A photograph of two men standing in a lush green rice paddy field. The man in the foreground is wearing a light-colored, long-sleeved button-down shirt and dark trousers. The man in the background is wearing a dark green tank top and brown shorts. The field is filled with young rice plants, and the water is visible between the rows.

Managing competing water users in a small watershed using decision support tools – A case study for Burkina Faso

J. Wellens, F. Traore, M. Diallo, M. Diakité, A. Midekor, J. Derouane & B. Tychon
International Congress: Water 2011 – Mekelle, Ethiopia, 19-26 September 2011



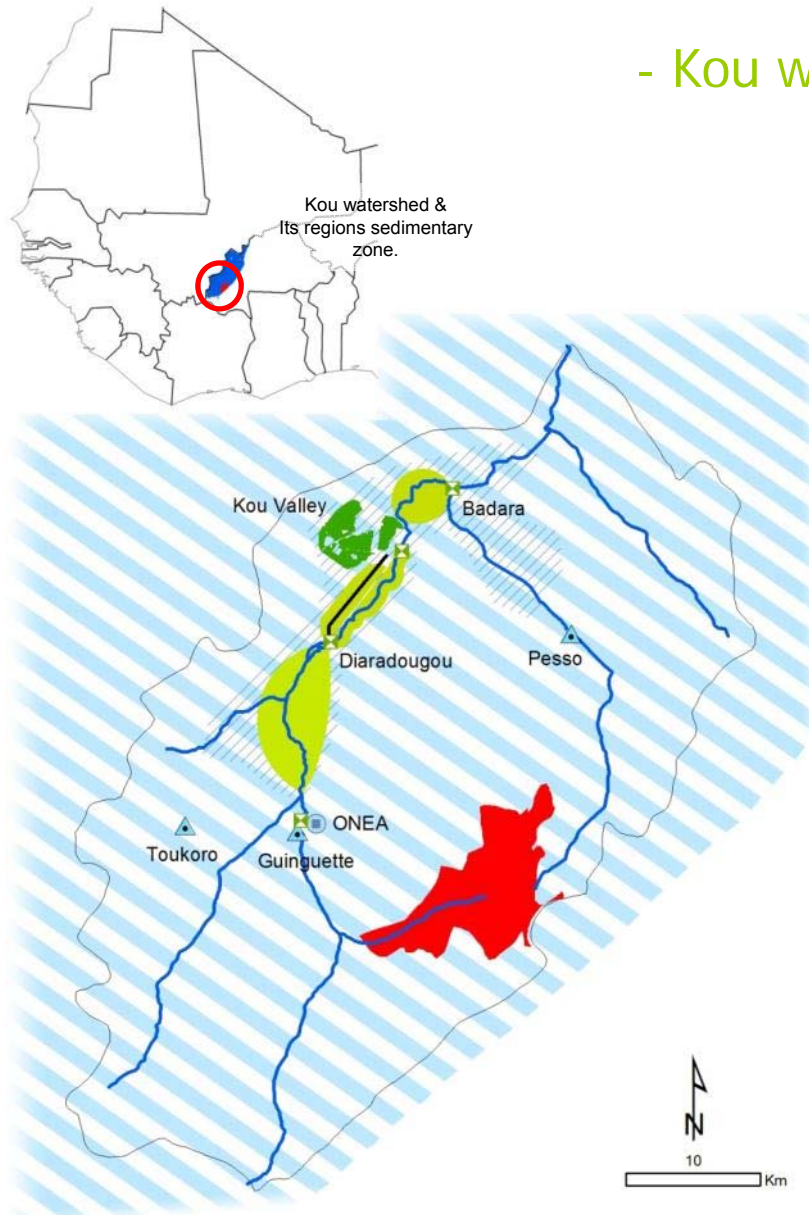
... The experiences of GEeau
- lay-out -

- ① The Kou watershed: intro & facts;
- ② Towards a better management;
- ③ Towards a better understanding.



1.i Introduction

- Kou watershed: its resources and its users -



The Kou Watershed: 1.800 km²

Its water resources:

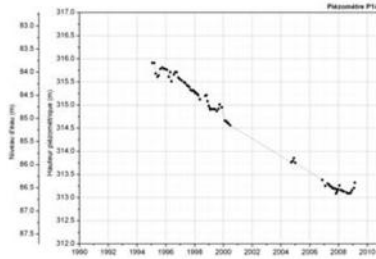
- ▲ springs;
- perennial rivers;
- ▨ sedimentary water layer (medium to profound depth) ;
- ▨ alluvial water layer (shallow depth) ;

Its users:

- Drinking water for Bobo-Dioulasso (600.000 hab.);
- town of Bobo-Dioulasso;
- several agricultural regions.

