International Institute for Applied Systems Analysis
IIASA www.iiasa.ac.at

science for global insight

The Potential of Crowdsourcing and Mobile Technology to Support Flood Disaster Risk Reduction

Linda See, Ian McCallum, Wei Liu, Reinhard Mechler, Adriana Keating, Stefan Hochrainer-Stigler, Junko Mochizuki, Steffen Fritz, Sumit Dugar, Michael Arestegui, Michael Szoenyi, Juan-Carlos Laso-Bayas, Peter Burek, Adam French, and Inian Moorthy

ZURICH

Neogeography
UGC
Extreme citizen science
GeoWeb
VGI
PPGIS
Citizen science
Geocollaboration
Web mapping
Crowdsourcing
Collaborative mapping
Participatory sensing
PPSR

citizen cyberscience centre

Citizen Scientists League

citizen cyberLab

project noah

ACT Centenary BioBlitz

Audubon Christmas Bird Count

iSpot your place to share nature

ExCiteS

JAY WATCH A CITIZEN-SCIENCE PROGRAM

FROG WATCH USA

Citizen Science Alliance

eye on earth

ZOONIVERSE Real Science Online

d.e.w. Digital Earth Watch

socientize citizen science projects

Reef Check Worldwide

Dolphin Watch Junior

COBWEB Citizen Observatory Web

GEO-Wiki

eBird

European Citizen Science Association

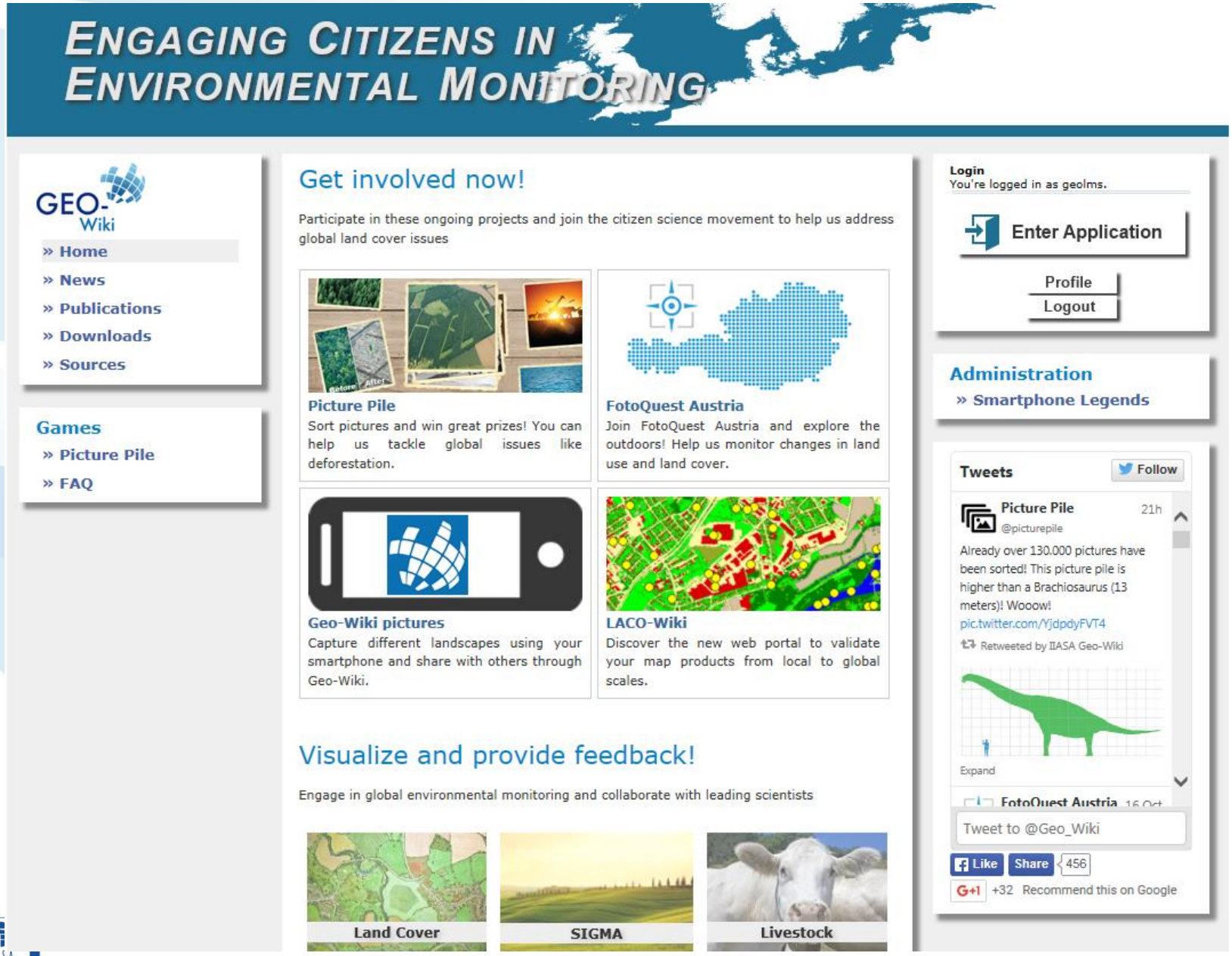
science for citizens .net

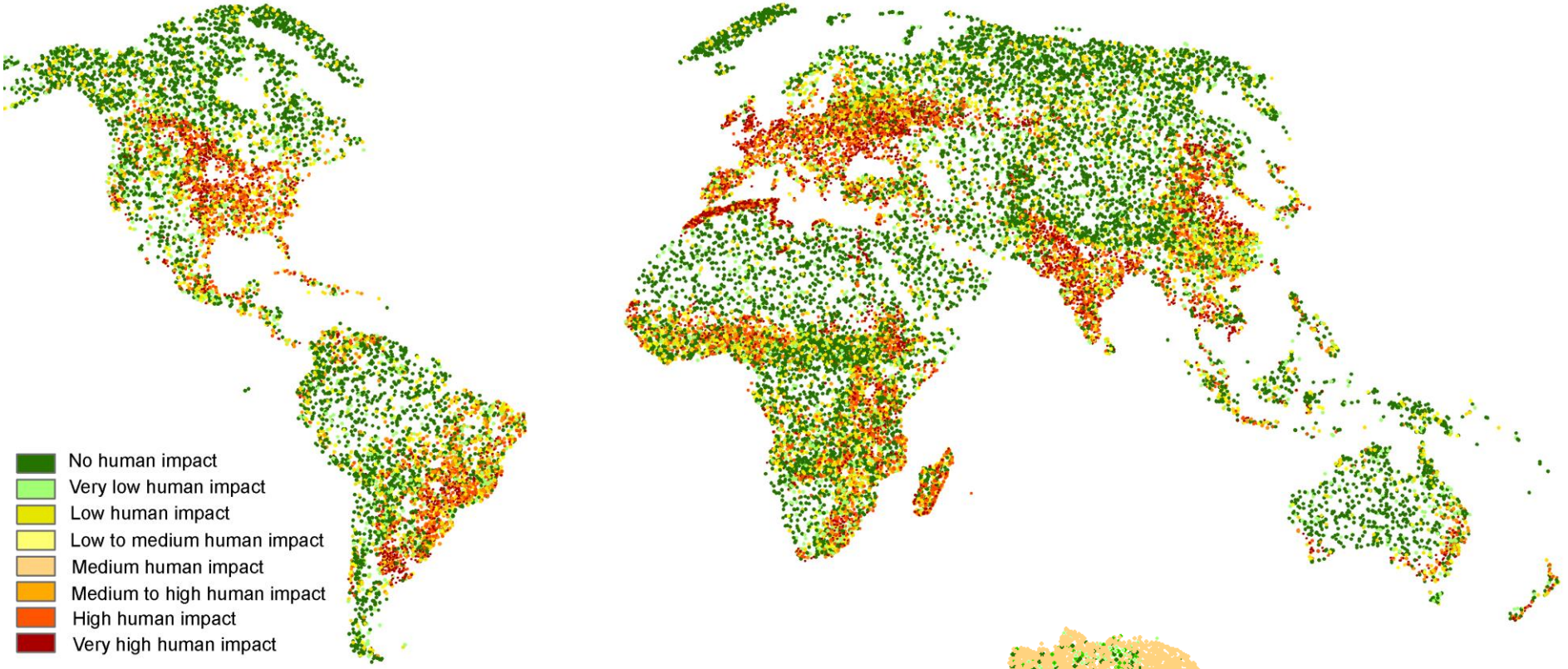
Citizen Science OPT Foundation

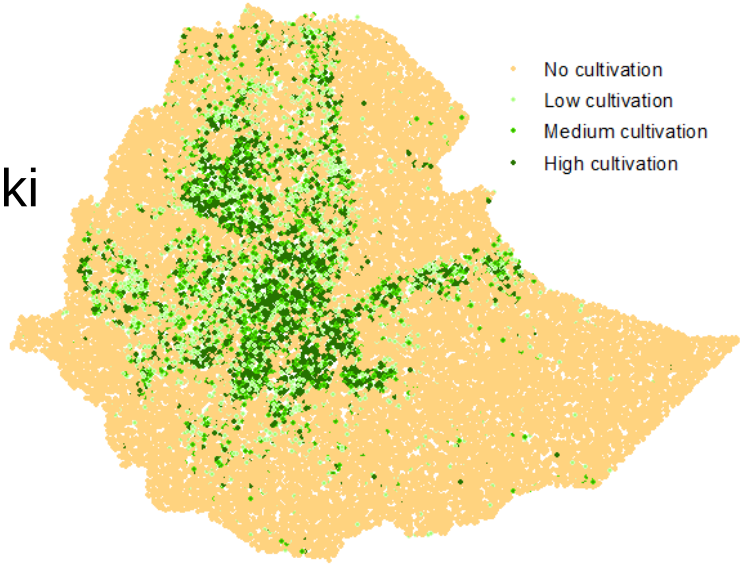
fold it Solve Puzzles for Science

IIASA

http://www.geo-wiki.org







- Satellite image interpretation via Geo-Wiki
  - ~50K observations of human impact
  - ~80K observations of cultivation
  - ~4.6 million observations of cropland

