

Stories of Change and Innovation in the Volta Basin Development Challenge Program



*Karen Marie Greenough, PhD
Post-Doctoral Social Anthropologist
with Diarra Aly, Anna Tarrant and Kalie Lasiter*

March 2014

Greenough, Karen Marie. 2014. *Stories of Change and Innovation in the Volta Basin Development Challenge Program*. Challenge Program for Water and Food — Volta Basin.

This report is the culmination of 2 years work with the Coordination and Change Project (V5), of the Volta Basin Development Challenge, within CGIAR's Challenge Program for Water and Food, and under the auspices of the Volta Basin Authority.

Copyright 2014, Karen Marie Greenough and Volta Basin Development Challenge.

“

When your back is against the wall your creative ingenuity will be released so that you can create something new out of the resources already available to you, plus the ideas in your head — something that will allow you to live better. [A local technician]



Canoes cross the Boura reservoir with a fish pen in the background (V3, Burkina Faso, June 2012).

Executive Summary

Innovation seems to be the lead buzz-word of the 2010 decade, a must for funding proposals. In this report, to go beyond buzz words and dictionary definitions, I try to tell stories of change and innovation within the Volta Basin Development Challenge, or CPWF-Volta, of CGIAR's Challenge Program for Water and Food. The stories about change and innovation told in this report come from the people involved in the VBDC: the project team members and project participants. Has the VBDC produced innovations? The answer to that question would seem to depend on how one defines and perceives the changes in knowledge, practices and relationships of VBDC stakeholders. These definitions and perceptions depend on context and point of view. We found that different people, of different statuses, see innovation in different lights, but also that the VBDC projects have produced many changes. It is too early to say whether they will persist as innovations in the eyes of outside evaluators, but many in-country researchers and facilitators have seen and experienced what they call innovations in their partnerships with VBDC.

This research can only give a few snapshots of changes engendered by VBDC projects. Here we look at three to five case studies, plus consider our observations and participation in various project workshops, platforms and focus group consultations. We interviewed a majority of researchers and technicians in each of the projects, and a majority of local stakeholders in four different sites of three projects:

- ◆ V2, Ghana — Lawra (Upper West Region) and Tolon Kumbungu (Northern Region)
- ◆ V3, Ghana — Binaba (Upper East Region)
- ◆ V4, Burkina Faso — the Bougouriba 7 watershed and *Comité Locale d'Eau* (Southwest Region)

Due to the extensive nature of the project, we were not able to conduct participation-observation of the changes that our interviewees described as innovations. A more precise characterization of innovations produced by project activities requires a future, rigorous evaluation of VBDC impacts.

This exploration of VBDC project activities stayed away from monitoring and evaluation, neither will this report evaluate the different activities of the VBDC projects. From the responses to our interview questions and our observations, however, I have derived four issues for consideration by future research for development (R4D) programs to create a climate in which to foster innovation. Firstly, during project activities, R4D programs should consider the vast array of people involved, especially local stakeholders, as individuals with their varying livelihoods and cross-cutting socio-economic classifications, rather than simply categories; such as farmers, pastoralists, water users, and women. The second factor is time. Development activities, especially the participatory approaches that the CPWF promoted for their basin programs, take much more time than was allowed by the ambitious scope of the R4D proposals.

The third factor is communication including informal exchange, as well as more formal analysis of intra-program communication. The most important factor in innovation is the exchange of ideas and information. More exchange — especially face-to-face informal discussion — within and between projects would provide an encouraging

atmosphere for the stimulation and development of ideas into innovations. For the analysis of intra-program communication, program leaders should ask how people are communicating with each other — not necessarily the amount or technological means of communication, but the manner in which information is communicated. Does information flow between people in two (or more) directions, and in a manner of mutual respect?

The fourth factor, investment in development, comprises two almost contradictory facets and must find a balance. First, have the donors and the program invested enough resources to properly conduct both research and development? Project members from OECD countries should be thoughtful when asking “sacrifices” from national partners with much smaller budgets and incomes. Secondly, how does a project promote local stakeholder involvement that does not depend on per diem and meals, but rather on interest in advancing the project? To help answer the latter question, I propose that research for development programs follow the lead of most development programs in asking local stakeholders to contribute financially to activities from which they derive a benefit.

From these considerations, I assemble a description of a research for development program that may have a better chance of producing sustainable innovations:

- A program more focused and concentrated in space, with more informal face-to-face interaction.
- More time devoted to project activities, especially on-the-ground interaction with local stakeholders, and time for analysis of preliminary studies.
- More analysis of how project members are communicating with each other.
- Sufficient resources from the program, balanced with realistic project design, plus financial input, however limited, from local stakeholders, matched concurrently with an acknowledgment and appreciation of the differentiation of economic statuses of project members.

None of these issues are easily resolved, then then, too, neither is innovation easily fostered and developed. 💧



Women head to market along the Binaba Dam (V3, Ghana, January 2013)

Acknowledgements

First of all, I would like to thank everyone who gave us their time for interviews, conversations, and to show us their work with their projects. It is impossible to thank everyone individually and as much as I would like. I am also grateful to project and activity leaders who, despite being unsure as to what this research was all about, granted access to meetings, their team members, and reports.

The V5 team including Olufunke Cofie (basin director), Mahamadou Sawadogo (project officer) and Adjara Dindané (office assistant) gave us the most support possible. Within the V5, I especially thank my research assistant Aly Diarra and the V5 chauffeur (and sometime photographer) Joachim Bado, who both made our research missions not only possible, but successful and enjoyable.

Our interns, master's students Kalie Lassiter and Anna Tarrant from Emory University in Atlanta, Georgia, USA, conducted interviews for us in Ghana and contributed greatly to our research team. Though Karin Neumayer, our master's student from the University of Natural Resources and Applied Life Sciences (BOKU) in Vienna, Austria, did not work with the Innovation Research team, she contributed intellectual and moral support to the research.

We hired four translators for our interviews in Ghana and I must thank Hudu Adam in Nyankpala, Appiah Desmond in Binaba, and Dakyiere Vitus and Saamuo Francis in Lawra. Interviews with farmers, processors, traders and dealers would not have been possible without them.

I would also like to thank Katherine Snyder, Beth Cullen, Mulugeta Lemenih, Alan Duncan, and Kees Swaan of the Nile Basin Program, who discussed their project activities and this research with me.

Finally, but by no means less important, I am grateful to the people who provided technical help: Evence Zoungrana of WASCAL (West African Science Service Center on Climate Change and Adapted Land Use) for his great patience with all my requests for GIS and mapping help; and Heather Fredericks for her help in editing the report. 💧



A woman prepares vegetables and onions for Binaba market (V3, Ghana, January 2012).

Table of Contents

Executive Summary	3
Acknowledgements	5
Abbreviations	10
Section I : Introduction: The VBDC and the Innovation Research	11
---- Figure 1: Organogram of CGIAR, CPWF and VBDC	12
---- Figure 2: Network of VBDC Partners	13
----The Volta Basin and Integrated Water Resources Management	16
---- Figure 3: Map of the Volta Basin with isohyets and project sites	17
----Notes for Section I	21
Section II : The Innovation Research and the Vs.....	23
----The Innovation Research	23
---- Figure 4: Map of project sites and interview sites	25
----The VBDC Projects and the Case Studies	26
---- V1: Targeting and Scaling Out	26
---- V2: Integrated Management of Rainwater for Crop-Livestock Agroecosystems	28
---- V3: Integrated Management of Rainwater and Small Reservoirs for Multiple Uses	31
---- V4: Sub-basin Management and Governance of Rainwater and Small Reservoirs	35
---- V5: Coordination and Change	38
---- Volta Storylines and Scenarios	40
----Notes for Section II	41
Section III : Results: New Knowledge, New Skills and Innovations	43
----Time	44
----Discussing the Project: Participants	46
----Personal Goals	48
----New Knowledge and Practices	51
---- What participants and non-participants learned	51
---- V2 Participants	51
---- V3 Participants	55
---- V4 Participants	56

----- Team Members' New Knowledge, Skills and Practices 58

----- Interactions 63

----- V1 63

----- V2 64

----- V3 66

----- V4 67

----- V5 68

----- Innovations 69

----- Definitions 69

----- Experiences of Innovations 70

----- Teaching the Facilitators 73

----- Notes for Section III 73

Section IV: Discussion: Fostering Innovation75

----- People77

----- Seeing like Researchers77

----- Seeing like Farmers 79

----- Gender 80

----- Time81

----- Communication..... 82

----- Investment..... 85

----- Conclusion..... 87

References 88

Annex: Survey Questionnaires 90



The Binaba Reservoir (V3, Ghana, January 2013).

Abbreviations

2iE	Institut International de l'Ingénierie, de l'Eau et de l'Environnement	Burkina Faso
AEM	Agence de l'Eau du Mouhoun Mouhoun Basin Agency	Burkina Faso
AEN	Agence de l'Eau du Nakanbé Nakanbé Basin Agency	Burkina Faso
AIS	Agricultural Innovation System	
ARI (CSIR-ARI)	Animal Research Institute	Ghana
CGIAR	Consultative Group on International Agricultural Research	
CIRAD	Centre de Coopération Internationale en Recherche Agronomique pour le Développement	France
CLE	Comité Local de l'Eau Local Water Committee	Burkina Faso
ComMod:	Companion Modeling Modélisation ou Modeling d'accompagnement	
CPWF	Challenge Program on Water and Food	Sri Lanka
CSIR	Council for Scientific and Industrial Research	Ghana
CVD	Conseil Villageois de Développement Village Development Counsels	Burkina Faso
DGRE	Direction générale des Ressources en Eau Ministry-level Water Department	Burkina Faso
ECOWAS	Economic Community of West African States	
FNGN	Fédération Nationale des Groupements Naam A National Farmers' Organization	Burkina Faso
GAB	Groupe d'Apprentissage pour la gestion des ressources en eau au Burkina Learning Group for water resources management in Burkina	Burkina Faso
GIS	Geographic Information System	
GWP:	Global Water Partnership	
ILRI	International Livestock Research Institute	Kenya
INERA	Institut National de Recherche Agricole	Ouagadougou

IP	Innovation Platform	
IRD	Institut de Recherche pour le Développement	France
IWMI	International Water Management Institute	Sri Lanka
IWRM	Integrated Water Resources Management	
	GIRE Gestion Intégrée des Ressources en Eau	
KNUST	Kwamé Nkrumah University of Science and Technology	Ghana
MoFA	Ministry of Food and Agriculture	Ghana
MSP	Multi Stakeholder Platform	
NGO	Non-governmental Organization	
PGIS	Participatory Geographic Information System	
PRA	Participatory Rural Appraisal	
R4D	Research for Development	
RWH	Rain Water Harvesting	
SARI (CSIR-SARI)	Savanna Agricultural Research Institute	Ghana
SEI	Stockholm Environmental Institute	Sweden
SNV	Netherlands non-governmental organization	Netherlands
SP/ PAGIRE	Sécrétariat Permanent du Plan d'Action de Gestion Intégrée des Ressources en Eau	Burkina Faso
SWC	Soil and Water Conservation (Techniques or Strategies)	
TAGMI	Targeting Agricultural Water Management Interventions	
TU Delft	Delft University of Technology	Netherlands
UDS	University of Development Studies	Ghana
UMR-Geau	Unité Mixte de Recherche- Gestion de l'eau, acteurs, usagers	France
UNDP/PNUD:	United Nations Development Program	
UO	University of Ouagadougou	Burkina Faso
VBA	Volta Basin Authority	Burkina Faso
	ABV Autorité du Bassin de la Volta	
VBDC	Volta Basin Development Challenge	Burkina Faso
VREO	Valorisation des Ressources en Eau de l'Ouest	Burkina Faso
WASCAL	West African Science Service Center on Climate Change and Adapted Land Use	Germany
WRC	Water Resources Commission	Ghana
WRI (CSIR-WRI)	Water Research Institute	Ghana
WUR/PPS	Wageningen University/ Plants Production System	Netherlands
WVBB	White Volta Basin Board	Ghana



This stream collects irrigation water from Binaba gardens downstream of the dam (V3, Ghana, January 2012).

Introduction: The VBDC and IWRM

We heard from time to time, that the Challenge Program for Water and Food (CPWF, supported by the CGIAR¹) and the Volta Basin Development Program (VBDC, aka CPWF-Volta), had set out to do research in a different way than “business as usual.” They wanted to move away from a “pure” and linear research model where scientists’ research results were simply made available to policy makers, extension agencies or development organizations, to a research for development (R4D) model, where the scientists themselves would be involved in development. The CPWF program started their Phase 1 in 2002 supporting 68 projects in 10 river basins around the globe, including the Volta Basin.² Phase 1 ended in 2007, and Phase 2 started in 2009. The VBDC projects did not begin their planning stages until late 2010.

In order to create a more coherent program,³ Phase 2, reduced the number of basins to six (Volta, Nile, Limpopo, Ganges, Mekong and Andes), with each basin program integrating a small number of projects. The VBDC contained five projects. Figure 1 presents an organizational chart that shows the VBDC and its projects within the overarching CGIAR consortium. The International Water Management Institute (IWMI) and the International Livestock Research Institute (ILRI) anchored CPWF within the CGIAR, but other international partners, such as the Stockholm Environmental Institute (SEI) and l’Institut de Recherche pour le Développement (IRD), led and participated in the five projects. The VBDC R4D program targeted the dry lands of Burkina Faso and Northern Ghana, with primary objectives of improving rainwater and small reservoir management, reducing poverty, and

improving livelihood resilience and people’s well-being. These objectives took into consideration goals of integrated water resource management (IWRM): the relationships between upstream and downstream water resource users, and ecosystem services. In order to

accomplish the VBDC objectives, each project, or “V,” brought together several institutional partners for multidisciplinary, multi-component, multi-level R4D, conducted with local stakeholders, i.e. farmers, extension agents, technicians and engineers (see Figure 2, below, for the network of VBDC partners). The projects integrated “southern,” local

“ The program is not something that was conceptualized or defined outside of the context of the basin. There were a lot of interactions. They may not have been in-depth to the grassroots level, but at least it brought together people that should know more about things on the ground to inform what the focus should be for the projects. And CPWF tried to ensure that the projects brought many disciplines together, tried to engage different types of partners. And then they encouraged the projects to keep talking to the people who should use these results — the people who should benefit from them. The way the CPWF operates, in the context of the CGIAR, it’s not business-as-usual. It’s not the way the CGIAR does things. [An international researcher]⁴



Zuur Gaetem Naburmy, farmer leader for V2, stands with the Naburnye sign directing to the V2 trial plots.

(Continued on page 14)

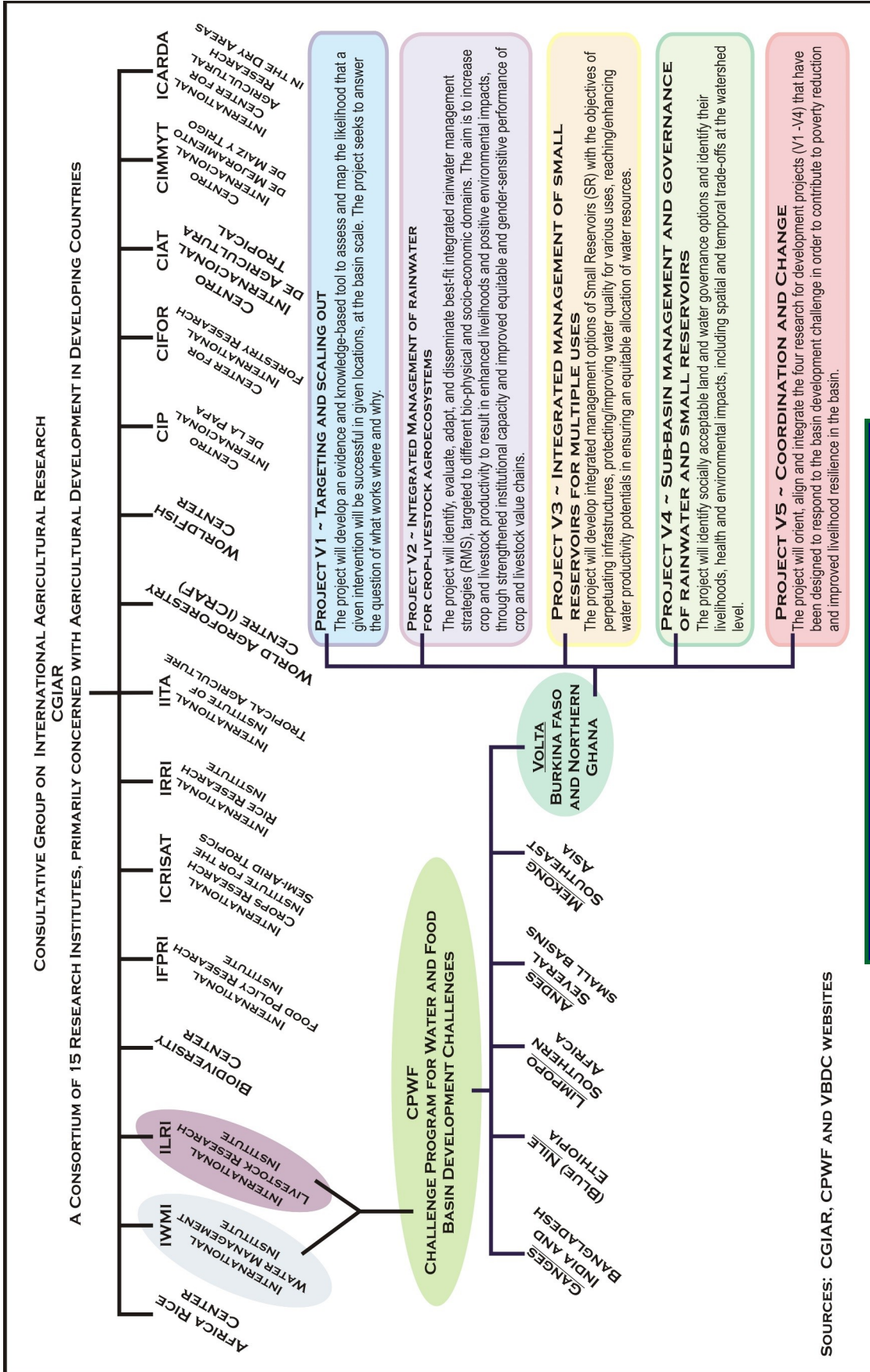


Figure 1: Organogram of CGIAR, CPWF and VBDC

2IE	International Institute for water and environmental engineering
CIRAD	Centre de coopération internationale en recherche agronomique pour le développement
CPWF-Sec	Challenge Program on Water and Food Secretariat
CSIR-ARI	Council for Scientific & Industrial Research - Animal Research Institute
CSIR-SARI	Council for Scientific & Industrial Research - Savanna Agricultural Research Institute
CSIR-WRI	Council for Scientific & Industrial Research - Water Research Institute
G-EAU	Gestion de l'eau et des écosystèmes associés
GWP-WA	Global Water Partnership- West Africa
ILRI	International Livestock Research Institute
INERA	Institut de L'Environnement et de Recherches Agricoles
IRD	L'Institut de recherche pour le développement
IWMI	International Water Management Institute
KNUST	Kwame Nkrumah University of Science and Technology
SEI	Stockholm Environment Institute
SNV	Netherlands Development Cooperation
SP-PAGIRE	Secrétariat Permanent au Plan Action et de Gestion Intégrée des Ressources en Eau
TU-Delft	TU Delft
U-Ouaga	University of Ouagadougou
UDS	University of Development Studies
VBA	Volta Basin Authority
WRC-WVBB	Water Resource Commission-White Volta Basin Board
WUR	Wageningen University

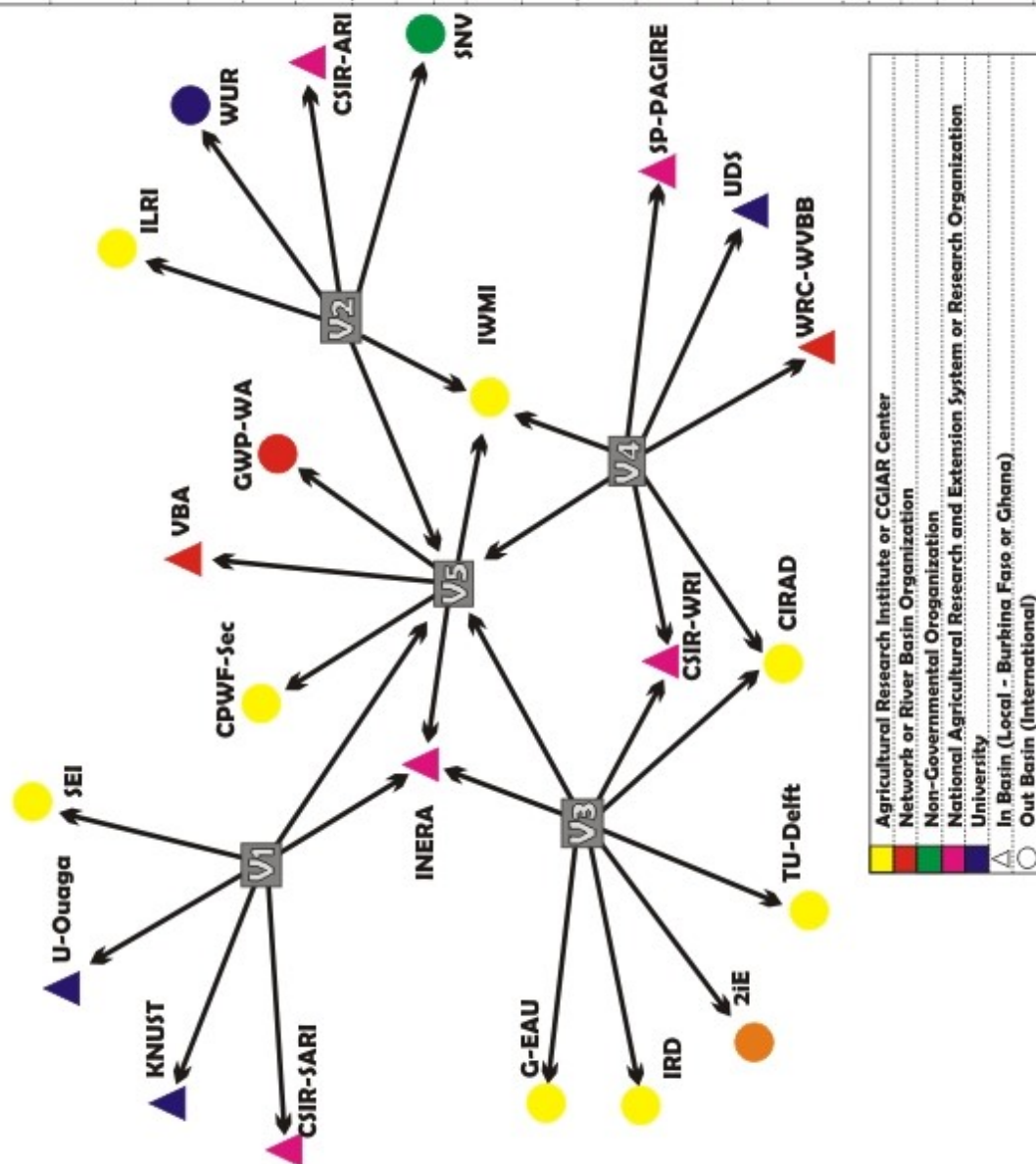


Figure 2: Network of VBDC Partners

(Continued from page 11)

research and development institutions with “northern,” international research institutions as well as the local branches of an international non-governmental organization, SNV, from the Netherlands. Though a northern institution led every project except V5, the local research institutions, development organizations, and extension agencies carried out most of the on-the-ground-work.

Globally, the basin programs and their partnerships worked at different levels in their basins, following the concept of Agricultural Innovation Systems (AIS): researchers work together with other stakeholders to produce innovative processes, technologies and policies. AIS tries to link research institutes, policy makers and local producers through the various forms of multi-stakeholder platforms of “Innovation Research” so that innovative developments will be accepted and integrated into policy as well as adopted and adapted by producers at the farm level (Hall 2006; Hounkonnou, Kossou et al. 2012; Klerkx, van Mierlo et al. 2012). The Volta Basin’s five projects worked with farmers at the household level as well as members of their value chains (V2), with reservoir water users at the level of reservoir watersheds (V3), with stakeholders in water resources at the sub-basin level (V4), and with policy makers and development organizations at basin, national and region levels (V1, V5). Each Volta project attempted to align their research objectives with the demands of their various populations, from farmers involved in the action-research of V2 and V3, to government agencies in V1, V4 and V5.



Jean Philippe Venot presents work from CPWF Phase 1 at the National Forum on Water in Ouagadougou, Burkina Faso (December 2011).

“ The way they all had conceived the program to be, it’s not exactly working out like that because it was too ambitious, given the resources that are available. So you find that many activities have been dropped. [An international researcher]

The VBDC started in late 2010, and in May 2011 convened its “Inception Workshop,” a conference that brought the Vs together to review how their projects were beginning and how they could work together. This was also the time that V5, the Coordination and Change project started — six months after the other Vs had already been establishing their courses of action.

The institution CPWF, as an international researcher told us, “wanted science, very good science, but science that makes a difference.” Their framework, however, was experimental, using various models that were unfamiliar to most project team members, especially for the participatory research, and monitoring and evaluation. The methodology of AIS multi-stakeholder platforms was adopted by the VBDC projects in the form of workshops, Learning Events, Feedback Meetings, and Innovation Platforms.

The Theory of Change and its Outcome Logic Model, however, used for monitoring and evaluation, were less easily understood and never really accepted. The late start of V5, whose task as Coordination Project was to integrate all five projects, also presented a challenge to the cohesion of the basin program. Lack of time and financing combined for a third set of challenges for the projects. “Too ambitious” was a common theme in researchers’ interviews.

In 2012, as the CPWF looked forward to a future phase,⁵ its executive board and budget were absorbed by those of IWMI. This did not seem to affect the VBDC, but in the same year a substantial budget cut, and no CGIAR-based

funding in 2013, delivered more burdens to the project teams. The international partners did their best to make sure that their local partners did not suffer, but international researchers cut back, at least on paper, the time they spent working on the project. As mentioned above, while the CPWF started in 2009, the VBDC did not start until late 2010, and when most projects received no outside funding in 2013, most brought their projects to a near close in September of that year, with limited activities after that. This complex and ambitious program was active for less than three years, including six months of planning, site selection and project refinement. Different interviewees brought up the insufficiency of “three years” for an R4D program over and over again.

That said, the basin program itself was described as an innovation by a few team members, and it provided many opportunities for project members, including local scientists and graduate students, to carry out research and development projects. All of our technician and farmer interviewees told us about the new knowledge and skills that they gained.

This report tells, through the voices of project team members and participants, about the new knowledge and skills they described. It cannot tell everything, as I explain in the next section, due to the breadth of the program, but the stories of change and innovation will give an idea of non-material outcomes of the program, and give a basis for the final section on fostering innovation. The report is made up of four sections: Introduction, Innovation Research and the Vs, Results and Discussion. In the rest of *Introduction: The VBDC and IWRM*, I discuss the Volta Basin and Integrated Water Resources Management. Then in *Innovation Research and the Vs*, I explain the objectives and methodology of the Innovation Research, and give brief descriptions of each project and our “case studies.” In *Results: New Knowledge, New Skills and Innovations*, I detail the responses to our interview questions given by the different interviewees — international and local researchers, technicians, and project participants. In the final section, *Discussion: Fostering Innovation*, I use our findings to discuss how future programs might better foster innovations in AIS partnerships. 💧



Olufunke Cofie, VBDC Director, explains V5 research at the CPWF Third International Water Forum in Johannesburg, South Africa (November 2011).



Boura dam and reservoir (V3, Burkina Faso, June 2012)



The highway between Diébougou and Gaoua creates the Bapla dam and large reservoir (V4, Burkina Faso, June 2012).