1.ii Some ideas

- intensification & deterioration -



groundwater level drop

Availability of the resources:

- Drop in piezometric readings;
- Diminishing sources.

Quality of the resources:

- Several deterioration threats.

Hydro-agricultural activities:

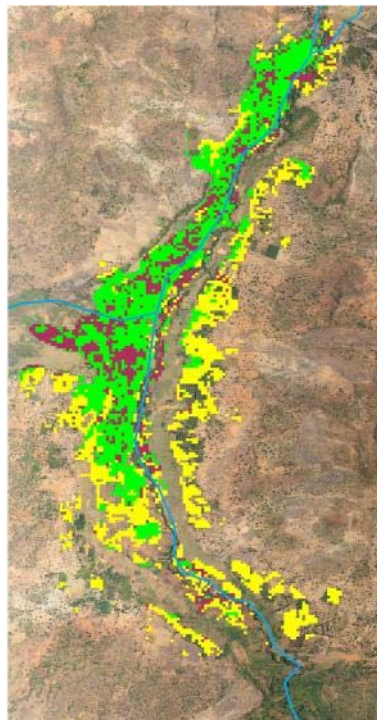
- Anarchic intensification;
- Lack of water management.



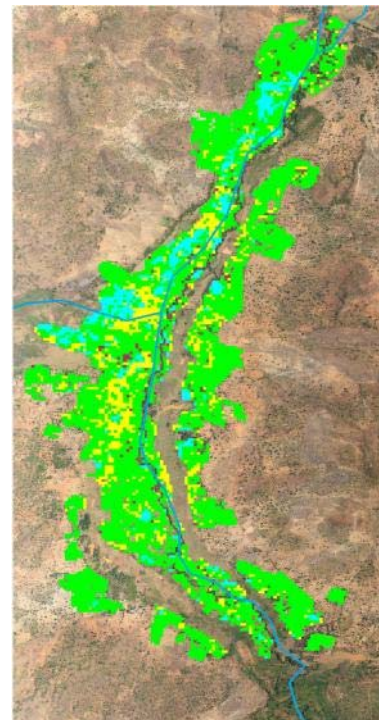
(Knowledge) Data Bases



Monitoring and managing tools



Fields (green):
May 1988



Fields (green):
May 2007
Saturation!





1.ii Some ideas - the state run rice scheme -

- 8 water users associations
- Lack of maintenance
- Lack of respect for the local regulations
- Deficit water management (distribution efficiency of 44%)
- Slump local economy
- $\frac{1}{4}$ of the area: vacant !!



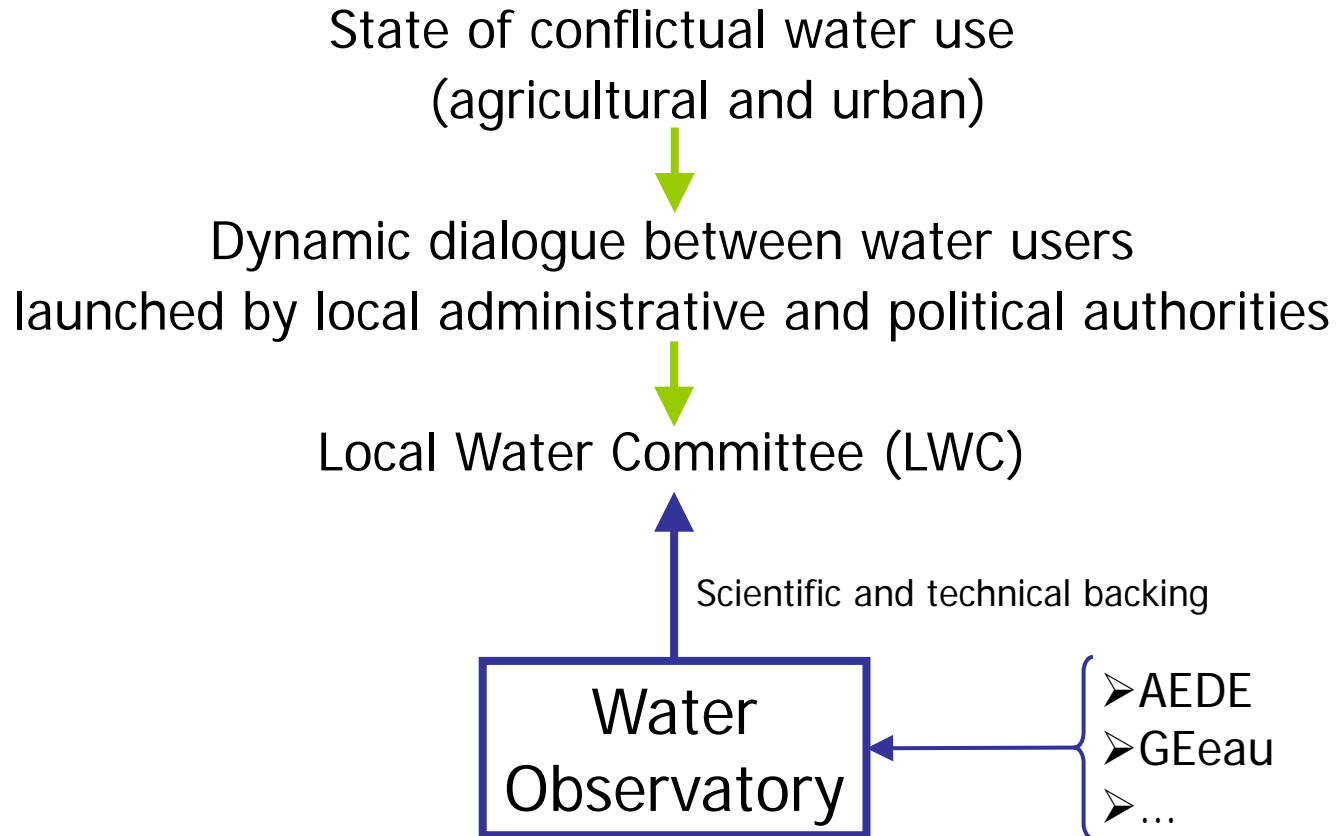
... The experiences of GEeau
- lay-out -

