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Cities need to modify and/or adapt their urban form, the distribution and location of services and learn how to handle the increasing complexity to face the most pressing challenges of this century. The scientific community is working in order to minimise negative effects on the environment, social and economic issues and people's health. The three issues of the 14th volume will collect articles concerning the topics addressed in 2020 and also the effects on the urban areas related to the spread Covid-19 pandemic.

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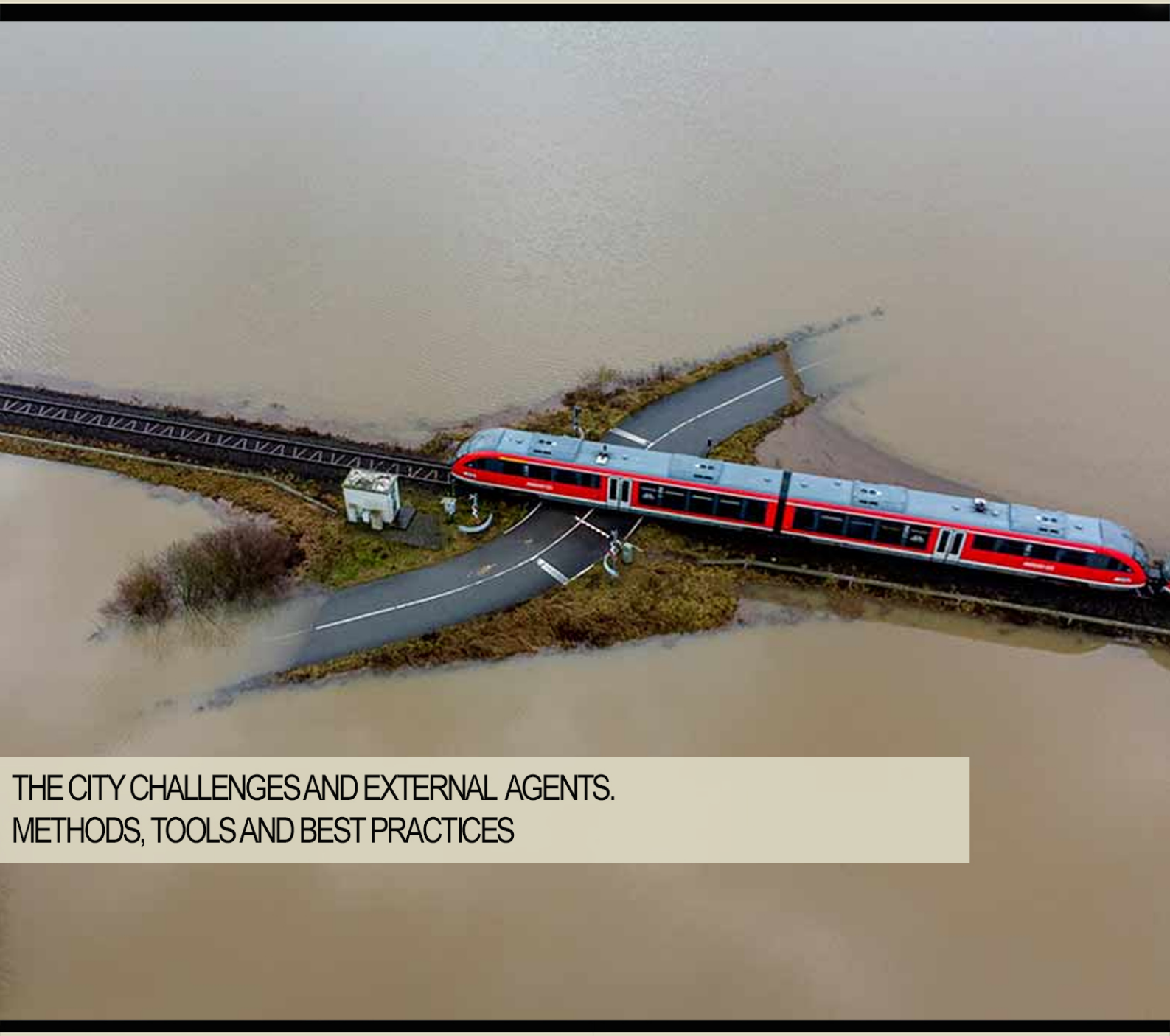

