IMPACT-SC5

ASSESSING THE IMPACT PATHWAYS OF IA/RIA SC5 PROJECTS THROUGH THE USE OF PORTFOLIO ANALYSIS

ENVIRONMENT, BIODIVERSITY & ECOSYSTEMS

Policy Co-Creation Workshop on the impact of European research and innovation projects

Date: 6 May 2021

Time: 10:00-12:15 CEST

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869746

tecnalia Inspiring Business

JIIP Joint Institute for Innovation Policy

VTT

Q-PLAN INTERNATIONAL

Table of Contents

1 Introduction

The H2020 project ***IMPACT-SC5: Assessing the impact pathways of IA/RIA SC5 projects through the use of portfolio analysis*** (GA 869746), elaborated by Fundacion Tecnalia Research & Innovation (coordinator) in collaboration with VTT Teknologian Tutkimuskeskus, the Joint Institute for Innovation Policy (JIIP) and Q-PLAN INTERNATIONAL, is set to review the projects supported under the Horizon 2020 Societal Challenge 5 (SC5) – Climate Action, Environment, Resource Efficiency and Raw Materials – Work Programme 2014-2015, as well as its supplementary Work Programmes and calls (e.g. Water-2014, Waste-2015, EE-2014, etc.) both individually and across portfolios of projects. By doing so, IMPACT-SC5, aims to: (i) inform the Commission about the short-, medium- and longer-term impacts of H2020 SC5 projects and (ii) provide the Commission with a methodology for the ex-post evaluation of Horizon 2020 for SC5 and related areas, and for other evaluations.

To this end, the scientific, economic, societal and environmental performance (impact pathways) of the 87 Research and Innovation Action and Innovation Action projects under scrutiny have been measured by means of a well-designed set of indicators. A portfolio analysis complemented the project-level analysis in order to determine how projects perform together in relation to different objectives.

In the framework of the IMPACT-SC5, 5 thematic policy co-creations workshops will be organised with a view to discuss the results of our analysis regarding the impacts of the Horizon 2020 SC5 projects and collectively identify how policy on national and European level can facilitate the enhancement of SC5 impacts' diffusion and uptake across the EU.

Third in the series is this workshop on **Environment, Ecosystems and Biodiversity SC5 related projects**. This workshop will be held online on 6 May 2021, 10:00-12:15 CEST.

The workshop will involve two parts:

- a discussion on the outcomes obtained during the study in relation to the Environment, Ecosystems and Biodiversity related SC5 projects, and
- a co-creation process to explore how impact pathways can be integrated into the policy-programme cycle and monitored.

The agenda of this workshop is presented hereunder:

Table 1: Workshop Agenda

Time (CET)	Topic	People engaged
Session 1 – Presentation of portfolio's conclusions and panel discussion		
10:00-10:05	**Welcome and brief presentation** of the IMPACT-SC5	Mr. Xabier Uribe (*Tecnalia*)
10:05-10:15	The **ECOPOTENTIAL project and its results**	Dr. Antonello Provenzale (*Coordinator of the ECOPOTENTIAL project - National Research Council of Italy*)
10:15-10:30	Presentation of the **portfolio results & conclusions**	Mr Kevin Trendafili (Q-PLAN)
10:30-11:15	Panel discussion on the **portfolio results and conclusions** Comments of each panellist on our findings on: • Scientific Impacts • Societal/Environmental Impacts • Economic Impacts Q&A session from participants	1. Ms Chiara Pocaterra (*Italian NCP – APRE*) 2. Ms Vaya Piteli (*Greek NCP – PRAXI Network/FORTH*) 3. Prof. Nicolaos Theodossiou (*AUTH and UN Sustainable Development Solutions Network*) 4. Dr. Antonello Provenzale (*Coordinator of the ECOPOTENTIAL project - National Research Council of Italy*)
Session 2 – Co-Creation on Policy Recommendations		
11:15-11:20	Approach & methodology utilised during the co-creation	Mr. Xabier Uribe (*Tecnalia*)