- ① The Kou watershed: intro & facts;
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- ③ Towards a better understanding.



2 Local Water Committee

- towards a sustainable solution -



2 Local Water Committee

- engagements -



- ✓ Pursuing members through awareness, information and formation sessions;
- ✓ Dialogue between concerned users;
- ✓ Management and Development Plan.



2 Local Water Committee

- lessons to remember -

- + Proof of imagination through its informal creation.
- Structuring of its animation & leadership:

Dir. of Water → Dir. of Hydraulics → Dir. of Agriculture and Hydraulics



Structural limits;
Institutional instability;
Budgetary limits (actions).



2 Local Water Committee

- solution (?): Public Private Partnership -

- ✓ *Ad hoc* committee:
administrative staff & civil society
- ✓ Water Observatory:
scientific and technical backing (civil society & projects/programs)



Improving knowledge on land and water;

Decision support tools:

- at plot level;
- at scheme level;
- at watershed level.



... The experiences of GEeau

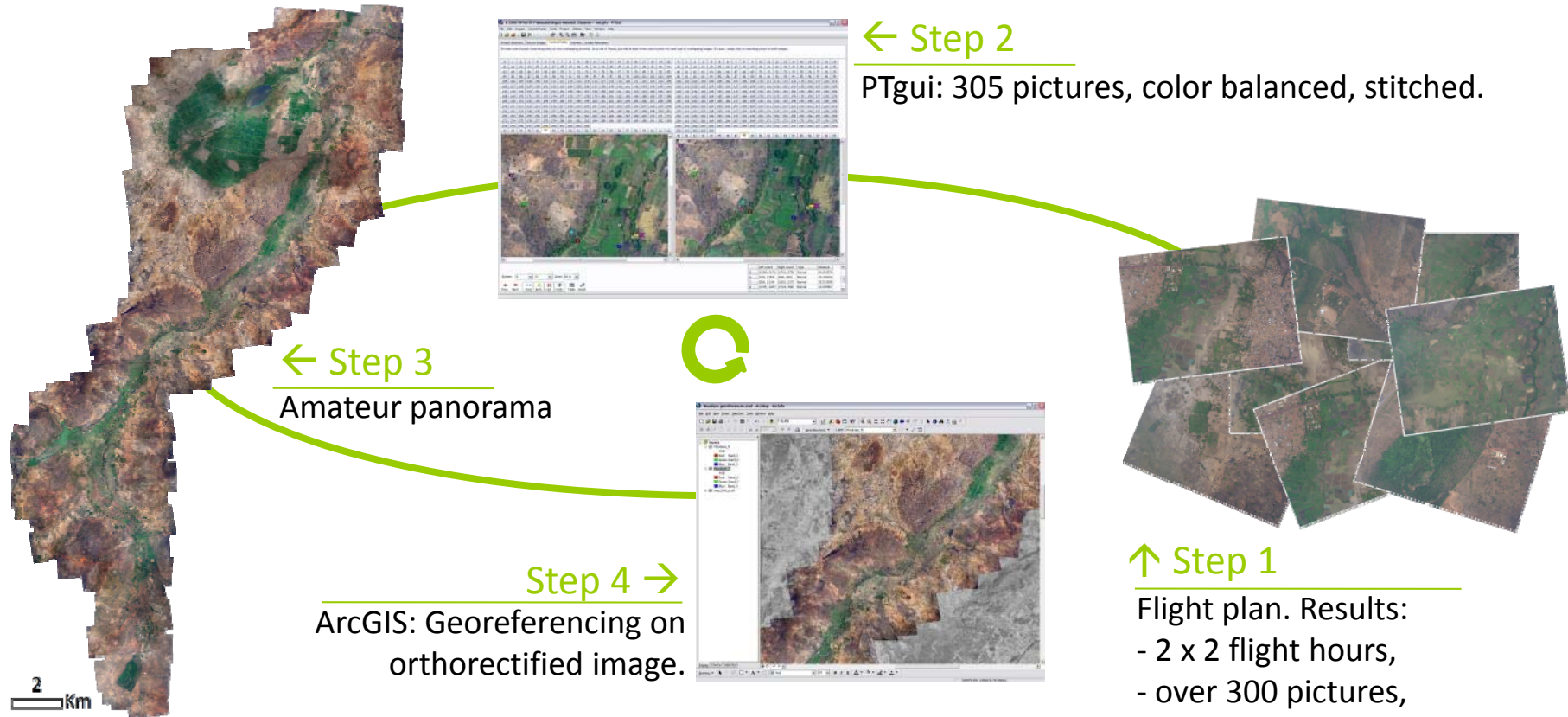
- lay-out -

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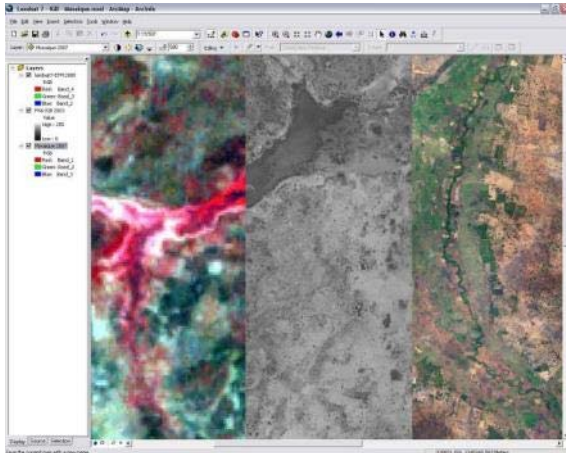


3.i Amateur aerial photography

- non commercial -



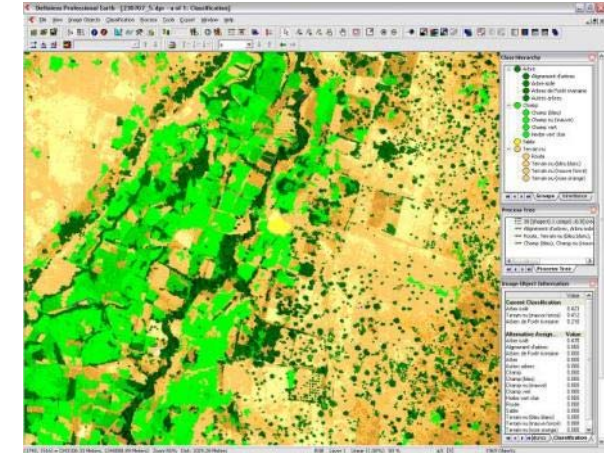
3.i Aerial photography - in a GIS environment -



Comparison of a 30 m. resolution Landsat 7-ETM image, a commercial aerial photograph (5 m. res.) and the georeferenced panorama (0,8 m. res.).