THE CITY CHALLENGES AND EXTERNAL AGENTS. METHODS, TOOLS AND BEST PRACTICES

Vol.14 n.2 August 2021

print ISSN 1970-9889 e-ISSN 1970-9870
University of Naples Federico II

TeMA Journal of Land Use, Mobility and Environment

THE CITY CHALLENGES AND EXTERNAL AGENTS. METHODS, TOOLS AND BEST PRACTICES

2 (2021)

Published by
Laboratory of Land Use Mobility and Environment
DICEA - Department of Civil, Architectural and Environmental Engineering
University of Naples "Federico II"

TeMA is realized by CAB - Center for Libraries at “Federico II” University of Naples using Open Journal System

Editor-in-chief: Rocco Papa
print ISSN 1970-9889 | online ISSN 1970-9870
Licence: Cancelleria del Tribunale di Napoli, n° 6 of 29/01/2008

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The cover image is a train passes a rail road crossing that is surrounded by flooding caused by rain and melting snow in Nidderau near Frankfurt, Germany, Wednesday, Feb. 3, 2021. (AP Photo/Michael Probst)

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TeMA 2 (2021) 279-284
print ISSN 1970-9889, e-ISSN 1970-9870
DOI: 10.6092/1970-9870/8054
Received 24th May 2021, Available online 31st August 2021

REVIEW NOTES – Town Planning International Rules and Legislation

Resilience as an urban strategy: The role of green interventions in recovery plans

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Abstract
Starting from the relationship between urban planning and mobility management, TeMA has gradually expanded the view of the covered topics, always following a rigorous scientific in-depth analysis. This section of the Journal, Review Notes, is a continuous update about emerging topics concerning relationships among urban planning, mobility and environment thanks to a collection of short scientific papers written by young researchers. The Review Notes are made up of five parts. Each section examines a specific aspect of the broader information storage within the main interests of the TeMA Journal. In particular: the Town Planning International Rules and Legislation Overview section aims at presenting the latest updates in the territorial and urban legislative sphere. The issue of the current recovery and resilience plans and the related reforms envisaged in them aim to give impetus to new forms of organization of urban systems and all its components. In this direction, the content of this review describes the reforms envisaged in the National Recovery and Resilience Plan of Italy and Germany with a focus on the due mission based on the green revolution and ecological transition. Furthermore, this review aims to define the role of these plans for future urban strategies to face the great challenges to which cities are called to respond such as climate change, energy efficiency while also respecting the principles of environmental sustainability.

Keywords
Urban sustainability; Green energy; Resilience plans; Covid-19.

How to cite item in APA format
Gaglione, F., & Ania, A. E. D. (2021). Resilience as an urban strategy: The role of green interventions in recovery plans. *Tema. Journal of Land Use, Mobility and Environment, 14* (2), 279-284. http://dx.doi.org/10.6092/1970-9870/8054

