

Imperial College
London



Organización de las Naciones Unidas
para la Educación, la Ciencia y la Cultura

Workshop Drought Vulnerability

Wouter Buytaert, Boris Ochoa, Barbara Orellana



The science – policy interface

10 – 12.30pm: The science – policy interface in water management

(Wouter Buytaert)

A participatory monitoring network (Boris Ochoa)

Discussion

1.30 – 4pm: Changing Water Cycle: Hydrological Extremes and

Feedbacks (Barbara Orellana)

Discussion and breakout working groups



The science – policy interface in water management

Experiences from the Andes



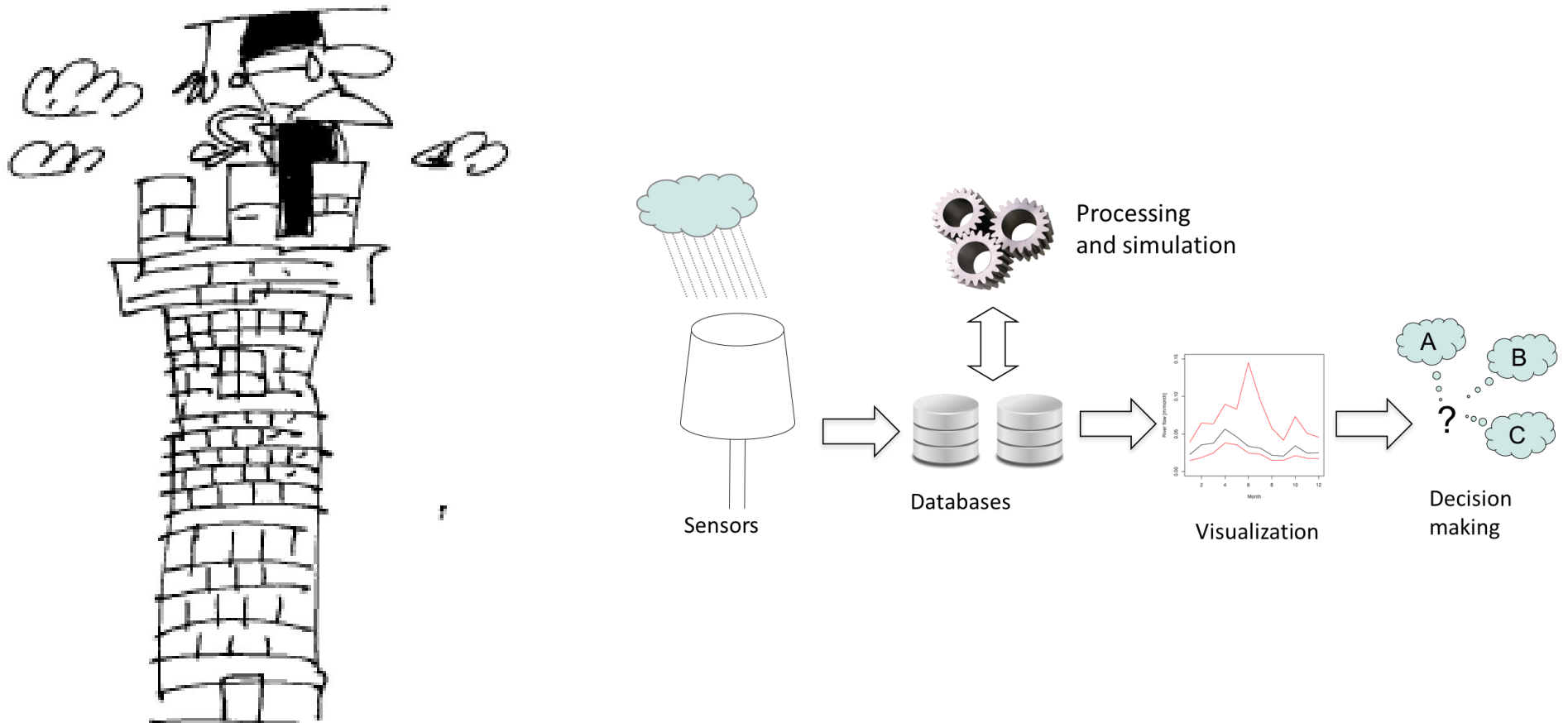
Wouter Buytaert

w.buytaert@imperial.ac.uk

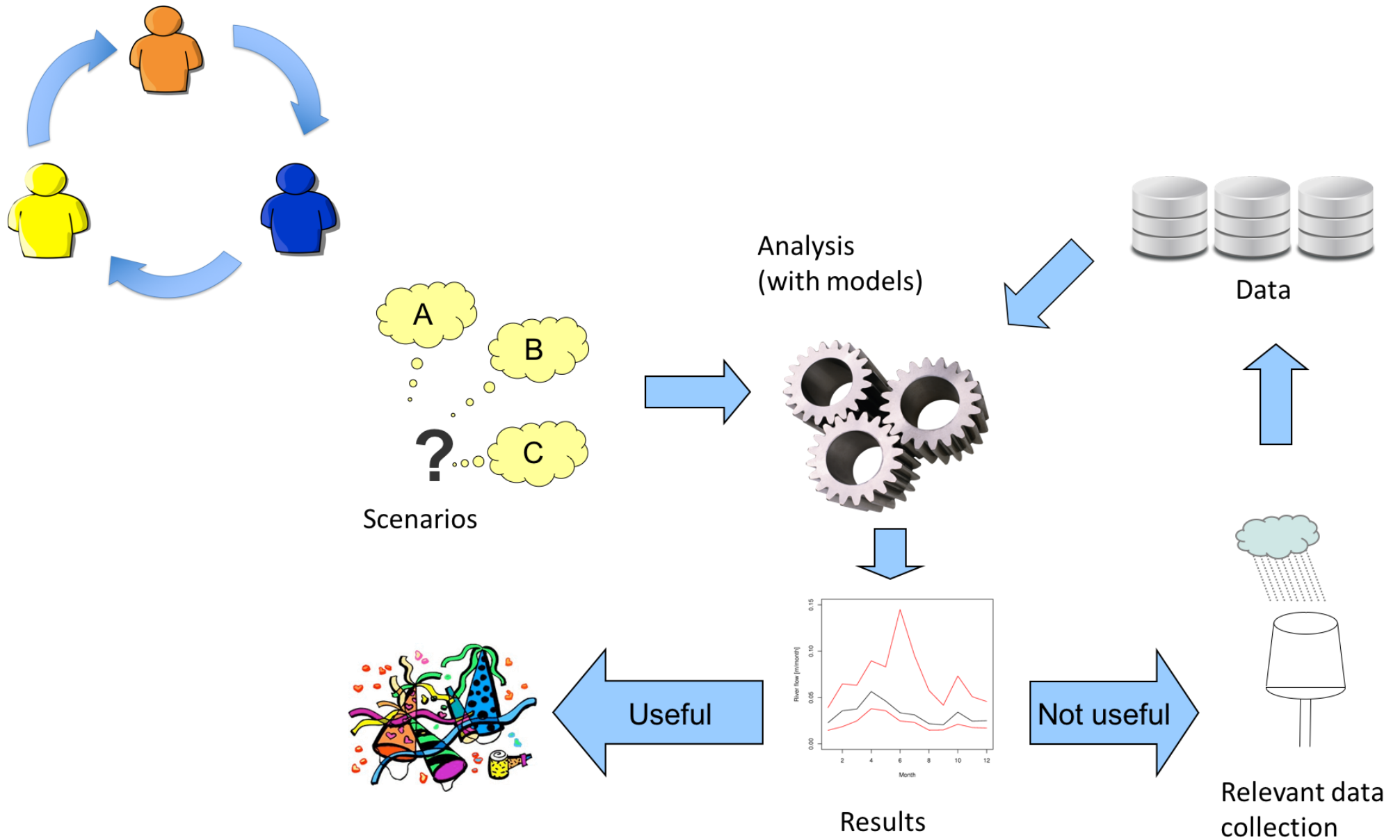


The science – policy interface

The “classic model”