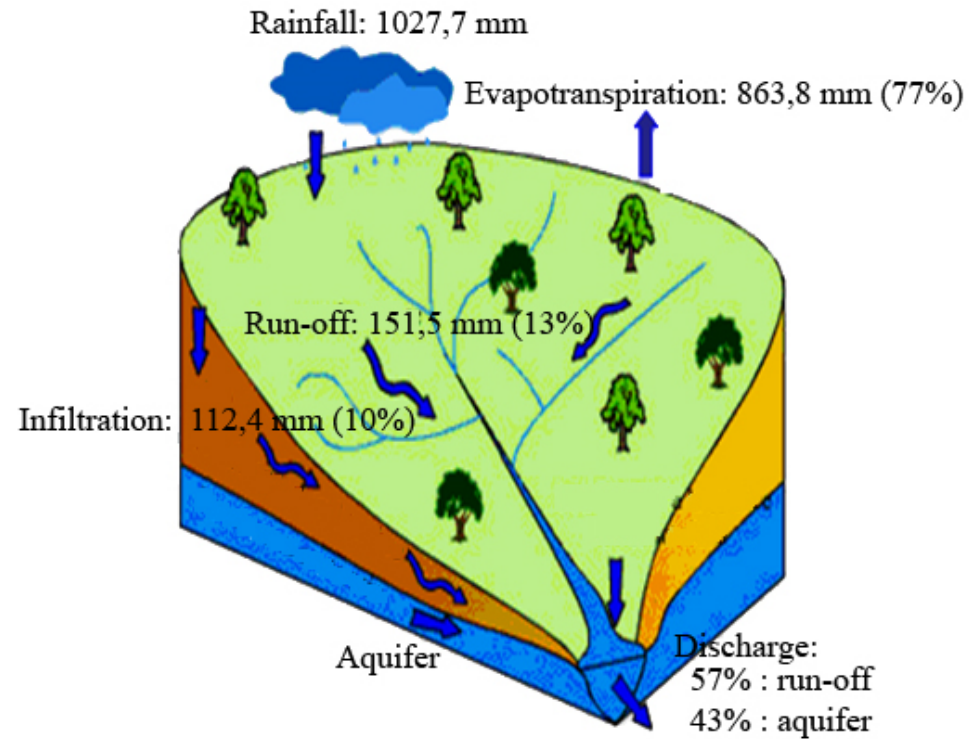
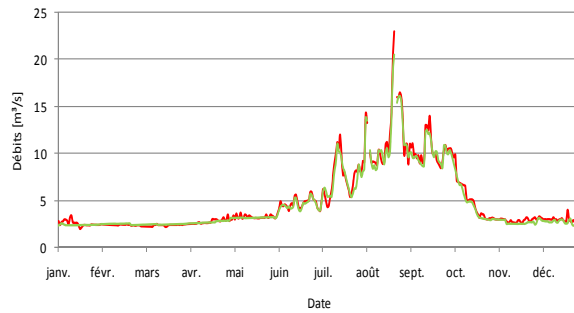
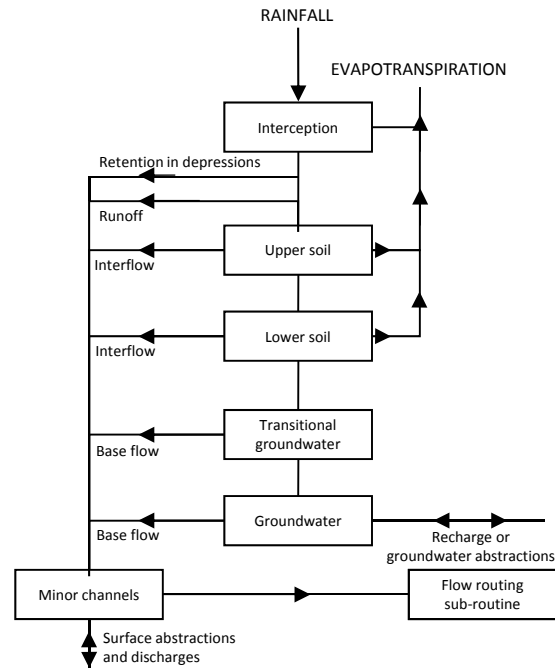
Panorama detail: village of Diaradougou, the river Kou (center) and irrigated plots bordering the river.



Classification of the region plotted in photo 2 using eCognition:

