

Transparent monitoring for sustainability through DPIs

By Gabriela Vergili, Data Privacy Brasil; Pedro Saliba, Data Privacy Brasil; Vinay Narayan, Aapti Institute; Soujanya Sridharan, Aapti Institute; Avani Airan, Aapti Institute;

Abstract and Keywords

The lack of efficient and transparent monitoring and control over environmentally dangerous activities sets a high risk scenario regarding climate change. One example is the Brazilian government transparency issues regarding cattle chain agents' personal data that impacts fundamental rights of consumers, traditional and local communities and workers in the field. The confidentiality status on this type of information masks the agents of environmental damage resulting from illegal practices like "cattle laundering".

The tracking of the beef cattle production chain and other agricultural products must be taken as a priority when assessing the issue of climate change. That said, there is a need for digital public infrastructures (DPI) that are able to facilitate the monitoring and control of environmental impact, particularly in a manner that is truly transparent, allowing crossing of databases and access to relevant information on offenders by different stakeholders. The aim for the next few years must be to set a system to track agricultural products.

And to do so, governments worldwide must consider principles of digital public infrastructure such as interoperability, scalability, security and privacy by design, public benefit, trust and transparency, and also inclusivity in order to foment innovation without undermining social control on environmental policies. The Brazilian G20 Presidency has the opportunity to continue the work of the Indian Presidency and give the Global South the space to bring issues that, even though are local, impact the whole planet and should matter on a global scale.

The challenge of a participative governance centered in public interest must be faced in order to assess Global South pitfalls and achieve real and effective change on climate and environmental

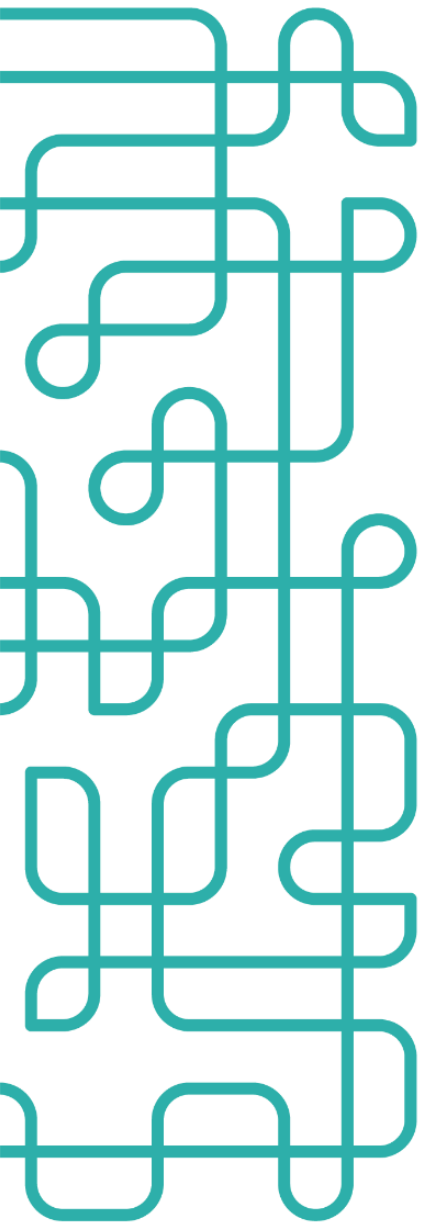
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São Paulo – SP
CEP 01419-904

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matters.

Diagnosis of the issue

The lack of efficient and transparent monitoring and control over extreme weather events and environmentally dangerous activities sets a high risk scenario regarding climate change. Transparency in this regard is essential since there are multiple actors profiting from various illegal uses of land, such as through deforestation of protected areas, despite government efforts to control and supervise against such activities.

Additionally, there are also social and economical interests in accessing information regarding who the actors (companies or individuals) are that are not complying with environmental law. Looking from the perspective of native and traditional communities there is the interest to protect their land (in Brazil, for example, there are legally protected territories), protect their people against encroachment and preserve their culture deeply rooted in the land.

From the consumers' point of view there is an interest in knowing where the product came from and if it attends their need of quality standards. Similarly this happens to other agents in the chain of production that acquire those products, they need to know the source in order to attest quality and comply with labor and economical legislation, along with the principles of good faith and free competition.