1 Introduction: EU response

When the WHO declared on the 11th of March 2020, the novel coronavirus out break a global pandemic, majorly spread through air transport (Ania & Joseph, 2021), nations imposed global lock down restrictions on movements and that consequently affected the global economy across all sectors. According to the Congressional Services Report 2020, the pandemic has disrupted lives across all countries and communities and negatively affected global economic growth in 2020 beyond anything experienced in nearly a century. Estimates indicate the virus reduced global economic growth in 2020 to an annualized rate of -3.4% to -7.6%, with a recovery of 4.2% to 5.6% projected for 2021. Global trade is estimated to have fallen by 5.3% in 2020 but is projected to grow by 8.0% in 2021. Accordingly, Regions have had to devise strategies of getting economies back to work to least pre-Covid-19 levels, and so did countries revise their national strategies for growth. For the EU, this pandemic is an opportunity to tilt more towards its net carbon and green growth targets and GHG targets by 2050 and 2030 respectively through its newest strategy, the (European Commission, 2021) to getting out of Covid-19. The EU therefore mandated its member states to adopt national plans ones that sync with the EU broader framework aiming to forge a climate-resilient Europe. In that sense as part of this report, Germany is chosen for study to examine its resilience strategy to the EUs and respectively analyse both under the Paris Agreement of 1.5 °C pre-industrial levels to prevent global warming. In that manner this report examines what exactly the EU strategy is theorizing about or what is not theorizing about underpinned by Paris and net carbonising by 2050 and meeting its immediate 2030 set targets of 55% GHG cut back (European Union, 2020). As such, the EUs, "Forging a climate-resilient Europe - The new EU Strategy on Adaptation to Climate Change" implicitly is a theory of policymaking. The strategy indicates transversal priorities such as: (i) developing solutions based on the improvement of the urban environment, which are wide-ranging, with multi-benefit and multiplier effects in support of various objectives of the European Green deal, such as the protection and restoration of biodiversity, the regularization of the water cycle by mitigating the effects of drought and flood phenomena; (ii) to intervene with local actions, since they represent the basis and the implementation of adaptation actions. This is a big step forward, given the multitude of funding and resources allocated to a city model geared towards mitigating climate change. Cities represent places to organize an effective response to combat climate emergency (Carter et al., 2015; Dodman et al., 2012). Climate change mitigation is a long process whose results are difficult to achieve in a short period of time. Only in recent years has it been understood that the impacts of climate change would increase due to the retarding effects of urban interventions aimed at reducing gas emissions, the scientific community has therefore begun to analyse the relationships between urban characteristics and climate impacts of cities from an adaptation perspective (De Silva et al., 2012). Therefore, the Commission has proposed to strengthen and give more support to existing instruments, such as the Covenant of Mayors in particular, highlighting how achieving resilience in a fair and equitable way is essential so that the benefits of climate adaptation are broadly and shared. However, the Commission considers it increasingly necessary for the support to privilege education, training and requalification initiatives that lead to strategies, actions and interventions that aim on the one hand to improve the sustainability of cities and on the other towards green energy strategies. In accordance with this trend, the issuance of the current recovery and resilience plans and the related reforms envisaged in them aim to give a push towards increasingly sustainable forms of organization of urban systems. Of the six missions in which the plan moves, they are: (i) digitization, innovation, competitiveness, culture and tourism; (ii) green revolution and ecological transition; (iii) infrastructures for sustainable mobility; (iv) education and research; (v) inclusion and cohesion; (vi) health, what has a decisive role on cities is the mission based on the green revolution and ecological transition. Aiming for a green city model and towards an ecological transition means putting in place a coordinated system of strategies, actions and interventions to improve the great challenges that cities today are called to respond to the reduction of the effects of climate change, energy of urban areas as an improvement of sustainable mobility. The multidisciplinary nature of

