ADDRESSING INEQUALITIES IN SMART PLACES: A PRIMER FOR PUBLIC ADMINISTRATIONS AND THIRD SECTOR ORGANISATIONS

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Executive summary

Over the past 15 years, a variety of initiatives that claim to make places smarter have been launched at different geographic levels and scales, with smart cities and smart villages being just the most prominent examples of this phenomenon. Despite their promises to foster socio-economic development through the implementation of innovative solutions, these initiatives have also attracted several criticisms. One of the areas of major concern for scholars, policymakers and activists is the ambiguous impact of smart places on existing inequalities. Much attention has been paid to the effects of smart cities and smart villages on digital and spatial divides within and between urban and rural areas. Many have also emphasised how biases in the design and implementation of smart technologies may accentuate socio-economic, gender-based and racial discriminations.

Drawing on this academic debate, this report presents the results of a multidisciplinary research project exploring how inequalities are conceived and assessed in the context of smart places. The analysis focuses on two second-tier cities in Italy and Scotland and highlights a series of shortcomings in how inequalities are dealt with by policymakers and practitioners. To address these shortcomings, the authors propose a set of recommendations targeting both public administrations at different geographic levels and civil society organisations committed to reducing inequalities in smart places.

Recommendations for local administrations

- Designate a Digital Equality Officer, in charge of estimating the impacts of smart places and identifying preventive or corrective measures.
- Create multiple occasions for an open dialogue on socio-digital inequalities with their local communities.

Recommendations for national and international institutions

- Funding bodies should prioritise smart place projects tailored to the needs of diverse communities and inclusive of measures aimed at tackling inequalities.
- National agencies and regulators should provide practical guidance to conduct equality impact assessments on smart places.
- International agencies and regulators should define technical standards and indices for the measurement of inequalities in smart places.

Recommendations for civil society organisations.

- Assist local governments in better understanding the needs of local communities.
- Collaborate with a wide range of local actors to gain broader consensus and get access to complementary competencies.
- Partner with IT professionals and data protection experts to influence and steer the design of inclusive smart technologies.
- Keep local communities in the loop to raise their awareness on the risks of digital technologies.

What makes a place a 'smart place'?

'Smart places' refer to a wide range of initiatives that promise to boost the economic development and quality of life of urban or rural areas by harnessing innovation[1]. Whereas scholars have agreed that the word 'smart' may assume different meanings depending on the local contexts[2], smart place initiatives tend to display some shared characteristics:

- They target specific geographic areas, usually defined by existing administrative boundaries[3];
- They entail the development and deployment of some form of innovation, including (but not limited to) technological advancements enabled by the diffusion of digital technologies[4,5];
- They rely on the collaboration of multiple local and non-local stakeholders, including public administrations, civil society organisations, local enterprises and multinational technology suppliers[6,7];
- They consist of multiple projects, aimed at the delivery of either innovative services or innovative infrastructures[8].

'Smart cities' are perhaps the most popular example of smart places[9,10]. For the past 15 years, municipal governments in metropolitan and urban areas have been implementing innovative solutions empowered by digital technologies to boost the efficiency, effectiveness and responsiveness of their local services[11,12]. For instance, shared mobility has been introduced as a complement to public transportation[13], while 'smart' lighting systems and 'smart' bins have been deployed to make public lighting and waste collection more efficient and environmentally friendly[14].

Similarly, across different global regions, rural communities have been experimenting with the development of 'smart villages'[15]. These initiatives usually combine technological advancements with innovative organisational models to expand the provision of critical infrastructures, enhance the governance of local resources, and empower local communities[16]. Examples of 'smart village' include the interventions funded by international organisations to promote sustainable agriculture and renewable energies in rural communities across the Global South, as well as grassroots projects aimed at leveraging e-commerce and incentivising social entrepreneurship in rural regions of the European Union[17].