One example is the Brazilian government transparency issues regarding cattle chain agents' personal data that impacts fundamental rights of consumers, traditional and local communities and workers in the field. [Livestock and other agricultural products traceability must be taken as a priority when assessing the issue of climate change.](#)

Similar sustainability issues can be seen in other production chains such as deep sea mining and predatory fishing that not only can damage ecosystems but also impact local and indigenous fishing communities. Data collection is crucial to map out the scenario and implement public policies.

With the advent of extreme weather events, it is important for

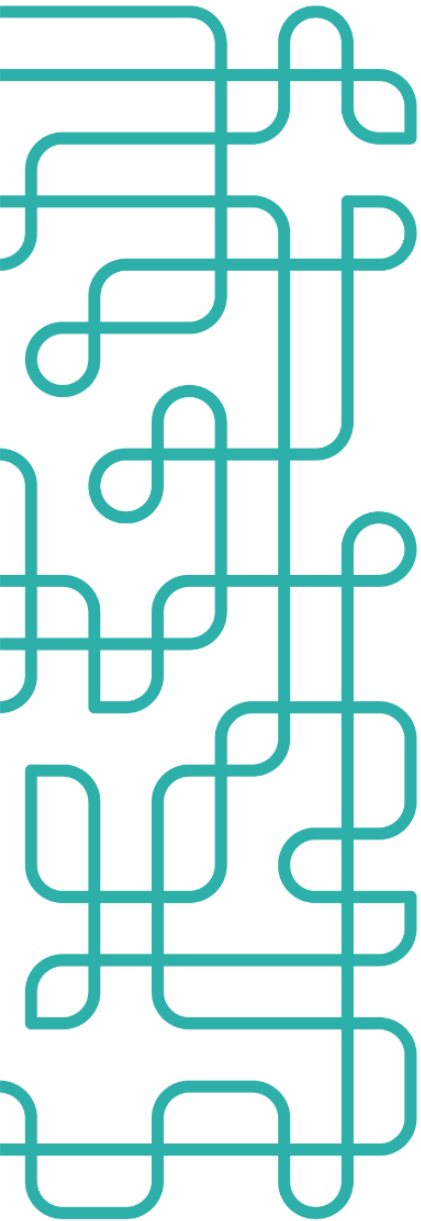
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countries to collect climate data and share it with interested stakeholders, such as small farmers and populations in areas vulnerable to floods or heat waves. Such measures will be essential in the coming years, ensuring a minimum predictability regarding events that may have economical and social effects.

In this regard, [digital public infrastructures \(DPI\)](#) can play a massive role. DPIs will be able to facilitate the monitoring and control of environmental impact, particularly in a manner that is truly transparent, allowing crossing of databases and access to relevant information on violations by different stakeholders.

DPI, or in other words, digital infrastructure that is secure and interoperable, built on open standards to deliver and provide equitable access to the public and/ or private services at societal scale brings many benefits to society as a whole. Firstly, since they can be designed with sectoral considerations and accountability mechanisms, a satisfactory level of transparency will be much easier to obtain and to request, compared to systems that are wholly controlled by the private sector.

Second, active participation from public institutions with assurances of transparency enhances trust in DPI systems - both among communities and companies alike.. Third, with governments leading this process there is a better chance of success at a national level with a standardized system, with a possibility of mandating integration across market players. t. This means more effectively enforced law and consequently a more sustainable impact.

Considering all examples described above, DPI, even though it depends on national public actions, is an international matter that should be incentivised by bodies such as G20. G20 influence is crucial to stop climate change. Since G20 also promotes the connection between multi stakeholders it has a tremendous relevance as a space to bring awareness to this issue and its financial and economic impact on the markets, as well as help actors outside the public sector to become a voice in their own countries to request change and collaborate with DPI initiatives.

