and articulate them to development actors, including AAS providers;
- Monitor and evaluate the performance of AAS providers and provide feedback to them, including proposing specific improvements;
- Ensure that members comply with agreed rules and regulations, and impose and enforce sanctions on those members who don't;
- Increasingly provide services to members, including accessing inputs at subsidised rates where available, controlling the quality of inputs, collectively managing agricultural machinery and appliances where available and identifying private sector service providers for such services;
- Interact with farmer organisations in other irrigation schemes via national level fora, exchange visits etc.;
- Increase the technical and entrepreneurial capacity of its members via training and farmer-to-farmer training – i.e. become AAS providers themselves.

Developing these capacities is a long-term process that requires significant investments both from farmers themselves and development agencies. A flurry of short-lived interventions working with farmer organisations will not be enough:

- A coherent and long-term strategy is needed that sets out the development objectives for farmer organisations and the pathways towards achieving these.
- Once such a strategy has been developed, different donors and projects can contribute financial and technical resources for specific elements, whilst working towards an agreed objective. A more coherent and harmonised approach could avoid duplication of efforts in favour of more effective and efficient support to farmer organisations.

3.4 CREATE AND FACILITATE A COMMUNICATION SPACE WHERE FARMERS' ORGANISATIONS, IRRIGATION SCHEME MANAGING AGENCIES AND OTHER AGRICULTURAL SERVICE PROVIDERS CAN COORDINATE AND NEGOTIATE

Actors: Irrigation scheme managing agencies and farmers' organisations, with support from NGOs, donors and government agencies

Both the demand and supply side of AAS need to be effectively linked via sustainable, equitable mechanisms. GWI's action research demonstrates the importance of safe spaces where farmer representatives, irrigation system managers and others can interact transparently and openly to discuss all aspects of their relationship, aiming to improve service delivery, system performance and thus ultimately farmers' productivity and incomes.

Developing such spaces is likely to be easier where an AAS strategy is already in place and where farmers' organisational capacity has already been developed. However, constructive dialogue and negotiation can also shape AAS strategies and contribute to farmers' organisational capacity, in particular improving leaders' accountability to their members.

- We therefore recommend that development agencies and investors consider creating and facilitating such spaces as an integral part of irrigation scheme development.
- The process of creating such spaces needs to include an initial institutional assessment to understand what spaces already exist, who participates in them, who sets the agenda, and how they perform.
- As with all such mechanisms, there need to be incentives for participants to invest their time and effort in the process (e.g. by assuring them that agreed actions have a high likelihood of being implemented).
- Good facilitation is a key component to ensuring that decisions are documented and implemented, that there is follow-up, and that funding sources are mobilised for this from existing budget lines (e.g. the farmer organisational development component of the irrigation scheme managing agency and from farmer organisations' own budgets).
- Communication needs to be extended as widely as possible using e.g. rural FM radio to engage in dialogue with a wider group of local actors.



CONCLUSIONS

This action research has demonstrated the need to address agricultural productivity not just from a technological and infrastructure angle, but also (and perhaps foremost) from an institutional one.

The justification for the huge investments in irrigation infrastructure is a combination of high agricultural productivity, reduced risks and increased resilience for both participating farmers (via sustainable and diversified livelihoods) and the national economy overall (via increased rice self-sufficiency). In the case of large dams, substantial development benefits from clean electricity production and other non-agricultural benefits may also arise. Yet GWI's research shows that the net present value of dams' agricultural component is often negative, because productivity levels projected at the design stage have not been achieved (Kaboré and Bazin, 2014; Hathie, 2015).

At least as serious as this overall shortcoming are the many farmers' claims that their lives have not improved since they started irrigated rice production. In some cases farmers had to abandon their plots because they were unable to mobilise the resources required for intensive rice production, failed to generate a sufficient income to pay the irrigation fees or because they were unable to follow the recommended cropping practices²⁵.

With many new irrigation schemes under development in the region (see also Section 1.1) and enormous commitments from national governments and development finance to support these, it is high time that we identify and address the underlying institutional challenges for low productivity.

25. When compulsory transplanting was introduced in Sélingué, some farmers found it impossible to mobilise the amount and type of skilled labour required for this operation and had to give up their plots. These plots were then re-allocated to other farmers, often immigrants from other parts of Mali. Farmers thus lost their land twice: first when the dam was built, and again when they had to give up the plot that they received in compensation for the lost rainfed land (personal communication with farmers in Sélingué, November 2014).