Whereas smart places are often presented as promising approaches to enhance the well-being of urban and rural areas and boost their socioeconomic development, many commentators have expressed growing concerns about the impact that these initiatives may have in terms of exacerbating existing inequalities and creating new ones[18,19]. Such concerns are mostly associated with the risks and challenges posed by the pervasive diffusion of digital technologies, which are adding to the spatial and socio-economic divides still persisting within and across regions[20,21].

Inequalities in smart places: what do we already know?

In the literature on smart places, inequalities have been analysed and debated from multiple perspectives. First, scholars have explored how smart cities and smart villages interact with existing digital, spatial and socio-economic inequalities. Second, they have investigated whether and how these initiatives can help mitigate existing inequalities or rather contribute to aggravating them.

Much attention has been paid to the interplay between smart places and the ***digital divide***[22,23]. The latter refers to the gap existing between those who can benefit from digital services and those who are left behind because they have limited access to digital technologies (access divide) and/or do not know how to use them (skills divide)[24].

Smart villages have been described by some as a potential solution to the urban-rural digital divide, given their commitment to boosting the diffusion of digital infrastructures and promoting the development of digital skills in rural communities[25]. Conversely, smart cities have been blamed for potentially broadening the existing digital divide by pushing for the digitisation of public services that then become unavailable to those who cannot afford digital technologies or lack the skills to use them[26]. Without proper measures to bridge the digital divide, local communities are de facto unable to participate in the development of smart places and to benefit from their services and opportunities[27].

Smart places have also been accused of amplifying existing ***socio-economic and spatial inequalities*** as they tend to replicate ongoing discriminations and territorial divides. Previous studies showed that deprived and peripheral neighbourhoods are frequently excluded from smart city projects[28]. Conversely, low-income households are the most affected by the gentrification processes often caused by these initiatives[29]. As to smart villages, they may help mitigate infrastructural and economic gaps between rural and urban areas[30]. However, these initiatives could also lead to the creation of new divides within rural regions if their interventions and benefits remain confined to a limited number of communities[31].

Beyond their impacts on ongoing digital and spatial divides, smart cities have also been accused of reinforcing existing ***discriminations against marginalised and underrepresented social groups*** because of biases in the design and implementation of smart technologies, and in the data underpinning them[32,33]. Notorious cases include facial recognition technologies and algorithmic-based decision-making systems that were found to be actively discriminating against transgender people, migrants and members of ethnic minorities[34,35]. Similarly, the ***accessibility*** of smart cities has been questioned, as their services and infrastructures are often designed without considering the specific needs of ***people with disabilities***[36,37]**.** Such limitations have been observed across long-established as well as still-emerging technologies. Often-mentioned examples include the limited integration of assistive technologies for visually impaired users[38] or autonomous

vehicles that are not trained to recognise individuals with mobility restrictions[39].

Smart technologies have also been blamed by some for reinforcing ***gender-based discrimination*** since they are primarily conceived around the experiences and needs of male users[40,41]. Nonetheless, other studies suggested that both smart cities and smart villages have the potential to reduce gender divides, especially in the Global South, when they embed specific measures to promote the digital and socio-economic inclusion of women. Examples of these measures include programmes to foster the access of young women to STEM education, as well as training and grants to incentivise female entrepreneurship[42,43].

It must be highlighted that in the context of smart places socio-economic and digital inequalities often add to and intersect with each other. For instance, women from low-income and migrant backgrounds are less likely to possess digital devices and/or the digital skills needed to use them. Likewise, individuals with disabilities and low levels of education are also the most vulnerable to digital divides.

How are inequalities being dealt with in smart places? Insights from two second-tier cities in Scotland and Italy

The scholarly debate may be well-advanced but how are inequalities conceived and assessed by real-world practitioners directly involved in the development of smart places?

A recent survey[44] has evidenced that the social and ethical implications of digital solutions remain a major challenge for local administrations involved in smart city development, and existing regulations or policies are not offering sufficient guidance to deal with them[45]. This report provides further insights into this crucial matter, drawing on data collected in two second-tier cities in Italy and Scotland (see Box 1 for further details on our methodology).