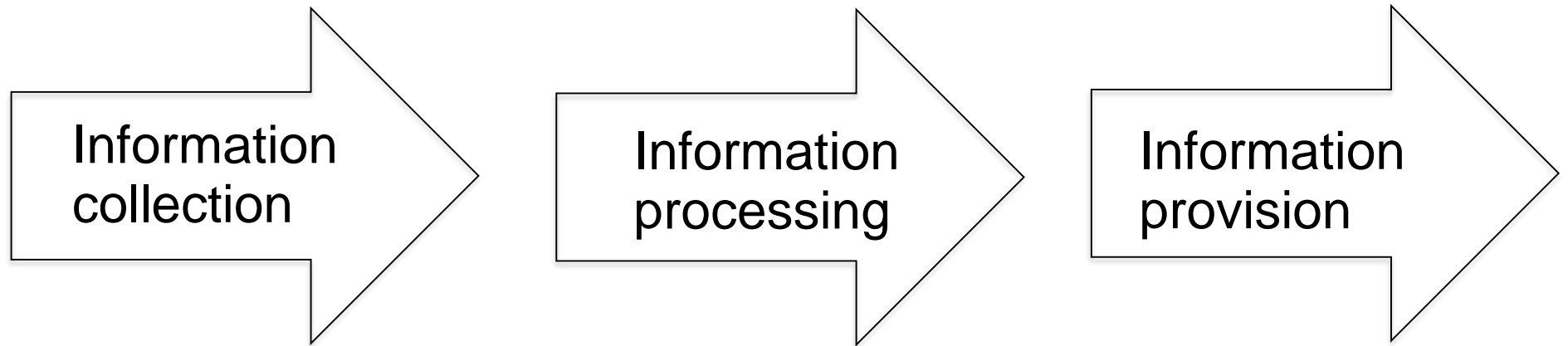


A polycentric, multidirectional and interactive model



Conceptualization

Actionable knowledge generation



Multi-level
monitoring, data
collection &
citizen science

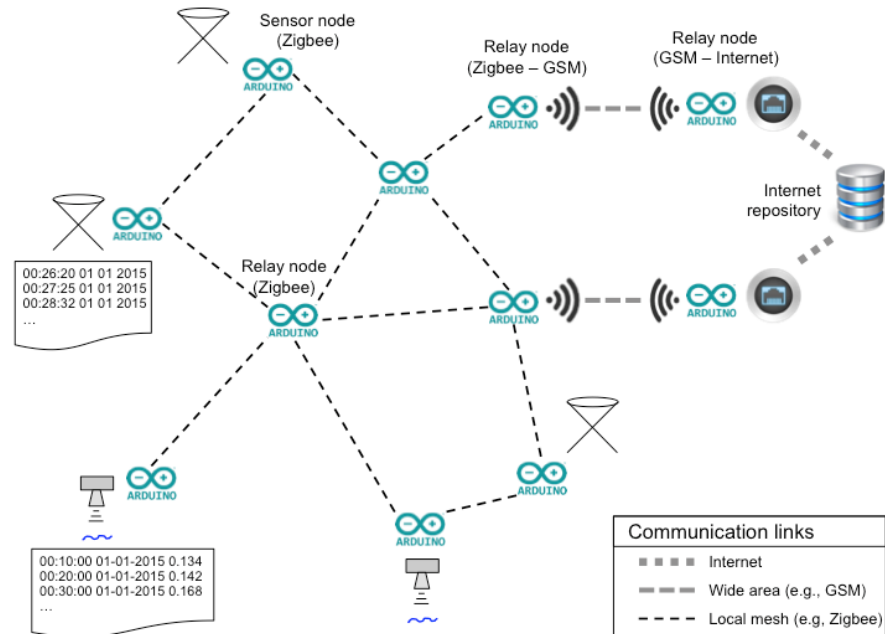
Modular and
distributed workflow
construction,
simulation, and
prediction

De-centralized
communication and
policy support
systems

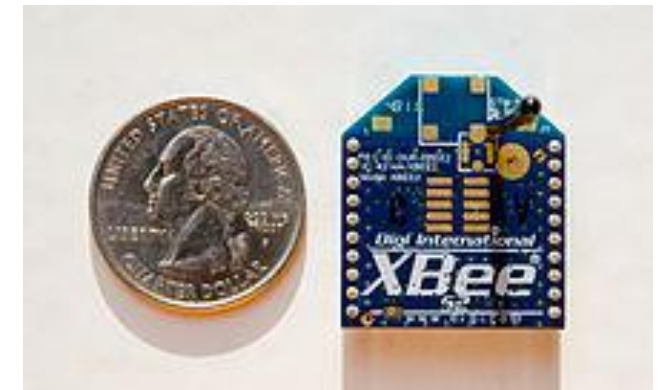
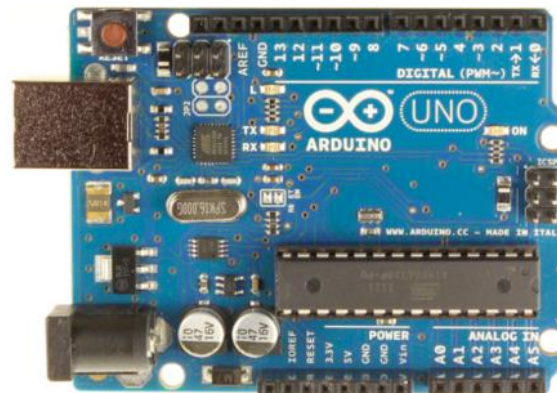
Polycentric governance of natural resources

