



USAID WA-WASH

Water Accounting Tool Workshop

Koudougou, Burkina Faso July 6-7, 2015

Virginia Tech Team

In Burkina Faso:

- **Ralph Hall** – Assistant Professor of Urban Affairs and Planning
- **Emily Van Houweling** – Associate Director of Women and Gender in International Development, OIRED
- **Nicholas Polys** – Director of Visual Computing
- **Sophie Wenzel** – Assistant Director, Center for Public Health Practice and Research
- **Paige Williams** – Undergraduate Student

At Virginia Tech:

- **Peter Sforza** – Director of the Centre for Geospatial Information Technology
- **Eric Vance** – Director of the Laboratory for Interdisciplinary Statistical Analysis
- **Venkataramana Sridhar** – Assistant Professor of Biological Systems Engineering

Our Goals

- Learn about the water accounting tool
- See the MUS program in action
- Understand how data is collected, shared, and managed
- Understand how NGOs, governments, and communities coordinate and interact
- Propose and test some ideas for advancing the water accounting tool
 - Simplifying data collection
 - Integrating data
 - Standardizing the water accounting process
 - Visualizing data
 - Improving decision making processes
- Collect the information needed to apply for future grants

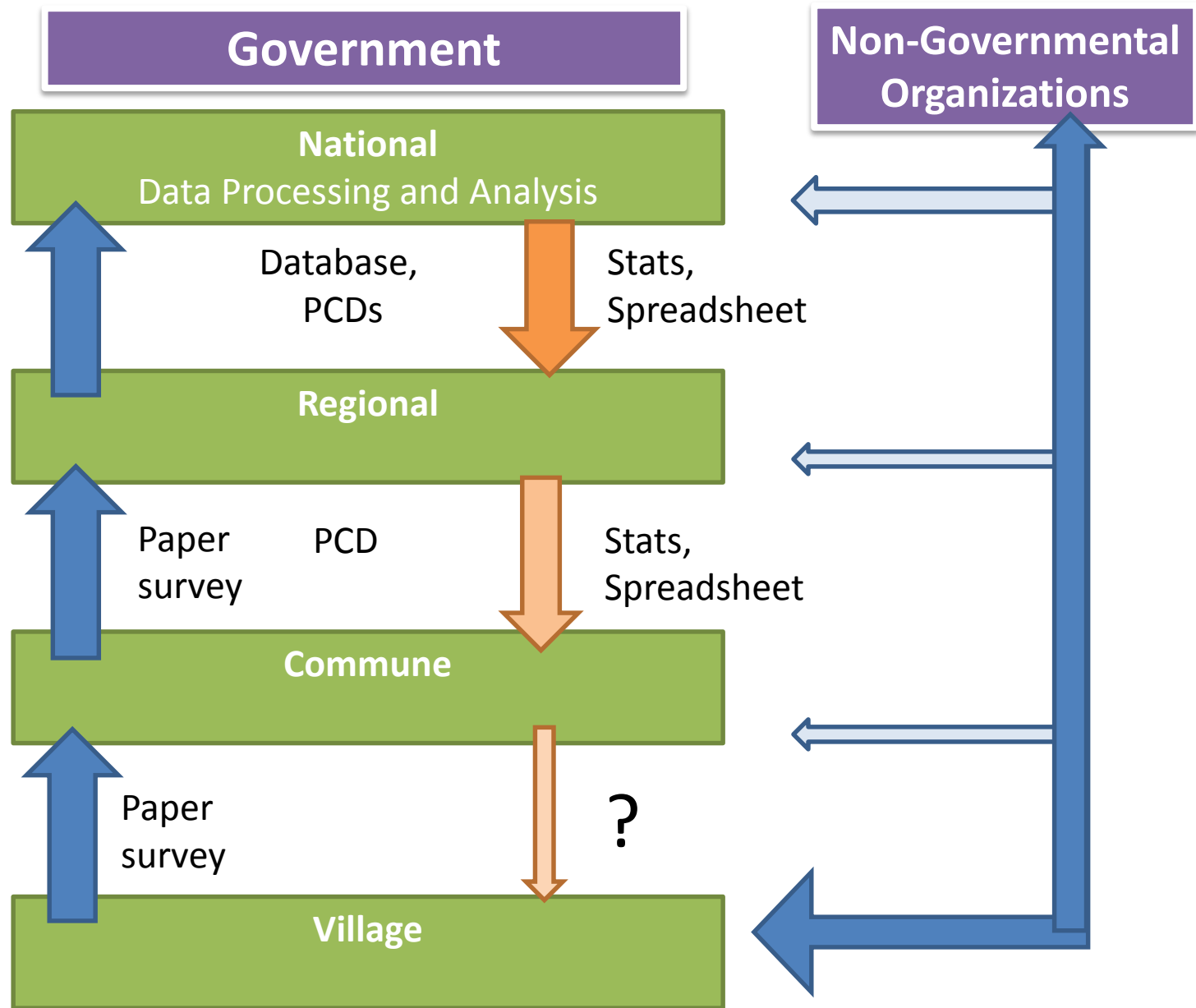
What We Have Done

- Virginia Tech workshop with Winrock DC staff
- 2 days of meetings with Winrock in Ouagadougou to learn about the water accounting process
- 1 day tour of Koukouldi to see the Winrock MUS project and test satellite imagery and GIS maps
- 1 day of community mapping and discussion in Batondo with men's and women's groups, taking GIS points afterwards
- Meetings with communal and regional water offices

Perceived Challenges and Difficulties

- Estimating water supply from traditional sources
- Time and human resource costs, capacity considerations