11:20-12:05	**Co-Creation**: How policy on national and European level can facilitate the enhancement of SC5 impacts' diffusion and uptake across the EU.
	• How can **impact pathways be integrated** into the policy-programme cycle so that scientific, societal, environmental and economic impacts from projects are enhanced?
	  ○ Programmes, calls for proposals, projects need to be designed in view of impact pathways. How can this be achieved?
	• How can **projects be monitored** such that it allows measuring short, mid and longer-term impacts?
	  ○ A number of information and data are reported about projects elaborated on regional, national and European level during their inception and implementation. But hardly any information is recorded with respect to the impacts after projects completion. How can this be improved?
	15 minutes (*5 minutes per team*) will be allocated to rapporteurs to present each table's key findings
		All participants

12:05-12:10	Closing remarks	Mr Kevin Trendafili (Q-PLAN)

2 Our methodological approach

As stated above, the objective of the IMPACT-SC5 project is **to evaluate the progress made and the achievements and impacts** of the RIA and IA projects funded by Societal Challenge 5 under the work programme 2014-2015. Hence, the evaluation study carried-out by the IMPACT-SC5 project has analysed the impact of the 87 SC5 projects resulting from 2014-2015 calls, utilising:

- The concept of **impact pathways** so as to trace the different paths how the project results and outputs have reached (or are expected to reach) wider impacts.
- Cross analysing the outputs, outcomes and impacts achieved with **wider societal context** such as policies or external contextual factors pursuing a better understanding of why and how certain impacts have (not) been achieved.
- **Project, portfolio, and programme** levels.
- **Quantitative and qualitative analysis of data** and information collected from secondary (desk research) and primary (survey, interviews, stakeholder workshop) sources.

The 87 SC5 projects consist of 53 RIAs and 34 IAs, while it includes projects responding to 6 different calls and 30 specific topics.

Evaluation framework and criteria

The evaluation exercise conducted in the IMPACT-SC5 project has been mostly guided by the application of "impact pathway" time-sensitive approach[1] . Therefore, a list of short, medium- and long-term indicators associated to each impact pathway has been developed aiming at monitoring the performance of the target projects towards its objectives.

In accordance with the objectives and expected impacts of the SC5 WP 2014-2015, under the evaluation framework of the IMPACT-SC5 project, three different impact pathways have been considered:

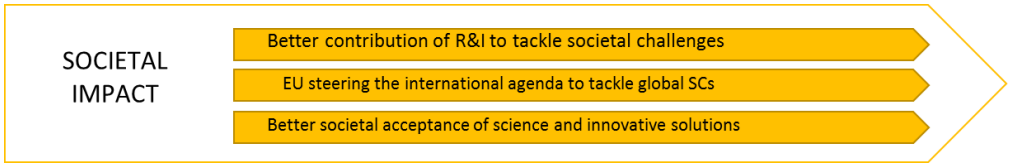
Scientific impact pathway

Related to the SC5 WP 2014-2015, the expected scientific impacts relate to addressing gaps in the knowledge base needed to understand changes in the environment, identify the policies, methods and tools that would most effectively tackle the challenges related to climate action, environment and resource efficiency, generate world class excellence in science in areas related to the societal challenge, develop skills and improve working conditions, deliver and use knowledge and technologies working on an open data basis and define international partnerships.

[1] Brussels, 7.6.2018 COM(2018) 435 final ANNEXES 1 to 5 ANNEXES to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination {SEC(2018) 291 final} - {SWD(2018) 307 final} - {SWD(2018) 308 final} - {SWD(2018) 309 final}

Societal impact pathway

Related to the SC5 WP 2014-2015, social impact has focused on providing evidence-based advice and recommendations to better position EU in the international agenda for the transformation to sustainability, in particular through the implementation of the Sustainable Development Goals and on analysing the capacity to develop green innovations and to strengthen the uptake of those by society.



Economic impact pathway

Related to the SC5 WP 2014-2015, economic impact expectations are focused on the analysis of its capacity to generate innovation-based growth to improve the EU competitiveness and achieve its global leadership, the capacity to create more and better direct and indirect jobs and to leverage investments in R&I from other funding sources.

