

A SURVEY-BASED IMPACT EVALUATION OF NRRP ON ITALIAN MUNICIPALITIES

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Abstract. This contribution presents results from the project *A Survey-Based Impact Evaluation of NRRP on Italian Municipalities*, which aims to assess the effects of the National Recovery and Resilience Plan (NRRP) on local public administration, territorial development, and citizen well-being. The research focuses on municipalities, as a significant share of NRRP investment lines directly involves their participation. Municipalities act as implementing authorities for many interventions funded by the NRRP, both in terms of territorial initiatives and the modernization of public administration. Data were collected through a national survey targeting Italian municipalities designated as NRRP implementing entities. The questionnaire included both subjective assessments and quantitative data about expected changes with and without NRRP support. The paper illustrates results as to territorial sustainability by highlighting the evidence emerging across geographical macro-areas. Findings aim to inform policymakers on the territorial effectiveness of the NRRP and to suggest improvements for the design and implementation of future policy instruments fostering inclusive growth.

1. Introduction

COVID-19 pandemic significantly worsened Italy's already fragile economic and social landscape, underlining its structural vulnerabilities as well as its sluggish productivity growth. Between 1999 and 2019, Italy's GDP increased by only 7.9%, markedly less than Germany's 30.2%, France's 32.4%, and Spain's 43.6%. Social issues have also intensified, as poverty rose from 3.3% in 2005 to 7.7% in 2019 and reached 9.4% in 2020, disproportionately impacting youth and women (Presidenza del Consiglio dei Ministri, 2025). Persistent regional disparities remain, notably between the more developed Northern part of the country and the less developed Southern regions, posing significant challenges to the catching up process of the latter to the former ones. Moreover, environmental and geomorphological issues brought by earthquakes, droughts, and floods further threaten the country's resilience.

In response to these challenges, Italy's National Plan of Recovery and Resilience (NRRP), a key component of the European NextGenerationEU (NGEU) Program, designs reforms and investments to boost competitiveness, promote green and digital transitions, inclusivity, and foster regional cohesion, allocating around 40% of

resources to the South. The plan identifies six priority areas: digital innovation, ecological transition, sustainable infrastructure, education and research, social inclusion, and healthcare, with a particular focus on gender equality and youth employment (Italia Domani, 2025). NRRP has been approved in July 2021 and relies on approximately 194.4 billion euro (including loans and grants), further supplemented by a national fund of 30.6 billion euro. It originally established 190 interventions—132 investments and 58 reforms—recently including additional missions like RePower EU. A significant amount (about 36%) of the resources are managed at regional and local levels, including municipalities and metropolitan cities, in charge of designing reforms and projects supporting the territorial recovery (IFEL, 2024; ANCI, 2023; Sacchi and Rubino, 2023).

The project entitled "A survey-based Impact Evaluation of NRRP on Italian municipalities" aims at monitoring the action of local authorities to assess the effectiveness of their policy designs and NRRP investments to modernize administration, reduce inequalities, improve infrastructure, and enhance citizens' quality of life. It also attempts to identify potential challenges and delays faced by municipalities in project implementation. Due to the unavailability of real outcome data, the study relies on survey-based opinions to evaluate potential impacts, following an evidence-based approach enabling more effective evaluations once actual results can be measured.

The main objective of the work is that of quantifying the extent at which NRRP has affected the development paths of Italian municipalities. In particular, this paper aims to assess whether the plan has fostered territorial development and sustainability, taking into account the specific critical issues of each municipality, including those related to geographical factors.

2. The construction of database

The database relies on the answers of 376 respondents to an original survey addressed to the entire population of Italian municipalities (nearly 7,900 units in 2024). Since participation was voluntary, and low response rates among local governments are well documented—a compelling issue in the era of widespread online surveys (Krause *et al.*, 2024)—we extended participation to all municipalities rather than relying solely on the initially planned stratified sample (Enticott, 2003; Ermini *et al.*, forthcoming). The elementary statistical unit is the individual municipality. The questionnaires focus on NRRP projects activated by municipalities in their role as implementing entities. Municipalities act as implementing authorities for many interventions funded by the NRRP, both in terms of territorial initiatives and the modernization of public administration.¹ As such,

¹ The questionnaire is available at: <https://nrrpsurvey.econ.univpm.it>

they are key actors in the implementation process and play a pivotal role in shaping the plan's local effectiveness. Each municipality was invited to participate to the survey by designating one or more officers directly responsible for NRRP-related functions—typically mayors, deputy mayors, administrative managers, or heads of technical offices. These actors constitute the institutional figures best positioned to report on the design, management, and local implementation of NRRP interventions (Moore *et al.*, 2017). Data collection has been developed through online interviews using a CAWI (Computer-Aided Web Interview) system, further complemented with telephone interviews, reminders, and individual email follow-ups (Moore *et al.*, 2017), carried out by a TelePerformance's operational consultancy, specialized in data collection and analysis.