Recommendations

The global climate crisis necessitates urgent action, particularly in

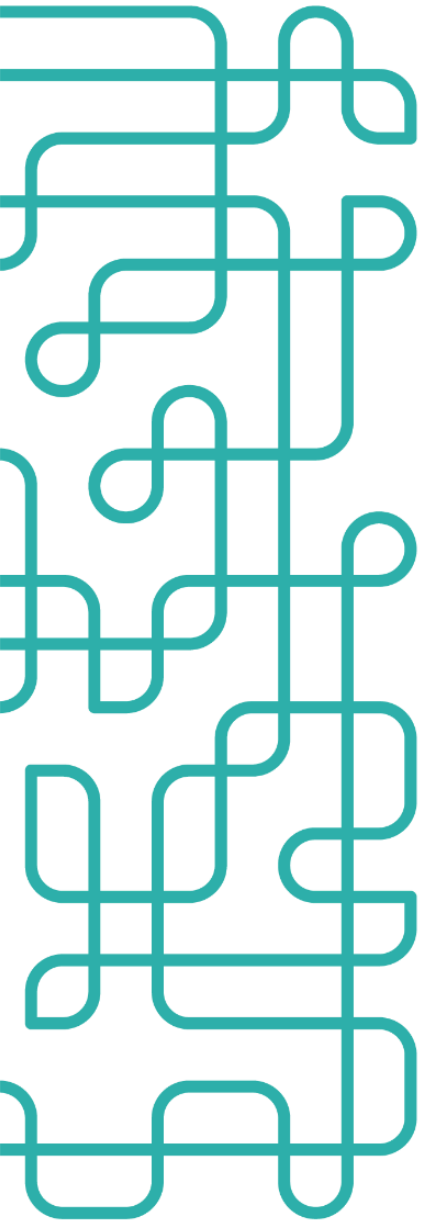
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regions like the Global South where environmental challenges intersect with socio-economic complexities. This policy brief advocates for the adoption of Digital Public Infrastructure (DPI) as a [transformative approach](#) to address climate-related issues, focusing on Brazil's role as the G20 Presidency. By leveraging DPI, governments can enhance transparency, accountability, and efficiency in monitoring and controlling environmentally detrimental activities.

DPI offers a [paradigm shift](#) in environmental governance by providing a robust framework for data exchange and collaboration among stakeholders. In the context of Brazil, where issues like cattle laundering threaten ecosystems and communities, DPI can facilitate real-time monitoring of supply chains, enabling swift interventions against illegal practices. Moreover, DPI ensures transparency by allowing cross-referencing of databases, empowering consumers, local communities, and regulatory bodies to hold accountable those responsible for environmental harm. Specifically, we propose adopting data exchange mechanisms - a core component of emerging global DPI - as a plausible risk mitigation pathway to addressing evolving climate change challenges.

To that end, [data exchange mechanisms](#) within DPI are pivotal for effective environmental management. By integrating diverse datasets related to agricultural production, land use, and deforestation, governments can gain comprehensive insights into environmental trends and patterns. This holistic understanding enables targeted interventions to mitigate climate risks, such as deforestation-driven emissions or unsustainable agricultural practices. Additionally, data exchange fosters collaboration between public and private sectors, encouraging innovation in sustainable production and consumption.

Many encouraging [DPI and DPI-like initiatives](#) have already been implemented across the environment and sustainability space, beginning with [Global Forest Watch](#) - an open-source data sharing

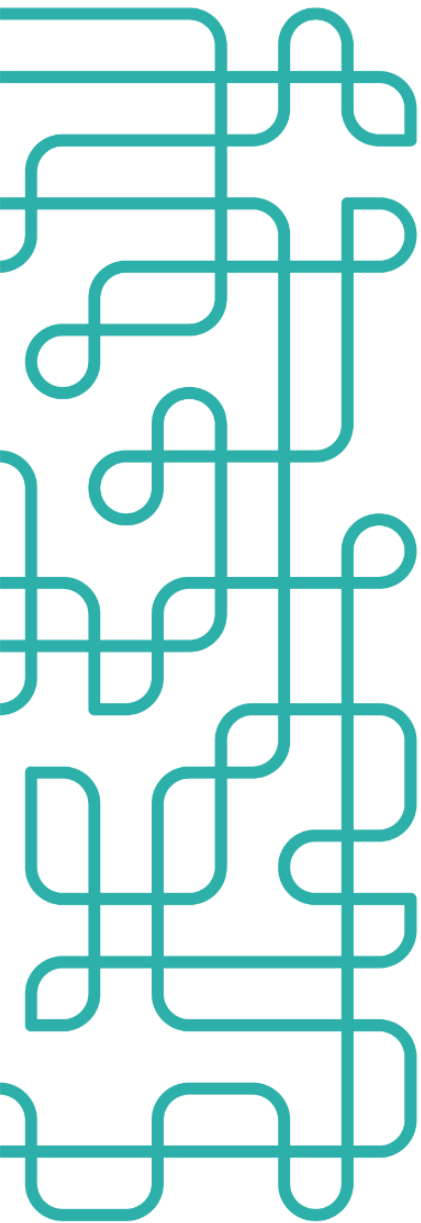
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platform developed by the World Resources Institute that leverages satellite imagery and geospatial data to monitor deforestation. Similarly, proposed carbon market DPI interventions such as the World Bank's [Climate Action Data Trust](#) and Namibia's [National Carbon Registry](#) are other examples that promote climate action through open data and standards. In Brazil, the [Rural Environmental Registry](#), a public database related to rural properties and environmental policies, has the potential to be used as a DPI, as it aggregates information across the entire national territory for specific environmental protection purposes. Though largely nascent in the deployment, these initiatives offer practical levers that policymakers can leverage while promoting digitalisation within sustainability strategies. In fact, adoption of the DPI approach hinges on 3 pillars - invest in people, reuse existing infrastructure and overhaul policy landscape - that have been detailed below with attendant recommendations¹ on how to achieve the same.