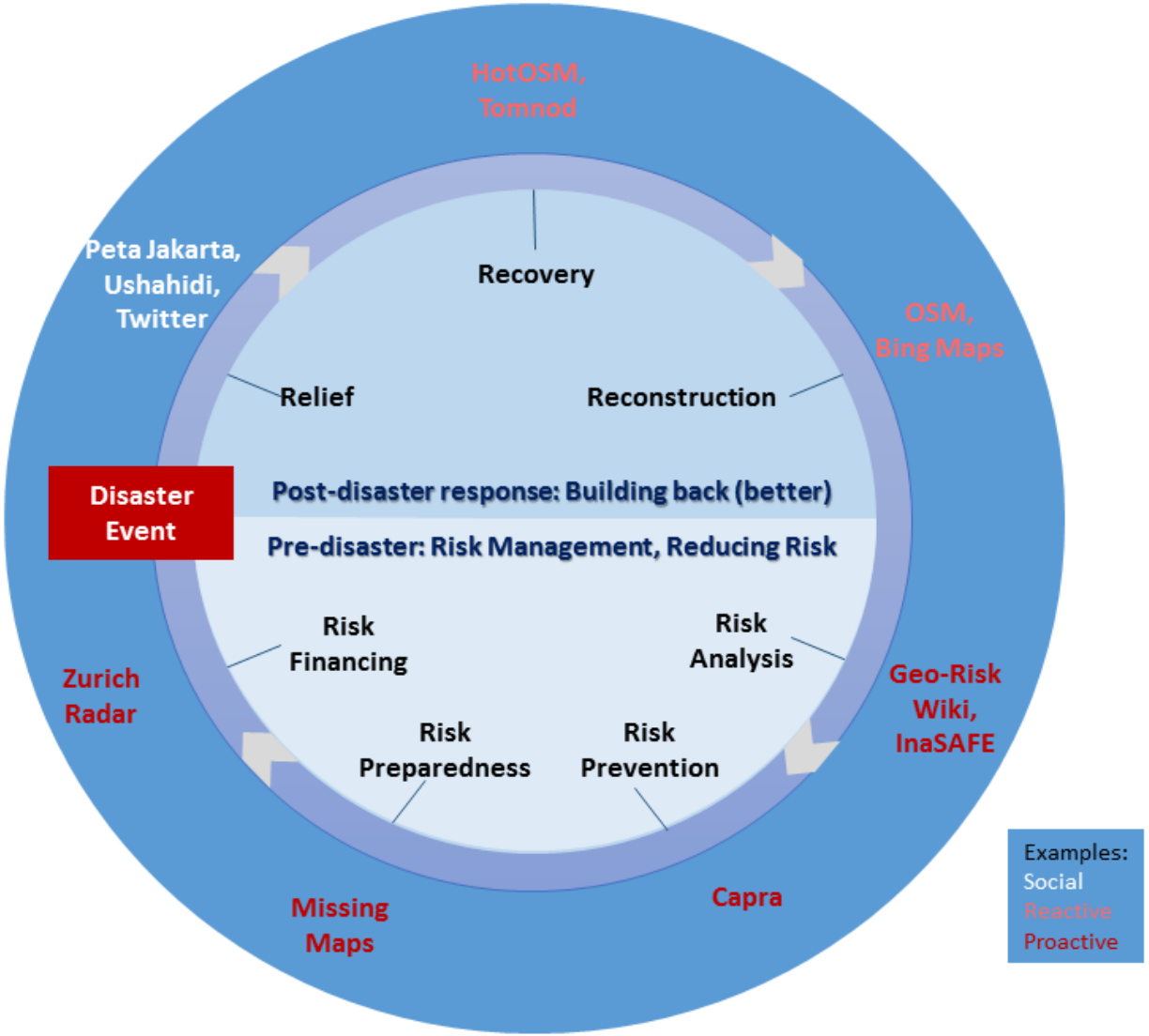
HOTEL
HOTEL
AM
PEGEL

More mobile phones than people and multiplying 5Xs faster than we are