New technologies for environmental sensing

Sensor networks

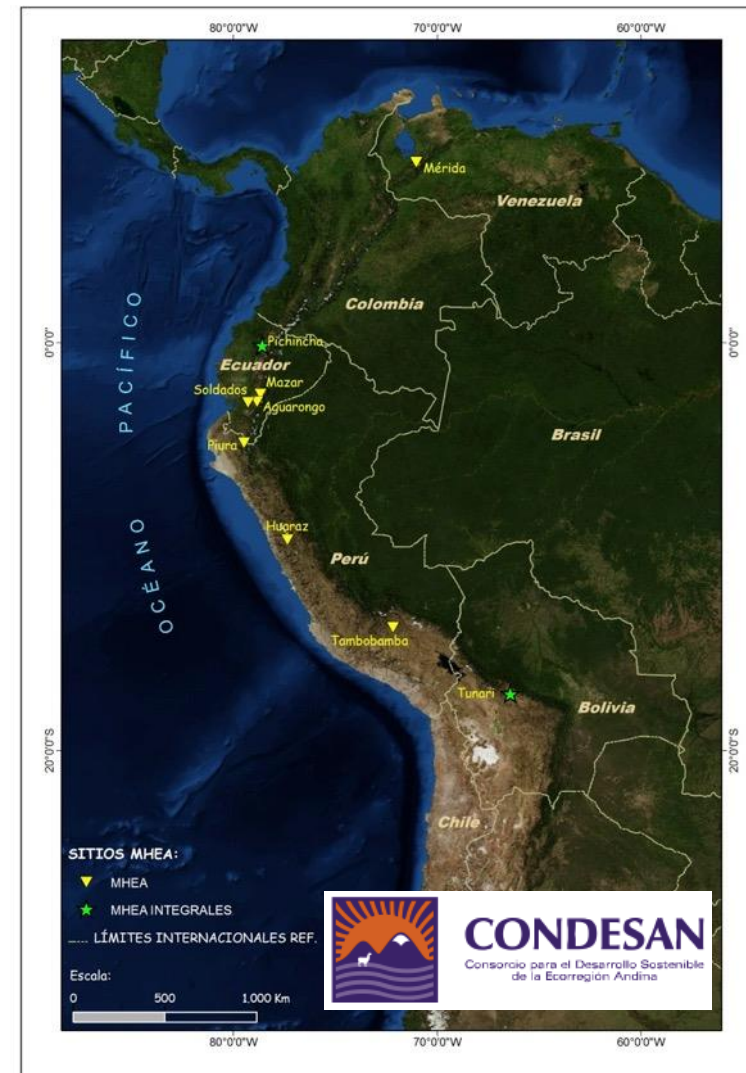


oxfloodnet.co.uk



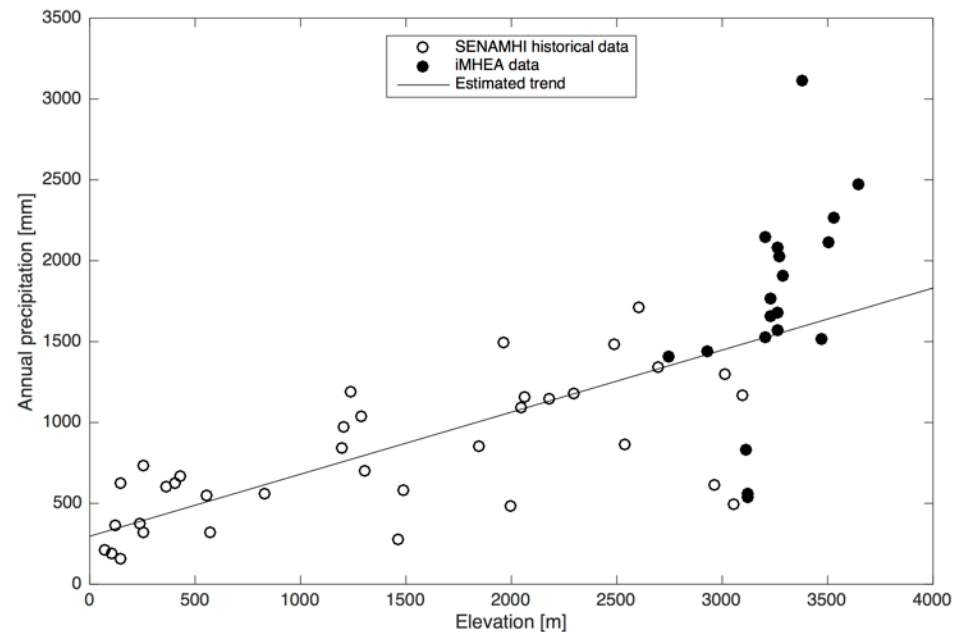
Participatory monitoring

- Precipitation and river discharge
- Responding to local questions on land-use impacts
- Local buy-in and participation