1. **Invest in people:** Digitalisation is a promising course of action to achieve SDGs, as indicated by research that demonstrates the positive correlation between digital transformation efforts and SDG acceleration. However, it is crucial to ensure that digital transformation through DPI adoption is alive to perils of exclusion and marginalization that technology may engender. Accordingly, this pillar calls for:
 - a. Codifying for integration of technology with [offline architectures and processes](#) to bridge the digital divide, thus ensuring inclusive and equitable access to DPI.
 - b. Undertaking [capacity building](#) and awareness initiatives that promote welfare, enabling individuals and organizations to acquire the necessary skills and

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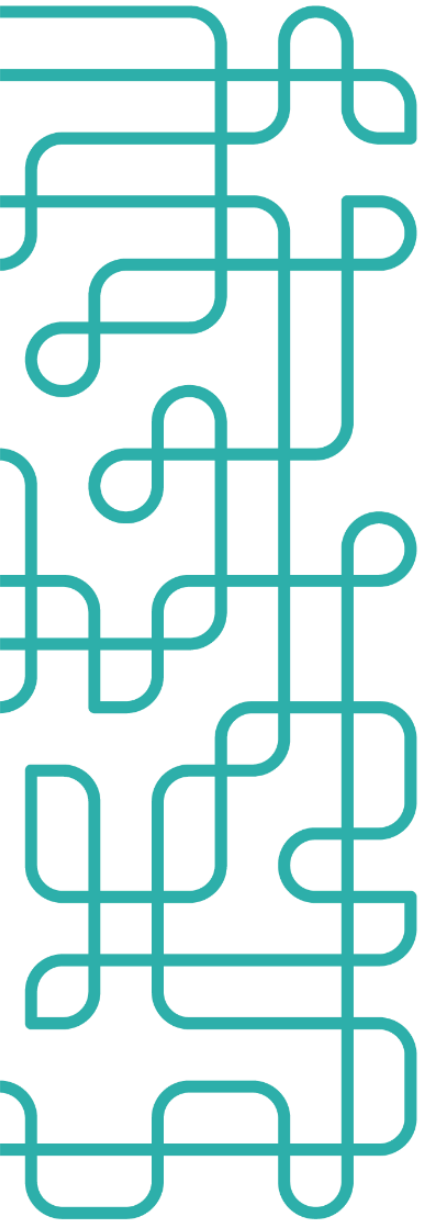
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¹ Recommendations borrowed from 'DPI Governance: A Playbook', Aapti Institute, 2024 (Upcoming publication - copy available upon request).



knowledge to effectively engage with and benefit from the DPI.

- c. Establishing [diverse expert committees and advisory boards](#) with stakeholder representation to provide guidance, expertise, and ensure a broad range of perspectives are considered in the decision-making processes related to the DPI, promoting transparency, inclusivity, and public trust.
- d. Implementing [responsive and independent grievance redressal mechanisms](#) to address complaints and provide effective remedies for individuals and entities affected by DPI operations.