3 Environment, ecosystems, biodiversity project portfolio results

This portfolio includes in total **sixteen (16) projects** distributed in two distinctive clusters as follows:

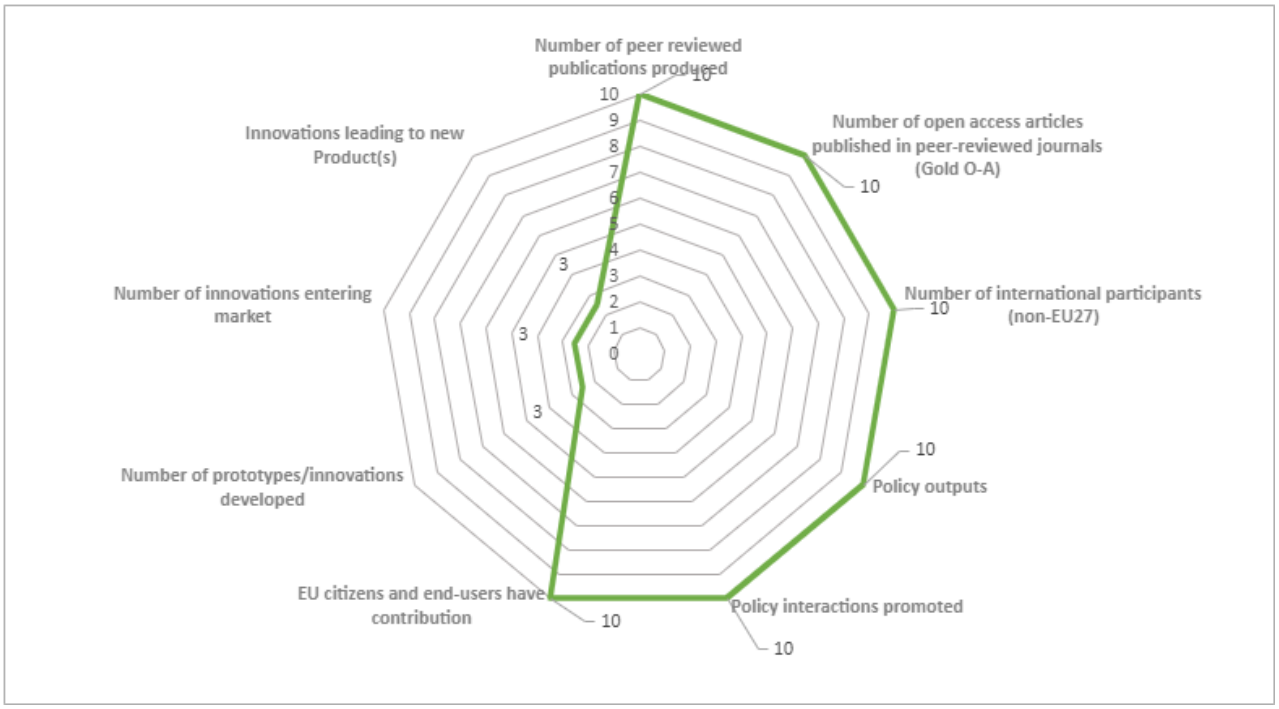
- Project cluster 2.1: **seven** (7) projects aimed at protecting the environment, sustainably managing natural resources, biodiversity and ecosystems.
    - two (2) projects awarded under the call for proposal "*Improving the preservation and sustainable exploitation of Atlantic marine ecosystems*" (BG-01-2015). These include: ATLAS and SponGES.
    - one (1) project received funding from the call "*Developing in-situ Atlantic Ocean Observations for a better management and sustainable exploitation of the maritime resources*" (BG-08-2014). This specific project is AtlantOS.
    - two (2) projects awarded under *"Biodiversity and ecosystem services: drivers of change and causalities"* (SC5-06-2014) call, namely AfricanBioServices and AQUACROSS.
    - two (2) projects awarded under call *"More effective ecosystem restoration in the EU"* (SC5-07-2015). These project projects are: AMBER and MERCES.
- Project cluster 2.2: **nine** (9) projects related to the environmental sustainability and preservation of natural resources through earth observations, citizens engagement and observatories as well as including the concept of air quality in climate policies.
    - two (2) projects awarded under the call for proposal entitled *"Making Earth Observation and Monitoring Data usable for ecosystem modelling and services"* (SC5-16-2014). These projects are ECOPOTENTIAL and SWOS.
    - four (4) projects awarder under *"Demonstrating the concept of 'Citizen Observatories"* (SC5-17-2015), including the following projects SCENT, Ground Truth 2.0, LANDSENSE and GROW.
    - three (3) projects awarder under "*SC5-04-2015 - Improving the air quality and reducing the carbon footprint of European cities"*. These projects are CLAiR-CITY, iSCAPE and ICARUS.

