

# First WP4 Workshop report in Zebilla

Date: 8-10<sup>th</sup> June (Ouagadougou) and 11-13<sup>th</sup> (Bolgatanga and Zebilla)

Martine Antona, William’s Daré and Frédérique Jankowski, (CIRAD)

**With the comments of:** Sarah Jones (Bioversity International) and Fred Kizito (CIAT)

**TAI Participants:** Fred Kizito (CIAT), Martine Antona, Frédérique Jankowski, William’s Daré (CIRAD), Mansour Boundaogo (SNV World), Sarah Jones, Isabel Lopez Noriega (Bioversity International), Kate Brauman (Minnesota University), Katja Malmborg (SRC), Pamela Katic (IWMI), David Smedley (King’s College of London), Raymond Kasei (UDS)

<b>1</b>	<b>Context of the workshop in Zebilla: From CPWF V4 project to the WLE IF Targeting Agricultural Innovation and Ecosystem Service Management in the northern Volta (TAI) project .....</b>	<b>2</b>
1.1	Workshop context and objectives .....	2
1.2	The former CPWF V4 project .....	2
1.3	The WLE-TAI Project .....	3
<b>2</b>	<b>Workshop preparation .....</b>	<b>5</b>
<b>3</b>	<b>Partnership with the Water Resource Commission .....</b>	<b>6</b>
3.1	The institutional support of the WRC .....	6
3.2	WRC presentation and insights .....	6
<b>4</b>	<b>Description of the workshop progress in Zebilla.....</b>	<b>6</b>
4.1	Playing the Bawkudo game Day 1.....	6
4.1.1	Introduction to the RPG: Update about the game.....	6
4.1.2	Game Board and time steps of the game .....	7
4.1.3	Playing the game Day 1 am.....	8
4.1.4	Discussion groups – Day 1 .....	10
4.1.5	The debriefing of day 1.....	11
4.2	Outcome of the game Day 1.....	11
4.2.1	Main observations from the game playing.....	11
4.2.2	Discussions and debriefing with players.....	12
4.3	Playing Day 2: playing with direct levels interactions and the evolution of the facilitation process.....	13
4.3.1	Organization of the activities.....	13
4.3.2	Debriefing of the game session.....	13
4.4	Outcome of the game Day 2.....	14
4.4.1	Main observations from the game playing.....	14
4.4.2	Debriefing with players.....	15
<b>5</b>	<b>Discussion.....</b>	<b>17</b>
5.1	Summary of main findings.....	17
5.2	What worked well, what could have been improved .....	17
5.3	Lessons for future work on the TAI project: new issues to tackle regarding ComMod process and ecosystem services.....	18

## 1 Context of the workshop in Zebilla: From CPWF V4 project to the WLE IF Targeting Agricultural Innovation and Ecosystem Service Management in the northern Volta (TAI) project

As part of the TAI Project, CIRAD, CIAT, Bioversity International and WRC organized a 2 day stakeholder meeting in Zebilla based on the previous insights from the CPWF V4 project.

### 1.1 Workshop context and objectives

As a foreword to this report, it is important to insist on some specificity that characterizes this workshop in Zebilla in terms of objectives and constraints.

**Sharing knowledge** was one of the main objectives of this workshop in order to make the partners of the TAI more familiar with the Companion Modelling approach and its outcomes. But this objective had to face certain constraints notably in terms of time to help them acquiring new skills:

- time: usually initiated with a two-weeks training session mixing theory and practical activities, the transfer of the elements of the methodology had to be done in two days
- facilitation: a guide was adapted from a previous version produced in the Challenge Program on Water and Food (CPWF) V4 project to help the new facilitators to endorse their role and follow the principles of facilitation
- debriefing: the aim of this collective exercise was to support participants' elicitation about their feelings, activities, interactions in the game in order to better understand their rationality, but also to share their experiment with the other groups (if group activities have been conducted). The debriefing is not a classical interview based on what the theme interviewer consider as relevant for his analysis.

Based on these workshop outputs, the second main objective was to **improve our understanding of the ecosystem services** of importance to farmers and other landscape managers, and explore options for their management using participatory methods. The intention for this was to provide baseline information on ecosystem service management that TAI researchers could use to shape and inform their own research.

The workshop was also important to revive relations with stakeholders and decision makers of the watershed that have been developed in Challenge Program for Water and Food. It was also a way to enhance the interactions between different WorkPackages of the TAI project.

### 1.2 The former CPWF V4 project

Within the Challenge Program for Water and Food (CPWF), the Volta 4 project "Sub-basin management and governance of rainwater and small reservoirs" was implemented in the southwest of Burkina Faso and in the Upper East Region of Ghana, from 2010 to 2013. The V4 project was led by IWMI, with partners from CIRAD, WRI, WRC, SP PAGIRE<sup>1</sup>. The objective of the CPWF V4 was to enhance the interactions between the multiple levels of decision-makers involved directly or indirectly in water management with the multiple water resources users at the local and community levels.

