



Horizon 2020 Societal challenge 5
Climate action, environment, resource
Efficiency and raw materials

D8.6: INTERNAL PROGRESS REPORT AND MINUTES OF THE EAB MEETING M36

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Executive summary

Changes with respect to the DoA

No changes with respect to the DoA. The third meeting of the External Advisory Board is on 27 March 2020 and originally foreseen to be held in Month 36 (May 2019). It was decided by the consortium to meet with the EAB early 2020, to have a stronger focus on the legacy and exploitation activities of the project.

Dissemination and uptake

The report is public and for release through the website (www.sim4nexus.eu).

Short Summary of results (<250 words)

This report is a progress report from SIM4NEXUS and summary of the third meeting of the External Advisory Board, held on 27 March 2020. Due to COVID-19 we decided to organize this meeting remotely. The EAB commented the project is quite groundbreaking, with solid scientific output and a sincere attempt at a more iterative and inclusive approach to the science-policy interface for the nexus in Europe. Also the data visualisations and the game interface in particular, are very impressive. Comments also indicate a more systematic-scale story is necessary to help situate the importance and value of the work. Also, more transparency is needed when communicating the modelling exercise and outputs. Finally, the EAB comments the project team would benefit from a collective internal evaluation and lessons learning exercise. Several follow-up actions are defined by the consortium. Two deliverables (Deliverable D1.5 and D2.5) will focus on the integration of work across the work packages. SIM4NEXUS will also organize an evaluation of the project (September 2020). Such an evaluation will follow-up to reach a lessons learning exercise. The evaluation framework will be used to test the contribution the project has made to nexus research and practice.

Evidence of accomplishment

Report.

Glossary / Acronyms

AUB	AMERICAN UNIVERSITY OF BEIRUT
CAP	COMMON AGRICULTURAL POLICY
EAB	EXTERNAL ADVISORY BOARD
EIP	EUROPEAN INNOVATION PARTNERSHIP
EU	EUROPEAN UNION
FAO	FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
FD	FLOOD DIRECTIVE
GWP	GLOBAL WATER PARTNERSHIP
ICTA	INSTITUTE OF ENVIRONMENTAL SCIENCE AND TECHNOLOGY
IPCC	INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE
KEE	KNOWLEDGE ELICITATION ENGINE
MAGIC	MOVING TOWARDS ADAPTIVE GOVERNANCE IN COMPLEXITY: INFORMING NEXUS SECURITY
SIM4NEXUS	SUSTAINABLE INTEGRATED MANAGEMENT FOR THE NEXUS OF WATER-LAND-FOOD-ENERGY-CLIMATE FOR A RESOURCE-EFFICIENT EUROPE
UNEP	UNITED NATIONS ENVIRONMENT PROGRAMME
UNFCCC	UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE
WBCSD	WORLD BUSINESS COUNCIL FOR SUSTAINABLE DEVELOPMENT
WFD	WATER FRAMEWORK DIRECTIVE
WU	WIRTSCHAFTSUNIVERSITÄT WIEN

Introduction

The SIM4NEXUS consortium is planning a project meeting on March 25 & 26, 2020 (Vienna) and the External Advisory Board (EAB) is invited October 2019 to prepare for a two days meeting. The EAB is planned to join the project meeting on March 26 and 27. The meeting was originally planned to be held in Vienna, but is cancelled on March 11 due to the Coronavirus (COVID-19), and is held remotely, using Zoom, and which allows:

- Share screen, for presentations, video clips etc
- Chat
- Record meeting
- Polls
- "Breakout rooms" for discussions outside the main web meeting

The main objectives of the project meeting are to take-stock of the achievements in the project, prepare for the last quarter of SIM4NEXUS, focus on the legacy of project and explore initiatives towards exploitation. The consortium will meet for two days (March 25 & 26, 2020), followed by a meeting with the External Advisory Board on March 27.

The External Advisory Board (EAB) met on Friday March 27. The following members did participate: Gillian Foster (WU Wirtschaftsuniversität Wien), Louise Gallagher (University of Geneva), Mario Giampietro (MAGIC project), Konstantin Ivanov (Global Water Partnership Central and Eastern Europe) and Rabi Mohtar (American University of Beirut, AUB). The EAB is invited to present their initial feedback on Friday afternoon.

The Friday will focus on the External Advisory Board. All WP leads will present their work during 15 minutes, plus about half hour for Q&A. Each WP is presented along three questions:

1. What is the key objective of the work?
2. What outputs are achieved of your work, and how are they used inside and outside SIM4NEXUS?
3. What is the planned outcome, your message for other nexus research?

Presenting the workpackages

WP1 – Understanding and assessing the nexus in various contexts

WP1 presents the key components of the Assessment Framework, including: (i) the nexus concept in SIM4NEXUS, (ii) a consolidated version of the framework informed by the work in the case studies which can be applied for the development of new cases, (iii) a list of innovations and their impact on the nexus, and documentation of innovations arising from the project; (iv) a methodology for assessing the relevance of interlinkages, and (v) a glossary of nexus terminology in SIM4NEXUS.

Also, a nexus tree is designed, a schematic depiction of all the possible pathways of influence from one of the nexus components towards another. This tree shows direct, second, third and fourth degree interlinkages. It is a way to build the case study nexus tree, identifying the most influencing and the most vulnerable resource.

WP1 also developed the Nexus chord plots, to quantify every flow of one nexus component / resource to another. The output of such an analysis would be a Nexus chord plot, which can constitute the nexus signature of a case study. The nexus chord plots are revealing on the coupling or decoupling of the Nexus components.

WP2 – Policy analysis and the nexus

A key objective of WP2 is identify integrated strategies towards resource efficient and low carbon Europe. So far, investigations concluded most EU policies in the domains of water, land, energy, food and climate coherent, although synergies are not systematically assessed and addressed, and trade-offs are only partly addressed. The crux is in the implementation, and barriers are identified are in the case studies. WP2 also identified factors for successful nexus policymaking, including political will, mindset, knowledge management and careful organisation of the process.

The project is heading for the final outcome: recommendations for integrated strategies towards resource efficient and low carbon Europe, and a so-called outside-in approach is used taking the following steps:

- Nexus challenges for transition towards a low-carbon and resource efficient Europe. EU Green Deal.
- Policy coherence within the nexus and between outside policies and the nexus. The challenges to explore and exploit synergy. The challenges to explore and tackle conflicts.
- Pathways for transition towards a low-carbon and resource efficient Europe.
- Added value of a water-land-energy-food-climate nexus approach for resource-efficient and low-carbon policies.
- Recommendations for EU-wide coherent short-term and long-term policies, strategies, content and process.
- Recommendations for research, Horizon Europe.