Information collection: new institutional dynamics

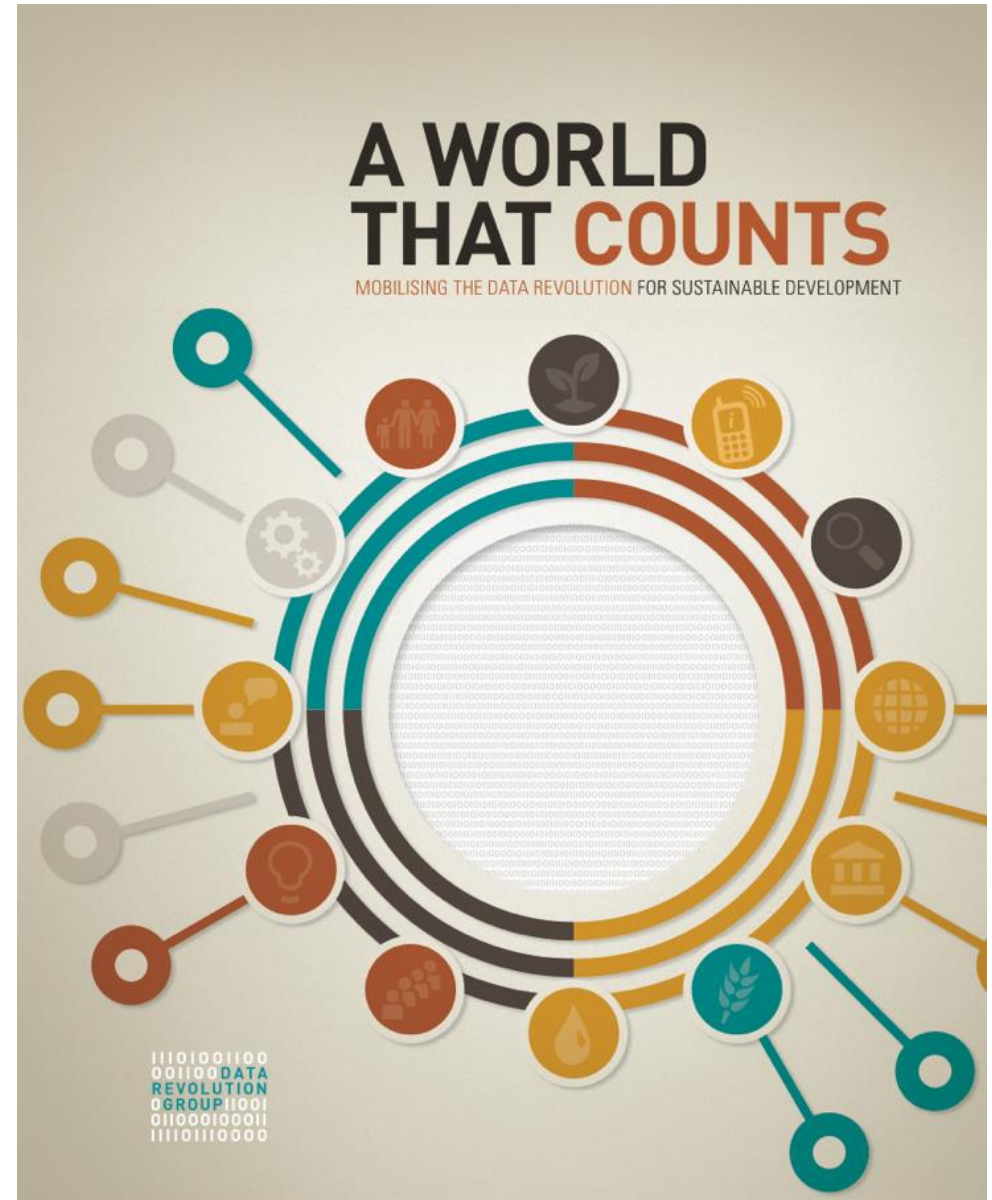
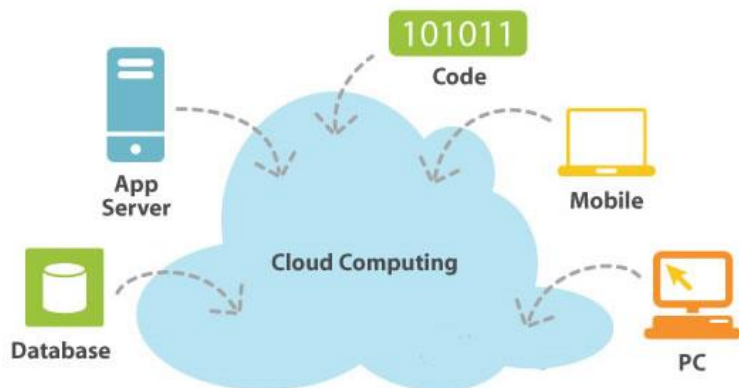
- Potential to break open traditional and formal monitoring silos
- Multilevel, multipurpose
- Complementarity vs. resilience
- Adaptive governance
- Trust, credibility, acceptance
- “Polycentric monitoring”