---

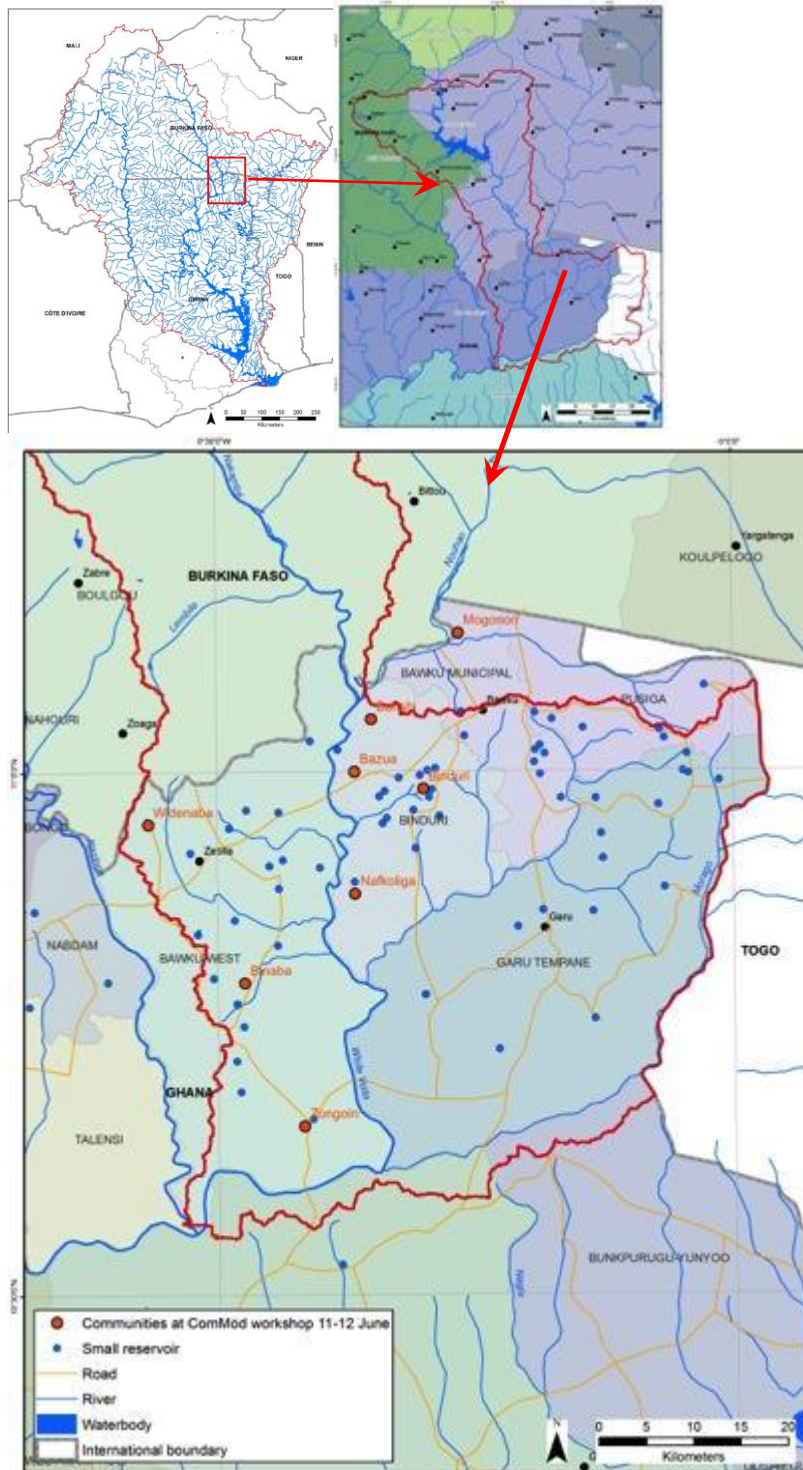
<sup>1</sup> International Water Management Institute (IWMI), Centre de coopération internationale en recherche agronomique pour le développement (CIRAD), Water Research Institute (WRI), Water Resource Commission (WRC), Permanent secretary for IWRM (SP PAGIRE)

During this 3 year-project, the participants developed a Companion Modeling approach (ComMod) which progressively engaged stakeholders from various sectors of water management (health, education, environment, agriculture, political decision making) operating at 3 levels: region (Bolgatanga), district (Bawku West or Zebilla, Bawku Municipal and the new district of Binduri creating in 2013) and 8 communities in these districts. Three participatory workshops and a series of in-depth studies (with interviews) were conducted and facilitated by researchers and interns.

The workshops were organized as *multi-stakeholders platforms* (MSPs) where participants were encouraged to express their voices and concerns in terms of water management (issues, opportunities, constraints) and to simulate their activities on the ground from farming practices to environmental regulations. In the first two workshops, participants from the 3 levels of decision-making were separated in order to express their own views without the influence of the others. Several issues emerged. In the last workshop, they were collectively invited to simulate their activities while interacting with the other users on the same spatial representation of the watershed. During the role-playing game (RPG), they worked on one of the common issues expressed by all three levels of participants: how to limit riverbank cultivation to reduce flood impacts on stakeholders' livelihood and food security. An agent based model (ABM) was associated with the role-playing game, both resulting from the first two MSPs. One of the main results of this work was that by the end of this last MSP, participants decided to continue interacting altogether as a "mini-board" arena with the support of the Water Resources Commission (WRC).

### 1.3 The WLE-TAI Project

The project on Targeting Agricultural Innovation and Ecosystem Service Management in the northern Volta Basin (TAI), funded by the Water Land and Ecosystems (WLE) Innovation Funds, from 2015 to 2016, aims at increasing the capacity of communities, NGOs and extension services (private and public actors) in the northern Volta basin "to target irrigated and rainfed technologies to increase adaptability and transformability of local livelihoods and to close yield, nutrition and ecosystem service gaps". Three development outcomes (DO) have been identified: "(DO1) increased food security by closing resource - notably water - efficiency gaps and promoting equitable and sustainable sharing of resources at the regional level; (DO2) enhanced system-level resilience, landscape multi-functionality and equitable sharing of benefits through collective management of ecosystem services in two target landscapes; and (DO3) improved water-use efficiency for increased productivity through informing specific intervention decisions currently under consideration". This project is divided into five work-packages. The TAI project will focus on two sub-catchments of the White Volta (or Nakanbé) River Basin, lying within the Centre-Est region of Burkina Faso and Upper-East Region of Ghana (downstream of Bagré dam, which includes the watershed where the CPWF V4 project had previously conducted its activities).



The field workshop, described here, is the first one held in the Upper-East region of Ghana as part of the project. This workshop is closely linked to the WP4 “Enhancing institutional capacity” and builds on the previous CPWF V4 outcomes. Furthermore, it allowed the WP4 researchers to interact with partners of other WPs and particularly with SNV World who will lead WP4 workshops in Burkina Faso, but are not familiar with the ComMod approach.



