



ECSA Policy Paper #3

Citizen Science as part of EU Policy Delivery - EU Directives

Key Recommendations

ECSA call on the EU to:

1 – Review key Environmental Directives & Regulations, to remove barriers to & focus the attention of Member States on, the value & power of Citizen Science applications to support quality data acquisition on the effectiveness of those Directives;

2 – Support the development of an open common data base system to store citizen science data and to provide the tools for analysis of that data by citizens in conjunction with the European Environment Agency, the United Nations Environmental Programme UNEP LIVE, and/or other relevant international organisations working in the citizen science domain;

3 – Develop a decision making framework to identify the top 5 opportunities where Citizen Science would add greatest value to the delivery of EU Policy and to support the development of EU wide common monitoring programmes; and

4 – Identify clear policy leads on citizen science across the EU Directorates and within the EU Parliament to work with ECSA and to support engagement with the Eye-on-Earth Special Interest Group to shape the emerging global citizen science coalition.

1. Introduction

Most EU Directives were drafted in an era when, although Citizen Science existed, technology had not opened up its potential to support policy delivery or even to predict policy need. Data from citizens was also viewed with suspicion in that it lacked accuracy, was not systematically collected and was not statistically reliable. In short, it could neither be used to justify policy need or to measure policy effectiveness. This situation no longer applies and it is time for a major change of direction in how the effectiveness of EU Environmental Directives is monitored.

The breadth of Citizen Science is now immense,¹ ranging across all the main environmental and climate change issues of our era. The willingness of large numbers of volunteers to take part continues to grow and the benefits to policy makers are becoming clear as the value, volume and accuracy of the data gathered grows.

¹Understanding Citizen Science & Environmental Monitoring, UK Observational Framework, Roy et al November 2012, UK.

The European Environment Agency has recognised the value of Citizen Science² and the UNEP at the technical release of UNEP LIVE in January 2014 highlighted that *“the role of citizen science or the crowd-sourcing of data is one of the most cutting-edge and exciting tools emerging in the global research arena”*. At a national level, regulators such as The Scottish Environmental Protection Agency (SEPA) have reviewed citizen science and put in place rigorous decision making systems and strategic frameworks to guide their use of Citizen Science.³ The USA through the Executive Office of the President, Office of Science and Technology Policy has also issued a memorandum to all its Heads of Executive Departments and Agencies recognising the value of Citizen.

At the Global level the Eye –on-Earth Alliance Members – AGEDI⁴, GEO⁵, IUCN⁶, UNEP⁷ and WRI⁸ at their summit in October 2015 in Abu Dhabi, United Arab Emirates, recognized the global importance of citizen science in support of policy delivery. The Summit highlighted the role of citizen science groups in supporting governments to fill data gaps, particularly across the environmental and social dimensions of sustainable development. The importance of citizen engagement in decision-making processes was highlighted. The summit also agreed to set up a Special Interest Group to build a global citizen science coalition⁹.

This ECSA Policy Paper has been drafted by the Policy Group and has been adopted by the ECSA Steering Committee on 8th January 2016 for publication on the ECSA website. It is designed for use in discussions with the European Commission in order that we may press for similar initiatives across the EU and Members States in view of the clear opportunity citizen science now presents to support EU policy makers in the delivery of key policy objectives.

2. The Current Position

Citizen Science is not yet recognized by the EU as an effective method to monitor the success of EU Directives. Despite the leadership being shown at the National level there are few EU wide programmes in place to engage citizens in Environmental Monitoring in support of EU Environmental Objectives.

For Citizen Science projects to flourish at EU level common platforms for environmental citizen science data acquisition and harmonisation are a prerequisite for success. A clear route map is needed to develop a series of protocols that will allow ECSA members and other citizen science groups across the EU to build up an overarching open access data archive for European Citizen Science data. We also require a suite of tools that can be used by EU Citizens and policy makers both at EU and National level to use and analyse, at different geospatial scales, the European data held on or accessible from Citizen Science Programmes. The 2008 SEIS Communication also recognized these issues and called for data to be made fully available to the general public. This principle of open data, along with the use of open source software, is fundamental to the citizen science movement (Ala-

² Late lessons from early warnings: science, precaution, innovation. EEA Report No1/2013, Copenhagen, Denmark.

³ Pocock, M.J.O., Chapman, D., Sheppard, L., Roy, H.E. (2013) Developing a Strategic Framework to Support Citizen Science Implementation in SEPA. Final Report on behalf of SEPA. NERC Centre for Ecology & Hydrology.

⁴ Abu Dhabi Global Environmental Data Initiative (AGEDI)

⁵ The Group on Earth Observations (GEO)

⁶ The International Union for Conservation of Nature (IUCN)

⁷ The United Nations Environment Programme

⁸ The World Resources Institute (WRI)

⁹ Eye –on-Earth : Summary of Outcomes (<http://www.eoesummit.org/news/eye-on-earth-summary-of-outcomes/>)

Mutka, 2009¹⁰; Roy *et al.*, 2012¹¹; Zapico, 2013¹²). Furthermore, the Digital Agenda for Europe (a Europe 2020 initiative) importantly records citizen science within the Open Science domain. The recently developed UNEP LIVE programme may offer a way forward on this issue, as it has recognized the power of Citizen Science and the data it can provide and has started to add a citizen science section on the platform (see <http://uneplive.unep.org>).

The 2014 EU White Paper on Citizen Science¹³ and the earlier In Depth Report on Environmental Citizen Science¹⁴ both make the case that the time has arrived for a comprehensive review on the current use of citizen data by policy makers in the EU. The evidence is clear that substantial opportunities exist to use lay and local knowledge and citizen science programmes as an early warning of both the impacts of human activity on our environment and the effects of climate change.

