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POLICY BRIEF

A HUMAN DEVELOPMENT APPROACH TO MEASURING AND IMPROVING THE DIGITAL LIVELIHOODS OF VULNERABLE POPULATIONS

Task Force 6

ECONOMY, EMPLOYMENT, AND EDUCATION IN THE DIGITAL AGE

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فريق العمل السادس

الاقتصاد والتوظيف والتعليم في العصر الرقمي

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ABSTRACT

In today's digital economy and society, effective usage of new technologies has become critical to improving one's resilience and livelihood. Digital inclusion is widely recognized as an important catalyst to achieving the Sustainable Development Goals (SDGs). However, the pathways from digital access and skills to the development and attainment of the SDGs are not clearly defined. This brief clarifies such pathways and provides recommendations to assist the G20 in developing a globally coordinated approach to "Digital Livelihood." A critical step in this process is the measurement of digital participation to identify those who are digitally disadvantaged. In this way, policies can better bridge digital divides and minimize impacts on the livelihoods and human development of vulnerable populations, especially those that have been marginalized due to economic position, gender, age, ethnic origin, disability, location, and displacement.

أصبح الاستخدام الفعال للتقنيات الجديدة في الاقتصاديات والاجتماعيات الرقمية أمرًا حيويًا لتحسين مرونة الأفراد وسبل عيشهم. ثمَّة إقرار واسع النطاق بأن الشمول الرقمي حافز مهم لتحقيق أهداف التنمية المستدامة. ورغم ذلك، فإن مسارات الوصول والمهارات الرقمية لوضع أهداف التنمية المستدامة وتحقيقها ليست محددة بوضوح. يوضح هذا الملخّص هذه المسارات، ويقدم توصيات لمساعدة مجموعة العشرين في وضع نهجٍ منسَّق على مستوى العالم "لسُبل العيش الرقمية". ومن ضمن الخطوات الجوهرية في هذه العملية قياس المشاركة الرقمية لتحديد غير المستفيدين رقميًا. وبهذه الطريقة، يمكن أن تربط السياسات الانقسامات الرقمية بشكلٍ أفضل، وتقلل التأثيرات في سبل العيش والتنمية البشرية للضعفاء، وبالأخص أولئك الذين تم تهجيرهم بسبب الوضع الاقتصادي والجنسي والعمري والأصل العرقي والإعاقة والموقع والنزوح.

CHALLENGE

In 2015, the United Nations adopted the 2030 Agenda for Sustainable Development Goals (SDGs). The SDGs address pressing global challenges to promote more sustainable, inclusive, and resilient societies worldwide. While digital inclusion is not explicitly listed as one of the goals, it is increasingly recognized as an important catalyst to achieving the SDGs (ITU 2018a; Marolla 2018; OECD 2019; Sachs et al. 2016). The positive impacts of digital technologies on individual, economic, and societal well-being have been documented. These digital transformations, coupled with improved access to information and communication technologies (ICTs), have accelerated progress toward all 17 Global Goals, as they allow for the rapid, scalable, and cost-effective delivery of quality services for health, education, and various other areas (ITU News Magazine 2017). As digital technology access continues to expand, it provides enormous potential for the attainment of the SDGs. More than half of the world's population now has access to the Internet and close to two-thirds are connected via mobile devices (GSMA 2019; ITU 2018a). However, large gaps in digital access and usage persist—especially among the most vulnerable populations in Africa, Southeast Asia, and the Middle East (Chetty et al. 2017; GSMA 2019; ITU 2018c; Lyons et al. 2019b). These groups often include—but are not limited to—the poor, women, youth, the elderly, persons with disabilities, ethnic minority groups, those living in remote areas, migrants, and refugees. Addressing the digital divides of these marginalized populations remains a critical development challenge globally, and has mobilized policymakers and multilateral organizations.

The ongoing coronavirus pandemic (COVID-19) has further intensified the need to bridge the divides, as digitalization is increasingly being used as a tool to sustain economic and social activities remotely (United Nations Conference on Trade and Development 2020). The crisis has accelerated the transition to digital solutions such as telework, telemedicine, and virtual education. Such changes are expected to have lasting effects as the global economy begins to recover, and will hasten the transition toward a digital world. Meanwhile, the disparities in digital readiness between and within countries have yet to be effectively addressed.

Efforts to improve access to digital technologies have mainly focused on issues related to connectivity and infrastructure development (Chetty et al. 2017; Cobo, Zucchetti, & Rivas 2018; ITU 2018a; Lyons et al. 2019b). However, access still poses a challenge. For example, some areas may have connectivity, but large segments of the population, especially in lower socioeconomic and rural areas, may have limited or no access to digital devices or platforms, or they may not meet accessibility standards, and thus may not be equally accessible to all, especially to persons with disabilities.

Lack of digital knowledge and skills also constitutes a major barrier to effective usage. To enhance one's livelihood and build resilience in the face of digital change, it is necessary for individuals to become digitally competent across many aspects of human development, which is critical to the achievement and sustainability of the SDGs. As such, attempts to measure the progress toward the attainment and sustainability of these goals in the context of digitalization remains a challenge.