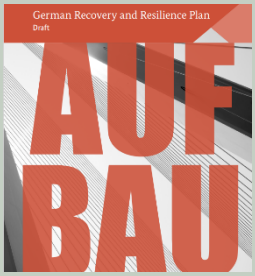
these issues raises several research questions in urban planning practices studied by the relevant scientific community. It also demonstrates that it is necessary to intervene on all the components of the urban system (socioeconomic, physical, functional, and environmental) and on the relationships that exist between them with a view to looking at the city with a holistic-systemic approach (Gargiulo, & Papa; 1993). In particular, the scientific literature for years has focused on developing research on the occurrence of the various phenomena of climate change with the aim of effectively responding to the impacts of climate change on urban systems. A large scientific body has addressed the problem of heat waves and related droughts such as Kleerekoper & Salcedo, 2012; Gago et al. 2013; Rizwan et al. 2008, paying particular attention to the geometry and shape of urban areas with the aim of reducing the intensity of heat islands. Furthermore, the studies questioned what the causes of the occurrence of the phenomenon were as in the materials used in the construction of an urban fabric such as streets, buildings, and squares. Some studies have highlighted how material characteristics such as terminating capacity and conductivity, greater or lesser permeability, reflectivity, and emissivity of materials on buildings affect the thermal comfort of urban areas. At the same time, the materials of the roads, such as, for example, in many Italian historic centres have a paving system (smooth stones, cobblestones, etc.) have good permeability characteristics because they limit the flow and promote the absorption of rainwater and at the same time the high breathability allows to maintain constant heat exchange between the surface and the air. The multidisciplinary nature of the issue highlights how reducing the phenomenon of urban heat islands also leads to an improvement in the energy efficiency of urban settlements. Some studies have examined how compact urban configurations reduce heat exchanges between buildings and the external environment but also reduce solar heat gains by reducing the occurrence of climate change (Xu et al., 2019; Emmanuel & Krüger, 2012). Other studies have focused on the functional mix of urban areas combined with the percentage of jobs and how these variables affect the energy consumption of transport. The push that Covid-19 provided was precisely to encourage different forms of mobility compared to the usual ones such as road and rail transport. Encouraging forms of "soft" mobility such as the use of bicycles, micro mobility services aim to rethink how to implement interventions aimed at improving roads, public spaces and increasing the cycle and pedestrian network (Zecca et al., 2020). This new trend could have a long-term impact on the progress of urban areas towards clean energy, if the positive aspects associated with user behaviour can be sustained thanks to the new reforms in place. In this direction, the content of this review aims to carry out an excursus of the current reforms implemented through the resilience and recovery plans of two European states with a focus on mission two based on the green revolution and ecological transition. Furthermore, this review aims to define the role of these plans for future urban strategies, as climate change, energy efficiency in accordance with the principles of environmental sustainability to which cities must strive.

National Recovery and Resilience Plan (PNRR), Italy

The National Recovery and Resilience Plan (PNRR) is part of the Next Generation EU (NGEU) program, the 750-billion-euro package, about half of which is made up of grants, agreed by the European Union in response to the pandemic crisis. The main component of the NGEU program is the Recovery and Resilience Facility (RRF), which has a duration of six years, from 2021 to 2026. The PNRR is a unique opportunity to accelerate and overcome the barriers that they have proved critical in the past.
The Plan is developed around three strategic axes shared at European level: (i) digitization and innovation to which 27% of total resources have been allocated, (ii) ecological transition 40%, social inclusion another 40%. It is an intervention
which aims to give a boost after the pandemic crisis and to accompany the country to face the great challenges in the various territorial contexts. In fact, the main objective is to contribute substantially to reducing territorial, generational and gender gaps. The Plan is divided into sixteen Components, grouped into six Missions. In detail, this sheet examines mission 2, or revolution of the green and ecological transition. Mission 2, in turn, is divided into four areas of interest: (i) sustainable agriculture and circular economy; (ii) energy transition and sustainable mobility; (iii) energy efficiency and building renovation; (iv) protection of the territory and of the water resource.

