

SUSTAINABLE INTEGRATED URBAN PLANNING AS RESILIENT KNOWLEDGE BUILDING: NARNI (ITALY) AND THE LIFE IN-PLAN PROJECT

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ABSTRACT

Climate-proofing planning can be challenging especially for small-sized local authorities. Municipalities usually find themselves caught between an ever-changing regulatory framework and a lack of operational power to act upon the insights gathered on-site. Narni is tackling the challenge through a variety of solutions, among which stands out the LIFE IN-PLAN project. This project has the double advantage of operating as a support to integrated spatial planning while also creating a knowledge-sharing opportunity among local, regional, national and transnational organizations. On one hand, it aims to support local and regional public authorities to strengthen, implement and monitor holistic energy and climate strategies by integrating them into their official spatial plans (and possibly with other plans, such as mobility and power) and by linking them to their budgets (thus formalizing their commitment to the EU 2030 and 2050 goals). On the other hand, it carries on a methodological effort where lighthouse municipalities are helping proactively in co-creating a shared practice for local climate targets identification and tuning, regardless of their scale, and for their integration and implementation in spatial plans. Narni has thus the opportunity to address the challenges of future-proofing both in its planning models and in its adaptability as a lighthouse organization. An interesting experience in complexity management which other small or medium-sized entities could benefit from.

Keywords: *Narni, urban planning, complexity management, administrative performance.*

1 INTRODUCTION

This paper aims to present the experience of the municipality of Narni in successfully applying complexity management to climate change challenges by means of effective integrated planning, exploiting the support of the LIFE IN-PLAN project.

The land of Narni consists in a 198 km² area located in the south-western corner of the province of Terni, in central Italy. Onlooking the course of the Nera River in correspondence of its junction with the Tiber Valley, this hilly terrain played a significant role throughout both the Roman and Medieval era as a strategic hub and vantage point on the surrounding territory. Many monuments account today for such historical legacy, among which the Benedictine Abbey of San Cassiano prominently stands out dominating the southbound landscape and overhanging the passage to the Nera Gorges. Yet, Narni's most defining asset in terms of medieval heritage is no material Middle Age structure. In fact, a great deal of the city attractiveness depends on its annual historical re-enactment *Corsa all'Anello* (i.e. 'Ring Race') which takes place between the end of April and the first half of May during the celebrations for the local Patron Saint Juvenal. For three weeks, the city delves itself into a rigorous mock-up of medieval life where all of the community comes into play with a myriad of parades, games and ancient rites culminating into the actual Ring Race that gives name to the whole event.

Honouring the ancient *ludi* codified by the City Statutes of 1371, the modern time Ring Race consists in an equestrian tournament of great prowess and skill. Two knights on horseback representing each of the three factions (*terzieri*) joust against each other in an



attempt to spike with a spear a set of three progressively small rings dangling from different posts. Time is of the essence as the competing champions ride simultaneously, each of them sweeping through a hemicycle of the elliptical track. Not only do they have to pinpoint the rings: they also have to do this faster than the opponent, in a balanced effort between speed and focus where field awareness is as important as velocity. As for precision, mere acceleration could in fact backfire and bring the horse rider to a miss, while instead knowing when and how to slow down is crucial in order to hit the target, amongst the cheering crowd.

2 COMPLEXITY MANAGEMENT FOR SMALL-SCALE PUBLIC ADMINISTRATION BODIES

The Ring Race described above is not only a depiction of a captivatingly elaborated pageantry but serves also as an apt metaphor for the Municipality's administrative performance when it comes to urban planning. Having to deal with an ever-changing legal framework, a small-scale local authority such as Narni finds itself engaged in a multilateral decision-making process, that occurs simultaneously and at many interdependent levels. Much like the riding knight trying to spear the tiniest ring, the public workforce as an institutional actor has to issue the most appropriate regulatory response possible while reading, at the same time, the broader field – or in Anthony Giddens' words, it winds up using as well as interpreting existing institutional rules [1].

2.1 Public management coping with complexity

Urban planning and land management are per se inherently complex policy acts involving territorial, social and economic sectors. In addition to that, their subject matter is intricated by the fact that the recent shift toward a climate transition mindset calls in the sustainability principle, which is on its own a multi-faceted concept. Today, compliance with environmental standards is no longer the only pillar underpinning green development, with financial viability and stakeholder engagement becoming more and more key determinants of sustainable action. As a consequence, European Commission recommendations – e.g. (EU) 2022/822 of 18 May 2022 on the matter of renewable energy projects – stress that 'the needs and perspectives of citizens and societal stakeholders should be taken into account at all stages of renewable projects development – from policy development to spatial planning and project development – and good practices for ensuring just distribution of the various impacts of installations among the local population should be encouraged.'