Table 1 – The NRRP's Missions and Components.

Mission	Id	Components
M1	M1C1	Digitalization, innovation, and Security of the Public Administration
M1	M1C2	Digitalization, innovation, and competitiveness in the production system
M1	M1C3	Tourism and culture 4.0
M2	M2C1	Green Firms and Circular Economy
M2	M2C2	Energy Transition and Sustainable Local Mobility
M2	M2C3	Energy Efficiency and Building Requalification
M2	M2C4	Protection and Enhancement of the Territory and Water Resources
M3	M3C1	High Speed and Maintenance of the Road Network
M3	M3C1	Intermodality and integrated logistics
M4	M4C1	Enhancement of Teaching and the Right to Study
M4	M4C2	From research to firms
M5	M5C1	Labour Policies
M5	M5C2	Social infrastructures, families, communities and the third sector
M5	M5C3	Special territorial cohesion interventions
M6	M6C1	Proximity assistance and telemedicine
M6	M6C2	Innovation, research and digitalisation of healthcare
M7	M7C1	RePower EU

Source: Italia Domani (2025).

The survey reports both qualitative and quantitative information on municipal activities connected to digitalization, territorial resource enhancement, and the promotion of human well-being. Specifically, it investigates aspects connected to digital public services and territorial investments—including waste separation, renewable energy, and energy efficiency—as well as tourism, culture, and social

inclusion indicators like nursery and school places, green spaces, and parks. A detailed description of the missions in the NRRP has been provided in Table 1. Data, including opinion and quantities evaluation, are collected on the current and expected levels of these indicators for different key timeframes, including the ongoing year of implementation (2023) and projections for the end of the NRRP (2026).

Table 2 – Respondents by macro-area (Panel A) and by population class (Panel B).

<i>Panel A</i>			
Macroarea	Respondents	Councils in the Sample (%)	Councils in Italy (%)
North - West	115	30.58	37.87%
North - East	78	20.74	17.57%
South	70	18.61	22.58%
Center	67	17.81	12.26%
Islands	46	12.23	9.73%
Total	376	100	100.00%
<i>Panel B</i>			
Population - class	Respondents	Councils in the Sample (%)	Councils in Italy (%)
0-3000	187	49.73	56%
3000-5000	38	10.11	13%
5000-10000	52	13.83	15%
10000-20000	46	12.23	9%
over 20000	53	14.10	5%
Total	376	100	100%

Source: Our elaboration on Italian Municipalities NRRP Survey. Statistics for Italy are referred to 2024.

3. Description of respondents

Table 2 describes the distribution of respondents classified according to the corresponding macro-area and the size of population. Overall, the sample is reasonably aligned with the national municipal structure, even if respondents from the central macro-area and from larger municipalities are slightly more represented. In particular, looking at the macro – area, most of respondents, (30.5%), are located in the North – Western part of the country, while the number of respondents in the other continental areas are almost equal (around 18% of the total respondents). The lowest share of respondents, about 12%, belongs to the insular areas. The right side of the table classifies the respondents according to the size of its population. In the sample, a prevalence of respondents is included in the municipalities within the population class 0 – 3000, i.e., small municipalities, while, the other population classes include, on average, around 12% of respondents.

Almost all units of the sample (372 su 376), except for 4 north – western municipalities, apply to the NRRP at least with one project, mostly as exclusive implementing entity, (73% - 267 municipalities), with a minor share as executing

entity or partner or in both roles (24%). Geographically, exclusive implementing entities are mostly located in North – Western areas, even if significant also in the South, North – East and Central areas, remarking a homogeneous distribution throughout the national territory. Municipalities acting as implementing and executing entities seems to be more common in the Northwestern, Northeastern and Central areas, thus suggesting a more articulated structure of partnerships. With reference to the outcomes of the calls, 46% of municipalities (174) declares that all presented projects have been approved and funded, while 50% (188 municipalities) reported a mixed outcome, resulting not all approved projects. Only the 1% (4 municipalities) reports received the approval of none of the projects. As highlighted in Table 3, most municipalities with approved projects, acted as exclusive implementing entity (about 71%), while the roles of mixed entity have been covered by 24%. The participation with exclusive roles of executing and partner is very low (lower than 2%). At a territorial level, the role of implementing subject dominates all areas, exhibiting higher values in the North – West and Southern areas, while the presence of mixed roles is more frequent in North – Western, North - Eastern and Central zones, delineating a wider variety of planning governance.