In the past decade, both cities have been implementing smart city projects across different domains. Our interactions with local stakeholders contributed to shedding light on both the mainstream narratives and the practical strategies shaping local approaches to tackling inequalities in smart places.

In both cities, smart city developments included ad hoc interventions to tackle the digital divide. Public investments to bridge gaps in the supply of fast connectivity have been complemented with training and drop-in sessions to strengthen the digital skills of local communities. These efforts have been jointly delivered by public entities, such as schools and libraries, academic institutions, and civil society organisations, such as neighbourhood associations, local charities and non-profit foundations.

The commitment of local administrations and their partners to both expand digital access and promote digital skills is undoubtedly great news and represents an important step forward compared to earlier approaches to smart city developments, which tended to focus only on the deployment of internet connectivity without considering other barriers to digital adoption.

BOX 1 – Methodology

The data for this report were collected between September 2022 and March 2023 through 16 interviews, two focus groups and two site visits. The analysis focused on two second-tier cities in Scotland and Italy, with a population comprised between 150,000 and 200,000 inhabitants.

Both cities have been developing smart place initiatives since 2014-2015. In the Italian city, smart city developments prioritised the digitisation of public services and the regeneration of public spaces through the creation of innovation hubs and co-working spaces. In the Scottish city, smart city projects concerned a variety of technological solutions, from 5G to data platforms, from electric vehicles (EV) for sustainable mobility to CCTVs for security purposes.

Yet our data revealed that digital divides are mostly conceived as something exogenous, determined by the decisions of actors external to the local contexts. Conversely, the impacts that smart city projects may have on ongoing digital divides remained largely unquestioned by those promoting these initiatives. For instance, in the Italian city, the national agency in charge of developing e-government services was criticised for creating applications that are not user-friendly or accessible. However, there was little consideration of how the decision to digitise public services may itself be disproportionately affecting those communities that are more vulnerable to digital divides.

As to spatial inequalities, the two cities showed different sensitivities to territorial imbalances. In the Italian city, as part of the local Smart City Plan, the municipal government has invested in the regeneration of deprived areas just outside the city centre by transforming vacant industrial buildings into public spaces devoted to the promotion of innovation and creativity. The local council has also partnered with non-profit organisations to deliver digital skills training in peripheral neighbourhoods. However, all their smart city initiatives stopped at the council's boundaries: neighbouring councils in peri-urban and rural areas have not been involved in any smart place initiative. Conversely, in the Scottish city, the local council has partnered with bordering local authorities to deploy broadband and CCTV infrastructures across both urban and rural communities. Nonetheless, their smart city projects focusing on electric vehicles and 5G networks seemed to prioritise central areas over peripheral neighbourhoods.

Regardless of the approach followed, these smart city developments seem unlikely to address and bridge existing spatial inequalities. During the site visit to the Italian city, it became evident that the innovation hubs created as part of urban regeneration projects are struggling to find sustainable ways to integrate and involve local communities. Likewise, the Scottish case suggested that collaborations and synergies among local councils are limited to specific projects, rather than part of a systemic approach, leveraging smart places to achieve territorial cohesion.

Both case studies also provided various examples of smart city initiatives purposely targeting marginalised communities (including but not limited to digital skills training for younger women, senior citizens, and people with disabilities). In the Italian city, the council

opened a FabLab in a peripheral neighbourhood, where youth from different backgrounds can familiarise themselves with advanced technologies, such as 3D printing. In the Scottish city, the consultancy managing the local smart mobility programme launched a pilot to test accessible EV charging stations, designed to meet the specific needs of people with disabilities.

Although very promising, all these projects remain sporadic and often depend on the autonomous initiative of single individuals and teams. In fact, our data clearly evidenced the lack of structured and systematic processes to identify, measure and address existing and emerging inequalities in the context of smart city developments.