- Movement for decentralization, but now all decisions are made at the national level
- Understanding the maps and using them for decision making
- Coordination between government and NGOs for data collection, sharing, management and alignment of priority areas
- Community input not well integrated into decision-making
- Databases are not regularly updated and shared

Information Flow in Burkina Faso



Ideas for Moving Forward....

- **Calculating needs and supply**
 - Start with community maps
 - Combine productive and domestic water needs
 - Estimate traditional water source supply
 - Simplify and integrate surveys
 - Integrate community inputs
- **Visualizing maps**
 - Use community generated symbols
 - Calculate the water gap for each neighborhood
 - Integrate community perceptions
 - Maps understandable across all levels (national to village)
- **Decision making and data sharing**
 - Monitoring technologies (cell phones, handpump monitors)
 - Web based information services for coordination and sharing data
 - Decision support tools

Community Mapping

Process

- Small groups map water sources and important community landmarks

Outcomes/purpose

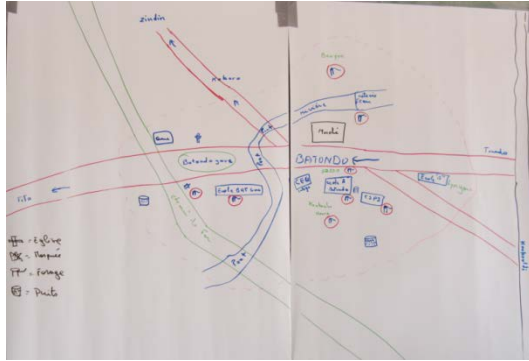
- Community participation/engagement “Nobody had ever asked us before”
- Rapid identification of community water sources and approximate locations
- Information about each source: seasonality, wait times, uses, and water tariffs
- Confidence that all sources are captured and that the information is accurate
- Community perceptions of water sources, supply, and issues

Lessons learned

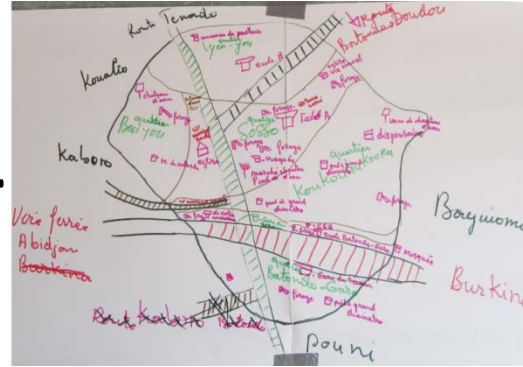
- Number of people and the setting impacts participation and results
- Need groups of 5-15 people, with representatives from each quartier
- Women may need more assistance and a flexible approach