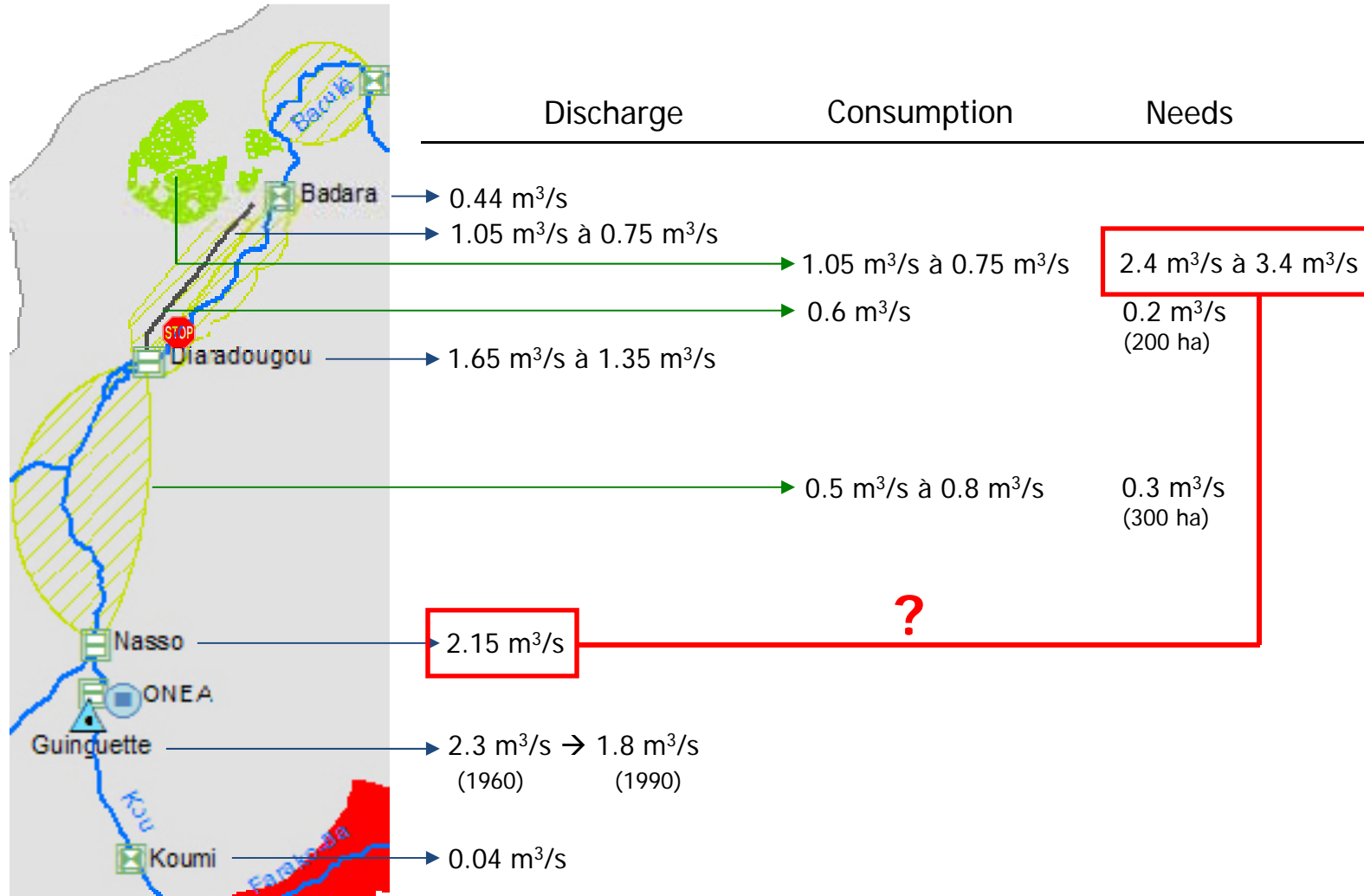
- Vacant and forested terrain;
- Isolated trees;
- Fields and savannah;
- Sable, ...

3.ii Water balance - hydrological model HYSIM -

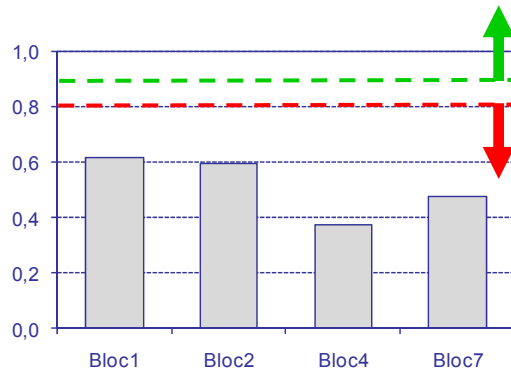


3 The first facts

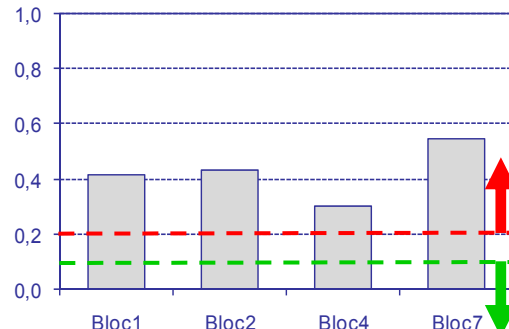
- water competition -



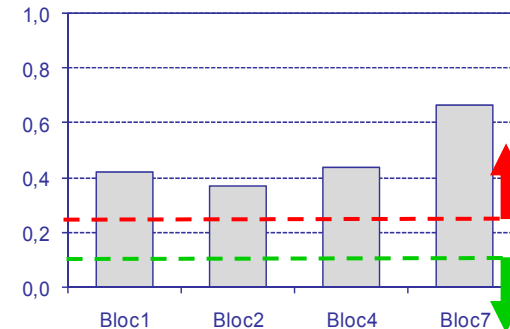
3.iii Rice scheme diagnostics - indicators of performance -



Adequacy: spatial and temporal mean between delivered and required amount of water.



Reliability: indicator of efficiency for the on time arrival of the amount of water.



Equity: indicator of efficiency for the spatial distribution of the water allocations.



