COWM

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Citizen Observatories for natural hazards and Water Management

organized by   *Distretto delle Alpi Orientali*

CITIZEN SCIENTISTS MONITORING THE ENVIRONMENT: THE LATEST APPS FROM IIASA

Steffen Fritz

Center for Earth Observation and Citizen Science (EOCS)
IIASA – International Institute for Applied Systems Analysis

International Institute for Applied Systems Analysis

IIASA   www.iiasa.ac.at

Agrotutor: Sustainable agricultural intensification in mexico

Ongoing collaboration between IIASA and the International Maize and Wheat Center (CIMMYT) Mexico

Key needs and proposed solutions

- Sustainable intensification: Need for increased food production **and** improved ecosystem services

- Poverty alleviation and achieving food security by improving crop performance: lower costs and higher yields

  1. Targeted and timely agricultural recommendations

  2. Support overloaded agricultural extension systems

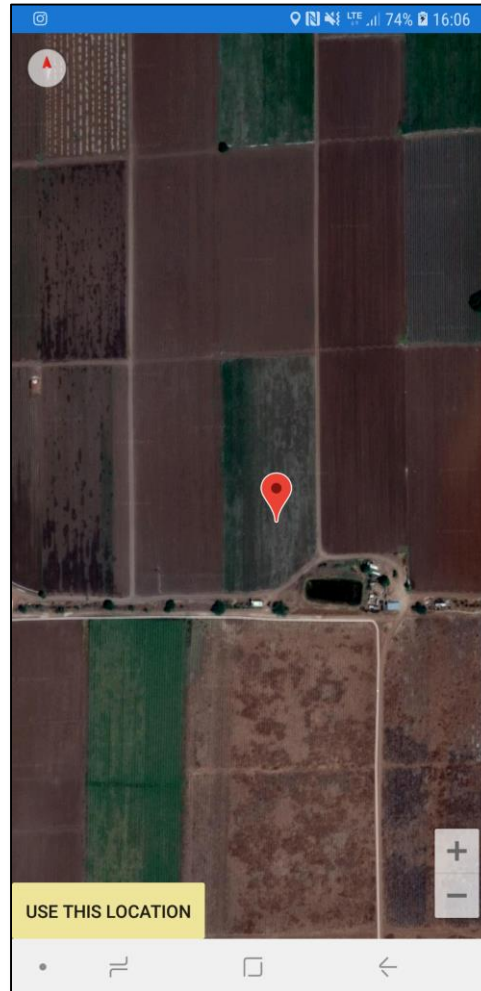Guanajuato farmers, scientists and extension agents

Transform smallholders into "small smart farmers"

(B. Govaerts – CIMMYT)

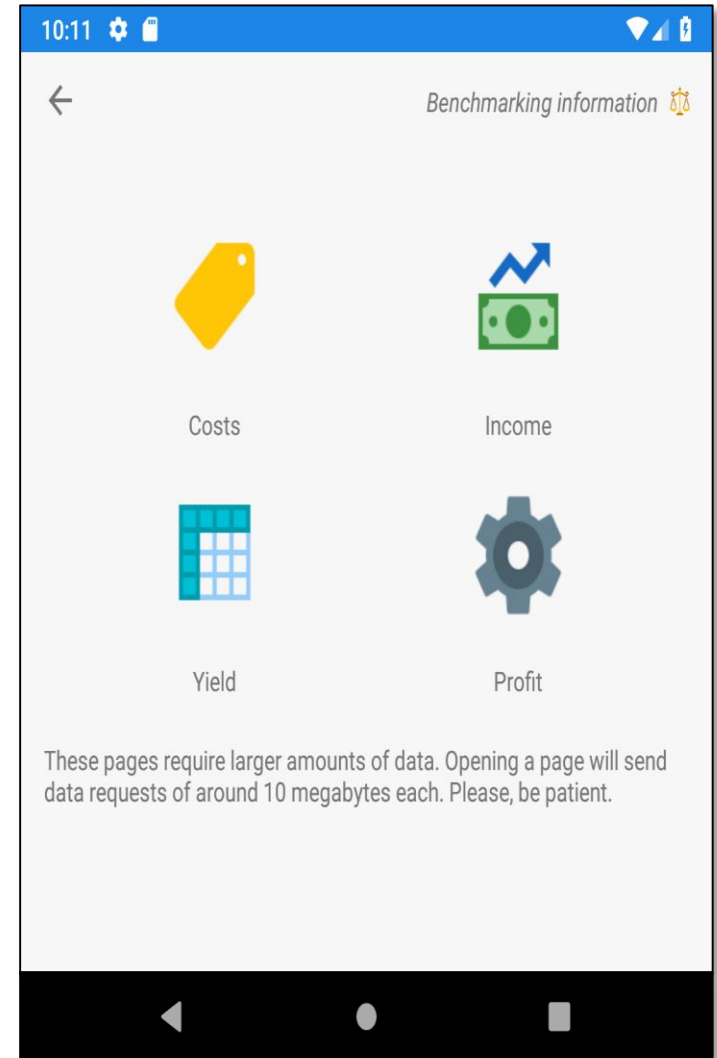Steffen Fritz – Citizens monitoring the environment: IIASA apps