Of the four areas of interest, in turn, the reforms implemented, and which directly affect the components of the urban system that can constitute a starting point for addressing the great challenges that cities are called to respond to are examined. For the mobility system, the aim is to strengthen cycling mobility. The intervention aims to facilitate and further promote the growth of the sector through the creation and maintenance of cycle networks in urban, metropolitan, regional and national contexts, both for tourist or recreational purposes, and to encourage daily travel and intramodality, ensuring safety. The measure also has the objective of improving social cohesion at national level, with 50 per cent of the resources allocated to the Southern Regions. Specifically, the measure provides for the construction of approximately 570 km of urban and metropolitan cycle paths and approximately 1,250 km of tourist cycle paths. Furthermore, the development of mobility based on electric vehicles trying to reduce the vehicular pressure of urban systems representing a significant opportunity for decarbonisation of the sector, but to date it is extremely limited and accounts for 0.1% of the total number of vehicles in compliance with the objectives set within the Green Deal. These measures are aimed at promoting the development of sustainable mobility and accelerating the transition from the traditional model of fuel-based refuelling stations to refuelling points for electric vehicles. In addition, the plan also includes investments for the renewal of the bus fleet with low environmental impact vehicles. This can be accelerated through the implementation of the National Strategic Plan for Sustainable Mobility and provides for the gradual renewal of buses for local public transport and the creation of dedicated charging infrastructures. In particular, the purchase of approximately 3,360 low-emission buses is expected by 2026. About one third of the resources are destined for the main Italian cities. The intervention is consequently aimed at spreading and promoting the technological transformation of the supply chain linked to bus production in Italy, with the main objectives of expanding production capacity and improving the environmental impact. Regarding, the urban component relating to buildings, the PNRR provides for large investments in the energy efficiency of buildings which represents one of the most relevant and efficient levers for reducing emissions in our country, in line with the European Clean Energy Package and with national emission reduction targets. The current National Integrated Plan for Energy and Climate (PNIEC) already includes ambitious goals in terms of energy efficiency. In detail, the planned reforms relating to buildings move along three axes: (i) introduction of a temporary incentive for energy requalification and anti-seismic adaptation of private real estate and social housing, through deductions tax for the costs incurred for the interventions (ii) development of efficient district heating systems. Therefore, to cope with the long amortization times of building renovations, to stimulate the construction sector, which has been in severe crisis for years, and to achieve the challenging objectives of energy saving and reduction of emissions by 2030. Tax deductions of 110% are envisaged. for interventions aimed at insulation, efficient fixtures, replacement of heating and air conditioning systems and installation of plants for the generation of renewable energy. The admissibility of the interventions is conditioned by an improvement of at least two energy classes of the building, demonstrable by comparison with the energy performance certificate (APE) before and after the intervention. The energy improvement of buildings involves the development of an improvement in the thermal comfort of urban areas. The resources of the PNRR will be used to finance projects related to the construction of new networks or the extension of existing district heating networks. In this regard, priority is given to the development of efficient district heating, i.e., that based on the distribution of heat generated from renewable sources, from waste heat or from congenators in high-performance plants. The investment measure relates to the development of 330 km of efficient district heating networks and the construction of plants or connections for the recovery of waste heat for 360 MW, assuming that 65 percent of the resources are allocated to the networks (cost 1,3 million per km) and approximately 35 per cent is dedicated to the development of new plants (cost 0.65 million per MW).
Furthermore, as regards the urban component relating to open spaces, in accordance with current national and community strategies, it aims to provide a wide-scale quality of life and well-being of citizens through the protection of existing green areas and the creation new ones, also to preserve and enhance biodiversity and ecological processes linked to the full functionality of ecosystems. The plan envisages a series of actions aimed mainly at the 14 metropolitan cities, which are now increasingly exposed to problems related to air pollution, the impact of climate change and the loss of biodiversity, with evident negative effects on the well-being and health of citizens. The measure includes the development of urban and peri-urban forests, planting at least 6.6 million trees (for 6,600 hectares of urban forests).

National Recovery and Resilience Plan (DARP), Germany



Germany's resilience and recovery plan aims to define Italy as a set of measures aimed on the one hand at giving the country an economic recovery and on the other hand to face the great challenges that European countries are called to respond to today. such as climate change and digital transformation. Climate-friendly measures cover a broad spectrum of interventions that affect all components of an urban system: from decarbonisation through renewable hydrogen and climate-friendly mobility to climate-friendly construction. Digitization runs through almost all the measures of the development plan. The plan is divided into 40 measures. The 40 measures are defined in six main axes: (i) climate policy and energy transition; (ii) digitalisation of the economy and infrastructure; (iii) digitization of education; (iv) strengthen social participation; (v) Strengthen a pandemic resilient health system; (vi) modern public administration and dismantling of investment barriers. This sheet examines the measures concerning the first main axis which in turn includes three components. The first component concerns decarbonisation