In both cities, there were no formalised procedures to assess ex-ante the risks posed by these initiatives. Interviewees explained that some evaluations are only conducted as part of routine project management practices, but these are not specifically aimed at or designed for thorough equality impact assessments. Likewise, our interactions confirmed that both local governments have yet to implement a monitoring system to purposely track the impacts of smart place initiatives. Some ex-post evaluations are conducted but they tend to be project-specific and not necessarily focused on various forms of inequality.

Any effort to assess and measure the impact of smart places is further hampered by the lack of disaggregated granular data and ad-hoc metrics for the measurement of inequalities in smart places. Furthermore, our interactions evidenced that a shortage of advanced skills and technological capacities further jeopardise the ability of local administrations to conduct comprehensive and systematic impact assessments as part of their smart place programmes.

It must be highlighted that, in neither city included in this study, local smart places have entailed the deployment of facial recognition or other technologies that most raise concerns among scholars and activists. Nonetheless, our discussions with local stakeholders proved that even those smart solutions that seem less controversial may entail trade-offs between different types of users, potentially generating new forms of discrimination.

Let’s take automated traffic control systems as an example. These systems promise to minimise road congestion by applying objective and rigorous algorithms that adjust the duration of traffic lights based on historical and real-time data on actual traffic flows. What emerged from the case studies is that these algorithms are not as neutral as they tend to be depicted because they are (more or less) implicitly designed to prioritise one type of road users over another (e.g., vehicles over pedestrians, private cars over public transportation).

Furthermore, these systems require capillary networks of cameras and sensors, which may jeopardise the privacy of residents, drivers and passers-by. How these risks were computed in smart place developments varied between the two cities analysed in this study. The Italian city worked with legal experts to devise a procedure preventing the installation of sensors and cameras in the whereabouts of schools, hospitals and other sensitive public spaces. The Scottish city, instead,

treated CCTVs as public safety infrastructures, which are not subject to any public consultation: this admittedly caused some discontent among local residents.

Again, these findings reiterate the problematic absence of systematic, holistic approaches to assessing and tackling inequalities in the context of smart places. Whereas it cannot be denied that our analysis also provided some valuable examples of how smart city projects can be conceived and designed to address existing inequalities, for these to be more than just stand-alone, isolated cases, systemic changes are urgently needed. Our recommendations, listed below, go in this direction, offering practical guidance to both policymakers and civil society organisations involved in the development of smart place initiatives.

How to deal with inequalities in the context of smart places? Recommendations for policymakers.

Smart places are local, context-based initiatives but they are also influenced and normed by policy decisions taken at national and international levels[46]. Consistently, our recommendations are directed to decision-makers situated at different geographic and administrative levels, from municipal governments to international intergovernmental organisations.

Municipal governments should designate a Digital Equality Officer in charge of i) estimating the impacts of smart places on local communities, and ii) identifying preventive or corrective measures, when necessary. The Digital Equality Officer should conduct impact assessments both before and after the implementation of smart place initiatives to verify that these projects are receptive and responsive to the needs of diverse communities[47,48]. They should also oversee the implementation of the preventive and corrective measures put in place to mitigate the risks and negative impacts of smart place initiatives. To successfully accomplish these tasks, Digital Equality Officers should be granted access to granular disaggregated data and should have sufficient resources and autonomy, to perform in-depth evaluations, also engaging with local communities and their representatives.

***Municipal governments should create multiple occasions for an open dialogue on socio-digital inequalities with their local communities*.** Such interactions already exist in many cities, but they tend to be one-off initiatives, not necessarily open or accessible to everyone. Conversely, municipal governments should create regular occasions for local actors (including residents, civil society organisations, activist groups, universities, schools, etc.) to exchange views and learn from each other about the impacts of smart technologies on inequalities, as well as potential solutions to minimise such risks. Online platforms for civic engagement could prove a useful tool to streamline these dialogues, but they cannot replace physical, on-site

interactions, to also reach and capture the voice of those communities that are less likely to engage with online participatory tools.