THE VOLTA BASIN AND INTEGRATED WATER RESOURCES MANAGEMENT

The Volta Basin drains into three major tributaries of Lake Volta. The Mouhoun starts in south-western Burkina Faso, bends up in north-western Burkina, and comes back south to create the western border with Ghana, where it is called the Black Volta (Lemoalle and de Condappa 2009). The Nakanbé⁶ starts in northern Burkina Faso and becomes the White Volta when it enters Ghana, just below the Bagré hydroelectric dam and reservoir. The Pendjari begins in north-western Benin, creates most of the Benin-Burkina border, becomes the Oti in Togo and creates a small part of the Togo-Ghana border before flowing into Ghana and Lake Volta. This large man-made lake, which takes up four percent of Ghana's land area (McCartney and King 2011:17), is created by the Akosombo hydroelectric dam far south in Ghana. The Volta River flows from the dam into the Gulf of Guinea about 160 km east of Accra.

Although the Volta Basin extends into six countries — Côte d'Ivoire, Mali, Burkina Faso, Ghana, Togo, and Benin — Burkina Faso and Ghana contain 43% and 42%, respectively, and it covers 61% of Burkina and 70% of Ghana (Lemoalle and de Condappa 2009:10). The VBDC projects took place in the northern part of the basin in the watershed of the

Nakanbé and northern part of the White Volta, and in the middle section of the Mouhoun-Black Volta watershed.

Most of the rivers in Burkina are seasonal. The Mouhoun contracts to a large stream in the dry season. In the Nakanbé Basin, water remains year round in only one natural lake, *Lac du Bam* (West 6454:702), and in a multitude of reservoirs, most of them small, but including at least two large reservoirs. The Bagré hydroelectric dam, just north of the Ghana border, creates one large reservoir, and the other, northeast of Ouagadougou, provides that city with its water. The White Volta has become a perennial river only because of the Bagré Dam

(Continued on page 18)



The headquarters of the Agence de l'Eau du Nakanbé in Ziniare, Burkina Faso (January 2012).

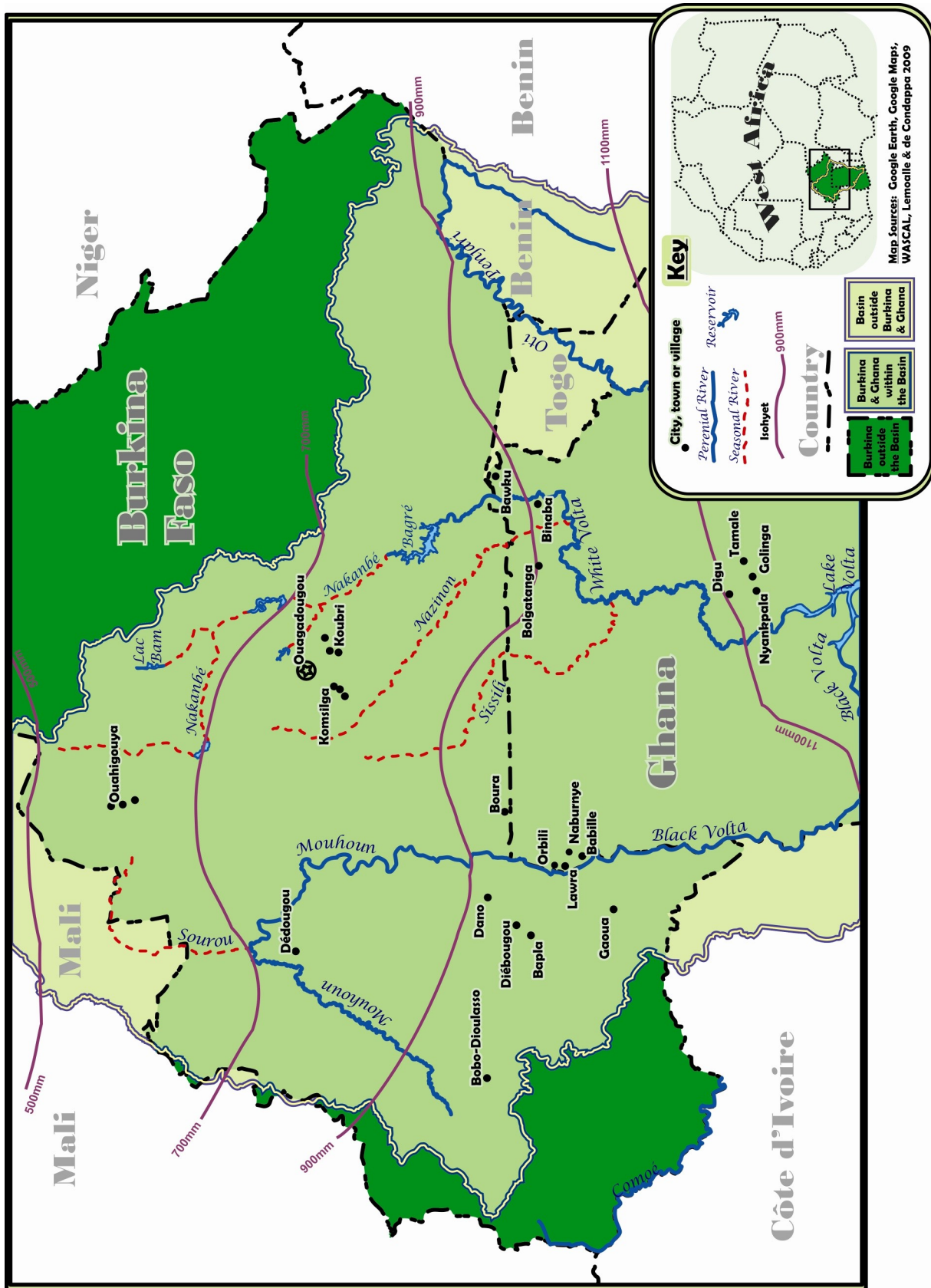


Figure 3: Map of the Volta Basin with isohyets and project sites.



The spillway of the Bapla Dam under the highway that created the dam; water will flow in the rainy season (V4, Burkina Faso, June 2012).

(Continued from page 16)

(Lemoalle and de Condappa 2009:24). Orbili gardeners on the Black Volta told us that the water there has become much more constant with the construction of a hydroelectric dam at Bui, about 75% finished as of November, 2013 (personal communication, Joachim Abungba, Ghana Water Resources Commission).

Much of Burkina Faso and northern Ghana, the area in which the VBDC projects were located, lies within two isohyet zones, Sudano-sahelian in the north and Soudanian in the south. The annual rainfall ranges from

500 mm in the very north to 1100 mm in the south. The northernmost V2 sites were around the 700 mm isohyet while the southern-most were near the 1100 mm isohyet. Most projects sites were near the 900 mm isohyet. These numbers, however, are averages of annual rainfall that varies widely from year to year.

As most rural income-generating and subsistence activities depend on this variable rainfall, some attempts have been made over the years to mitigate its unpredictability in order to make water resources more secure and livelihoods more sustainable and resilient. Some of these strategies have been soil and water conservation (SWC) techniques, such as *zai* and contour bunds (see, for example, West 2013); others have been large irrigation schemes, such as those below the Bagré dam and in the lower Sourou valley (Lemoalle and de Condappa 2009:60-65). The water resources management strategy

with the greatest geographical

presence, if not impact, has been small reservoirs. Lemoalle and de Condappa (2009:68) define small reservoirs “as those having a storage capacity of less than 1Mm³,

while Venot and Krishnan (2011:316) state that a definition for small reservoirs has not yet been determined.⁷ Lemoalle and de Condappa count over 1400 small reservoirs in Burkina Faso with over 1100 in Burkina’s portion of the Volta Basin; Venot and Krishnan, two years later, count over 1000 in Ghana, and over 1700 in Burkina. The Irrigation Development Authority of Ghana counts 289 reservoirs in the small Upper East Region alone (personal



The well-managed flood plain of the Moutori dam, near Dano, is sponsored by the Dreyer Foundation, a German research institute located nearby (Burkina Faso, February 2013).



The canal running from Binaba dam to the gardens on the left bank of the flood plain (V3, Ghana, January 2013).

communication, Joachim Abungba, Ghana Water Resources Commission).

While some dams are quite old — Binaba reservoir in V3's Ghana site is over 50 years old — researchers told us during VBDC workshops that most small dams were built hurriedly after the droughts of 1973-4 and 1984-5. Many, like that at Bapla (part of V4's Burkina site), take advantage of highways with their spillways running under the roads. Some of the reservoirs, again like Bapla, have no other infrastructure than the dam itself and a spillway. Others, like those at Binaba and Boura (V3, Burkina), have concrete canals running downstream of the dams, permitting irrigation in the floodplains below. One reservoir that we discussed with some V4 participants near Dano is part of a carefully constructed system created by the nearby Dreyer Foundation, a German research institute. The Foundation built canals and fenced much of the floodplain, the management of which it has turned over to a gardeners' organization. The gardeners pay various fees into the organization for water use and upkeep of the canals and fencing.

Another water management strategy is the man-made pond or "dugout." Projects or government programs dig some, many have been left by road-building crews, and communities themselves sometimes dig small ponds. The dugouts collect rainwater that can last far into the dry season. Following the example of one Orbili (V2) farmer, who had a road crew dig him a pond, the V2 Ghana team had a pond dug for another Orbili farmer who uses the water for his livestock, a small garden and household purposes.

All of these water resources, but especially rivers and reservoirs, have multiple uses and users, including gardeners, rice and maize cultivators, fishermen, transhumant pastoralists and local livestock raisers. Women wash clothes and men wash their cars and motorcycles on reservoir banks. Reservoir water also helps to maintain high water tables so that communities can obtain drinking water from boreholes with mechanical pumps.

The international policy that both Ghana and Burkina use to administer water resource use is Integrated Water Resources Management (IWRM; *Gestion intégrée des ressources en eau, GIRE*), adopted in



Cattle water at an old dugout late in the dry season along the Ouagadougou-Bobo Dioulasso highway (Burkina Faso, March 2012).



This dugout near Yako, Burkina Faso, was dug through a project. A nearby community uses it to water livestock. At the beginning of the late 2013 rainy season, it is not yet full (V1 PGIS, June 2013).



Women pump water at Bapla not far from the reservoir (V4, Burkina Faso, June 2012).



A miner sluices for gold in the bed of the Bougouriba River (V4, Burkina Faso, February 2013).



During the dry season, miners dam what water remains in the Bougouriba River so that they can dig for gold in the bed (V4, Burkina Faso, February 2013).

1998 in West Africa at the West African Ministerial Conference on IWRM for the Economic Community of West African States (ECOWAS) (Water Resources Commission 2012). The Global Water Partnership, created in 1995 by the United Nations Development Program (UNDP) and the World Bank to promote IWRM (Global Water Partnership *History*, retrieved 24 November 2013; see also Cherlet and Venot 2013), defines the concept as

a process which promotes the coordinated development and management of water, land and related resources in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital eco-systems (Global Water Partnership *What is IWRM?*, retrieved 24 November 2013).

IWRM is a globally developed, comprehensive policy that covers all aspects of water resource management — urban and rural, health and waste, industry and ecosystem services. The VBDC, along with the whole CPWF program, used IWRM as a guide for its project planning and implementation. The V3 and V4 projects, especially, looked at the many different uses of reservoirs and rivers as well as issues of equitable resource management. We heard of several conflict issues at the local level, especially between livestock keepers and cultivators around reservoirs and in

the downstream flood plains. People who used the Bougouriba River (V4 Burkina site) were also concerned with gold mining activity because the miners dig deep holes in the river bed during the dry season, and use poisonous chemicals while sluicing for gold. Pesticides used to kill fish for consumption, plus runoff from riverside and reservoir bank cultivation also contribute to water pollution, dangerous for people and livestock. The sedimentation of rivers and reservoirs caused by cultivation along the banks is an important concern of policy makers and water resource users alike, though program hydrologists told us that sedimentation in the project site reservoirs did not seem to be an actual problem. Cultivators are expected to respect a wide space around reservoirs and along river banks, but most do not have the resources to pump water away from the water's edge for irrigation. Many farmers cultivate close to and even in the White Volta. Though they will gain a high yield if they harvest their crops, this activity is very risky in the rainy season due to unpredictable sudden releases of water from Bagré Dam.

The V3 project included participatory modelling that should help stakeholders practice IWRM within their reservoir watersheds. Institutions such as Burkina Faso's Local Water Committees (*Comités Locales d'Eau*, CLE, V4) and Ghana's White Volta Basin Board (WVBB) are supposed to deal with IWRM issues at the river basin level. Aaron Aduna, direc-

tor of the Water Resources Commission in northern Ghana, told us during the VBDC Science Workshop of 2012, and during later conversations, that he would propose that the WVBB divide into smaller sub-basin groups. His work with V4 helped him to realize this idea for better local water resource management. At a meeting on August 31, 2012, the WVBB debated whether and how to create smaller basin boards for parts of the White Volta and for tributaries to the White Volta. Later, Aduna told me that the WVBB was progressing with the creation of smaller sub-basin structures.

The other V's were more indirectly involved with IWRM. V2's SWC rainwater harvesting techniques help prevent run-off and erosion. V1 searched for the most successful development interventions for agricultural water resources, which should also fit into successful IWRM. V5, at the national and regional level, tried to keep the projects on course with IWRM and other national policies. I describe the five projects in more detail in the next section. 💧



Fish from the Bougouriba River (V4, Diébougou, Burkina Faso, February 2013; photo credit, Joachim Bado).



The Mouhoun River flows south to form the Burkina-Ghana border, and becomes the Black Volta in Ghana (from the Diébougou-Boura road, Burkina Faso, June 2012).

NOTES FOR INTRODUCTION

¹Consultative Group on International Agricultural Research, <http://www.cgiar.org/who-we-are/>

²See Research: <http://waterandfood.org/approach/research/>; and Phase Results: <http://waterandfood.org/phase-1-results-update/> on the CPWF website.

³One of our interlocutors told us that donors had looked at CPWF Phase I, and said that CPWF had no program, only a large collection of projects.

⁴NB: Quotes from interviews have been liberally edited for conciseness and clarity. To simplify the policy of anonymous interviews, no interlocutors will be identified.

⁵This would become Water, Land and Ecosystems (WLE).

⁶The name of this river is variously spelled Nakanbé and Nakambe. I will use the spelling used by the Basin Agency, *Agence de l'Eau de la Nakanbé*.

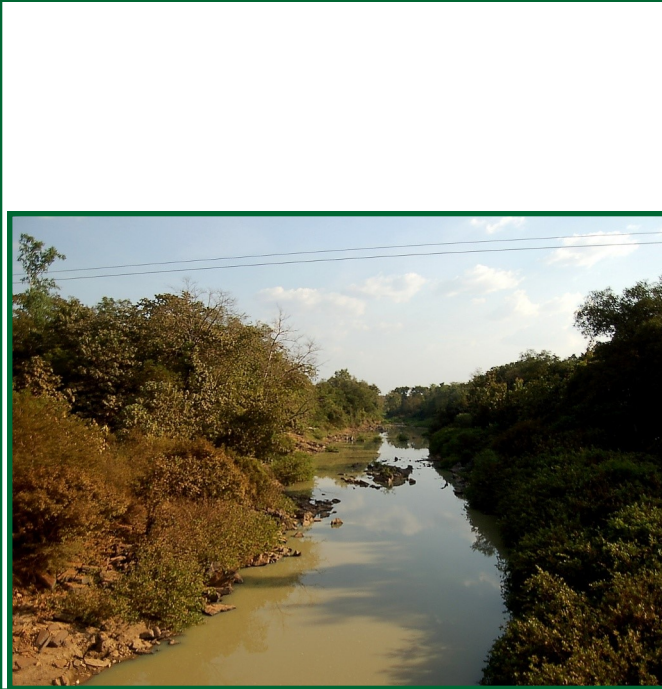
⁷Mm³ = million meters cubed.



The Nazinon flows south into Ghana where it becomes the Red Volta. Shown here a couple of months after the end of the rainy season, it is nearly dry. (Left, upstream, and below, downstream, of the bridge on the highway from Po to Ouagadougou, Burkina, November 2013).



The Nazinon River in the rainy season (left), looking from nearly the same place as the above picture (Burkina, August 2012).



The Nazinon becomes the Red Volta in Ghana, shown here, a few days before the top pictures, upstream (above) and downstream (left) of a bridge on the road to Zebilla. It parallels the White Volta to the west until it meets and joins the larger river (Ghana, November 2013).

The Innovation Research and the Vs

THE INNOVATION RESEARCH

The Coordination and Change Project of the VBDC (V5) addressed the question: How can we best orient and integrate research on rainwater and small reservoir management to help reduce poverty and improve livelihood resilience?" To support the VBDC's program goals, the V5 coordinator (also the Volta Basin leader) decided to go beyond the rather metaphorical label of "Innovation Research" to conduct an investigation of the possible innovations that could be emerging from the five projects. I was hired 1 November 2011, in the second year of the project, six months after V5 itself started. We hired Diarra Aly as translator and research assistant the next March. In the summer of 2013, two students, Kalie Lasiter and Anna Tarrant, from Emory University (Atlanta, Georgia, USA) joined us for a few months of interviewing at the Ghana project sites. This report is the result of our investigation.

Early in the planning phase of the research, through discussion with another social scientist, we decided that, in order to gain as much acceptance as possible from project team members, the study would not be an evaluation. Neither has it been "research" in the classical sense of the word. As time passed and we learned more about the different projects in the program, our questionnaires changed and a method of analysis developed very slowly. The selection of interviewees and interviews proceeded over too long a period and a bit too haphazardly to give us consistent data. Nevertheless, the research has resulted in an exploration of changes brought about by project activities, often in conjunction with influences from other projects and government sensitization (*sensibilisation*) and education programs.

Beginning our study nearly half-way through the project, we set our goal to find new knowledge, skills and interactions emerging from project activities. These categories came from the VBDC's Outcome Logic Model and other V5 interests, such as Stakeholder Engagement. We looked for potential innovations. We did not, however, identify these innovations ourselves, but asked project team members to first define their meaning of innovation and then identify what they thought was innovative in their projects.

This report is a story of what we discovered, and also a story of part of the VBDC as told through the voices of project team members and participants: what they learned and how the projects changed them. To conduct the research, Aly and I attended several multi-stakeholder platforms and workshops, and read reports and other project documents. Kalie and Anna joined us later for one workshop and many interviews. These activities provided context for the



I interview the Aaron Aduna, director of the Water Resources Commission, Bolgatanga, Ghana (V4, July 2012; photo credit, Joachim Bado).



Right to left, Aly talks with Apam Abendere and John Apabum in the Binaba onion fields (V3, Ghana, January 2013).



Fred Kizito (center) and I interview Zuur Gaetem Naburmy in his Naburnye field on the VSS tour (V2, Ghana, July 2012; photo credit, Joachim Bado).

most important part of the research: our interviews of project team members and project participants. Team members included researchers from international and national (Burkina Faso and Ghana) research institutes, graduate students from national universities, technicians from national research institutes, members of international and local development organizations, and extension service agents. Project participants were mostly Ghanaian farmers in projects V2 and V3, but in V4’s Burkina component, we interviewed members of government departments (water, health and livestock), a local NGO and district-level associations; the latter included fishermen, pastoralists, livestock raisers and a women’s association.

We were not able to cover the whole program by interviewing all team members and participants. The program was too vast, geographically and demographically. Some local researchers were based too far south in Ghana; some inter-

national researchers came to the sites for only brief, rushed visits. While some participants took part in project activities throughout the duration of the program, many others, especially in V1, V4 and V5, participated in only one platform or community focus group.

Because we could not explore every project fully — indeed we were limited for various reasons from studying Burkina projects — we chose what we call case studies from certain projects. Though we interviewed as many team members as possible, we concentrated on interviewing the participants at these project sites. We also attended many platforms and workshops in both countries. ♦

Burkina Faso			Ghana		
Place Based	Project	No.	Place Based	Project	No.
<i>Researchers, Technicians, Faciliatators</i>			<i>Researchers, Technicians, Faciliatators</i>		
Ouagadougou	all	13	Tamale	V2	1
Ouahigouya	V2	4	Nyankpala	V2	6
Bobo Dioulasso	V3/5	5	Lawra	V2	1
		22	Babille	V2	2
<i>Participants & other interviewees</i>			<i>Participants & other interviewees</i>		
Dano	V4	3	Wa	V2	1
Diébougou	V4	6	Bolgatanga	V4	2
Bapla	V4	5	Bawku	V3	2
Navielgane	V4	1	Binaba	V3	2
Tiankora	V4	1			17
Diourawo	V4	2	<i>Participants & other interviewees</i>		
Bouroum-Bouroum	V4	1	Binaba	V3/4	21
Dedougou	V4	1	Lawra	V2	6
Gaoua	V4	3	Orbili	V2	16
		23	Naburnye	V2	8
<i>R,T,F based elsewhere</i>			Golinga	V2	10
	V1 & 2	5	Digu	V2	12
					73
			Total Interviewees		140



Mahamadou Diallo, V4 participant, shows Aly the stable he has built for his milk cows. He uses the manure in his biogas digester (for light and cooking) and then sells the compost to gardeners. (Burkina, November 2014)

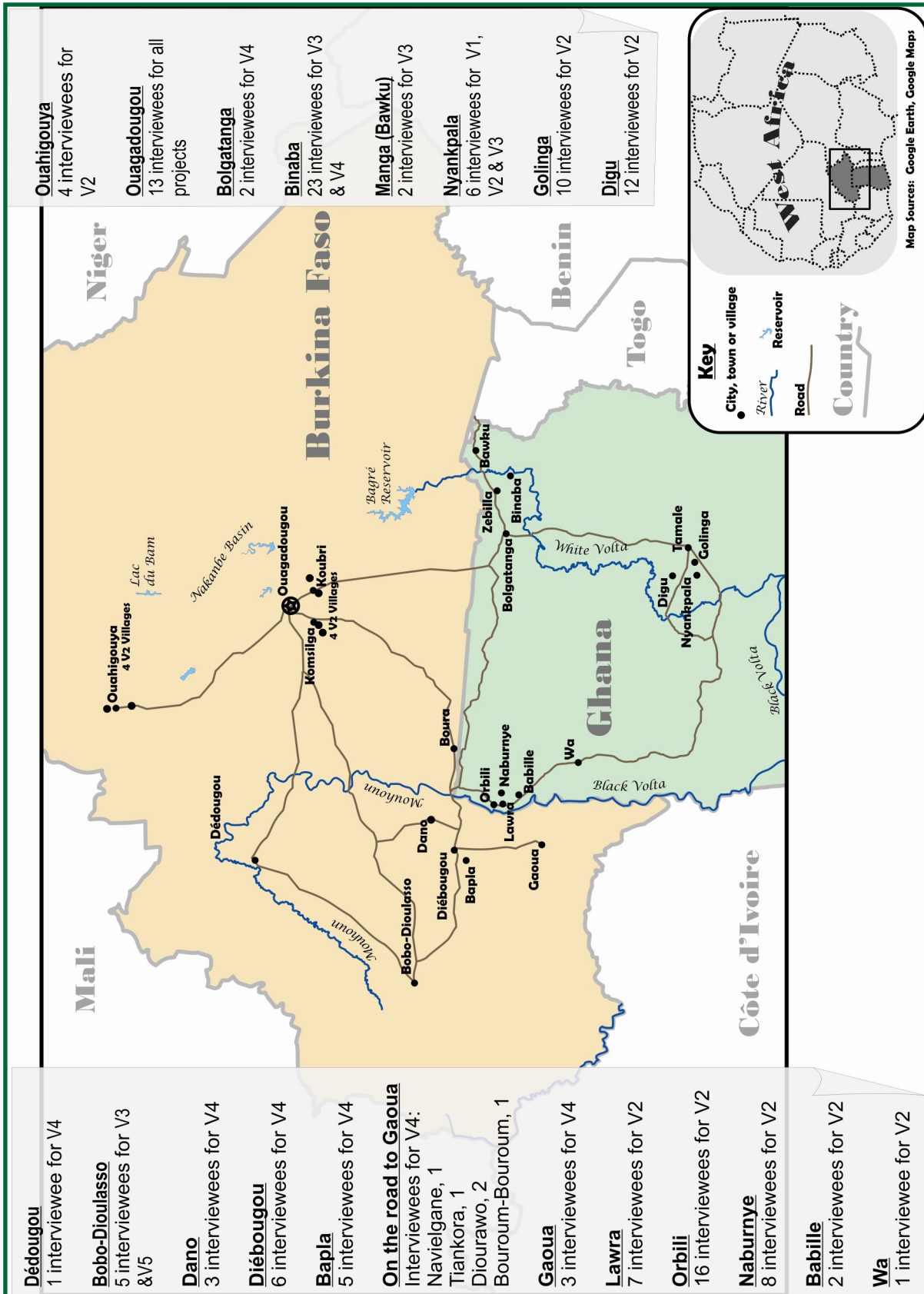


Figure 4: A Map of project sites and interview sites.

THE VBDC PROJECTS AND CASE STUDIES

As mentioned above, this report will not detail every element of the complex projects. It will focus only on the components of the projects on which we concentrated. First, however, I will give brief overviews of each project to help put into context both our case studies and the information gathered from project members. These sketches come from our interviews and observations, as well as from project documents.

The Venn diagrams for V2, V3 and V4 show how we saw the different institutions interacting in our case studies. One can see how the local institutions acted as intermediaries between the international institutions and local communities. At times, individuals from international institutions worked for a day or two with farmers, but for the most part, local researchers and especially technicians led the everyday work. V4 was an exception since the international researchers worked more closely with Burkina workshop participants and led all the workshops in both countries.

V1: Targeting and Scaling Out

V1, led by the Stockholm Environment Institute (SEI), based its project around the development of a computer model

called Targeting Agricultural Water Management Interventions, or TAG-MI.¹ The model uses Bayesian statistics to identify areas where successful development interventions in agricultural water management might be initiated. This project's multi-stakeholder platforms, called Learning Events, brought together experts from government agencies, development NGOs, universities and research institutes to identify indicators of successful development interventions and other factors which the team members used to build the model. In this project, the researchers would learn from participants of the platforms. Between Learning Events, researchers from national research institutes (INERA in Burki-

(Continued on page 28)



Project Snapshot ~ V1 Basin level

Title: Targeting and Scaling Out	
Lead Partner: Stockholm Environment Institute (SEI)	Headquarters: Stockholm, Sweden
Consortium Partners:	
Institut National de l'Environnement et de Recherche Agricole (INERA)	Ouagadougou, Burkina Faso
Dept. of Geography of the University of Ouagadougou (UO)	Ouagadougou, Burkina Faso
Civil Engineering Dept., Kwame Nkrumah University of Science and Technology (KNUST)	Kumasi, Ghana
Savanna Agricultural Research Institute (CSIR- SARI)	Accra, Ghana

Project Component

Building a GIS-linked Bayesian network model to provide two estimates of the probability that an Agriculture Water Resources Management intervention might be successful:

- 1) probability of success at a particular location based on evidence of successful and unsuccessful interventions elsewhere and evidence about the proposed site
- 2) a probability map of where within the basin an intervention is likely to be successful, provided the necessary spatial datasets are available

Methods:

"Training" of a Bayesian belief network
Data collection through Participatory GIS
Learning event workshops

PGIS Sites:

Several sites of previous project interventions in the Volta Basin zone covered by VBDC

Sources: Project proposal, reports, interviews, observation

“ What we ideally wanted to look for — and it’s really hard to get at, we knew it coming in — is food security. So, in the Learning Events, we asked them a series of questions, first of all, to list some agricultural water management interventions. We asked about examples that they knew of, whether they were successful or unsuccessful, and how they knew the examples were successful or unsuccessful. So, that’s how we get at this indicator question. But that turned out to be all over the place.

Different projects had different goals, or the people evaluating them used different criteria for their evaluations. But lots of criteria made a lot of sense to us, like more income for women, for example, or increased yields, and increased organic matter in the soil. Some of the indicators are very directly biophysical on-the-ground, on the fields; some of them are social; some of them are persistence measures. That is: “We went back two years later and they’re still happy with the intervention.” If the funder left and it’s still working well enough that they haven’t abandoned it, it’s a success. Then we asked what contributed to the success or failure. So, then we got a list of those factors of success or failure, and those were more or less as we expected.

And then we asked people to get creative and think of any data that they could lay their hands on, that already exists, without going to the field, not measuring anything new; something that’s already collected by someone on a regular basis, that could be used to evaluate whether these factors of success are present or absent. That’s where the surprises came in, because I felt like there were some really good ideas, and frankly there’s more data out there than you might expect. Some of it, unfortunately, is sitting in somebody’s district office in a binder, but it’s a wealth of data that’s potentially available. That was a pleasant surprise. And then some of it isn’t sitting in a binder, and it’s available electronically.