AgroTutor: Geo-location of plots and crops

- Location and delineation of parcels

- Recommendations sent back to the farmers are location and crop-specific

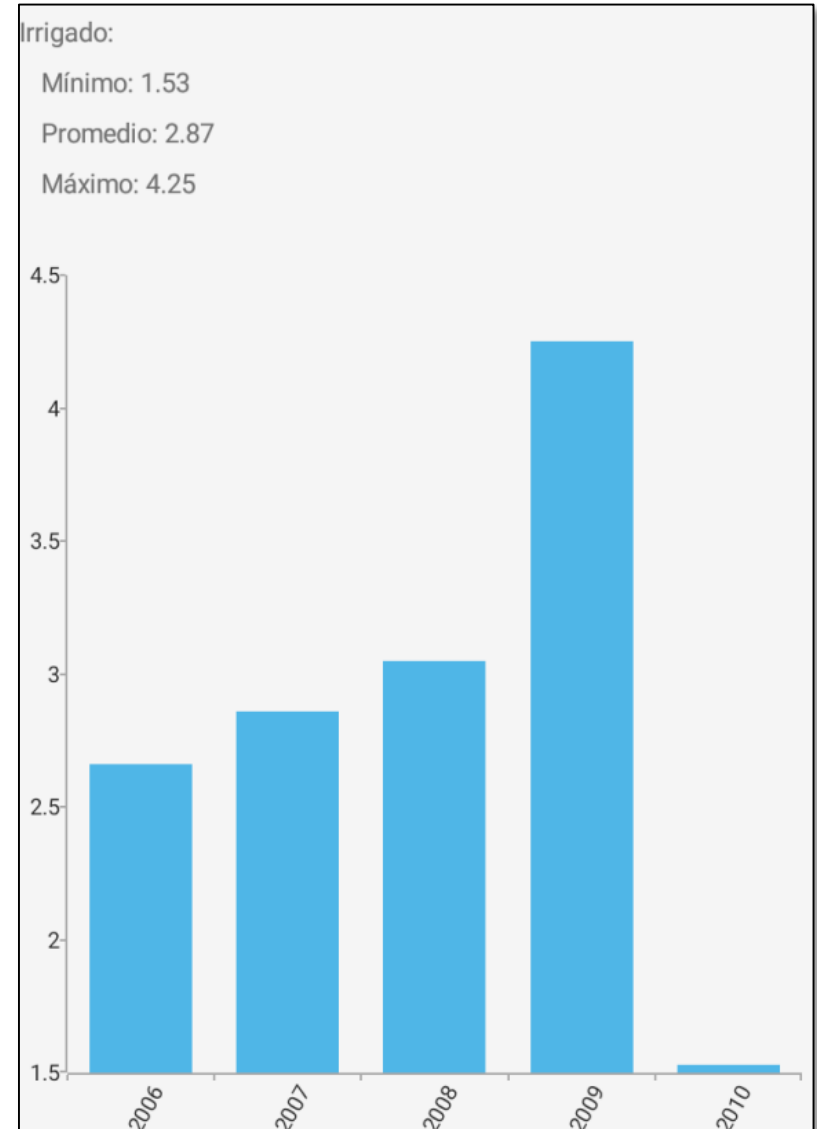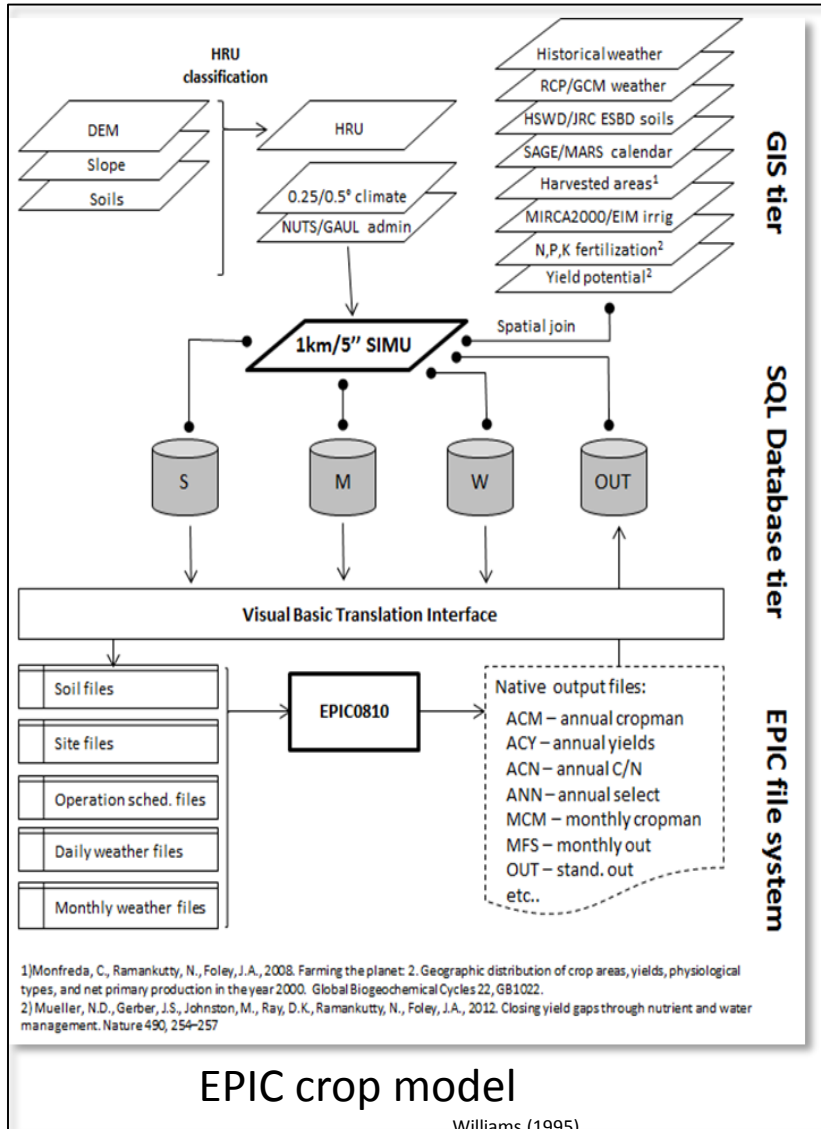Steffen Fritz – Citizens monitoring the environment: IIASA apps