These are complex and diverse, as GWI's ongoing farming systems research study is showing²⁶, with access to sufficient irrigated land and timely agricultural credit at the forefront of most farmers' concerns.

However, functioning institutions are absolutely essential in order to achieve good rates of return to labour and capital investments (in particular investments in expensive seed and fertiliser); to produce high quality paddy (and to meet the quality required to sell it at a profit); to produce sustainably without degrading soils and polluting water bodies; and to regularly maintain irrigation infrastructure and so reduce the need for expensive rehabilitation. We have shown that agricultural advisory services need to be at the heart of these institutions, because AAS provide the link between farmers and their organisations on the one hand, and different types of service providers on the other.

The key role of downward accountability has emerged strongly throughout the research process. Farmer organisations need to be accountable to their members, and service providers need to be accountable to their users. Reforming AAS from the supply side alone (through training programmes, organisational restructuring, development of strategic and management frameworks etc.) will only have a limited effect in the long term, if service users are not exerting a demand-side pressure on service providers.

For demand-side pressure to be effective, strong, representative and transparently operating producer organisations are essential. These must demand good governance and services, but must also be able to take on their own responsibilities to ensure that the irrigation scheme can operate for the benefit of all.

Working group participants in Bagré commented that if the institutional processes initiated by GWI had been an integral part of the irrigation scheme from the beginning, a lot of time and money could have been saved. We cannot prove whether or not this is true, but it certainly seems worth looking for these savings in the future.

26. Ongoing research, to be shortly published and available on www.gwiwestafrica.org

BIBLIOGRAPHY

- Anderson, J. R., Feder, G. and Ganguly, S. (2006) The rise and fall of training and visit extension: an Asian mini-drama with an African epilogue. World Bank Policy Research Working Paper 3928. The World Bank, Agriculture and Rural Development Department, Washington. <https://openknowledge.worldbank.org/bitstream/handle/10986/8447/wps3928.pdf?sequence=1>
- ARID (2004) Le conseil aux irrigants en Afrique de l'Ouest Sahélienne. Formation au diagnostic rapide, Projet APPIA (Amélioration des performances des périmètres irrigués en Afrique sahélienne). Formation au diagnostic rapide du projet APPIA, avril-mai 2004. http://www.on-mali.org/pdf/le_conseil_aux_irrigants_en_ao.pdf
- Assembly of the African Union (2003). Declaration on Agriculture and Food Security in Africa. Assembly/AU/Decl.7 (II), African Union, Maputo.
- Bagrépôle, Direction de la Valorisation Economique (2013) Manuel du conseiller agricole dans les périmètres aménagés de Bagrépôle. Bagrépôle, Ouagadougou
- Bagrépôle (2015) Plan d'action pour l'amélioration des services de conseil agricole dans la plaine aménagée de Bagré au Burkina Faso. IIED, London. http://www.gwiwestafrica.org/sites/default/files/plan_d_action_bf_final.pdf
- Boutsen, S. and Aertsen, J. (2013) Peut-on nourrir l'Afrique de l'Ouest avec du riz? *MO papers* No. 74. Mondiaal Nieuws, Brussels. http://www.cfsi.asso.fr/files/575_mo-paper74_riz_fr.pdf
- Cessouma, B. and Touré, Y. (2015) Lier la demande et l'offre de conseil agricole autour des grands barrages – Le cas de Sélingué au Mali. IIED, London. <http://pubs.iied.org/G03998.html>
- Cissé, S. and Diouf, M. (2015) Lier la demande et l'offre de conseil agricole autour des grands barrages – Le cas de Niandouba et Confluent au Sénégal. IIED, London <http://www.gwiwestafrica.org/fr/lier-la-demande-et-loffre-de-conseil-agricole-autour-des-grands-barrages-le-cas-de-niandouba-et>
- CORAF / WECARD (2007) Strategic Plan 2007-2016. CORAF, Dakar. http://www.coraf.org/documents/StrategicPlan07_016.pdf
- Coulibaly, Y. (2011) The council for family-based agriculture in the Office du Niger, Mali—the CEF *Proceedings of the international Conference on Innovations in Extension and Advisory services*. CTA, Wageningen. http://extension.cta.int/pages/Documents/Tools%20and%20Approaches/2.Changing%20Concepts%20and%20Functions%20to%20Empower%20Farmers/CTA129%20Changing%20Concepts%20and%20Functions%20to%20Empower%20Farmers_Coulibaly_04.pdf
- Faure, G., Pautrizel, L., de Romémont, A., Toillier, A., Odru, M. and Havard, M. (2015) Management advice for family farms to strengthen entrepreneurial skills Note 8. *GFRAS Good Practice Notes for Extension and Advisory Services*. GFRAS, Lindau. <http://www.g-fras.org/en/good-practice-notes/management-advice-for-family-farms-to-strengthen-entrepreneurial-skills.html?showall>
- Fofana, I., Goundan, A. and Magne, L. (2014) Impact Simulation of ECOWAS Rice Self-Sufficiency Policy IFPRI Discussion Paper 01405. <http://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/128894/filename/129105.pdf>