So I’m looking forward to pulling that together. When you go and look at the realities of data, I think we’ll end up finding out that there are some big gaps. And it may be that one thing coming out of this, if this proves true, is we can just say, look, there’s actually a lot of existing data. And what’s needed is a bit of funding for somebody to do some really boring data entry. Just take those binders and put them in a database. [An international researcher]



Eric Kemp-Benedict leads a V1 Learning Event at the Volta Basin Authority, Ouagadougou (Burkina Faso, August 2012).



Mariam Balima of V1 Burkina and her geography students conduct a PGIS focus group (Burkina Faso, June 2013).

(Continued from page 26)

na; SARI in Ghana), with students from local universities (UO and KNUST), conducted Participatory GIS exercises with farmers, government department directors and extension agents at different sites around their respective countries. The data collected from the focus group interviews also helped to build the model. Team members and participants identified locally accessible sources of data that could be fed into the model. We interviewed four researchers and participated in two Learning Events and one PGIS exercise. We were not able to interview Learning Event participants.

V2: Integrated Management of Rainwater for Crop-Livestock Agroecosystems

V2 based its project around Action-Research in field trials with selected farmers, and Innovation Platforms where those same farmers were to meet with members of one or two of the value chains they participate in: trades people, processors, extension agents and directors of micro-finance institutions. The project was sited in eight villages in Burkina Faso and four villages in Northern Ghana, all located in a crooked north-south transect from Ouahigouya through Koubri and Komsilga, Burkina Faso, to Lawra and Tolon-Kumbungu, Ghana. Half of the villages have small reservoirs nearby, to which some farmers have access for irrigated gardens, rice or dry season maize. Most farmers in Orbili, Lawra District, farm dry season gardens along the Black Volta.

The project focused, however, on rainy season crops, and rainwater harvesting (RWH), using soil and water conservation (SWC) techniques such as contour bunds, either of stone or earth, and tied ridging, where the crops are sown on ridges with cross-ridges tying the planted ridges together. The tied ridging creates a checkerboard of pockets where rainwater is trapped.

Researchers from the national research institutes (INERA in Burkina; Animal Research Institute in Ghana) first conducted

(Continued on page 30)

“

A V2 team member described the problem and a possible solution for the IPs:

So far, the IPs have always been dominated by farmers, which really does not really help them. Because the whole idea of the IP is to link different actors: link farmers to credit, farmers to the market. A kind of actor web, interrelating, interacting. But when you have only the producers, only the farmers coming to the IPs, then, even they are not gaining in that process. The problem was that the issues being addressed at the IPs were not really of interest to the other actors. If we were addressing, for example, how producers can better manage a financial system, that may be of interest to the micro-finance people. And they might say, okay, we have these loans, or tools that we can use to track the loan. But if all the time, we are only discussing the soil and water conservation techniques — that's of little interest to those micro-credit agencies.

So now we are ready to change the agenda of the IP. To ensure that different actors would be interested, to engage their interest. So, that means we talk less of production issues which just concern farmers. They may even talk more on a particular commodity. And a good example, some farmers told us they have this variety of white sorghum that traders always come to buy from them because it's used for locally brewed alcohol. So, if we had known that before — if we had done a good market opportunity study, we could have focused all our action-research on this white variety of sorghum for local breweries.

But we can now identify those traders and maybe those local distillers, bring them together. And of course, we can bring in a credit agency, and the research institute. Okay, how can we get more of this seed, this white sorghum variety? Because here there is money at stake. They'd be assured that if they can produce this white sorghum variety, they produce enough quantity, we can even start to ask those distillers, what quantity do you need? How much could the farmers produce? What can we do to ensure the yield increase to meet the demand?

**Project Snapshot ~ V2
Household Level**

Title: <u>Integrated management of rainwater for crop-livestock agroecosystems</u>	
Lead Partner: International Livestock Research Institute (ILRI)	Headquarters: Nairobi, Kenya
Consortium Partners:	
International Water Management Institute (IWMI)	Colombo, Sri Lanka
Institut National de l'Environnement et de Recherche Agricole (INERA)	Ouagadougou, Burkina Faso
Catholic Relief Services / replaced by SNV-Burkina	Ouagadougou, Burkina Faso
Sub-contracted by SNV-Burkina	
Federation Nationale des Groupements Naam	Ouahigouya, Burkina Faso
SNV-Ghana	Accra, Ghana
Animal Research Institute (CSIR-ARI)	Accra, Ghana
University of Development Studies	Nyankpala Campus
Ministry of Food and Agriculture (MoFA), Lawra Station	Lawra, Ghana
Savannah Agricultural Research Institute (SARI), Ministry of Food and Agriculture (MoFA) for varietal seeds	
Wageningen University, Plant Production Systems (WUR-PPS)	Netherlands
Project Components:	
Integrated Rainwater Management Strategies	Sites:
Rainwater Harvesting (RWH) and Soil and Water Conservation (SWC) Techniques	Burkina Faso
Improved crop varieties	Northern Region (Ouahigouya)
Livestock health and nutrition	Bogoya
Innovation platforms (IP)	Koura Bagré
	Pogoro-Silmimossé
	Ziga
	Central Region (Koubri & Komsilga)
	Bousouma
	Wamtinga
	Toéghin Peulh
	Kalzi
	Ghana
	Tolon-Kumbungu (Northern Region)
	Golinga
	Digu
	Lawra (Upper West Region)
	Orbili
	Naburnye
Methods:	
Action Research with selected farmers	
Cultivating trial plots with improved seeds	
Using different SWC and fertilization in subdivisions of trial plots	
Intercropping cereals with legumes	
Regular vaccinations of small ruminants	
Encouragement to house small ruminants	
Feed trials for sheep	
Innovation platforms	
Discussion and planning of action research	
Selection and capacity building of a value chain	

Sources: Project proposal, reports, interviews, observation



The Animal Research Institute, Nyankpala station (near Tamale) Ghana (May 2012).

(Continued from page 28)

participatory rural appraisal (PRA) exercises, household socio-economic surveys and introductory Innovation Platforms (IPs) in each of the villages. Then they began on-farm trials with selected farmers, male and female (eight per village in Ghana). The IPs were administered by SNV Burkina, which subcontracted with the *Fédération Nationale des Groupements Naam* (FNGN), a national farmers' NGO in Burkina, and SNV Ghana to facilitate the meetings in their respective countries. In the first workshops, the farmers identified which value chains they would work on, and these determined what crops they would grow in the trial plots and which animals they would focus on.

To create a workable scenario for the researchers, the farmers all had to decide on one grain and one legume to grow in their plots. In Ghana the farmers all grew maize, intercropped with soybeans. On half-acre plots of the farmer's own land, farmers, researchers and technicians worked together to install the SWC techniques for rainwater harvesting (RWH), and the farmers sowed improved varieties of crops with seeds provided by the research institutes (INERA and SARI). The researchers showed them how to experiment with manure, fertilizer, manure and fertilizer, and no inputs on different sections of the plot.

The farmers worked with techniques new to many of them: intercropping, sowing in rows rather than broadcasting, sowing one seed per hole (the certified seed was guaranteed to sprout), applying manure, and the RWH systems. A livestock component provided the selected farmers with free vaccinations for their small ruminants and trained them in

composting and fodder collection. The project encouraged them to enclose their livestock in "housing" or stables so that they could more easily gather manure for their fields. The stabling, participants told us, also facilitated daily health checks and protected the animals against thefts.

Subsequent quarterly IPs tried to connect the farmers with traders and processors who would buy the farmers' crops and livestock, as well as input sellers (seeds, fertilizer, pesticides), extension agents, and directors of microfinance groups. The IPs ran into several problems in both countries, primarily because they became discussions of the trial farming and trainings instead of engaging other actors of the value chain. SNV tried to address this in the 2013, with some success in Ghana, at least.



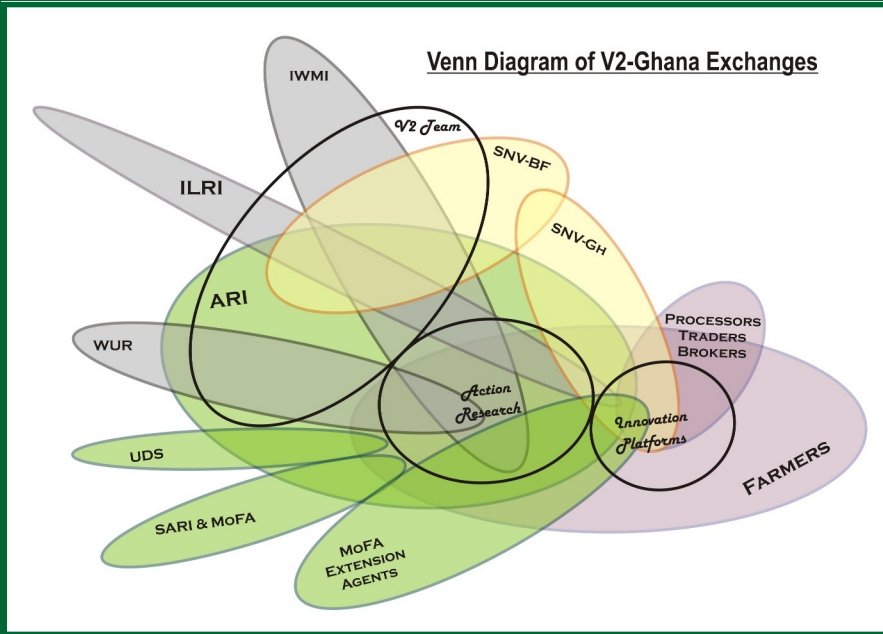
Yamali Shaibu, a Digu farmer, shows one of his rams that participated in V2's feed trial (Ghana, May 2013).



Joruba Joyce Nelle, malt processor and Lawra IP participant, shows her malted sorghum, ready for brewing into beer (V2 Ghana, July 2013).



Tied ridging in Orbili (top) and Naburnye (bottom) maize fields (V2 Ghana, July 2012).



Innoussa Allassan, V2 trial farmer, shows the rain gauge with which he measure rainfall in Golinga (Ghana, July 2012).

The Ghanaian researchers from ARI worked closely with the farmers, and in Lawra at least, also extension agents from the district station of the Ministry of Food and Agriculture (MoFA), including veterinarians who cared for the farmers’ livestock. Researchers from IWMI and Wageningen University also carried out experiments with the local team members and farmers, who collected rainfall data and participated in livestock feed trials. In Ghana, the ARI researchers designed a special feed which participating farmers fed to confined sheep. The farmers very much appreciated the growth of the sheep during the trial, but some technicians thought the feed would probably be too expensive for them to buy, considering the ingredients.

V3: Integrated Management of Rainwater and Small Reservoirs for Multiple Uses

V3 was sited in two reservoir watersheds: Boura in Burkina Faso, near the border with Ghana, and Binaba in Ghana, also not far from the border with Burkina. We concentrated on Binaba because members of this village also took part in V4’s workshops in the White Volta sub-basin, and also because we were told that Boura residents had become very tired of being surveyed and interviewed by V3 researchers. A V3 Burkina student told us that their attitude brightened, however, once they began to see results from V3’s work in Boura.

V3 had the most complex, but also the most geographically focused project, though other program members and external reviewers had trouble seeing a connection between the hydrological and agricultural aspects of the project. V3 researchers insisted, however, that their work, especially the field trials and research into an invasive plant in the Boura reservoir, reflected community demands. Local researchers also told us how much they learned from other V3 components, e.g. agronomists

“ Now, in V3, the specific things we did: one, the watershed management; two, we evaluated new varieties, used the participatory varietal selection to test some promising rice varieties with farmers. The third thing is community seed production with some rice varieties.

And the fourth is the IPM — Integrated Pest Management for onions. We introduced two onion varieties to grow, and also planted one from here, the Bawku Red. Even though, it’s resistant to local pests and diseases, the bulbs are always very small. The market is looking for larger bulbs. So, the idea is to introduce those two from Niger, but they are very susceptible to pests and diseases. So, assuming we are introducing them, how should they be managed? So, what we tried to do was to use an IPM approach to introduce them. [A local researcher]



Boura community assembles for a V3 feedback meeting (Burkina Faso, April 2012).

learned about hydrology and modeling. The project included hydrological and biological research on the reservoirs themselves, and agricultural action-research with on-farm trials in the floodplains, downstream of reservoirs' dams. There was also a participatory modeling component, using SEI's Water Evaluation and Planning Tool (WEAP), that would permit the reservoir users to better plan their management of the reservoir and watershed resources.

In both Boura and Binaba, researchers from INERA and SARI, respectively, worked with farmers to grow improved varieties of rice, and trained the farmers to grow their own certified seed from these varieties. In Binaba,

(Continued on page 34)

“

Around April, June, July, in Boura, we'll implement a new operation not scheduled at the beginning. We call it "Pest Expo." The idea is, in one operation involving a number of partners, to look for indicators of exposure to pesticides, simultaneously, in all riverain populations, including humans and aquatic communities. This involves chemists who will use "chem-catchers" — small things we put in the water for two or three weeks, and during that time they accumulate all contaminants.

After that we measure the amounts and know exactly what's in the water current. This is the chemistry part, with people from a French institute. 2iE and University of Bobo will work on aquatic communities. Two French epidemiologists will design and organize an epidemiological survey, to be implemented by a team from a national research institute.

We have a double objective: first to prove that we can construct an efficient consortium of partners to cope with an important question. If we can effectively give this proof that we can do that, then we can find funds to organize something more important later.

Secondly, we want to find something interesting in people in the aquatic ecosystem, and to initiate CCI: Controlling

Consequences of Agricultural Intensification. How to cope with agricultural intensification, something that is a necessity, and protect ecosystems? That is, contaminants, in riverain populations, in terms of exposure, and in some communities in the aquatic ecosystems.

And if we succeed in doing that, I think that in terms of objectives regarding the V3 project, we'll give something valuable and new. Definitely new. This is a societal question, as well as a scientific question. [An international researcher]



The onion trial plots of V3 in Binaba, (Ghana, January 2013).

Project Snapshot ~ V3
Reservoir Watershed Level

Title: Integrated management of rainwater and small reservoirs for multiple uses

<u>Lead Partner:</u> Unité mixte de recherche (UMR) - Gestion de l'Eau, Acteurs, usages (G-Eau)	<u>Headquarters:</u> Montpellier, France
--	---

<u>Consortium Partners:</u> Centre de coopération internationale en recherche agronomique pour le développement (CIRAD), and l'Institut de recherche et développement (IRD)	Montpellier, France
Institut International de l'Ingénierie de l'Eau et de l'Environnement (2iE)	Ouagadougou, Burkina Faso
Delft University of Technology (TU Delft)	Delft, Netherlands
Institut National de l'Environnement et de Recherche Agricole (INERA)	Ouagadougou, Burkina Faso
Savannah Agricultural Research Institute (CSIR-SARI)	Accra, Ghana
Water Research Institute (CSIR-WRI)	Accra, Ghana

Project Components:
 Local ecological and health impacts of the small reservoirs (SR)
 Assessment of the SR water resources
 Typology of SR uses and external diagnosis
 Participative diagnosis and modeling for IWRM of the multiple uses of the SR

Methods:
 Monitoring ecological properties of the small reservoirs
 Assessing the reservoirs' capacities and documenting the various flows of water, incoming and outgoing
 Household surveys of water use (agriculture, livestock, household, etc.) (*Boura*)
 Action Research with selected farmers

- Participatory Varietal Selection (*Binaba*)
- Cultivating rice trial plots with improved seeds (*Both*)
- Training selected farmers to grow certified seed (*Both*)
- Master Farmer Forums (*Binaba*)
- Cultivating onion trial plots with improved seeds (*Binaba*)
- Integrated pest management for onions (*Binaba*)
- Community meetings to report findings and plan future actions (*Both*)
- Participative modeling

Sites:
Burkina Faso
Southern Region
 Boura
Ghana
Upper East Region
 Binaba

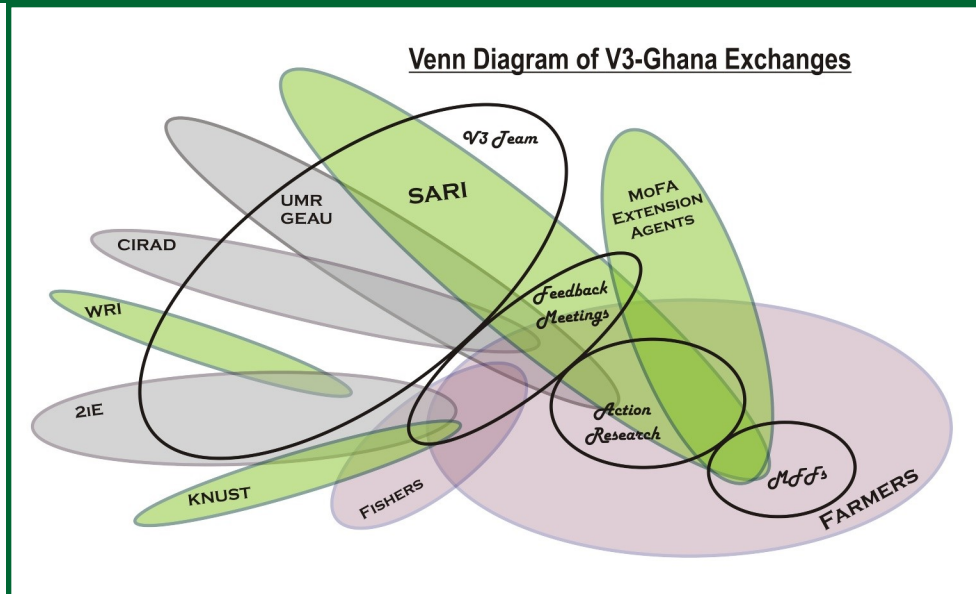
Sources: Project proposal, reports, interviews, observation



Researchers from the Savannah Agricultural Research Institute were partners in V1 and V3, and provided seed for V2 (Nyankpala, Ghana, May 2012).

(Continued from page 32)

the researchers told me they carried out participatory varietal selection for rice, and in the second dry season (2012-13), they introduced two new varieties of onions. As described in the quote, they used Integrated Pest Management (IPM), with chemical and non-chemical strategies, to reduce the pests and diseases that affected the Nigerian onions in northern Ghana.



The SARI researchers developed biweekly Master Farmer Field Schools (or Forums) in which they discussed various agricultural issues with the farmers. The V3 teams in both sites also held semi-annual multi-stakeholder platforms: Feedback Meetings, where they presented their research findings, and discussion workshops, where they discussed with the community where to go with the research. In 2013, the team held a “Pest Expo” in Boura to investigate how different pesticides affect the reservoir and the humans that depend on it.



Violet's onion plot, V3, in Binaba (Ghana, January 2013).



Philippe Cecchi and a Boura fisherman show the lake weed (macrophytes) that cause many problems and create a research opportunity for V3 (Burkina Faso, June 2012).

V4: Sub-basin Management and Governance of Rainwater and Small Reservoirs

Of all the projects, V4 was the most oriented toward social science and institutional development. The researchers began their project with multi-stakeholder platforms called “Rainbow Framework.” Like V1’s Learning Events, this was a consultation platform that grouped policy makers and development program leaders to discuss important issues around agricultural water resources management. In Ghana, the team members worked in two districts of Upper East Region — Bawku Municipal and Bawku West — on either side of the White Volta River.² Their semi-annual multi-stakeholder platforms used Companion Modeling to elicit information from community members, their leaders, and civil servants at both the district (in Bawku and Zebilla towns) and regional levels (in Bolgatanga). They also discussed issues that both community members and government departments, e.g. Environment and Agriculture, thought important: degradation of the riverbanks, flooding, and bush fires. Information collected from the workshops and by other methods assisted the construction of a model that would be able to predict future scenarios depending on human actions (e.g. cropping on the river banks, or burning forest land).

About six members of Binaba community attended the V4 workshops. Our interviews included a few of them, but our research mostly focused on V4’s activities in Diébougou in the Southwest Region of Burkina Faso.

The Burkina Faso component of V4 focused on the *Comité locale d'eau* (CLE, Local Water Committee) of Bougouriba 7. The 2001 “Law No. 002-2001/AN related to the orientation law of water management (Youkhana, Korth et al. 2006:13)” established three levels of water resource management agencies and committees in Burkina Faso at the national, basin, and sub-basin levels. For the latter, rivers were divided into sections with radii of about 50 km in order to facilitate committee members’ attendance at meetings, and international NGOs began to help the basin agencies set up CLEs for each of these sections at the sub-basin level. The SP-PAGIRE, a government agency responsible for IWRM policy (GIRE in French), asked V4 to help “operationalize” a CLE. The Bougouriba 7 was chosen because it was the only sub-basin entirely contained within one region, making administration of the project easier.



Jean-Philippe Venot explains the modeling that results from participant input at a V4 workshop in Bawku, Ghana (March 2012).



Regional level bureaucrats play V4's Companion Modeling game at the Water Resources Commission in Bolgatanga (Ghana, March 2012).

Around 2002, VREO, *Valorisation de ressources en eau de l'Ouest*, a European Union financed program, took advantage of the construction of a new highway to build a dam on a stream that runs beside Bapla community, south of Diébougou, and empties into the Bougouriba River. This dam created the Bapla reservoir — relatively large for a small reservoir — that serves three villages besides Bapla. While there are gardens around the reservoir, and fishermen catch fish in the reservoir, no canals were built downstream of the dam and little development has taken place in the floodplain.

In 2009, with the assistance of VREO, the process was begun to establish the Bougouriba 7 CLE for the section of the Bougouriba River that empties into the Mouhoun (Black Volta). The river itself is used by fishermen, gardeners, pastoralists and miners. The major issue for both the river and the reservoir is gardening too close to the banks, which causes sedimentation. The river also suffers from pollution from mining activities and illegal fish poisoning.

While the Bougouriba 7 CLE had been established to manage all water resources in the sub-basin, it had not yet acted when V4 began. V4 worked with the same CLE board that had been set up a year or two earlier. This was headed by the high commissioner for Bougouriba province, with the provincial director for the department of Agriculture and the president of the fishermen's union of Bapla as general secretaries. Some of the other workshop participants, also representatives of producers' groups (fishermen, pastoralists, etc.), had attended the three or four original VREO meetings. Other participants included members of associations in Diébougou (capital of the province of Bougouriba),

Project Snapshot ~ V4

Sub-Basin Level

Title: Sub-basin management and governance of rainwater and small reservoirs

Lead Partner:

International Water Management Institute (IWMI)

Headquarters:

Colombo, Sri Lanka

Consortium Partners:

Centre de coopération internationale en recherche agronomique pour le développement (CIRAD) Montpellier, France

Water Resources Commission (WRC) - White Volta Basin Board Bolgatanga, Ghana

Secrétaire Permanent - Plan d'Action pour la Gestion Intégrée des Ressources en Eau (SP-PAGIRE) Ouagadougou, Burkina Faso

Water Research Institute (CSIR-WRI) Accra, Ghana

University for Development Studies (UDS) Nyankpala (Tamale), Ghana

Project Components:

Institutional and political context analysis

Multi-stakeholder platforms

Modeling of the biophysical conditions of the two pilot watersheds

Sites:

Burkina Faso

Southwest Region

Bougouriba 7 sub-basin

Diébougou

Bapla Reservoir

Ghana

Upper East Region

White Volta Basin communities

Bawku Municipal District

Bawku West District

Bolgatanga City

Methods:

Rainbow Framework workshops with local experts

Workshops to operationalize the Comité Locale d'Eau (CLE):
Bougouriba 7

Companion Modeling with stakeholders from local to regional levels:
White Volta Basin

Sources: Project proposal, reports, interviews, observation

mayors and préfets, and representatives from government departments (Animal Resources, Health, Environment) in Gaoua, the regional capital, and Dano, the capital of Ioba province to the north. The Bougouriba watershed extends into Ioba and Poni province in the south.

V4 facilitated semi-annual workshops with a participatory approach that asked participants to reflect on and discuss the roles, issues at stake, and actors of the CLE. The first meetings had separate workshops for community members and government agency representatives. Later meetings brought together municipal, district and regional level representatives of these groups, selected by V4 team members (e.g. a president of a charcoal producers' association, a mayor, and a member of the regional water department). The V4 researchers also held a national level workshop where ministry representatives discussed the same issues. The results of this meeting were reported back to the Bougouriba 7 participants. We interviewed the selected participants of the later Bougouriba 7 CLE workshops, plus a few friends and neighbors of these participants.

While most participants appreciated the participatory nature of the workshops, the fact that,

“ A V4 participant describes the participatory nature of the workshops:

The general secretary (secrétaire général) of the province was there! But he didn't have the influence that he would normally have. He couldn't have influence over the people at the meeting. We came to the meeting just as he came to the meeting. And there the titles were left at the door. We all had the same title. And everyone has his ideas. It's not a brawl; it's ideas.

“ A V4 participant described the establishment of a CLE:

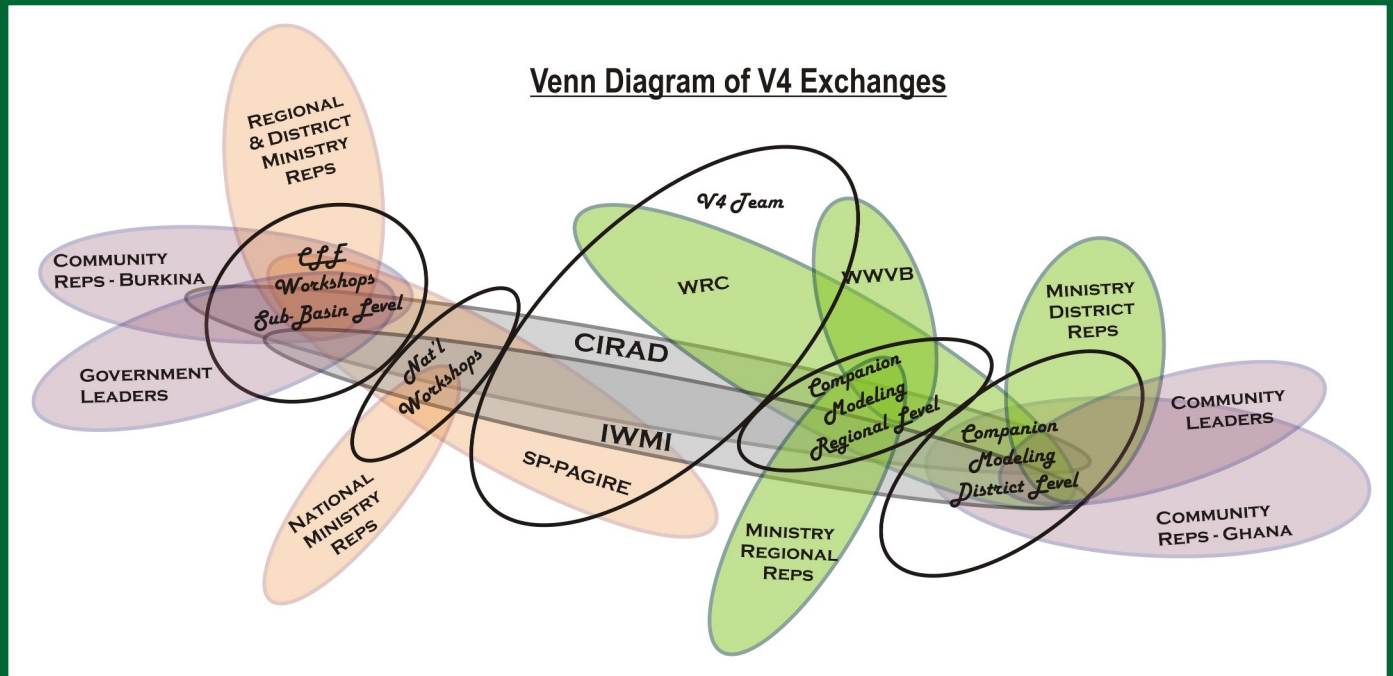
The Water Department (*Direction d'Eau*) piloted the establishment of the CLE with a well laid out guide. We first did a diagnostic of the area: Who's there? What do they do? How do they occupy the area? What are the stakes, the problematic of the presence of such and such actors? After the diagnostic, we report to the actors we identified, including mayors, CVDs (*Conseils villageois de développement*), préfets, development agents, and the population itself.