AgroTutor: Historical benchmarking information

- Using historical information gathered by CIMMYT, historical costs, income, profit and yield are shown.

- Information is corresponding to the area / conditions where the farmer's plot are located

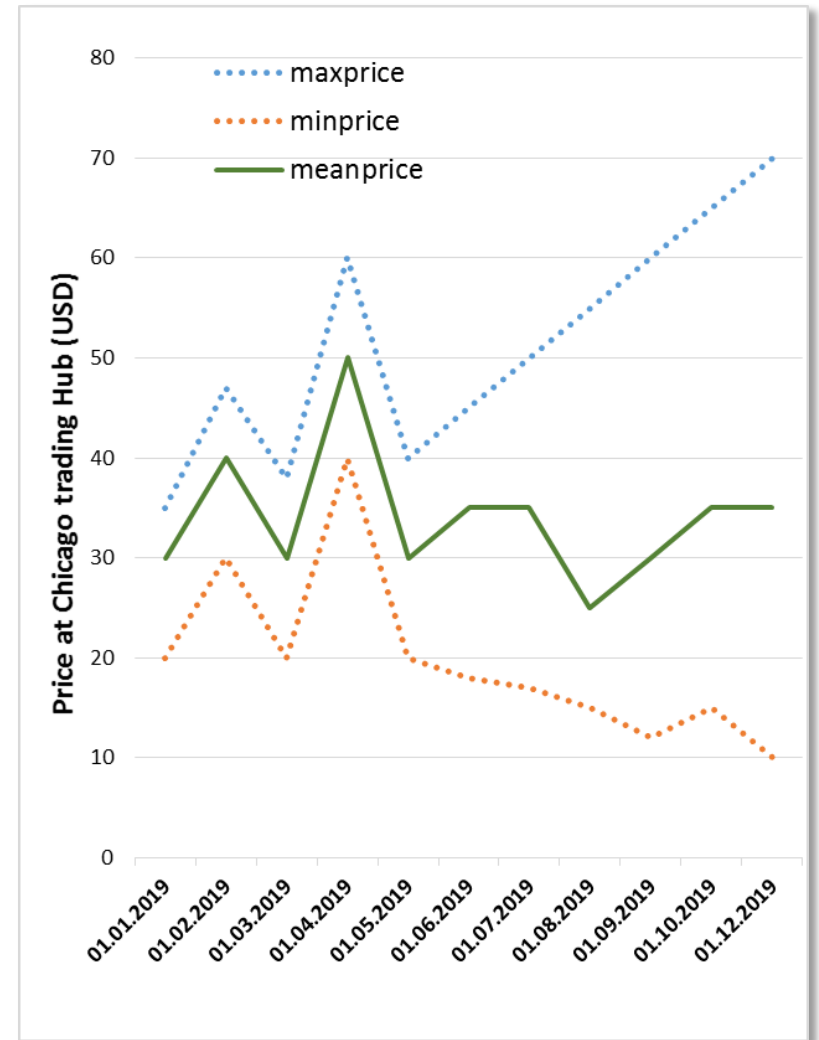- Data is anonymous and is meant to indicate the area and crop potential

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AgroTutor: Potential crop yield

EPIC crop model

Williams (1995)

1)Monfreda, C., Ramankutty, N., Foley, J.A., 2008. Farming the planet: 2. Geographic distribution of crop areas, yields, physiological types, and net primary production in the year 2000. Global Biogeochemical Cycles 22, GB1022.
