T20 INDONESIA 2022 THINK

Policy Brief

DIGITAL PATHWAYS TO RESILIENT COMMUNITIES: ENABLING UNIVERSAL INTERNET ACCESS AND UTILISING CITIZEN-GENERATED DATA

Task Force 2
Meaningful Digital Connectivity, Cyber Security, Empowerment

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Abstract

Smartization of sustainable development that requires equitable digital channels alters the organisation structures of governments, civil societies, and corporations, resulting in a data revolution. The discourse around data revolution brings multiple challenges. This policy brief argues for two-way communication emphasising universal internet access and citizen-generated data as a solution. The policy brief further argues that while universal internet access requires addressing the problem of affordability, infrastructure, and digital governance as an enabler of the development, the utilisation of citizen-generated data is conditional on the citizens' incentive, smartphone use, web-based applications, social media platforms, big data transparency, and data governance.

Challenges

Technology, innovation, and data access are natural enablers of sustainable development, which became absolute necessities during the COVID-19 pandemic (Huang, Qiu and Wang 2021). To provide technological justice and to build a post-pandemic global society 5.0 post-pandemic, digital technology plays an important role. Despite the availability of technological solutions, an inappropriate strategy may push the development process further behind. Therefore, the smartization of sustainable development requires an equitable digital channel that supports innovation, data access, and data generation, ready to be further activated during the development process. The discourse around "data revolution" has changed the dynamics of corporations, governments, media, researchers, and non-governmental organisations (Mckinsey & Company 2020, Budd, et al. 2020)

Data revolution comes with multiple challenges. For instance, governments, civil society organizations, and corporations require quick, relevant, and low-cost real-time data as an enabler of development, both ex-ante and ex-post of any development intervention. However, collecting real-time data in the field, compiling, annotating, and structuring existing data is costly and cumbersome. To overcome this problem and achieve sustainable development, there is a need for citizen participation in the data generation process, especially during disasters like cyclones, floods, wildfires, and pandemics. Citizens also require timely information and support to enjoy the benefits of the development process, especially those with low income and are prudent in survival challenges (Ravensbergen and Plaat 2010). The lack of support from the government or civil society is mainly due to the lack of information (European Union Agency for Fundamental Rights 2017). Therefore, citizens should be required to generate data to participate in and benefit from the development activities, especially during disasters and pandemics.

This policy brief argues that a two-way communication channel, a digital pathway between governments and citizens, is necessary to build resilient communities by providing technological justice. The structure of technological justice relies on two main pillars: access to data (Ortega, Pérez, and Turianskyi 2018, Taylor 2017) and generating data (World Development Report 2021). In this policy brief, we analyse both aspects and propose solutions. This solution can extend further in the context of the G20, where it requires a significant role in providing technological justice through innovation, technology, justice, and equality to build a resilient community for sustainable development.

Citizens do not have equal access to data at any given time; therefore, there is a digital divide (Broom 2020, Stoiciu 2020). Albeit every country emphasises providing internet access to their citizens, Figure 1 shows that in many countries, most of the population still lacks basic internet access. Therefore, there is a digital divide within and across the countries. The success of sustainable development is contingent on two-way communication. However, the lack of internet access (Ortega, Pérez, and Turianskyi 2018) and, therefore, the majority of the population's inability to access information and data (UN News 2021) slows down communication. It hence stalls development, causing further inequality (Dijk 2020). Several studies point out that affordability (Affordability Report 2021) and lack of infrastructure (Shenglin, et al., 2017), among others, are the main reasons for this divide.

Figure-1: Internet Penetration (percentage of population) 2020
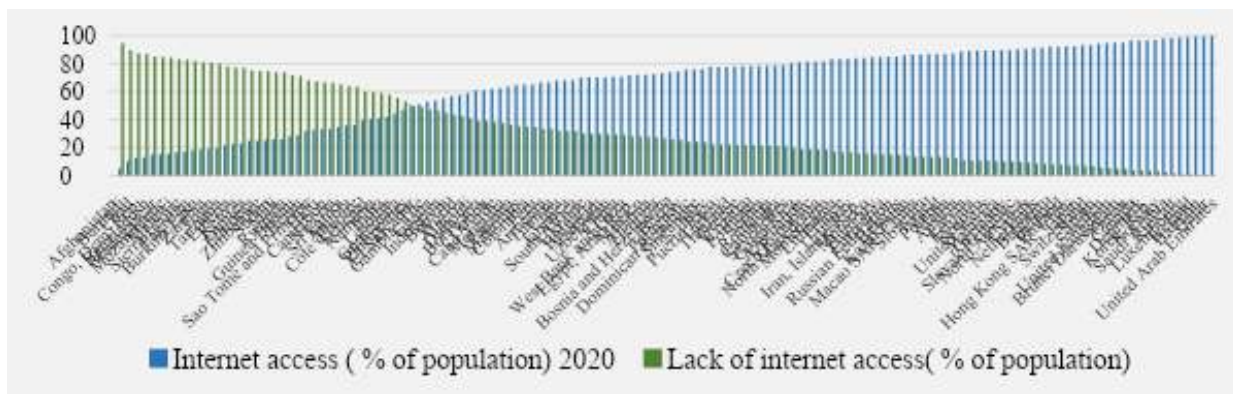