LPG
3
TOKIC

gettyimages
CHRISTOPHE ARCHAMBAULT

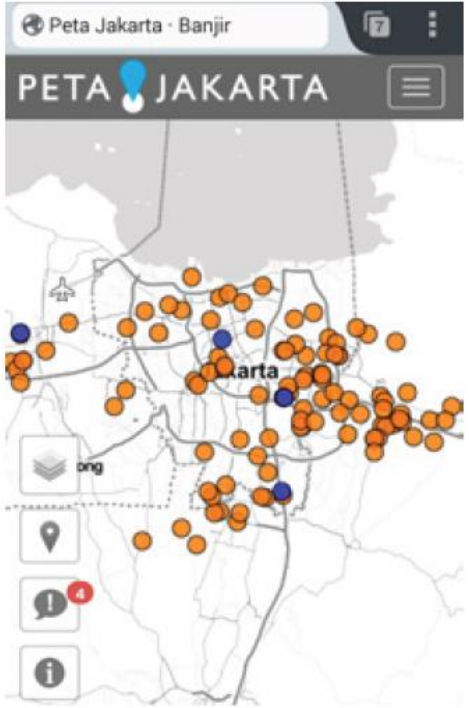
Disaster Risk Management

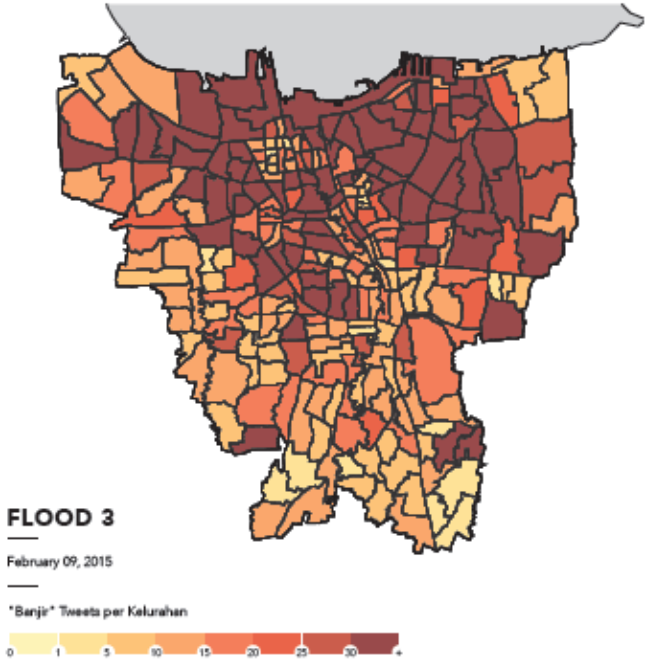