## 2 Workshop preparation

In Ouagadougou (at the CIRAD-IRD center), the two first days of the week were dedicated to the preparation of the workshop. Eight of the project team were present.

First, CIRAD presented the CPWF V4 project in order to inform all the participants of its outcomes. The multidimensional context of water management (hydrology of the watershed, soil fertility, farming activities, sensitivity to bushfire and flood, institutional settings) was introduced to set up the frame of the participatory approach developed. The principles, the participants, the phases and the results of the implementation were presented. We focused on two main outcomes: stakeholders' engagement in water management through the creation of a miniboard and co-building of knowledge between the researchers and the stakeholders through the ComMod process (cf. [EdC Bawkudo2015 WLE IF](#))

Next, Bioversity International introduced the TAI project to all the partners describing the structure and the focus of each work-package ([SJ presentation for workshop prep.pptx](#)), since this was the first time some of the project team were meeting in person. The WP4 "Enhancing Institutional capacity" is supposed to be the link between biophysical and social contexts "to test whether local institutions can lead collective ecosystem service management approach to take the lead in management of those resources". Moreover, partners from CIRAD and CIAT have led the CPWF V4 with partly the same stakeholders, they have built trust and relationships needed for the TAI activities. The participatory ComMod process will help to identify the knowledge gaps perceived by stakeholders, to test potential scenarios of ecosystem management (access, location, etc.) and to link two pillars of the project: one focused on knowledge generation and boundary setting (WP1 "social-ecological characterization" and WP2 "Future scenario analyses") and the second focused on landscape assessment (WP3 "Benefit sharing mechanisms", WP5 "Intervention, decision analysis").

- The main expectations of each TAI partner (provided during and in advance of the meeting) about his/her participation in the ComMod workshop were translated into questions as followed:
  - Is the ecosystem service (ES) concept relevant for local stakeholders and decision makers in terms of water management to reduce food insecurity?
  - What are the critical ES related to food security (quality, availability, access) and norms for their management?
  - How do these differ across stakeholders?
  - What are the drivers of change / threats to these ES (social and biophysical)?
  - What are the synergies and trade-offs between ES and stakeholders ?
  - What are the options and challenges for managing ES at the field to landscape level (i.e. social constraints and enablers)?
  - What (if any) information on ES do stakeholders want to inform decision-making?

Based on these different expectations, the secondary objectives of the **use of the Bawkudo role playing game (RPG)** were to:

- 1- Increase understanding among TAI partners about regional and local water and land management issues,
- 2- Identify alternative landscape management scenarios to improve provision of water and other ecosystem services important for local food production (switching crop types, protecting riparian buffer zone, conservation of crops, etc)

- 3- Observe direct interactions between the 3 decision-making levels (communities, districts, region) to gain a better understanding of the social context and constraints.

Then the project team spent the remainder of the two days planning the workshop activities, agenda, session formats, facilitation roles and facilitators. A trial run of the game, led by CIRAD and with all of the project team involved, was used to train the facilitators and ensure the project team were familiar and could actively support the ComMod process.

### 3 Partnership with the Water Resource Commission

#### 3.1 The institutional support of the WRC

The WRC organized all the logistics for the workshop, which took place in Zebilla. It was also important to renew the interactions with the White Volta Basin officer and his team and our support to his implementation of Integrated Water Resource Management activities in the area. The TAI project and its partners have been quickly introduced as a follow up of the CPWF V4, in which Aaron Aduna was involved as the main institutional support from the writing of the project to the *Bawkudo Role Playing game*. The objective of Bawkudo RPG was to describe water management issue in order to support IWRM implementation by the WRC.

Aaron Aduna introduced the WRC to all the TAI partners (cf: [IWRM Media Bolga](#)), describing the activities, organization and mandate of WRC. He expressed his interest in participating in research for development projects. Within the CPWF V4, the interest was to test WRC's policy to protect resources for people and children. Regarding the CPWF V4 he stressed that the RPG experiment helps the WRC to move from a single basin entity to a divided one into connected sub-basins, and allows tackling the discussion on riverbank cultivation.

#### 3.2 WRC presentation and insights

By the end of the workshop the WRC renews its engagement with the TAI partners.

After a short presentation of WRC (cf [WRC presentation](#)) - IWRM context, the Ghanaian water policy, the role and the structure of WRC – Aaron Aduna introduced his work about buffer zone policies (harmonization about the different sizes of buffer zones in the different institutions concerned), river bank protection (ex Mognori), surface water harvesting.

He explained the positive results obtained with his engagement in the CPWF: setting up of smaller units management and their governance within multi-institutional boards (Upper, Lower, and Middle White Volta basins, Sissili, Kulpawn )

He mentioned also his links with WASCAL (water and energy balance) and Glowa (transboundary issues) projects.

### 4 Description of the workshop progress in Zebilla

#### 4.1 Playing the Bawkudo game Day 1

##### 4.1.1 Introduction to the RPG: Update about the game

Aaron Aduna (WRC) introduced the workshop, stressing that all participants (from communities, districts and region) are to talk on what challenges they face in the agricultural and water sector and highlight which activities were going to be followed up from the previous game sessions in 2013.

A general introduction was done by CIRAD and CIAT to remind people about what was done in previous workshops but without going into too many details not to bias their current activities<sup>2</sup>. Notably, They did not mention the scenarios co-designed and discussed by the end of the CPWF V4 workshops. The same tool, Bawkudo RPG, is reused to understand how the situation has evolved since December 2013, and notably how the stakeholders used different resources to achieve “food security”.

