D1.6 Framework Alignment and Theory Update (ed. 1)

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0.3	05/06/20	Pavel Kogut	21C	Content and edits
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1.1	30/06/20	Pavel Kogut	21C	Final version

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Executive Summary

The original framework provided a general direction for the project while giving pilots and subject matter experts enough flexibility to tweak individual tasks as they see fit. This approach ensures that PoliRural develops according to real-life needs and best practices rather than some hard and fast rules determined at the outset.

To check whether the framework is still fit for purpose, periodic revisions are conducted as part of *T1.3 Framework Alignment and Theory Update.* T1.3 acts as a tool for retrospective analysis that compares original ideas with what actually happened in different project stages. Specifically, it captures changes to the initial framework by taking stock of recent activities performed by the wider PoliRural consortium, with a special focus on pilot work. As revisions take place, early ideas of what might work are replaced with practical knowledge of what really worked (or didn't) and why.

Pilot activities and their allied tasks in M1-M12 were found to be broadly in line with the high-level approach outlined in the work plan. Needs gathering (T4.3) identified issues for policy matching (T4.4) which in turn provided inputs to policy evaluation (T4.5). Foresight planning (T5.2), SD model building (T5.1) and Semex development (T2.3) all have been running in parallel to support pilot work within WP4. However, at task-level, important differences were observed in all of the above except T4.4 and T4.5. Some differences were caused by the addition of new concepts and methods, some by the fact that elements which had been initially foreseen by the framework weren't implemented, for technical and other reasons.

This deliverable is the first in a series of three updates to come out of T1.3. The entire series is primarily intended for "internal consumption" i.e. project partners involved in the delivery of an online course and accompanying webinars (D7.7, D7.8, D7.9, D.10). The aim is to create learning content that is based on best practices and lessons learned. That said, other beneficiaries of T1.3 include PoliRural pilots and stakeholders outside the consortium circle who may wish to follow the PoliRural approach in a new setting. An updated framework will come in handy as it will allow interested parties to ground their activities in tried and trusted methodologies rather than some untested assumptions that may be plausible in theory but not in practice.

Keywords

Framework, revision, update

Introduction

D1.2 PoliRural Framework sketched the contours of the main stages in the project lifecycle. To recap, PoliRural starts with an investigation of rural situation in the twelve study regions by identifying current needs, existing policy measures and stakeholder experiences with these measures through a multi-method evaluation exercise. In the second stage, new or enhanced policy interventions are conceived and tested under different scenarios using a range of innovative techniques and tools, including design thinking, system modeling and dynamic simulations. Potential interventions whose results show the best fit with desired futures are then framed as missions that regional stakeholders will strive to implement in a bid to make rural areas more attractive places to live, work and invest.

In designing the framework, the aim was to set the general direction for the project while leaving the partners ample room for manoeuvre. Dispensing a very strict and prescriptive set of actions in D1.2 would have done a great disservice to the iterative, bottom-up nature of the project. For that reason, the framework was not carved in stone. Activities presented in D1.2 are merely suggestions that pilots and subject matter experts are free to tweak as they see fit. This flexible approach ensures that PoliRural's methodology remains a living process whose core principles are determined at the outset but any future modifications are refined based on real-life needs and experiences that emerge as the project develops.

To check whether the original framework is still fit for purpose, periodic revisions are conducted as part of *T1.3 Framework Alignment and Theory Update*. T1.3 acts as a tool for retrospective analysis that compares original ideas with what actually happened in different project stages. Specifically, it captures changes to the initial framework by taking stock of recent activities performed by the wider PoliRural consortium, with a special focus on pilot work. As revisions take place, early ideas of what might work are replaced with practical knowledge of what really worked (or didn't) and why.

This deliverable is the first in a series of three updates to come out of T1.3. Each document will review a different set of elements within the framework:

- First edition (D1.6): needs gathering, foresight planning, model building, text mining
- Second edition (D1.9): text mining, policy evaluation, model building
- Third edition (D1.12): scenario analysis, model building, dynamic modeling[1]

Intended audience

The entire series is primarily intended for "internal consumption" i.e. project partners involved in the delivery of an online course and accompanying webinars (D7.7, D7.8, D7.9, D.10). The aim is to create learning content that is based on best practices and lessons learned. That said, other beneficiaries of T1.3 include PoliRural pilots and stakeholders outside the consortium

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[1] The scope of D1.9 and D1.12 is tentative and may change as the project develops.

circle who may wish to follow the PoliRural approach in a new setting. An updated framework will come in handy as it will allow interested parties to ground their activities in tried and trusted methodologies rather than some untested assumptions that may be plausible in theory but not in practice.

Deliverable structure

After the introduction, we have a quick overview of the PoliRural framework. Chapter one briefly describes the main stages along with the accompanying activities and transversal tasks that support pilot work. It ends with a list of framework elements that were selected for a review by D1.6. The main criterion for selection is a marked change between the initial thinking and what actually happened in the project, or between assumptions and reality.

The following four chapters then deal with those elements in turn: needs gathering (chapter two), foresight planning (chapter three), system dynamic model building (chapter four) and text mining (chapter five). Each chapter follows the same structure:

- An explanation as to why a particular element is important, and what was the reason for including it in the PoliRural framework in the first place
- A brief summary of initial expectations and thinking concerning the element's execution during the project
- A succinct report on changes that were made or discussed in relation to the identified elements in the period covered by this deliverable (M1-M12)

Drawing on the wisdom of hindsight, chapter five discusses the main take-aways and new ideas developed in the first year. The deliverable concludes with a list of recommendations for the framework update.