2. Reuse existing infrastructure: Reusing existing infrastructure is essential for maximizing the efficiency and cost-effectiveness of DPI initiatives in the environment and sustainability sector. This pillar emphasizes the importance of leveraging existing data sources, technological platforms, and institutional frameworks to build interoperable and scalable digital infrastructure for environmental governance. Reusability is best achieved through:

- a. Promoting [openness in technology architecture](#) to foster innovation within the DPI ecosystem, enabling collaboration and the development of new applications and services over existing digitisation initiatives for public benefit.
- b. Mandating interoperability and modularity in the design and operation of DPI components, thus adopting a [building blocks approach](#) where different systems and services can seamlessly work together, enabling integration and scalability.
- c. Considering use cases for emerging DPI methodologies, such as the '[DPI as a Packaged Solution](#)' model, that help contextualise digitalisation

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efforts and provide avenues for rapid adoption at scale.

3. Overhaul policy landscape: Another crucial pillar for DPI adoption is concomitant policy innovation that must accompany technological innovation as countries contemplate increasing digital integration in the public sector. It is best reflected in the need for regulatory reforms, institutional restructuring, and policy coherence to address legal and governance challenges and promote digital innovation for environmental governance. Policy innovation can take the form:

- a. Prescribing [decentralised data governance approaches](#) that distribute data across multiple nodes or systems, enhancing privacy and security while simultaneously reducing the risks associated with breach, loss, or concentration of control.
- b. Establishing [codified consultation processes](#) for developments within the DPI, ensuring that stakeholders and the public have opportunities to provide input, feedback, and suggestions on the design and implementation of new initiatives.
- c. Providing for [regulatory sandboxes](#), controlled environments where innovators and developers can experiment and test new ideas, technologies, and applications within the DPI, encouraging innovation, risk-taking, and learning without disrupting the overall system.
- d. Implementing governance frameworks for non-personal data that consider questions around the access, use and dissemination of anonymised and aggregated data that are transacted over/using data exchange DPI, given enormous [socio-economic value](#) inherent to such data.

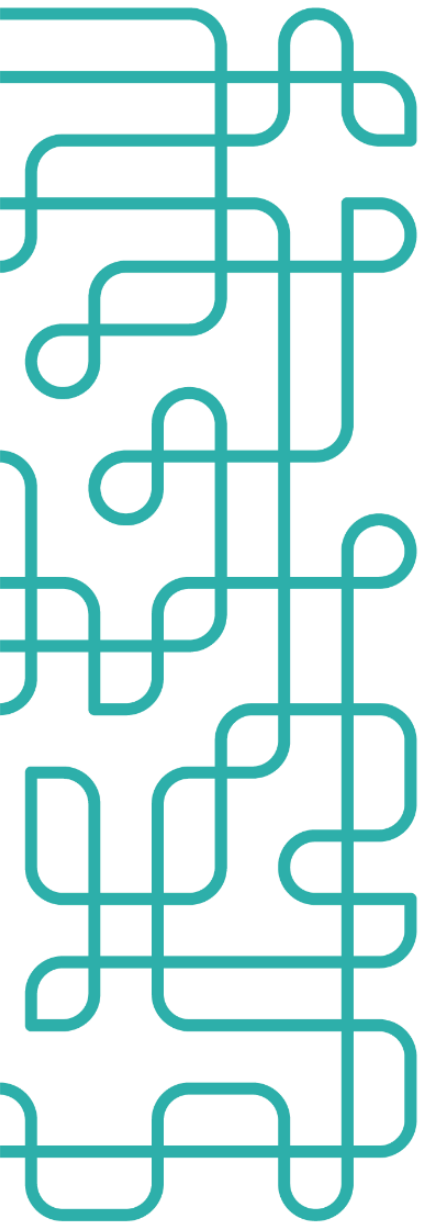
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Scenario of outcomes

Adopting the recommendations set out above is likely to foster a situation which sees increased digitalisation, done in a meaningful way, where members of the public contribute data and are able to benefit from data contributions and insights of others. This happens in an open, interoperable system with high levels of transparency and security. By creating the infrastructure for seamless data exchange and conducting digital literacy campaigns, the ideal outcome would see the leveraging of individual actors to source hyper-local data with the multiplicity of actors serving as points of checks and comparison. In doing so, we should reach a situation where we have adequate up to date information and data to tackle illegal efforts that have a significant impact on the climate.

Considering the diagnosis and recommendations, it is crucial to acknowledge the existence of barriers to overcome. Primarily, there is a challenge regarding the acceptance of measures related to public transparency and the implementation of DPIs. Certain groups may resist sharing data, particularly concerning production and property, fearing that its public disclosure could be exploited by corporations for their economic advantage. In cases like this it will be necessary to bring awareness to the matter and face interests that go against public interest. Additionally, implementing systems with privacy-by-design methodologies can address these concerns by enabling stakeholders to share their apprehensions and mitigate associated risks.