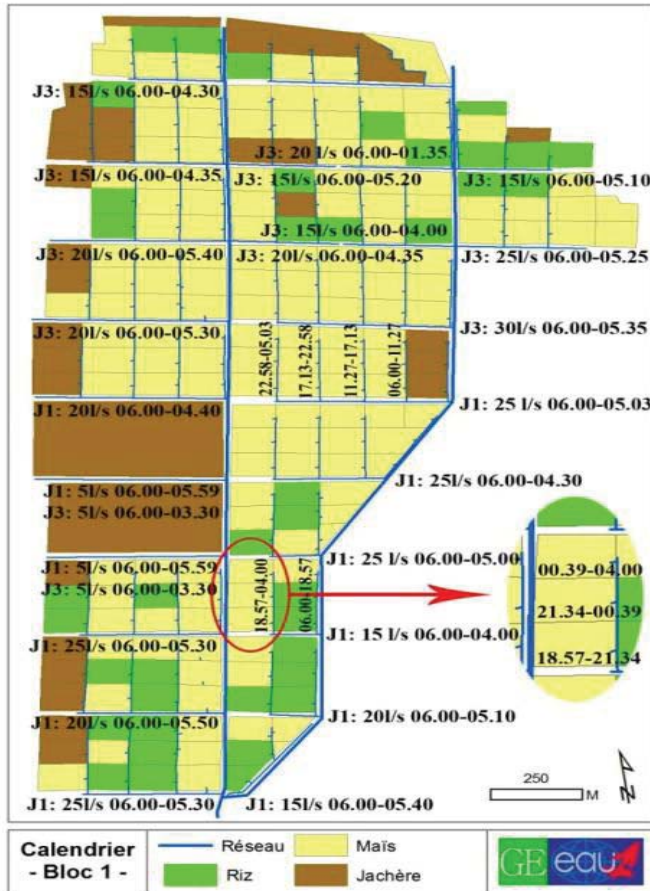
Need for an irrigation water management tool!



SIMIS



3.iii SIMIS: results - proposed calendars -



Detailed spatialization of calendars for canals and plots (programming & Photoshop)



3.iv Budget → AquaCrop

- field level water balance -



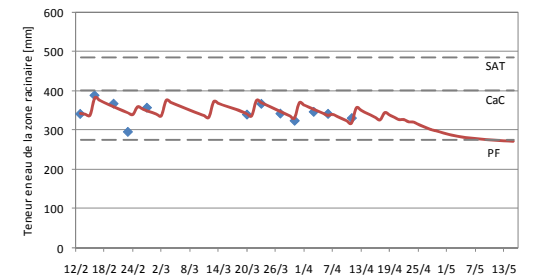
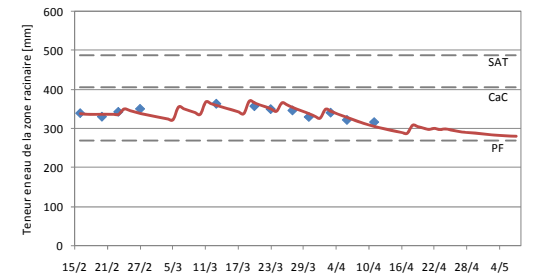
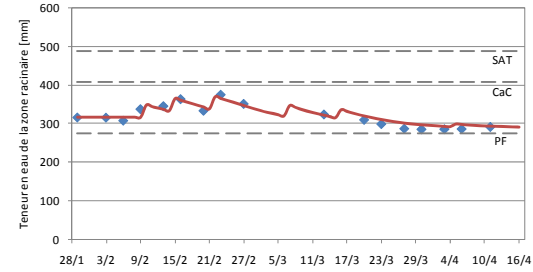
Calibration & Validation →

Field data collection:

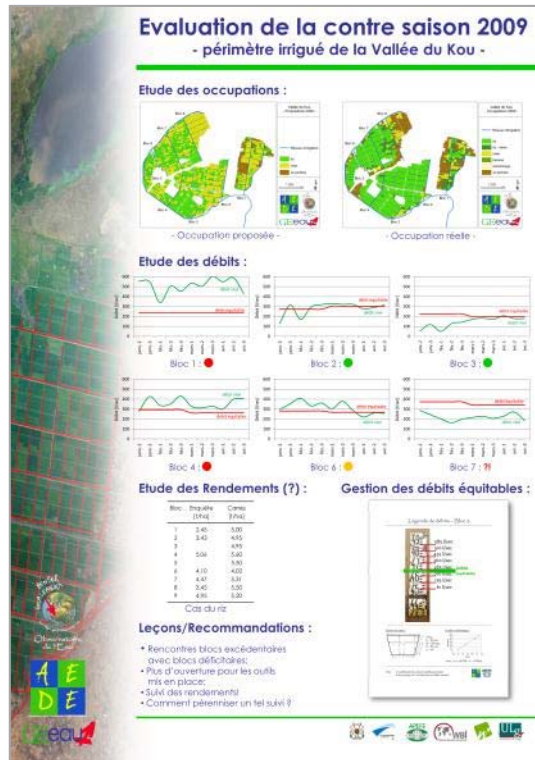
- ✓ Soil humidity
- ✓ Soil characteristics
- ✓ Irrigation calendars
- ✓ Yield