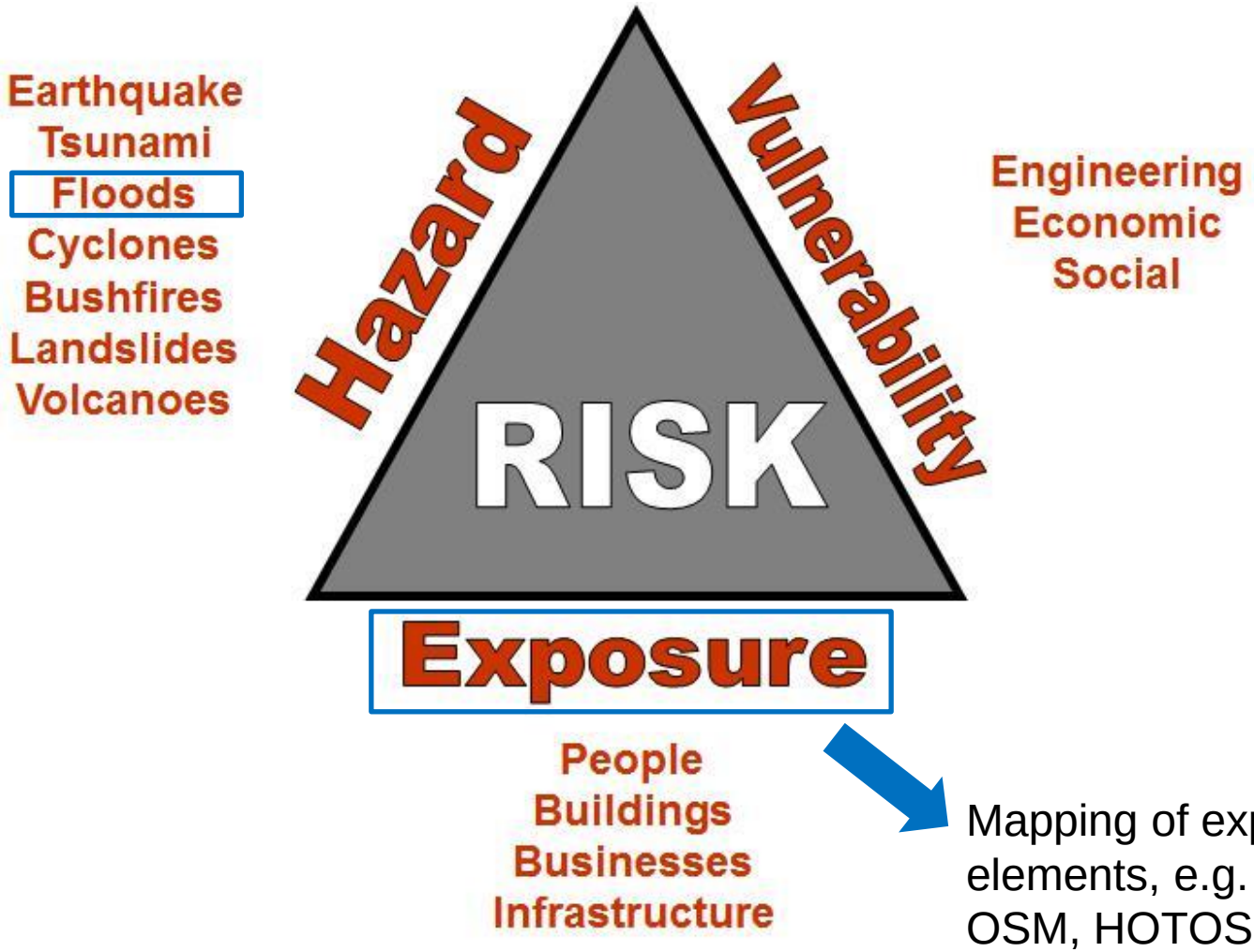
Collecting flood heights
and flood occurrence
e.g. PetaJakarta Twitter

