Mobilizing mass action through mobile devices: Challenges and opportunities for science, policy and governance

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Outline

1. Global challenges and opportunities
2. Theory and practice of citizen science
3. Finding solutions within a new epistemology
Our Challenges

Consumption as if we lived on 1.5 planets

Consuming beyond our means

Biodiversity loss

Climate change
Living as if we owned an extra planet or two
We need to produce more with less

By 2050 ...

70% more food production will be needed while climate change dries river basins and increases the pressure on crop yields.

3.5 billion people in water-stressed river basins by 2025
Half of all higher animal species lost since 1970s

Total Living Planet Index = -28%
To address these problems we need...

**a systems approach ...**

**at scale**

To meet the urgency of the modern environmental challenge, we need solutions that can deliver at scales of at least:

- **1 million**
  - hectares of habitat protected
  - tonnes commodities certified as sustainable
  - tCO2e emissions reduced
  - people informed and active

- **$ billion**
  - financial flow influenced
We have some solutions

**Protected Areas**
Amazon Region Protected Area Program, Brazil
Results: 52 M ha, 1.2 B CO2e ↓, $80 M finance

**REDD+ / Green Development**
Mai Ndombe Emission Reduction Program, DRC
Planned Results: 13 M ha, 29 M CO2e ↓, $176 M

**Market Transformation**
Certification Schemes (FSC, RSPO etc)
Results (FSC): 183 M ha of forest certified

**Catchment Management**
Danube River Basin Commission
Results: A cleaner, swimable river
And there is no shortage of money

New financing for climate and sustainable development

<table>
<thead>
<tr>
<th>Public climate finance (REDD+ / Adaptation, Land degradation neutrality)</th>
<th>$7-9 billion allocated since 2007.</th>
<th>$20-30 billion potential from Paris outcome 2015</th>
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<tbody>
<tr>
<td>Private finance (e.g. Green Bonds, banking standards, ESG)</td>
<td>$37 billion in green bond issuances in 2014 and accelerating</td>
<td></td>
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<tr>
<td>Impact investing / entrepreneurs</td>
<td>$11 billion estimated value in 2014</td>
<td>Impact entrepreneurialism has the potential to produce local solutions faster and more sustainably.</td>
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But where is technology among these solutions?

What if we could harness the energy of a billion people for the whole year rather than just an hour?
Can mobile technology help transform how we live on this planet?
Citizen science is growing exponentially
Mobile phones are a truly disruptive technology

What is the potential when we combine citizen science and mobile tech?
Global Problems: Air Pollution

Solution: iSPEX

iSPEX – simple attachment to iPhones to measure aerosol optical thickness (size, concentration)
Global Problem: Natural Disasters

Solution: MicroMappers

MicroMappers UAV tablet app – for rapid identification of areas of damage
Global Problems: Food Insecurity and Malnutrition (Vulnerability)

Solution: GeoODK

Satida Collect – app to gather household data on the ground and visualize drought info

Global Problems: Disagreement between land cover products/lack of in-situ data

Solution: 10,000+ Registered users

http://www.geo-wiki.org/

→ A tool for: visualization, validation, crowdsourcing
Global Problem: The need for improved land cover and other new global datasets

Improving Land Cover via Geo-Wiki

Field Size

Wilderness

Forest Cover

Hybrid Land Cover

Fritz et al. (2015) in Global Change Biology

See et al. (2015) in Technological Forecasting and Social Change


See et al. (2014) in ISPRS Photogrammetry and Remote Sensing
Global Problem: Locating the world’s croplands

Solution: Cropland Capture

Entering the World of Mobile Serious Games

About Cropland Capture

By 2050 we will need to feed more than 2 billion additional people on the Earth. By playing Cropland Capture, you will help us to improve basic information about where cropland is located on the Earth’s surface. Using this information, we will be better equipped at tackling problems of future food security and the effects of climate change on future food supply.

Get involved and contribute to a good cause! Help us to identify cropland area!

http://geo-wiki.org/oldgames/croplandcapture
Global Problems: Deforestation, Human Impact, Natural Disasters, Water Scarcity

Solution: Picture Pile

http://geowiki.org/games/picturepile
Global Problem: Illegal Logging

Solution:

Moabi DRC is an independent initiative to collaboratively monitor natural resource use in the Democratic Republic of the Congo.
Unclear land tenure leads to:
- Low productivity
- Environmental degradation
- Corruption and bribes
- Unsafe livelihoods
- Forced evictions.

75% of world land is unregistered

Land Tenure
Many countries are recognizing the economic value of clarifying land tenure.

Traceability
Major consumer brands increasingly need to prove sustainability in supply chains.

Two services in one app

A mobile platform that allows farmers and communities to affordably map their land and begin to unlock its value.
LANDMAPP
For farmers
Land profiles with crop metrics
Land certificates at low price
Microfinance access
LANDMAPP

For buyers

Farmer dashboards

Product dashboards

Village and area maps
Some Lessons from Mobile Citizen Science

- Think carefully about how best to engage citizens – media, feedback and dialogue, gamification, incentives (sometimes)

- **Design for scaling** – pilots, stress testing

- Focus on the **big problems and the big solutions**

- **Build with business** people from the start – they know about scale!

- Build **platforms** as well as products
And three questions to you

• How can you engage citizens in helping to improve your science and policy making?

• Where can you combine your efforts with others and rethink for scale?

• Are you talking to business people, marketers and communicators to sell, systematise, fund and scale your science?
The epistemological shift
The epistemological shift
The epistemological shift
“Had we but world enough, and time”
thank you
Recap: Questions to you

• How can you engage citizens in helping to improve your science and policy making?

• Where can you combine your efforts with others and rethink for scale?

• Are you talking to business people, marketers and communicators to sell, systematise, fund and scale your science?