National and international funders promoting smart place initiatives should prioritise those projects that are tailored to the needs of diverse communities and inclusive of ad-hoc measures to tackle existing or emerging inequalities. The scope and design of smart place projects are often shaped by the criteria set by the funders providing financial support for these initiatives. Such criteria should, therefore, be updated to make sure that existing and emerging inequalities are effectively taken care of as part of smart place developments. For example, when screening funding requests, national and international funders should assign extra scores to those projects that include and target diverse communities. The participation of underrepresented communities should be further incentivised and remunerated by allocating adequate resources to compensate for their time and contribution. Finally, national and international funders should introduce the completion of equality impact assessments as a mandatory requirement to obtain financial support.

National agencies and regulators should provide local governments with practical guidance to conduct equality impact assessments. National agencies promoting the digital transformation of the public sector should develop clear guidelines and templates for the evaluation and monitoring of inequalities in the context of smart place projects. Data protection authorities could also assist local governments with ad-hoc training and regulations to inform the collection and usage of disaggregated data without threatening or undermining the privacy of residents.

International institutions should define technical standards and indices for the measurement of inequalities in smart places. Standardised indicators, methods and procedures for the impact assessments of smart place initiatives would much benefit those municipal governments that have limited resources to develop their own evaluation systems. United for Smart Sustainable Cities (U4SSC) and the Cities Coalition for Digital Rights represent good examples of international fora where global and local leaders could work together to forge and share successful processes and metrics to estimate and quantify the impacts of smart place initiatives on existing and emerging inequalities.

How to deal with inequalities in the context of smart places? Recommendations for civil society organisations.

As we recognise and endorse the fundamental role played by civil society organisations (CSOs) in the context of smart cities and smart villages, we also propose a set of recommendations to amplify the impact of these organisations and further boost their contribution to the development of smart places.

The efforts of CSOs should not be limited to advocacy: these organisations should also help local governments to better understand the characteristics and needs of local communities. Given their proximity to underrepresented communities, CSOs are the best placed to collect either qualitative or quantitative data on the specific habits and needs of these residents. Such data would prove essential to designing more inclusive smart technologies and services. CSOs can also play a vital role in facilitating the inclusion and participation of local communities in co-design and co-creation activities.

CSOs should collaborate with a wide range of local actors to build support for their causes and combine their complementary skillsets. Natural candidates would be universities, research institutions, and other non-government organisations committed to advancing public debates and spreading knowledge. The interaction with these actors would be pivotal to spreading the message of CSOs, sensitising different audiences, developing intersectional perspectives, and building stronger coalitions around common causes and shared instances. By partnering with other actors, CSOs could also access additional expertise, which may be particularly useful to better grasp the implications of digital transformation processes and properly assess their evolving impacts on marginalised and underrepresented communities.

CSOs should also partner with IT professionals and data protection experts to get directly involved in the design of inclusive smart technologies. Across the world, there are plenty of digital initiatives that are being developed by grassroots organisations[49]. Examples include Goteo, a platform for civic crowdfunding developed by a non-profit foundation based in Barcelona (Spain), as well as Signalise, a platform cooperative providing sign language interpreting services. By joining or initiating these grassroots digital initiatives, CSOs can make a concrete contribution to shaping inclusive smart places, where the design and governance of technologies remain in the control of local communities.

CSOs should not forget to keep their local communities in the loop to boost their awareness on socio-digital inequalities and guarantee their support. Too often the debate on the risks of digital technologies is confined to echo chambers and fails to reach larger audiences, who remain uneducated on the risks that smart technologies may pose to them. Finding effective ways to clearly communicate and regularly engage with local communities is, therefore, crucial for CSOs to raise awareness among the general population and build strong support for their causes. Furthermore, regularly exchanging views with local communities would enable CSOs to quickly identify new challenges emerging in the context of smart places as well as novel grassroots solutions that can be leveraged to counteract such threats.

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