WP3 – Thematic models and integration

The objectives of WP3 are:

- To select and adapt the thematic models for each case study and to apply them in coordination with WP5.
- To review and select appropriate complexity methodologies and integration approaches (System Dynamics Modelling).
- To develop complexity science tools for the needs of the serious game in WP4 (as feeders for the Serious Game).
- To implement the complexity science models for the case studies, running hypothetical scenarios, including taking into account uncertainty.
- Task 3.1 (Coordination – data base – data flow semantics) is on-going.
- Task 3.2 (Downscaling of climate/climate change and socio-economic scenarios) is completed.
- Task 3.3 (Thematic models: Application to all case studies under selected scenarios) is completed.
- Task 3.3 (Thematic models: Application to all case studies under selected scenarios) is completed.
- Task 3.4 (Complexity Science tools- Selection and development of the integration methodologies) is completed.

Task 3.5 (Implementation of the complexity science tools for each case study under different scenarios) is on-going and includes the following steps:

- Populating the conceptual models with numerical data (quantitative phase)-in parallel with T3.4-ongoing- Completed for 11 Case Studies
- Calibration and testing of the complexity science models-ongoing only for 1 CS
- Implementing and running them for multiple scenarios (link to WP5 and WP1)
- Developing the policy cards (with WP4)-link to WP5/WP2- reported in WP4
 - Translating the models in Python to use for the KEE (link to WP4)-ongoing
 - Review and revise the models (links to WP5 and WP2)-ongoing
 - Perform any additional runs as needed for the Knowledge Elicitation Engine (KEE). Links to WP4
 - Produce accompanying manuals/reports for the models

Task 3.6 (Overall assessment of the complexity science models and integration approach in SIM4NEXUS) is on-going and includes assessing the:

- Integration methodologies for the Nexus
- Use of the thematic models in developing the complexity science tools and models
- Complexity science models per se (application, calibration)
- Transferability of the models
- Added value for the EU

WP4 – Serious Game development and testing

Key objectives of WP4 are to design, implement, and validate the Serious Game, including:

- game strategy, users, roles, storylines, gaming objectives, considering different temporal and geographic scales, and the deployment in a development environment
- while integrating and accumulating knowledge from the Nexus, and user behaviour

The status of the Serious Games is presented during this slot.

WP5 – Implementing Nexus-compliant practices

The objectives of WP5 are (i) to apply the methods and tools of integrating the Nexus components in 12 selected case studies, and (ii) establish a science-policy participatory process, guiding end-users towards Nexus-compliant practices that support a resource-efficient Europe. WP5 includes three tasks:

- Task 5.1 – Developing a common application & evaluation framework for SIM4NEXUS tools is completed.
- Task 5.2 – Supporting decision making in 12 case studies will be completed in April 2020.
- Task 5.3 – From case study applications to EU-wide recommendations will be completed during the remaining months in the project. This task will include: (i) structuring policy recommendations (best scale and pre-conditions for ensuring effectiveness); (ii) identifying general lessons on effective science policy interfaces, (iii) identifying general lessons on the use of serious game to support policy making; and (iv) workshops and reports to share experience, results and recommendations from all case studies towards a wider application / extrapolation to other decision making arenas.

Some lessons learnt from interacting with stakeholders. First, there are challenges, including (i) length of the process (4 years) is hard to keep people committed and vulnerable to political changes; (ii) time consuming (organisation of events, analysis of outcomes); (iii) limited availability of experts or decision maker Workshops : full day events, requires travelling time; (iv) fear to take decisions/ question of legitimacy; and (v) do you need the 'Nexus' word? Better use the vocabulary the stakeholders are used to. Second, there are opportunities, including (i) access to a diversity of knowledge : dialogue among actors with various views & interests & disciplines, (ii) valuable inputs for the project : confirm/detail/add to the team's assumptions; (iii) be part of current policy discussions and evaluations, (iv) contribute to transdisciplinary work, and (v) boomrang invitations to stakeholders organisations events.

WP6 – Exploitation impact and SIM4NEXUS business plan

Key objective of this work package is to maximize impact of the project by creating new activities/economic environment. The following outputs are achieved: (i) market study - on serious gaming, (ii) exploitation strategy & business model - current exploitation strategy is an outcome of discussions with the Steering Group and other partners to develop the more adequate exploitation strategy to the project, and a business model is develop for the related exploitation strategy, (iii) Nexus Business Groups testing the serious game and gather feedbacks. For internal use, (i) during the project, feedbacks from the market for market-driven approach (for developing fit-for-purpose p & s),

(ii) at the end of the project: support exploitation of the outputs of the project. For external use: WP6 work enables to let people know about the Nexus and the SG and sustainable resource management. The planned outcomes include (i) an exploitation strategy for SIM4NEXUS outcomes (Nexus Science activities, Serious Game activities and Serious Game commercial packages), (ii) Nexus Business Group feedbacks and (iii) market study.

WP7 – Dissemination and communication

The objective of this work package is to achieve impact: (i) To effectively disseminate, communicate and interact with the potential users of the outcomes and products resulting from SIM4NEXUS; (ii) To stimulate discussions, support decisions and popularize the SIM4NEXUS gaming method; (iii) To identify, specify and clarify research questions, and (iv) To contribute to the IPCC AR6 review process.

The approach is (A) Unique identity ('who we are' + 'what we do'): (i) SIM4NEXUS envisions the operationalization of the Nexus concept as an integral part of the transition towards a resource-efficient and low-carbon economy; (ii) SIM4NEXUS quantifies the water-energy-land-food and climate nexus for resource efficiency; (iii) SIM4NEXUS makes explicit the links, trade-offs and synergies between water-food-energy-land under climate change, and the risks for the nexus sectors and their decision-makers and (B) SIM4NEXUS communicates impact-related key elements: (i) Results and outputs of SIM4NEXUS: Expertise and Nexus knowledge, Thematic models, Complexity science tools and data platform, Serious Game, Knowledge Elicitation Engine (KEE); (ii) Key messages about the science and policy outcomes of SIM4NEXUS; (iii) Calls to action for the different specified target audiences in all nexus sectors.

Target at Research community offering the SIM4NEXUS approach as a new target for nexus modelling using accepted communication channels (publications, workshops). Main outcomes include 30 publications, 303 citations, 85 conferences attended.