After the reporting, we move to the installation phase, but before the installation, we sensitize (*sensibiliser*) them: “We've diagnosed this and that problem, and you've said this and this and this. Do you think that it's this aspect that's causing that problem? If it's this aspect that's causing that problem, what can we do? We've discovered that it's better if people sit together to find a framework that unites the necessary interventions. In this project, we can't tell you to put the committee in place. You yourselves identified the necessity. You need to come together and discuss your own problems.”

Then we hold a General Assembly. But, if you have a General Assembly of 300, 400 people, it's difficult to come to an agreement. So, you have to have representatives by activity sector, by social groups. Then we put a small board in place that will try to work for everyone. So, that's the CLE. It's the actors themselves who identify the necessity to come together to discuss their preoccupations. (*see also Direction Général de l'inventaire des Ressources Hydrauliques 2004*)



William's Dare (center) helps a participant at the V4 national-level CLE workshop in Ouagadougou, Burkina Faso (June 2012).



during the three years of the project, the CLE board never met on its own initiative concerned several of our interviewees at community, district and regional levels. V4 hoped to hold a last workshop in December 2013, to design an Action Plan for the coming years of the CLE.

In 2013, the *Agence de l'Eau du Mouhoun*, the Basin Agency, which also began its institutional life with VREO, became a *Direction*, a government department in its own right, with more power and responsibilities, including overseeing the CLEs in the Mouhoun Basin. A few neighboring CLEs have also been established, again with the aid of projects such as Millennium Challenge Initiatives. A few of the V4 participants also participate in the new CLE for Bougouriba 6, just upstream of Bougouriba 7.

V5: Coordination and Change

V5 was the lead project and headed by the VBDC basin leader. To successfully carry out research for develop-



An old VREO sign stored at the Department for Water, Gaoua, Burkina Faso (V4, July 2013).



Aly and Ouedraogo Abdoulay, V4 participant, at the Department of Environment for Ioba Province (Dano, Burkina Faso, February 2013).

ment, the basin leader encouraged regular meetings within and between project teams, as well as with “next-users” and “end-users” — i.e. local stakeholders who would ultimately use the results of the R4D projects. To this end, besides regular meetings between the basin leader and project leaders, either in person or virtually, V5 organized multi-stakeholder platforms in the form of annual conferences, or “science workshops,” and a Field Tour (2012) of the Burkina project sites for project team members, external CPWF leaders and some invited guests. They also held a National Stakeholder Consultation in Ouagadougou in February 2012 that brought together members of high level Burkinabe and regional policy making institutions (e.g. ECOWAS) with representatives of the project teams.

The basin leader and project officer tried to keep all five projects coordinated and informed as much as possible of each other’s activities. The project officer also acted as communications officer, with some assistance from Global Water Partnership’s communications expert. Among many other tasks, he designed and managed a website and wiki-site, as well as edited and sent out a regular newsletter to team members and high level stakeholders.

The Innovation Research team, besides participating in the various multi-stakeholder platforms of the other projects and conducting the interviews for the research, also represented CPWF-Volta, and subsequently the Volta Basin Authority (VBA), in the GAB (*Group d’Apprentissage pour la gestion des ressources en eau — Burkina*, or Learning Group for water resources management — Burkina). This platform, organized by the Regional Learning Center of WaterAid, an international NGO, brings together members of international and local NGOs who worked in water and agriculture like

the VBDC, or water and sanitation. We met every four to six months and over two years worked out a Memorandum of Understanding to establish the Group with signatory members, as well as an Action Plan.

The Innovation Research team was able to act as a catalyst to bring the VBA’s librarian, the IT specialist from WASCAL (a West African research institute affiliated with the University of Bonn), and the VBA’s IT specialist together with the GAB to initiate a “Common Platform for Documentation” on water resources management. Using open-source software, the VBA’s librarian and IT specialist, along with the communications officer for the Re-

Project Snapshot ~ V5
National, Basin and Regional Levels

Title: Coordination and Change

Lead Partner:

Volta Basin Authority (VBA)

Headquarters:

Ouagadougou, Burkina Faso

Consortium Partners:

Global Water Partnership (GWP)

Ouagadougou, Burkina Faso

Institut de l’Environnement et des Recherches Agricoles (INERA) (dropped in 2012)

Ouagadougou, Burkina Faso

International Water Management Institute (IWMI)

Colombo, Sri Lanka

Project Components:

Research coordination

Fostering change through multi-stakeholder Processes

Communication

Monitoring and evaluation (M&E) and adaptive management

Innovation research

Gender mainstreaming

Capacity development

Methods:

Regular meetings with project leaders

Stakeholder engagement at national and regional levels

Annual VBDC workshops for all projects

Website with wiki-site, individual wikis for each project

Innovation Research

Involvement in the Group d’Apprentissage pour la Gestion des Ressources en Eau - Burkina (GAB)

Sources: Project proposal, reports, interviews, observation

gional Learning Center and librarians from member structures will create an online, searchable database for all documents which the various members of the GAB possess. In some cases, the members, such as the *Direction Générale des Ressources en l'Eau* (DGRE) and 8iE have extensive libraries with on-line catalogues. In other cases, such as the library of the *Agence de l'Eau du Mouhoun*, they possess many documents, but only a digitized catalogue on one computer. Other members have only scattered reports on bookshelves with little organization. The technical committee for the Documentation Platform, with assistance from the Volta Basin Authority and WaterAid, has begun to bring a few of these members on-line with a beta version of the platform.

Volta Storylines and Scenarios

Volta Storylines and Scenarios was an inter-V project that looked at drivers of change in agriculture in the Volta Basin. The ultimate goal of the project was to model livelihood resilience and interventions to enhance livelihoods in order to improve decision-making about such interventions.

Although I interviewed the leader of the project early in our research, and accompanied him on two tours of VBDC sites, we were not able to follow this project as closely as components of the others. The tours introduced me, however, to the Ghana V2 sites and the researchers and technicians of the Animal Research Institute. ♦



Hilmy Sally (second from left) and Mahamadou Sawadogo (second from right) meet with Director Dibi Milogo (center) and agents of the Nakanbé Basin Agency to strengthen stakeholder relationships (V5, Ziniare, Burkina Faso, January 2012).



Aly works with a small group at the 5th GAB meeting (V5, Ouagadougou, Burkina Faso, March 2013).



Assi Elvis of the Volta Basin Authority works with Some Tifori, librarian of the Mouhoun Basin Agency to assess the library's situation for the Common Platform for Documentation (V5, Bobo Dioulasso, September 2013).





Participants in the 2012 Field Tour, visiting V4 sites, talk to the fishermen's association in Bapla (Burkina Faso, June 2012).



Mohamed Tintaba of ARI translates for Fred Kizito (not shown) for a VSS focus group in Bantoroyili (Ghana, May 2012).



Binaba rice fields post harvest (V3, Ghana, January 2013).

NOTES FOR INNOVATION RESEARCH AND THE VS

¹Website: www.seimapping.org/TAGMI

²In 2013, a new district, Binduri, was established in the same area, creating a third district for the project site.



Williams Lanuzie, a V2 trial farmer, shows us the gardens along a channel of the Black Volta. In the rainy season these gardens will be flooded (Orbili, Ghana, November 2013).



The Bougouriba River in the dry season, upstream of a dike built by Diébougou fishermen (V4, Burkina Faso, February 2013).

Results: New Knowledge, New Skills and Innovations

Before we asked our interviewees about their new knowledge and practices, we asked the project participants about their livelihoods and the team members about their backgrounds, as well as their involvement with the projects. The program encompassed a vast array of people, from crop and livestock producers to research institute technicians and technical service agents to researchers and representatives of government ministries. Throughout the research, we viewed everyone involved with the program as stakeholders. This term included the researchers, who had as much stake in their research as the farmers in V2 and V3 had in the outcomes of the field trials. In this report, however, in order to simplify the account, I have grouped the interviewees as project team members and project participants, though I hesitated before classifying two people as, one, a participant and, the other, a team member, as they could have fit into both categories. We administered slightly different questionnaires to each group (see Annex).

For this report, I use a somewhat artificial classification to put the project team members into two groups: researchers and technicians. Researchers include people with PhDs, doctoral students,¹ and a few engineers with higher degrees. I further divide researchers into the categories of “local” or “national,” and “international.” Local researchers work for national research institutions — INERA in Burkina Faso, and SARI, ARI and WRI of Ghana’s Council for Scientific and Industrial Research (CSIR). International researchers work for European institutes based in France, Sweden and the Netherlands, or IWMI and ILRI of the CGIAR. Technicians include mostly men² working for the national research institutes, agents working in agricultural ministry extension services, and facilitators working for national and international NGOs. In the latter case, SNV was the only international NGO partner of the VBDC, and FNGN the only national NGO. The latter was not a VBDC partner, but, like SNV-Ghana, subcontracted by SNV-Burkina.

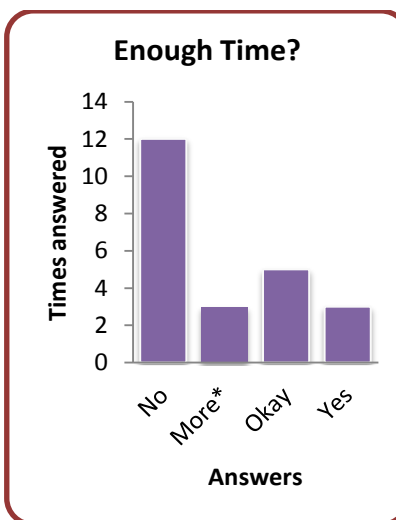
In V2, V3 and V4, we also interviewed “non-participants”: people who had not been chosen as workshop participants, trial farmers or IP members. The first IPs that V2 held were open to many members of the community, but the team members felt the discussions unwieldy with so many people, and early in 2012, they limited farmer participation to the “focal points,” i.e., those farmers — men and women — who were participating in the field trials. Thus, for V2 and V4, we interviewed friends and neighbors of platform participants, more for V2 than for V4. In V3, we found it a bit difficult to identify participants and non-participants as both the feedback and planning meetings held by the French

researchers, and the Master Farmer Field Schools were open to the community and all interested farmers. The latter seemed to cover many of the issues that V3 dealt with, though only ten farmers participated in both the rice and onion trials. In the end, I classified “non-participants” as those who attended none of the meetings. 💧

“ In the proposal, fifteen percent of my time was budgeted for. And that was the case until this year, when there was a 21 percent budget cut. So in order to accommodate the budget cut, I reduced my time to seven percent. But, to be honest, in reality I spend more than that. I mean with reporting and attending meetings. Because seven percent is just about, let’s say, 14 or 15 days. I think instead of 15 days, I may be spending close to twenty-five or thirty days. [An international researcher]

Do you feel like you spend sufficient time on the project?

Enough time?	
No	12
More*	3
Okay	5
Yes	3
Responses	23
<i>N = 42</i>	
<i>*did not respond, but spent more time than contracted for</i>	



TIME

As mentioned in the Introduction, time was often a concern for the team members. Because we had been hearing

these concerns, we asked our team member interviewees how much of their time they spent on the projects vs. how much they had been contracted for, and whether they thought the time they spent was sufficient. Members of some international research institutions keep track of the percentages of their time that they spend on each project (most work on more than one at a time), and the contracts or terms of reference for some local partners included percentages of time that they were expected by the VBDC to spend on their project. Many team members felt like they were spending more time than they should on the project, or at least more time than they had contracted for.

After the budget cut in 2012, some international researchers cut the contracted time they should spend on their projects, but still worked more than they were supposed to. This was not the experience for everyone, though; researchers who expected to give most or all of their time, or who had more flexible schedules, felt less pressured by project demands. Others were not required to keep track of their time. Almost all of the students we interviewed worked full time on the projects.

“ I think it’s 10% in the contract, but I usually work more than that. It’s not all evenly spread out, though; in chunks, like this week is mostly devoted to CPWF. [A technician]

“ We have no specific amount of time directly committed to this and that issue. It’s different for people from IWMI, who have to count the hours — ten hours for the project, one hour for me, etc. We are not like that, and I think it’s better. [An international researcher]

Time spent on the projects was seasonal for many team members. While researchers like hydrologists and social scientists worked more during the dry seasons when community members had more time to work with them, cropping seasons were especially busy for the V2 and V3 team members who worked on field trials. One technician described days working from early morning until past sunset preparing trial plots for planting with the farmers, and then making sure that the planting and fertilization were done correctly.

Another concern about time, which worried project participants as well, was the short duration of the project. After project planning, team members spent two cropping seasons (either rainy or dry seasons depending on the project) working in the communities. When the projects planned early conclusions due to lack of funding in 2013, participants and team members worried that research and development interventions would not be completed. For some local team members, just two seasons of experimentation³ was not sufficient to successfully conclude field trials. One local researcher told me that they should conduct another seed trial after the project's end to be sure of their results. Farmers in Lawra

“ Now, I hope that the project can support us, as it was agreed, for our three years. It's sure that the project ends in 2013; for us doctoral students who didn't start in 2011, we won't have had the three years of support at the end of 2013. Because the thesis is three years, but we haven't had those three years.

told me that the variety they grew the first year (2012) did very well, but the variety they grew in the second year (2013), though developed to be drought resistant, did very poorly in their area in a year with too little rain.

Students were especially worried that they would be dropped mid-term of their three-year research commitments.

On a different note, at least two local team members mentioned with satisfaction that they learned “time consciousness” from the Europeans. ♦

“ How much time do you spend on the project?

It's a lot of time. I won't be able to put a figure to it, but there are days, as I come into the office, the project takes all my time, that is, particularly now that it is the rainy season.

Do you feel like you have enough time to devote to the project?

Yes and no. Yes, because if the project weren't there, I would be doing my own research that I should be doing on the station. In that aspect, the project is taking a lot of time away. And no, because, of course, that is we are employed to do: work with partners. So in that aspect, it's not taking time unnecessarily away from the work. [A local researcher]

“ And time consciousness: if they say 8:00, you must be there. But previously, you know, we as Africans, if we say 12:00, it will be tomorrow at 2:00. But from the project I learned time consciousness.



Vendors sell tomatoes and onions along the Ouagadougou-Bobo Dioulasso road, produce that comes from reservoir irrigated gardens (March 2012).



Madame Mandé of FNGN translates for the Koubri/Komsilga IP, held in Komsilga in March 2012 (V2 Burkina).

“ In the training, they told us that they are not only training us who are taking part in the project. But they want us to go home, and extend the knowledge that we have gotten from the project to other people in the communities and to the whole district. [A V2 participant]

D ISCUSSING THE PROJECT: PARTICIPANTS

Because during innovation platforms, V2 team members encouraged their focal point farmers to discuss what they had learned back in their communities, we asked all participants

“ Usually the women after V2 meetings get together to discuss what happened. We don't get together with the men. It's not a formal arrangement. If it was a formal arrangement, the men might come. We just meet informally about what transpired during the meeting. Because it's not everything that we'll be able to get right. This person can understand this part of the explanation, and this person will understand this part, and we'll share. [V2 female participant]

whether or not they discussed what they had learned during project activities with people outside the project. We also asked non-participants whether or not they learned things from project members and how. Many V2 Ghana participants said that they held regular, if perhaps informal, meetings to discuss the project, but these meetings often seemed to include only the farmer representatives. Like the women in this quote (left), they may have wanted to make sure that they had a good understanding of what they had heard at the innovation platforms.

Women often mentioned that they discussed project activities with their families and perhaps a few friends. The men who participated in V2 were by far the most communicative about their new knowledge.

While the V2 men talked about discussing the project under their “meeting tree” or during a beer drinking session, these were men-only conversations. Women non-participants were more likely to say that they did not hear anything about the project.

“ Usually when I come back from a training, I don't keep it to myself; I share it with my family. When I come home, I call the family, the children there and then the young guys. I gather them and then tell them what I have gotten from the training. That the facilitators said if we practice these techniques, it will help us to get more yield. [V2 female participant]

“ Even yesterday after the meeting I went and sat with them and told them about the things we heard at the meeting. I tell them about how to protect the river. You shouldn't go there and farm along the riverbank. And they shouldn't just burn the bush. If you want to farm, you need to gather what you have cleared and make stacks and burn them like that. [V3 participant]

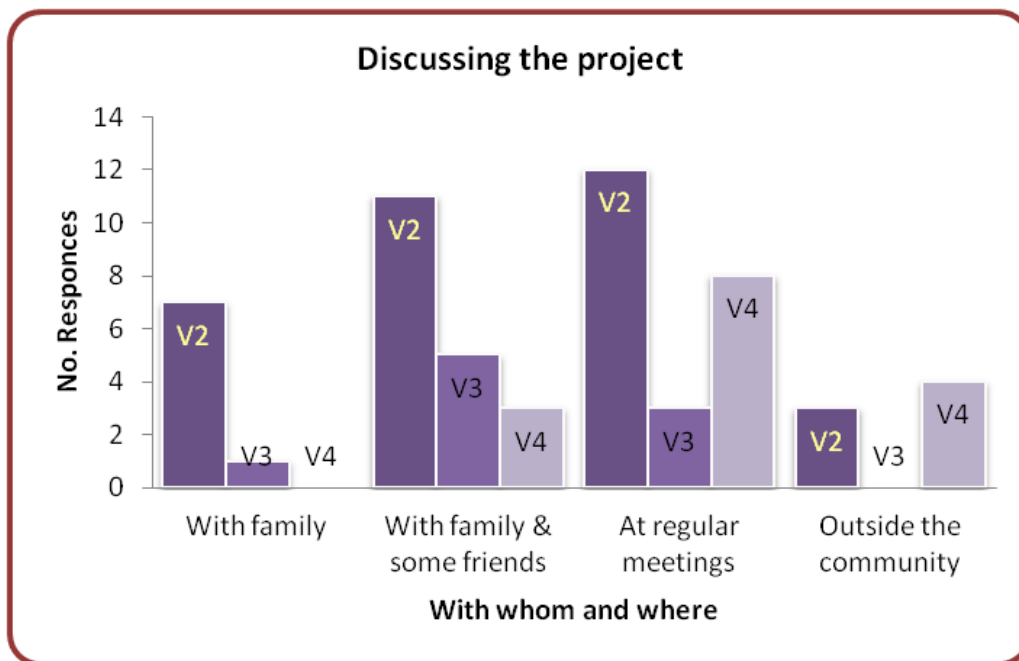
That said, some of the women involved in project activities were also very active in associations or income-generating activities that took them outside their communities, where they discussed what they were doing in the projects.

Farmers in Binaba who attended either the Master Farmer Field Schools or the V3 feedback and planning meetings, also discussed what they learned with friends and neighbors, as the quote on the right indicates.

Many V4 participants who told us that they shared the information they received from the workshops, did so in order to “sensitize” or educate community members against bad practices along the rivers or around the reservoirs. Some non-participants learned from their friends who were workshop participants that V4 and the CLE was a project that was going to help them.⁴ ♦

“ Everything the farmers learn at these meetings, we take back to our neighbors and friends and tell them these things. If we're a part of a farmers' group, we share the new knowledge with the group members. [V4 participant]

With whom do you discuss the project?					
	V2	V3	V4	M	F
With family	7	1	0	3	5
With family & some friends	11	5	3	10	9
At regular meetings	12	3	8	16	7
Outside the community	3	0	4	6	1
<i>Responses</i>	33	9	15	35	22
<i>N =</i>	38	12	19	53	37



PERSONAL GOALS

We asked both team members and participants what their personal goals were for participating in the projects — what they hoped to get out of the projects. The two groups gave similar answers, but, of course, each with their own differences, especially as the researchers focused on their research results.

“My goal is that I usually find it difficult to pay my children’s school fees due to having to buy food from the market. But now V2 has come to teach us the correct methods of farming, so now we have enough food at our house — we don’t buy food from the market — and we use the money that we would have spent at the market to pay for the children’s school fees. [V2 participant]”

Participants

The participants gave far fewer material goals than one might expect from a development project. Because researchers, technicians and facilitators all repeated over and over in meetings that the program was a research program, there to disseminate knowledge rather than give things to people, only those who had not yet heard this message were likely to cite material gain.

We interviewed several new V2 members who had attended only one IP, if any at all. A few of these cited material gain; one new IP participant thought she might obtain a job. Interestingly, only one V3 participant replied that she wanted to “get abundant harvests, more than the old ones,” which I categorized as “farming improvement.” All the rest of the V3 participants who responded cited goals of aid, fertilizer and infrastructure (mostly fencing for floodplain gardens and rice fields).

V4 participants had different goals from those of the other projects. They wanted to develop and improve their own communities and the other communities in their provinces. A few wanted to gain information so they could sensitize various populations, especially gardeners along the banks of the reservoirs and rivers. One man wanted to protect community forests. In Burkina, people said they wanted to see the CLE functioning, which I put in the “development” category.

Team members

Technicians and researchers had rather different goals from each other, except for development in general. An international researcher told me that, while he was committed to the research he was recruited for, he was also convinced that small reservoirs were effective solutions for rural communities. I counted the latter phrase as

(Continued on page 50)

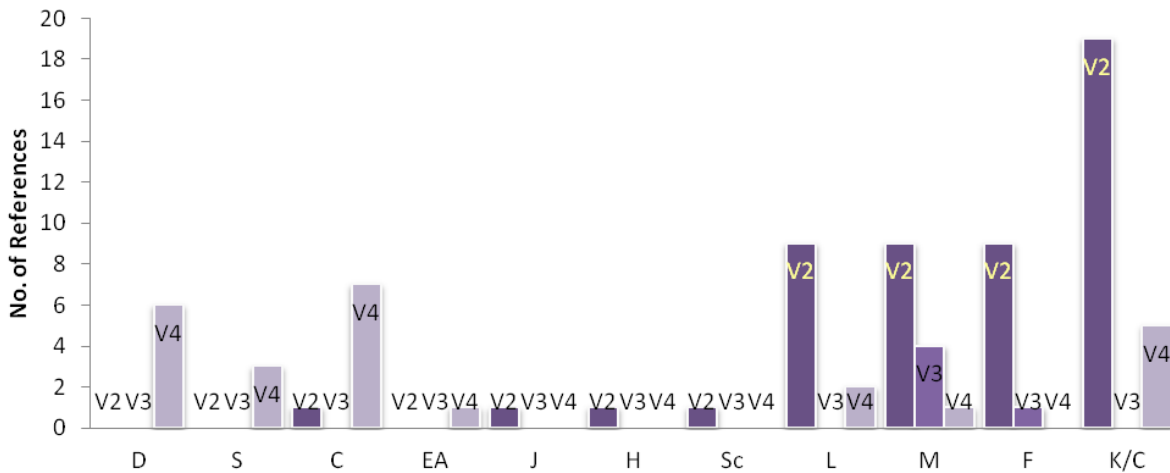
“Well, scientific papers is the first goal, I guess, and all the scientific quality. Then, of course, there is personal growth. All that you learn from working with people from another culture in another environment. [An international researcher]”

“The fertilizer aspect was my main reason for joining. I wanted to know how to get the fertilizer so I can apply it to my plots. So I went to the project farmer leader about this problem and he said they cannot supply us with fertilizer. What I can afford myself is very small. [V3 participant]”

“Anyway, we’re tired of those meetings. They’re good, but we have to have something concrete. There are river banks to protect, and there’s reforestation to be done to remove some of the people along the banks. [V4 participant]”

“In every research program that I participate in, my main goal has been to get new ideas, new ways of looking at the issues in the basin, so that there will be sustainability in the management. [A local researcher]”

Project Participant's Goals



Descriptions of Goals

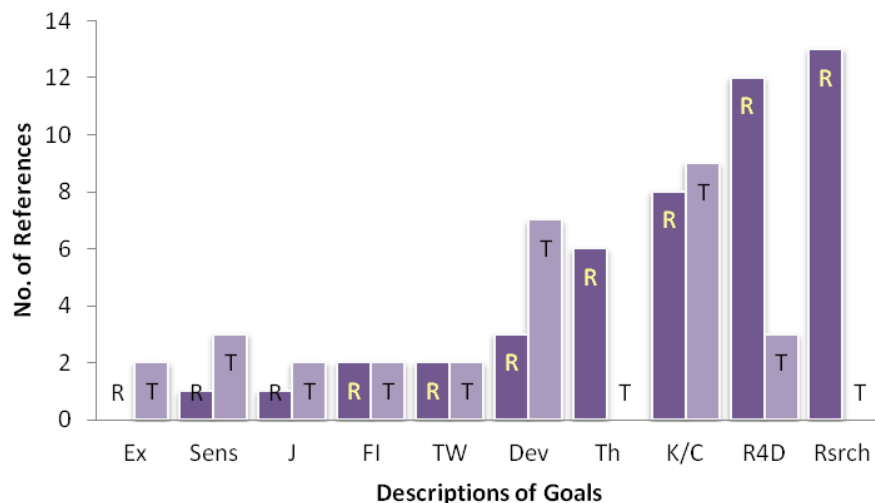
Project Participants' Goals

		V2	V3	V4
Development	= D	0	0	6
Sensitisation	= S	0	0	3
Community improvement	= C	1	0	7
Extension Agency contact	= EA	0	0	1
Job	= J	1	0	0
Health (human)	= H	1	0	0
School	= Sc	1	0	0
Improved living standards	= L	9	0	2
Material aid	= M	9	4	1
Farming improvement	= F	9	1	0
Knowledge, Capacity Building	= K/C	19	0	5
Responses		50	5	25
Responders		35	5	16
N =		38	12	19
<i>Participants' 1st goals = 56; 2nd goals = 23</i>				

Project Team Members' Goals

		R	T
Exchange with farmers	= Ex	0	2
Sensitization	= Sens	1	3
Job	= J	1	2
Farmer's interests	= FI	2	2
Teamwork, multidisciplinary	= TW	2	2
Development	= Dev	3	7
Thesis	= Th	6	0
Knowledge, Capacity Building	= K/C	8	9
Research for Development	= R4D	12	3
Research	= Rsrch	13	0
Responses		48	30
Responders		25	15
N =		26	16

Team Members' Goals



(Continued from page 48)

“research for development,” which it seems the researchers were more interested in, or perhaps understood better than the technicians, who were more likely to cite simply “development” goals.

In the category of R4D, a local researcher told us that he wanted to ensure that “our research activities translate into development outcomes, thereby impacting in concrete terms on the livelihoods of poor farmers.” Similarly, though less explicitly R4D, a technician said that he would be happy “when drought would not be a problem anymore

“My objective is to share my experience, to give and to receive. Especially when one speaks of the peasants. To give and to receive. That’s what makes my experience, the receiving, and then being able to use the experience for other things. To always be able to make links between what I do. To be able to easily analyze my activities, my objectives, my results. At what level have these results succeeded? Are they good to share? Use all my ideas that I’ve gotten from the different projects. [A female technician]

for our farmers.” He wanted to “find better ways of farming.”

Interestingly, only the women technicians cited exchanges with the farmers as goals, though several researchers and technicians in subsequent answers told us that they had exchanged with and learned from the farmers. Several team members from all categories cited farmer knowledge as a goal, however, and several expressed a wish to further farmers’ interests. One facilitator told me that he “really wanted to see that farmers needs are taken into consideration by the researchers.”

The doctoral students, of course, had finishing their theses as a goal. Some researchers hadn’t worked much with water and wanted to learn more in that respect.

I categorized some goals as “sensitization” along with development or research for development. One local researcher told us that he wanted to use the participatory approach he was learning “to show people some practices with water resources are not beneficial.”

A technician said that he wished “to improve the life of my people.” He saw people suffering: “Not that they’re lazy, but they need someone to direct them. I should be one of the people who directs them.”

A few people honestly told us that they were working in the project just because it was their current job or because they were hoping it would lead to a future job. One technician told us, “I worked in the project because my institution was involved. I work for the institution. It was a new experience.” It is these experiences that people describe in their answers to the next questions. 💧

“What is your personal goal for the research?”

To learn more about how to do better research for development. I would like to shorten the gaps between research and development. Usually you have a lag between research results and implementation of three to five years or more. CPWF is trying one way to reduce this. Maybe there are other ways. [An international researcher]

“I’m interested in a new subject, water, which was never my subject at all. The subject of water is global. There’ve even been wars over access to water. So, that’s my first interest. [A local researcher]

“So, for me personally, it’s to reinforce my capacity in the domain of water. Because I have worked a lot with soil. I’ve remarked that the subject of water is missing somewhat in that area. So that’s why I’m interested. [An international researcher]



A stable for sheep and goats in Golinga, constructed by one of V2's trial farmers (Ghana May 2013).