Thus, planning activity navigates through a complex environment where it has to (a) determine the most appropriate decision, (b) constantly assess inbound information from a variety of messy data, and (c) cross-check interpretations with a series of upper-intermediate institutions, which are in turn coping with the same decisional and organisational process. In other terms, strategic choice lies in a state of 'unstable equilibrium' where multi-channel feedback loops into each other.

Moreover, these exogenous factors are usually coupled with other endogenous aspects of public administration complexity, as Đulabić [2] points out. Variety of organisational settings, interaction between politicians and professional civil servants, conflicting values, multiple competency-based procedures: these are just some of the internal sources adding on uncertainty to administrative efficiency. In fact, other typical pain points such as shortage of personnel and lack of proper onboarding to wicked problems may also contribute to hinder the effort from a human resources management perspective, especially in small or even medium-sized Italian PA bodies.

2.2 System theory as a guiding principle

How is it then possible for small local authorities to respond and take complexity-informed action? To be able to provide a reliable answer to this question, administrative science researchers have tried to broaden their understanding of institutional performance by deriving actionable insights from other disciplines. In this sense, as Klijn [3] and Kiel [4] pointed out, complexity theory and systems thinking have proven fruitful fields of study to go beyond a rigid hierarchical model where governance proceeds downstream through a chain of subordinate individual agents. If a PA body is rather interpreted as a whole that is more than the sum of its parts, certain conceptual lenses become relevant to better understand the dynamics of constructive and unconstructive governance as it unfolds between central, regional and local level.

This is the case for example of the concept of ‘alternative institutions’. As Eppel and Rhodes [5] put it, ‘Alternative institutions are those that can influence the actions of interdependent, autonomous agents as they iteratively explore alternative solutions to wicked problems, such as distributed authority arrangements, multi-sector decision-making and multi-channel feedback arising from new communication technologies.’ According to this conceptualization, each PA body can be thus interpreted as a system that a) is closed in its domain of jurisdiction and yet b) it is in some degree of mutual dependency with other systems, regardless of operational size. That is to say, administrative institutions and other entities such as public agencies and stakeholder groups co-evolve in a networked cluster of systems where overall resilience to uncertainty is produced (or destroyed) via incremental and non-linear interaction.

Given these heuristic devices, it becomes possible to focus on interconnectedness as a recurring pattern when defining problems and designing solutions. Furthermore, this gives the opportunity to ponder whether it is possible to establish an iterative methodology through which different complexity-dependent PA bodies can work together to mutually foster short time adaptation and long-term change, given their respective context and resource limitations.

3 METHODOLOGICAL APPROACH

Local and regional governments play a vital role in the fight against climate change in the European Union. They are directly responsible for enabling and/or enforcing the implementation of national and European legislation into practice as they directly and indirectly control the development of their territories. In order to do so, local and regional governments already have various tools at their disposal for sustainable energy and climate planning, yet they too often rely on voluntary schemes (such as SECAPs and SUMPs) which are not implemented systemically. That is, they lack institutionalised procedures and operate through a ‘silo’ mentality that (a) does not allow them to spill over knowledge across similar planning efforts and (b) prevents linkage between plans and municipal or regional budget lines. To support municipalities in this sense, the IN-PLAN project general objective is to develop, test and roll-out a long-lasting support framework through which local and regional governments and their agencies can develop, implement and monitor integrated energy, climate, mobility and spatial plans. It tackles four key issues in particular that hinders the capacity to implement a proper integrated urban planning approach:

- Lack of capacity to enact and enforce binding energy and climate strategies, plans, and policies on a local or regional level.



- Lack of vertical (i.e. local, regional, and national governance) and horizontal (e.g. built environment, transport, agriculture, and industrial sector) integration or alignment of strategies, plans, and policies.
- Lack of alignment between planning and the allocation of financial resources.
- Lack of a systemic, integrated, and consistent approach to energy and climate planning.

Co-founded by the EU Commission within the framework of LIFE Clean Energy Transition, the project brings together five regional partners (REGEA from Croatia, EKV from Sweden, AREA Science Park from Italy, TEA from Ireland and ALEA from Romania), three knowledge partners (IEECP (Institute for European Energy and Climate Policy from the Netherlands), UIV (Urban Innovation Vienna) and TUS (Technological University of Shannon in Ireland)) and one network partner (FEDARENE (European Federation of Agencies and Regions for Energy and Environment)).