using renewable hydrogen, the second Climate-friendly mobility and finally the third Climate-friendly renovation and construction. The National Hydrogen Strategy describes an important addition to the future energy supply in Germany. an important role in achieving energy and climate goals and in decarbonising the economy and parts of the transport sector. The National Hydrogen Strategy within the recovery plan lays the foundation for making Germany a leading international market for the production and use of green hydrogen technologies. Germany aims to pave the way for production, infrastructure, research and development and logical development technology, as well as about the rapid expansion of renewable energy sources necessary to produce green hydrogen. The emphasis is on the reduction of CO_2 in the atmosphere linked to the emissions process by developing new production processes, in the context of an initially low level of technological maturity. Research approaches consist, for example, to use hydrogen in energy-intensive processes (metal production, glass production) or to partially replace cement in concrete production by developing new input materials, which would allow CO_2 emissions, related to the process. in the production of cement at least partially avoided. The objective pursued within this strategy is to seek solutions for a sustainable future in many metropolitan areas in the context of adaptation to climate change. The funds allocated will allow cities to promote knowledge creation in relation to concrete action options and processes, as well as to increase the effectiveness of measures to adapt to climate change. The second strategy concerns the transition to a climate-friendly environment mobility. It considers country specific recommendations on investments in the ecological transition sector, in particular sustainable transport, and contributes to the implementation of the EU flagship initiative Recharge and Refuel. In particular, the country aims to give subsidies for the construction of filling and charging infrastructure are intended to support the market ramp-up of battery- and hydrogen-based electric vehicles. This requires a comprehensive network of charging infrastructure in line with demand. This is a key element for low-carbon vehicles. In particular, the planned interventions aim on the one hand to develop electric mobility and on the other hand interventions aimed at promoting local public transport with an alternative drive system. In addition, subsidies are also envisaged to finance alternative systems initiatives in rail transport. All these interventions and reforms favour a type of sustainable mobility within cities by reducing vehicular pressure and the related noise pollution and improving the quality of users' movements. The third component aims at the energy efficiency of buildings covered by the research program and EU flagship Renovate. The Confederation reorganizes its financing for energy efficiency in buildings in connection with the implementation of the climate action The 2030 Program and the financing strategy "Energy Efficiency and heat from renewable energies" ("Energieeffizienz und Wärme aus Erneuerbaren Energien"). The aim is to encourage investments that will improve energy efficiency and increase the share of renewables energies in the final energy consumption of buildings. Funding will be provided for the construction and renovation of "efficiency" residential buildings", whose energy needs and CO_2 emissions it will be well below the legal requirements. Funding will be provided for innovative energy-related projects publicly owned renovations or new buildings companies.

The key elements of these subsidies are the introduction of the "EE" classes (e.g. "Efficiency house 55 EE") for the use of renewable energy; higher rates of financing for the efficiency home level EH 40 as a particularly ambitious project; promotion of digitization measures to optimize consumption (e.g. Efficiency Smart Home) with a technologically neutral approach. The development of these interventions improves at the same time the thermal comfort of urban areas making urban environments more liveable and friable for every category of users, in particular vulnerable groups of the population The funding guideline will play a key part in reducing greenhouse gas emissions from buildings to 70 million tonnes of CO2 equivalents by 2030 and thus in achieving both national and European energy and climate targets by 2030.

The coordinated set of interventions and reforms envisaged are aimed, first, at promoting greater harmony and more effective coordination of research policies at European, national, regional level and at strengthening the competitiveness of researchers on the global stage.

In conclusion, the coordinated set of interventions and reforms envisaged in the National Recovery and Resilience Plans aim, first of all, to favour greater harmony and more effective coordination of research policies at European, national, regional level and to strengthen competitiveness. of researchers on the global stage. These plans also represent the synthesis of the lines of action in the field of scientific research carried out by the national system that seek to address the great challenges that cities are called upon to respond to climate change, energy efficiency, soil protection. For example, the improvement of the energy efficiency of buildings, the creation of green infrastructures, the encouragement of sustainable mobility that reduces the pressure and vehicular congestion of our cities, lead to a reduction in the effects of climate change, a greater thermal comfort of the cities, but above all an improvement in the quality of life of our citizens in the various territorial contexts. These interventions implemented by public decision makers with local actions represent the basis and implementation of the adaptation actions of cities.

In addition, the heterogeneous set of interventions (small and medium-sized) will increase the resilience of the territory by adapting and renewing itself, respecting its functions and its identity.

Author Contributions

The work, although the result of a common reflection, was divided as follows: Federica Gaglione, paragraphs 1 and review box of "National Recovery and Resilience Plan (PNRR), Italy"; David Ania Ayiine-Etigo, review box of "National Recovery and Resilience Plan (DARP), Germany".

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