In a garden, where a V2 farmer had put in tied ridging last year, he now has something like zai holes, more practical for hand watering (Orbili, Ghana, November 2012).

NEW KNOWLEDGE AND PRACTICES

We next asked all interviewees, “What have you learned from project activities?” and, “How have your practices changed because of what you’ve learned?”

What participants and non-participants learned

V2 Participants

V2 is the only project where participants’ answers are consistent and numerous enough to chart. This has something to do with the fact that we interviewed more V2 members than anyone else, but I think also because V2’s IPs, trainings and farm trials concentrated on “training,” reiterating to the farmers that they were being trained and asking them what they had learned so far. Therefore, when we asked the V2 participants what they learned, they told us what they told the IP facilitators at the beginning of each IP meeting.

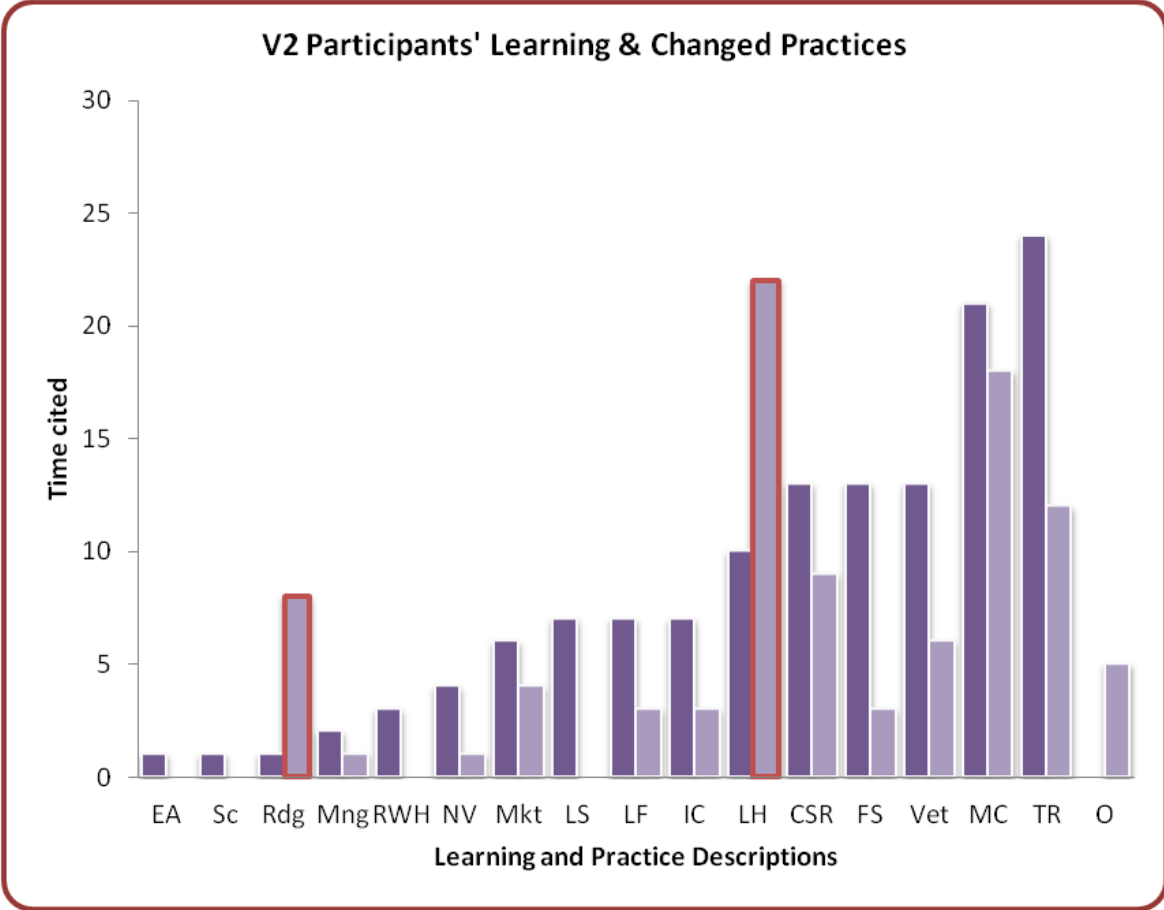
“ Sometimes there are some extension officers on the radio, teaching people about how to apply manure. And then I’m also getting information through some of the project farmers, who farm close to me. I saw that they are also applying manure. So I tried it and saw that it’s nice. That’s why I’m also using it. So I learned from friends, the nearby farmers, and also sometimes through the radio. [A non-participant neighbor of V2 farmers]

It does seem that the farm trials, where interviewees told us they could tell the difference between the crops fertilized with manure and those with no fertilizer, really did prove to them the efficacy of using manure as fertilizer. Both farmers and technicians told us that a combination of manure and fertilizer gave the best yields.

“ The first thing I learned is in the field, they made us put manure on some areas, and then fertilizer on some areas. And then some areas, we didn’t put anything. And when you go and see the three different plants, you’ll be able to tell which one is the best way to use, because it is very different. You can see the difference from how I normally farm. So I have gotten something from that. Now I know what to apply to the farm so I can get more yields, based on the training that I’ve gotten from the project. [A V2 trial farmer]

(Continued on page 53)

V2 Participants and Nonparticipants' Learning and Changed Practices					
<i>Learning and Practice Description</i>			Ln	Prc	
Contact with Extension Agents	= EA	1	0		
School (send children)	= Sc	1	0		
Ridges	= Rdg	1	8		
Management (people, groups)	= Mng	2	1		
Rainwater Harvesting besides tied-ridging & ridges	= RWH	3	0		
New variety (about)	= NV	4	1		
Marketing strategies; financing	= Mkt	6	4		
General livestock strategies (care, breeding)	= LS	7	0		
Livestock fodder	= LF	7	3		
Intercropping	= IC	7	3		
Livestock housing (stables, pens, night confinement)	= LH	10	22		
Crop spacing & sowing in rows or lines (with a rope)	= CSR	13	9		
General farming strategies (e.g. fertilization, harvesting)	= FS	13	3		
Veterinary care, vaccinations	= Vet	13	6		
Manure &/or Compost	= MC	21	18		
Tied ridging	= TR	24	12		
Other	= O	0	5		
<i>V2 Participants = 38; Nonparticipants = 12</i>					
<i>Learning references</i>			<i>Part</i>	110	
			<i>NP</i>	23	
			<i>Total</i>	133	
<i>Counting own and other's practices</i>			<i>Practice references</i>	<i>Part</i>	78
				<i>NP</i>	17
				<i>Total</i>	95



(Continued from page 51)

I also questioned interviewees in Golinga and Digu about whether practices such as using manure for fertilizer and stabling or housing livestock were entirely new. They told me that both had been promoted by projects and extension agents before. They remembered radio programs about using manure and compost.

V2 reinforced these ideas and encouraged villagers to build new, or rebuild dilapidated stables for their small ruminants. This was particularly the case in the Tolon-Kumbungu villages where even non-participants were building stables.

Farmers explained that they understood the value of manure for their crops and therefore saw the value of stabling their animals. Some wanted the project to give them more livestock so that they would have more manure to put on their fields.

“ I asked a technician: You said that part of your goal is to have better farming practice so that drought won't affect the farmers so much. Is this project is doing that?

Yes, for the time being, it's helping. With the tied ridging.

But will the farmers keep doing the tied ridging?

Yes! That is now the problem. If that system were simple, even when the project is gone, the farmers could still go ahead and continue it. But, it's quite tedious. It's tedious. So, after this project, whether farmers will go implement it? Can they continue it?

Interviewees explained that, while some people habitually let their livestock run free, others kept them penned in rooms in their compounds: a “traditional” way of penning their livestock. After some participants either built new or rehabilitated old stables outside their compounds, interviewees saw that this kept the compounds much cleaner. However, one of the villagers' concerns — which night penning reduced — was livestock theft. It would seem that keeping compound at night, instead of in exterior stables, would reduce the risk of theft. It may turn out, after the project's intervention has ceased, that protection within the compound is worth the inconvenience of cleaning up after the goats and sheep in the compound every morning.

Some people told us that they learned about new fodder for animals, including a new kind of bean.⁵ Although some of the people who never confined their livestock also never fed them, many people

had been feeding them cassava peels and waste from the corn mills before V2's intervention.

As for the rainwater harvesting strategies, tied ridging most impressed people in the way it conserved both water and soil, but also in the “tediousness” of the work. The technicians worried that the farmers would not adopt this practice because it was so labor intensive. Unlike contour bunds and zāi holes, which remain intact for several years (West 2013), the tied ridging must be recreated each season and sometimes even within a season after a strong rainstorm.

“ Sometimes goats will have diarrhea and watery eyes. V2 has taught us that if we see these signs we should call the veterinary doctors to come and vaccinate them.

And the project has given us a particular bean to cultivate. We harvest the leaves and dry them and store them. We use the residue of this bean harvest to feed the goats, so that the goats don't go out far — they just stay around the house.

“ A technician told us:

My father, he has been doing the ridging a long time, but not like how we did it here. Because even these people they are complaining. They say it's tedious, because they do like fifteen rows, and between the fifteen, they also tie fifteen rows across. So they said it's quite tedious. But traditionally, my father will go to the end of the ridges, then block the water. But he doesn't actually tie in between. But there are people here who are actually adapting to that style of farming. But not exactly like what the project did.

“ I can see that the project has changed the way of my farming. Though not completely. But I’m waiting for next year, because I can see that the plot with the tied ridging, it looks nicer than the one without the tied ridging. But I’m not used to that. So I’m waiting to do that in my farm next year.

In Lawra, one of the technicians told me that his father and others have practiced a technique of “traditional ridges.” One or two other farmers described this older technique as well.

Some of the V2 interviewees told us that one of their new practices was “ridges.” It was not clear if this was tied ridges, or if this was the traditional ridging without ties. It could be something in between: an adaptation of the tied ridges that eliminated the “tedious” work of building many ties between the ridges. Both interviewees and technicians told us that Orbili (Lawra) farmers had put in tied ridging in their irrigated gardens along the river. During interviews, a few people told us that they themselves would put tied ridging in their fields — next year.

“ The new thing is like these tied ridges. We already do the ridges but not like this. *(He draws in dirt.)* We don’t divide it like what is here. During the process of cropping, I realized that the plots with tied ridges have more yield than the other plots.

On a trip back to Lawra in November 2013, farmers in Orbili and Naburnye told me that the season had been very poor. A new variety of maize that they had been given for the trial plots also was not appropriate for their area. The crops grown on the tied ridges, however, did better than any others. People will adopt the practice, they told us, because they could see that it really does conserve water. A gardener, though, who had used tied ridges in his riverside garden the year before, told us that he had taken them out this year. They were not suitable for irrigation. Instead, he had created something like zaï holes, which he called “traditional.”

Veterinary care was another practice that had spread from participants to non-participants. Farm trial participants received free vaccinations, but non-participants told us that when they saw how much healthier the participants’ goats and sheep had become, they too were willing to call a vet and pay for the vaccinations. On our November trip, a V2 participant in Golinga told us that many goats had died, however, from PPR, a respiratory disease that vaccinations should have prevented. I was not able

“ We were trained to use a rope in sowing the seeds, so that the plants will be in line form. When I came and shared this technique with the family, that is how they did this year. And then they saw that it’s very, very important to be doing that all the time. Because you can see that the crops are very different from the way we used to do it, and this is the best way to sow.

to find out what had happened, but in earlier interviews, local team members told me that sometimes they encountered problems with vaccine deliveries from government pharmaceutical suppliers.

A few farmers told us that they were encouraged (to continue) to send their children to school because they themselves couldn’t understand the English spoken in the meetings. They wanted to make sure their children would be able to understand English. We asked all the participants if language was ever a problem in the various meetings. The great majority said, no, because the translators did a good job of explaining. There were only a few in V2 and V4 who told us they had trouble understanding, like the man quoted here.

Some of the farming strategies that V2 and V3 farmers said they learned were techniques that MoFA agents had been promoting before the projects, such as

“ Language is really a problem in V2 because when we come we don’t hear much. We’ve started sending our children to school so our children can learn English so that language will not be a problem for our children in the same way.

“ One important thing I also learned is that, in fact, it was not easy for farmers to put down records in the process of the farming. I also learned how to put down those records because they are very important for the farmer to see whether they have gained or they have lost.

sowing in lines or rows. The projects gave the agents and the research institute technicians the chance to retrain and re-emphasize these techniques for farmers. Local researchers and technicians told me that sowing in rows, while perhaps more work than broadcasting, allows for more systematic application of fertilizer and easier control of pests and diseases.

In the “other” category of practice, several participants cited many benefits from the new knowledge. One woman joined a woman’s savings and loan group, and another told facilitators about traditional farming techniques. A farmer thought that people were more willing to learn, and another said there was now less wage labor migration because people were making money from their dry season gardens (not a V2 intervention). One man said that he was now keeping accounts for other

farmers because of what they had learned about marketing in the IPs.

We interviewed a few friends and neighbors of project participants, though not in a systematic manner, to see how project ideas were spreading. We found the most spread in V2 Ghana, both in the Tolon Kumbungu and Lawra villages. Using manure on the fields and building livestock stables received the highest counts here. This accounts for the high number of references to livestock housing as a changed practice. Binaba farmers also learned from people who attended the Master Farmer Field Schools and the farmers participating in the field trials.

V3 Participants

Ghana V3 participants learned from the Master Farmer Field Schools, the field trials and the feedback and discussion meetings. At the time of the interviews, as we did not know about the Field Schools and therefore did not distinguish them from the feedback and planning meetings that the French researchers held, or the field trials in our interviews.

V3 participants and some non-participants learned about the new varieties of rice and onions and how to better manage the irrigation water from the canals. “And how to take care of the rice. The rice doesn’t need a lot of water. It has a limit,” one young man told us. He said that they used to put 15 to 20 rice seedlings in one transplanting hole, but learned that when they do this, there will be too little room for the rice to grow well. The farmers also learned how to better schedule their fertilizer application, and one man said that he now knew how to prevent soil erosion and plant trees.

“ A community MoFA volunteer in Binaba (V3) told us:

They taught the farmers how to prepare the land, how to keep the seeds for the next year, how to prepare their seed, and how to get money to buy items like fertilizer for their seeds. And they asked them where they get seeds for sowing. They also taught the farmers about what causes diseases for onions and rice.

Last year they brought new onion seeds and rice seeds. The farmers said they did well. The researchers gave seeds to a few people for a trial and they said it was fine so the agents gave them to others to try. The new varieties have bigger yields and a better taste.

Was the information they were teaching the farmers all new information?

Some was new and some was old. Farmers already knew about land preparation, but the new thing they learned was not to burn their fields to prepare them. Another new thing was learning about composting instead of buying fertilizer. Also the new thing was teaching them how to separate seeds from food stores so they will keep better for the next planting season and not spoil.

“ A local researcher told us about V3 Burkina farmers:

The producers' groups have changed. Before, they either got their seed from their granaries, or they went to the market to buy it. But now they go to the agriculture agency, so they can choose INERA's variety. I think we have introduced an innovation with this, by choosing the crop that is appropriate for their environment.

Others learned about storing onions in new onion storage houses that were built with assistance from a different project. People also mentioned learning to separate seed for the next season from their food stocks. The lessons in integrated pest management also taught them how to manage pests and diseases in their the quote here, a volunteer agent (a community leader) describes the SARI researchers' and MoFA extension agents' activities.



In the Binaba onion plots, farmers had trouble with onion borers, a pest V3's IPM strategies fought against. The photo on the right shows some of the insecticide farmers tried against the onion borers before IPM was implemented (Ghana, January 2013).



onions. In extension

As mentioned previously, we did not have the opportunity to interview V3 participants in Burkina, but one of the researchers told us that the farmers in Boura had taken the new rice variety to heart.

V4 Participants

In Ghana, V4 participants learned that cultivating along the river and reservoir banks will lead to sedimentation and possible flooding. They also discussed bush burning, or burning forest land. During a platform discussion group in Zebilla (Bawku West district capital), women told us that farmers did not burn the forest on purpose; hunters might use fire to catch game, and honey gatherers and charcoal producers caused accidental fires.

In the Burkina Faso workshops, people learned about the CLE and how it should operate, but one man said that he learned they “can't rely on the CLE, so they have started to take the initiative to do things themselves.”

Some people told us how much they appreciated the participatory process of the workshop, and a few said they planned to use that approach if they were called upon to lead such a workshop. A women's association leader said that she had learned to group people by the activities that they participate in, and now she and another association leader did the same in their meetings.

We had the impression that V4 had the least spread of information, even among friends of project participants. It may not have been clear to these people, though, that what V4 participants told us they communicated — e.g. sedimentation of the river, the production sectors (*filières*) working together — came from the V4 workshops. We also did not interview very many non-participants of V4.

“ They spoke to us about farming along the riverbank, the disadvantages of it. We have to educate the other people who farm along the reservoir, so that they will be able to know the goodness or the badness of farming along the bank. [V4 Ghana participant]

“ It's true, because without these workshops, I wouldn't know that there's a structure here that is concerned with water here in the region. It's through participation in these workshops that I learned that the CLE is here for good water management. [V4 Burkina participant]

A few V4 participants cited the need to sensitize others to the necessity of stopping bad practices, but one man said that “other people's problems taught him the value of water.” Another man gave us a list of the bad practices he had learned about:

- ◆cultivation near water leads to sedimentation
- ◆miners are destroying the river by mining in the river bed
- ◆destruction of forests
- ◆people poison fish to catch them
- ◆cultivation near livestock routes to water can cause conflict

He also said he had learned that if you want to sensitize someone successfully you have to set an example yourself. He told us that in his community, with the help of the Environment Service (Forestry), they were now cutting trees in a more sustainable manner. They had stopped creating new fields, and were instead composting to increase fertility. They keep their fields away from livestock routes to minimize damage and conflict, and the people in their community are now taking better care of their own livestock. Of course, not all of these changed practices emerged solely from the V4 workshops, but they were all related to discussion topics in which this man had participated.

Other people cited instances where they had been able to stop people poisoning fish in the river, while asserting that this was not a practice of professional fishermen — something the fishermen had also made clear in the workshops. Two people said that they had bought fuel for service vehicles so that the Environment agents could go out to catch people polluting the river. People also told us that mining was a very difficult problem



A maize field on a bank of and in the White Volta river, south of Bolgatanga, Ghana (August 2012).

as the miners were paid and protected by powerful people with links to politicians and other government personnel. (There were no mining representatives at the workshops we attended. We were told during the 2012 Field Tour that attempts had been made to include miners, but among other reasons, because they are itinerant, it was difficult to identify a representative.)

In their concern for sensitizing community members about natural resource management, these V4 participants were not unlike some of the technicians and local researchers.



Cattle are watered at the Bougouriba river, east of Diébougou (V4, Burkina Faso, February 2013).



A group of VBDC and CPWF researchers accompany community members to the Bapla reservoir on the 2012 Field Tour (V4, Burkina Faso, June 2012).

“ I’ve had a few field visits; I love field visits, I always learn something new with those. I’ve been out before in Burkina in the dry season, and this time unfortunately it’s a dry start to the rainy season, but there was some rain. It looked very different. And it was good to drive the north-south transect, the road from Ouagadougou down to Tama-le, where you can see the gradient. [An international researcher]

“ It’s complicated! We have to have complicated research to deal with a complicated world. We have to have complex partnerships for complex problems. There’s no chance that one actor can find the answer to these complex problems.

Of course, there are transaction costs. We don’t know if it will work, yet. We’re working on this one model (the CPWF model of R4D) and maybe we will learn something along the way. We underestimated the time needed for administration, M&E, and other things. We need to put resources into learning. We need researchers as dedicated staff (working full time on the project) for the project core.

CPWF had very high expectations for impacts from the project. CPWF said that if we got R4D right, we can have impact. We need to have more modest expectations of impacts. I think the impacts will be a combination of opportunities external to the program (VBDC) and project activities. We also learn together as a team, but this learning will be very hard to measure because we will take it with us as we move to new jobs and projects. This is human capacity which is important for our southern research partners who need to learn analysis and how to be critical. [An international researcher]

Team Members’ New Knowledge, Skills and Practices

A few team members told us that they had not learned anything, either because they were doing the same work they had been doing before the project, or because we interviewed them not long after they started working in their project. Most, though, gained a great variety of new knowledge and skills. For many of the students, this question was difficult to answer merely because they were focused on education and learning for their thesis research. They learned “something new every day.”

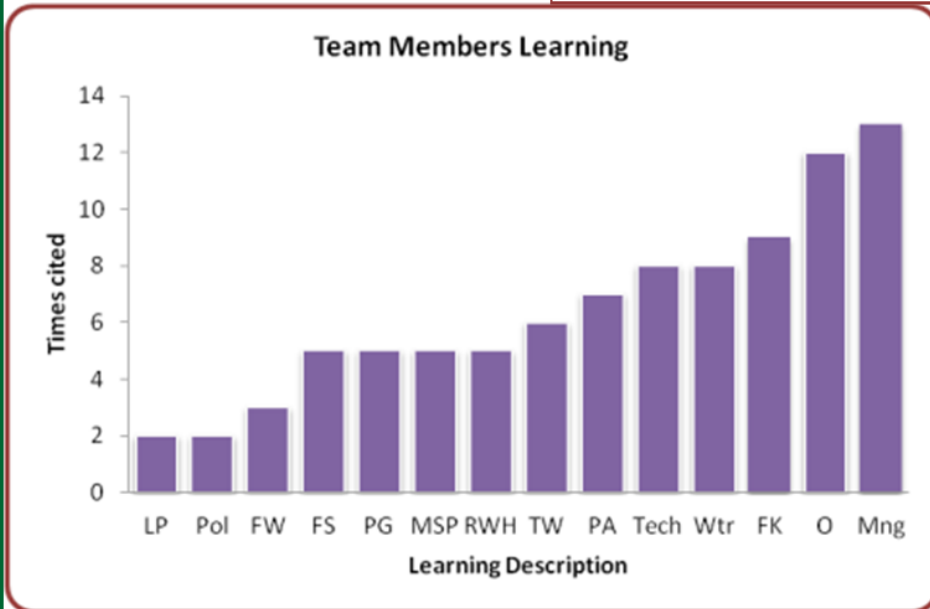
Project leaders notably told us in different ways that they discovered their projects were over-ambitious, too complex and under-resourced, especially when it came to time and people. In this respect, “CPWF is a real challenge,” a researcher told us. One researcher emphasized that while resources had been

(Continued on page 60)

“ The program built a lot of capacity, even for me as a researcher, the project has built my capacity in a lot of fields. I’ve never done a household survey in all my life. The project got me into that, and I learned a lot. PRA, I’ve never done anything. I’ve done that. So the project, I would say, definitely has built a lot of capacity for a lot of staff here. [A local researcher]

What Team Members Learned

Learning Description		
Difficulties with local partners	= LP	2
Policy and natural resource management	= Pol	2
Farmers' willingness, enthusiasm	= FW	3
Farming strategies (new varieties, layout of field, etc.)	= FS	5
Personal growth	= PG	5
Multistakeholder Platform process (IP, MFFS, ComMod)	= MSP	5
Rainwater Harvesting (tied ridging)	= RWH	5
Teamwork	= TW	6
Participatory Approaches (PA, PAR)	= PA	7
Technology	= Tech	8
Working on water; water management	= Wtr	8
Farmers' Knowledge (importance)	= FK	9
Other	= O	12
Managing people, projects	= Mng	13
Interviewed Team Members = 42		Learning references = 90



“ A local researcher cautioned:
 One thing I learned was what I may think was successful, others may think it’s not. Because at the first meetings we held with all the stakeholders, water-users’ association members, the Board of Irrigation Development people, those who build the dams, we asked, “Okay, what worked? And what didn’t work?” And sometimes what the Irrigation Development Authority people said worked, the farmers who actually use the technology, they said it doesn’t work! That was interesting for me, because it means what those who implement policy think works, sometimes the farmers don’t think it works.

“ One researcher emphasized the importance of funding southern partners. This lesson was qualified by other researchers, like this international researcher:
 Many of our people are still like children. You have to run after them. I mean, it’s a bitter lesson for me to learn. Some people are not really straightforward when it comes to financial reporting. Okay, I’ve seen that before. I mean, partners making false expense claims. Multiplied missions for per diems, with no report, nothing to show for it.

(Continued from page 58)

underestimated, they had over-estimated the project's impact. "But research for development is also very complicated."

One researcher emphasized the importance of funding southern partners. This lesson was qualified by other researchers, who indicated that there had been some problems with project accounts, as illustrated by the quote on the previous page.

“ [V4 Ghana] And so if you just take a policy and say because it's working in the United States, it must work here — it may not work here. And if you look at a policy that we think is working in one region, if that same policy is implemented in another region, it may fail. So, I have come to learn that we cannot have a blanket policy — even in the same country — you cannot have something blanket and say, "This is what must be done." In the same country, issues differ from one region to the other. In drafting that single policy, there should be room for adjustment when you move from one place to the other.

I've also come to understand that if I have to draft a policy, I don't just look for a consultant, unless the consultant is ready to go to the ground level, to find what is there, what is necessitating the policy. Until you address those things, you can put a wonderful policy on paper, very interesting for a research presentation, very interesting for a presentation at the UN, or at the World Water Forum —but it may not be interesting where it's actually needed.

Another researcher told us how much he appreciated the farmers' enthusiasm and knowledge (FW, FK). "I was very happy that farmers are more knowledgeable than sometimes we think they are. And we should not underestimate their level of understanding."

Another found a "tendency of public administrators, even technicians," to belittle farmers' knowledge. Local V1 team members cited the importance and usefulness of Google Earth in mapping (Tech). As mentioned in V1's Project Description above, one researcher was happily surprised at the data available to build the Bayesian model.

In Burkina Faso, V2 technicians told us that the IP process and the concept of value chain were the most important lessons for them. One man told us that he found the value chain more useful than a similar approach that he had been using in another project. He wanted to adopt the value chain concept for his other projects.

To best manage natural resources, a V4 researcher told us, the policy has to be well-formulated. Another (left) discussed how he had learned that one policy will not fit all cases, and policy must take into consideration the realities in local communities. A V3 researcher (right) discussed changes that he learned should happen in policy making.

Some natural scientists and engineers told us that they were learning more about social science, and one of the social scientists described one of his colleagues as having become a "social hydrologist." Several researchers appreciated what they learned when working directly with community

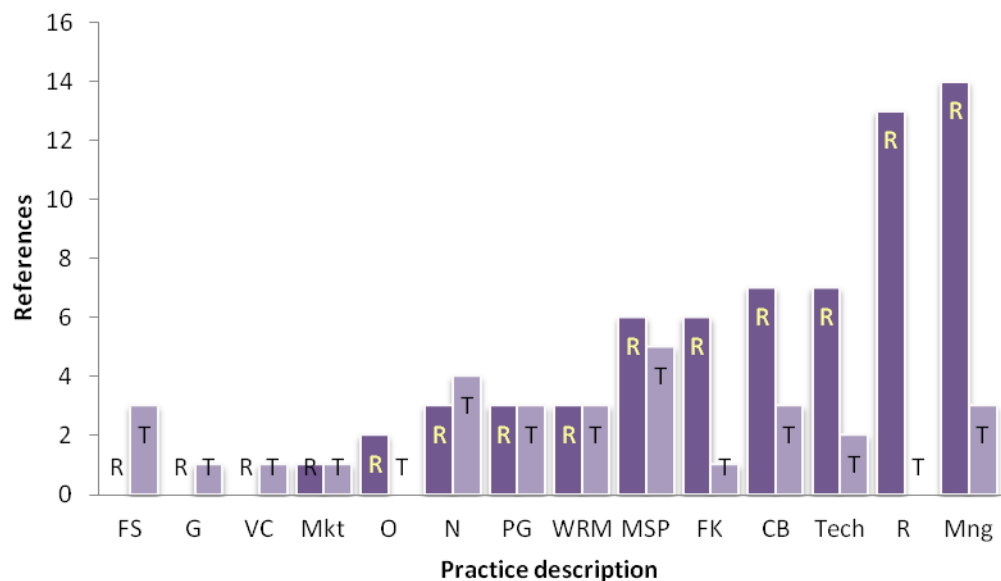
“ [V3 Burkina] There haven't been any changes in practice. But the changes I can talk about, are changes that should happen in the behavior of the actors who make decisions about water resources. A dam shouldn't be constructed just like that without doing an ecological impact study, environmental impact. Because water is in demand in our country, a Sahelian country where water is difficult. So, when someone asks for water, he needs to be quickly satisfied. That means the impact studies come afterward. That's what we've seen in Burkina. So, perhaps, I can say, there will be maybe an innovation with these deciders.