Target at Online dissemination using pre-existing tools, both from the consortium partners and other initiatives; linked to website. Main outcomes include: 523 Tweets with 7537 interactions, 17 posts on Slideshare with 1414 views, 9 posts in newsletters with 8529 clicks, 41 posts on external websites with over 20500 clicks. Database with 107 newsletters and portals. In addition, policy briefs are launched, and a Nexus Glossary will be released.

Target at Promotional material to prepare flexible promotional material, to be used for multiple purposes (e.g. Serious Game video; Final project brochure).

Target at Policy makers and outputs/materials will be communicated to policy decision-makers at different geographic levels. Main outcomes include: Policy consultation/briefs on (1) climate change adaptation; (2) WFD and FD fitness check > Water sector; (3) CAP reform > Agriculture sector; (4) European Green Deal > all sectors. In addition, contribution is made to the @Horizon 2020 results platform and support is given to (35!) policy events, e.g. EIP water conference (650 participants + Director General ENV).

Conclusions

The report of the EAB is presented in Annex A of this deliverable (with Annex B as a suggested starter for an evaluation framework). Several follow-up actions are defined by the WP (co-) leads, and summarized below. Comments in the EAB report relate to the overarching questions driving the project as a whole, and holding the work packages together, became a little lost in the materials shared and in the presentations. Comments are partly integrated in two major deliverables due for M48, including:

Deliverable D1.5 – Framework for the assessment of the nexus: (i) Framework methodology, (ii) Framework application and innovations for case studies and (iii) Relevant performance indicators and benchmark values and corresponding calculation methodologies) (due for M48). This deliverable integrates all scientific advances from WP1 (Understanding and assessing the nexus in various contexts) and does integrate the outcomes of WP1 against the achievements from WP2-WP5. We consider the framework to be an important outcome of the project, which potentially supports future nexus assessments drawing from transdisciplinary approaches to assess the impact of alternative policies. The findings of the project will be a solid basis for future assessments adopting a step-wise approach including (i) development of nexus knowledge, (ii) profiling of the nexus domains, (iii) preliminary nexus assessment, (iv) model development, (v) science-policy interface and (vi) conclusions, findings and recommendations.

Deliverable D2.5 – Strategies towards a low-carbon and resource efficient Europe (due for submission M49). This deliverable is the final policy support report and uses the available knowledge gained throughout the project from the 12 case studies, using (i) the scientific advancements regarding interlinkages across the nexus sectors, (ii) the modelling work and game development in WP3 and WP4 (thematic models, the System Dynamics Modelling, the Serious Games) and (iii) the transdisciplinary work with the 12 case studies (WP5 working to interact with all other work packages). This deliverable also integrates the outcomes from all 12 case studies, using Deliverable D5.6 (Report summarising the policy recommendations from all case studies) (planned for submission M48). Deliverable 2.5 will also cover the comment in EAB report ‘that [we] are not trying to produce policy recommendations that are relevant to all cases. There are trade-offs in relation to all sustainability indicators when dealing with the nexus ...’) (page 3, EAB report). EAB report also recommends ‘... to identify the specific policy stakeholders who [we] are trying to reach’ (page 4, EAB report). Also, ‘Defining criteria for successful nexus policymaking outcomes and process (separately) is really useful’ (page 6, EAB report).

Comments related to WP6 (exploitation strategy) will be covered in the exploitation strategy, to launch during the summer of 2020. There is another comment related to WP7 (Feedback on communications strategy), concluding ‘there is one communications strategy for the overarching SIM4NEXUS project, but it does not seem to specify clearly who we are communicating with, and to what end, beyond increasing the project visibility’ (page 5, EAB report). The feedback from WP7 will be summarized below.

While these two deliverables (D1.5 and D2.5) will give proof-of-evidence the way SIM4NEXUS does interact among work packages, a response to the EAB report will be provided in the Technical Report (due for August 2020) and SIM4NEXUS will organize an evaluation of the project (September 2020) (Wageningen Research and PBL will prepare for this) (Floor Brouwer and Maria Witmer). Such an evaluation will follow-up to Comment 8 in the EAB report: ‘The project team would benefit from a collective internal evaluation and lessons learning exercise’ (page 1, comment 8). Page 6 of the EAB report has some good bullets to address to learn across the whole project. Similarly, all comments on page 7 of the EAB report could guide us in launching the exploitation strategy. The evaluation framework will be used to test the contribution the project has made to nexus research and practice (page 8 of the EAB report).

The EAB notices on WP7 (Feedback on communications strategy) ‘there is one communications strategy for the overarching SIM4NEXUS project, but it does not seem to specify clearly who we are communicating with, and to what end, beyond increasing the project visibility’ (page 5, EAB report).

WP7 RESPONSE

The project, usually jointly between WP7 and other work packages, has developed and updated a communications strategy which clearly specifies the target audiences as well as the purpose of communications (it also details which are the preferred media to access the target audiences and by when such communication shall take place. Within the implementation of the strategy, it has undertaken: (i) communication with the participants in the case studies (regional, national, European) (as part of the research process) for example during workshops, (ii) communication with EU staff (to share outcomes of the project) for example via policy brief, workshops and conferences, (iii) communication with practitioners (visibility, outreach and impact), (iv) scientific communication (outreach, impact), for example at scientific conferences or via journal publications.

According to the communications strategy, the following target audience is defined for the project:

The following general key target audiences have been identified by SIM4NEXUS. They refer to the 5 thematic nexus domains. Within each domain public and private institutions are targeted at different levels, including businesses, research community and civil society organisations. The list is not ranked according to importance.

- Water decision-makers or influencers (e.g. United Nations branches in relation to SDGs like UN-Water, UNEP, GWP, OECD, DG ENVIRONMENT, national water planning authorities, water regulators, water authorities' associations, local utilities)
- Energy decision-makers or influencers (e.g. SDG-promoting institutions, planning or strategy departments of energy providers; authorities, DG ENERGY, energy regulators)
- Food decision-makers or influencers (e.g. SDG-promoting institutions, FAO, CGIAR, Ministries for Agriculture/Food, Sustainability and/or RSC managers of retailers, DG AGRI). It is yet unclear how far the food chain will be addressed (e.g. food waste, dietary changes)
- Land decision-makers or influencers (e.g. CGIAR, DG REGIO, regional authorities, ministries for land management and urban planning)
- Climate change decision-makers (e.g. IPCC, UNFCCC, DG CLIMATE, national climate change authorities and agencies, regional and local climate change decision-makers)
- Environment agencies at EU, national and regional level
- Civil protection agencies, for example related to flood prevention
- Cities and Regions: (e.g. Regional authorities, city and town associations, municipalities)
- Researchers, in particular those involved in the IPCC review
- Educators and students (potential future decision-makers)
- Platform and networks (e.g. SDSN, EIPs Water, Agriculture and Raw Materials, CGIAR, GWP, other)
- Civil society representative organizations / NGOs /Charities dealing with water
- (Large to medium) industry actors (WBCSD) and businesses (e.g. insurance, energy and water operators, retailers, food production companies, engineering) and investors (e.g. World Bank Group, EIB)
- Media (business-oriented, policy-oriented, administration-oriented, innovation brokers)
- Interested public.