- Guèye, B. (2014) Specialisation or diversification? Divergent perspectives on rice farming in three large dam-irrigated areas in the Sahel IIED, London. <http://pubs.iied.org/17568IIED.html>
- Guèye, B. (2015) Irrigated agriculture and resilience of family farms – a clash of perspectives GWI Briefing Paper. IIED, London. <http://pubs.iied.org/G03932/>
- GWI (2014) Rapport technique de l'atelier régional "Rentabiliser les grands barrages en Afrique de l'Ouest : Quel rôle pour le conseil agricole ?", Bamako, Mali, 4-5 Juin 2014. <http://www.gwiwestafrica.org/fr/rentabiliser-les-grands-barrages-en-afrique-de-louest-quel-role-pour-le-conseil-agricole>
- GWI (2015a) Vers un agenda commun pour la production agricole dans les grands barrages: Rapport de l'atelier du Burkina Faso. IIED, London. http://www.gwiwestafrica.org/sites/default/files/rapportcaburkina_final23112015.pdf
- GWI (2015b) Vers un agenda commun pour la production agricole dans les grands barrages: Rapport de l'atelier du Mali. IIED, London. http://www.gwiwestafrica.org/sites/default/files/rapportatelier_camali_22122015.pdf
- GWI (2015c) Vers un agenda commun pour la production agricole dans les grands barrages: Rapport de l'atelier du Sénégal. IIED, London. http://www.gwiwestafrica.org/sites/default/files/rapport_atelier_ca_gwi_senegal_30112015.pdf
- GWI (2015d) Vers un agenda commun pour la production agricole dans les grands barrages: Synthèse des ateliers nationaux. IIED, London. http://www.gwiwestafrica.org/sites/default/files/synthese_ateliers_conseil_agricole_gwi_2015_final_16112015.pdf
- Hathie, I., Diouf, L., Diouf, M. and Kama, M. (2015) Évaluation économique ex-post des barrages de Niandouba et Confluent au Sénégal IIED, London. <http://pubs.iied.org/G04007.html>
- Hathie, I., Diouf, L., Diouf, M. and Kama, M. (2013). Les enjeux pour les petits producteurs dans l'irrigation à grande échelle – cas du barrage de Niandouba et Confluent (Anambé), Sénégal IIED, London. <http://www.gwiwestafrica.org/fr/les-enjeux-pour-les-petits-producteurs-dans-lirrigation-grande-echelle-le-cas-des-barrages-de>
- Hussein, K. (2001) Producer organizations and agricultural technology in West Africa: institutions that give farmers a voice. *Development* 44: 4 61-66.
- Kaboré, E. and Bazin, F. (2014) Évaluation économique ex-post du barrage de Bagré au Burkina Faso IIED, London. <http://pubs.iied.org/G04006.html>
- Kergna, A. O., Cissé, I., Meïté, F. and Cessouma, B. (2013). Les enjeux pour les petits producteurs dans l'irrigation à grande échelle – cas du barrage de Sélingué et de Maninkoura au Mali. IIED, London. <http://www.gwiwestafrica.org/fr/les-enjeux-pour-les-petits-producteurs-dans-lirrigation-grande-echelle-le-cas-du-barrage-de-selingue>
- Lempérière, P., van der Schans, M. L. and Gandhi Bavanirajan, V. J. (2014) Research for development using participatory rapid diagnosis and action planning for irrigated agricultural systems: a manual for development researchers and practitioners. Updated edition. Food and Agriculture Organization of the United Nations (FAO, Rome); International Water Management Institute (IWMI) Colombo, Sri Lanka.
- MAHRH, Burkina Faso (2010) Le Système national de vulgarisation et d'appui conseil agricole (SNVACA) http://www.inter-reseaux.org/IMG/pdf/Document_final_SNVACA_fev_2011.pdf

