Exploitation Plan

IMPETUS 4CHANGE

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Summary for Publication

I4C's preliminary exploitation plan. This focus on ensuring the availability of the technical developments including data, code and software of project are accessible (according to FAIR principles) beyond the project's lifetime.

Contribution to the top-level objectives of Impetus4Change

Objective	Contribution from Deliverable
Overall Objective: to improve the quality, accessibility and usability of near-term climate information and services at local to regional scales – where impacts are most keenly felt and on-the ground adaptation is implemented – to strengthen and support end-user adaptation planning and action	The exploitation plan, and its successful implementation is a key metric by which we will measure the success of the project. The overall objective requires the exploitation in order that it is achieved.
7) Ensure high impact and visibility through robust and targeted communication and engagement;	The exploitation plan is critical to meeting this objective
8) Commit to Open Science through development of open access tools and exploitation of data/model outputs via relevant platforms thereby ensuring improved accessibility and usability of climate knowledge.	The exploitation plan is critical to meeting this objective

Detailed Report

Description

Traditionally, climate data analysis has been carried out by downloading datasets from data servers and using local workstations or local computing infrastructures to perform data analysis. This approach is inefficient in the era of big data, due to the high cost of transferring raw data over the Internet. Climate data analysis involves processing raw data from a wide range of sources, including observations and models, to provide distilled actionable local climate data for various applications (such as the I4C demonstrators, https://impetus4change.eu/). Some of this processing workflow is standard (subsetting, regridding, bias adjustment, etc.) and can be carried out using existing packages implementing best practices, avoiding repetition and potential errors. Recently, web-based computing frameworks such as Jupyter

Notebook and cloud computing have emerged as an alternative computing infrastructure that improves accessibility and facilitates reproducibility and reusability. Cloud systems are often built on top of object storage and new data formats and libraries have been created that take advantage of this new type of storage. All these new technologies have converged in the development of data spaces, web-based virtual research environments that speed up data analysis making it more efficient by putting together data and computational resources with ready to use software frameworks.

As part of the exploitation activities of I4C a legacy data space will be produced to seamlessly integrate core datasets and user-relevant software packages allowing users to reproduce relevant results (e.g., preparing local data using bias adjustment methods). This data space will be integrated into the European Open Science Cloud (EOSC, https://eosc-portal.eu) to ensure the legacy of project results and their use by society beyond the lifetime of the project.

In addition to this legacy data space, more traditional archives are envisioned for exploiting our model output and blended forecasts. These, such as the Earth System Grid Federation (ESGF), ensure long-term accessibility of these data to the broader scientific community well beyond the project period. A climate hazard toolkit, that can be easily implemented in demonstrator city planning workflows will be developed. Further, the bespoke adaptation support packs (which include the toolkit) will be generalized to a roadmap for adaptation planning that will extend beyond the project lifetime. These last two exploitation ambitions ensure that the legacy of I4C science is also ensured for our stakeholder communities and beyond, in particular those involved in climate adaptation planning in urban areas.

These tools and solutions form the four pillars to our exploitation plan. These encompass raw model output data generated in the project, post-processed/tailored data, toolkits and adaptation support guidance. The table below details each of these pillars along with measurement criteria. The exploitation plan is a living document and will be updated regularly throughout the project. A crucial element at this early stage is seeking out solutions that ensure continuity beyond the project lifetime. Therefore, I4C will engage with actors who, through e.g., core funding from the EC, can maintain access to resources developed within I4C (e.g., EEA's ClimateAdapt).

Table 1: Exploitation measures description and status

Exploitation Pillar	Description	Target audience(s)	Status	Means of verification
Open Science tools and code	• European Open Science Cloud (EOSC) I4C Dataspace	VIACS community members; climate science community; stakeholders	Begins summer 2023	Code and tools available in an I4C repository (GitHub/GitLab) and documentation (Zenodo) in addition to availability on EOSC dataspace.
Modelling	• Raw model output from S2D predictions (WP2) • Raw model output from CPRCM simulations (WP3) • Blended forecasts (WP5) • Statistical downscaling and statistical emulator data (WP3)	High level users, the broader scientific community	04.2023 – Modelling work in-progress	Raw GCM output accessible via ESGF or similar (e.g., C3S) A selection of blended forecasts shared via public data repositories (e.g. EuDAT, Zenodo). CPRCM data solution is in discussion.
Hazards toolkit	• User-driven identification of hazard metrics • Development of new metrics based on stakeholder needs • Extremes/hazards analysis across diverse high-resolution products	Stakeholders within the project and beyond. VIACS community	04.2023 – D4.1 in progress	Make toolkit available via e.g., EEA's climate-adapt portal; implemented in workflow of demonstrator cities and beyond. Critical risk is to ensure legacy beyond project lifetime.
Adaptation Support Packs	• Strategic guide for innovative climate data to supports urban adaptation • "Roadmap" based on I4C learnings from implementing the coproduction framework in the four demonstrator cities and trialing the approach in two testbed cities	Stakeholders in demonstrator and testbed cities (WP6); policy makers; broader stakeholder community engaged via knowledge networks (WP1). Also the VIACS community.	04.2023 - co-exploration work in progress, co-evaluation work launched. First Adaptalab – Fall 2023 to discuss structure of ASP	Make adaption support packs and roadmap available via e.g., EEA's climate-adapt portal or other that will ensure continuity and accessibility beyond project lifetime. Share through WP1 Knowledge Networks. Link to EU's Adaptation Mission.