2) Mueller, N.D., Gerber, J.S., Johnston, M., Ray, D.K., Ramankutty, N., Foley, J.A., 2012. Closing yield gaps through nutrient and water management. Nature 490, 254–257

Irrigado:

Mínimo: 1.53

Promedio: 2.87

Máximo: 4.25

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AgroTutor: Price forecasting (ongoing work)

- Twelve month predictions using trading hub historical prices

- Based on an array of time series multivariate models

- Use of climatic, financial and macroeconomic variables and market fundamentals

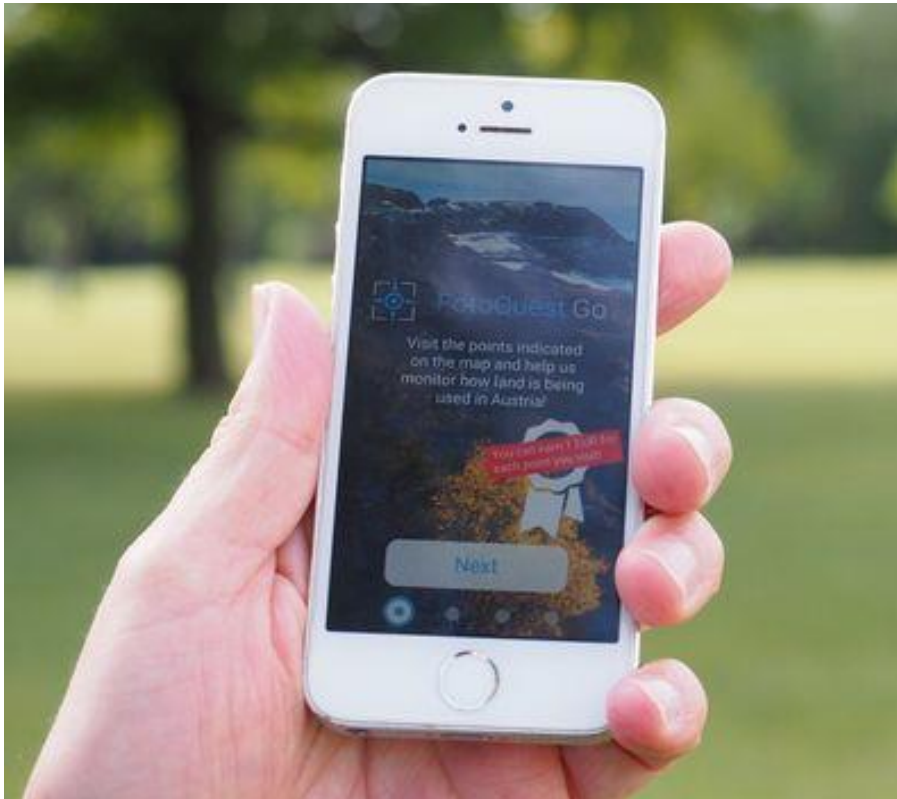- Developed at IIASA in collaboration with research centers in Vienna