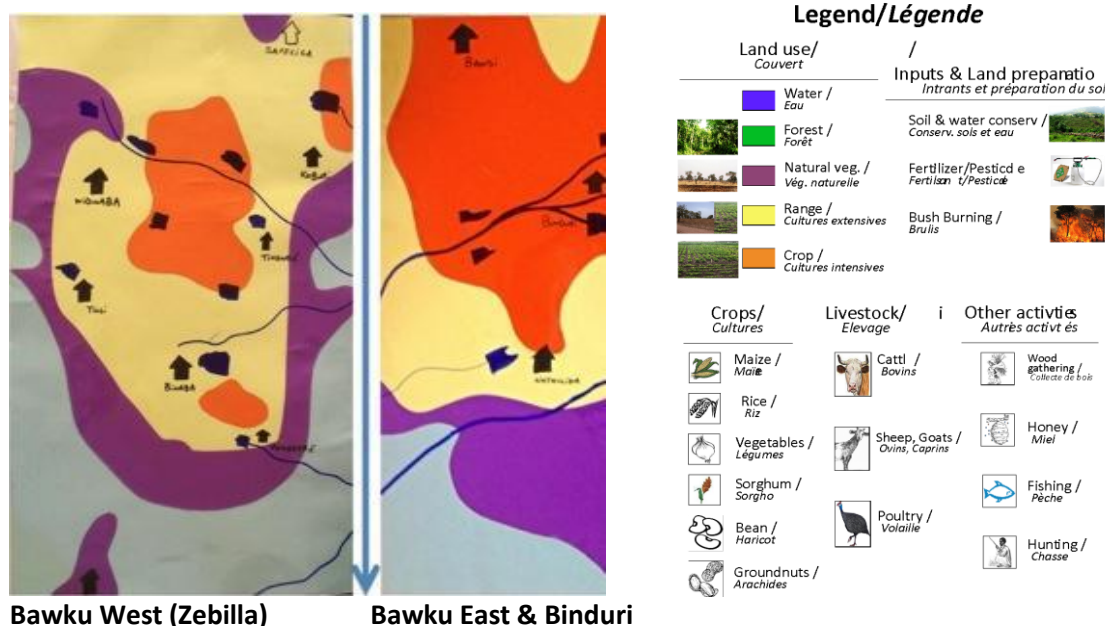
34 participants attended the meeting (cf: [Attendants-list](#)). Civil servants from regional ministries and NGO, researchers working at the regional level, elected and appointed District representatives from Binduri, Bawku Municipal and Zebilla, and Farmers from 8 communities (Binaba, Widenaba, Zongoyiri on the west side and Mognori, Bansi, Bazua, Binduri, Nafkuliga on the east side of the river).

Some participants anticipated that we were coming back to provide technical or financial solutions about issues (river bank cultivation) which had emerged at the last CPWF V4 meeting. Aaron Aduna clarified that this research project will lead to recommendations for decision-makers and other stakeholders who will find their way to implement them.

#### 4.1.2 Game Board and time steps of the game

**On the game board**, the Watershed is divided into two distinct boards representing each side of the watershed. The location of different resources and land uses are displayed: water, forest, natural vegetation, range, crops, and urban area (black house in the board).

The associated legend gives information about the different activities a farmer can play. The district players use the same board to locate their regulatory activities on it.



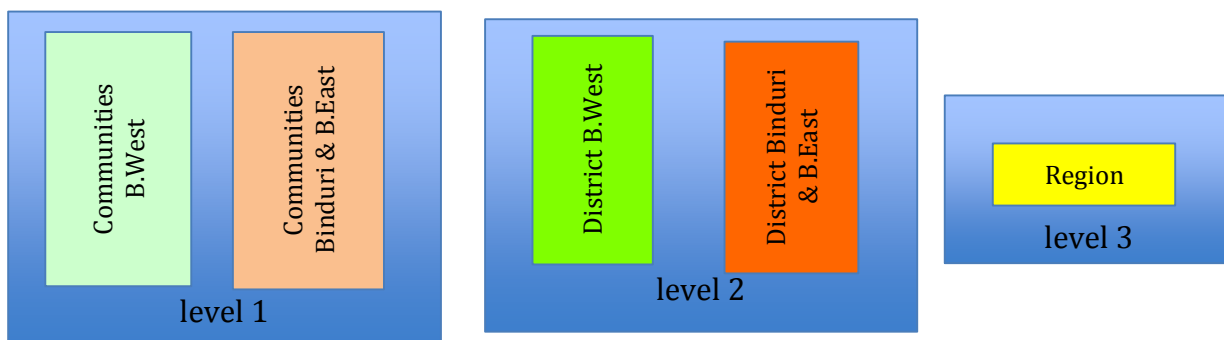
**Bawku West (Zebilla)**

**Bawku East & Binduri**

Time step of the game is one season. The players played only one rainy season in Zebilla.

<sup>2</sup> Basically previous workshops were to identify constraints and issues for all actors, and to study interactions among actors in land and water resource management. The last day of the last workshop participants ranked different possible options or interventions and then produced scenarios representing different uses of the land, based on the selected interventions.

### 4.1.3 Playing the game Day 1 am



Farmers, districts and region played separately. Farmers played accordingly to their villages' location on one of the two watershed-side boards. Districts were also playing on their own watershed-side board. Region actors were playing without game board in order to represent the entire region across the target districts.

Communities played on the board representing their side of the watershed (Bawku West on one side, Bawku East and Binduri on the other side). The players (12 from the East side and 6 from the West side) chose activities within a proposed set, and located them on the board. The incomes in the form of tokens from their production were calculated. Using this income, they were allowed to invest in livestock.

Districts played the same way on two boards representing each side of the watershed. They were representing different types of institutions working at district level (Assembly men/women, civil servant, NGO, etc). They located their activities on the board and wrote on a sheet the issue tackled by each activity. These activities included communication, sanction and incentives. While they were playing, they could see what the farmers were doing but they did not communicate with them.



**District players' sheet**

The Region played without any board. Players of the region were representing different roles (MoFA, GIDA, SARI, WRC, Women & children Affairs). Each type of role had different human and financial capital to conduct costly activities within a set of proposed interventions. They noticed the issue and the district targeted an appropriate intervention measure. While they are playing, there was no communications between the communities and the districts.