3.1 The LIFE IN-PLAN project: A proposed guideline for an integrated urban planning practice

As stated in Holodkov et al. [6], integrated planning has become increasingly important in addressing complex planning challenges and facilitating local implementation of measures to achieve energy, climate, and sustainability goals. To attain the EU's objective of becoming climate neutral by 2050 and to enable a just and inclusive transition, it is essential to collaborate with all key stakeholders, including local and regional governments, citizens, academia, and businesses. Integrated spatial planning plays a pivotal role as a catalyst for implementing transformative processes and innovative actions. It also contributes to better management and implementation of a territory's economic, social, cultural, and ecological policies. Moreover, integrated plans ensure support for all individuals, including those who are most vulnerable to sustainability challenges. However, there remains a disconnect between spatial plans and other types of plans due to the absence of a binding legal framework for energy, climate, and mobility planning. As a result, this alignment relies on voluntary commitments to meet EU climate and energy targets, as PAs lack a multifaceted and interdisciplinary approach encompassing scientific, administrative, and policy aspects in order to contribute to a balanced regional development following a strong overall strategy.

The IN-PLAN practice is an iterative multi-step methodology which aims to equip local governments with tools to address the challenge of integrating energy and climate objectives into local steering and planning documents. As a guidance tool, it is the result of a co-creation process involving the lighthouse municipalities participating in the IN-PLAN project. Starting from 1 October 2022, 15 lighthouse cities across five EU countries (Italy, Croatia, Ireland, Romania and Sweden) developed and tested the practice, that presented the double advantage of operating as a support to integrated spatial planning while also creating a knowledge-sharing opportunity among local, regional, national and transnational organizations. After a first phase of work with the lighthouses as 'forerunners', since 2024 the roll out of the practice is expanding to six pilot cities in each country involved and to a further number of replicators in other regions and EU countries by means of a two-stage capacity building programme.

The resulting practice [7] is articulated in five phases structured around a set of guiding questions meant to provide a methodological framework for integrated planning (Fig. 1).

Considering the differences among spatial planning systems in Europe, the IN-PLAN practice is designed to be as generally applicable as necessary, but at the same time as precise





Figure 1: Diagram of the IN-PLAN methodological process.

as possible in the way the process is described. Municipalities are guided through it with specific questions and the expected outcomes of each phase are presented and paired with the main steps to be made in order to reach them and specific good practice examples. The final version of the practice will be available in September and has been enriched by the feedback and experience shared by the lighthouses.

As of now, the first phase focuses on the setup of the integrated planning process to get a clear picture of its goals, timeline and stakeholders to be involved in order to include perspectives from different experts and sectors and cross departmental collaboration. Via a series of specific questions (e.g. How can we establish political commitment to the plan? Who is leading the planning process and are other partners needed to set it up? What is the timeline for the planning process? Which stakeholders should be involved in the integrated process, at what point and in which formats? Are there any risks to timely implementation of the process?) it catalyses the attention from the onset on the pivotal role of a comprehensive vertical and horizontal stakeholder engagement plan. Doing so, it also defines clear roles, responsibilities and timeline in process management, outlining the overall integrated planning process and helping organizations in risk assessment and allocation from a project management perspective. Finally, the first phase ensures adoption and implementation by seeking out commitment by the policy makers and guaranteeing at the same time the necessary human and financial resources.

The second phase is designed to conduct a baseline assessment to fully understand the relevant existing policies, planning documents and legal framework. At the same time, it is intended to assess which data shall be used/collected and whether they are accessible/available. This phase is meant to have an overview of the status quo (analysis and forecast) which will be instrumental to define vision and goals in the following phase. A set of guiding questions helps streamlining the activities to be carried out (Which planning documents are available and which existing legal instruments can be utilized? Which

international good practice examples can guide and inspire our work? What spatial data is available, what other data do I need, how can I access and manage this data? What relevant information can data give about the current status of the place and how it will develop in the future?). As a result, a review of the existing planning documents and legal frameworks is expected while delving into contemporary standards and good practices from the field and deploying a data management plan central for evidence-based, sustainable and effective spatial planning but also for effective monitoring and evaluation of planning efforts. Finally, basic research on status quo can be supported by different planning tools (e.g. spatio-temporal modelling based on geographic information systems (GIS)) to build a base for spatially differentiated decisions.