Note our target audiences are usually located in the middle-upper management (e.g. head of unit or department), dealing e.g. with policy development or assessment, sustainable development, environmental management, corporate social responsibility, or communication. At these levels, the decision-makers are often aiming to connect silos and interact/communicate with other relevant departments/sectors to solve problems, e.g. in the nexus. Private businesses and industry actors are

addressed separately through the SIM4NEXUS exploitation strategy and business plan (WP6). Though the call text focuses on water, it will be important to target adequately all nexus sectors, in particular those that actively drive changes in water (energy, food, land).

The key messages to the different stakeholders are listed below, as well as the aimed impact of the project communications:

Impact	Target stakeholders	Key messages ¹
1. Increased understanding of how water management, food, biodiversity and land use policies are linked together and to climate and sustainability goals.	Global policy-makers: UNFCCC, CBD and UNCCD, UN-SDGs EU level policy-makers: DG CLIMA, DG ENV, DG ENER, DG AGRI, DG REGIO, DG CONNECT, DG R&D National and regional level policy-makers: National, regional and local governments and other authorities as identified in SIM4NEXUS cases	Successful water/energy/land/food/climate policies depend on successful and aligned policies in the other nexus sectors: energy, food, land and climate. Coordinate with policy-makers from these other nexus sectors in an integrated way to ensure good and sustainable policy results in your sector. SIM4NEXUS provides knowledge on the positive and negative interlinkages between your policy sector and the other nexus sectors that help to develop integrated and sustainable policies.
	Decision-makers and practitioners and private sector - WssTP - Large-medium companies (WP6)	Use SIM4NEXUS outputs and tools for better decision-making regarding strategic planning and your safeguarding investments and assets in water/energy/land/food/climate sector. Tap into the business potential of SIM4NEXUS: explore the marketable uses and market share for Serious Game; Link-up with Earth Observation initiatives (GEOSS, Copernicus) to populate databases with reliable open standardized data and modelling outputs.
	Civil society organisations and general public	Water, energy, land, food and climate are all interlinked. This web of interconnections between the various resources is called 'nexus'. Our everyday choices and behaviours regarding one of these nexus elements have impacts on all other nexus elements. Learn how water, energy, land, food and climate are interconnected to make better choices and help ensure sufficient and uninterrupted access to these resources for your community and beyond both now and in the future. Use SIM4NEXUS outputs and tools for communicating better on the water-energy-land-food-climate nexus.
	Educators and students	Teach/learn about the interconnections within the water, energy, land, food and climate nexus to deepen the understanding of the complexities of sustainable natural resource management. Integrate this knowledge in the decision-making in your future career. Use SIM4NEXUS the interactive and engaging SIM4NEXUS serious game for best learning outcomes.
2. Reduction of the uncertainties about the opportunities and limitations of low-carbon options, such as bioenergy technologies and resource efficiency measures, in view of relevant near-term policy initiatives.	Policy-makers and policy advisors/consultants	Use SIM4NEXUS outputs and serious game to test scenarios and low-carbon policy choices for water/energy/land/food/climate sector taking into account the interlinkages with the other nexus sectors.
3. Contribution to future (SCIENTIFIC EVIDENCE)	Scientific Evidence review community: IPCC, CBD, UNCCC,	Apply the science and advanced modelling tools developed in SIM4NEXUS, in order to capture the complex

¹ The key messages will be rephrased according to the target audiences

assessments, including those of the IPCC, with multidisciplinary and integrated tools.	UNCCD, EEA and all ETCs, JRC, Water Europe, ICT4water cluster	interrelationships of the nexus to further research in your sector.
	Policy advisors, consultants, advocacy organisations (NGOs)	SIM4NEXUS provides state-of-the-art inputs to policy consulting evidence assessments in the water/energy/land/food/climate sector towards integrated and sustainable policies taking into account the water-energy-land-food-climate nexus.

For example, 27 policy communication actions have been implemented during the project. This includes the following:

EU and international level

- Acteon hold a short presentation on the ISRivers Conference 2018, 4th-5th June in Lyon, France with a total audience number of 450 participants.
- SIM4NEXUS took part at the 3rd EWaS (Efficient Water Systems) International conference on Lefkada Island, Greece, from 27th till 30th of June 2018.
- Minister of State for Food Security, Office of the Prime Minister of the United Arab Emirates visited Wageningen University & Research, on July 17th 2018.
- Conference Water Science for Impact, 16 – 18 October 2018, Wageningen: SIM4NEXUS workshop with serious game and several presentations.
- Nexus projects workshop, organised by EASME, 27 November 2018, Brussels: Global and European cases presented.
- COP24 Katowice, 14 – 15 December 2018: SIM4NEXUS co-organised two side events about the Nexus approach.
- Policy briefs on CAP and on EU Water policy, aimed at revision of the CAP and evaluation of the WFD, March and April 2019. Contribution to EU consultation about water policy.
- PBL organised a SIM4NEXUS partner event at the Greenweek in Brussels, 16 May 2019.

National regional and local levels

- Regional FR-GER case study stakeholders involvement: Regional Water Agency meeting, 4th June 2018, organised by ACTeon
- The Latvian national case study organised their 3rd Stakeholder workshop on the 3rd of October 2018.
- On the 21st of November 2018 the 2nd Stakeholder Workshop from the Andalusian regional case study took place in Seville.
- Workshop with stakeholders of Southwest Waters case, to conclude the SIM4NEXUS plenary workshop, 16 November 2018, Exeter.
- The first Stakeholder Workshop from the Sweden case study took place, 13th of March 2019 in Uppsala.