- MAHRH, Burkina Faso (2011) Stratégie Nationale de Développement de la Riziculture.
- Mboup, C.M. and Anouilh, D. (2014) 50 ans d'histoire du conseil agricole en Afrique de l'ouest et centrale. *Revue Grain de sel*, 41-42 : L'agriculture en quête de politique (Inter-réseaux).
<http://www.inter-reseaux.org/publications/revue-grain-de-sel/41-42-l-agriculture-en-quete-de/article/50-ans-d-histoire-du-conseil-2678?lang=fr>
- Merrill-Sands D and Collion M. H. (1994) Farmers and researchers: the road to partnership. *Agriculture and Human Values* 11: 2, 26-37
- Ministère de l'Agriculture, République du Mali (2009) Stratégie Nationale de Développement de la Riziculture.
- Ministère de l'Agriculture, République du Sénégal (2009) Stratégie Nationale de Développement de la Riziculture.
- Ministère de l'Agriculture, République du Sénégal (2010) Société de Développement Agricole (SODAGRI) Cinquième lettre de mission 2010-2011-2012.
- Ministère du Développement rural, République du Mali, Office de développement rural de Sélingué (2013) Contrat-plan 2014-2016 Etat – ODRS – Producteurs.
- Morabito, V. (1977) L'Office du Niger au Mali, d'hier à aujourd'hui. *Journal des Africanistes* 1977, 47: 1 53-82. doi : 10.3406/jafr.1977.1786 http://www.persee.fr/web/revues/home/prescript/article/jafr_0399-0346_1977_num_47_1_1786
- ODRS, Union Samogosso des sociétés coopératives de Sélingué and Union des sociétés coopératives de la zone ODRS (2015) Plan d'action pour l'amélioration des services du conseil agricole dans la zone de Sélingué au Mali. IIED, London.
http://www.gwiwestafrica.org/sites/default/files/plan_d_action_mali_final.pdf
- One.org / 40chances (2013) The Maputo Commitments and the 2014 African Union Year of Agriculture.
https://s3.amazonaws.com/one.org/images/131008_ONE_Maputo_FINAL.pdf
- Osborn, T. (1995) Participatory Agricultural Extension: Experiences from West Africa Gatekeeper 48 IIED, London <http://pubs.iied.org/6062IIED.html>
- Ouédraogo, O., and Sedogo, S. A. (2014) Les enjeux pour les petits producteurs dans l'irrigation à grande échelle – cas du barrage de Bagré, Burkina Faso. IIED, London.
<http://www.gwiwestafrica.org/fr/les-enjeux-pour-les-petits-producteurs-dans-lirrigation-grande-echelle-le-cas-du-barrage-de-bagre-au>
- RESCAR-AOC (2015) Atelier de formalisation du Réseau des services de conseil agricole et rural d'Afrique de l'Ouest et du Centre (RESCAR-AOC). 18-20 Février 2015, Abidjan, Côte d'Ivoire. Compte-rendu des travaux et synthèse des principaux résultats. http://www.g-fras.org/images/members/rescar-aoc/Rapport_atelier_de_formalisation__du_RESCAR-AOC___Abidjan__18-20_fevrier_2015___Abidjan.pdf
- Sally, H. and Léville, H. (2011) Participatory diagnosis of the irrigation schemes in the Sahel: Experiences from Burkina Faso and Niger *ICID 21st International Congress on Irrigation and Drainage*, 15-23 October 2011, Tehran, Iran.
http://irncid.org/GetFileArticles.aspx?FilePrm=8143_60506.pdf