Buytaert, W., Dewulf, A., De Bièvre, B., Clark, J., & Hannah, D. M. (2016). Citizen Science for Water Resources Management: Toward Polycentric Monitoring and Governance? *Journal of Water Resources Planning and Management*, 01816002.

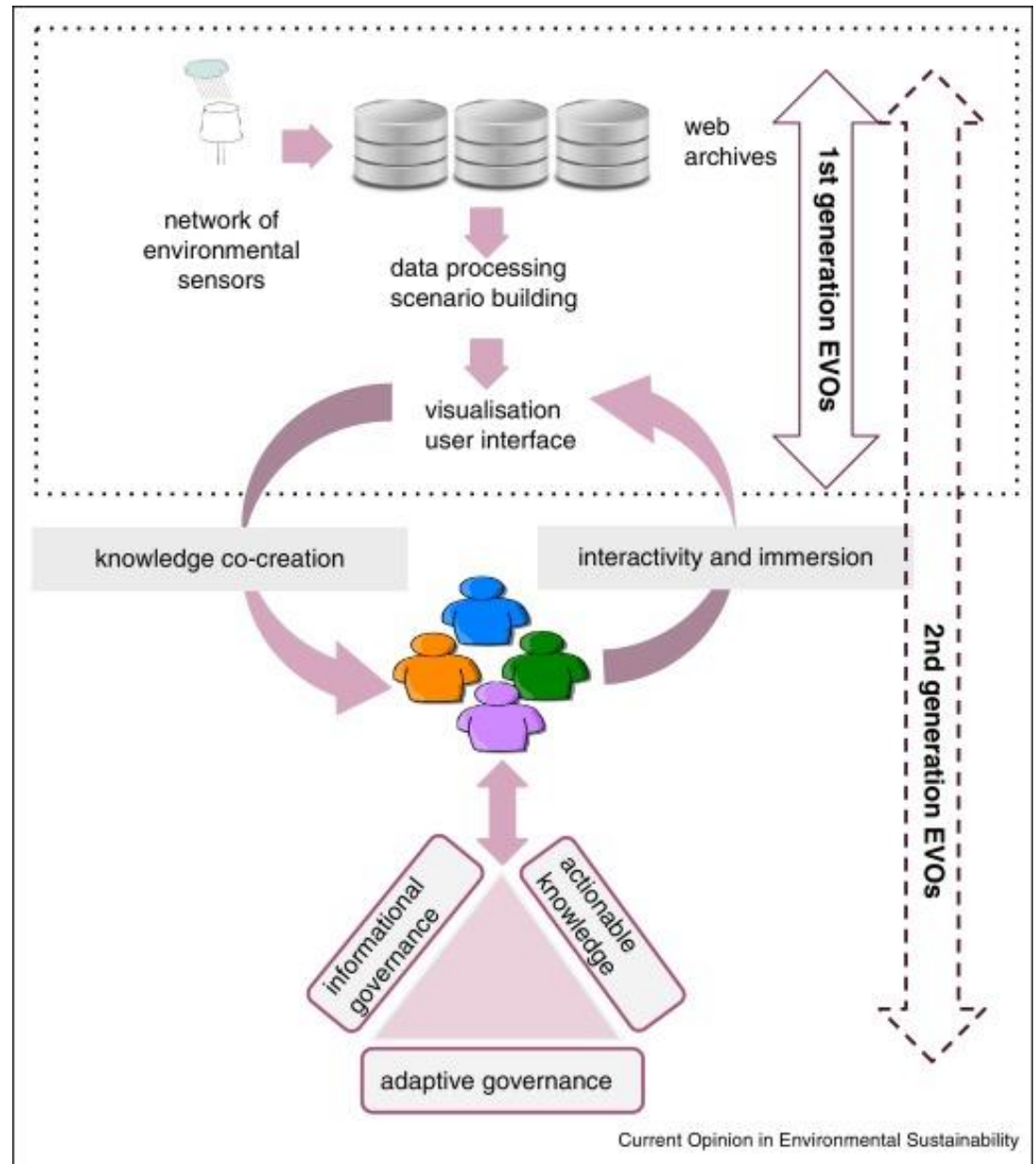
Information processing: new technologies