Source: ITU

B1.1. Affordability

Equitable internet access is contingent upon affordability (Affordability Report 2021). Figure 2 shows that the cost of data is not uniform and varies from 58 cents to 49.67 USD per GB. Although high-income countries are expected to have a low cost of data, the same is cheaper in many emerging countries. This high data cost hindrances citizens' participation in two-way communication for the development activities. This relationship also raises a pertinent question regarding the low-income trap. On the one hand, low income reduces access to the internet, resulting in low data access, and on the other, a low level of access hinders the prospect of increasing income. Therefore, it is essential to provide facilities to access the internet.

Since data is not a public good and the market mechanism fails to provide free data, we suggest providing free data up to a specific limit to encourage citizens to participate in the development process. The G20 needs to corroborate with the governments and ISPs to develop

a tariff plan to make the market mechanism while citizens can access free data up to a specific limit.

Figure-2: Average Cost of 1 GB of data (2022)
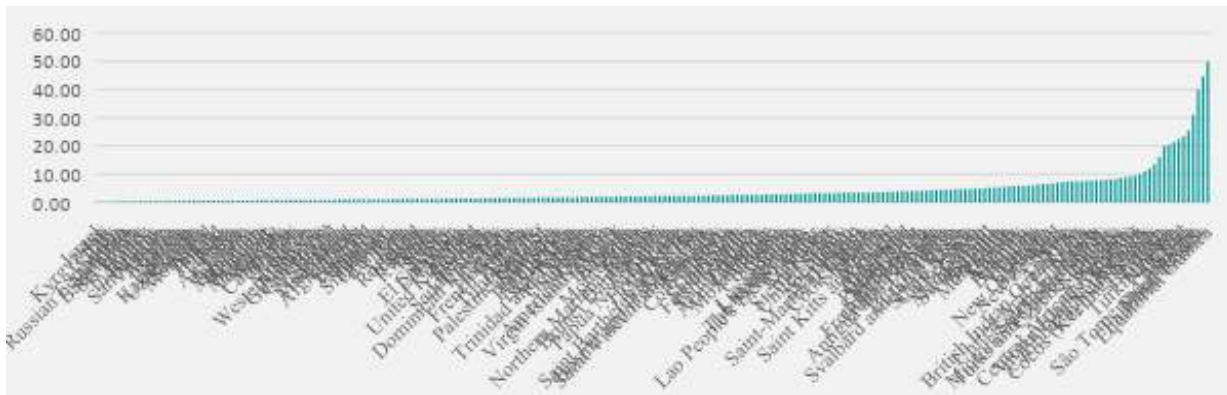

Source: cable.co.uk

B.1.2. ICT and Data Infrastructure

Infrastructure is crucial to facilitate internet access to all citizens, but the market mechanism fails to operate as providing infrastructure with a minimum return is not a viable business option. At the same time, the service provider as a third party will build up infrastructure in a densely populated urban area than in a sparsely populated rural area.

Access and generation of data require data storage which demands a considerable investment. This data can be stored in the colocation data centre or the cloud. Since there are multiple service providers, they need physical locations through which ISPs (Internet Service Provider) and CDNs (Content Delivery Network) can connect. Figure 3 shows that although there is not much difference in the internet exchange point between the different income-group countries, there is a significant difference in the colocation data centre and cloud ramps. Therefore, data managed and controlled by the service provider to maximise profit may not be conducive enough to provide facilities to reduce inequality and pave the way for sustainable development. At the same time, installed mobile towers across the regions of any country are not uniform. However, service providers may not be willing to build the infrastructure unless a business proposition is viable.

