8 Keys Competences Open Educational Resources Explorer

Environmental Citizen Science

A different way in which citizens can be involved in science

Erasmus+ Strategic Partnerships for adult education

Cooperation for innovation and the exchange of good practice

Simone Pagni Pisa, 10.10.2017

Defining Citizen Science (CS)

Since 1995, Citizen Science has been defined as:

- **Expertise that exists among people traditionally seen as ignorant (Irwin, 1995)**
- **Research techniques that enlist the help of members of the public to gather scientific data (Bonney at al., 2009b)**
- **Involvement of volunteers in science (Roy at al., 2012)**

Today, it is used to refer to:

- **Knowledge of local environments**
- **Knowledge gained through experience**
- **Submission of scientific data by large numbers of volunteers**

Environmental issues are relevant topics

Citizen science classifications (I)

Citizen science classifications (II)

Haklay classification

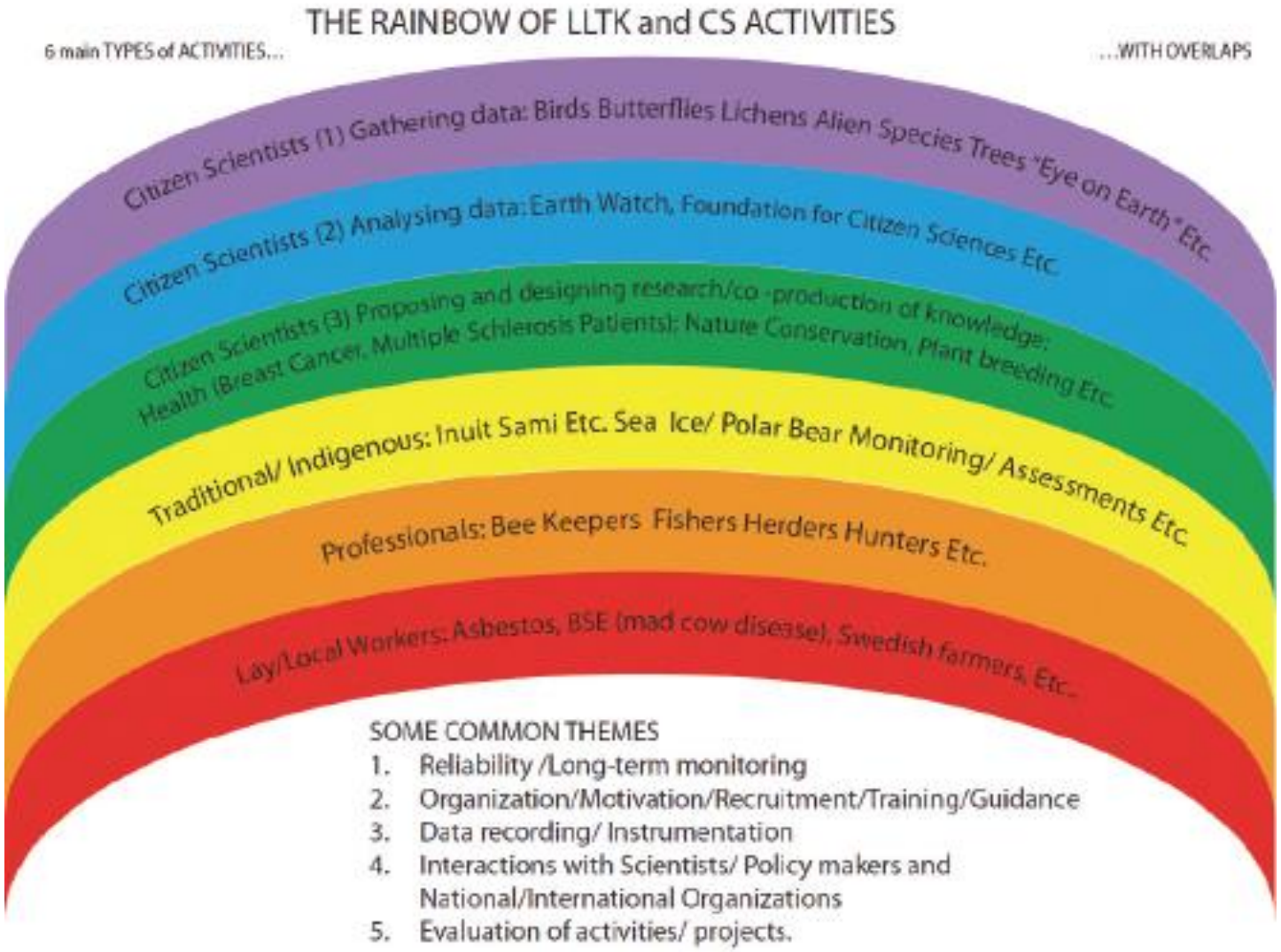
Level 4
"Extreme Citizen Science"
- Collaborative science – problem definition, data collection and analysis