- web technologies
- Cloud computing
- Big data
- Web-based processing and modelling
- Model coupling, uncertainty analysis, uncertainty propagation



Information processing: new policy dynamics

- ICT, web technologies
- Multilevel, multipurpose, multidirectional
- Integration of heterogeneous data & knowledge
- Polycentric models of data curation, knowledge co-generation, and governance





Simulating the impact of land-use changes

This system allows you to simulate the impact of land-use changes in the Pacaipampa basin. Select the land-use scenario with the sliders below and click the simulation button. Simulations are performed in real-time using a hydrological model (topmodel).

Basin characteristics

Land use

Change the sliders from top to bottom. You cannot change the last slider. Instead change the other three.

- Native Forest: 15%
- Pine forest: 0%
- Grassland: 80%
- Cultivation: 5%

You can also call the modelling server directly using [this link](#) or pasting the following url in your browser:

`http://paramo.cc.ic.ac.uk/espa/server?
Service=WPS&Version=1.0.0&Request=GetCapabilities`

Note: you will need to authenticate first.

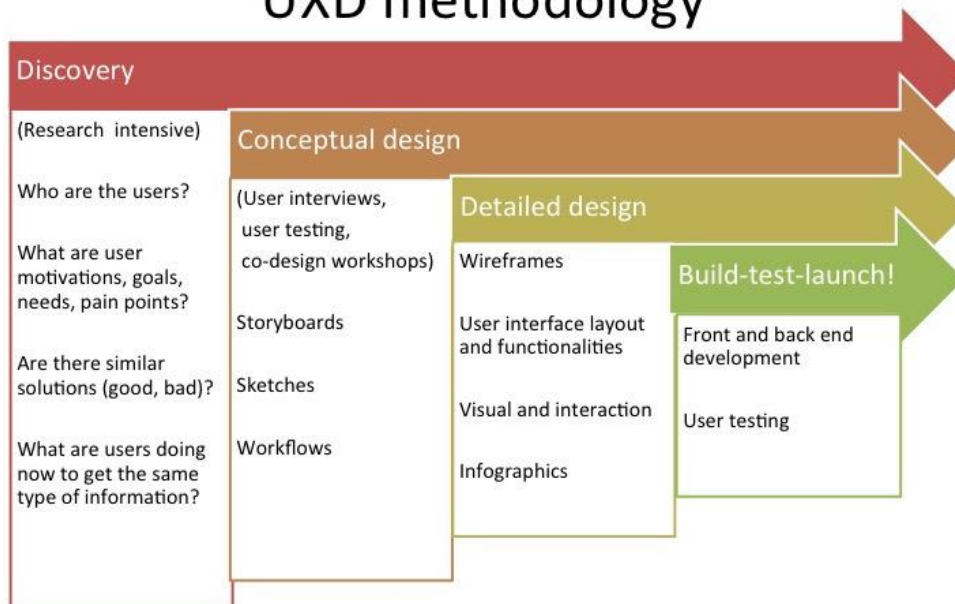


Information provision

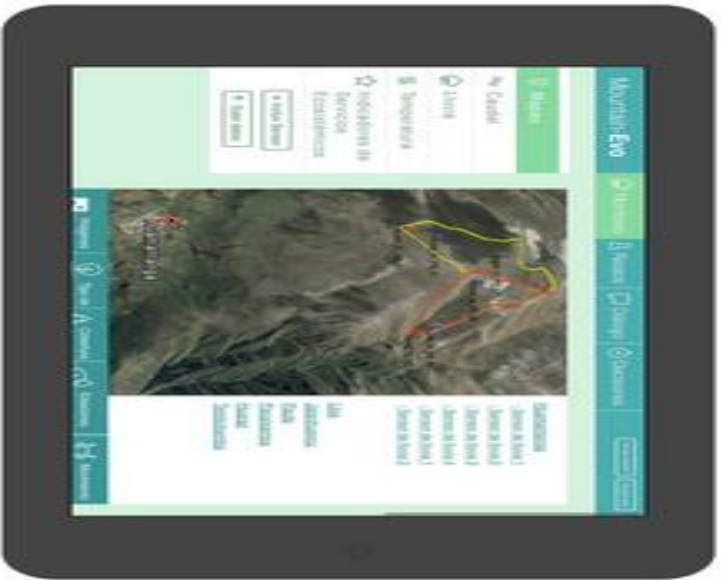
- Visualization & communication
- User interface design
- Scenario building