	What you can do?	For what issue ?	How is it feasible?
1	Sensitization meetings		
2	Farmer field school		
3	Planting tree		
4	Monitoring field visit		
5	Setup community level committees		
6	Radio announcements		
7	Recruiting volunteers		
8	Training volunteers		
9	"Frowning"/Blaming		
10	Monetary fines		
11	Fines (in kind)		
12	Court case		
13	Providing water lifting devices		
14	Providing alternative land		
15	Drilling wells		
16	Building small reservoir		
17	Good farmer award		
18	Input reward for good farming practices		
19	Others		

### Regional player's sheet (MoFA & GIDA)

#### MoFA and GIDA

	Human	Financial	Total
<b>What you have</b>	<b>6</b>	<b>10</b>	<b>16</b>

What you can do?	For what issue	In which district?	What it costs		
			Human	Financial	Total
Radio announcements			1	1	2
Good farmer award			1	1	2
Monitoring field visit			5	4	9
Fund the Planting tree			3	6	9
Fund the Recruiting/training of volunteers			3	5	9
Fund sensitization activities (community)			3	5	9
Fund inputs			2	10	12
Providing water lifting devices			3	10	13
Building small reservoir			8	30	38
Others					

Facilitators and observers were dedicated to each group. The facilitator recalled the components of the game: the board and the legend of its color codes, the potential activities (farming practices for communities, regulation options for district and region) the different types of households for communities game, and the sheets to fill in for the district and the region games. The observers noted all the indices allowing to answer the questions defined by the team and observations concerning the relevance of the different elements represented on the board for the main problematic of the project.



#### 4.1.4 Discussion groups – Day 1

**Discussion groups** were organized in two rounds to allow farmers and districts, and districts and region to exchange information on what was played and to make them express their differences and commonalities. There was no time for direct discussions between the Region and communities.

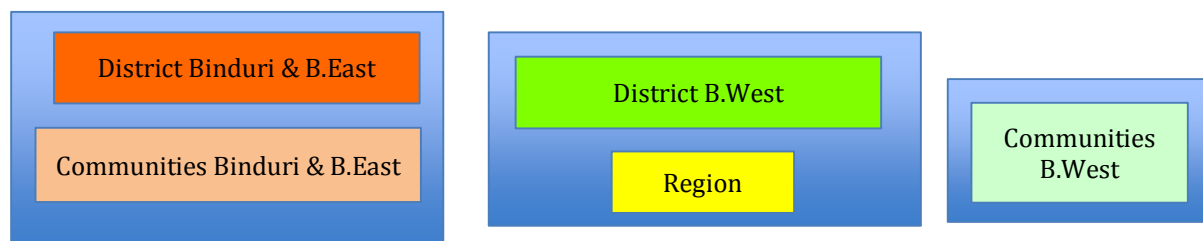
Facilitators organized the two rounds of discussion

- Group1 (District + its Communities): On the game board, farmers explained to the district representatives what, why and where they had conducted their activities. Then the district presented and showed the farmers, with their own game board, the results of their planning activities, and the main issues they wanted to tackle.
- Group 2 (Other District+ Region): The district explained to the region representatives what, why and where they had focused their activities. Then the Region presented the main issues they wanted to fund. They all discussed about the synergies or the contradictions between their proposals.
- Group 3 (the communities from the district who were not meeting another level players): With their game board they elicited the rationale of the activities they played and the links with their real farming systems.

The facilitator supported the discussions and could focus on issues mentioned in the discussion between the players (reasons of their choices; potential alternatives; water in terms of distance, quality, availability; reservoir functionality in relation to the season of the year, potential for presence of diseases in reservoir areas, their links with other natural resources; representations of activities in the game; position regarding the regulations proposed by the district) (see 3.2)

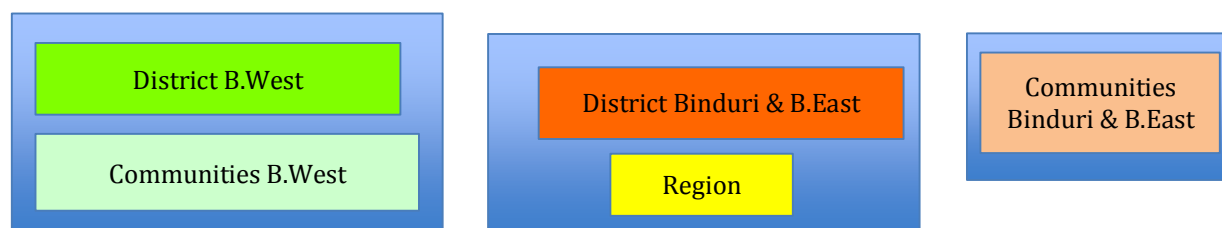
#### ROUND 1

- GROUP 1: District level actors from Bawku East and Binduri with farmers from communities in the same districts
- GROUP 2. District of Bawku West with Region
- GROUP 3: the communities of Bawku West alone



#### ROUND 2

- GROUP 1: District level actors from Bawku West with farmers from communities of the same district
- GROUP 2. Districts of Bawku East and Binduri with Region
- GROUP 3: the communities of Bawku East and Binduri alone.



#### 4.1.5 The debriefing of day 1

After the two round group discussions held with facilitators, CIRAD and CIAT facilitated the discussion with the players in the plenary around 3 main themes:

- their feeling about the game,
- their ability to meet their food needs in reality,
- the potential changes in the interactions between the Region, the Districts and the Communities.

At night, a roundtable was organized only with TAI partners to make them express their feeling about the game session of the day 1 and their expectations (see 4)

## 4.2 Outcome of the game Day 1

### 4.2.1 Main observations from the game playing

*Use of the game board by Players*

- District players were more guided by land cover types than geographical locations in the map, as if issues were the same in all pieces of land dedicated to a certain use, without making differences among villages. They didn't refer to projects and initiatives going on, nor talk about particular opportunities or challenges in certain areas represented in the map.
- District participants talked rather about things that they could do, and only in a few occasions about what they are already doing (Charles from the Ministry of Agriculture mentioned that they are using fines and farmers' awards in some places).