Overall, the list of projects is presented in Annex I.

3.1 Environment, ecosystems, biodiversity portfolio: Impact pathways assessment

The radar chart below shows the data for the project portfolio Environment, Ecosystems, Biodiversity for the selected nine key indicators:

Figure 1: ENVIRONMENT, ECOSYSTEMS, BIODIVERSITY project portfolio radar chart



As expected from the objectives and expected impacts of the calls under which portfolio 2 projects have been awarded, this portfolio mainly focused on reinforcing and extending the existing science base and therefore establishing high quality new knowledge and reducing knowledge gaps. On top of that, portfolio 2 excelled in terms of policy-related outputs and impacts by developing policy briefs, policy recommendations, etc. and stimulating policy interactions so as to addressing specific EU policy priorities or Sustainable Development Goals (SDGs). Moreover, projects engaged more than one hundred organisations coming from non-EU 27 countries indicating that portfolio 2 triggered international cooperation.

In this context, when comparing this portfolio with the other portfolios of our analysis, it is observed that portfolio 2 comes first in relation to a series of scientific and societal impact indicators, such as (i) Number of peer reviewed publications produced, (ii) Number of open access articles published in peer-reviewed journals (Gold O-A), (iii) Number of international participants (non-EU27), (iv) Policy outputs generated, (v) Policy interactions promoted as well as (vi) EU citizens and end-users' engagement. In terms of economic impact though, portfolio 2 is lagging behind. Given the fact that three quarters of the projects are RIAs and thus commercialisation activities are out of the scope of their activities, it was expected that portfolio 2 to underperform, from an economic impact perspective, in relation to the other portfolios.

With that said, the following sections concludes on the scientific, societal and economic impact pathways of the whole portfolio 2 incorporating the qualitative and quantitative analysis performed for clusters 2.1 and 2.2.

3.1.1 Scientific impact pathway assessment

From a scientific point of view, it is noticeable that portfolio 2 has contributed towards addressing the objectives and expected impacts of the Work Programme under scrutiny. The portfolio primarily consisted of scientifically oriented activities aiming to **establish high quality new knowledge and reduce knowledge gaps.** Towards this end, projects under this portfolio introduced new or improved technologies, products, processes, services, methods, tools or solutions. In parallel, they developed comprehensive and sustained global environmental observation and information systems and designed technological solutions to fight against climate change. Moreover, a number of **advanced technologies** were developed and used, such as sensor devices crowdsourcing platforms, mobile applications, etc.

Portfolio 2 excelled in producing scientific outputs such as peer-reviewed publications, datasets and research infrastructures. In further detail, the portfolio generated more than seven hundred (700) articles that were published in peer-reviewed journals, some of which published in high impact ranked journals. Moreover, projects included in this portfolio were really active in providing their **scientific knowledge via open data**. For instance, amongst the peer-reviewed publications, more than half were provided via gold open access thus being available with unrestricted access to any interested party.

On top of that, **a great number of new datasets was produced while existing datasets were reinforced**. Particular attention has been paid to make the datasets produced findable, accessible, interoperable as well as reusable. In this context, portfolio 2 projects - following the EC policy on open access - developed datasets being "as open as possible and as closed as necessary". As such, altogether, the projects provided more than two hundred and fifty (250) new datasets via open access. By doing so, portfolio 2 has contributed towards accelerating data discovery from other researchers as well as enabling replicability and reproducibility.

Another important point is that portfolio 2 **strengthened the potential and future career perspectives of the researchers involved.** This can be attributed to the fact than many research organisations as well as higher/secondary education organisations were involved in the projects. As such, projects actively supported PhD and Master students in advancing with their research activities while it was also reported that many of the researchers that participated in the different projects still continue to do research in the area after the completion of the projects.