Community Mapping

Men



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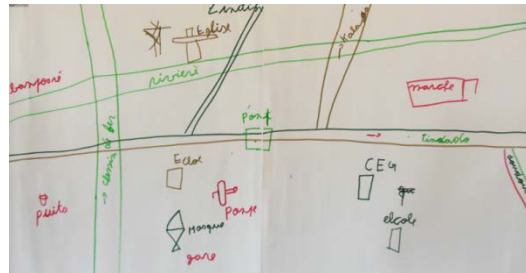


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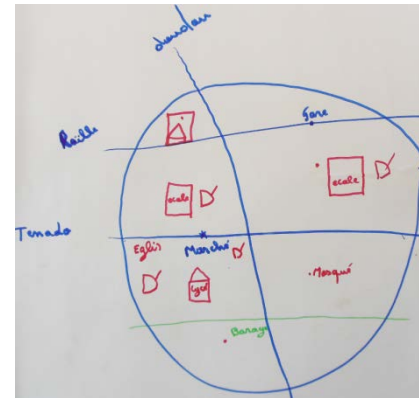


Women

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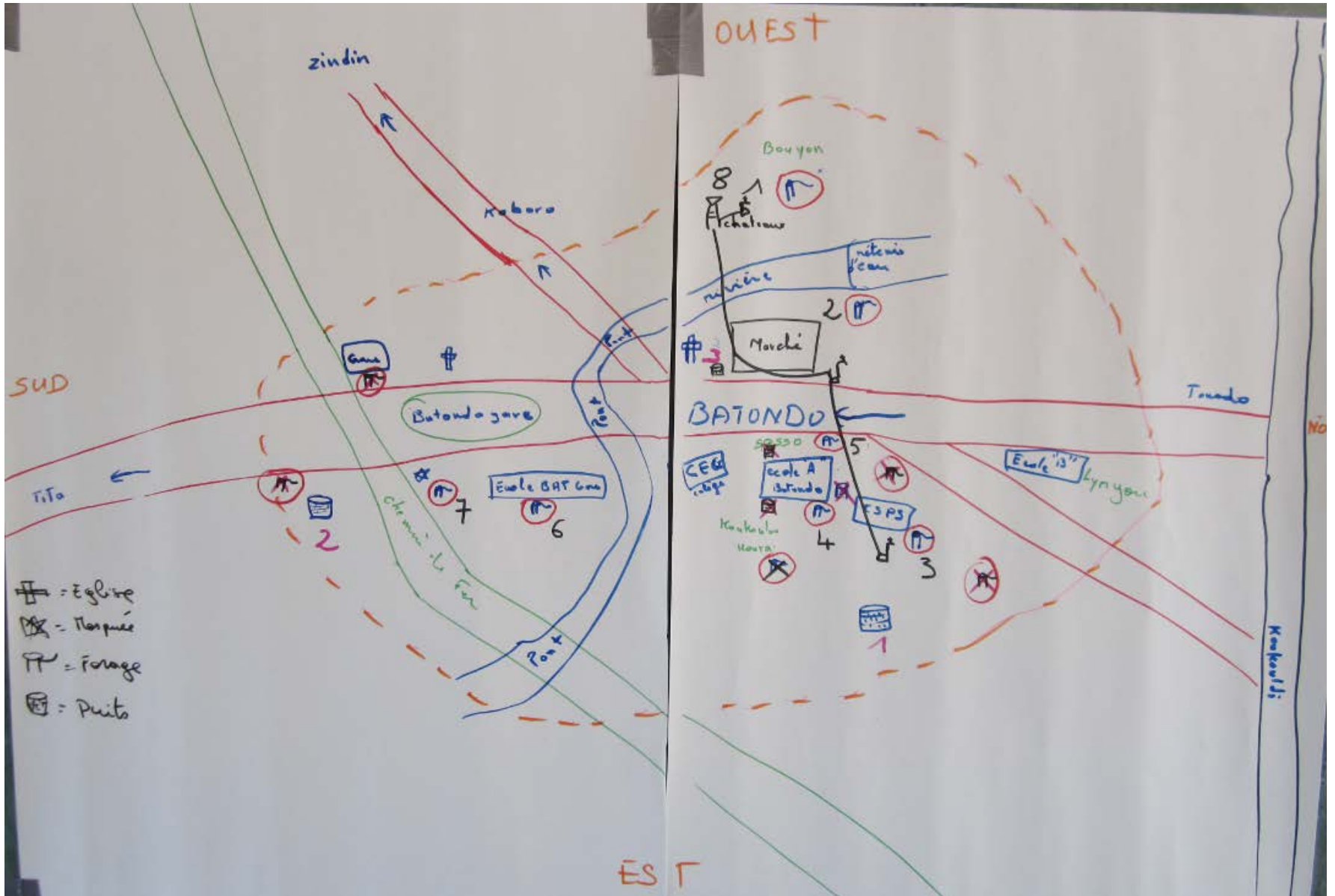
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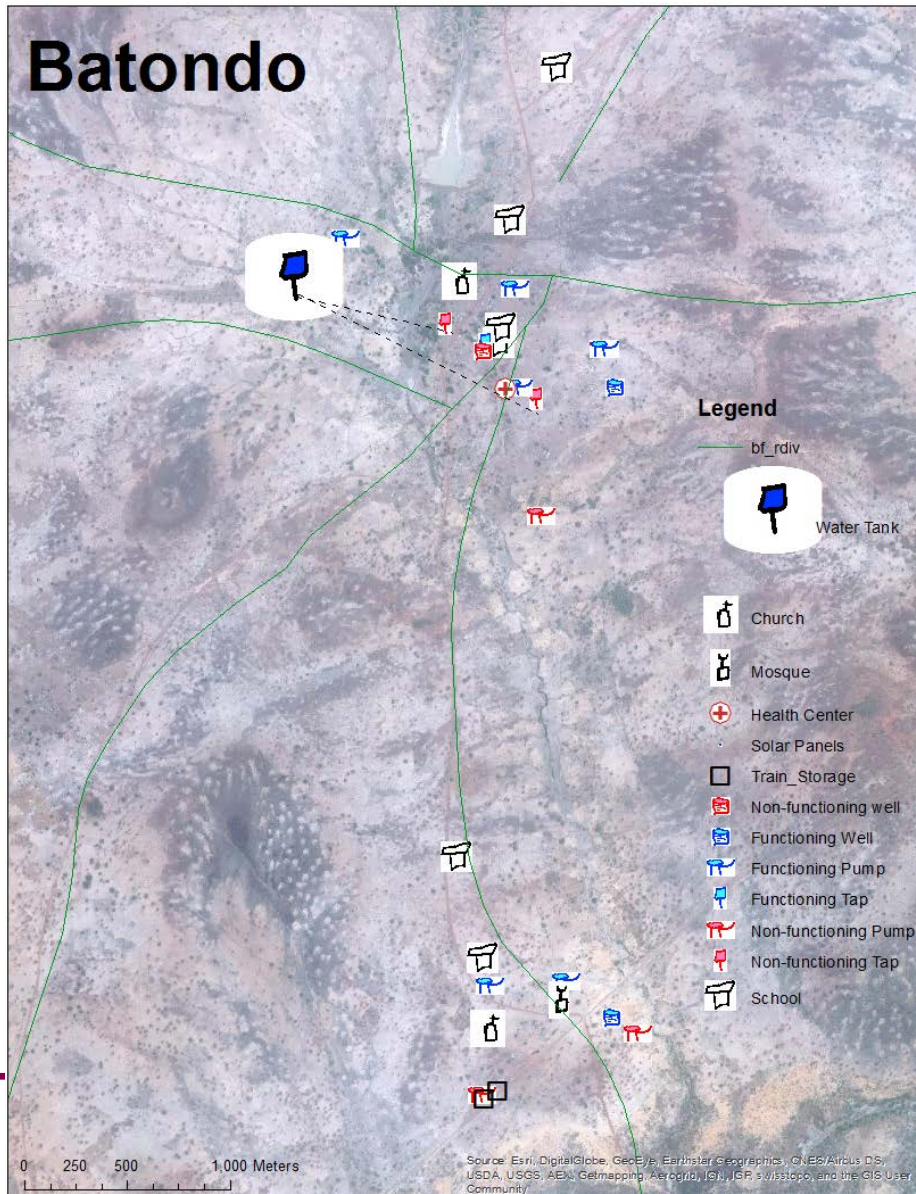
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VT & Winrock: Batando, BF - July 3, 2015