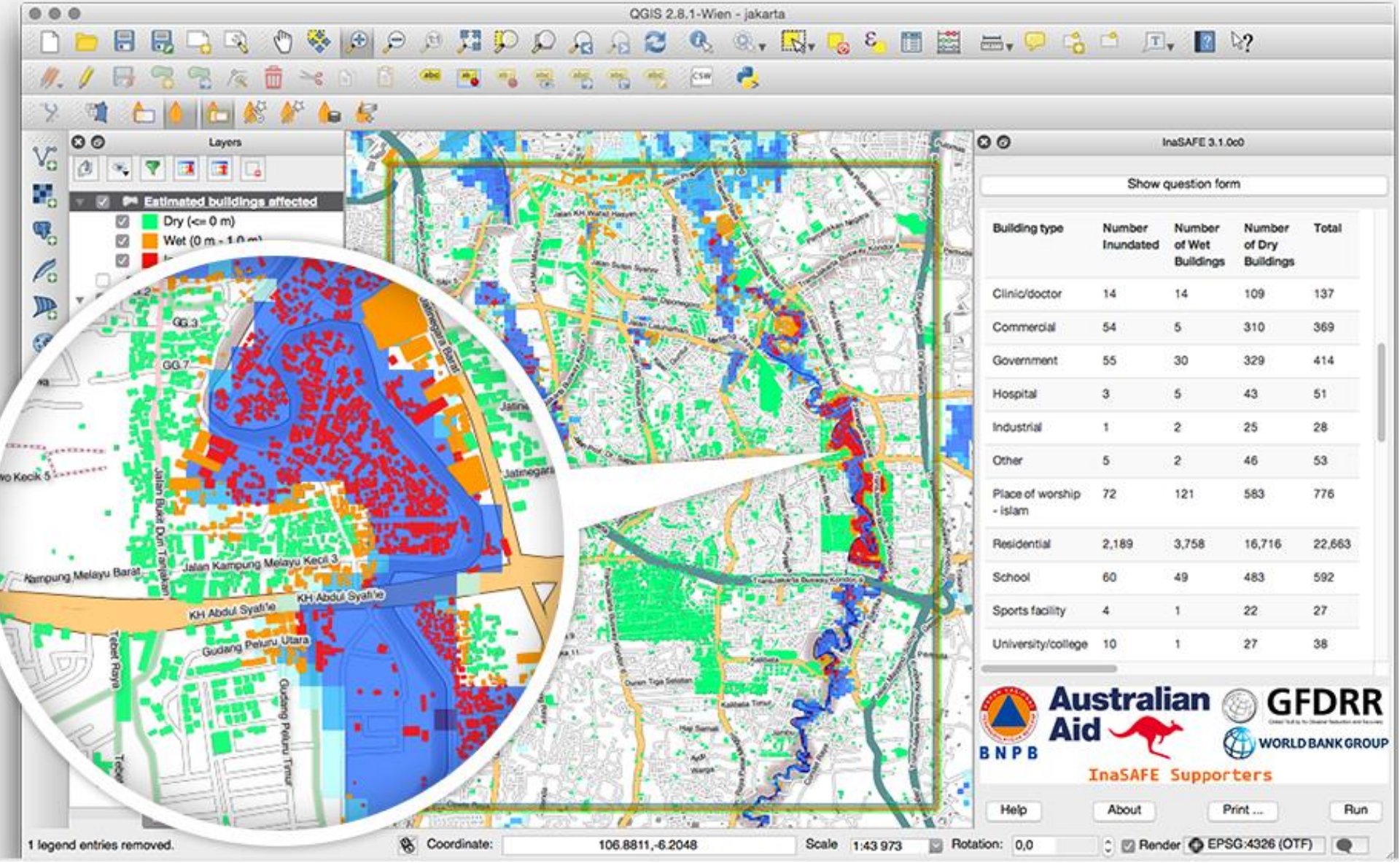
Taufiq A. Pratama
@petajkt #Banjir ± 50cm-60cm dijalan kebantenan 4 RT10 RW04 cilincing Jakarta Utara