Chapter 1: Framework Overview

PoliRural is organised around three main stages that run along the present-future continuum. The first stage ("Current Rural Situation") starts with an issues analysis and culminates in the evaluation exercise that shows how well existing rural interventions are performing. This is achieved by combining traditional survey research with advanced text mining techniques that so far have found little application in rural policy making. Evaluation results are meant to highlight areas for improvement on the basis of which new or improved measures can be introduced in each of the 12 pilot regions.

The second stage ("Future Regional Outlook") builds on the evaluation results to enable the co-design of potential interventions, which are then tested for impact under different scenarios and drivers of change. Qualitative techniques are combined with system dynamic (SD) modeling to deliver robust insights into the evolution of study areas under the proposed policies over the next two decades i.e. until 2040. Policy options with the most favourable outlook become regional missions whose foundation is established in the third and final stage.

"Mission Oriented Innovation" concludes the high-level framework. The aim here is to use simulation results to develop region-specific missions that are bold and ambitious but not so much that they become near impossible to execute. In keeping with the spirit of mission-oriented approach, local action plans will be co-created by PoliRural pilots with a wider community of rural stakeholders. As mission implementation can be a drawn out process (running for 15 years or more), it is highly unlikely that mission outcomes will fully manifest themselves during the project's lifetime. For that reason, only ex-ante and ex-durante assessments are envisaged in the final stage.
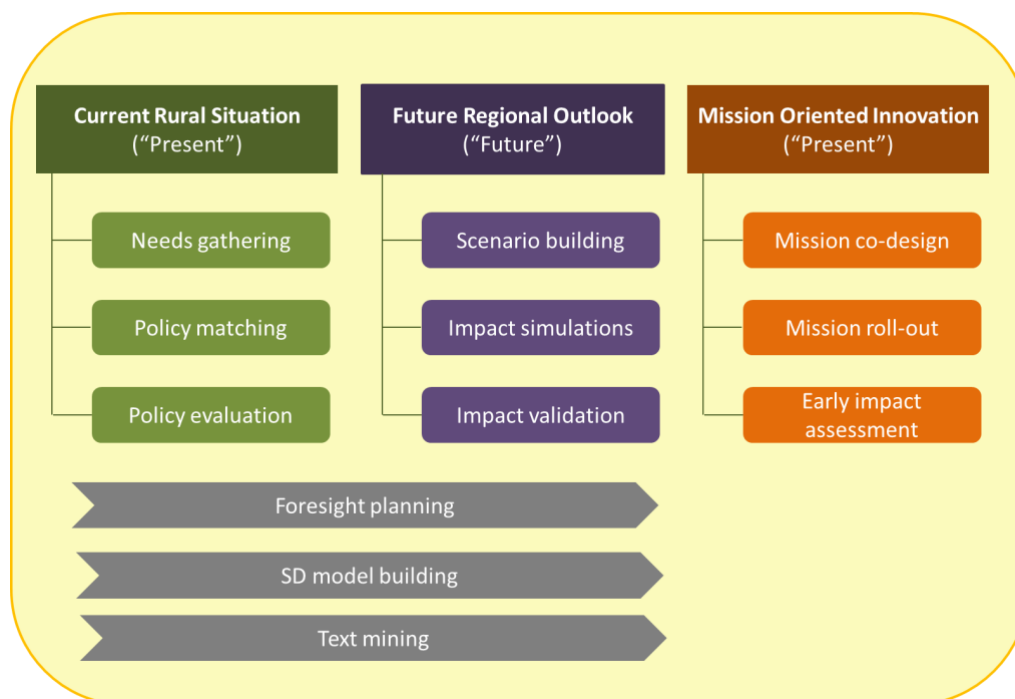

Figure 1. Main stages and activities in PoliRural[2]

The framework was deliberately kept broad to allow task leaders to introduce the necessary changes in response to local needs and project requirements as and when they happen. During M1-M12, important changes occurred in some but not all of the planned tasks. For instance, policy mapping was carried out without any major deviations from the framework. But needs gathering, foresight planning, SD model building and text mining all proceeded differently than planned. By differently we mean i) the addition of new activities not foreseen in the original framework or ii) partial implementation of activities that were originally planned. It is these four tasks that we are going to review in turn, starting with needs gathering.

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[2] The first year covers two thirds of 'Current Rural Situation' i.e. needs gathering and policy matching, as well as all three transversal activities: foresight planning, SD model building and text mining.

Chapter 2: Needs Gathering

The goal of needs gathering is to obtain an overview of challenges that pilot regions need to address in the coming years in order to make their rural areas more attractive. Attractiveness is a broad concept and can mean different things to different people. Some may see it as a purely quantitative phenomenon (e.g. abundance of rural jobs or recreational activities), some may focus more on qualitative aspects e.g. good employment conditions, clean air or waterways. Some may think of it in terms of wellbeing for those who live in rural areas, some in terms of richness of experience that tourists get when they visit the area. Yet for others rural attractiveness can be more about cultural heritage, economic diversification or support for start-ups.

To find out what rural attractiveness means in different regions, PoliRural performed an issues analysis in the twelve study areas. This deliverable does not seek to repeat the findings of *T4.3 Regional Needs Gathering and Analysis* for they are comprehensively discussed in *D4.2 Grassroot Needs and Factors of Rural Attractiveness*. Instead the aim here is to simply review the approach taken by pilots against the initial framework conditions. Which of the original steps were followed? What new steps were introduced, if any? What steps weren't followed and why?