Team members changed Practices

Learning and Practice Description				R	T
Farming Strategies	=	FS	0	3	
Working with (other) gender in a new way	=	G	0	1	
Value Chain	=	VC	0	1	
Marketing strategies; financing	=	Mkt	1	1	
Other	=	O	2	0	
Nothing changed	=	N	3	4	
Personal Growth	=	PG	3	3	
Water resource management	=	WRM	3	3	
Using MSPs	=	MSP	6	5	
Working with farmer's knowledge	=	FK	6	1	
Capacity building; improved work methods	=	CB	7	3	
Uses new technology	=	Tech	7	2	
Uses new research methods: data collection, analysis	=	R	13	0	
New project design or management; grp management	=	Mng	14	3	
Researcher respondents = 21 ; N = 26			Responses = 65		
Technician respondents = 15 ; N = 16			Responses = 30		

“ Because through this project, we have first have been able to have interdisciplinary exchanges. That has been very important. Everything that concerns hydrology, depth, quality, etc., has really been edifying. And also, especially, with modeling. It's very, very important. We were able to have training in statistics and modeling. [V3 local researcher]

Changed Practices, Researchers & Technicians



members. It has even changed how they conduct their research. The on-farm trials were especially important for V2 and V3 researchers and technicians.

Several people, both researchers and technicians, said that they learned about and through teamwork, i.e., from working with different people. Not all of this learning was positive: a technician told us he had learned that in order to be respected you have to have a PhD. V3 team members, though, because of intra-project meetings, remarked on how much they learned from each other — agronomists and soil scientists learned from hydrologists, and hydrologists learned about household economics. An agricultural technician had learned about feeding fish. Another technician told us that he would use what he has learned about weather and water sampling when he applied for a master’s degree.

“ I would say that the project has given me another vision in the activities I conduct at the station. Because with the work at the station, you're not in direct contact with the producers. So you conduct your experiments without knowing what the impact will be on the ground. But here, you work directly with the beneficiaries. And you see directly their concerns, their problems, their expectations. It has given me another vision of research. You shouldn't do research just out of curiosity, research for research's sake, research to see what data it will give for scientific curiosity. You should actually conduct research for development. Then you're in touch with reality and your research contributes to the development of the principle beneficiaries of the country.

There are many research results that lead to dead-ends that have no success, just because they didn't meet the concerns of the producers. So, here we work to put the research and the producers together in a synergy. That, frankly, has really taught me something. And my way of doing things has changed, because doing research without knowing what the producer expects is really not worth it. That changes your vision. When you design a future project, you proceed in this sense: What will really be useful for them? What will be useful for their work? Where you will really have consequences? Personally, that's given me another outlook that I didn't have when I was on the station. [V3 local researcher]

“ The project when it was created was a very nice object. But it was too complicated. Definitely too complicated. The idea was: sign the contracts in November; in January, this is done; in February, this is done; in March, this is done. Then, suddenly it's November [again] and things aren't done! So, the nice project is all distorted. From the beginning. And if it's too complicated, you can't manage the distortions. So, be simple, be realistic, be organized. [An international researcher]

Team members cited personal skills, patience and tolerance, learning a new language, and working in a new culture. A technician talked about the cultural differences between the communities he worked in. Some people learned about managing people and projects, especially the need for communication among team members and participants. “If one can communicate on the same level with farmers, a technician told us,” they will help you to achieve things.” Another told us, though, that it is challenging working with farmers who consider themselves to be poor, and another thought that there was too little engagement from the technical services in Burkina Faso. People told us they had learned about the challenge to reconcile farmers' needs, research needs, and donors' needs.

One researcher learned about designing projects; another, how not to design projects. A technician told us about the importance of writing terms of reference, and now tries to write

them for all of his activities.

Much of this acquired knowledge and these new skills and practices, including the knowledge and new practices of the participants, influenced what team members told us about innovation. Before we asked about the innovations they saw, though, we asked all interviewees about new interactions that they had experienced and noticed. ♦



Tazen Fowe presents his research at a V3 feedback meeting in Boura (Burkina Faso, April 2012).

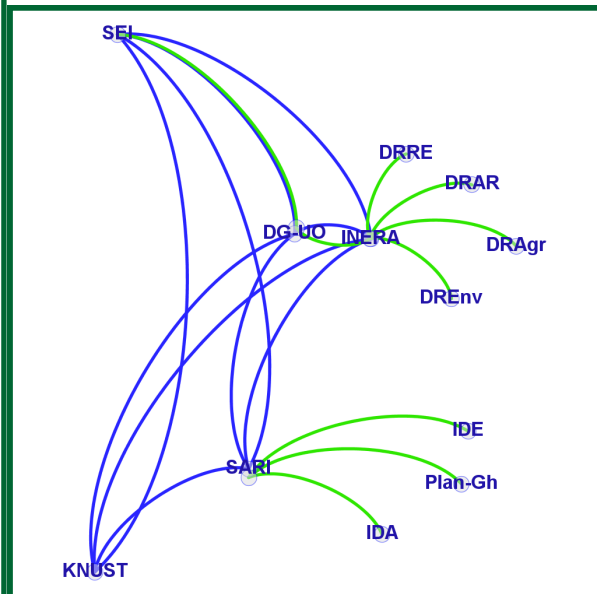
I NTERACTIONS

As we were attending meetings and conducting interviews, we were struck by the number of new connections made between institutions, between local communities, and between individuals. Therefore, in our interviews we asked people about the new interactions they had experienced or seen. People mentioned several, which, of course, all depended on the different contexts of each project. While some of these connections were not maintained outside the various platforms where they occurred, they still provided temporary opportunities for people to exchange knowledge. This was true for V4 Ghana community participants, who were not able to keep up their connections with

“ The project has definitely strengthened relationships with partner institutions. It definitely has. We have worked more closely. Before the project I didn’t have any link with the university. The project came in, and now I have a link with staff at the university. So it’s definitely strengthened institutional relationships. [A local researcher]

distant communities. They still learned about what was happening in those different communities — e.g., projects to replace riverside cultivation with trees, and the availability of farmland in other areas.

Other interactions seemed to lead to longer-lasting relationships, especially among and within institutions. Some of these connections already existed, but were renewed with different links in different contexts. In the network charts below, I have over-laid the original partner network of each project (blue) with new institutional or organizational links (green) that people told us about. These are certainly not all of the new links , and only the few old links (red) that people mentioned are shown, but the network graphs give an idea of the multiplicity of new links created by the projects’ activities. People also talked about many new connections between individuals, but to preserve interviewee anonymity, institutions and organizations stand in for these personal relationships; individuals are not shown on the network charts. Only time will tell whether or not all these new relationships will last beyond the program.



Label	Full Name	Country
SEI	Stockholm Environment Institute	SW
VBA	Volta Basin Authority	INT
DG-UO	Dept. of Geography of the University of Ouagadougou	BF
DRAgr	Directions Régionales de l’Agriculture	BF
DRAR	Directions Régionales des Ressource Animales	BF
DREnv	Directions Régionales de l’Environnement	BF
DRRE	Directions Régionales des Ressources en Eau	BF
INERA	Institut National de l’Environnement et de Recherche Agricole	BF
IDA	Irrigation Development Authority	GH
IDE	International Development Enterprise	GH
KNUST	Civil Engineering Dept., Kwami Nkrumah University of Science and Technology	GH
Plan-Gh	Plan Ghana	GH
SARI	Savanna Agricultural Research Institute	GH

V1

Researchers at INERA and SARI told us how they made new relationships with institutions through the Participatory GIS (PGIS) exercises. V1’s project leader from SEI worked hard to create a new relationship with the University of Ouagadougou’s Geography department (DG-OU). Though INERA and the Geography Department had already had a relationship, the PGIS activities created a new context for their relationship.

V2

As an example of old relationships being renewed in different contexts, ARI is a neighbor of the University of Development Studies (UDS), but the PRA exercises and household surveys for V2 gave the ARI researchers and technicians new links with UDS departments and professors. National researchers and technicians within other institutions, though working in different areas, were able to build closer ties through their project activities.

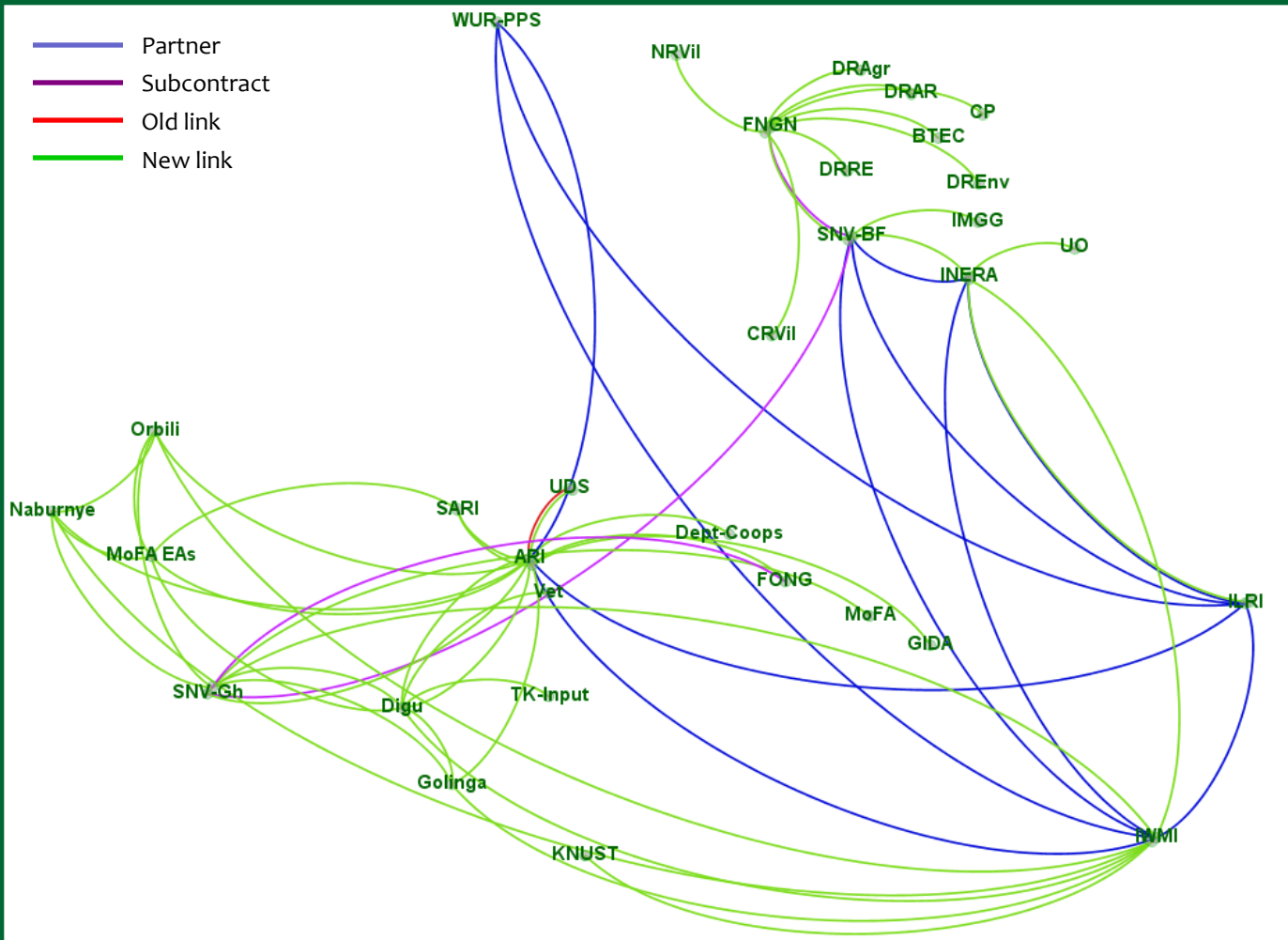
The V2 villages in Tolon-Kumbungu district, Golinga and Digu, created an inter-village Farmer-Based Organization (FBO) through the Farmers' Organizations Network of Ghana (FONG). In the V2 villages, besides their new relationships with their "partner" villages — Golinga-Digu and Orbili-Naburnye — participants also mentioned new relationships within their villages as the trial farmers interacted with other farmers wanting to learn the new V2 information. Men and women also connected with farmers in other villages to talk to them about V2 activities. V2 Ghana farmers strengthened or built new relationships with ARI researchers and MoFA extension agents.

FNGN technicians in Burkina Faso told us how they made new connections with V2 villages and strengthened relations with regional ministry departments. Technicians remarked that farmers, traders and processors were beginning to have better commercial relationships. Working in a different value chain, a Burkina V2 technician who assisted a women's soap cooperative was able to source ingredients from one of the V2 villages.

<u>Label</u>	<u>Full Name</u>	<u>Country</u>
ILRI	International Livestock Research Institute	CG
IWMI	International Water Management Institute	CG
WUR-PPS	Wageningen University, Plant Production Systems	NL
BTEC	Credit Agency	BF
CP	Caisse Populaire (Credit Agency)	BF
CRVil	Central Region Villages	BF
DRAgr	Directions Régionales de l'Agriculture	BF
DRAR	Directions Régionales des Ressource Animales	BF
DREnv	Directions Régionales de l'Environnement	BF
DRRE	Directions Régionales des Ressources en Eau	BF
FNGN	Federation Nationale des Groupements Naam	BF
IMGG	IMGG/Bureau d'études - Research Consultancy	BF
INERA	Institut National de l'Environnement et de Recherche Agricole	BF
NRVil	Northern Region Villages	BF
SNV-BF	SNV-Burkina	BF
UO	University of Ouagadougou	BF
ARI	Animal Research Institute	GH
Dept-Coops	Department of Cooperatives	GH
Digu	Digu producers	GH
FONG	Farmers' Organizations Network of Ghana	GH
GIDA	Ghana Irrigation Development Authority	GH
Golinga	Golinga producers	GH
KNUST	Kwame Nkrume University of Science and Technology	GH
MoFA	Ministry of Food and Agriculture	GH
MoFA EAs	Ministry of Food and Agriculture Extension Agents	GH
Naburnye	Naburnye producers	GH
Orbili	Orbili producers	GH
SARI	Savanna Agricultural Research Institute	GH
SNV-Gh	SNV-Ghana	GH
TK-Input	Tolon Kumbungu Input Suppliers	GH
UDS	University of Development Studies	GH
Vet	Veterinary doctor	GH



Two V2 villages work in small groups at a V2 IP meeting in Komsilga, Burkina Faso (March 2012).



HAMIDA IDRISU ENT.
AGRO INPUTS DEALER
 P.O. BOX 4
 KUNYUKUO-BABILE-LAWRA DIST.
 Tel: 0540532537- 0207862208

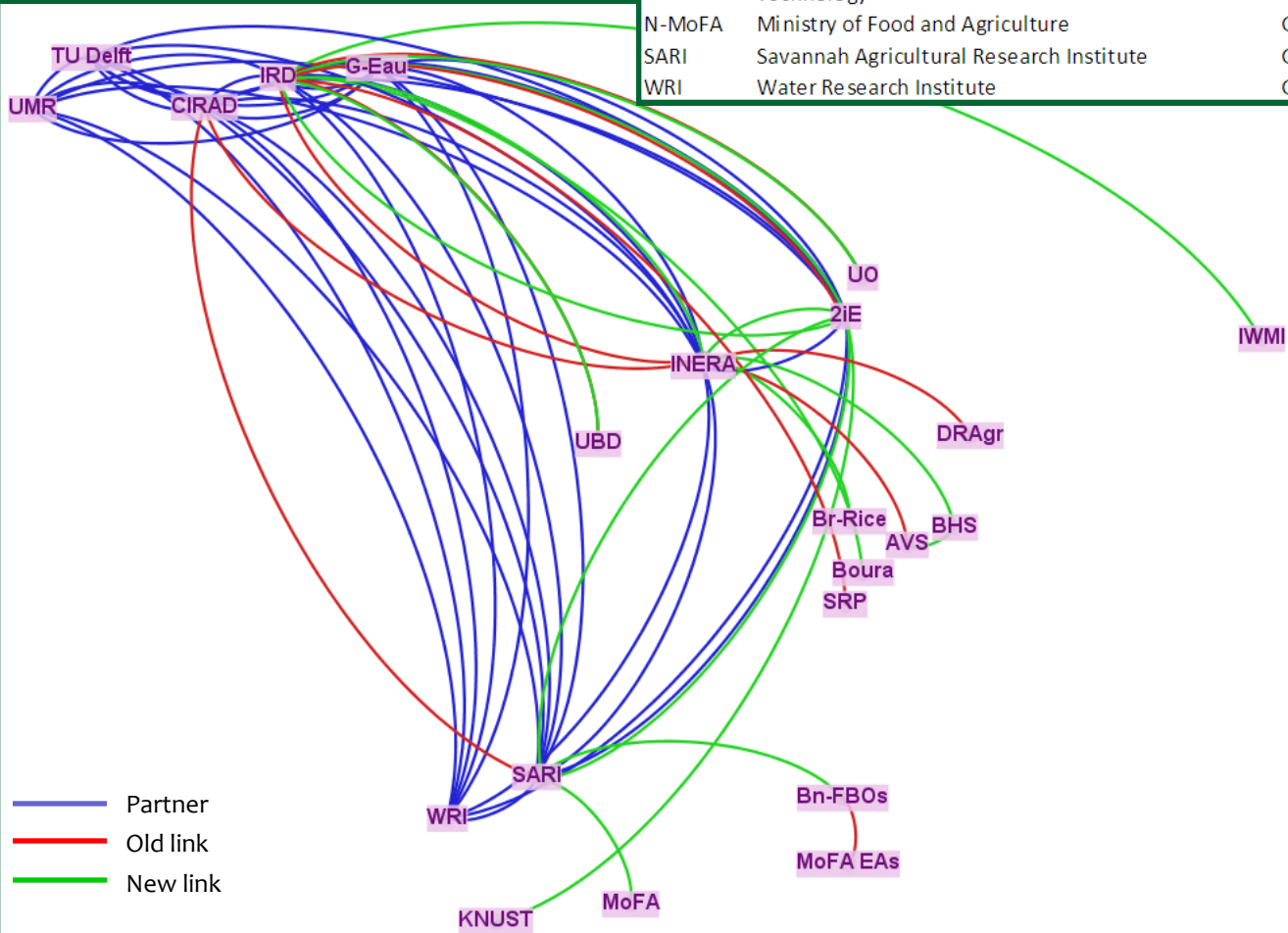


Hamida Idrissu (far left), V2 IP participant, sells seed, fertilizer and pesticide at her store in Lawra market (Ghana, July 2013).

V3

Although language was a problem for some people between Francophone Burkina Faso and Anglophone Ghana, there were new cross-border interactions between individuals in V3 institutions such as 2iE in Burkina Faso and those in the Ghanaian institutions SARI and KNUST. Many local researchers and technicians mentioned their new personal relationships with international researchers. Unfortunately, as “interaction” was sometimes a difficult concept to translate, this question was skipped in interviews with V3 participants.

<u>Label</u>	<u>Full name</u>	<u>Country</u>
CIRAD	Centre de coopération internationale en recherche agronomique pour le développement	FR
G-Eau	Gestion de l'Eau, Acteurs, usages	FR
IRD	Institut de recherche et développement	FR
UMR	Unité mixte de recherche	FR
TU Delft	Delft University of Technology	NL
IWMI	International Water Management Institute	CG
2iE	Institut International de l'Ingénierie de l'Eau et de l'Environnement	BF
AVS	Agriculture Vulgarisation Service	BF
BHS	Burkina Health Services	BF
Boura	Boura Community	BF
Br-Rice	Boura rice producers	BF
DRAgr	Direction Régionale de l'Agriculture	BF
INERA	Institut National de l'Environnement et de Recherche Agricole	BF
SRP	Small Reservoir Project	BF
UBD	University of Bobo Dioulasso	BF
UO	University of Ouagadougou	BF
Bn-FBOs	Binaba Farmer-based Organizations	GH
MoFA EAs	Ministry of Food and Agriculture Extension Agents	GH
N-KNUST	Kwami Nkrume University of Science and Technology	GH
N-MoFA	Ministry of Food and Agriculture	GH
SARI	Savannah Agricultural Research Institute	GH
WRI	Water Research Institute	GH

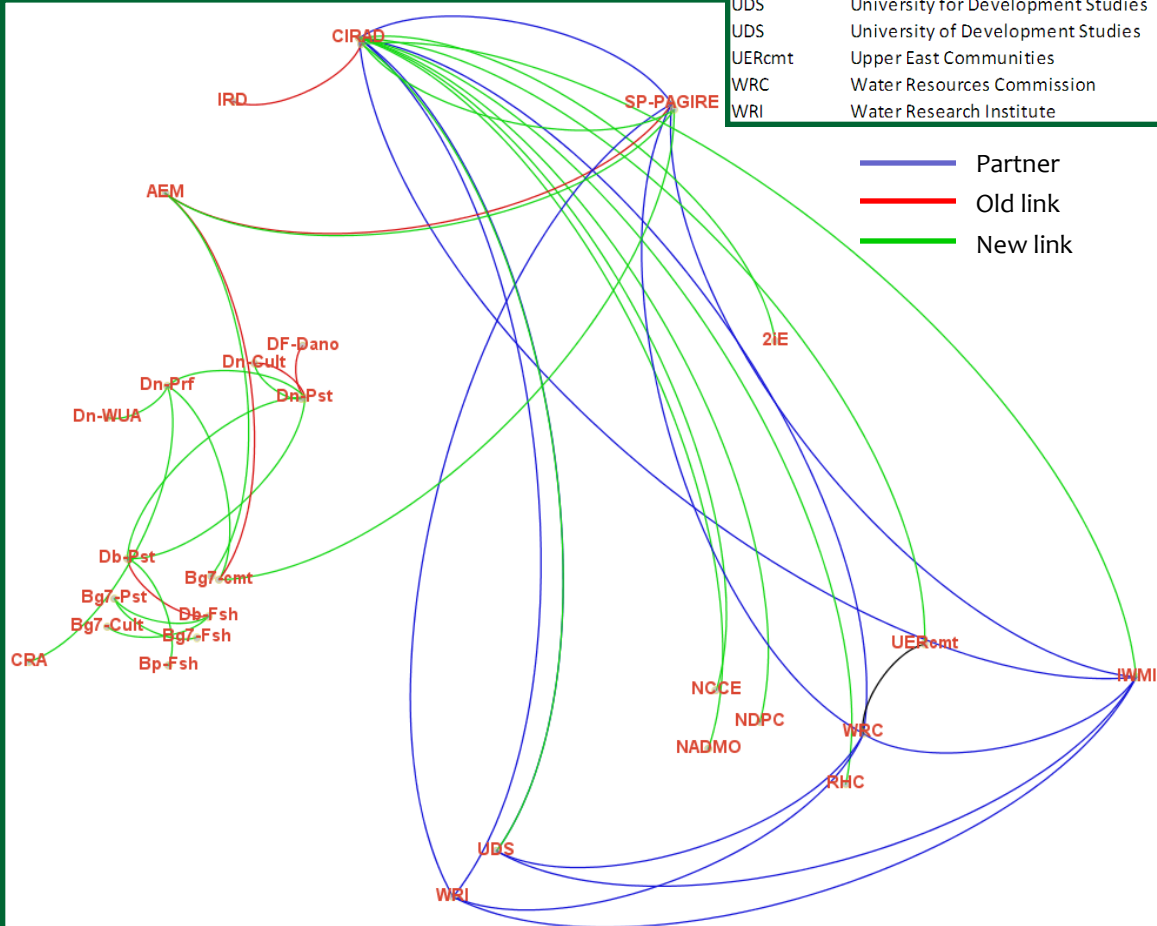


V4

Contrary to the V4 Ghana participants, some of the V4 Burkina participants seem to have built longer lasting individual relationships. In Burkina’s Southwest Region, members of the CLE workshops spoke about the new relationships they had cultivated with other participants living in other places. An exception to this was what seemed to be an old and somewhat rancorous relationship between the fishermen from Diébougou and those from Bapla. Some livestock raisers, however, mentioned finding new customers, and others told us that they contacted the fishermen to buy fish from them. Thus, V4 played its own part, rather inadvertently, in developing value chains.

More in line with V4’s work, however, workshop participants explained to us how they learned about each others’ livelihoods and the challenges they faced.

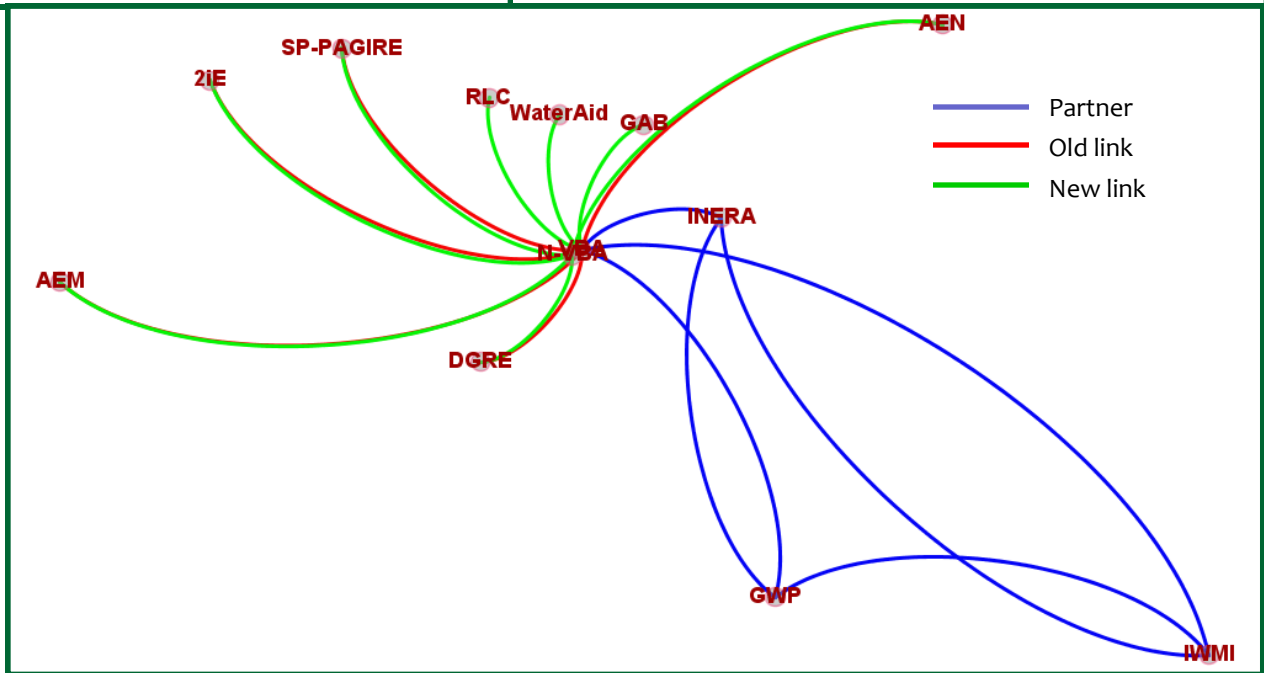
Label	Full name	Country
IWMI	International Water Management Institute	CG
CIRAD	Centre de coopération internationale en recherche agronomique pour le développement	FR
IRD	Institut de recherche et développement	FR
2iE	Institut International de l'Ingénierie de l'Eau et de l'Environnement	BF
AEM	Mouhoun Basin Agency	BF
Bg7-cmt	Bougouriba 7 communities	BF
Bg7-Cult	Bougouriba 7 cultivators	BF
Bg7-Fsh	Bougouriba 7 Fishermen	BF
Bg7-Pst	Bougouriba 7 Pastoralists	BF
Bp-Fsh	Bapla fishermen	BF
CRA	Regional Chamber of Agriculture	BF
CSPS	Centre de Santé et de Promotion sociale	BF
Db-Fsh	Dieboucou fishermen	BF
Db-Pst	Dieboucou pastoralists	BF
DF-Dano	Dreyer Foundation - Dano	BF
Dn-Cult	Dano cultivators	BF
Dn-Prf	Prefecture Dano	BF
Dn-Pst	Dano pastoralists	BF
Dn-WUA	Dano WUAs	BF
DPAgr	Provincial Direction of Agriculture	BF
DPAR	Provincial Direction of Animal Resources	BF
DPEnv	Provincial Direction of Environment	BF
SP-PAGIRE	Secrétaire Permanent - Plan d'Action pour la Gestion	BF
NADMO	National Disaster Management Organisation	GH
NCCE	National commission of civic education	GH
NDPC	National Development Planning Commission	GH
RHC	Regional House of Chiefs	GH
UDS	University for Development Studies	GH
UDS	University of Development Studies	GH
UERcmt	Upper East Communities	GH
WRC	Water Resources Commission	GH
WRI	Water Research Institute	GH



Label	Full name	Country
VBA	Volta Basin Authority	INT
GWP	Global Water Partnership	INT
IWMI	International Water Management Institute	CG
INERA	Institut National de l'Environnement et de Recherche Agricole	BF
WaterAid	WaterAid	BF
RLC	Regional Learning Center for Water Resource Management	BF
GAB	Learning Group for Water Resource Management	BF
DGRE	Direction Générale des Ressources en Eau	BF
SP-PAGIRE	Secrétaire Permanent - Plan d'Action pour la Gestion Intégrée des Ressources en Eau	BF
AEM	Mouhoun Basin Agency	BF
2iE	Institut International de l'Ingénierie de l'Eau et de l'Environnement	BF

V5

V5 made many connections with higher level government institutions. Although these are probably not new connections for the Volta Basin Authority, the VBA's new relationship with the Burkina Learning Group for Water Resources Management (GAB) is leading to new relationships with old partners, including WaterAid and the Regional Learning Center. The VBA's librarian will take over as VBA representative to the GAB, and he and the VBA's IT specialist are helping GAB member institutions to join the on-line Common Documentation Platform. 💧



“ Well, for me, it's allowed me to rub shoulders with not a few researchers of different disciplines. The researchers' manner of approaching the question challenges us to use the multi-stakeholder platform. That is, question things, see how we can resolve the problem. Don't just attack the things like that. Really try to understand them and their causes, and then be able to interact. Especially environmental questions. To take them in their context. [A local V4 technician]



Participants in a V4 workshop post their ideas about the roles and actions of the Bougouriba 7 CLE (Diébougou, Burkina Faso, March 2012).