PETA JAKARTA
petajakarta.org
TWEETNYA!
#banjir @petajkt


Peta Jakarta · Banjir
PETA JAKARTA


FLOOD 3
February 09, 2015
"Banjir" Tweets per Kelurahan
0
1
5
10
15
20
25
30
+


Earthquake
Tsunami
Floods
Cyclones
Bushfires
Landslides
Volcanoes
Hazard
Vulnerability
RISK
Engineering
Economic
Social
Exposure
People
Buildings
Businesses
Infrastructure
Mapping of exposed elements, e.g. through OSM, HOTOSM, Missing Maps
Use of InaSAFE



InaSAFE →integrates data from multiple sources including citizens
→free software to build scenarios for planning, preparedness and response activities

Earthquake
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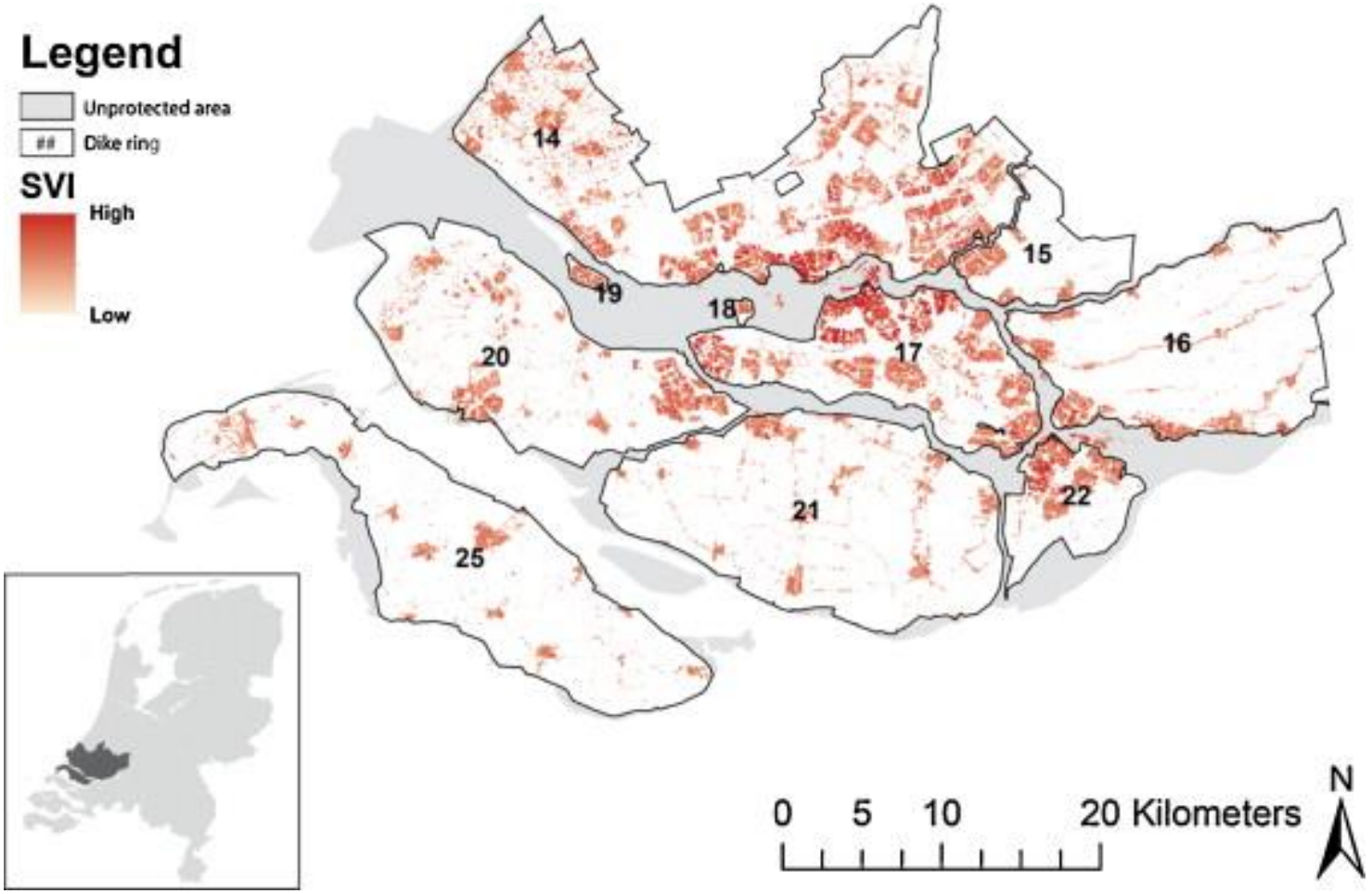
Infrastructure