Initial thinking

According to the framework, the needs analysis was meant to focus on recognised local challenges, as well as on the exploration of needs and challenges emerging elsewhere. The process was meant to start with the identification of needs that are already mentioned in policy documents and local development discourse by means of literature review and survey research. To address future local needs, it was suggested to focus on needs that are known and recognised at a global level or in regions across Europe and beyond. This required search and research relating to local and international sources of information, insight, opinion and social commentary. Text mining was seen as an important enabler of this kind of task, and was thus included in the research toolbox for needs gathering and analysis.

What actually happened

In carrying out needs gathering, pilots reviewed policy and research literature, engaged regional stakeholders and launched an online survey to gain an understanding of pressing issues affecting their region. As foreseen by the framework (T4.3), the SWOT analysis was introduced as an extension to the survey. Following the SWOT approach outlined by JIIP, pilots discussed research findings, validated local needs and defined factors of rural attractiveness together with regional stakeholders at participatory workshop sessions.

Two elements of the original framework that weren't addressed by the needs gathering task are the analysis of global challenges-cum-drivers and the use of Semex,[3] a text mining tool. One could argue that by not employing these techniques, pilots missed an opportunity to enhance local needs exploration with insights from global horizon scanning and big data analysis. There are several reasons why these two tasks would have been beneficial. First, a review of international drivers could have highlighted new and unexpected issues that no one in the pilot had thought about previously. In most cases these would be things that have already become issues elsewhere but are not yet manifest locally. Second, text mining would have made it easier to compile an inventory of factors that are driving change elsewhere, that create development challenges, and that may require a policy response from regional actors sooner than later. Text mining could have also provided a valuable contribution at the survey stage by uncovering new issues in a variety of online sources e.g. social media platforms, blogs, discussion forums.

The main reason for text mining's absence in T4.3 is that Semex was still in development while needs gathering was underway. And what concerns the drivers analysis, although it did not provide any direct input to D4.2, the activity proceeded in parallel as part of *T5.2 Literature Review and Data Collection*. As it falls under *WP5 Future Rural Outlook*, we will report on the drivers analysis in the next chapter that deals with foresight.
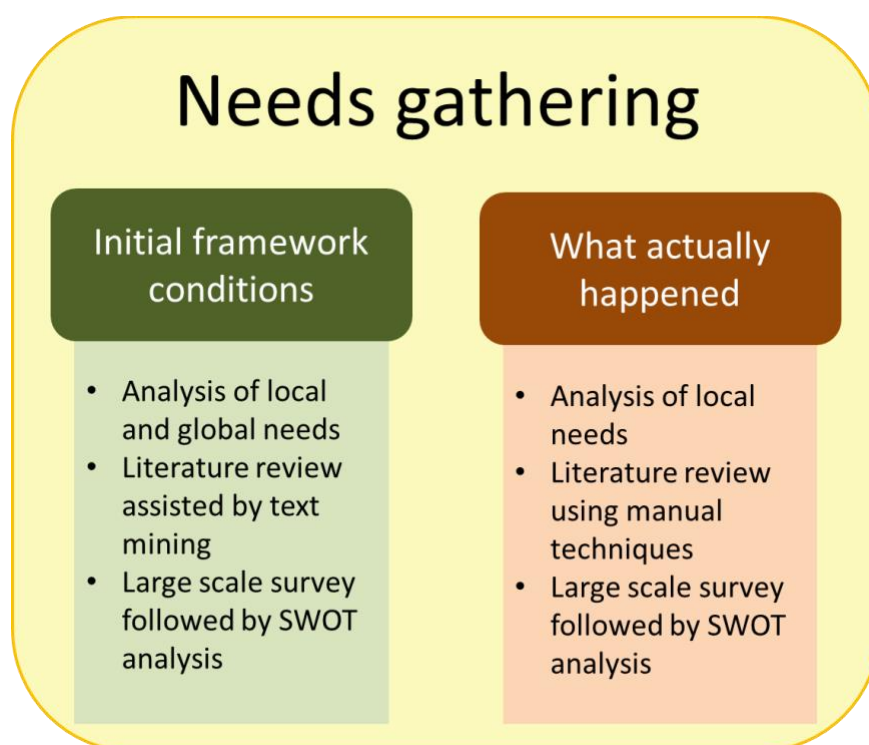

Figure 2. Needs gathering: ideas v. action

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[3] http://semex.io/

Chapter 3: Foresight Planning

Foresight plays a major role in PoliRural. It occupies two-thirds of the overall framework, covering the Current Rural Situation and the Future Regional Outlook. The adopted foresight approach is expected to provide a good understanding of change, of how it is happening in the world, how it will play out in the 12 study areas, and how local/regional decision makers can leverage new knowledge for the benefit of rural areas and people. The last point highlights foresight's close relationship with Mission Oriented Innovation, which aims to change the present in order to prepare for the future.
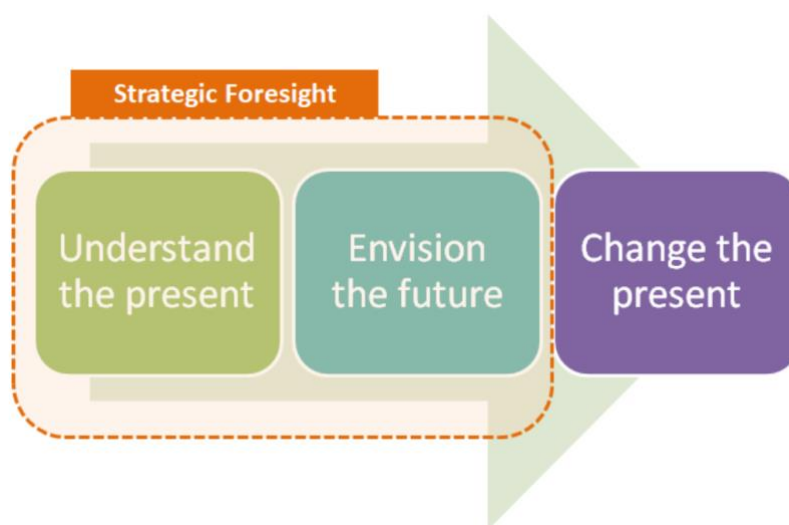