Regarding scientific articles, the following have been published:

AUTHOR	YEAR	TITLE	MAGAZINE
JAN POKORNÝ, PETRA HESSLEROVÁ, HANNA HURYNA, AND DAVID HARPER	2016	INDIRECT AND DIRECT THERMODYNAMIC EFFECTS OF WETLAND ECOSYSTEMS ON CLIMATE	SPRINGER INTERNATIONAL PUBLISHING SWITZERLAND
FLORIAN HUMPENÖDER, ALEXANDER POPP, BENJAMIN LEON BODIRSKY, ISABELLE WEINDL, ANNE BIEWALD, HERMANN LOTZE-CAMPEN, JAN PHILIPP DIETRICH, DAVID KLEIN, ULRICH KREIDENWEIS, CHRISTOPH MÜLLER, SUSANNE ROLINSKI AND MIODRAG STEVANOVIC	2018	LARGE-SCALE BIOENERGY PRODUCTION: HOW TO RESOLVE SUSTAINABILITY TRADE-OFFS?	IOP PUBLISHING LTD
JANEZ SUŠNIK, CHENGZI CHEW, XAVIER DOMINGO, SIMONE MEREU, ANTONIO TRABUCCO, BARRY EVANS, LYDIA VAMVAKERIDOU-LYROUDIA, DRAGAN A. SAVIC', CHRYSI LASPIDOU AND FLOOR BROUWER	2018	MULTI-STAKEHOLDER DEVELOPMENT OF A SERIOUS GAME TO EXPLORE THE WATER-ENERGY-FOOD-LAND-CLIMATE NEXUS: THE SIM4NEXUS APPROACH	WATER 2018, 10(2), 139
SARA MASIA, JANEZ SUŠNIK, SERENA MARRAS, SIMONE MEREU, DONATELLA SPANO AND ANTONIO TRABUCCO	2018	ASSESSMENT OF IRRIGATED AGRICULTURE VULNERABILITY UNDER CLIMATE CHANGE IN SOUTHERN ITALY	WATER 2018, 10(2), 209
JEAN-FRANCOIS MERCURE, HECTOR POLLITT, NEIL R. EDWARDS, PHILIP B. HOLDEN, UNNADA CHEWPREECH, PABLO SALAS, AILEEN LAM, FLORIAN KNOBLOCH, JORGE E. VINUALES	2018	ENVIRONMENTAL IMPACT ASSESSMENT FOR CLIMATE CHANGE POLICY WITH THE SIMULATION-BASED INTEGRATED ASSESSMENT MODEL E3ME-FTT-GENIE	ENERGY STRATEGY REVIEWS; VOLUME 20, APRIL 2018, PAGES 195-208
NIKOLAOS MELLIOS, JASON F. L. KOOPMAN AND CHRYSI LASPIDOU	2018	VIRTUAL CROP WATER EXPORT ANALYSIS: THE CASE OF GREECE AT RIVER BASIN DISTRICT LEVEL	GEOSCIENCES 2018, 8(5), 161
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Appendix A:SIM4NEXUS External Advisory Board – Feedback and recommendations

Board Members

Gillian Foster (WU - Vienna University of Economics and Business); Louise Gallagher (University of Geneva)*; Mario Giampietro (MAGIC project); Konstantin Ivanov (Global Water Partnership Central and Eastern Europe); Rabi Mohtar (American University of Beirut, AUB).

About

The SIM4NEXUS project team is taking stock of their project as it nears its end. The purpose of the EAB is to support the SIM4NEXUS project team 1) as they assess their project achievements, and 2) in preparing for their last months of work. The EAB have been requested to give concrete recommendations and feedback on how to build the legacy of the project, recalling that the project is nearing completion and the project team have just a few months of follow-up activities.

Summary report

➤ General comments

- SIM4NEXUS is quite groundbreaking. Good work, timely, needed, with solid scientific output and a sincere attempt at a more iterative and inclusive approach to the science-policy interface for the nexus in Europe. The data visualisations, and the game interface in particular, are very impressive.
- The project needs a more systematic-scale story to help situate the importance and value of the work. Each work package mostly completed their intended work programme, with some deviations. However, the overarching questions driving the project as a whole, and holding the work packages together, became a little lost in the materials shared and in the presentations. Integration across WPs in the communication of results could be improved, with specific connections to and from the communications WP7 and a clear over-arching articulation of the added value of SIM4Nexus to very specific target audiences. *See further details in recommendations section below.*
- One original goal was to test the models with local policy makers in real decision making under uncertainty contexts. Given the coronavirus situation, this has become a greater challenge but can be valuable. Perhaps the project team can try to define the policy audience tightly and perhaps a virtual testing possibility will emerge as being feasible and doable in the time remaining to the project.
- Part of explaining the added-value of SIM4Nexus will include addressing this comment: “Analysing action in a complex system does not always need complex models. Sometimes complex models are not useful in decision making. Sometimes simplifying into simple approaches and analysis tools is also helpful”.
- More transparency is needed when communicating the modeling exercise and outputs. *See detailed comments below in feedback.*
- “Stakeholders” and “policymakers” were referred to a little generally and vaguely throughout,. This may well be because the project team have focussed on the individual case study-level to date and have not yet analysed, or refreshed their initial analysis, on the policy opportunities and key stakeholders etc. that SIM4NEXUS should be addressing as a whole package across all the case studies and at the EU-level.
- Important to pay a little more attention to communicating how you are contextualising the modelling activity and results, stakeholder engagement. - it is delicate to transfer one policy

to another context. Try to use the models to expand on the similarity, differences and compatibility of the cases. Targets not clear or defined (at least as we've seen today).

- The project team would benefit from a collective internal evaluation and lessons learning exercise. The term "project impact" was used too generally and varied as a term across the SIM4Nexus team during the Friday 27 March meeting. Think more broadly about the lessons learned from the case studies and go well beyond the model results and suggested policy pathways in each case (which are probably not comparable). *See detailed comments below in recommendations.*

➤ EAB general feedback on the project

On nexus science and policy-relevant research components (WP1-5)

We give feedback here primarily on how the nexus framework, modelling activities and results, were communicated in the materials and presentations for the 27 March 2020 meeting, recognising that the SIM4Nexus team may already have contemplated these points to follow but chose not to present them today:

How the nexus framework and modelling are communicated

WP1

- In the presentation the methodology for stakeholder identification and mapping was not communicated but it should be clear who was engaged and who was not. Why them and not others? Be clear about at what stages, why and how were stakeholders engaged in the modelling process. For example, who were the case experts?
- How is the nexus tree established / identified?
 - It is stakeholder-dependent and centered around "priority themes" from these stakeholders. The example showed, W is the center, this may change if there are different hotspots and different stakeholders mixes.
 - How did you determine / establish the most influencing or vulnerable resource, did you survey stakeholders and conduct network analysis?
 - How did you establish the strength of the linkage? Did you use data from the network analysis? Clarity needed about data sources, data collection constraints when communicating about this.
- Boundaries, scales, and externalisations need to be clearly communicated. Example: unclear assumptions on GHG gas emissions - are they domestic emissions or also taking into account emissions elsewhere.
- Some comments should be made on the substitutability of resources in the resource flow diagrams. Even if the question is not an easy one to tackle.