Portfolio 2 consortia included a **large number of international partners** indicating the importance of international **cooperation when it comes to environmental issues**. More specifically, more than one hundred (100) non-EU 27 organisations were engaged coming from different parts of the world such as North and South America, Africa and Asia. It is to be mentioned though that approximately half of these organisations were coming from the UK. Further to this, during the elaboration of the projects, **cooperation with international organisations** (outside of the project teams) was achieved to linking international efforts and fora on environment, biodiversity and ecosystem services.

Interesting is also the fact that **citizens science was stimulated**. In this context, innovative technologies and approached were used to create new in-situ citizens observatories where citizens using their own devices (e.g. smart phones, tablets, laptops, and other social media) collected meaningful data for researchers in terms of environmental monitoring. By doing so, portfolio 2 projects not only achieved to collect the necessary data but also increased citizens' awareness of problems related to their immediate environment.

Last, to communicate projects results, portfolio 2 projects participated in **joint activities with other H2020 projects**. Moreover, close collaboration was established with other SC5 projects as well as other European initiatives during which knowledge was transferred and project outputs were shared.

3.1.2 Environmental and societal impact pathway assessment

From an environmental point of view, no immediate environmental impacts are observed from the projects under portfolio 2. In fact, the concept of portfolio 2 was mainly to trigger **intelligent environmental policy making and political decisions** on local/ regional/ national/ European level through the creation of the necessary environmental knowledge base.

In this context, portfolio 2 collected data and developed **new databases for guiding the decision process of policymakers**. Moreover, projects included in this portfolio **produced a considerable amount of policy outputs**, such as direct policy recommendations, policy briefs, roadmaps etc. Moreover, the vast majority of projects promoted **policy interactions** at local/regional, national, European as well as international level through forums, conferences, trainings and public consultations. Direct dissemination of projects results to policy makers via policy workshops and conferences has also been achieved.

In line with the objectives of the Work Programme, cluster 2.2 projects **strongly involved citizens** in the framework of their activities. In further detail, a wide range of **citizens participatory approaches** were employed – co-creation workshops, campaigns, surveys, etc. – so as to support the communication of the activities to different target groups as well as to efficiently incentivize, motivate and mobilise citizens.

Moreover, the **citizen science approach** has been employed to gather primary or complementary information. Tailored designed mobile apps were designed for citizens to ease the process of data collection. In parallel, more traditional data collection techniques were utilised (surveys). Public involvement through the use of smartphone apps and surveys not only provided additional data to the projects, but directly involved the citizens in thinking about local environmental problems.

Except for citizens, projects engaged the whole a **wide range of stakeholders** (business, academia, including social sciences and humanities, public administrations and civil society) including **vulnerable people** (such as poor and disabled people) **and minors.**

3.1.3 Economic impact pathway assessment

When it comes to economic outputs and impacts, it is evident that portfolio 2 is lagging behind in comparison with the other portfolios under scrutiny. Given the fact that three quarters of the projects constituted RIAs and thus commercialisation activities were (in most of the cases) out of the scope of their activities, it was expected that portfolio 2 to underperform to this end.

Although projects did not include commercialization activities, **several tools, models, methods and processes** developed may have future market potential and with some further development can be rolled-out to the markets unlocking the potential for the sustainable production of new products and industrial applications. Moreover, the **datasets produced** can have future market potential. With the above in mind, these outputs can result in green energy infrastructures, improved energy security and generation of jobs and boosting European competitiveness

On top of that, portfolio 2 projects developed advanced **tools, services and resources to mobilize and engage citizens** in citizens observatories and citizens science. In this context, different mobile applications, platforms and serious games were produced that are currently under further development so as to be commercially exploited in the near future. Moreover, portfolio 2 brought into life a number of **policy related tools** that can help local governments in better decision-making through the empowerment and active role of citizens.

3.1.4 Success factors and barriers

The following section includes the barriers and success factors identified during the implementation of the portfolio 2 projects and as those were reported from projects' coordinators in the course of our interviews.