- Sedogo, S. A. and Bourgou, T. (2015) Lier la demande et l'offre de conseil agricole autour des grands barrages – Le cas de Bagré au Burkina Faso IIED, London.
<http://pubs.iied.org/G03997.html>
- Skinner, J., Niasse, M. and Haas, L. (eds.) (2009) Sharing the benefits of large dams in West Africa *Natural Resource Issues* 19 IIED, London.
<http://pubs.iied.org/12555IIED.html>
- SODAGRI and FEPROBA (2015) Plan d'action pour l'amélioration des services de conseil agricole dans le périmètre irrigué de l'Anambé au Sénégal. IIED, London.
http://www.gwiwestafrica.org/sites/default/files/plan_d_action_senegal_final.pdf
- Sulaiman, S. V. and Davis, K. (2012) The "New Extensionist": roles, strategies, and capacities to strengthen extension and advisory services Global Forum for Rural Advisory Services, Zuerich. <http://www.g-fras.org/en/knowledge/gfras-publications/file/126-the-new-extensionist-position-paper?start=20>
- UEMOA, CEDEAO and NEPAD (2015) Accélérer la mise en œuvre de l'ECOWAP/PDDAA. Programme d'appui à la mise en œuvre de l'Offensive régionale pour la relance durable et soutenue de la riziculture en Afrique de l'Ouest.
- van der Schans, M. L. and Lempérière, P. (2006) Manual: Participatory Rapid Diagnosis and Action Planning for irrigated agricultural systems (PRDA) FAO, Rome.
ftp://ftp.fao.org/agl/iptrid/appia_manual_en.pdf

ANNEX ACTION PLAN FORMAT

Action fiche A	
Title of work stream	
Justification of work stream	Why have actors decided that this work stream is important?
Objective(s) of the work stream	This indicates the objective(s) of the actions overall. It's possible to have several objectives if necessary. 1. 2.
Responsibility	Who has overall responsibility for achieving this objective? Further down you can identify responsibilities for each activity that is needed to achieve the objective.
Results	Indicators
What do you want to achieve? Be as specific as possible.	How / using what indicators can one measure whether the result has been achieved? Indicators need to be specific, measurable, agreed, realistic and time bound.
1.	•
2.	•
3.	•
Hypothesis and risks	What needs to be in place to assure that the results are achieved and what could prevent it?

Action fiche A – Communication processes			
Activities What needs to be done to achieve the results?			
Activities	Managers / participants	Description of additional resources needed	
The specific activities needed to achieve each result	Who needs to participate?	It is not always necessary to have additional resources. Often changes can be brought about by doing things differently rather than doing different things...	
1.1	1.1	1.1	
1.2	1.2	1.2	
1.3	1.3	1.3	
2.1	2.1	2.1	
2.2	2.2		
2.3			
3.1	3.1		

Action fiche A – Communication processes (to be filled out individually by managers and not in a working group, as the form is too complicated)					
Means of implementation	Logistics				
	Human resources				
Budget	Budget lines		Summary description	Costs (FCFA)	Source of funds
		Total			

Design by Eileen Higgins: ehdesign@virginmedia.com

Copy-edit by Maggie Watson.

Printed by Full Spectrum Print Media, United Kingdom, on 100% recycled paper, using vegetable oil based ink.

Photographs

Cover: Preparing sacks of rice on market day in Sélingué, Mali. Credit: Mike Goldwater

Title page: A Fulani herder who has come from Bougouni, 100 km from Sélingué, and is employed to graze this herd. Credit: Mike Goldwater

Chapter 1: Farmers in their paddy nursery below Sélingué dam. Credit: Barbara Adolph

Chapter 2: Brickmaking provides additional income for many farmers in Sélingué.

Credit: Mike Goldwater

Chapter 3: Rice grown in the irrigated perimeters of Sélingué dam is parboiled and sold by a women's cooperative. Credit: Lucile Robinson

Chapter 4: A pineapple grower in Sélingué who would welcome advice from extension workers but says he has never seen any in the area. Credit: Mike Goldwater

Large state-managed irrigation schemes in West Africa are expected to meet the ambitious rice production targets of governments and ensure the livelihoods of small scale rice producers. Functioning institutions are a prerequisite for achieving these sometimes conflicting objectives. Agricultural Advisory Services (AAS) have an important role to play in supporting farmers and their organisations along the value chain and linking them to a range of service providers. However, communication and cooperation between the government agencies managing irrigation schemes and providing AAS, and the farmer organisations representing smallholder rice producers are often undermined by weak capacity and fragile governance systems.

This report summarises three years of action research on the institutional and governance aspects of AAS in three government-managed large-scale irrigation schemes in West Africa – Niandouba/Confluent in Senegal, Sélingué in Mali and Bagré in Burkina Faso. The report offers practical recommendations on how improved services can better respond to farmers' needs, and how the empowerment of farmer organisations is essential if they are to effectively represent the interests of their members.

<http://pubs.iied.org/12595IIED>
ISBN: 978-1-78431-382-1