Figure 3. Foresight in the PoliRural framework

Initial thinking

The original framework extensively discussed foresight as a concept but not how it should be executed in the participating regions. This is because, at project-level, the priority was to address some of the inherent foresight challenges (i.e. the quantitative-qualitative divide)[4] and make the discipline more innovative through the use of tools such as text mining. The methodology was given less attention, which is evident in the way pilot foresight was initially conceived. On paper, most of the pilot work is concentrated in three work packages (WP4, WP5, WP6) that broadly fall into the high-level framework. However, these three work packages do not cover all of the tasks needed to implement a meaningful foresight pilot. Moreover, the corresponding deliverables do not include the documents that are typically created in the course of a foresight initiative. All this created a need to provide the teams running the regional pilots with additional guidance and tasks.

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[4] Both approaches have their advantages and limitations. From PoliRural's perspective, both approaches can provide interesting insights about the future and these insights can certainly be improved by using all available techniques and tools. That's why PoliRural will use pilot tasks as a living laboratory for exploring the role of text mining and SD modelling in the context of a regional foresight activity.

What actually happened

The original framework was short on details of how foresight is to be executed. This limits our ability to do a strict before/after comparison within the context of T1.3. All foresight related activities that happened in the project thus far can be considered 'new' because most weren't specified as such in the framework.

The main point of departure in our foresight journey was the creation of the model foresight process by PoliRural's in-house foresight expert CKA. The model has served as a guide for people leading the pilot initiative at regional level. It presents foresight as a collection of three sequential phases: 1) preparation and mobilisation, 2) exploration and visioning, 3) post-foresight planning and follow-up. The model contains clear instructions on what is expected at each phase, while leaving sufficient room for pilots to adapt the model in accordance with specific challenges and constraints they are facing.

Phase 1: Preparation and mobilisation

The first phase was in fact groundwork that required pilots to assemble the initial team, conduct stakeholder analysis, review institutional arrangements that can either hamper or facilitate progress (forthcoming elections, budget cycles etc.), identify relevant sources of knowledge (e.g. policy documents, strategy papers, foresight studies) and develop an initial vision statement. To better coordinate these efforts between the twelve regions, and to ensure that pilots provide consistent results, CKA created a special data collection tool in the form of a template. The impact of this preparatory work is felt beyond WP4 and WP5, as PoliRural website now has a dedicated section where all 12 pilot fiches are published (WP7).[5]

Phase 2: Exploration and visioning

The second stage is still in progress. Pilots organised workshops to explore local issues and challenges. They performed a drivers analysis using the STEEPV framework. In the coming months, two additional tasks will be carried out. The first one will focus on exploring future outcomes based on different scenarios, the second one on reaching a consensual vision for a desired future that can be achieved with the help of appropriate policies, programs and accompanying legislation.

Local issues and challenges were covered in the previous task. Here we will just briefly mention how the work on drivers was organised. The results are still being processed and although this task is not an official deliverable, it is our intention to publish a complete drivers inventory in the coming weeks.

The work of developing the shared inventory was divvied up between the partners involved in T5.2. Six teams were formed, one for each letter of the STEEPV mnemonic. STEEPV refers to a variety of general headings that provide a starting point for strategic discussions. In our case it

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[5] https://polirural.eu/pilots/

was used to start a conversation about drivers and trends relevant for rural development: social, technological, economic, environmental, political or policy related, and value based. By casting the net so wide, we wanted to make sure that we cover as much ground as possible at the beginning, and that no stone is left unturned as pilots set out to explore the future.

Table 1. STEEPV teams in PoliRural

Category	Lead	Supporting partners
Society	MAC	NUVIT, VPR, InnovAgritech, TRAGSA, HAMK
Technology	AUA	CZU, NUVIT, BOSC, NP, SocialInnolabs, MAC
Economy	AgFutura	BOSC, AREI, HAMK, GGP
Environment	VITO	Agroinstitut, BOSC, SPI, ERDN
Politics / Policy	JIIP	Nitra, SPI, Migal, ERDN, Murgia Piu
Values	VIPA	LLF, JIIP, ERDN, CONF

Phase 3: Post-foresight planning and follow-up

The last phase will commence towards the end of the project. We will report on its implementation in the final edition of this deliverable. Briefly speaking, phase three will focus on how to achieve the shared vision for the region in 2040. Expected main outputs are

- A roadmap detailing the actions to be taken along with a specific means for execution
- Operational objectives based on quantitative and qualitative indicators
- A plan for monitoring progress
- A clear commitment from key beneficiaries and potential adopters in the form of Letters of Intent or other endorsements