Barriers

- Poor technical capability of international partners coming from underdeveloped countries participating in the projects (such as countries from Africa).
- Large consortiums, including partners from more than 10 participant countries. This barrier though was overcome in most of the cases by regular meetings and putting a lot of effort into staying in touch and being inclusive.
- COVID-19 related issues.
- Lack of continuity in the topics funded by the European Commission.
- Lack of instruments to continue providing financial support to strategic follow-up activities after the completion of the projects.
- Short period of time so as to implement effectively all the activities of the projects. A number of projects reported that more time was needed in order to further develop their projects' actions.
- Several staff changes (including project managers, EU project officers and other key people switching jobs) negatively affected portfolio 2 projects.
- Another barrier identified is associated with the difficulty to engage the underrepresented citizens (youngsters, the elderly, etc) and to have their views on the table.
- Reluctance of engaged citizens with respect environmental issues.

Success factors

- The active international collaboration triggered through the implementation of the projects. For example, Europeans and Africans worked together as equal partners in a scientific project related to the conservation of protected areas.
- The composition of the different consortia including both researchers and non-researchers.
- The active support from the EC services mainly during the preparation of the Grant Agreement as well as in the course of amendment times. Moreover, the active support and guidance coming from the EC project officers.
- Apart from sheer dissemination channels, some projects used larger relevant network to facilitate the use of outcomes produced.
- The Advisory Boards' established in the projects positively contributed towards the effective implementation of the projects. To this end, the careful selection of the people was important and played a critical role.
- Serious games developed constituted an intriguing mechanism which actively supported the motivation of citizens in contributing to data collection processes.

Annex I – List of Portfolio 2 SC5 projects

Table 2: Projects considered under the ENVIRONMENT, ECOSYSTEMS, BIODIVERSITY project portfolio

Clusters of projects	Project Acronym	Project name	Project URL
Portfolio 2.1: PROTECTING THE ENVIRONMENT, SUSTAINABLY MANAGING NATURAL RESOURCES, WATER, BIODIVERSITY AND ECOSYSTEMS	ATLAS	A Trans-AtLantic Assessment and deep-water ecosystem-based Spatial management plan for Europe	https://cordis.europa.eu/project/id/678760
	SponGES	Deep-sea Sponge Grounds Ecosystems of the North Atlantic: an integrated approach towards their preservation and sustainable exploitation	https://cordis.europa.eu/project/id/679849
	AtlantOS	Optimizing and Enhancing the Integrated Atlantic Ocean Observing System	https://cordis.europa.eu/project/id/633211
	AfricanBioServices	Linking biodiversity, ecosystem functions and services in the Great Serengeti-Mara Ecosystem (GSME) - drivers of change, causalities and sustainable management strategies	https://cordis.europa.eu/project/id/641918
	AQUACROSS	Knowledge, Assessment, and Management for AQUAtic Biodiversity and Ecosystem Services aCROSS EU policies	https://cordis.europa.eu/project/id/642317
	MERCES	Marine Ecosystem Restoration in Changing European Seas	https://cordis.europa.eu/project/id/689518
	AMBER	Adaptive Management of Barriers in European Rivers	https://cordis.europa.eu/project/id/689682
Portfolio 2.2: PROTECTING THE ENVIRONMENT, SUSTAINABLY MANAGING NATURAL RESOURCES, WATER, BIODIVERSITY AND ECOSYSTEMS: OBSERVATION, INFORMATION AND DATA SYSTEMS	ECOPOTENTIAL	Improving Future Ecosystem Benefits Through Earth Observations	https://cordis.europa.eu/project/id/641762
	SWOS	Satellite-based Wetland Observation Service	https://cordis.europa.eu/project/id/642088
	SCENT	Smart Toolbox for Engaging Citizens into a People-Centric Observation Web	https://cordis.europa.eu/project/id/688930
	Ground Truth 2.0	Environmental knowledge discovery of human sensed data	https://cordis.europa.eu/project/id/689744
	LANDSENSE	A Citizen Observatory and Innovation Marketplace for Land Use and Land Cover Monitoring	http://cordis.europa.eu/project/id/689812
	GROW	GROW Observatory	https://cordis.europa.eu/project/id/690199
	CLAiR-CITY	Citizen Led Air pollution Reduction in Cities	http://cordis.europa.eu/project/id/689289

Clusters of projects	Project Acronym	Project name	Project URL
	iSCAPE	Improving the Smart Control of Air Pollution in Europe	http://cordis.europa.eu/project/id/689954
	ICARUS	Integrated Climate forcing and Air pollution Reduction in Urban Systems	http://cordis.europa.eu/project/id/690105