We propose a private-public partnership model to connect the last mile to overcome this problem. While the government generates revenue by auctioning various telecom spectrums, technological superiority helps an ISP make a profit. Therefore, the government can set up infrastructure in a sparsely populated area and allow ISPs to use the same on rent. The G20 needs to provide facilities to the government for these private-public partnerships.

Figure-3:   **Countries**   **with**   **Data**   **Infrastructure**   **(Numbers)**
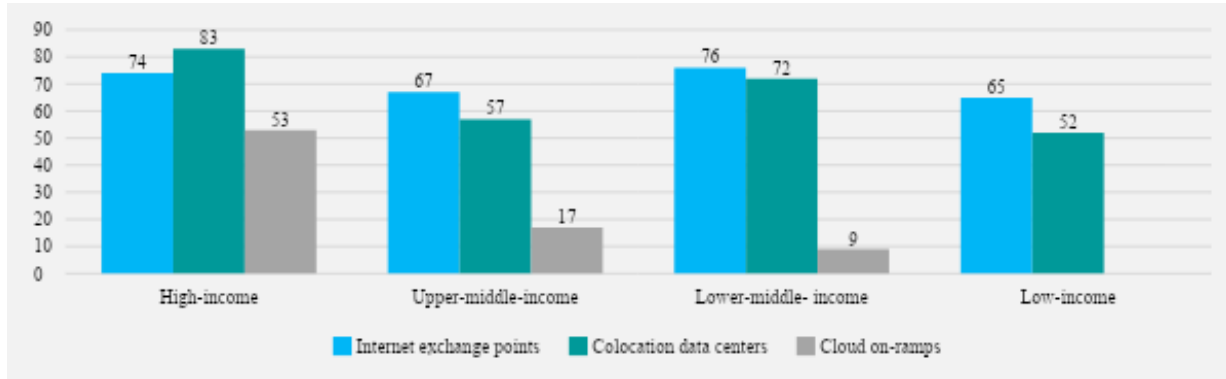
Source: World Bank

A successful development activity necessitates the participation of stakeholders while governments and civil societies take the more significant responsibilities. However, there is a gap in the two-way communication to create an effective development process or disaster management system (Esiere and Obot 2014). This gap mainly arises due to inadequate infrastructure, failure of the traditional statistical procedure to gather real-time data, and lack of proper communication with the stakeholders. This gap calls for citizen participation to complement the existing mechanism by generating and providing data.

B2. Generation of Data

The increasing importance of data has seen a proliferation in data availability from various sources. Albeit the generation of data requires enormous infrastructure and investment, data generated (through participation and feedback) by the stakeholders have the highest importance in achieving sustainable development. As a result, citizen-generated data (CGD) has become increasingly crucial for societal development, primarily to address short and medium-run problems.

B2.1. Citizen Generated Data

Citizen-generated data (CGD) is a channel for citizens to crowdsource their local knowledge to participate and engage in the governance of their communities (Ponti 2020). CGD initiatives open up new relationships between individuals, civil societies, and public institutions for local development, enhancement of educational programs, and community outreach (Lämmerhirt et al., 2018)· Different communities can have different response mechanisms depending on their geography (Broom 2020), ability to access information (Sparrow, Liu and Wegner 2011), and skill in using internet technology (Shaw, Kim and Huaa 2020). Generating data takes many shapes, from collecting new data in the field to compiling, annotating, and structuring existing data to enable new ways of seeing things through data. However, CGD may not immediately

conform with the established practices of data generation unless citizens are encouraged to understand their problems to address, the political dynamics to benefit, evidence to collect (in the form of images or documents), and participate in the development process or rebuilding society during disasters and pandemics. CGD can be obtained through various channels at a low-cost, such as crowdsourcing, smartphone applications, and web-based applications or initiatives to provide rich and real-time responses to the government, policymakers, and civil society organisations.

B2.1.1. CGD Pathways

The generation of data encompasses an enormous amount of investment. However, CGD provides a low-cost but effective solution. CGD enables citizens to participate and engage in the governance of their communities (Meijer and Potjer 2018). CGD is a collaborative method for development activities, disaster response, rebuilding, or preparedness. Therefore, the CGD is crowdsourced. However, communities of similar geographic locations can have different response mechanisms depending on their requirements, interests, available infrastructure, and skill set (Broom 2020).

To address the problem of high cost, skill level, and diverse interests, we suggest three solutions for citizens to generate data.