Table 3 – Role of municipalities within the NRRP projects.

Macroarea	Exclusively implementing entity	Exclusively executing entity/partner	Both implementing and executing entity/partner	n.d.	Total macroarea
North - West	87	1	21	6	115
North-East	51	2	23	2	78
Center	43	3	21	0	67
South	55	1	13	1	70
Islands	31	0	14	1	46
Italy	267	7	92	10	376

Source: Our elaboration on Italian Municipalities NRRP Survey.

4. A general assessment of territorial development and sustainability expectation over years 2021-2026.

This section illustrates outcomes of survey questions about the expected impact over the period 2021-2026 of the NRRP on territorial development and sustainability, which is analyzed along three dimensions: sustainable energy, energy efficiency, and renewable capacity. Respondents were also asked what development they would expect in the relevant area in the absence of NRRP funding. The answers reflect two distinct perspectives: a counterfactual scenario — that is, the expected outcomes in the absence of funding — as reported by those who received NRRP

funds; and the actual expected outcomes as reported by those who did not receive any funds and thus carried out potential projects using their own resources. Overall, the evidence highlights the relevance of the role of the NRRP in contributing positively to all three areas, although with significant territorial disparities.

Table 4 – Perceptions of respondents on Sustainable Energy: Changes with PNRR.

Macro Area	No funds	Much worsened	Slightly worsened	Unchanged	Slightly improved	Much improved	n.d.	Tot
North -West	35	0	1	7	35	20	17	115
North-East	27	0	0	8	17	17	9	78
Center	17	0	0	7	20	10	13	67
South	20	0	0	6	21	18	5	70
Islands	19	0	0	2	10	9	6	46
Italy	118	0	1	30	103	74	50	376

Source: Our elaboration on Italian Municipalities NRRP Survey.

With reference to energy sustainability of municipalities, Table 4 shows that about 47% of municipalities expects an improvement, among which 20% expect a high improvement, while only 0.3% fears a consistent worsening. Perceptions of significant improvements are more spread in the northwestern and southern areas, especially in the insular zones. Nevertheless, a significant share (32%) of municipalities has not yet received specific dedicated funds.

More pessimistic perceptions arise looking at the framework without NRRP². Within this context, about 33% municipalities expect unchanged conditions, while 7% expects a sharp worsening and the 10% a slight worsening. Municipalities located in the southern part of the country report worsened expectations. Among them, 17% expect a significant worsening. Opposite, the northwestern and northeastern areas are more optimistic, even if worrying about likely negative scenarios without the financial support. In general, municipalities report a moderate optimism with reference to benefits connected to NRRP funds on energy sustainability, thinking that, without them, the changings will be contained further implying a high risk of worse conditions.

² From this point onward, detailed data on expectations without NRRP funding are available from the authors upon request, due to space constraints.

Table 5 – *Perceptions of respondents on Energy Savings: Changes with PNRR.*

Macro Area	No funds	Much worsened	Slightly worsened	Unchanged	Slightly improved	Much improved	n.d.	Tot
North -West	35	0	0	14	28	20	18	115
North-East	26	0	0	6	20	16	10	78
Center	16	0	0	4	24	10	13	67
South	19	0	0	5	20	21	5	70
Islands	18	0	0	2	13	6	7	46
Italy	114	0	0	31	105	73	53	376

Source: Our elaboration on Italian Municipalities NRRP Survey.