Small Smart Farmers: AgroTutor contribution

- Integration of systems can deliver robust pictures of farmers fields allowing them to select and combine information

- Crowdsourced ground data is hard to obtain. AgroTutor provides an excellent opportunity while respecting farmers privacy

- Success of AgroTutor relies on integration of systems with proven agricultural best practices to ensure farmer value, uptake and ongoing usage

FotoQuest Go

Mobile application for in-situ data collection to promote community-based Land Use and Land Cover monitoring and awareness.

http://fotoquest-go.org/

FotoQuest Go

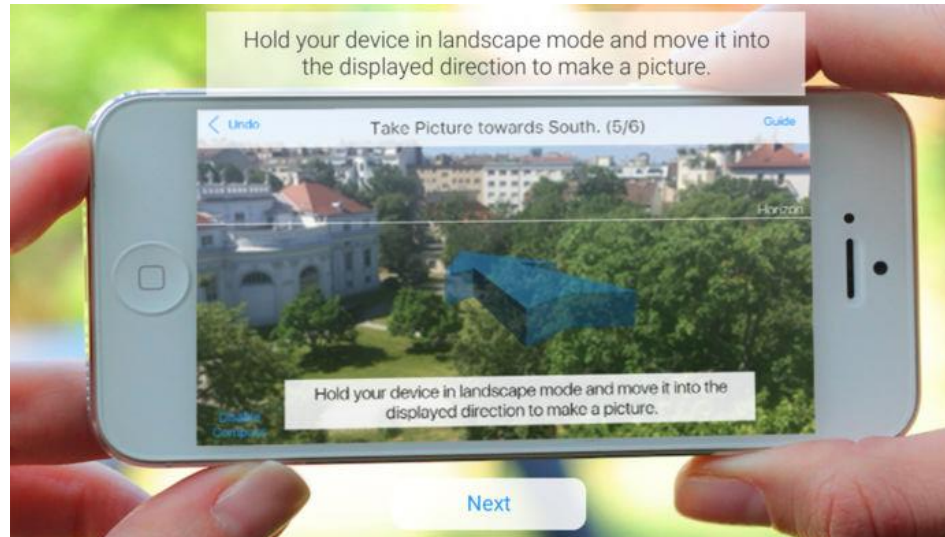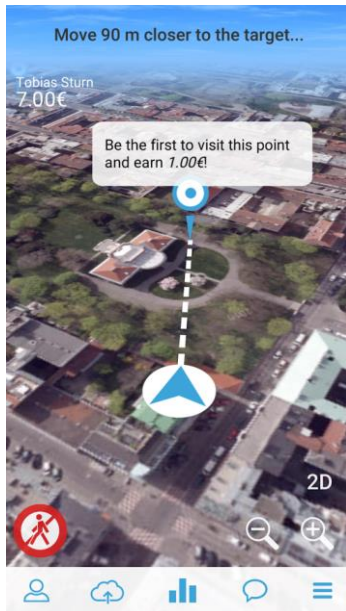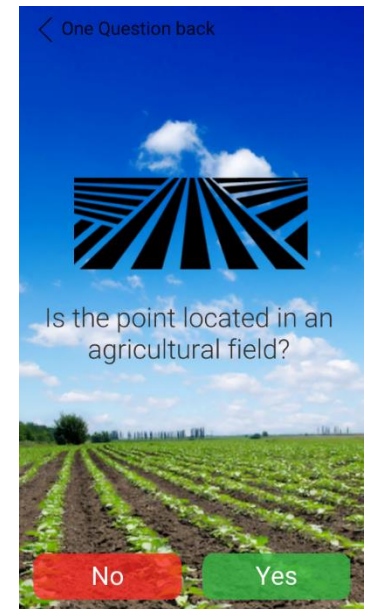| Step 1	Step 2	Step 3	Step 4	Step 5
Navigate to Location	Take photos	Answer questions	Submit for QA	Feedback to contributor