AquaCrop simulations:

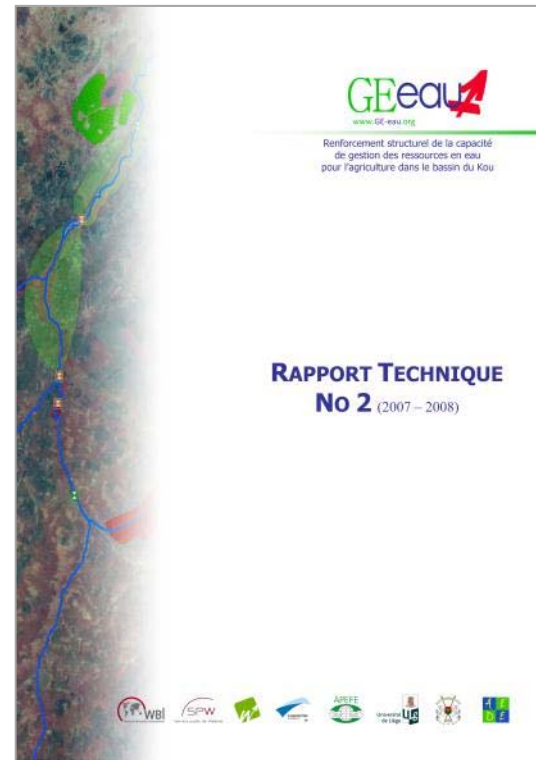
- ✓ Soil water contents
- ✓ Yield estimations
- ✓ Irrigation efficiencies



4 Popularization - all levels -



Posters & organized popularization sessions



Technical reports & notes

GE eau Renforcement structurel de la capacité de gestion des ressources en eau pour l'agriculture dans le bassin du Kou

Accueil
Présentation
Activités
Formations
Infothèque
Contacte

Promouvoir des approches innovantes de recherche développement en matière de **Gestion Intégrée des Ressources en Eau (GIRE)**:

"Volet scientifique et technique":
Concevoir des outils pour la gestion de l'eau dans le bassin du Kou. Plus concrètement: (i) acquisition, analyse, contrôle et archivage des connaissances scientifiques et techniques relatives aux ressources en eau du bassin et aux usages de l'eau pour l'agriculture; (ii) mise au point d'outils permettant de réduire la consommation en eau par l'agriculture ou de mieux la gérer; (iii) mise au point d'outils de suivi de l'évolution de l'intensification de l'agriculture dans le bassin.

"Volet socio-économique":
Motiver les populations à prendre en main leurs problèmes: (i) faire prendre conscience aux agriculteurs de l'urgence dans laquelle ils se trouvent pour les faire réagir et prendre leurs responsabilités; (ii) lancer une nouvelle dynamique de gestion basée sur la responsabilisation des acteurs concernés par l'utilisation de l'eau en agriculture.

"Volet institutionnel":
Renforcement du Comité Local de l'Eau (CLE). Le CLE est une structure de suivi et de gestion intégrée de l'eau sous la présidence du Haut-commissaire de la province du Houet permettant à chaque secteur et chaque type d'usage de l'eau d'être représenté et pris en considération dans la gestion intégrée de l'eau du bassin.

Direction Régionale de l'Agriculture, de l'Hydraulique et des Ressources Halieutiques des Hauts-Bassins
Direction Générale de la Coopération au Développement de Belgique
Wallonie - Bruxelles International
APEFE - Association pour la Promotion de l'Education et de la Formation à l'Etranger

Association Eau Développement et Environnement
Observatoire de l'Eau des Bassins versants du Mouhoun, de la Comoé et du Banifang
Université de Liège Département Sciences et Gestion de l'Environnement
Service Public de Wallonie: Direction générale opérationnelle Agriculture, Ressources naturelles et Environnement

Créé par: J. Wellens
Mis à jour le: 27 Janvier 2010
Visiteurs: 001161

www.ge-eau.org

5 Conclusion

- repositioned stakeholders responsibilities -

The PPP developed des new responsibilities:

- ① Technical Assistance:
 - research & development;
 - training.
- ② Private partner:
 - immersion, appropriation & capitalization/validation;
 - publication & distribution of objective data and studies.
- ③ Public partner:
 - accompanying measures;
 - impose rules (and inflict sanctions).

For the LWC:
& its member

- nevertheless a substantial progress in the water management;
- genuine awareness of the problems and the proposed outcomes ;
- desire a further formalization of the PPP.

Still a long way ahead!





More on : www.GE-eau.org