Foresight planning

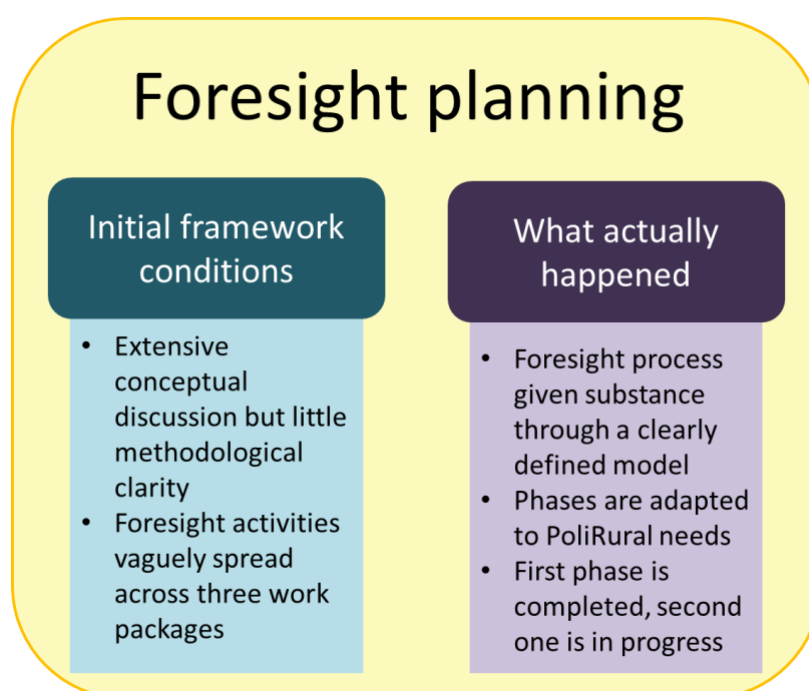| Initial framework conditions	What actually happened
• Extensive conceptual discussion but little methodological clarity • Foresight activities vaguely spread across three work packages	• Foresight process given substance through a clearly defined model • Phases are adapted to PoliRural needs • First phase is completed, second one is in progress

Figure 4. Foresight planning: ideas v. action

Chapter 4: SD Model Building

A quantitative arm of foresight, system dynamics (SD) plays a supporting role in PoliRural. Thanks to SD pilots can gain a better understanding of how the world is changing, and how this change affects local conditions. Crucially, SD can show how change can be manipulated not just by forces over which we have little control, but by our own interventions e.g. policies, laws, programs. As the impact of different interventions is illuminated, we can gain valuable insights into the best course of action needed to achieve a desirable future. We added SD modelling to the PoliRural framework to help people understand the ways in which different forces, factors and drivers interact and evolve over time, and how they can be influenced by policy measures at different levels of governance. The aim is not to make hard and fast predictions about the future but rather to help pilots gain a deeper, more insightful view of the world, how it works, how to influence change and what can happen if a certain line of action is taken (or not).

Initial thinking

The framework outlined the SD modeling as a process combining quantitative and qualitative characteristics. The model's structure is considered qualitative to the extent that it reflects local reality, its inherent characteristics and specificities, whereas statistical input fed into the model is meant to add to the model's quantitative dimension. To make the overarching model as representative as possible of the rural ecosystem, seven modules were proposed covering population, education, land use, economy, agriculture, infrastructure and quality of life, and policies. The plan was to build the model in four iterations.

An important consideration in this regard concerns knowledge acquisition and knowledge sharing. For the model to work as intended, deep domain expertise in SD must interface with grassroot knowledge possessed by regional actors. The involvement of local stakeholders should create an open learning environment, one that challenges assumptions, removes prejudices, stimulates debate and improves communication, ultimately helping everyone involved to reach a consensus on what trajectory is best for the region. Additionally, SD results should critically inform the formulation of new policies and priorities for the participating pilots.

What actually happened

Changes to the model

Technically, model building proceeded as planned. Two out of four deliverables were submitted in the first year. D5.1 placed the initial model in the broader context of foresight action and established links with other project tasks and outputs e.g. the vision of rural attractiveness (D1.1), text mining (WP2). The seven-module structure was revised to reflect these changes. Specifically, D5.1 suggested adding one more module related to population ('post school population will'), one more module related to agriculture ('agricultural production'), and a new module on territorial capital. The education module was replaced with the 'post school

population will.' The economy module was replaced with 'rural employment.' The policies module was removed for the time being.

Action toward the consortium

For many in PoliRural, SD modeling is a new field. Without a basic understanding of what it can and cannot do, pilots will not be able to harness its benefits to inform policy making. It was therefore important for the in-house SD expert (22Sistema) to initiate a training process with the goal of building capacity within the consortium and especially among the pilot partners to understand the basic assumptions behind SD, to learn how to use the simulator, adjust parameters and read the results (charts). To that end, hands-on workshops were held online and face-to-face during project meetings. Since it wasn't possible to use real-life models at such an early stage, case studies and toy models were used instead for education purposes. This allowed the participants not only to learn more about SD basics but also to get a better feeling of how change happens and what factors bring it about. By M12, seven toy models were built by 22Sistema, all of which can be accessed via the isee Exchange platform.[6]

Changes to the process

At the end of first year, the second PoliRural model (D5.2) was published. It formalised model building by defining key stages in the process: drivers analysis, driver-KPI mapping, high-level model building, and expert-layer creation. Building on the SWOT results and a ranking of needs presented in *D4.4 Needs Policy Canvas,* D5.2 was able to sketch the contours of 'template modules' that pilots will have to elaborate during the upcoming driver-KPI mapping stage.

Additionally, D5.2 reiterated the commitment to bottom-up engagement, especially in stages two, three and four where the interface between SD experts and local stakeholders is particularly important. For instance, how does infrastructure, cultural sites, events or hotels affect the number of visitors to Monaghan (IE)? Without input from pilot stakeholders, it will be extremely difficult for 22Sistema to answer such questions, and to define relationships between drivers and KPIs for a given region. Driver-KPI relationships must be defined locally before SD experts can start building a high-level model.

The last important change worth mentioning concerns the model's structure. Whereas D5.1 expanded the number of modules to nine, D5.2 decided to liberalise the structure to enable pilots to assemble the model that best represents their rural ecosystem. Thus regional models no longer need to follow the nine-module framework as suggested in D5.1.