Level 3
"Participatory Science"
- Participation in problem definition and data collection

Level 2
"Distributed Intelligence"
- Citizens as basic interpreters
- Volunteered thinking

Level 1
"Crowdsourcing"
- Citizens as sensors
- Volunteered computing

The rainbow of lay, local, traditional and citizen science activities (source: EEA, 2011)



Can you classify these projects ? (I)

Project	Brief description of project
Galaxy Zoo	Classifying images of galaxies
eBird	Collecting bird observations
What's Invasive	Locating invasive plants
ReClam the Bay	Restoring local bay's clams and oysters
Corfe Mullen Bio-blitz	Identifying species in Corfe Mullen village and local area
Climateprediction.net	Volunteers' computers used to run climate prediction models'

Can you classify these projects ? (II)

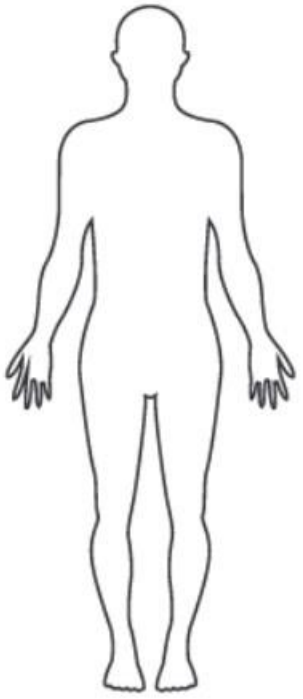
Project	Brief description of project	Haklay classification
Galaxy Zoo	Classifying images of galaxies	2 – distributed intelligence*
eBird	Collecting bird observations	2 – distributed intelligence
What's Invasive	Locating invasive plants	2 – distributed intelligence
ReClam the Bay	Restoring local bay's clams and oysters	**3 – participatory science**
Corfe Mullen Bio-blitz	Identifying species in Corfe Mullen village and local area	3 – participatory science
Climateprediction.net	Volunteers' computers used to run climate prediction models'	1 - crowdsourcing

The value of citizen science

The “value” of citizen science is fourfold:

Scientific

Educational



Social

Policy

Scientific value: the quality issue

The value of citizen science is dependent on the quality of data collected. Citizen science activities can be split into two types depending on the quality assurance methods employed:

- **verified citizen science, in which observations are checked by experts**
- **direct citizen science, in which observations are submitted without verification**

Educational value

The educational benefits of citizen science are found in formal education (mostly children and young people) or as part of informal learning (adults and children).

ITC increase opportunities for mass participation and potentially learning: Information and Communication Technologies are generating a new 'wave' of citizen science activities, but there is a risk that the lack of contact decreases engagement.

ITC offer new ways to influence how science and policymaking are carried out.

Societal value

Citizen science has the potential to bring society closer to science and to nature, bringing about a sense of ownership and helping create the kind of society that works to protect its natural environment.

Value for policy-making

Citizen science can serve policy makers by:

- **raising awareness and providing evidence to support regulatory compliance and inform policymaking about an environmental issue**
- **providing evidence and opportunities to address environmental issues that directly affect citizens – at local, national and global scales – and influence decision-making about these issues.**

Key challenges and opportunities facing CS

Key challenges:

- **Involvement of citizen scientists representing a broad spectrum of society**
- **Recognition of scientific value**
- **Political and financial guarantees for action on findings**

Key opportunities:

- **Power to address large knowledge and funding deficits**
- **Educating public about environmental policy issues**
- **Timely data from disperse sources**
- **Participatory democracy**

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Citizen Science (CS)

Social and civic competences: ability to participate effectively and constructively in one's social and working life and engage in active and democratic participation

For more information:

- **Report "Environmental Citizen Science":**

http://ec.europa.eu/environment/integration/research/newsalert/pdf/IR9_en.pdf

- **Science for Environment Policy website:**

http://ec.europa.eu/environment/integration/research/newsalert/index_en.htm

Group activity

Aim: discussion about some case studies providing examples of recent projects with a range of subject areas, approaches and potential impacts.

4 groups with a coordinator

- 15 minutes for internal discussion (read&check)

- **5 (x 4) minutes for plenary presentation**
- **15 minutes for a final discussion**