Merged Community Map



Batondo (non-Winrock Community)



Field data collection including:

- discussion groups and community mapping
- GIS data
- Native WWW technology

Interactivity for Tradeoff Analysis

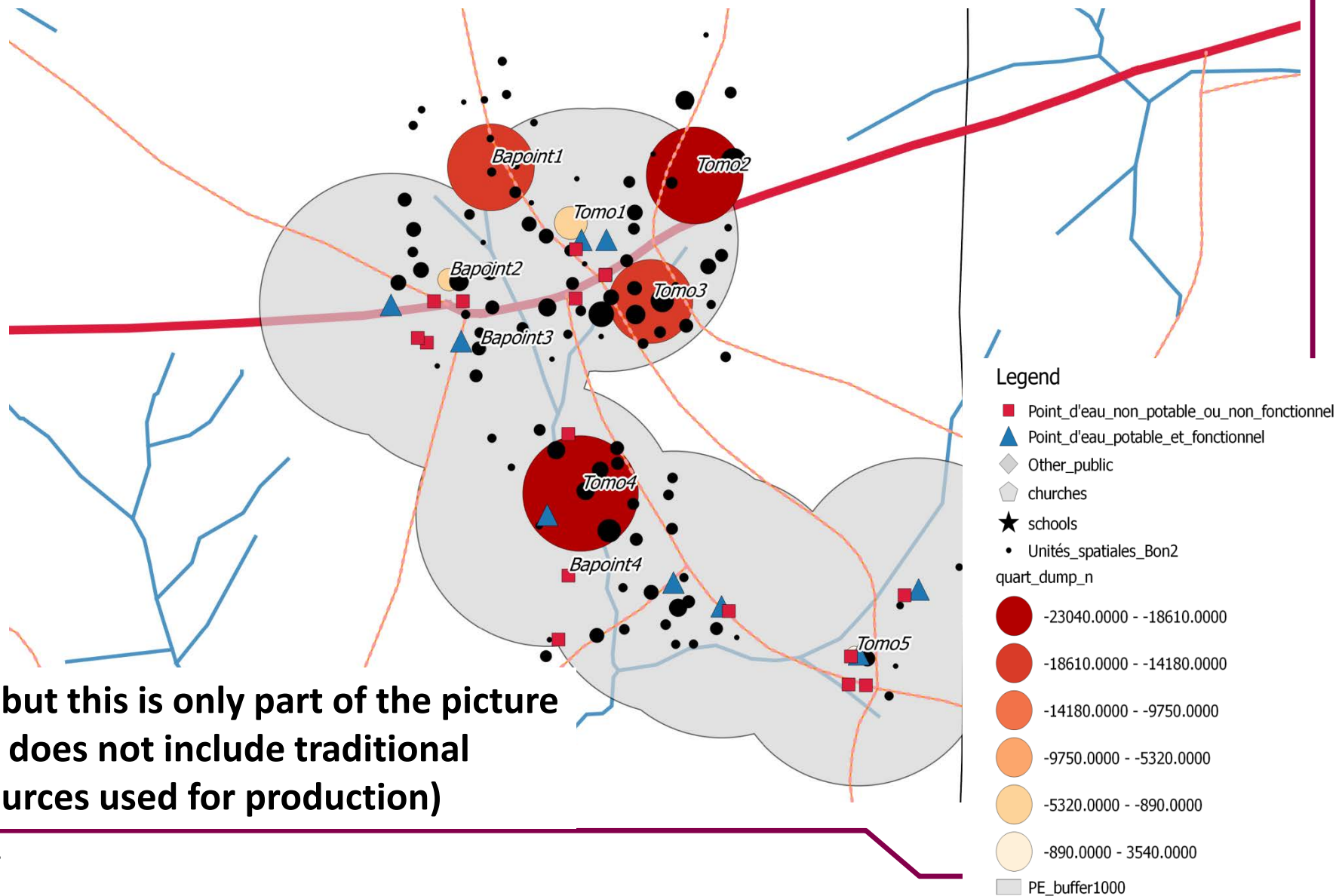
- Decision makers must consider numerous factors and constraints
- Algorithms like geospatial resource allocation can help, but it is a human who decides
- Web-based visualization tools can help
- Examples (OpenLayers) :