The same paper however recognised the challenge that engaging citizens brings with it: -

“the sharing of information – the ‘data commons’ – risks drawing public attention to the extent of environmental decline with no guarantee of practical actions to effect change (Cuff *et al.*, 2008) . Therefore, political and financial commitments to tackle environmental degradation will be required to avoid public disillusionment”.

It is ECSA’s view that this is precisely why we need Citizen Science programmes to build understanding of key environmental issues and to drive policy change.

We still have few examples where participatory citizen science has had a tangible impact on decision-making – though the potential is very often noted (Cohn, 2008¹⁵; Grove-White *et al.*, 2007¹⁶; Davies *et al.*, 2013¹⁷). The EU report on Environmental Science (referenced above) makes the point that “few formalized citizen science projects have so far provided evidence of directly influencing policymaking” and again “for value to emerge from lay knowledge and citizen participation in environmental governance, policymakers must understand that value and accept participatory processes as legitimate ways to carry out policymaking (Leino and Peltomaa, 2012). Attempts – in part - to rebalance this situation are seen in a number of EU (FP7) funded citizen science projects such as Citizen Observatory WEB (COBWEB) that aim to collect environmental data using mobile and sensor devices, ultimately for policy formation and delivery through the application of co-design principles and in combination with global spatial data infrastructure initiatives to bring about societal, commercial and environmental benefits.

¹⁰ Ala-Mutka. (2009). *Review of learning in ICT-enabled networks and communities*. JRC Scientific and Technical Reports, EUR 24061 EN, 1-86. [Online]. Available: <http://ftp.jrc.es/EURdoc/JRC52394.pdf> [Accessed: 17th September 2013].

¹¹ Roy, H. E., Pocock, M. J. O., Preston, C. D., Roy, D. ., Savage, J., Tweddle, J. C., & Robinson, L. D. (2012). *Understanding Citizen Science and Environmental Monitoring* (pp. 1–179). Final Report on behalf of UK-EOF. NERC Centre for Ecology & Hydrology and Natural History Museum. Available: www.ukEOF.org.uk/documents/understanding-citizen-science.pdf

¹² Zapico, J.L. (2013). *Hacking for sustainability*. Doctoral Thesis in Media Technology and Graphic Arts, Draft for final seminar, 7th March 2013. Stockholm, Sweden. 1-122.

¹³ White Paper on Citizen Science for Europe, prepared by sociotize consortium, University of Zaragoza for the European Commission, September 2014 Spain.

¹⁴ Science for Environmental Policy, In-Depth Report: Environmental Citizen Science, December 2013 Issue 9, European Commission, Brussels

¹⁵ Cohn, J. (2008). Citizen science: can volunteers do real research? *Bioscience*, 58(3), 192-197. DOI: 10.1641/B580303

¹⁶ Grove-White, R., Waterton, C., Ellis, R., Vogel, J., Stevens, G., & Peacock, B. (2007). *Amateurs as Experts: Harnessing New Networks for Biodiversity: End of Award Report*. 1–179. Lancaster University and Natural History Museum. Available: <http://csec.lancs.ac.uk/docs/Amateurs%20as%20Experts%20Final%20Report.pdf> [Accessed: 24th October 2013].

¹⁷ Davies, L., Gosling, L., Bachariou, C. Eastwood, J. Fradera, R., Manomaiudom, N. and Robins, S. (Eds.) (2013). *OPAL Community Environment Report: Exploring Nature Together*. Open Air Laboratories (OPAL), London. 1-84.

It is time this situation was changed.

3. A case Example

SEPA provide an excellent case example where a regulator has explored the potential for Citizen Science to support its regulatory and policy effort. They have reviewed citizen science and put in place rigorous decision making systems and strategic frameworks to guide their use of Citizen Science.¹⁸ They have assessed the potential of Citizen Science and concluded that Citizen Science is suitable for assessing impacts of a wide range of environmental pressures. They have concluded that for their work Citizen Science could make a significant contribution to assessing impacts of key environmental pressures listed in the Scottish Environmental Monitoring Strategy as follows:-

Well Worth Considering Further	
Invasive Non Native Species;	Recreation Pressures;
Impoundments and barriers;	Noise and Vibration;
Ozone precursors (air quality monitoring);	Nutrient enrichment;

Worth Considering Further	
Greenhouse Gas Emissions	Acidic Substances
Hazardous Substances	Particulates (air quality)
Waste Management	Abstractions and flow modifications
Hydrological impacts of discharges	Forestry
Urban development	Agriculture
Fishing & aquaculture (freshwater)	

We need a similar decision making framework and assessment for EU Directives and clear guidance in Environmental Directives on how such an approach can be delivered. It requires a fundamental re-assessment of how environmental data is acquired, stored, accessed and used by the EU and in particular how Citizen Science data can complement that obtained by Member State Governments through conventional channels

3. Conclusion

ECSA will continue to seek funds for a comprehensive work programme that would address this policy issue. Work has begun to assess the data requirements of each of the main EU Directives, to understand how that data is delivered, how the costs are met and where the barriers may lie in building citizen science programmes into formal reporting systems on the effectiveness of EU Directives. Full details of this work will be presented to the EU to support the key recommendations of this Policy Paper.

Approved by the ECSA Steering Committee, 8 January 2016.

¹⁸ Pocock, M.J.O., Chapman, D., Sheppard, L., Roy, H.E. (2013) Developing a Strategic Framework to Support Citizen Science Implementation in SEPA. Final Report on behalf of SEPA. NERC Centre for Ecology & Hydrology.