B2.1.1.1. *Crowdsourcing through social media*

By providing various channels, CGD can be obtained through low-cost means such as crowdsourcing through smartphone applications and other web-based applications or initiatives. Among the channels, social media is the most effective as 4.62 billion users worldwide (as of January 2022) use social media where users actively or passively share real-time local information in images, documents, and data. After ensuring users' privacy and anonymisation of data, government agencies can use this data to provide necessary support even in disasters (Fakhruddin, Chu, and Li 2019).

B2.1.1.2. *Crowdsourcing using Smartphone Applications*

Along with the technology platform, CDG requires individuals to have technology devices to capture, generate, and share data. Smartphones are readily available technology devices, and around 96.2 percent of internet users aged 16 to 64 own a smartphone (Dataportal 2022). These smartphones provide local information to their users, including weather conditions, hazard information, maps, routes, and other warning systems. More so, various mobile applications or software serve the purpose of disaster data collection, transmission, and analysis (Hsu, Weinfurter, and Yan 2017).

B2.1.1.3. *Crowdsourcing using Web-Based Initiatives*

Additionally, in an effort not only to mitigate the impact of natural disasters but also to develop rural and urban resilience through achieving Sustainable Development Goals, several CGD-

related initiatives have been launched. The Humanitarian OpenStreetMap Team (HOT) is the most prominent of these initiatives dedicated to humanitarian action and community development through open mapping (Lang et al., 2020). HOT has also been incredibly supportive in cases of natural disasters. For instance, through Volunteered Geographic Information, the Caribbean Disaster Emergency Management Agency (CDEMA) has relied heavily on data and maps from HOT, which have assisted in relief and damage assessments in extreme weather events. Currently, as the Caribbean region is vulnerable to natural disaster threats, CDEMA relies on spatial data from HOT to ensure a timely response in cases of natural disasters. A brief about the HOT is in Box 1 below.

BOX1: HIGHLIGHT "HUMANITARIAN OPENSTREETMAP TEAM"

Dedicated to humanitarian action and community development, the HOT team collaborates to provide map data through open mapping. Through mapping, HOT has provided support to several countries facing natural disasters.

HOT is an open-source application that helps citizens create maps through OpenStreetMap. These maps can also be edited on the field by OpenMapKit, and unmapped areas using RapiD, a tool that uses Artificial Intelligence to detect unmapped roads and buildings.

During the Cyclone Idai disaster in 2019 that hit 3 African countries—Mozambique, Malawi, and Zimbabwe—HOT provided information that facilitated live-saving aid to reach over 5 million off-the-grid and on-the-grid communities. HOT readily assisted the International Federation of Red Cross (IFRC) and Medecins Sans Frontieres by mobilising 5,723 mappers, mostly volunteers, from all over the globe by adding 25,700 square kilometres to maps from roads, buildings, and waterways. Multiple layers of information and data were provided on a single map to ensure timely and efficient coordination in humanitarian response, especially for remote and disaster-prone areas. This emergency response was the largest in West Africa since the 2014 Ebola epidemic.

B2.1.2. Incentives for Citizens to Participate in Development Activities

The major challenge of CGD is the lack of motivation of the citizen and awareness regarding the importance of participating in development activities (Ponti 2020, Danielsen, Burgess and Balmford 2005). Various studies revealed that citizens are willing to generate data if it engages their individual, collective, and political interests (Meijer and Potjer 2018). Therefore, for effective two-way communication with an objective of sustainable development and disaster management, the government must play a pivotal role in encouraging citizens to participate actively by responding quickly to solve their problems, providing sufficient information, easy access, and rewarding their contribution. This information may include new schemes, facilities, warnings during an emergency, financial inclusion, local governance or grievances, and

combatting misinformation spread. Many countries are yet to adopt digital technology significantly to provide digital governance despite the importance of citizens' participation.

We propose that governments provide information regarding actions taken to address grievances and preparedness to combat the challenges in development activities and disaster management and acknowledge the contribution of the citizen by adopting digital governance. Although G20's Anti-corruption Working Group (ACWG) is working on public sector transparency, it still needs to bring all the governments under an open data policy to monitor government affairs.