- Batondo

- Koukouldi

Quartier	Besoin total (litres)	Sources existantes (litres)	Gap (litres)	X_PROJ	Y_PROJ
Bapoint1	16440	0	-16440	550839	1349734
Bapoint2	8860	7200	-1660	550521	1348880
Bapoint3	6620	7200	580	550754	1348356
Bapoint4	18060	21600	3540	551429	1346631
Tomo1	11240	7200	-4040	551447	1349311
Tomo2	18760	0	-18760	552390	1349672
Tomo3	22940	7200	-15740	552056	1348714
Tomo4	23040	0	-23040	551521	1347255
Tomo5	14640	14400	-240	553604	1346031

Koukouldi (Winrock Community)



... but this is only part of the picture
(it does not include traditional
sources used for production)

Challenges in Visualizing Map Data

- Connecting satellite data and maps with the truth on the ground: views vary by season and are quickly out of date



- Different representations are necessary, such as landmark maps vs. satellite imagery
- Different data access is crucial for different stakeholders

Benefits of Open Standards and Open Software

- Durability
- Portability
- Inter-operability
- International community

Open Standards, Open Source

- International not-for-profits are driving the open standard languages:
 - World Wide Web Consortium (W3C.org)
 - OpenGeospatial Consortium (Opengeospatial.org)
 - Web3D Consortium (Web3D.org)
- Open source software tools support these standards:
 - QGIS, Post-GIS, Geoserver, OpenLayers, X3DOM

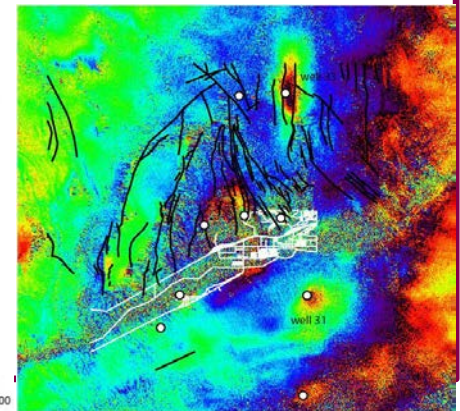
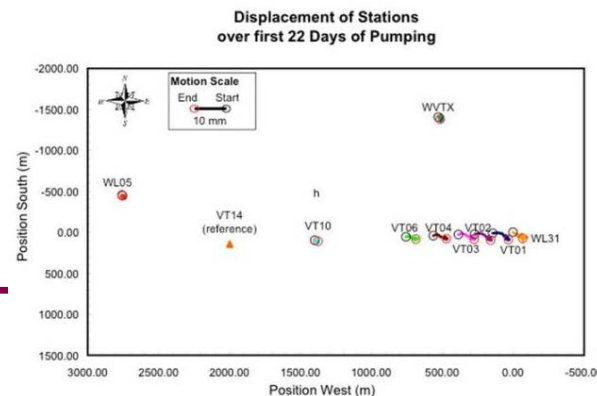
Web-based Visualization Services

- Roles and access levels can be clearly defined
- Smart phones are available and powerful
- Streamlined data entry and sharing
- Centralized data storage, processing, and analysis
- 2.5D and 3D visualization in web browser

Geo and Hydro Modeling

Virginia Tech Capacity:

- Geosciences Department: www.geos.vt.edu
- Computational methods for estimation, interpolation, transport
- Supercomputers and computational specialists scale up resolution from local to planetary scale: www.arc.vt.edu



Questions for the Workshop?

- How could we estimate the yield from traditional water sources and groundwater availability?
- How to share data with NGOs and different levels of government?
- What kinds of decisions about water should be made at each level of government?
- Where is capacity building for water decision making most needed?