*Household representation*

The initial typology of household was not considered as relevant for the communities' players who asked for modifying the type of household represented in the game. Especially it did not represent the importance of livestock that each farmer has or wants to be represented in the game and its diversity. The facilitator authorized them to build their own household related to their real one. Most of them had only added livestock (mainly small ruminants for men and poultry for women). This introduced an interesting but real and practical dynamic where players were representing their own experiences.

*Agrarian systems and food security in the rainy season:*

"Food security" is not a term used by farmers.

*Interactions between levels:*

During the RPG, even if the players from district could go and see what the farmers or the region were doing, most of them did not circulate and use the information to adjust or modify their actions of regulation on the field.

*Interactions within levels:*

- Farmers of the three districts did not interact with each other, and the configuration of the room did not make the interaction easy as they progressively move to each side of the big table
- Districts tried to work initially altogether but as they had different viewpoints they considered easier to take individual decision and fill the sheet individually. Nevertheless they discuss a little in some sub-groups of 2-3 persons about the different activities and their location on the board.

#### 4.2.2 Discussions and debriefing with players

All information presented here are coming from Day 1: some are coming from the discussions between players along the day whereas some others are coming from the debriefing in the end of the day 1.

##### *Use of the game board by players*

##### *Agrarian Systems and food security*

- Rainy Season – dry season: The problems of food insecurity are not occurring during the rainy seasons. But whereas most of them can feed their families, in some communities, food shortage may occur in the dry season. It depends on rainfall and soil fertility but also on the size of the household. Some can even sell some products and/or move to another area if their fields around the house are not sufficient enough to feed their family.
- During the dry season, farmers also deal with Fulanis who stay with their cattle on their farmlands in order to improve their soils fertility.
- Most of crops are maize, sorghum (red or white), rice, beans, vegetables, and need fertilizers. Crops are more productive around the house where soil fertility is higher. There are more opportunities to sell red sorghum than white one; the white is more used to make local beer. In communities, they do not crop in the forest but use natural vegetation and forest area for hunting, collecting honey or dead wood, or other non-timber forest products, and can feed cattle near the forest.
- The access to certified seeds is a problem as the farmers can not produce them. So even if they are expensive and not easily available, they have to buy some each 1 or 2 years. But the MoFA (District) and SARI consider that farmers do not follow their advice and keep using traditional crops.

##### *Access to water /to resources*

- Farmers use little irrigation (pipe, wells, drain water) to avoid water stress of crops.
- Most of floods affect rivers banks but not dams
- Some farmers fish in the dams during the rainy season but most of them are silted (Timonde, Widnaba, Koubri) except Binaba dam. Hence water may not be available even during the rainy season.
- 22 dams in BW with water users associations who give a small contribution to prepare for dam management needs.
- Many dams are opened too early in the season and dry up before the end of the dry season.

##### *Interactions between levels*

- The recruitment of volunteers to disseminate extension services is perceived as important but in reality did not happened for a while notably for fire volunteers (whereas bushfire has been identified by a representative of Binduri District Assembly as crucial).
- MoFA is known as having the closer network to field activities but access to fertilizer and pesticide is still problematic.
- SARI selects new varieties of seeds but their access is limited due to a lack of breeder and foundation seeds for multiplication and distribution even for the MoFA at district level.
- In terms of river bank buffer zone, harmonization between the different sizes of buffer has been provided by WRC into the “Riparian buffer zone policy” (june 2013) based on



sedimentation risks whereas district consider that preventing flooding of farmland is more important than siltation of dams. But districts were not aware of this new policy.

### *Interactions within levels*

The traditional authorities are less influential than in the past (around 15 years ago) to enforce rules. With the right to vote and chose parties to be in power, in several cases the traditional authorities make concessions to or do not penalize those who vote for them or are members of their parties, when they don't follow the rules. With the decentralization progress, more political cronyism occurs and allows transgressing some former traditional rules. This in turn impacts on how interventions can be devised for the critical challenges identified by stakeholders notably bushfires, riverbank cultivation and reservoir sedimentation.

## **4.3 Playing Day 2: playing with direct levels interactions and the evolution of the facilitation process**

During the TAI partners debriefing of the first day some adaptations to the game and specifics objectives for the day 2 were defined.

These objectives were:

- to observe more particularly the interactions between the different levels
- to determine whether the critical ES related to food security (quality, availability, access) and the rules for their management are different between the dry and the rainy season (notably between male and female activities).

### **4.3.1 Organization of the activities**

Participants were divided into 3 groups mixing all the levels (region, district and communities) regarding gender and riverside criteria. Each group had a facilitator and observers.

- Bawku East and Binduri: Male farmers from this district, district level actors from this district, half of regional level actors
- Bawku West: Male farmers from this district, district level actors from this district, half of regional level actors
- Women group: Farmer women from Bawku East and West with the woman representing the Ministry on Women and Children

Players were asked to play as the first day morning but during a bad dry season. Farmers put their activities on their board representing their side of the watershed. District players chose their activity-cards (regulation, incentives, etc), filled in their sheet and put their cards on their board. The Region players filled in their sheet. Then the facilitator asked about the main changes they imagine in the future.

### **4.3.2 Debriefing of the game session**

A general and short debriefing was organized with players in plenary. One or two representatives of each group presented quickly their results to all participants.

CIRAD synthesized the results of the 2 days session.

As an open question, one women farmer asked what the WRC is doing to support farmers. WRC listed the support they have already given to some communities (water pumps, livestock, dry season seeds).

Aaron Aduna wrapped up the sessions and thanked the participants for the exchanges.

Discussions between TAI partners were organized on the third day morning to analyze the 2 days results.