WP3+4+5

- ➔ It is worth stating clearly upfront that SDM is an underutilised method in nexus research, and explain why this is the case, including concerns held about the methodology. Why did you choose SDM as your chosen integrated modelling method and not another approach? What do you aim to learn about this method for the nexus research field as a whole? This discussion and tradeoffs in methodological choices was missing from the presentation.. Complex models requiring extensive data may not be as accessible for discussions with the decision makers the project would like to reach?
- ➔ A theoretical framework for modeling and integration is missing, including stakeholder engagement.
- ➔ Generally when communicating the legacy of the work, a greater degree of transparency and clarity is required in communicating about what is in the model, the model assumptions

(cause-effect relationships); what the models do and do not do, and how they interact and do not; how the scenarios were developed; about how the cases interact; who the stakeholders were and how they are selected, and how were they included in the creation of model structure and interpretation of results etc. Some key questions in our mind are:

- ◆ It is not clear what modelling platform you are using? Or did you develop your own?
- ◆ What is the external referent of the model?
- ◆ What is determining causal relations – i.e. if we do A then we expect B to occur – across dimensions (water, energy, food, land use, biodiversity, and economic processes)?
- ◆ Are you conducting econometric analysis? If so, how does this integrate with the SDM?
- ◆ How do you address the role of externalisation of resources obtained through imports (water footprint, energy footprint, carbon footprint, ghost land, embodied work from developing countries?). Or if you do not, be clear that this is the case.
- ◆ There is an issue of scale in the modelling activities that needs to be carefully communicated. By not looking at the openness of the system, you are missing an enormous part of the problem re. Exported footprint of EU. What if targets, results, and problems look different at different scales?

How do your models address this, or how should people understand your models and interpret their results in light of different scales.

- Issues of scale are not explicit in how you connected the different data sets. For example, how do the regional and global models connect? How do the magpie and SDM models interact?
- It is useful to have local SDM for local and regional issues. However, the boundaries and methods of reconciling scales - when it comes to different components with different scales, i.e. water as regional and unpriced, quality when returned to system is important (externalities), embodied/virtual water - needs to be better explained and better communicated to reduce questions of credibility. Environmentally extended input-output tables might be a solution. The methodological choice is fine but it needs to be explained. <https://www.exiobase.eu/>
- ◆ Be clear about who (a stakeholder typology) was included, the degree of participation and how exactly stakeholders engaged in the various modelling exercises across the cases (in WP5).
 - Your protocol for stakeholder engagement is not clear.
 - Being totally stakeholder-led creates an issue if you don't use the game/models to support challenging of their assumptions, as well as your own, or those of policymakers. As such it is not sufficient to say that these models are created bottom-up without articulating how the models were validated, and how they were used in social/group learning. What new insights emerged for who? What changed in people's expectations for the future, preferences, risk perceptions?
 - Were there specific stakeholder types that you were trying to reach? Why these?
 - Were there any interactions among these stakeholders on the model building, or any other dimensions of data collection, model output or other data interpretation? Or this is an individual activity?
 - How did you build scenarios? With stakeholders? Or by analysts with stakeholder input?
- ◆ Model validation? There was little mentioned on model validation methods in the presentations and this needs to be rectified in future communications.

- Were the nexus health targets produced by the models, and how were they validated? Could players designate their own targets and use the simulation interface to assess policy options to achieve them.
- Are you also accumulating knowledge of the player (about policies, their experience of system behaviour), as well as about the player's behaviour in the game simulation? If so, can you use the game in validation procedures for the models and have you done this?
- Do you teach players how to interpret the modelling results? How are you communicating about uncertainty and decision making under uncertainty?
- ◆ Be clear once you start talking about the modelling and cases that you are not trying to produce policy recommendations that are relevant to all cases. There are trade-offs in relation to all sustainability indicators when dealing with the nexus – e.g. when considering GHG gas emissions you can reduce the local emissions by increasing them elsewhere. You can increase the requirement of water when trying to produce more energy with biofuels. Who decides and how the critical thresholds are identified is what matters. It is probably more correct to suggest that what you have captured are some stakeholder preferences, targets, goals/priorities and you are modelling pathways to achieve these in 12 separate cases. If this is true,
 - Are you trying to answer a global question of low carbon and resource efficient development in EU by adding up the results of the local system dynamic models?
 - If the indicators of Nexus Health are targets indicated by the stakeholders, basically the model helps to learn how to achieve a set of specific targets in a specific place, using a specific set of relations (indicated, bottom-up by local stakeholders). For this reason it would be important to explain what are the research objectives of the serious game in relation to the boosting collective learning across cases? Are you comparing/contrasting participatory and non-participatory SD modelling and coming up with different protocols for each approach? Will you do specific protocols for participatory SDM for nexus?

Policy outreach and impact at EU-level (WP2)

See points above on definition of stakeholders. In addition:

- It would be good to identify the specific policy stakeholders who you are trying to reach.
- Re: the criteria for identifying “nexus-relevant policy”? Very interesting idea. How did these criteria evolve with the understanding of the nexus that evolved in the project (as mentioned in WP1 presentation)?
- Defining criteria for successful nexus policymaking outcomes and process (separately) is useful and rich data. Perhaps the cross-case learning could help to isolate some of the most significant or important factors in the process?
- Lessons learned: Which of the barriers to implementation of the nexus is a real surprise to the team? Improve the analysis for EU-specific situation and make it clear which barriers are institutional, which are power-related, which are ‘fixable’. Also in the barriers for the implementation you did not include something that is very much discussed in many other case studies which is building incentives for stakeholders to come together to discuss the system of system solutions.
- Policy coherence scoring - did you use this in conjunction with the SDM analyses? Can you critically reflect on the usefulness of this method static analysis? Is it really worth doing one time?
- You make reference to controversial policy questions like diet and biofuels. Re. diet, are you discussing current consumption patterns, low meat / high food and vegetables diet, are you

referring to the Mediterranean diet, lancet diet? It is important that you clarify the type of diet.