LES SOURCES D'EAU NON POTABLE DANS LE VILLAGE DE KOUKOULDI

Productivité des puits communautaires non potables

- Bonne
- Abandonné
- Sec en saison sèche

Nombres de puits traditionnels non potables par Unités Spatiales

- 1-10
- 11-20
- 24

Productivité des puits traditionnels non potables

- Bonne, éboulement, baisse de débit
- Tarrissement, éboulement, baisse de débit
- Tarrissement en saison sèche

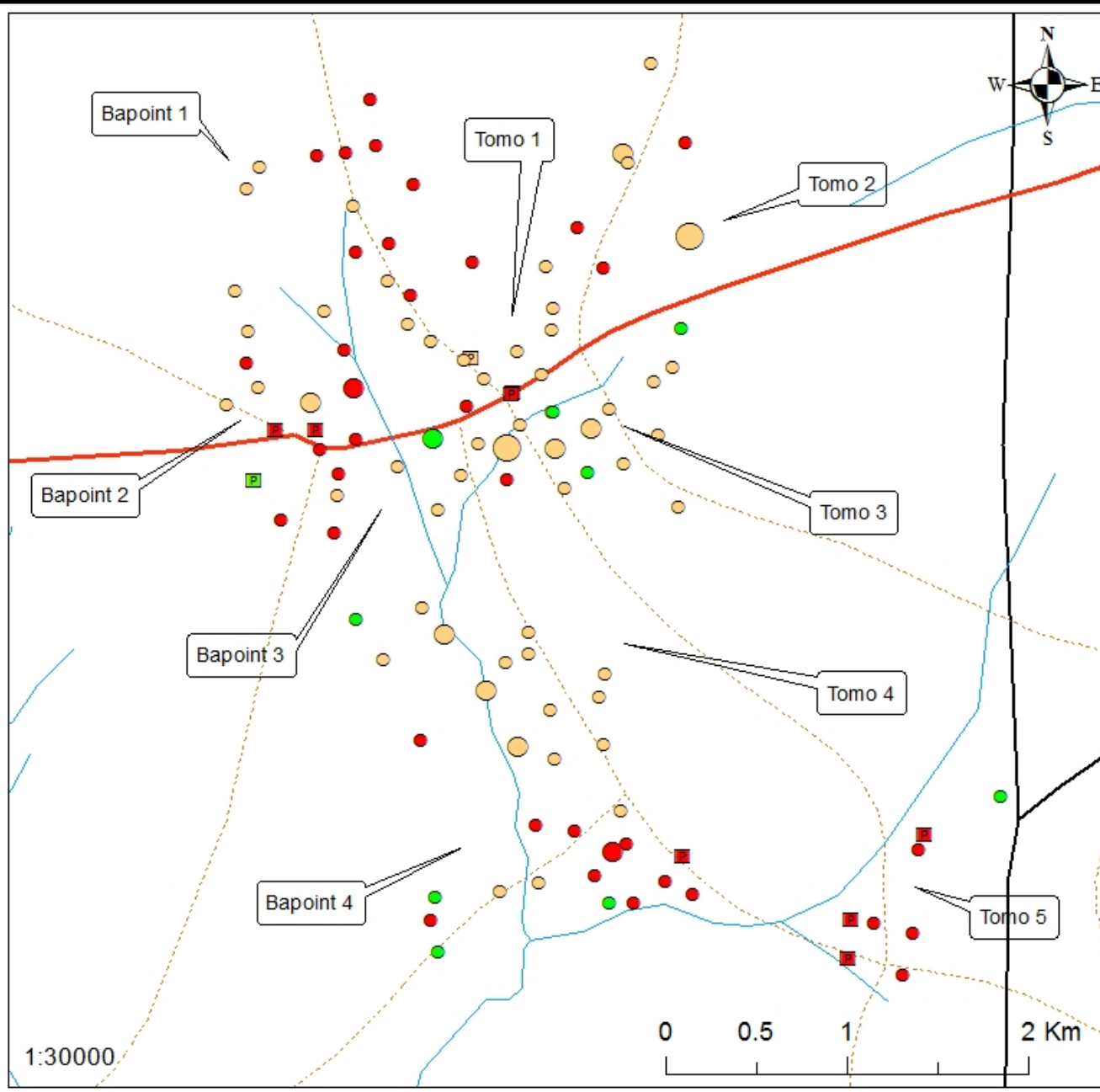
Bapoint 4 Nom de quartier

— Rivière

- - - Piste

— Route nationale

Limite communale



1:30000

0 0.5 1 2 Km



**MERCI POUR VOTRE ATTENTION
QUESTION?**