Photos in 4 cardinal directions plus target location itself
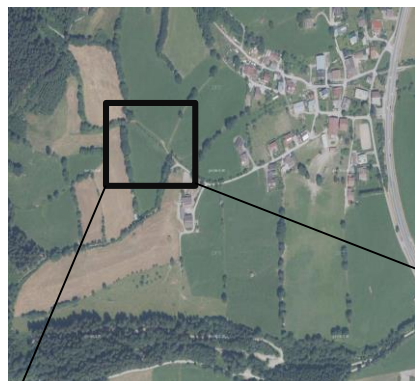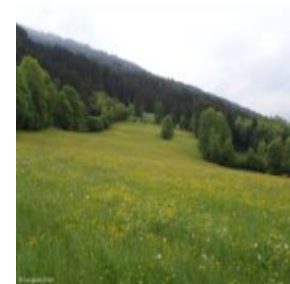
138 users

1614 quests

7652 photos

Country	
Austria	985
Spain	164
Netherlands	136
Germany	99
Romania	43
Italy	42
Sweden	35
Belgium	24

FotoQuest User   **Surveyor**

North

East

South

West

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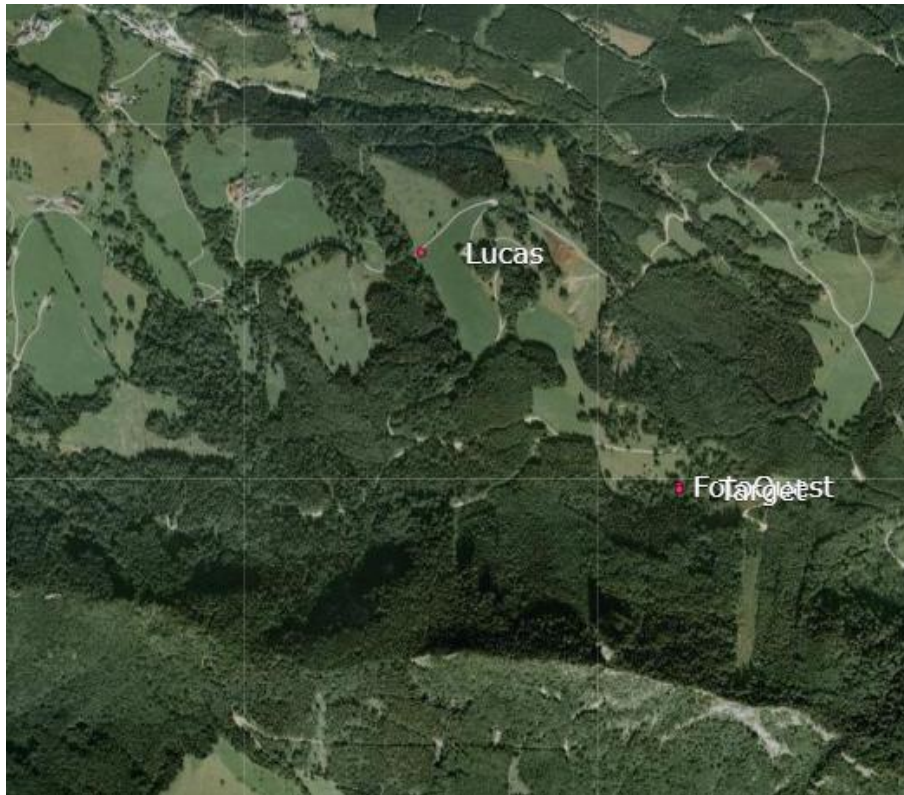
Good examples

- FotoQuest user is getting closer to the point than LUCAS
- LUCAS surveyors do not walk to very remote points
- FotoQuest user is reaching points in water!