Empirical cases and stakeholder engagement (WP5)

See point in general comments about the stakeholder definitions and participation analysis; see point above in WP2 on stakeholder incentives for involvement in policy. In addition:

- A minor comment on the label “nexus complaint:: do you mean “hotspot”? Because complaint is sometimes perceived as negative. “Hotspot” could be a better replacement.
- Nothing was mentioned about how power dynamics might have influenced who was selected to participate, and how they interacted with each other? How did you manage these?
- These references might be helpful for analysing the level of stakeholder participation/engagement across the case studies
<https://online.liverpooluniversitypress.co.uk/doi/pdf/10.3828/tpr.2020.7;>
<http://journals.openedition.org/rga/1144>
- The specific learning outcomes varied a lot in the presentation, and not in ways that could be explained by the targeting of different stakeholders. Promoting the nexus concept / raising awareness about the concept is not a research or learning objective. The survey is testing reported awareness but is not assessing genuine gains in capacities to apply the concept.
 - Some learning outcomes might be:
 - Identification of publicly acceptable and implementable entry points for policy.
 - Learning about their local system and identifying actions that could be taken at different levels. How did the understanding of interlinkages, resources flows, trade-offs and synergies change in the people that you engaged with? Their priorities and expectations of future resource availability, insecurities?
- The challenges of the stakeholder engagement that were communicated in the WP5 presentation are common and understood. Given your experience with involving stakeholders across such a variety of cases and contexts, what have you learned that is new?
- Do you have a formal method to support deliberation between different policy actor groups post-gaming?
- We noticed that the size of the project is not compatible with the participants/ workshop survey returns. They are very low in comparison with the size of the project.

Feedback on exploitation strategy (WP6)

- Market analysis needs to be further developed to explore marketplaces beyond university settings. Who is willing, but also able, to pay for access to the Serious Game? Is the market value profitable?
- The business model may need to expand beyond “nexus” language and focus and consider the broader range of adjunct commercial services and training that could be offered around the game.

Feedback on communications strategy (WP7)

- There is one communications strategy for the overarching SIM4Nexus project but it does not seem to specify clearly who we are communicating with, and to what end, beyond increasing the project visibility.
- Communication is a two-way and a learning process. How did you adapt communication to different groups? How did we integrate and change how we model with the feedback received? What were the most effective communications outreach mechanisms? What communications loopholes have been discovered and how will they be addressed?

- Recommendations for enhancing project legacy

Recommendations for developing SIM4NEXUS value-add and impact narrative.

This was not deeply explored during the March 27 discussion. While there were a few references to lessons learned for the individual work packages, it seems that some additional effort to generate a coherent analysis of lessons for the whole project would help to elevate the work. What has this project achieved as one whole? What worked, what didn't in the larger context of what we know and what we don't about the nexus as a concept and a method? What do you know now about integrated policy analysis and implementation for a low-carbon and resource-efficient (sustainable) future in the EU? If these types of questions could be answered with clear and distinct audiences in mind for this learning it would give a single, compelling impact narrative for the project, and clear people to whom this story should be told.

We recommend generating a shared impact narrative, with detailed descriptions of who are the target audiences for adding-value and in what ways SIM4Nexus as a whole, not just individual work packages, makes a difference for these groups. Defining this specifically is going to help articulate the project achievements in a more compelling way, and will support communications in the final months. Please see a suggested evaluation framework in the appendix below. This should become a guiding light for the team in finalising your research products and producing a strong, shared narrative about the project that would aid finalisation of communications activities and support future exploitation.

Think about your audiences first. To what groups are you well-positioned to add value at the 'whole project' level? Who are you learning lessons for? Who are your allies in building legacy? For example:

- The nexus research community, internationally* . In terms of value-add to the nexus research community and internationally: what direction do you think we should move in? Some interesting ideas raised during the day included High-quality nexus evaluations for projects and programmes
- The nexus research community in Europe*. What learnings can be shared with this group so they do better in terms of policy-relevant nexus research?
- Policy actors at EU-level engaged in the Green New Deal*, and in adjacent policy areas on low-carbon and resource-efficient pathways to sustainability in the EU.

Substantive elements of value-add mentioned during the Friday 27 March discussions:

- The visualisations for resource flows analysis - what do you know now about this that would help the nexus community do a better job of illustrating complexity in the nexus while also helping non-FEW communities to enter into the subject.
- Defining criteria for successful nexus policymaking outcomes and process (separately) is really useful
- Interesting point - resourcing for "in-between" issues that fall between ministries.
- A naming convention and protocol for standardisation of SDM for nexus assessments - ranging from less to more participative - combined with the visualisation testing the project team has been able to do and based on empirical experiences in 12 different cases is a significant contribution.
- A protocol for stakeholder inclusion in nexus modelling would be useful. Comments on an alternative protocol is probably good to include at this stage for a Corona epidemic. What do you think it might imply for meeting research goals in terms of workshops, activities, and meetings in these days and times where we cannot meet?

- Collective lessons to learn across the whole project and share, to our minds, include:
 - After 4 years, and 12 cases, what can SIM4Nexus say now about SDM in nexus research horizons? What new observations can you make about how to communicate effectively on the nexus theme in the EU and across different stakeholder groups?
 - After completing the 12 case studies, were there too many over a 4-year horizon? What would be your recommendation to nexus researchers in future? Were there any differences on nexus understanding found while preparing the case studies in Central Europe? What can you say about regional disparities generally?
 - How are the modelling approaches and structures different across the 12 cases? How are they alike? Are there common repeating dominant feedback loops regardless of who the modellers were?
 - Are you comparing/contrasting participatory and non-participatory SD modelling and coming up with different protocols for each approach? Will you do specific protocols for participatory SDM for nexus? A methodology to connect the various research teams and stakeholders at various scales could be useful.
 - Thinking more broadly about the lessons learned from the case studies (go beyond the models!), how do the cases compare, how are they similar and how are they different?
 - Degree of stakeholder participation across cases? Why was it different?
 - Differences in stakeholders involved across cases? Why do the typologies vary? Was it because of your networks? Or the cultural, social and political context of the policy/decision making context?
 - Who were you missing in all cases? Why was it so hard to include these stakeholders? What does this tell us about the nexus and who wants to work with the concept? Or who it excludes?
 - What themes are different across locations?

→ An important element of impact that might go overlooked is the legacy of stakeholder networks and their likely longevity. This seems like an interesting point to track and substantiate somewhat if possible.