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[6] https://exchange.iseesystems.com/directory (enter "PoliRural" in the search field)
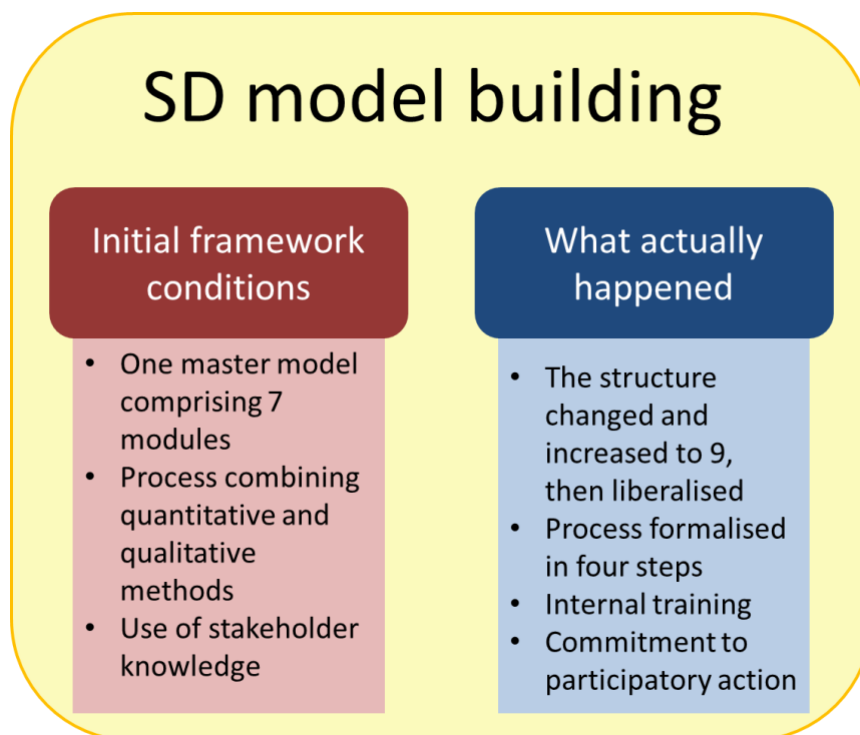
Figure 5. SD model building: ideas v. action

Chapter 5: Text Mining

Previous chapters made various references to text mining which attests to the techniques' transversal role in the project. Much information that researchers and policy makers need to make informed decisions is hidden in large amounts of textual data. However, the sheer volume of this data makes it impossible for any team, let alone individual, to perform a meaningful analysis using human effort alone. Text mining can help process vast amounts of information from structured and unstructured sources, enabling the discovery of new knowledge at relatively low cost. Text mining can be seen as a form of smart search that allows people to work efficiently and prepare high-quality inputs to various project activities, whether it's foresight, evaluation or SD modeling.

Initial thinking

The framework envisioned text mining as a support tool for needs gathering (T4.3) and policy evaluation (T4.5). These tasks required pilots to precompile regional libraries from a wide range of sources e.g. news articles, blogs, academic papers, policy documents, social media posts, discussion boards. Text mined regional libraries were meant to provide additional insights on regional issues and policy performance, essentially acting as an alternative source of knowledge to the more traditional survey research. A related enhancement envisaged in the framework concerns the integration of text mining data with survey results. The idea is to extract maximum value from both data streams by creating a unified processing capability within a

single software environment. Lastly, text mining was expected to work with all 12 national languages represented in the pilot network.

What actually happened

Some of these steps were achieved in the first year. Pilots managed to build libraries that collectively boast over two thousand sources and include everything from Twitter handles to pdf documents. Semantic Explorer (or Semex, for short)[7] is up and running. Processed texts show sentiment values (-1, 0, 1) per paragraph, as well as various Named Entities that were obtained in the process of semantic model training. There is also an analytical dashboard available (Kibana) for those who would like to drill deeper into the gathered data.

However, some text mining activities planned for M1-M12 weren't implemented. Because of the discrepancy in planning,[8] needs gathering proceeded without the support of big data analysis. Semex may be up and running now but further improvements are needed before pilots can use the tool effectively and have confidence in text mining results. When it comes to languages, we weren't able to cover Hebrew and North Macedonian because there are no trained models that we can easily avail of.[9,10]

On a more conceptual note, an important change occurred in the way the consortium began to see text mining and its role in the project. Our views have evolved and we no longer treat text mining as something limited to issues analysis and policy evaluation. Although the two are important, many new use cases have emerged, as described below.

The curated reading list use case

Much of the work that is required in the early stages of a foresight exercise is exploratory in nature and can be described as research to understand how change happens, what is driving the changes that will affect the region in question. Text mining could help by supporting the development of curated reading lists that include

- A collection of relevant articles, papers, books that provide insights on the subject
- Policies, programs or initiatives that have been designed to address rural challenges
- Studies or articles focusing on the impact or effectiveness of relevant policies, programs, initiatives etc.
- Lists of local sources of further insight such as prominent thinkers, journals, blogs etc.

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[7] http://semex.io/

[8] The needs gathering task (T4.3) started in M7 while the final text mining solution (D2.3) was scheduled for a release only several months later, in M12.

[9] The problem was less pronounced for Hebrew because many relevant sources for the Israeli pilot are available in English.

[10] What this means is that PoliRural's text mining partner KAJO would need to start developing semantic models for Hebrew and Macedonian languages from scratch. Given the absence of linguistic experts in the project, this task would be extremely difficult and time consuming.