UXD methodology



Technological opportunities



This screenshot shows the 'MyWorld-Evo' app interface with a news article titled 'Guía para la técnica de Cusco'. The article includes a photo of a person working in a field and text describing the project. The sidebar menu on the left lists various categories: 'Inicio', 'Mapa', 'Campaña', 'Noticias', 'Ayuda', 'Inicio', 'Mapa', 'Campaña', 'Noticias', 'Ayuda'.

Guía para la técnica de Cusco

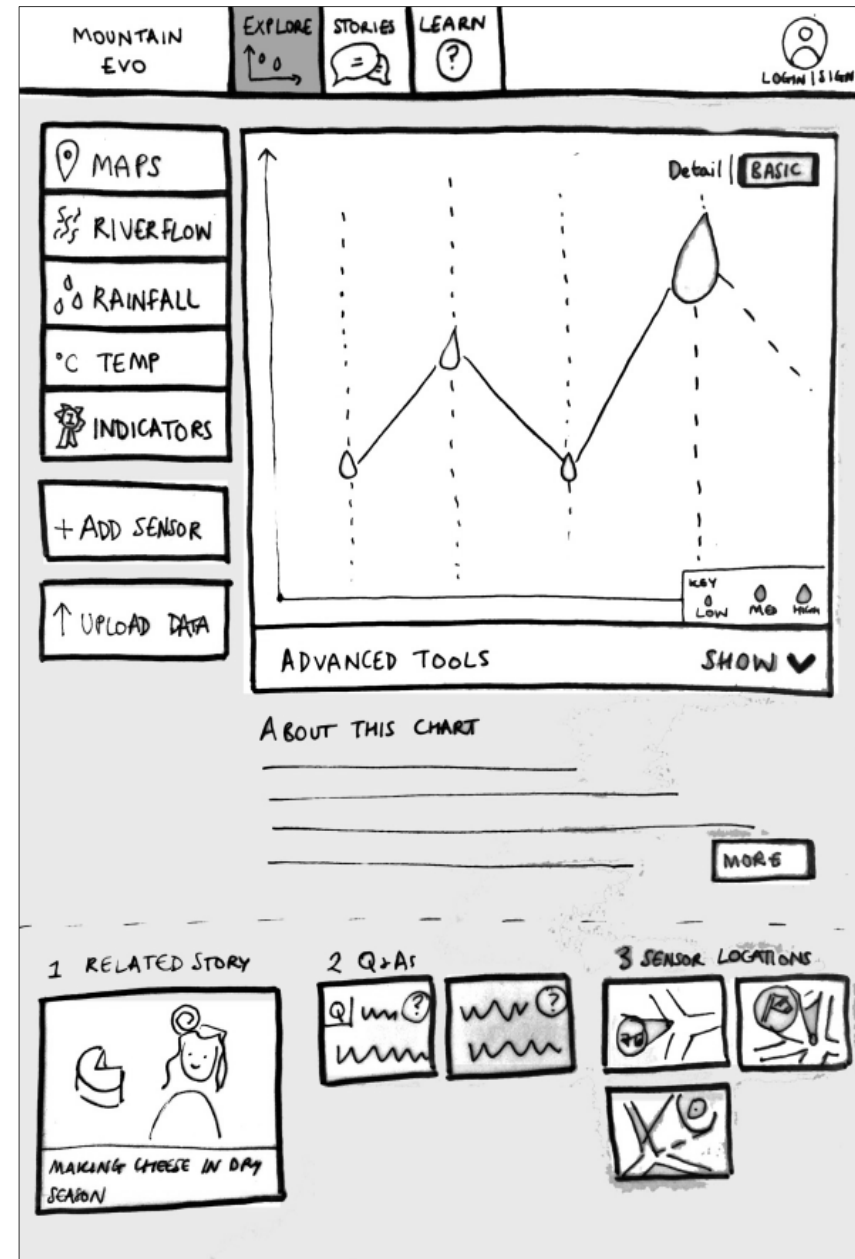
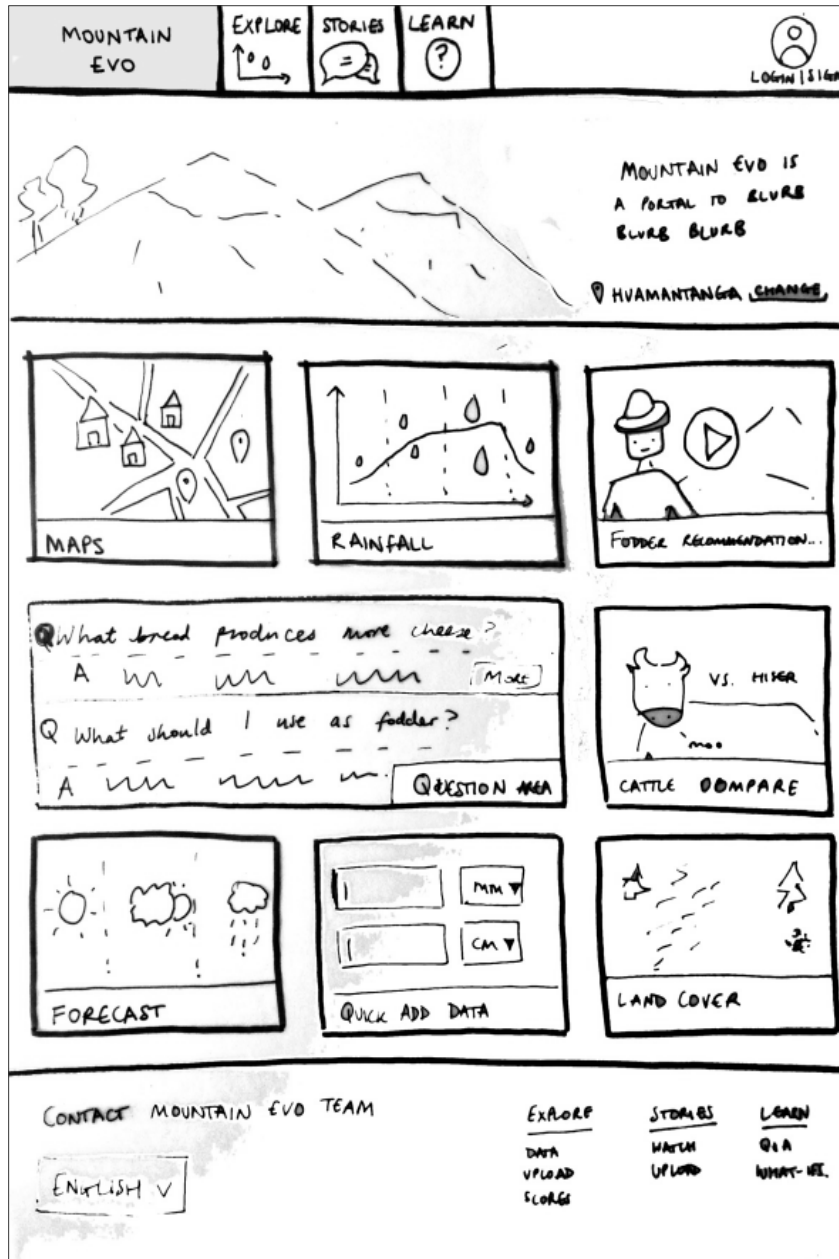
Un proyecto innovador de agua para el cultivo de papa en la zona de Cusco. El proyecto consiste en la implementación de sistemas de riego por goteo en las zonas de cultivo de papa en la zona de Cusco. El proyecto tiene un costo de 100 millones de dólares y se espera que genere un impacto positivo en la producción de papa en la zona de Cusco.