Recommendations on communicating modelling and outputs

See detailed feedback in section 2 and lessons learning proposals above.

1. Once outside of the context of specific cases, or without enough time to inform the audiences of the details of a particular case, emphasise what the research objectives were for learning across cases and present those results instead of referring to cases but not being able to satisfy questions about them.
- 2. Be clear about who the stakeholders are in all cases, how they were selected, the degree of participation and how exactly were stakeholders engaged in the various modelling and other exercises.
- 3. Exercise caution to avoid giving a misleading impression that the local models add up to answer a more global question for the EU.

Recommendations on boosting policy outreach, exploitation of project outputs and learning post-project to build legacy

- Refresh your EU-level policy opportunities and stakeholders analyses and choose a small number of targets and a clearly stated desired policy change to which SIM4Nexus is best placed to contribute (i.e. what it's really going to mean to operationalise the Green New Deal). Focus on achieving this, with

the most specific analysis and input tailored to that particular change, rather than taking a shotgun approach.

- ◆ What do the analyses teach us about where synergies are available, where unsustainable trade-offs are likely in the EU in different country contexts? Beyond recommendations at national level at implications for future EU-policy implementation barriers?
- ◆ How do you think the serious games should be used in operationalising the idealised nexus policy process mentioned in WP2? What does cross-learning across the cases tell us about the role of serious games in participatory policy formulation and deliberation; testing public acceptance of policy instruments; etc.?
- ◆ Other interesting points for EU policy messaging that came up during the day included:
 - Resourcing for “in-between” issues that fall between ministries, also crossing scales given that the ‘right’ scale for nexus implementation, for nexus assessments is likely to be subnational. Then, consider what this means for EU-policy formulation processes and implementation, and the resourcing.
 - Which groups stand ready to support cross-DG, cross-level activities and what gaps exist? What are existing entry-points in existing policy processes, i.e. should professional urban and rural planners be trained in nexus assessment methods? [From WP2]

→ In terms of improving the exploitation strategy, we consider the game interface to be your secret weapon. Explore using it as a teaching tool, as an interactive science exhibit, reach out to virtual reality tech partners...

- ◆ Could you build some coherent learning programmes around the game, organised around clear modules that exploit the game over a full semester and could you go beyond the ‘nexus’ label if needed? For example, modelling-based learning in the WEF nexus, model-based learning in sustainable development; policy analysis for sustainability transitions, policy analysis under complexity. Some examples for inspiration:
 - <https://www.ellenmacarthurfoundation.org/explore>
 - <https://www.water-energy-food.org/news/nexus-workshop-water-energy-and-food-eu-delegations-trained-to-apply-nexus-thinking/>

→ The communications strategy and exploitation strategy should be working hand-in-hand at this stage, defining a clear purpose for communications in the last months.

- ◆ What specific audiences and policy processes should the team be targeting? What forms of outreach are recommended for these particular audiences? What intermediate partners might be well-placed to carry forward the policy-relevant outputs of the project? (i.e. civil society partners?).
- ◆ We recommend defining a specific policy audience and focus on them for impact and legacy, rather than upping visibility of the project generally. Aim to be recognised by key players rather than by social media followers, retweets, etc,
- ◆ Have you reached out to fellow researchers from other relevant projects to consider a follow up research project or other joint communications or other activities based on the SIM4Nexus outputs and learning.

Appendix B: Suggested starter evaluation framework

The impact narrative the SIM4Nexus team should test is:

SIM4NEXUS has made - and can make even greater - positive and valuable contributions to nexus research and practice because it has:

A. Produced and finalised its major intended research outputs, with associated high-quality peer-review journal publications on:

1. An empirically-tested framework for the assessment of the nexus, including: (i) Framework methodology, (ii) framework application and innovations for case studies and (iii) relevant performance indicators and benchmark values and corresponding calculation methodologies for case studies).(WP1)
2. Nexus policy coherency analysis and a clear and compelling set of policy recommendations on a resource-efficient and low-carbon energy transition in Europe, grounded in empirical cases(WP2)
3. A global interactive model and visualisation of physical nexus resource flows and system dynamics modelling of cross-scale and cross-sectoral future scenarios and trends, which underpins the design of a Serious Game that generate new insights on interlinkages between resources, trade-offs and synergies, and develop recommendations for policy and business. (WP3+4)
4. Results from applied integrated nexus assessments addressing real-life challenges in 12 selected case studies across the European region Serious Games. (WP5)

=>Are these completed? Satisfactorily? Are they compelling results?

B. A clearly articulated statement about its added-value, including identification of the key beneficiaries to whom value has been, is and will be contributed.

1. To whom is the project providing value? Who are the target beneficiaries?
2. What kind of value? With what kind of outcomes?
3. Who are SIM4NEXUS' competitors and allies in this landscape? What, then, is SIM4NEXUS' value-add?

=>Is the add-value pitch clear and compelling?

C. An exploitation (WP6) strategy that seems likely, with self-funding mechanism, to support future:

1. **Conceptual uses of SIM4NEXUS learning and outputs:** SIM4NEXUS thinking, research outputs, cases etc. are referenced by academic, practice and/or policy audiences (citations, invitations to keynote or present at conferences, in policy statements)
2. **Instrumental uses of SIM4NEXUS networks, learning and outputs:** In other research, in developing new projects and case studies inside and outside of the SIM4NEXUS project network (Exploitation)
3. **Normative uses of SIM4NEXUS learning and outputs:** Project outputs have been/could be used to prescribe pathways and standards for improved governance and management of nexus linkages in real policy contexts (Exploitation)
4. **Strategic uses of SIM4NEXUS networks, learning and outputs:** SIM4NEXUS outputs have been/could be used to develop a mandate or gain additional mandates for policy bodies, civil society organisations, and/or academic research entities, etc. for nexus-related activities(Exploitation)
5. **Catalytic uses of SIM4NEXUS networks, learning and outputs:** SIM4NEXUS learning and outputs to date are used by the project team and others to fundraise for and kickstart

new projects [because of enhanced institutional capacity, relationships and joint actions (new networks, collaborations, partnerships) developed during the SIM4NEXUS project lifetime] (Business plan).

=>Does the draft exploitation and business plan strategy look like it will enable the above uses by specified target audiences? To what degree?

D. A communications plan and content in place that will support the exploitation and business plan (WP7).

=>Does the draft communications plan look like it will support the exploitation and business strategy effectively?

Given the impact narrative and all that we have learned about SIM4NEXUS, what key lessons would contribute new insights and thinking to our target audience communities?