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Not perfect examples

- FotoQuest user has not reached the target location
- User identifies wrong crop type or wrong field
- Photo quality & usability

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LandSense

A Citizen Observatory and Innovation Marketplace for Land Use and Land Cover Monitoring

18 Partner Institutions
9 Countries

Connecting citizens with satellite imagery to transform environmental decision making

September 2016 → August 2020

LandSense.eu

European Commission | Horizon 2020 European Union funding for Research & Innovation

LandSense.eu | @LandSense | info@landsense.eu

LandSense Themes

LandSense technologies are deployed across various themes to illustrate the potential of Citizen Observatories to tackle environmental challenges

URBAN LANDSCAPE DYNAMICS

Austria, France, Germany, Netherlands

AGRICULTURAL LAND USE

Serbia

FOREST & HABITAT MONITORING

Spain, Indonesia

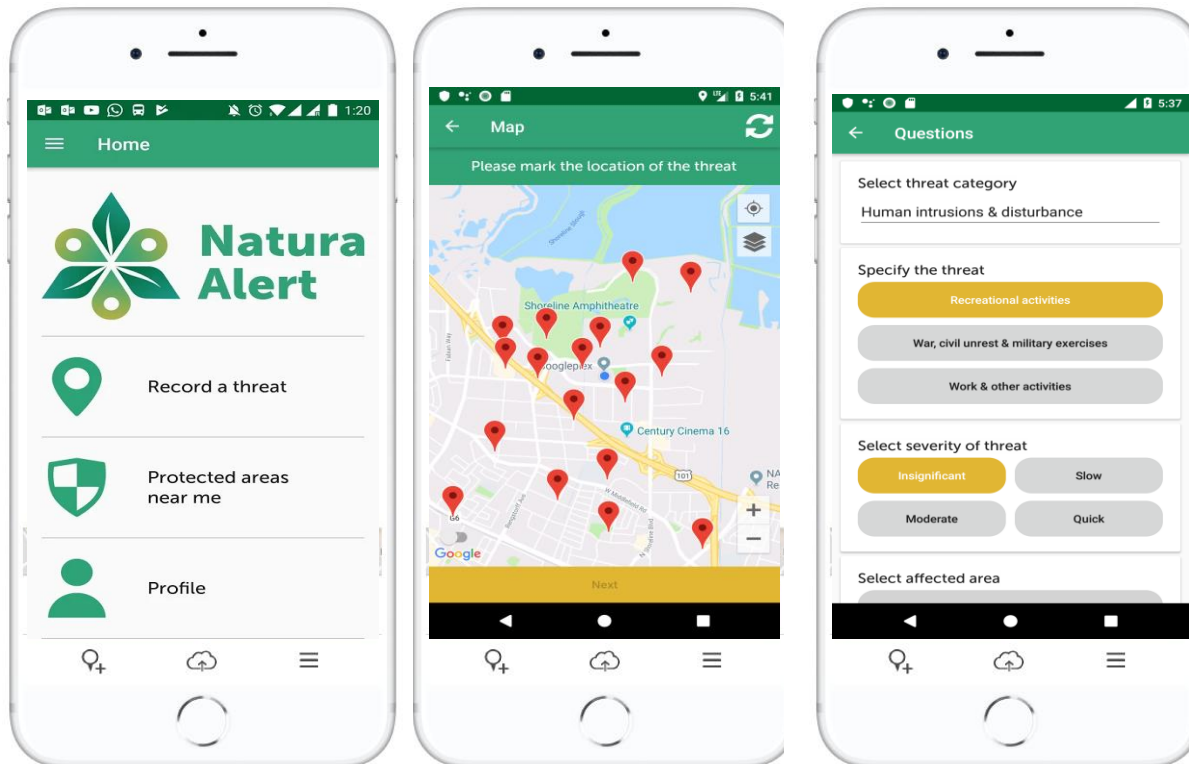# Habitat Monitoring – Spain, Indonesia

Mobilizing volunteers for *in-situ* data collection to help report biodiversity threats and monitor protected areas within the Important Bird and Biodiversity Areas (IBAs)

➢ IBA Caretakers

➢ Birdlife International volunteers

➢ Community monitoring (Indonesia)

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Natura Alert

- Volunteers can identify threats, describe severity and upload media

- Real time alerts to response team at BLI

Public Release in Spring 2019!

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Laso Bayas J.C., I. Moorthy, T. Sturn, M. Karner, C. Perger, D. Fraisl, D. Domian, J. Balkovič, C. Folberth, A. Gardeazabal, L.Vargas, S. Capellan, O. Danylo, M. Lesiv, M. Duraüer, C. Dresel, G. Hager, M. Saad, A. Subash, B. Smith, N. Joshi, D. Schepaschenko, I. McCallum, L. See, S. Fritz