This screenshot shows the 'MyWorld-Evo' app interface with a video player titled 'Conoce más sobre el video'. The video player shows a person standing in a field. The sidebar menu on the left lists various categories: 'Inicio', 'Mapa', 'Campaña', 'Noticias', 'Ayuda', 'Inicio', 'Mapa', 'Campaña', 'Noticias', 'Ayuda'.

Conoce más sobre el video

El video muestra a un agricultor trabajando en su campo de papa en la zona de Cusco. El video es parte de una campaña de promoción de la papa en la zona de Cusco.

User experience design







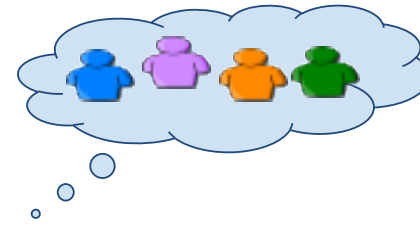
Data possibilities



Technological possibilities

Conceptual design

- DSS type
- Information base
- Interactivity
- Visualisation



Design space

User space

Iteration

Build!

Deploy

User testing

Actor-network analysis

- Roles and relations
- Interests
- Decision making processes and goals
- Knowledge creation and exchange



User requirements

- useful information
- usable information
- exchangeable information

Phase 1: Define

Phase 2: Refine

Phase 3: Deliver

Challenges

- Leveraging new technologies
- Ensuring a user centered approach
- Recognizing the polycentric nature of systems
- Adaptive governance & knowledge co-generation





Thank you



Zed Zulkafli, Bhopal Pandeya, Sam Grainger, David Hannah, Julian Clark, Art Dewulf, Timos Karpouzoglou, Johan Bastiaensen, Gert Van Hecken, Achim Schultze, Bhanu Neupane, Mark Foggin, Chris Hergarten, Munuvar Zhumanova, Aiganysh Isaeva, Deepak Paudel, Keshav Sharma, Jagat Bushal, Praju Gurung, Santosh Regmi, Tammo Steenhuis, Seifu Tilahun, Tilashwork Alemie, Bert De Bièvre, Cecilia Sandoval, Luis Acosta, Miguel Saravia

w.buytaert@imperial.ac.uk

Questions

- What are major gaps of data in your decision-making field and how can they be addressed?
- How are raw data processed in your decision-making field and how can this processing be made more actionable and relevant?
- How is information communicated in your field and how can these practices be improved?