I NNOVATIONS

We asked the project team members for their definitions of “innovation.” Then, after they had given us their definitions, we asked if, according to the definition they had given us, they had seen innovations in the projects where they were working.

Researchers gave somewhat different answers than technicians, and there were also differences between international and local researchers.

International researchers tended to be more hesitant than local researchers to say that innovations had occurred, at least at the time of their interviews.



“Chairman” Yamali Shaibu, Golinga lead farmer, shows a sample of the soybeans and maize he harvested from his trial plot (Ghana, May 2013).

“ What I know is that innovation, presumed innovation, always needs a long time to be effectively adopted. And I suppose also there is a question of numbers. If one person is adopting something very revolutionary, it’s not an innovation. If all people are adopting this revolutionary attitude, this is an innovation. So it’s a question of numbers. But what I think also is that innovation is not just technical. Innovation is first a social acceptance. [An international researcher]

Definitions

Everyone, of course, broadly defined innovation as something new, but many local researchers and technicians gave longer definitions than the international researchers, and often qualified their definitions with a sense of “new to us.” From the perspectives of local team members, an innovation could be something brought from somewhere else and adapted to the local context. Almost everyone thought that innovations should be positive, but many local team members thought that new technology or practices should also lead to sustainable development in order to qualify as “innovations.”

There was also a notable difference between innovations as objects, processes, and ideas or knowledge. Several people specifically defined innovation as processes. Technicians, notably,

described innovations as new or changed ideas or knowledge, and said they must improve peoples’ lives. One person distinguished innovation from invention, explaining that “with the latter, you have to create.”

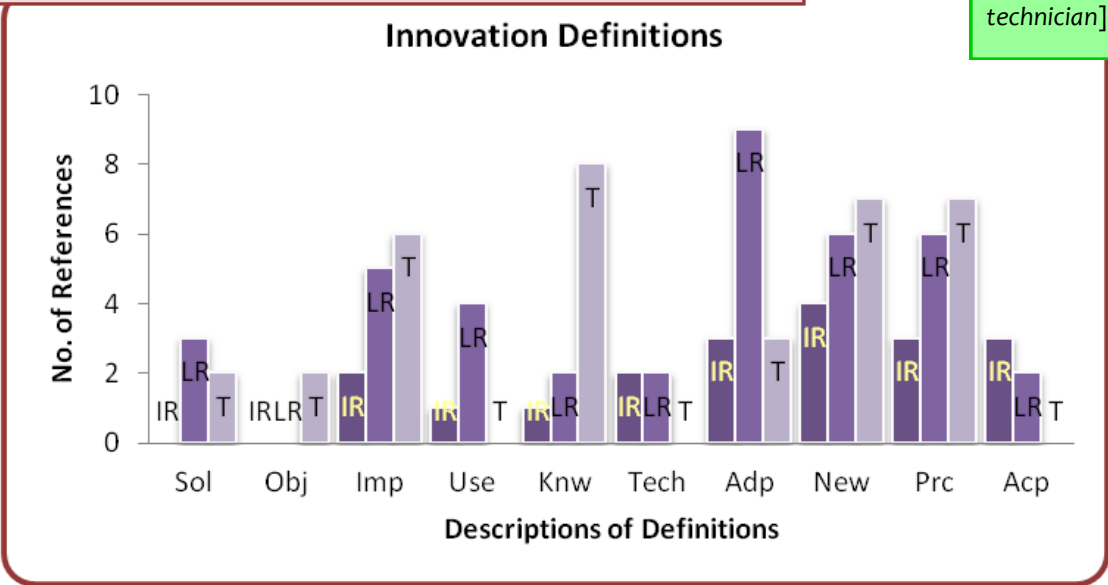
Some interviewees described innovations as being “useful, beneficial and improving livelihoods” (Use) and some local researchers and technicians described others specifically as solutions to problems (Sol).

If we had proceeded with a strict, outside (etic) definition of innovation to evaluate the changes emerging from project activities, the next section would not exist. None of the changes mentioned by interviewees could be described as innovative — yet — with such a definition. Instead we asked team members what innovations, according to their own definitions, that they had seen or experienced. All of the process,

“ How I see innovation, it’s not like reinventing the wheel, but you can pick things here and there, put them together, create something different, and it becomes a new thing. Putting what may have already existed together in a different perspective, for people to apply and achieve sustainability. That’s the way I see innovation. [A local researcher]

Innovation Definitions		IR	LR	T
Solution to a problem	= Sol	0	3	2
Object	= Obj	0	0	2
Improve (livelihoods)	= Imp	2	5	6
Useful, beneficial, sustainable	= Use	1	4	0
Change in knowledge or new idea	= Knw	1	2	8
Technology	= Tech	2	2	0
Adapted, new to us, added value	= Adp	3	9	3
Completely new, ingenious	= New	4	6	7
Process, change in practice	= Prc	3	6	7
Must be accepted & adopted	= Acp	3	2	0
References =		19	39	35
International Researcher Respondants (IR)	=	7	N = 9	
Local Researcher Respondants (LR)	=	16	N = 17	
Technician Respondants (T)	=	15	N = 16	

“ You create knowledge and then it might replace what you knew. So, it’s improving. But I would say, innovation is putting new ideas into action. If you have a new idea and you put a new idea into action, because people didn’t know about it, and it is quite new, and you turn it into action, I think you have contributed to innovating something. [A technician]



“ With me, an innovation, I think we’ll have to wait for the end. But we want to innovate. We want to change the manner of finding water quality. [A local researcher]

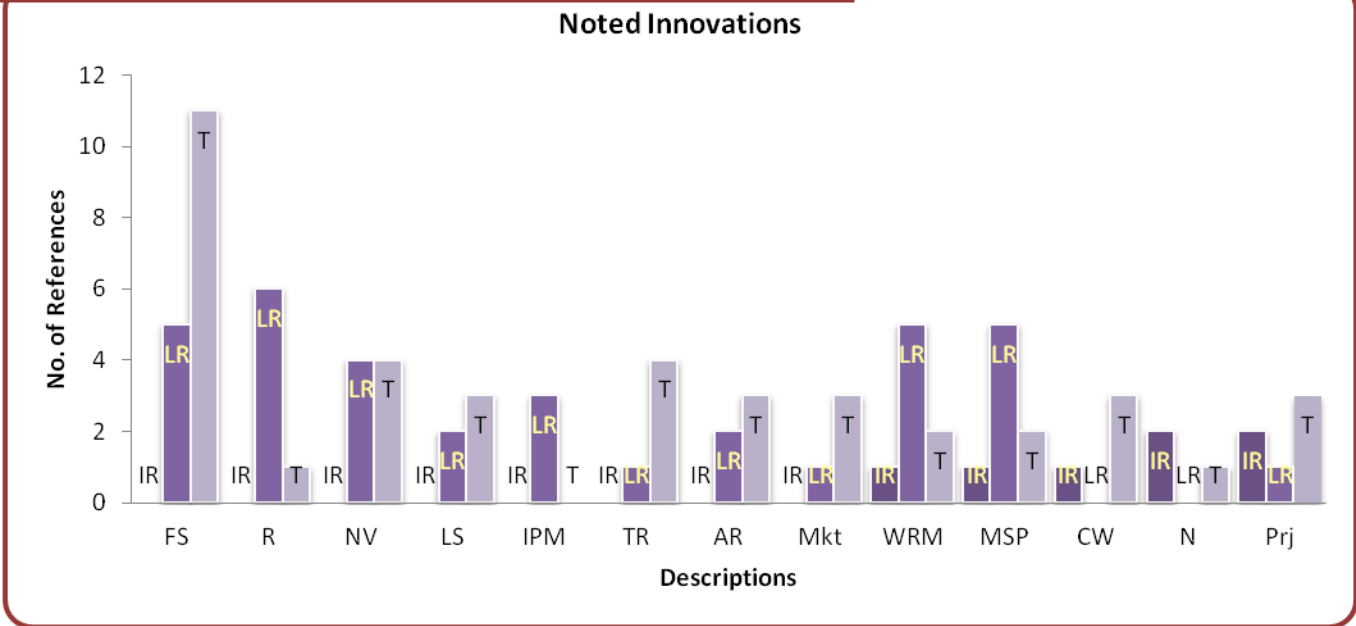
technologies and objects described in the next section, except the MFFSs, come from answers to that question. A few people did not answer, and a few answered none. The local team members used the qualifiers “new to us,” or “new to the farmers.” Several described — and I counted — potential innovations.

Experiences of Innovations

As mentioned above international researchers were more reluctant to describe emerging innovations, but some local researchers displayed similar tentativeness. I counted as “None” only responses that specifically stated no innovations had occurred, but not answers that simply did not describe innovations. Several categories included potential innovations, such as this quote on the left.

Other local team members described everything from the new varieties of seeds (NV) they tested with the farmers, to the various farming and livestock raising strategies (FS and LS), to the different participatory processes of the multi-

Noted Innovations		IR	LR	T
Various farming strategies	= FS	0	5	11
Research	= R	0	6	1
New varieties (farmers' acceptance of)	= NV	0	4	4
Various Livestock strategies	= LS	0	2	3
Various Pest management strategies	= IPM	0	3	0
Tied ridging	= TR	0	1	4
Action-research	= AR	0	2	3
Various marketing strategies	= Mkt	0	1	3
Water resources management, irrigation, dugouts	= WRM	1	5	2
Various multi-stakeholder platforms	= MSP	1	5	2
Community willingness to work, call meetings	= CW	1	0	3
None	= N	2	0	1
Design of the program, projects	= Prj	2	1	3
Responses		7	35	40
International Researcher Respondants (IR)	= 7	N = 9		
Local Researcher Respondants (LR)	= 15	N = 17		
Technician Respondants (T)	= 15	N = 16		



stakeholder platforms (MSP) they facilitated and participated in. In the “research” category (R), I counted several different research methods. V1 researchers described how using Google Maps with villagers allows for more precise PGIS. A technician said that helping to conduct the feed trials in V2 was an innovation for him, and a V3 researcher hoped that the participatory model the hydrologists were helping to construct would be an innovation helping communities to better manage their reservoir and water resources — an innovation that also fits under “water resources management” (WRM). Under the label WRM, I included mention of the understanding that the reservoir is an important resource to be managed, and one statement that communities will have no choice but to innovate as climate change leads to a decrease in water resources. I also included the dugouts (man-made ponds), mentioned by Orbili team members. One of these ponds was dug through a farmer’s personal initiative, the other with the help of the V2 team.

“ So this Master Farmer Field School was developed for V3?

We started it — we devised it when we started the project. We tried to think through how best to get the message across to the farmers within the shortest possible time. Then that idea came. So we started practicing it under this project.

When you say “we,” who exactly do you mean?

The team of agric extension agents, the farmers, the research team. I bring in another Upper West scientist sometimes. And at times I also bring the technicians with me. There were others who are not directly supported by the project. Just sometimes we want them to also come and learn.

But it was just the Ghanaian team? Not the Europeans?

No, no, no. These are our own ideas. [A local researcher]

Statements about “community willingness” (CW) were distinct enough to create a separate category. I included in community willingness the statement, “new thinking among the farmers that they should not rely on other people and their money; they themselves can do things themselves.” Another technician said that producers in the project now understand that they have to be organized and recognized as a farmers’ group so they can search for partners to help them with their challenges. One innovative experience combined water resource management with community willingness, in that the technician and his community, had come to see the reservoir as a key resource. They learned to open the canals only when needed, so water was not wasted.

Under “New varieties” (NV), one technician mentioned the quick transfer of improved varieties of crops and livestock to farmers. Another described as new to some farmers a vegetable, jambur, which controls striga (an invasive plant in maize fields) and repels mosquitoes. The fact that “input dealers have up-to-date inputs (seed, fertilizers, pesticides) and can get inputs directly to farmers through project,” I put under “Marketing” (Mkt). “Farming strategies” (FS) include crop spacing and sowing in rows, intercropping and the rainwater harvesting techniques, all innovations for many local team members. Because tied ridging was significant in the responses on Learning and Changed Practices, I included it separately here. “Livestock strategies” included farmers building stables and calling on veterinarians for their livestock. Under “action-research” (AR) I included the “participatory varietal evaluation with eight varieties of rice” of the V3 project as well as the new “capacity of ten farmers to produce certified seeds from foundation seeds.” A V2 technician cited the “opportunity to have researchers work directly with farmers,” which expresses how many local researchers and technicians felt. The field trial experience, while not necessarily an innovation was something “new to them.”

The multi-stakeholder platforms were innovative to team members because they went “beyond participative approaches.” Some team members cited the integration of many different components into their projects — or the integration of the different projects into the whole program — as innovative, though as mentioned above, they also cited this as complex and perhaps too ambitious.



Agricultural inputs – fertilizers and pesticides – sold in bottles in a roadside shop near Nyankpala, Ghana (May 2012).

The Master Farmer Field School may have come under the description of an “adapted idea to solve a problem” for the V3 Ghanaians. The researchers did not describe it as an innovation, though, and I did not include it in the table or graph.

One can see from the descriptions of innovations that most by far are processes and knowledge, not necessarily new in the world, but new to the local people who experience them. 💧



One international researcher told us:

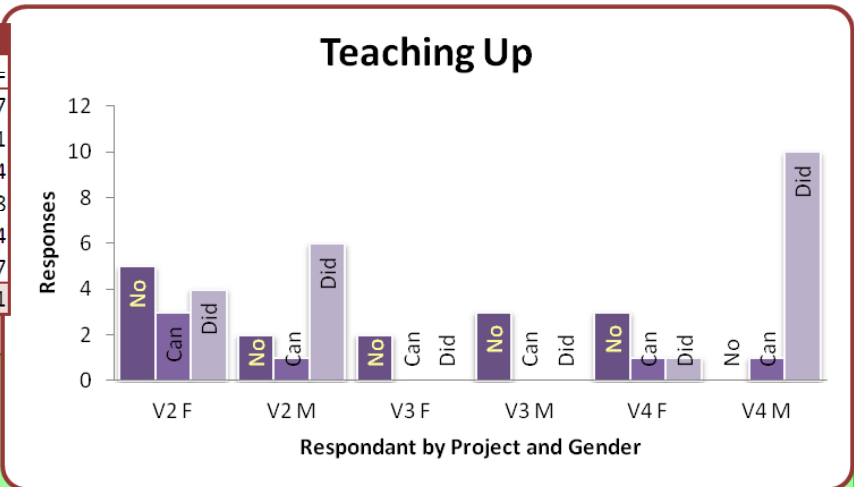
You might not believe it — there is a lot you learn when you come to the field. Just listening to the farmers. Just listening to their stories. It’s amazing what you learn. And I’ve learnt a lot.

TEACHING THE FACILITATORS

In order to understand better the participants’ views of project facilitation and their own participatory input, we asked them if they were able to teach project researchers, technicians and trainers anything. Most participants shared the outlook of the person who said, “No, they are supposed to teach us. How can you teach a teacher?” Several, though, told us they would if they were asked, or that they actually had taught something to at least one team member. On the other hand, several researchers and technicians told us how much they had learned from the farmers.

V4 presented a somewhat different case, as several of the workshop participants had similar education levels to the project team members. One was a veterinary doctor and regional department director, another a retired professor and air force officer. Most of the representatives from the community organizations also had higher education levels than the average V2 and V3 farmer, and were dynamic community leaders. When asked if they had been able to teach the facilitators, only a few said they were there to learn, not teach. Most said they taught everyone, including the facilitators, in the participatory discussions of the workshops. 💧

Teaching Up					
	No	Can	Did	Rsp=	N=
V2 F	5	3	4	12	17
V2 M	2	1	6	9	21
V3 F	2	0	0	2	4
V3 M	3	0	0	3	8
V4 F	3	1	1	5	4
V4 M	0	1	10	11	17
Total Responses =				42	71



NOTES FOR RESULTS

- ¹We were not able to interview any of the many masters’ students who conducted research within the program.
- ²We only interviewed one woman among each of the extension agents and facilitators, not because we ignored women, but because few work in these capacities and very few were included on project teams. See Gender in the Discussion section.
- ³The local research institutes in both countries were late delivering seed to trial farmers in 2011.
- ⁴The “Discussion” table and chart account for responses on a scale from no discussion to discussing outside the community. Some participants gave more than one answer, but I recorded only the “highest” response of each interviewee on the table. In the following tables, all interviewee responses have been accounted for.
- ⁵This could be pigeon pea, on which an ARI researcher told me he was conducting research, and which some farmers told us they were growing.



Maize grows in the flood plain of the Boura Dam; the canal from the dam is in the foreground (V3, Burkina Faso, June 2012).



A dust and rainstorm arrives near Koubri, the first good storm in the Central Plateau of the 2012 season (Burkina Faso, July 2012).

Discussion: Fostering Innovation

Will any of the novel ideas, practices and techniques discussed by VBDC project team members develop into persistent innovations? Only time will tell. The findings in our research, however, point toward factors of more effective fostering of innovation in research for development. Our exploration of VBDC project activities avoided monitoring and evaluation; we promised our interviewees that we were not evaluating them or their work. Neither will this report evaluate the different activities of the VBDC projects, though general program procedures and processes come under scrutiny. In a more critical vein than in the previous sections, here I will reflect on questions that future R4D programs should consider if they wish to foster innovation.

An Agricultural Innovation Systems (AIS) approach departs from a linear transfer of research results from scientist through technical services to farmer, or from researcher to policy maker — the “business as usual” for some other research institutes (see among others Clark, Smith et al. 2007; Hall, Clark et al. 2007; Hounkonnou, Kossou et al. 2012; Klerkx, van Mierlo et al. 2012). An AIS approach attempts to involve as many parties as possible — international and local researchers, policy makers, technical services, and farmers — in the research for development so that:

- ◆ the research is demand driven,
- ◆ research results will more directly benefit “end users,” and
- ◆ research results turn into concrete benefits more rapidly as compared to results handed over to policy makers and technical services.

These three points bring up questions, however, that R4D programs should not only seek to answer while planning their programs, but also make sure that team members and project participants understand and agree with the answers. AIS R4D goes beyond previous participatory development approaches, using various sorts of multi-stakeholder platforms that are meant to include all concerned stakeholders in research that should be relevant to their demand. Yet, who among these stakeholders has originated the demand? The end users? The next users? Secondly, who are the end users and next users? Are all team members in agreement with what these terms mean,

“

A researcher describes a situation where community members may not have fully understood the research and its objectives:

At the moment, we are in an uncomfortable situation, because so many of us have been in the project site to conduct surveys on people. This one came to ask about health. This other came to ask about economy. This one came to ask about agricultural practices, and so on and so on. And people are tired of our surveys, of our questions, and they ask, where are the answers? So, this is a problem, and also a risk, in terms of exchange with our local partners, these local stakeholders. They are complaining: well, these researchers are coming and we are discussing, under the tree, but what's the difference for us? No difference.

and who they are? Thirdly (but not finally), what are the objectives of the research results, and how are they connected to research demand? Are all stakeholders aware of the demand, and do all understand the objectives of the research?

Development in general, and AIS R4D in particular, encompasses a vast array of people (Mosse and Lewis 2006). In this report, for the purposes of presenting the research findings, I have grouped the stakeholders of the VBDC as participants and team members, and further divided team members into international researchers, local researchers and technicians. Within these overly simplified categories, we find doctoral students, engineers, research assistants, farmers, trainers, pastoralists, producers, extension agents, facilitators, department directors, traders, processors and input sellers. But we also find men and women, PhDs and people with no formal schooling, people in government and the private sector, people on association boards, people with five-figure salaries and those whose incomes are better measured in their annual harvest. In this way, professions and livelihoods are cross-cut and intersected by various other socio-economic groupings, including gender, class, income level, and education level.

Stakeholders are also connected to the other stakeholders in various ways, overt and obscured. An individual stakeholder's engagement in a project depends not only on his or her involvement with a certain livelihood, research discipline, or government agency, but also on how the stakeholder

understands the project and its objectives, what personal goals she or he brings to the platform, and how she or he understands the roles and objectives of the other stakeholders — researchers, technicians and participants. The potential for misunderstanding is as vast as the array of stakeholders involved in an R4D program. As one researcher pointed out, “It's complicated”; but also that “complex problems,” such as the combination of climate change, food security and water resource management, need “complex partnerships. Of course, there are transaction costs.”

Agriculture R4D needs a:

“systems approach [that] recognises that agricultural innovation is not just about adopting new technologies; it also requires a balance amongst new technical practices and alternative ways of organising, for example, markets, labour, land tenure and distribution of benefits” (Klerkx, Hall et al. 2009:412)

To better understand the stakeholders involved and improve communication and the exchange of ideas, this complexity of people must be considered while developing and implementing activities. In conjunction with the interacting issues of time, communication, and investment in the project, such an understanding is one of the “transaction costs” for fostering innovation in AIS R4D. Behind the labels of “stakeholders” and “producers” and “researchers” and “extension agents” are individual people who need time to communicate effectively with each other and understand the investments that each needs to make to own their part of the development project. 💧



Rebecca, V2 IP member, poses (third from right) with members of her vegetable vendors' association in Lawra market (Ghana, July 2013).

PEOPLE

Various authors have written about the crucial position of “brokers” within development programs — the facilitators, trainers and extension agents that mediate between program designers and stakeholders on the ground (Lewis and Mosse 2006; Klerkx, Hall et al. 2009). As important as may be this group of people, and the issues that revolve around them, in this section I would like to look at the two extremes on the spectrum of people involved in AIS R4D — the farmers or producers, and the researchers. As stated above, research for development involves very different kinds of people with often different understandings and different goals. These two groups of people do not always understand each other; indeed, they cannot always talk to each other because of language barriers. Their goals may be in conflict with each other; they may only want “stuff” from each other. Farmers want material gains, such as inputs and technology; researchers want research results with which to publish papers; everyone wants some sort of per diem allowance. During project activities, however, R4D programs need to see these stakeholders not as categories, but as individuals with all their varied interests and relationships.

Seeing like Researchers

Researchers, national and international, are as varied as farmers (and the rest of R4D stakeholders). They have different experiences with and perceptions of local stakeholders. These differences plus the varied understandings of R4D and AIS critically affect communication. Early in the CPWF Phase some attempts were made for international researchers, at least, to confer on these issues through Topic Working Groups. The TWGs, however, expired with the budget cuts of 2012.

“ The program is like a kind of laboratory, where the management team is testing and experimenting without being too mindful what that would mean in terms of demands on people implementing the projects. And now here is a new approach coming, and then they’re trying to test something else, and they’re more or less using our projects as guinea pigs for their experiments. I think it might to do with the prevailing orientation of among the donors. [An international researcher]

“ This project was more like a trial and error. So we did not have the impression that it was really, completely well-planned. [An international researcher]

Instead, project leaders and other international researchers often felt experimented on by the CPWF management team. They did not always understand what was demanded of them in the way of reports and monitoring and evaluation, or why they were being asked to carry out certain tasks for which they had little time.

“ An international researcher describes project planning:

We need to involve the partner as early as possible to make them to understand the way we imagine the process. This is the most important step of the project, and if we cannot succeed in this first step, all the other steps will not work.

“ This is very difficult: to have a scientific project, with a scientific definition as we do usually, and simultaneously to have this requirement of communication to our stakeholders. This is something very difficult, because this requires different skills, and requires probably different people. [An international researcher]

Because researchers need scientific results that they can publish in academic papers, they tend to feel more control over the research is necessary than what was meant for classical action-research (Greenwood and Levin 1998), and even, perhaps, for the platforms of AIS (Nederlof, Wongtschowski et al. 2011; Tenywa, Rao et al. 2011). Thus, farmers were given a limited number of choices for their field trials, and researchers may have felt that local partners needed to be “made” to understand the international researchers’ objectives (top right). One local researcher who told us, “You shouldn’t do research [just] out of curiosity (see page62),” had an alternate viewpoint which other local researchers, perhaps less burdened by the necessity to publish, shared.

At least one researcher seemed to feel manipulated by the R4D and AIS approach (bottom right). He felt as if innovations that researchers had come up with were then given over to others for appropriation in a manner similar to stealing intellectual property . He had no sense that innovation development was a joint enterprise among all stakeholders.

“ But in recent years, I think innovation is more an issue of psychological appropriation. It’s very important that people have the impression that it comes from them, you see? [An International researcher]



Boys water vegetable in the Binaba flood plain gardens (V3, Ghana, January 2012).

“ There is a tendency of public administrators, even technicians, to see peasants as having no knowledge at all. [A local researcher]

Besides farming rice and onions with V3 and participating in V4 workshops, Tonsel Aranaba sells wares in Binaba market (Ghana, January 2013).



Seeing like Farmers

One day at a project site, I waited with a young boy from the community for Joachim, our driver, to return from an errand. “They don’t like us,” he told me, referring to the researchers who came to the site now and then. Why would he say this? Although it may not be comfortable, one might try to imagine looking at researchers through the eyes of a villager:

Northern and even some southern researchers and development workers are a separate species from us farmers. They have more money than we will ever see in our lifetimes. They travel very fast in rich vehicles; wear rich, fancy clothing; live in rich, fancy houses; and stay in rich, fancy hotels. They will never understand or respect us. They can barely stand to be in the places we live. They won’t drink our water or eat our food, which is not good enough for them. We watch them rush in and out, knowing that when one project leaves another will come. So we strategize how to get as much as we can out of the one who is here now (Rossi 2006). We wonder whether to risk resources by trying this new technology that they’ve brought for us. The biggest difference between us, though? They can leave this place whenever they want, and they do leave. We can’t leave just like that.