Another pitfall, and a subject of substantial debate, pertains to how data will be accessed. This issue primarily concerns the utility of the database but also raises concerns regarding information security and data protection. Many databases are open to the public without considering their interoperability with other databases, and often, the published data is incomplete, lacking essential information. The absence of effective transparency diminishes the value of the database, rendering it less useful and exacerbating the debate surrounding the need for further transparency.

That said, the positive outcomes certainly outshine the obstacles. The main benefit of implementing DPI to increase environmental protection is safeguarding human and fundamental rights. When dealing with illegal use of land and environmental matters there is

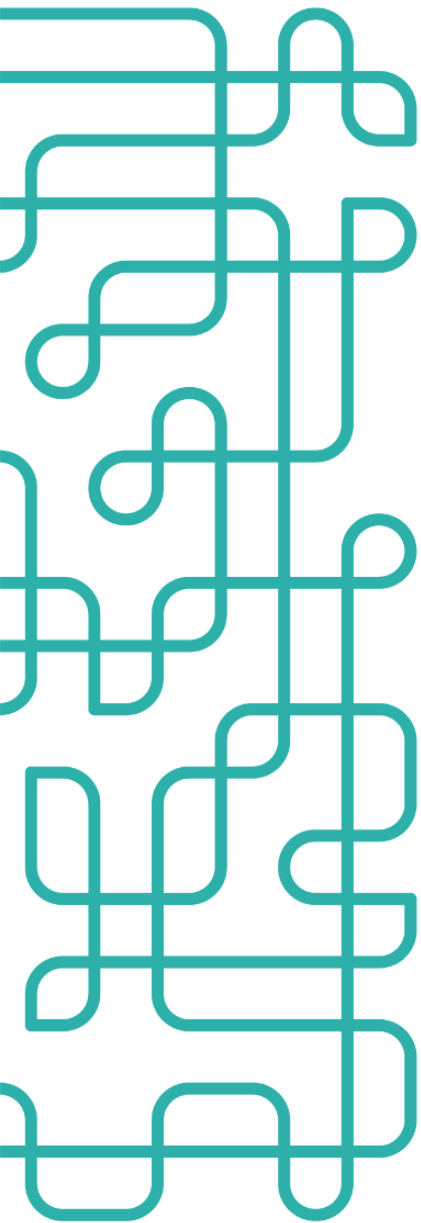
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always an impact on dignity and safety of indigenous and other traditional communities.

Also, there are impacts on consumers' rights to know the chain of production and workers who might not have their rights respected. DPI and especially public transparency protects people from harmful practices due to a shared control over activities and the publicity of the data, leading to more effective policies.

Moreover, DPIs have a positive impact on the market. Transparency regarding compliance with environmental law strengthens sustainability as a core value for both consumers and investors. This transparency not only enhances environmental reputation but also helps in assessing anti-competitive practices. Additionally, DPIs foster innovation by promoting a collaborative approach to utilizing open data in business intelligence, leading to the development of new services and methodologies.

DPI is not exclusively focused on commercial practices, such as material extraction or livestock traceability. It can also serve as a crucial tool to monitor and manage catastrophes and the consequences of climate change. In this context, DPI plays a vital role in informing public policies aimed at disaster prevention, addressing population needs, and mitigating the impact of environmental changes. This aspect is particularly important as it enables the identification and support of climate-vulnerable communities.