Shifting to opinions on energy savings, NRRP funds reveals as a significant opportunity of improvement, as reported in Table 5. Namely, about 19% of respondents expects relevant benefits, while almost 28% predicts a modest improvement (low). Only 8% of municipalities report no changes while none of the respondents expect negative outcomes. At the territorial level, the northwestern macro area shows more positive expectations, with 48 municipalities expecting improvements, while the islands are more cautions, with only 19 optimistic municipalities. About 31% municipalities (114), most of them located in the islands and in northwest, have not yet received NRRP funds, therefore not yet benefitting from any intervention promoting energy savings. Without NRRP funds, interventions connected to energy savings have not been effectively implemented, thus suggesting an overall negative stagnant situation. Specifically, most municipalities expect a stable evolution, while about 20% fear a general worsening, among which 8% expect a sharp worsening. Only 6% expect a significant improvement, and the 18% expects a slight improvement. Southern regions show the highest concerns of worsening, with about 17% of municipalities fearing a significant deterioration of energy saving trends. In summary, without NRRP funds, the overall perception is that the energetic saving would remain stable or worse, with low expectations of significant improvement because of not access to resources or less effective policies.

Answers related to the added operative capacity for the renewable energies, showed in Table 6, depict a critical framework with reference to the development perspectives in Italian municipalities. Specifically, NRRP is expected to positively impact the area, but with rather contained expectations. For the period 2021-2026, most municipalities (more than 21%) expect a limited improvement of renewable capacity, while, only a minor share, 16%, foresees relevant enhancements. A

significant share of respondents, i.e., 12% perceives a stable situation. The perception of a critical framework, with a less percentage of municipalities expecting significant improvements, is predominant in the Islands. Nevertheless, despite these regional peculiarities, the general framework remains positive. Remarkably, the first column of the Table also highlights that, for projects in this area, about 36% of municipalities, has not received NRRP funds, and have been excluded from the opportunities to increase the renewable capacity.

Table 6 – Perceptions of respondents on Renewable Capacity: Changes with PNRR.

Macro Area	No funds	Much worsened	Slightly worsened	Unchanged	Slightly improved	Much Improved	n.d.	Tot
North -West	41	0	0	16	29	11	18	115
North-East	30	0	0	8	15	14	11	78
Center	21	0	1	8	15	8	14	67
South	21	0	0	9	18	17	5	70
Islands	20	0	0	4	4	11	7	46
Italy	133	0	1	45	81	61	55	376

Source: Our elaboration on Italian Municipalities NRRP Survey.

Responses regarding expected changes in the absence of direct NRRP funding highlight a generally conservative outlook. Most municipalities (34%) foresee a stable trajectory, with renewable energy capacity remaining unchanged over time, although a considerable share anticipates a deterioration. Specifically, around 7% of respondents expect a significant decline, while 9% anticipate only a marginal decrease. Expectations of improvement are more cautious: only 5% of municipalities foresee a substantial increase in renewable capacity, while approximately 18% expect a modest improvement. Regional patterns are notable: in the Northwest, about 37% of municipalities expect no significant change, with relatively few negative expectations. In contrast, municipalities in the South and Islands display a more pessimistic outlook, with a larger proportion anticipating either no change or a deterioration. Overall, in the absence of NRRP support, the outlook appears more pessimistic: most municipalities expect limited or no growth, and in some cases even a decline in installed renewable capacity.

As seen in previous project areas, while the NRRP may foster some local improvements in renewable energy, expectations for significant growth remain limited. A lack of dedicated funding and persistent regional disparities contribute to a stagnant outlook unless stronger local policy action is taken.

5. Intermediate implementation of NRRP, in year 2023.

This section analyzes the outcomes of NRRP implementation as reported by the surveyed municipalities, focusing on territorial sustainability through specific projects aimed at promoting energy transition. As a relevant example, we illustrate in Table 7 outcomes as to the renewable energy production. The table presented refer to the year 2023 — two years after the launch of the NRRP in year 2021 — and illustrate results from an ongoing implementation phase. For 2023, it is recorded the actual value indicated by municipalities and the expected value in the absence of NRRP funding. As indicated above, the latter reflects the counterfactual scenario reported by those who received NRRP funds and the actual outcomes as reported by those who did not receive any funds and thus carried the activities using their own resources (therefore, in this case, the observed and the expected value without NRRP are the same).

Table 7 – *MWh through renewable resources (2021, 2023 actual and expected without NRRP – abs. and perc. variation).*

Macroarea	MWh through renewable resources (2021) – Abs. Values (1)	MWh through renewable resources (2023) – Actual MWh Abs. Values (2)	MWh through renewable resources (2023) – Expected value without NRRP Abs. Values (3)	MWh through renewable resources – 2021-2023 actual – Var: ((2)- (1))/(1)	MWh through renewable resources – 2021-2023 without NRRP – Var: ((3)- (1))/(1)
Centro	28561.91	53576.42	53576.22	0.876	0.876
Isole	756.43	663.95	658.53	-0.122	-0.129
Nord - Est	7966.46	8008.76	7734.81	0.005	-0.029
Nord - Ovest	18239.54	21965.23	21901.52	0.204	0.201
Sud	567.68	652.20	449.16	0.149	-0.209
Italy	56092.02	84866.57	84320.24	0.513	0.503

Source: Our elaboration on Italian Municipalities NRRP Survey.