The drivers analysis use case

There is potential for text mining to provide assistance in the development of a list of factors driving change globally and locally. In this regard, text mining could help create:

- Lists of drivers and enablers under the headings suggested by the various mnemonic tools such as STEEPV
- Lists of drivers and enablers under headings such as trends, mega-trends, macro-trends, micro-trends, trend-breaks, weak-signals
- Lists of books and articles that provide further information on the issues of interest

The SD modeling use case

The use of text mining in SD modeling can help

- Define regional characteristics, challenges to be addressed by the region, as well as how these challenges can play out in the future
- Obtain the dynamics in the form of pieces of text that can be easily translated into SD models
- Link the dynamics to the previously identified issues (multiple dynamics can be linked to a single issue)

The policy evaluation use case

The idea that text mining should support evaluation is not new. But because the use case wasn't thoroughly elaborated in the original framework, a special task force was assembled in M13 to drive the implementation forward.

To ensure that text mining is meaningfully represented in the final results, it was important to define at this early stage the different ways in which Semex can support evaluation. For example, Semex can:

- Identify additional issues/benefits linked to a specific policy (i.e. things that people talk about on the internet) that weren't picked up by the survey, and thus provide a more complete picture of a policy under investigation
- Confirm/validate survey findings by revealing broadly positive or negative sentiment toward to the same policy
- Cast the same policy in a different light compared to survey, allowing pilots to reach a more balanced conclusion about policy's performance
- Reveal local/regional measures that weren't picked up by T4.4. Needs-Policy Mapping but which are shown to be important according to the TM analysis and so merit closer attention by pilots
- Alert the research team to past evaluation studies that may contain useful information on policy or policies under investigation
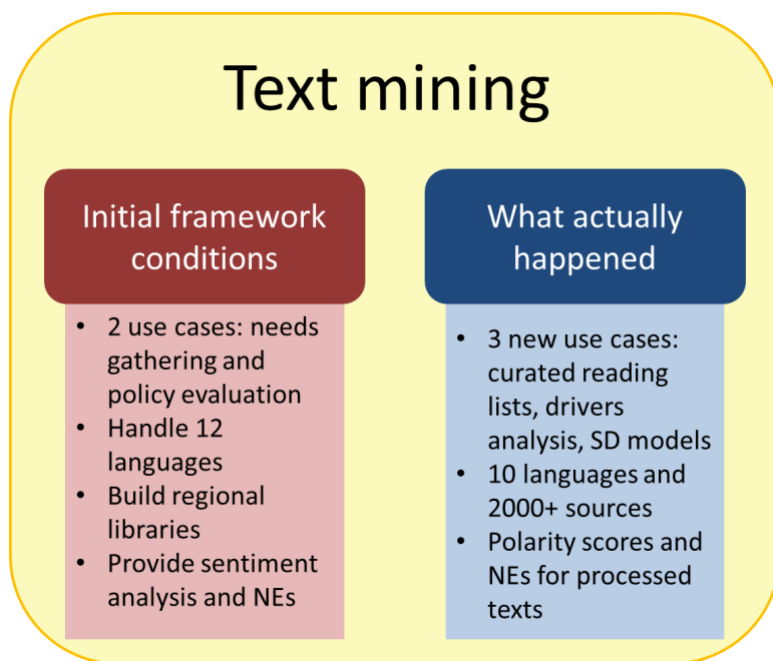
Text mining

Initial framework conditions

- 2 use cases: needs gathering and policy evaluation
- Handle 12 languages
- Build regional libraries
- Provide sentiment analysis and NEs

What actually happened

- 3 new use cases: curated reading lists, drivers analysis, SD models
- 10 languages and 2000+ sources
- Polarity scores and NEs for processed texts

Figure 6. Text mining: ideas v. action

Chapter 6: Discussion

Foresight (as opposed to strategy) is a social process that integrates the views of different stakeholders into a process of structured reflection that supports the development of a shared vision of a desirable future, and a plan or roadmap for how to get there.

Foresight initiatives employ a variety of tools. Depending on the time and resources available, key elements of the foresight process may include:

- Stakeholder analysis to understand which stakeholders to involve, when and how
- Issues analysis to understand the challenges to be addressed
- Drivers analysis to understand how change happens
- Vision building to define policy goals (with KPIs to monitor achievement of those goals)
- Scenario development to explore policy options and clarify intervention logic
- Road-mapping to clarify a timeline or concrete action

Since foresight is a social process, these tasks are generally carried out using a group work approach that encourages ideation, knowledge discovery and understanding through interaction and discussion.

A priori, SD modelling has nothing to do with this. Nevertheless, it is a tool that could be used in the context of a foresight exercise, but it is certainly not a "rival" method.

The same goes for text mining. The approach may be used to reduce the cognitive load on foresight teams. Those who must prepare documents to serve as inputs to group work tasks as indicated above. Relevant use-case scenarios were provided during the first year illustrating

how this might work. The scenarios are updated occasionally as new insights arise from an understanding of the semex.io tool and its functionalities.

One can also say the same about Mission Oriented Innovation, which is an old idea that has recently been re-emphasised by Prof. Mazzucato as a model for focusing research efforts at EU level. Mission Oriented Innovation can be explored in the context of a foresight exercise, either exclusively or as part of a broader canvas of concerns or intervention logics.

Foresight pilots

The project contains 12 pilots and there is no reason to expect or require that any of these pilots will resemble any other. Each will proceed as it can given the skills and experience of the foresight teams combined with the availability and temperament of the local actors (those who will finance the eventual action plans and specific measures).