The third phase is the envisioning step where a common vision and goals are defined, the purpose of the spatial planning process is determined and the problems to be addressed through integrated spatial planning are defined (starting from the following guiding questions: are these goals consistent with the targets defined in overarching inter/national strategies? How can all relevant stakeholders be brought on board with the defined vision and goals?). At the same time, a common understanding of vision and goals is created working with all relevant stakeholders and ensuring their interests are taken into consideration. In this phase, it is noted that further integration of energy and climate aspects into spatial planning may require further coordination efforts with a growing number of stakeholders, both external (utilities, network operators, private companies, citizens) and internal, breaking the 'silo' mentality existing among different municipal departments. Throughout this phase alignment of goals with overarching strategies as well as commitment to the vision by all relevant stakeholders is actively constructed. As a consequence, all stakeholders are invited to carefully evaluate the challenges related to climate change they want to address with integrated spatial planning (just to name a few: land consumption, traffic pollution, heat islands, climate change risks, energy efficiency and renewable energy) so that they can identify suitable goals to be reached. Thus, necessary measures and subsequent actions can be prioritized and implemented.

Phase four is the actual planning step where potential measures are identified, various scenarios are modelled and simulated and a formal draft of the plan is created and agreed upon (following a set of guiding questions: which measures can I take to reach the defined goals? Are these measures effective? Which measures are most effective? How can I put these measures together into a consistent action plan? Is this plan feasible? How can I finalize the plan and ensure the backing of all relevant stakeholders?). A final check for the feasibility and the spatial impact of the plan is carried out as well. In general terms, potential measures can fall within four main categories such as technical/construction measures (e.g. expansion of infrastructure), conceptual measures (e.g. heat action plan), regulatory measures (e.g. restrictions and regulations), informative measures (e.g. information campaigns). An important aspect to be considered is the creation of potential synergies between goals and measures. After the selection of measures, a further effort to assess their impact should be put in place, to make sure they effectively contribute to the defined goals, modelling and simulating different scenarios. Categories to be assessed might include target effectiveness, climate impact, implementation period, spatial level, synergy effects, potential conflicts, resource requirements. The selected measures are thus included in an action and implementation plan which contains expected costs and resources, target groups, implementation schedule, responsibilities, existing dependencies. Before finalising the plan, feasibility in terms of existing land use plans and of technical, financial and legal aspects is to be assessed while at the same time a spatial impact analysis is undertaken. At this point, the finalisation of the plan should be followed by a feedback loop involving different

municipal departments and finally the decision makers who shall confirm and approve it. The plan should also be shared with the public by appropriate means of communication.

Phase five deals with monitoring and evaluation and more specifically on how to set up a systematic monitoring system to measure performance and evaluate results. The main steps can be drawn up from the usual list of guiding questions (including: how can progress and implementation of the plan be monitored? Which actors are involved in the monitoring phase? How can the quality of implementation be evaluated and adapted? How are the results used and communicated?). This phase ponders how outcomes of the monitoring process are being used to inform decision and develop corrective measures, ensuring at the same time transparency throughout the whole process, as well as accessibility of open data gathered (e.g. by means of an open data dashboard). Having in mind that integrated spatial planning operates within a very complex system, this phase also addresses the fundamental differences between monitoring and evaluation, whereby the latter focuses on assessing the relevance and effectiveness of the plan itself. Thus, the concept of causality is taken into question and indicators for monitoring are established by taking into account a wide range of interrelated factors that, although non strictly related to strategy and implemented actions, could influence the final outcomes of the project.

Recognizing the diverse spatial planning contexts across municipalities, regions, and countries, the practice aims to remain adaptable, making it easily applicable in various settings while simultaneously providing guidance as specific as possible. Its purpose is to empower local and regional governments to create, execute, and oversee ambitious energy and climate plans, integrating them into spatial planning processes both vertically (across different governance levels) and horizontally (across different sectors). Additionally, by offering guidance on involving key stakeholders from the local and regional levels throughout the planning process – from inception to implementation and monitoring – it seeks to promote stakeholder engagement and participatory governance. In this sense, the IN-PLAN practice has also the advantage of ensuring cross-country compliance with the UN 2030 Agenda and especially with the interrelated set of targets stemming from SDG11.

Also the United Nations Committee of Experts on Public Administration (CEPA) in its ‘Strategy guidance note on long-term territorial planning and spatial development’ [8], which is part of the set of principles of effective governance for sustainable development meant to support the implementation of the 2030 Agenda, underlines the close relationship between long-term territorial planning and spatial development on one side and urban planning and urban development on the other, addressing a wide range of interrelated SDGs. At the same time, the note mentions the need to overcome the ‘silo’ approach, which does not allow an effective territorial planning, which on the contrary requires a multi-governance collaborative approach for a horizontally and vertically integrated and coherent policy making. It is worth mentioning that to ‘make cities and human settlements inclusive, safe, resilient and sustainable’ as stated by SDG11, among the 10 targets established to be reached by 2030, 2 shall be tackled by means of territorial planning: ‘Enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries’ and ‘Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning.’ Hitting such targets requires focused and collaborative efforts from local and national governments, businesses, civil society, and planning experts.