#### 4.4 Outcome of the game Day 2

##### 4.4.1 Main observations from the game playing

###### *Organization of the game area and game dynamics*

- In the east side of the Volta, groups played quite separately first, then they explained and discussed their actions with the others: farmers first, then district players and finally region players.
- In the west side of the Volta, they played as a whole group, each level of actors discussing with the others while they were doing their activities.
- In the women group (communities+region), farmers put their cards on the board, then the representative of the regional Women ministry put her activity-cards (regulation, incentives, etc). The facilitators conducted a focus group interview (themes: water use and management, cropping and other activities in dry season, activities of the Women ministry, difference between dry and rainy seasons, land and credit availability, market access and nutrition issues).

###### *Household representation:*

Farmers kept the same households they rebuilt in day 1.

###### *Agrarian systems and food security in the dry season:*

- Food insecurity is higher in the dry-season, so the farmers increased the number of crops in their field and concentrated their activities near of water-points, and sell more livestock.
- The variety of crops, especially those produced during the dry season (for income and nutritional needs) by women, is not represented in cards in the game as green pepper, tomatoes, okra, leafy vegetables, lettuces, and cabbages
- Importance of the use of riverbanks during the dry season reveals also the lack of representation of some dams in communities.

###### *Interactions between levels:*

- In Bawku East, (because of the configuration of the room?) board of districts and communities have been separated in the space which did not help increasing the interactions between these two levels while they were playing farming activities or district regulations. Region kept a step aside, working on its own.
- In Bawku West, District and farmers boards were closed which was supposed to help them interacting more altogether.
- There was no woman from district in this group. Communities and regional representatives exchanged directly.

###### *Interactions within levels:*

###### *Changes:*

Increase their crop production is their main wish. In Bawku East the scenario envisioned is intensive with fertilizers and irrigation accommodations whereas in Bawku West, the proposals are more ecological friendly (animal manure, planting trees, etc)

#### 4.4.2 Debriefing with players

##### *Agrarian systems and food security in the dry season:*

- Farming activities in the dry season: maize, onion, fish, pepper, okra, beans, cabbage, livestock (bovines, goats) and fish.
- Rice is not cultivated during the dry season
- Most of activities are near the water points (dams, river, wells near the river, drain water to the field, ...). As most of the dams are early silted and dried, farmers use fertilizers on crop (specially, onions, maize and pepper) and buy irrigation devices (pipe, pumps, motor machine) purchased mainly in Kumasi and Cinkansé. They sell livestock (cattle and small ruminants) at Bawku market and eggs at home or borrow money to buy these devices
- Some farmers pumping out of the white Volta are rich, so they can afford diesel and resources because they are growing high value vegetables all year round
- Specificities of women farming systems:
  - o They picking Non Timber Forest Products: honey and gathering dead woods in the forest.
  - o Groundnut are essential in terms of nutrition (soup is good to eat), income (they can sell it), livestock feed (leaves are dried and given in the dry season)
  - o Sell animals to pay hospital, school fees. Not really interested in cattle, as it requires more labor than small ruminants and poultry.

##### *Access to water*

- As the dams getting dryer and dryer as the dry season progresses, some fishermen move from the dam to the Volta River to get fish (2-30 km distance from their house)
- Siltation of dams is a big problem for farmers in the two sides of the river but they feel lonely to face this issue
- Water availability and access is depending on farmers' capacities to buy pumps or their relationships with neighbors in irrigated scheme who have access to water:  
Pumps are privately owned. Some households rent pump from others, or connect their irrigation systems to that of their neighbors. Canals are collectively owned. Some non-governmental projects, which constructed the dams and connected canals maintained them during the first years, but now users have to maintain them. Community self-organizes to maintain canals, taking it in turns.

##### *Access to land*

- Between farmers and landowners: request to access land is done to landowner which can allow farmers to cultivate during the dry season near of water bodies, but this may change in the rainy season. Plots near dams are rented out to others when owner doesn't have money to buy seeds or livestock and other inputs.
- Majority of land is also owned by local Chiefs, in Bawku East for example, farmers and some district officials noted that some Chiefs provide land to selected individuals around the reservoir areas and this would prevent actual implementation of the buffer zone policy.
- Some communities (Nafkuliga in Binduri District) have fertile lands but are far from the other communities (this problem is related to transport availability)
- Lands belong to husband, so women are dependent from him to have access to land and to cultivate.

##### *Interactions between levels:*

- Education and sensitization of farmers are the main activities of district representatives to limit bushfire, cutting trees, move from the riverbank. They also give award to farmers who have been able to follow MoFA recommendations, or MoFA technical advices. Awards are coming from national level or negotiated with NGOs.
- Ministry of women and Children Affairs interact with women on few education programs because of their limited resources: manage agrochemicals to prevent health or environmental problems (soil or water pollutions)
- Assembly men work closely with Water Resource Commission (WRC). WRC supports farmers on water bodies' management during the dry season and planting trees along the river bank. It also supports farmers access to water by buying motor machines to some WUA (Nafkuliga and Sapeliga) notably when they agree to move away from buffer zone area
- According to the districts men, farmers are not willing to use new seeds varieties from SARI due to the failure and also of the high cost of these new varieties.
- Farmers of Zebilla insisted about the siltation of dams and asked whether the District and Region can help them. Upper level recognized that siltation of dams is limiting their life span and effectiveness in the dry season, but they all their few funds to repair silted or broken dams because of their lack of maintenance.
- GIDA recognized that community interactions is key before its interventions happened but GIDA needs to know conditions of dams before acting as it is not just about siltation

#### *Interactions within levels:*

Land access and availability: Land access depends on the relationships of farmers with landowner and of the availability of lands in the communities or in the area.

#### *Changes*

Scenario building (what would they like to change if they could change their situation?)