The VBDC program, not unlike other projects, turned the host-guest relationship upside down and inside out when researchers and facilitators rushed into a town or village, hauled in food and water for coffee breaks and lunches, and put workshop or platform participants through long meetings. It is perfectly reasonable for researchers to “host” platform participants, especially if the meeting is more to the benefit of the researchers than the community members. Yet, the community members, rarely, if ever, had the opportunity to reciprocate. Are researchers interested enough in their lives — besides conducting surveys on them — to stop and visit and find out what is really going on? Not doing so may give the impression that “they don’t like us.”

This impression of “not caring,” is not true of every individual on the R4D stakeholder spectrum, of course, yet such an impression is something of which to be wary. One might put oneself in the place of the farmer sitting on a bench in a community hall listening to a sensitization lecture through a translator — or in the place of a project leader trying to figure out, mid-project, the new reporting requirements just sent from management.



A woman's stable built for a previous project in Godinga, Ghana (V2, May 2013).

Interviewees by gender							
Participants	V2	V3	V4	Total	Rsrch	Tech	Total
M	21	8	17	46	21	14	35
F	17	4	4	25	5	2	7
<i>total</i>	<i>38</i>	<i>12</i>	<i>21</i>	<i>71</i>	<i>26</i>	<i>16</i>	<i>42</i>
Total interviewed	V2	V3	V4	Total			
M	24	9	20	53			
F	26	8	5	39			
<i>total</i>	<i>50</i>	<i>17</i>	<i>25</i>	<i>92</i>			

Gender

One of the obvious categories that cross-cut classifications of stakeholders, and one of the issues that V5 took up, is gender: gender balance and gender awareness. Although some projects were able to specifically choose a balanced number of female and male participants, others inadvertently consistently invited more men than women, by about three or four to one. Two female participants told me about workshops: “Next time, they need to include more women!” Many administrative-level platforms also comprised a disproportion of men to women, but this reflected a national disparity of men to women in positions of authority. This disparity, as well as the gender disparity among program researchers and technicians, was passed on to the community-level workshop participants. Project partner men at national and regional levels sent invitations to men at district levels asking for representatives from farmers, pastoralists or livestock raisers (éleveurs), and fishermen, plus a representative from women’s groups. While fishing is the only exclusively male occupation — though women process and sell fish — when the representatives of producers groups were chosen, these were mostly men, except, of course, for the women’s representative. One woman told us that she was chosen “because they needed to invite a woman.”

The above disparity can be counteracted only by specifically asking for the participation of female farmers, livestock raisers and other professions. It can also be mediated by less of a disparity among the rest of the stakeholder spectrum. There appears to be a scarcity of women graduate students willing to go into the field, but we do not have concrete data to verify this. On the one hand, national universities and institutes should perhaps encourage more female engineering, natural and social science students willing to work in rural communities, but they also need to make sure those students feel safe in their work. On the other hand, international research institutes should also model a more equitable gender balance, proving that women are also engineers, hydrologists and soil scientists, as well as anthropologists and geographers. Women working with women in the field can make a difference, ensuring that women’s perspectives are included in R4D processes and final analyses. ◆

“Because of time and budget limitations, a male researcher told us, they were not able to divide their focus groups by gender. This caused a problem later.

At the first community we went to, when we asked about the main crops and livestock, I noticed a lot of answers came from the men. So I asked: “Why is it that the women are quiet all the time?” And the women said that they support whatever their husbands say. Fine. So I didn’t bother them with any more questions.

Then, because we have to prioritize, we wanted to choose the most important crops and livestock. And the ranking came out with maize first, yams second, and rice third. So when we had to choose the two most important crops, we obviously chose yams and maize.

Later, when time and budgeting allowed us to split the groups in two, male and female, the women kicked against yams as a main crop. Because this time around they were in their own groups and could speak their minds. The women were saying, “Why did the men choose yam as the main crop?” It’s not a crop that women can cultivate, because the yam mound making is a very tedious job for women; they can’t do it.

So we realized, if we had split the groups in two — male and female — from the first, the outcome of the main value chain crops would have been different. The women would have chosen maize and rice. So, I learned a lesson from that!

TIME

As indicated in the quote on the previous page, participatory development takes time. Despite the fact that approaches such as participatory rural appraisal (PRA) are touted as faster research than normal social science, participatory approaches need time for both facilitators and participants to understand the objectives and the processes, and then for effective exchange of knowledge and ideas. The R4D stakeholders need time for good communication, with opportunities for various social groups to speak freely. Standard preliminary or baseline studies and their analyses also take time.

Because the projects had planned so much research and so many activities, and because researchers and technicians had other projects, besides VBDC, to work on, insufficient time seemed to be planned throughout the program for all of the participatory activities, and the analyses of studies that should have informed the research. Program and project designers must critically consider the time and personnel necessary to properly conduct and analyze both their baseline studies and their participatory research.

The apparent rush through certain activities seems to have been partially a response to donors' demands for "efficient" research — more done at less cost. If participatory research or surveys are so rushed, however, that they give too little or invalid information, or are analyzed too late to be of any use, they are not efficient, but a waste of time and resources.

Another reason for rushing through some activities may be an overemphasis on research results to the detriment of "process." Several times in V5 we heard other project researchers' frustration with having to deal with "process" when what they wanted was results. Development, though, and especially participatory approaches, as well as AIS, is all about process — processes of understanding, developing knowledge, and changing institutions. Donors, program directors and researchers must cultivate the patience necessary for engaging participatory AIS development. More intensive social research, properly conducted and analyzed, will more richly inform subsequent research, both natural and social. 💧

“ One researcher told us about a preliminary study:

The dataset has been there for more than a year now. It was never cleaned. Nothing's happened with the data, so I was given a whole bunch of files, and now I'm cleaning the data.



A girl sells sorghum beer in Bapla, Burkina Faso (V4, June 2012).



A fisherman shows the fish he has caught in Boura Reservoir (V3, Burkina Faso, June 2012).

An irrigation canal runs from the concrete Binaba Dam canal (bottom) to the onion fields (V3, Ghana, January 2012).



C OMMUNICATION

Can researchers exchange with each other informally and often? Or are they instead cut off from each other with limited opportunities for communication? We interviewed four researchers, each with interesting ideas about participatory approaches, but these researchers, working in different projects, or in the same project but different countries, had never discussed participatory approaches with each other. Though some of the projects, at least within the same country, had productive exchanges among their own project members, interviewees were disappointed that there was not more inter-project exchange.

Though much effort was put into internet-based communication technology, especially wikis, we found that little of this was used. Even email had limited use outside large cities. Most project members within Africa, from researchers to farmers, used cell-phones for distant communication. One international researcher who was supposed to connect with researchers in a different project complained that he never knew until the last minute, despite the project wiki, when they would be in country.

“ A local researcher asked me to consider the benefits of looking at a group of innovators as a natural ecosystem:

For an ecosystem, you take a natural forest, like a rainforest. What is very interesting in the natural forest, there's really no artificial organization. You have really natural connections between the trees and the roots and everything.

And take this to social dynamics and you will notice this when you look at, for instance, the Silicon Valley system in the U.S. Silicon Valley is a real ecosystem — a natural system where people get in touch around a table, around a beer. They discuss ideas: “Ah, okay, you can do this; ah, okay, I can bring that, you can bring, and that —” There is a kind of natural connection between people, and they are able to build very innovative, strong products.

Why can't we duplicate this example in other parts in the world? Put people together around a table in a system, let them interact between themselves, put ideas and resources together, and discuss everything, and you will have innovation. We can use this dimension of innovation to put scientists together; also with the farmers, with other stakeholders — you mix all this, and I think innovation will grow.

“ It's a challenge to reconcile farmers' needs and research needs, and donors' needs. The research is on soil and water conservation, but farmers' needs are institutional. We must ask, how do we incorporate farmers' knowledge into research? Address farmers' real needs? Farmers and scientists speak different languages.

But I have grown to respect farmers as partners who really have knowledge. If you take time and follow, understand their thinking, it will contribute to the research output. Our local director insisted that farmers will come up with issues, and he was right. So with careful facilitation, farmers can come up with research issues.
[A local researcher]

One of the wishes of several Burkina researchers was to have courses, or even spend time in Ghana, so that they could improve their English. The English bias of the program made them feel left out at times.

A similar, though perhaps less obvious communication problem, jargon and acronyms within one language, plus translating them into another, comprises another transaction cost in development programs. Does everyone in the program understand all of the terms in the same way? Do the participants in the “Innovation System” understand what their involvement means and what roles they play?

“ Now, one problem that tires me out — and I think it prevents me from maximizing in the project — is the language. I don’t speak English. So, often because of that I feel like it takes a great effort to understand and I pull back. And often there are interesting things. Clearly! I think that I could have gained a lot more from all these projects. I just don’t know where to find the time to improve my English.

“ *I wonder how many people before working in this program had heard of innovation systems?*

Yeah, me? Almost nothing. I mean, what’s the definition of an innovation system? How do you frame it? Yeah, this is new. And now, innovation platform? Okay there was a training at the beginning, but how was it implemented in the field? [An international researcher]

Livestock drink at the Boura reservoir (V3, Burkina Faso, June 2013).

When working with local stakeholders, whether through translators or in national languages, researchers have the difficult task of making technical concepts comprehensible. We had problems in our interviews with the translations of the words “interaction,” and “watershed” but other seemingly simple words and concepts can also cause problems. Color words, for example, do not always translate easily into local languages. Reverse misunderstandings also occur: do researchers realize that “vegetables” in Ghana are leafy greens and do not necessarily include onions, tomatoes, okra and garden eggs?

MSP facilitators insisted that the projects were “research, not development” and only

“ Again this is a question of making time for people to sit all together, in the field or in a room, and to exchange — whatever the format, formal or not. But it is a slow process, also. By experience, I know that you cannot impose that on people. If you try that, be sure that they will refuse. ‘I am the [...ist]. I know exactly what I need. What will this guy give me as information that will be relevant? Because I am the [...ist].’ You see? So, we need to be prudent, go slowly. Creating a team is fundamental as we try to promote a multidisciplinary approach. How to create a team? What is the most important? The charisma of the leader? The necessity imposed by the question? The conviction that shared interest is enough to work all together? Each of these issues could be relevant, and each of them is not enough. So, this is something complicated, and we never have enough time. [An international researcher]



“ KMG: *In the meetings and the workshops, is language ever a problem for her?*

HA: *translates question*

Participant: *answers, in conversation with HA.*

HA (to KMG): *It's not a problem. Sometimes, though, when they [facilitators, researchers] are speaking English, they [participants] don't understand until they get the translator. Until the translator translates to them. And she doesn't know whether what they are saying is exactly what the translator is telling or different thing. Though they normally translate to them. But she doesn't know whether that's the right words.*

“accompanying” local stakeholders, meaning they had no material resources to give, only knowledge and training. During our conversations with local stakeholders, however, they made it clear that they understood “accompanying” to mean financial support from the project, just as much as any other term used by development projects.

A very important communication issue is the tone of the platform, workshop or meeting and the relationship between facilitators and participants, trainers and trainees. Are researchers, technicians and facilitators engaging farmers in respectful exchanges? Similarly, do researchers and technicians feel respected at the workshops they are asked to attend? Do the processes of these workshops have meaning for their participants? Innovation among a group of people requires two-way conversation on equal terms, with everyone expressing their point of view. A session of “sensitization (*sensibilisation*)” or “changing mindsets” may be perceived as necessary in some situations (Rossi 2006), but is probably not conducive to innovation development. 💧



Children fetch water from a concrete, open well (Burkina Faso, July 2012).

I NVESTMENT

Who owns the development? Development workers often ask this question in a different way: “How do we persuade local stakeholders to ‘own’ their development?” In R4D, however, we must ask two sides of the

“ Seeing like a Technician

I also have my own reservation about the project, because it has no money. We request for a lot of things and they tell you there’s no money. If you truly want to do effective work, you need money. For instance, last year, in my research project I needed to select some community animals and monitor them individually. And selection is not a problem. I can select like thirty, forty to monitor, but the animals were not tagged. And the following month, when I go back to the same farmer who has over a hundred animals, how do I differentiate one animal from another? We put in a proposal for money so that we could buy tags to tag the animals that we would be working on. But they refused. They said there wasn’t money.

“ Participant: The meetings are too long — people criticize them.

When you try to do the work of one week in three days, that tires people. It could also discourage others from coming. And — well, this is my point of view, eh?

As for the remuneration, often — you all do the same work, but some are left out, don’t receive any remuneration, while you’ve all done the same work together. They should really rethink this aspect. Do you understand? The treatment should be equal.

They talk about paying transport, okay, that’s fair, but in the meeting hall, everyone has some good ideas! And they contribute to the progress of the meeting, whatever is going on! Because the facilitators said there are no bad ideas.

KMG: How wasn’t it equal? The treatment?

Aly: Because they thought that some were favored over others with the per diem, since the people seemed to not have received the same amount.

KMG: How did that happen? Why weren’t they the same?

Participant: That’s it! That’s the question! No one knows!

same question. First, do the researchers own the development, or do the local stakeholders? The researchers are reluctant to give up control, but often local stakeholders acknowledge little actual “stake” in the project, or at least not what development workers or researchers expect them to have. They may have a real stake in the projects targeted goal, but without understanding precisely what that goal is, they also do not understand their stake. This uncertainty raises a third question: Why should local stakeholders care that researchers and technicians are trying to develop them?

Before examining these questions, though, we must look at investment fundamental to the program. Along with answering the questions about People, Time and Communications, project teams need sufficient resources — time, personnel and money — to carry out research plus

development. A popular coined word in Burkina Faso, “*chinoiserie*,” — derived from the words for Chinese and trickery or deception — describes cheap, defective, disappointing goods imported from China to Africa. At times, the VBDC seemed to suffer from a sort of *chinoiserie* when budgets there simply wasn’t enough resources to do correctly what had been planned.

An AIS program first need project objectives and design that realistically reflect available resources, but are also flexible enough to adapt to change in resources — a very tall order. It also needs a careful balance between contributions from local stakeholders and investment from donors. Local stakeholders should contribute money, however small the amounts, from the very beginning of project. This issue requires a lot of thought and planning, but it has become normal practice in NGO projects that bring

technology or construct infrastructure. Local communities give a certain percentage of their resources — time, in-kind contributions and money — in return for the development inputs. An R4D project should consider this when holding multi-stakeholder platforms, but must also keep in mind one other question: is the platform or workshop primarily interactive or extractive? Is the objective of the platform to elicit information from the participants? In the latter case, the researchers benefit and participants should be paid in some way as consultants.

Is the objective of the platform to provide participants with training that they desire or have requested? Then, perhaps, they should be paying the trainers, just as they would if they were in Europe or the United States, though of course not at the same level. This would necessitate a transparency of objectives and financing, which calls for respectful conversations among all stakeholders. It would also help clarify demand and ensure quality training of adults. People would only pay to attend if they felt they were getting their money's worth. Conversely, paying for worthwhile training, or to participate in worthwhile workshops would also increase their value. Paying for something of value gives one ownership.

Requiring participant contributions, even small amounts, for exchange platforms or training from which they will benefit would also help to counteract the “poor peasant” outlook. Researchers and technicians alike refer to the “poor peasant” as if he or she is helpless, a mindset transferred from agencies to farmers, and adopted by local stakeholders themselves. This characterization often plays to their advantage, but is detrimental to the creation of innovations.

Innovation is not lacking in Burkina Faso or Ghana. During a walk through downtown Ouagadougou or Tamale, one will come across any number of innovations among the vendors. When WASCAL created a competition for farmers' innovations in Ghana, they received hundreds of applications, some of which I had the opportunity to read. Many proved the ingenuity of farmers who conducted their own experiments, combining received knowledge with new ideas to come up with something novel and beneficial for their livelihoods.

Local stakeholders who are ready to invest in their own development may see challenges before them, but will need to see themselves as empowered, not poor. This brings us back to monitoring communication, which points to discourse: how different people communicate to, with, and about others. Research for development needs constructive communication among all stakeholders to foster innovation. It also needs time for researchers and technicians to listen to and work with local stakeholders' own ideas. ♠

A Sketch of Projects in One Village

Date	Project	Activity
1979	ABC	Earthen dikes
	DEF	live fencing
1984-2004	GHI1	tree nurseries
		natural regeneration
2005-2009	GHI2	stone bunds
		zaï
		tech training
		improved stoves
		soap making
2006-2009	JKL	composting
		latrines
2012		foot pedal pump wells
2008	MNO	open wells
		stone bunds
		improved seed
		tech training
		management committees
		improved zaï
		composting
		demi-lunes
2008-present	PQR	micro-credit
		soap making
		locust bean production
		rainwater harvest training

A village surveyed for a V1 PGIS has depended on more than thirty years of development projects and training. Yet, extension agents told us, they still need food-for-work every year to “encourage” them to participate in the projects. This was considered a “successful” village.



Fishermen in Bapla arrange their nets (V4 Burkina, June 2012).

CONCLUSION

The Volta Basin Development Challenge, despite its own plethora of challenges, contributed to positive changes in many aspects of stakeholders professional lives. Researchers, technicians, facilitators, extension agents, farmers, traders, and government functionaries told us what they had learned from their involvement with the projects and how their practices have changed.

Researchers, technicians, facilitators and extension agents told us what they experienced as innovations. Whether the innovations described here will prove themselves through adoption and adaptation by local stakeholders from producers to researchers, only time will tell. In the meantime, it is possible to learn from the processes of these changes and ask serious questions for future AIS R4D programs.

- Are stakeholders as well as program management able to see beyond the labels of various stakeholders to understand the people in all of their variety? Are they willing to try to understand the positions and points of view of the others?
- Has enough time been designed into the program to allow for proper baseline studies and participatory research? Do researchers have time to analyze baseline studies in order to inform subsequent research? Or will time be wasted conducting studies that will never contribute to overall program objectives?
- Are project team members able to interact and communicate with each other and with participants formally and informally in a respectful and productive manner? Has enough effort been made to make technical language comprehensible as well as to understand local idioms? Does everyone understand program and project goals and processes?
- Are donors and program management able to invest enough resources to properly support both research and development? Have they designed a program that local stakeholders feel is worth investing in? Will local stakeholders be willing enough to contribute resources and own the development? Are the requirements of contributions — time, financial, in kind — transparent and understood by all?

From these considerations, I assemble a description of a research for development program that may have a better chance of producing sustainable innovations:

- A program more focused and concentrated in space, with more informal face-to-face interaction.
- More time devoted to project activities, especially on-the-ground interaction with local stakeholders, and time for analysis of preliminary studies.
- More analysis of how project members are communicating with each other.
- Sufficient resources from the program, balanced with realistic project design, plus financial input, however limited, from local stakeholders, matched concurrently with an acknowledgment and appreciation of the differentiation of economic statuses of project members.

None of these issues are easily resolved, then then, too, neither is innovation easily fostered and developed. ♦



Ouattara Lassina, Diébougou fisherman (right), shows Aly and Joachim how the fishermen , on their own initiative, tried to dam a portion of the Bougouriba river to create more water for fish during the dry season. A man who lost his watch among the sandbags broke the dam (V4, Burkina Faso).

References

- Cherlet, Jan and Jean-Philippe Venot (2013). Structure and agency: understanding water policy changes in West Africa. *Water Policy* 15(3): 479-495.
- Clark, Norman, James Smith, et al. (2007). Livestock R&D in East and Southern Africa: An innovation systems perspective with special reference to the International Livestock Research Institute. *International Journal of Technology Management & Sustainable Development* 6(1): 9-23.
- Direction Générale de l'inventaire des Ressources Hydrauliques (2004). Les Comités Locaux de l'Eau (CLE) maillons de base du cadre institutionnel de Gestion Intégrée des Ressources en Eau du Burkina Faso : « Document Guide de Conception, Création et fonctionnement » Secrétariat Général. Ouagadougou, Burkina Faso: 36 pp.
http://eaurburkina.org/images/stories/SP-PAGIRE/Guide_de_conception_des_Comits_Locaux_de_lEau_Version_2004.pdf
- Global Water Partnership. History. About GWP Retrieved 24 November 2013, from <http://www.gwp.org/en/About-GWP/History/>.
- Global Water Partnership. What is IWRM? *Global Water Partnership Tool Box Integrated Water Resources Management - About* Retrieved 68 November 2013, from <http://www.gwp.org/en/ToolBox/ABOUT/IWRM-Plans/>.
- Greenwood, Davydd and J. Morten Levin (1998). *Introduction to Action Research: Social Research for Social Change*. Thousand Oaks: Sage Publications.
- Hall, Andy (2006). Public-private sector partnerships in an agricultural system of innovation: Concepts and challenges. *International Journal of Technology Management & Sustainable Development* 5(1): 3-20.
- Hall, Andy, Norman Clark, et al. (2007). Institutional change and innovation capacity: Contrasting experiences of promoting small-scale irrigation technology in South Asia. *International Journal of Technology Management & Sustainable Development* 6(2): 77-101.
- Hounkonnou, Dominique, Dansou Kossou, et al. (2012). An innovation systems approach to institutional change: Smallholder development in West Africa. *Agricultural Systems* 108: 74-83.
- Klerkx, Laurens, Andrew Hall, et al. (2009). Strengthening agricultural innovation capacity: Are innovation brokers the answer? *International Journal of Agricultural Resources, Governance and Ecology* 8(5/6): 409-438.
- Klerkx, Laurens, Barbara van Mierlo, et al. (2012). Evolution of systems approaches to agricultural innovation: concepts, analysis and interventions. *Farming Systems Research into the 21st Century: The New Dynamic*. I. Darnhofer, D. Gibbon and B. Dedieu. Dordrecht: Springer: 457-483.
- Lemoalle, Jacques and Devaraj de Condappa (2009). *Water Atlas of the Volta Basin / Atlas de l'eau du bassin de la Volta*. Colombo, Marseille: Challenge Program on Water and Food and Institut de Recherche pour le Développement. 96 p. http://hal.ird.fr/docs/00/50/51/16/PDF/Atlas_Volta.pdf
- Lewis, David and David Mosse, Eds. (2006). *Development Brokers and Translators: The Ethnography of Aid and Agencies*. Bloomfield, CT: Kumarian Press, Inc.
- McCartney, Matthew and Jackie King (2011). Use of decision support systems to improve dam planning and dam operation in Africa: CGIAR Challenge Program on Water and Food. 2. viii, 73 p.
http://dspacetest.cgiar.org/bitstream/handle/10568/3623/R4Do2_dss_sept4_web.pdf?sequence=8

Mosse, David and David Lewis (2006). Theoretical Approaches to Brokerage and Translation in Development. *Development Brokers and Translators: The Ethnography of Aid and Agencies*. David Lewis and David Mosse. Bloomfield, CT: Kumarian Press, Inc.: 1-26.

Nederlof, E. Suzanne, Mariana Wongtschowski, et al., Eds. (2011). *Putting heads together: Agricultural innovation platforms in practice*. Bulletins of the Royal Tropical Institute (KIT) Amsterdam: Royal Tropical Institute (KIT) Publishers. <http://www.kit.nl/kit/Publication?item=3166> <http://www.kit.nl>

Rossi, Benedetta (2006). Aid Policies and Recipient Strategies in Niger: Why Donors and Recipients Should Not Be Compartmentalized into Separate "Worlds of Knowledge". *Development Brokers and Translators: The Ethnography of Aid and Agencies*. David Lewis and David Mosse. Bloomfield, CT: Kumarian Press, Inc.: 61-49.

Tenywa, M.M., KPC. Rao, et al. (2011). Agricultural Innovation Platform as a Tool for Development Oriented Research: Lessons and Challenges in the Formation and Operationalization. *Learning Publics Journal of Agriculture and Environmental Studies* 2(1): 118-146.

Venot, Jean-Philippe and Jyothi Krishnan (2011). Discursive framing: Debates over small reservoirs in the rural South. *Water Alternatives* 4(3): 316-324. www.water-alternatives.org

Water Resources Commission (2012). National Integrated Water Resources Management (IWRM) Plan. Accra, Ghana. iii, 83 p. <http://doc.wrc-gh.org/pdf/National%20IWRM%20Plan.pdf>

West, Colin Thor (2010). Household Extension and Fragmentation: Investigating the Socio-Environmental Dynamics of Mossi Domestic Transitions. *Human Ecology* 38: 363-376.

West, Colin Thor (2013). Documenting livelihood trajectories in the context of development interventions in northern Burkina Faso. *Journal of Political Ecology* 20: 342-360. http://jpe.library.arizona.edu/volume_20/West.pdf

Youkhana, Eva, Oliver Korth, et al. (2006). The Water Sector of Burkina Faso: actors and institutions: Zentrum für Entwicklungsforschung (ZEF) Center for Development Research. 66 p.

The Bapla land chief (center) shows us the pump that waters his banana orchard in the flood plain of Bapla dam (Burkina Faso, V4, February 2013).



Annex: Survey Questionnaires

Researcher Field Questionnaire

Confidentiality Statement: Interviews are to be carried out between myself and the translator on one hand and the interviewee on the other, with no other persons, unless desired by the interviewee. The interviewee will be assured that his/her answers will never be linked to his/her identity, except in the context of my notes, to allow for possible follow-up interviews. No one in the program will know what s/he has told me. I will record the interview with her/his permission, but no one will listen to the recording but me, and possibly the original translator. The objective of the interview is to discover what activities of the project contribute to new understandings, new knowledge, new skills and new practices among the project participants.

Critique: Some of my questions may sound critical, but please understand that though I may be critical of the program as a whole, I am not critical of you personally, or of your work. I understand that we are all under a lot of pressure, and have too little time, money or other resources to do all that we are asked to do.

Interviewee Code:

Project Number:

Locale:

Date:

1) Gender:

2) Where are you based?

- 3) Background:
- 4) What tasks do you carry out for the project?
 - a. How much of your time (what percentage) is spent on the project?
 - b. Do you feel like you spend the right amount of time on the project?
 - c. (Do you feel like you have sufficient funds to do your project work?)
- 5) How is information communicated between different project partners?
- 6) What is your personal goal from working with this project?
- 7) What have you learned from project activities?
- 8) Have any of your practices changed? What practices?
- 9) What changes have you noted in your peers' practices?
- 10) Have you noted new interactions between you and your peers, or between your peers and others?
- 11) What is your definition of an innovation?
- 12) According to this definition, have you seen any innovations in this project?

Local Stakeholder Field Questionnaire

Objective of the interview: to discover what activities of the project contribute to new understandings, new knowledge, new skills and new practices among the project participants.

Confidentiality Statement: Interviews are to be carried out as much as possible between interviewer, translator and interviewee, with no other persons (unless specifically desired by the interviewee). Assure the interviewee that while the information will be used in reports, his/her answers will never be linked to his/her identity in these reports. No one in the project will know what s/he has said. Ask if you can record the interview, but assure him/her that no one outside of you and your boss will listen to the recording.

Interviewee Number:

Project Number:

Locale:

DEMOGRAPHY

- 1) Gender
- 2) Approximate age (ask the translator to provide a reference date: How old were you during ...?)
- 3) Education (government, literacy, Koranic)
- 4) Primary income activity (How do you support your household?): ___ Marketing? (How sold, where?)
- 5) Other income activities: ___ Marketing? (How sold where?)
- 6) Dry season cultivation (if not already mentioned)?
- 7) Access to reservoir?

- 8) Household status
 - 9) Administration (government or traditional)? Position:
 - 10) Association? Position:
 - 11) Project participant/representative? Position:
- PROCEEDINGS OF PROJECT ACTIVITIES**
- 12) Do you remember how were people chosen to participate in project meetings and workshops?
 - 13) Have you attended meetings, trainings and workshops? How many?
 - 14) How do you receive information from and about the project (besides attending meetings)?
 - 15) If you go to project meetings, are you able to discuss what you've learned back home with your friends and neighbors?
 - 16) Is language ever a problem for you?

CHANGES AND THE PROJECT

- 17) (P) What is your personal goal from working with this project?
- 18) What have you learned from either participating in or observing/hearing about project activities?
- 19) Have any of your practices changed because of what you've learned? What practices?
- 20) What changes have you noted in others' practices?
- 21) Have you noted any new interactions here in the community, or between this community and other people or communities?
- 22) (P) You've told me about the trainings that you've attended. Have you or your peers been able to teach the project leader anything?



CGIAR Challenge Program on
WATER & FOOD

A Partner of



**Research
Program on**
Water, Land and
Ecosystems



A fisherman paddles his canoe up the strong current of the Black Volta near Orbili (V2, Ghana, November 2013)