A further mention of the central role of urban areas not only in achieving the European Green Deal goals but also in fulfilling commitments related to several international initiatives, including the UN 2030 Agenda for Sustainable Development, as they can be considered as drivers of transformation for the achievement of the SDGs, is to be found in



Salvia et al. [9]: cities have become a ‘living laboratory’ where new development models can be tested aiming at making future cities inclusive, safe, resilient and sustainable as stated in the SDG 11. A further interesting topic emerging from Salvia et al. [9] are the main factors driving a smart and sustainable transition of cities towards carbon neutrality, ranging from Local Climate Plans, which might be dedicated as SEAP and SECAP or vertically or horizontally mainstreamed in sectoral or cross-sectoral plans, to Climate Emergency Declarations (CEDs) to Transnational Municipal Networks (TMNs) to international competition and city awards to finally include also participation in international projects on energy and climate related issues financed by different funding programs such as Horizon, Interreg and LIFE.

4 RESULTS

Acting as a lighthouse city during the co-creation phase of the initiative, Narni had the opportunity of being an early adopter of the IN-PLAN practice in some relevant integrated planning initiatives. For example, starting from 2023 the Department of Spatial Planning and Land Management decided to rely on this framework to undertake the update and adaptation of the town master plan by UN Agenda 2030 standards. In this sense, stressing out the importance of compliance with upper-intermediate sustainable development strategies first and foremost, the step-by-step methodology allowed Narni to actively search for compatibility with the regional strategy from the start. Thus, the local organization designed different subset of strategic objectives across three main areas (land consumption, sustainable mobility and air quality improvement) and for each of them defined interoperable metrics, e.g. in order to promote sustainable mobility for people and goods according to regional strategy, Narni chose as a contribution metric the variation percentage of families reporting difficulties in public transport connectivity, given the fact that the regional strategy selected a number of troubled families as its indicator. In addition to that, for each strategic objective, Narni outlined other action plans in effect (e.g. for air quality improvement, the Air Quality Accord for air pollution mitigation in the Terni Valley), therefore fostering regulatory context awareness and closely inter-locking vertical and horizontal synergy between strategies and stakeholders.

Another example is offered by Narni’s experience in managing National Recovery and Resilience Plan resources. With a portfolio of 19 projects approved and funded by the NRPP (16 of which regarding building and infrastructural interventions) the administration of Narni has to meet a strict schedule of concurring deadlines. To sustain such effort, starting from December 2022, management created an interdepartmental taskforce of officials related to different sectors who found themselves working together out of their normal work routine. As the team needed to face cross-sectoral complex problems, such as the fulfilment of the Do No Significant Harm (DNSH) principle, the IN-PLAN practice represented an actionable common ground to instruct knowledge transferral and spill-over among co-workers. In this sense, the framework allowed the team to work out as an experiment in knowledge building that replicated in a small scale the model of a ‘learning organization’ as defined by Garvin [10], sparking systemic problem analysis and solving, and allowing the workforce to resiliently steer through a scenario in constant flux.

5 CONCLUSIONS

The challenges which small-sized local authorities are going to face now and in the future are increasingly complex and require a collective, collaborative and multidisciplinary approach. The present widespread workflow organisation does not allow a multidisciplinary cooperation due to the habit of working in silos, where each department is used to deal only



with its own specific sector with little or no communication and coordination with the others. Acknowledging the need for problem decomposition and tackling of each single aspect by a different specific skilled expert, both internal or external to the organisation, without losing the general overview, coordinating the team working to reach the target efficiently and on-time is essential. A defined procedure set by guidelines can help the ‘integrated’ team to complete all the suggested steps and keep on track, without the need to reinvent the wheel every time.

In conclusion, it is possible to say that, in so far as they help in proceduralizing outward co-operation and internal cohesion, frameworks such as the IN-PLAN practice could prove beneficial for small-sized organizations like Narni. Further research is needed to evaluate the full scale of the impact determined by systemic adoption and specific assessment relating to organizational studies may be in order. Nonetheless, as they become a guiding principle in organizational culture, they have even now the potential to act as drivers of change, by reminding local authorities that no sustainable future is achievable without a systemic thinking approach capable of comprehensive responses to complex problems.

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