- Farmers (Bawku east): purchase more fertilizers and irrigation accommodations, and develop activities that generate more incomes
- Farmers (Bawku west):
  - o Relay on animal manure rather than on chemical fertilizers.
  - o Avoid grazing problems
  - o Planting trees along the river bank to prevent soil erosion
- Others
  - o Increase interaction with WRC and assembly to increase water lifting machinery and move away from river banks, to have access to pumps, seeds and ruminants even in dry season
- Women:
  - o Improve dam maintenance: by dredging dams
  - o Prevent soil erosion: by planting grasses useful to build roofs in the river bank, farming in contour line, planting trees
  - o Prevent from tree pests (especially on mango tree)
  - o Improve access to fertilizer



## 5 Discussion

### 5.1 Summary of main findings

Regarding our two main objectives: (MO1) share knowledge about the participatory approach and (MO2) improve understanding of ES important for farmers and other decision makers – and our two secondary objectives: (SO3) identify alternative landscape management scenarios and (SO4) observe direct interactions between the different levels, our main results emerged from this workshop were:

1. Even if time was stressed, TAI partners were able to play different role in the participatory process: facilitators, observers, etc. The preparation workshop in Ouagadougou (and notably facilitator guides) helps to reach the MO1 objective but material collected should be standardized to limit differences in groups' facilitation, in taking observers' notes, in taking relevant picture or video, which makes analysis more difficult.
2. Gender (here limited to women) issues need to be addressed by combining gender groups and mixed ones at different stages of the participatory process (MO1). Women activities are essential to ensure food security of the family, pay hospital or school fees (MO2)
3. Food insecurity is higher in the dry season and farmers multiply the crops cultivated around water points or riverbanks to face uncertainty. As most of dams are early silted and dried, some buy irrigation devices by selling livestock or eggs (MO2).
4. Access to land is a critical issue in the region as (i) farmers are dependent from landowners (who mainly are local chiefs) allocating fields through economic or political criteria, (ii) lands belong to man, (iii) fertile lands available are not enough and decreasing in some communities whereas others less populated have fertile lands (for example, Nafkuliga) but are far from the other communities (MO2).
5. Questions about future did not really help to build alternative scenarios: most of the proposals were limited to increase food production (*via* more fertilizers, irrigation devices, improve soil fertility, improve dam maintenance) or to protect ecosystems (by planting trees or by avoiding over-grazing) (SO3).
6. Regulation of riverbank cultivation, limitation of bush burning and cutting trees are the most important activities conducted by district technical staff through mainly sensitization to farmers and communities' members. WRC funds part of their activities and sometimes provide machines to communities. But, regarding the increase of food production, there is a gap between researchers and district technical staff activities to select and diffuse new varieties of seeds. Moreover, even if siltation of dams is recognized by all participants as a crucial issue GIDA does not interact enough with communities to focus its interventions (SO4).

### 5.2 What worked well, what could have been improved

The project team considered that the objectives for the workshop were met to a certain extent during the 2 days-workshop. Two main limits of the exercise were identified:

- 1- We worked with the Role Playing Game Bawkudo that have been constructed previously not with the same issue as those addressed here in the TAI partners. Therefore, it was helpful to make emerged some elements but not to embrace deeply the whole diversity and complexity of TAI issues.
- 2- People invited in the game session have already participated in the CPWF V4 activities, and the information they gave us may be biased by what they understood we would like to hear (notably in terms of bush burning or river bank cultivation). Therefore, it is important not to consider the RPG as a social investigation per se but more as a starting point to other inquiries that may need other types of tool and method.

Other issues discussed during the workshop debrief were:

- trade off between different land uses (forest vs agriculture)
- the game was useful for understanding key issues related to production of crops and therefore access to subsistence food, but not for understanding market or non-monetary exchanges
- natural resources and ecosystem services:
  - o type of resources discussed were limited to those represented in the game, mainly water.
  - o dams are not sufficiently represented in the game, and water quality is not an issue addressed through the game
  - o Further investigation needs to be done to characterize more precisely the elements of the ecosystem used, their functions, their location, the value given by stakeholders, etc.
- the game enabled researchers to get a good understanding of social interactions within levels and across levels of decision-makings. The main difficulty that remains is to enhance the linkages between actors at these different levels.

### 5.3 Lessons for future work on the TAI project: new issues to tackle regarding ComMod process and ecosystem services

This workshop was helpful to identify potential links between the different WPs and also to plan future development of the participatory approach in the WP4.

TAI partners proposed to model several Ecosystem Services in terms of agricultural production, water yield, water quality, erosion control, non-timber forest products, and pollination. The objective of these modeling processes is to identify the economical and technical conditions under which agricultural interventions (including creation or improvement of dams, improvement of access to seeds, ...) may increase significantly and sustainably food security in the area.

But all these interventions give little room to social and cultural determinants of the ES. “Discourse-based valuation of ES” (Wilson & Howarth, 2002) are the most used to collectively assess ES. Thus, we consider that the added value given to these different models by a ComMod approach could be to focus on the social and cultural dimensions of ES, notably regarding social uncertainties<sup>3</sup> linked with these ES. Therefore, we proposed to develop a role playing game to identify and characterize social “contradictions” between some activities and their locations with the social values that stakeholders give to the same places and/or activities. By doing so, we assume that

- ES depend on the social and cultural space where they are defining.
- The way interactions are organized to generate ES influence their social values.

Therefore, their social values may differ from one level to another. And, region, district or community may not be focused on the same type of services. We will develop a ComMod tool to see to what extent the ComMod approach can be useful to make participants discuss about their perception of ES and their different valuations. In the context of WP4; a complementary Agent Based

---

<sup>3</sup> Social uncertainties are linked with the existence of controversies, divergences of viewpoints or conflicts of interest (Dewulf et al., 2005; Hirschman, 1995). : « *Uncertainty refers to the situation in which there is not a unique and complete understanding of the system to be managed* » (Brugnah et al., 2008)

*We would like to thank all donors who supported this research through their contributions to the [CGIAR Fund](#).*

Model (ABM) tool that combines both the ComMod approach on stakeholder social preferences and other biophysical drivers of LULC change and related aspects that directly impact on ecosystem services such as water yield and erosion is under development by the CIAT team.