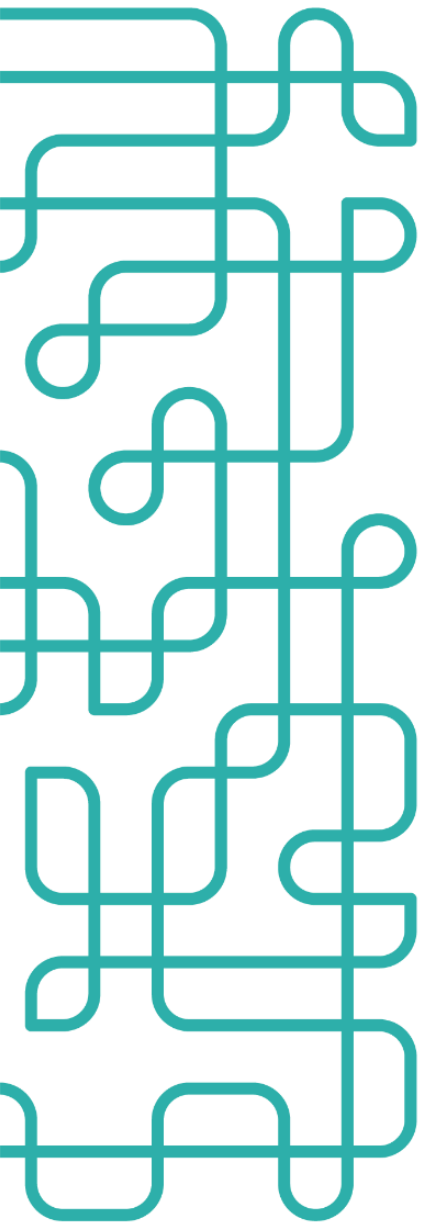
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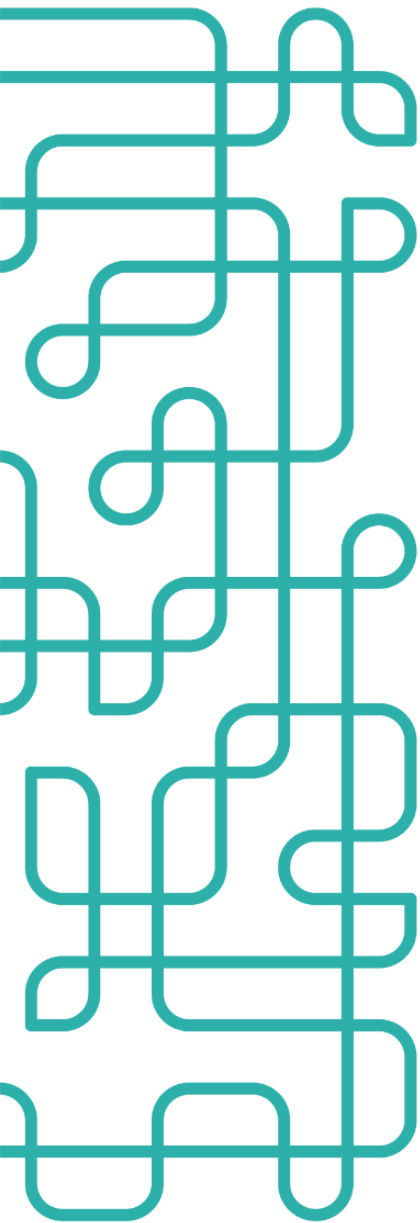
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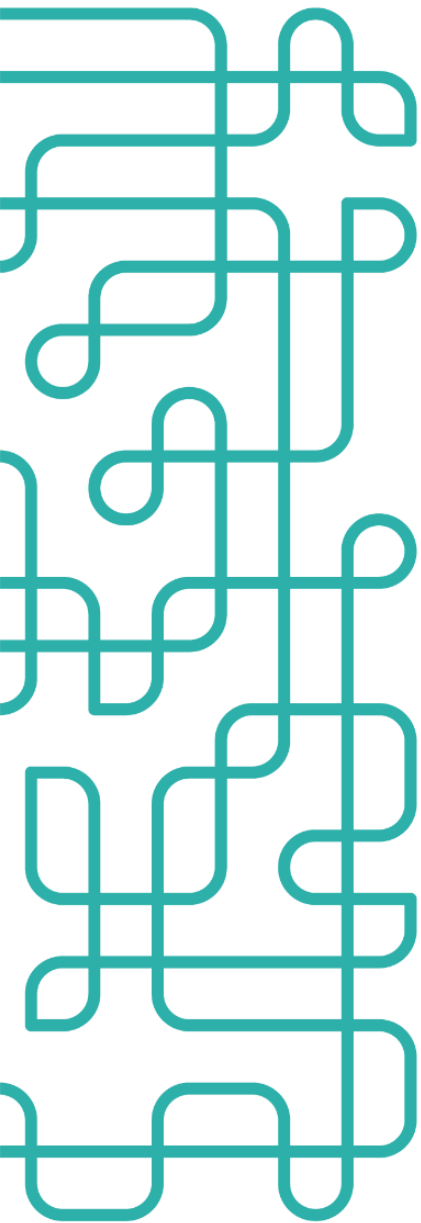
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