Each "pilot" is a pilot only in the sense that it provides an opportunity to pilot the application of novel text mining and SD modeling tools in the context of a foresight exercise. Each pilot is a fully fledged foresight exercise in the sense that it must work with local beneficiaries and local actors to identify priorities for development, agree a vision for the future and elaborate an action plan or roadmap designed to achieve that vision. There is a certain tension between these two goals in the sense that achieving the first goal with respect to the text mining and SD modeling tools, must not interfere with achieving the second.

To address this issue, pilots received foresight training and were able to refer to CKA, PoliRural's in-house foresight expert, as needed for occasional advice on running their activities. Pilots also received a "checklist" in the early stages to make sure that they are aware of the basic principles of foresight and know how to document their pilot processes. Furthermore, occasional memos are provided to address any needs and concerns as they arise.

To encourage cooperation within and between the pilots, and to prepare essential inputs to key processes such as the inventory of drivers, based on the well-known STEEPV mnemonic, which may later provide occasion for a formal evaluation of the text mining tool, *T5.2 Literature Review and Data Gathering* is being systematically used under the supervision of CKA. Future efforts under T5.2 will aim to support the design of SD models, the population of those models with relevant data sets, and the use of those models in the exploration of future scenarios.

Going forward, those leading the text mining and SD modeling tasks should devote some effort to the "design of experiment" in order to formally evaluate the added value of their prototypes. For best results, the use of such tools should be considered within an "Action Research" framework, where there is a rigorous attempt to codify what is expected from the tool in terms of added value, and a formal process to check to what extent this has been delivered by the prototype.

Model building

PoliRural sees potential in the use of SD to support scenario modelling, in a way that adds value to the task of driver's analysis. Our experts have proposed a meta-model made up of three layers:

- The top layer is composed of KPIs, which are understandable, measurable metrics of performance of the region
- The intermediate layer is composed of "factors" that will influence the KPIs. They can be thought of as drivers and enablers of, or barriers to, change in regional performance that is measurable via the KPIs
- The final layer is made up of measures or policy options layer

The way in which the final layer acts upon the intermediate layer can be thought of as implying a "theory of change" or implicit intervention logic.

In the case of rural tourism, for example, the KPI layer has four components:

- Number of tourism visitors
- Number of nights they stay over
- Amount they spend in the region
- Number of jobs created

The rural tourism model has factors such as:

- Infrastructure such as roads, ports, airports, etc.
- Accommodation e.g. hotels of different quality, youth hostels, camping sites
- Monuments and amenities that tourists can visit
- Events and experiences that they can enjoy

The final layer includes elements such as training, support for entrepreneurs, public works and investments in marketing and visibility such as regional branding and attendance at international trade fairs.

The intention is that the first two layers will model the dynamics of the region. Historical data can be used to parameterize this part of the model. The third layer allows one to test the "impact" of different policy scenarios on the 'factors' and therefore the KPIs. The intention is that this should allow us to compare different measures or policy mixes, in terms of their impact on the KPIs over a period of 10 years or more.

Conclusion

This deliverable reviewed selected developments in M1-M12 in order to understand their similarities and differences vis-a-vis the original framework. Overall, pilot activities and their allied tasks were found to be broadly in line with the high-level approach outlined in the work plan. Needs gathering (T4.3) identified issues for policy matching (T4.4) which in turn provided inputs to policy evaluation (T4.5). Foresight planning (T5.2), SD model building (T5.1) and Semex development (T2.3) all have been running in parallel to support pilot work within WP4. However, at task-level, important differences were observed in all of the above except T4.4 and T4.5.[11] Some differences were caused by the addition of new concepts and methods, some by the fact that elements which had been initially foreseen by the framework weren't implemented, for technical and other reasons.

In the last few paragraphs, we would like to make recommendations for the framework update based on lessons learned in the first year.

Needs gathering

- Local needs should be examined through the prism of changes that are happening elsewhere, because it is often just a matter of time before international challenges become local issues
- Text mining can greatly support needs gathering, however it takes time to develop a robust text mining solution. The two tasks should be well timed otherwise researchers will miss an opportunity to enhance their results with insights from big data analysis
- Exposing the local stakeholders to research findings contributes to the greater cross-fertilisation of knowledge and can lead to a higher uptake of final results

Foresight planning

- To ensure that foresight is firmly embedded in the project work plan, first outline the model foresight process and then organise your work packages around its three-phase structure
- In the first phase, assemble an initial team to formulate a clear statement of ambition for the pilot. Next, identify and organise meetings with key stakeholders. Capture their feedback on priority themes and opportunities to provide timely inputs. Ask them to suggest relevant actors who might be interested in the foresight study. Lastly, identify relevant sources of knowledge that can be studied and text mined to inform future foresight activities
- In the second phase, leverage existing methodological frameworks (e.g. STEEPV) and text mining tools to carry out exploratory work on drivers/enablers

SD model building

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[11] As mentioned previously, T4.4 proceeded as planned, while T4.5 started in M13.

- Make the process more coherent by defining four main steps as follows: drivers analysis, driver-KPI mapping, high-level model building, expert-layer creation
- Organise training sessions online and offline to educate the wider consortium on SD basics. Use toy models with only a handful of variables to illustrate how SD modeling works in practice
- Leverage stakeholder wisdom to define driver-KPI relationships before building the high-level model

Text mining

- Involve end users in solution design and development to ensure the tool fully meets their needs and expectations
- Some languages are easier to work with than others. If a language model is not readily available, an expert linguist will be required to build one from scratch
- Engage foresight experts to develop new use cases for text mining e.g. the curated reading list use case, the drivers analysis use case, the SD modeling use case
- Library building may sound like an easy task, however to have a library composed of high-quality sources that can add value to and meaningfully support allied tasks (e.g. evaluation) it is important to think this activity through well in advance and engage relevant experts from the very beginning to coordinate source gathering.