B2.1.3. Digital Governance to Connect Stakeholders

One of the significant challenges in data generation and access is the presence of accountable digital governance. Governance mechanisms are also essential components of two-way communications and a prerequisite to CGD. We have created an algorithm to count the number of government websites of the countries at a specific time. Data for 104 countries in figure 4 shows that mostly the less developed and developing countries have a low number of websites to provide information or collect information related to governance. This indicates that governments' responsiveness (Milakovich 2010) is less for many countries despite the importance of citizens' participation. Therefore, communication across the stakeholders becomes less transparent, time-consuming, and, hence less effective, resulting in delays in the development process and response during disasters. The government should therefore provide support by adopting digital governance. We advocate for government and civil societies to connect with citizens by providing timely information and registering their grievances digitally to overcome this problem. In this regard, the G20 can provide a platform for open digital government partnership to leverage the opportunities of evolving technology (such as AI, IoT, Robotics, and Big Data) and develop policies to deal with the threats, including disinformation, discrimination, and privacy concerns.

**FIGURE 4: NUMBER OF GOVERNMENT WEBSITES (2022)**
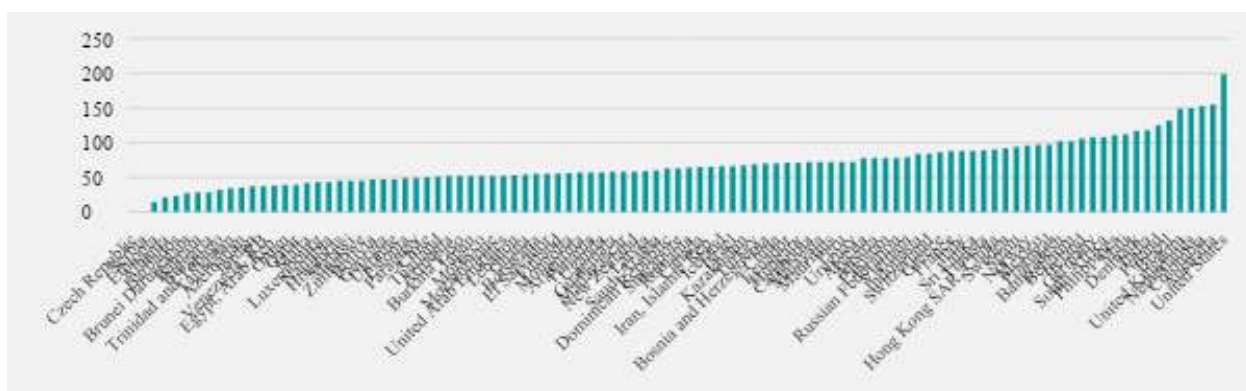
Source: 'Authors' Calculation

B2.1.3.1 *Data Governance as a Component of Digital Governance for Regulation*

The adoption of digital technology alters the organisation's structure and functioning. Therefore, effective digital governance requires a new set of rules and regulations. Since CGD is crowdsourced and may generate false information for personal gain and for creating propaganda (Kozyreva, Lewandowsky and Hertwig 2020), an entity needs to manage and monitor this big data as false information may cause social unrest and stall development activities or rescue operations during disasters. The incorporation of citizen-generated data requires a framework for dealing with big data. Big data exacerbates inequality by facilitating differentiation between persons based on personality traits or behaviour patterns. Regulation for data transparency can mitigate this inequality. However, figure 5 shows that few countries have an effective entity for data governance.

Figure 5: Number of Countries with a Data Governance Entity (2022)
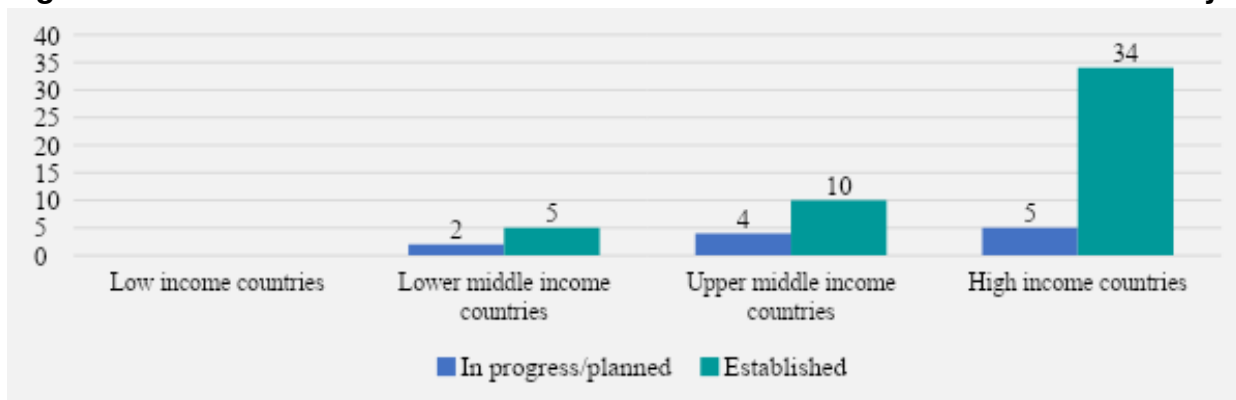
Source: World Bank