SVI for Rotterdam



Koks et al. 2015 in Environmental Science and Policy

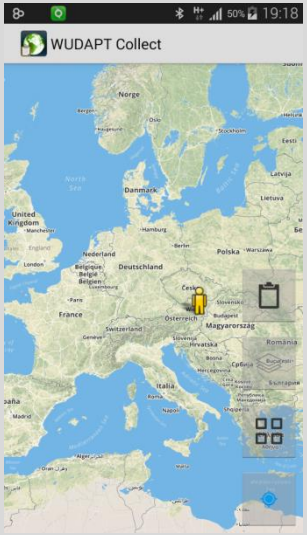
Zurich Global Flood Resilience Alliance

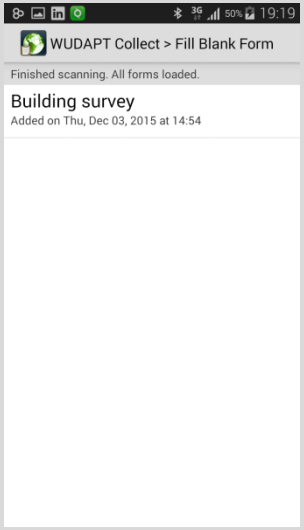
- Partnership between Zurich Insurance Group, IFRC, IIASA, Wharton Business School and NGO Practical Action
- To put more emphasis on risk reduction ‘ex-ante’ as opposed to recovery ‘ex-post’
  - Needs a community-based holistic approach
  - Need better information
- Resilience: robustness, redundancy, resourcefulness, rapidity
- Case studies in Nepal and Peru

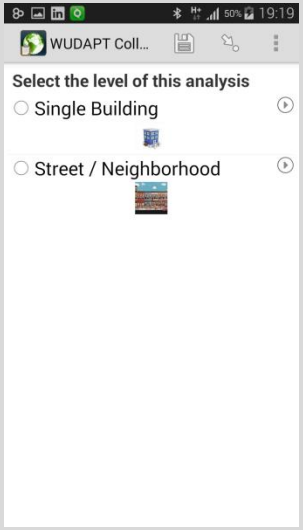
Community-based Vulnerability Mapping in Nepal (Karnali Basin)

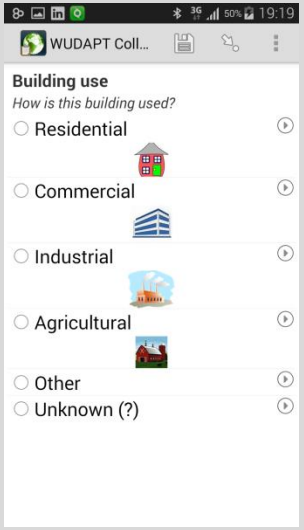
- Digitize the maps in OpenStreetMap
- Export to QGIS and add attributes related to vulnerability / draw flood risk zones
- View collectively across 74 communities e.g. on Risk Geo-Wiki
- Decision-support, raising community awareness, building resilience

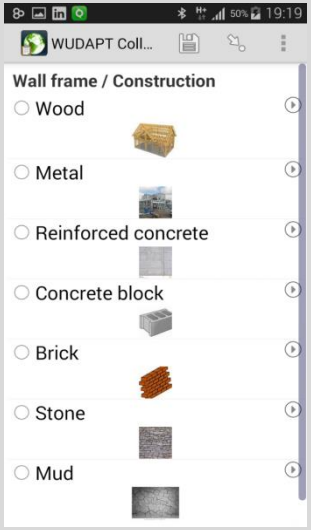
Mobile Phone Data Collection











Other Potential Ideas for Crowdsourcing and Mobile Devices

- Validation of flood risk maps
  - Perception vs. reality
  - Documenting flood heights post-event
- Crowd-based app for tagging location of assets
  - Evidence of flood proofing
  - Documenting location of assets
  - Documenting damage

science for global insight

Thank you!
Questions?

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