The comparative analysis of renewable energy production across Italian regions between 2021 and 2023—based on observed values (including NRRP funds) and expected values without NRRP funds—offers a comprehensive overview of the dynamics driving territorial sustainability, as sustained by NRRP resources. At the national level, the total volume of renewable energy produced increased by approximately 51.3% with NRRP funding while it would grow only 50.3% in the

absence of such funding. This modest difference suggests that, overall, the Italian renewable energy system exhibited significant growth during the period. However, in the absence of NRRP support, it would have grown at a slightly reduced pace. Therefore, the presence of targeted national funding appears to have contributed positively to the overall expansion.

Moreover, the aggregate figures conceal relevant regional disparities that highlight differentiated levels of structural capacity, institutional readiness, and dependence on external policy stimuli. When broken down by macro-area, these variations become particularly evident. Central Italy recorded the most substantial increase in renewable energy production between 2021 and 2023, with an identical growth rate of above 87.6% in both scenarios reflecting a mature and resilient regional ecosystem, likely due to a combination of pre-existing infrastructure, favorable regulatory environments, and active engagement in energy communities. In the North-West, growth was significant yet more moderate, ranging about 20.4%, both with NRRP support and without. This confirms the presence of a solid base for development, in which NRRP funds have acted as an enabling but non-essential factor. The North-East presents a less dynamic picture, with an almost negligible increase (+0.5%) under NRRP and a slight decline (−2.9%) in the absence of funds. This highlights a stagnating pattern and suggests that while public support may help maintain production levels, structural improvements or local mobilization mechanisms are still lacking. The presence of NRRP interventions helped contain a potential deterioration, indicating a beneficial alignment between policy priorities and local needs. This suggests that the NRRP has played a constructive role in supporting territorial resilience. The situation in Southern Italy is particularly telling: the area experienced a modest increase (+14.9%) with NRRP support but a substantial contraction (−20.9%) in its absence. This wide gap indicates a strong dependency on external funding to activate or sustain renewable energy production. The South appears to lack the autonomous capacity to support the energy transition without targeted investment. Finally, the Islands display a negative trend in both scenarios (−12.2% with NRRP; −12.9% without), suggesting the persistence of systemic obstacles—such as infrastructural deficits, administrative inefficiencies, or limited project uptake—that hinder renewable energy development despite favorable natural conditions. In conclusion, while national-level indicators point to strong overall growth, the disaggregated data underscore the critical role of place-based disparities. The NRRP has contributed to supporting weaker territories toward a more balanced and inclusive energy transition, especially in the South, yet its influence remains limited in structurally robust regions.

6. Conclusion

The paper illustrates outcomes from a survey directed to Italian municipalities on NRRP impact. The answers highlight a generic optimism within municipalities, with reference to the impact of NRRP funds on territorial development and sustainability. Most of the territories expect significant improvements, especially in the northwestern and southern areas, while the insular regions highlight a more cautious and less optimistic perception. Nevertheless, it is worth mentioning that a relevant share of municipalities, 32%, has not yet received specifically dedicated funds for multiple areas, among which energy and territorial management, thus limiting the potential expected benefits. The perception of an improvement without the direct intervention of funds seems to be rather contained, with many territories expecting unchanging or worse situations. In particular, expectations related to renewable energies and energetic saving are generally moderate, indicating that, without dedicated NRRP resources, progress could be contained or insufficient. Nevertheless, the data suggest that financial support has contributed to strengthening local development efforts, reinforcing the view that dedicated investment is essential to accelerate the transition toward more sustainable and efficient territorial systems. While some encouraging signals have already emerged at this interim stage of NRRP implementation, the actual impact of project plans will need to be assessed at the end of the programming period. Continuous monitoring remains crucial—not only to evaluate the overall effectiveness of fund allocation, but also to assess territorial outcomes, particularly in light of one of the NRRP's key goals: reducing regional disparities and closing the longstanding development gap between Southern Italy and the rest of the country.

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