There is no doubt that little control over big data can cause privacy and security breaches, especially if coupled with a profit-seeking motive (Zyskind, Nathan, and Pentland 2015).

On the other hand, too much control or inadequate data disclosure may cause hindrances to universal access to the internet and data and distrust in the digital pathways (Gallivan and Depledge 2003). Therefore, countries should invoke transparency as disclosure and transparency as accountability (Hacker and Petkova 2017). While *disclosure* requires different degrees of disclosure of how personal information is collected and used by providing a visceral notice with a formal approach at the time of information collected from the citizen, *accountability* incorporates transparency as a constituent element while also relying on citizen participation. Although big data is the source of discrimination in the digital age, reducing the availability of some users' data to reduce the potential for discrimination is not feasible.

To tackle this discrimination, following Hacker and Petkova (2017), we suggest four proposals: (1) mandatory active choice between payment with money and payment with data,

(2) ex-post evaluation of privacy notices, (3) democratised data collection, and (4) wealth- or income-responsive fines.

Data sharing, use, and production have always been a contentious issue for governments; however, CGD presents incentives for them. CGD can broaden the scope and coverage of government data portals (Wilson and Rahman 2020) which can be beneficial not only for governments but also for NSOs, civil society organisations, and national and international development agencies, as the inclusion of CGD in government portals implies that these datasets have met specific standards (Wilson and Rahman 2020).

A summary of Risk and Suggested Policy Responses is outlined in the Table below.

TABLE 1: RISK MATRIX OF UNIVERSAL DATA ACCESS AND CGD

Source of Risk	Relative Likelihood	Time Horizon	Potential Impact	Recommended Policy Response
Universal Data Access				
Lack of ICT infrastructure	🔴	Medium Term	**HIGH** Lack of access to the internet could potentially further alienate communities and risk data gaps in comprehensive policymaking	Private-Public partnership to build ICT infrastructure.
Affordability	🔴	Medium Term	**HIGH** The high cost of data creates a digital divide and reluctance of the stakeholders to participate in the development process. Lack of participation results in a failure to measure the effectiveness of the adopted policies.	Provide free data up to a specific limit to encourage citizens to access data while providing an environment for a market mechanism to play a significant role.
Citizen Generated Data(CGD)				

The expensive data generation process	●	Short-Medium Term	**HIGH** Citizens cannot afford to have expensive tools and technology to generate data.	Citizens can use Smartphones, various Applications, and web-based tools to gather and share data.
Lack of 'Citizens' participation	●	Short-Medium Term	**MEDIUM** Lack of incentive hindrances citizen participation in the development process.	The government must provide the required information and respond quickly to citizens' requirements.
Digital Governance and Data Governance	●	Short-Medium Term	**HIGH** The lack of sufficient government and civil society websites fail to provide and collect information	The government must engage in open digital governance to provide faster communication with citizens by providing required information.
Big Data	●	Medium Term	**HIGH** Inconsistent quality could potentially present a misleading outcome resulting in policy inefficiency	Government can make it mandatory to make an active choice between payment with money and payment with data. We also propose democratised data collection.

Source: Authors

Note: Matrix structure inspired by the IMF Country Risk Assessment Matrix

C. CONCLUSION

To build a global society 5.0 by providing technological justice, the G20 must form a consortium to enable universal access to the internet and utilise citizen-generated data. Since the benefits of digital technology become more significant with a greater number of users, and "citizens" participation is crucial in improving governance, it is essential to bring more citizens under the umbrella of ICT and encourage them to participate by generating data. However, since the market mechanism fails to provide universal access, governments with various infrastructure and data governance levels cannot provide a common agenda to reap the benefits of the synergy effect. The G20 requires collaboration with various government and service providers to provide universal access through infrastructure development, adopt open digital governance, set up internet tariff plans, and utilise citizen-generated data to achieve sustainable development.

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