PROPOSAL

Recent G20 communiques and the work of last year's T20 Task Force on The Future of Work and Education for the Digital Age have emphasized the need for digital access and skills to bridge the digital skills gap between education and the workforce (e.g., Chetty et al. 2018; Lyons et al. 2019a; Lyons et al. 2019b; Nofal, Coremberg, and Sartorio 2018; Shenglin et al. 2017). However, enhancing one's livelihood and building resilience in the digital age encompasses many more outcomes beyond employment. Furthermore, digital access and skills themselves are not the ultimate goals, although they are critical pathways to achieving sustainable human development and well-being in the digital age. While efforts are being made to identify these "digital dividends," there is a need to more formally identify the pathways from digital access and skills to human development and the attainment of the SDGs to better guide the G20 agenda. The following are specific recommendations to assist the G20 in this regard.

Proposal 1: Defining "digital livelihood" in the context of human development

Multilateral organizations including the UN and the OECD are making efforts to increase awareness for the challenges and opportunities of digital transformation in relation to people's well-being. The G20 is well positioned to encourage and support these global activities. As a first step, the G20 can establish an advisory group to develop a more coordinated, holistic, and guided approach to "Digital Livelihood." One of the main tasks of the advisory board should be to define—within the context of human development and the SDGs—what it means to "enhance one's livelihood" and "build resilience" in the digital age (Lyons et al. 2020). This includes identifying the type of digital access and specific digital knowledge and skills needed to achieve key livelihood and resilience outcomes.

Currently, the most commonly used metric to measure improvement in livelihood is the Human Development Index (HDI), which was created in 1990 by the United Nations Development Programme (UNDP). The HDI is a composite index used to rank countries along three key dimensions—namely, life expectancy, access to education, and standard of living. In 2011, the United Nations General Assembly passed Resolution 65/309, officially placing "happiness" and "well-being" on the global development agenda. In 2015, the United Nations 2030 Agenda for Sustainable Development was adopted, which resulted in the current set of development goals, collectively referred to as the SDGs. These goals address global challenges such as poverty, inequality, health, well-being, education, and work.

Recently, there has been a paradigm shift in the measurement of well-being of populations, from traditional economic performance measures (such as Gross

Domestic Product) to people-centered policy design within a social development framework (Hoekstra 2019; Stiglitz, Sen, and Fitoussi 2009). GDP and other related measures focus on the production capacity of a country, but do not adequately capture human welfare. Therefore, a number of countries are starting to focus on measuring quality of life and sustainability (Kapoor and Debroy 2019). One example is Bhutan's shift from using Gross National Product to Gross National Happiness (GNH) to guide national policy. GNH encompasses nine domains comprising psychological well-being, health, time use, education, cultural diversity and resilience, good governance, community vitality, ecological diversity and resilience, and living standards (Centre for Bhutan Studies & GNH Research 2016). Similarly, New Zealand has transitioned to a national "well-being budget," which emphasizes citizens' health and life satisfaction over wealth or economic growth. The budget has five priorities: (1) aiding the transition to a sustainable and low-emissions economy, (2) supporting a thriving nation in the digital age, (3) improving incomes, skills, and opportunities, (4) reducing child poverty, and (5) supporting mental health for all New Zealanders (Charlton 2019; The New Zealand Treasury 2019).

The critical gap in these transitional measures is that they do not adequately capture the role of the digital revolution and its impact on current development goals and measurements of human well-being within and across countries. As digital solutions are increasingly integrated in many aspects of life, using them becomes pivotal to improving livelihoods and well-being. Therefore, an evidence-based policy approach is required to measure, monitor, and assess the progress toward human development in the context of these new digital transformations.

Proposal 2: Constructing a "Digital Livelihood Index"

To this end, the G20 can assist the advisory group and member countries in developing a digital livelihood index (DLI) like the UNDP's HDI and other related measures of human development cited above. The G20 can turn to existing models and frameworks for guidance in developing the index (Carretero, Vuorikari, and Punie 2017; European Commission 2016, 2019; Foley et al. 2018; Fraillon et al. 2015; ITU 2018b; Karpati 2011; OECD 2018, 2019; UNESCO 2018; van Deursen, Helsper, and Eynon, 2014; Vuorikari et al. 2016; World Economic Forum 2016). For example, the European Commission has developed the Digital Economy and Society Index (DESI) to measure the progress of EU and non-EU countries toward a digital economy and society (European Commission 2019; Foley et al. 2018). The composite index covers five principal dimensions of a country's digital performance: (1) connectivity, (2) human capital/digital skills development, (3) citizens' use of internet and digital services, (4) private sector integration of digital technology, and (5) digital public services. Each is

divided into sub-dimensions, which are, in turn, comprised of individual indicators. Weights are attributed to each dimension and sub-dimension according to their relevance to a country's digital policy priorities.

The European Commission has also created the Digital Competence Framework for Citizens (also known as DigComp), which corresponds to the "human capital and digital skills" dimension highlighted in the DESI. The DigComp framework measures common areas of digital competencies (access, awareness, knowledge, skills, and engagement) needed at the individual level for citizens to thrive in today's digital economy and society (Carretero, Vuorikari, and Punie 2017; Lyons et al. 2019a). Other frameworks have taken a similar approach (e.g., Lloyds Bank 2019; UNESCO 2018; World Economic Forum 2016). All of these tend to focus on five core digital competencies: (1) information and data literacy, (2) communication and collaboration, (3) digital content creation, (4) safety, security, and privacy, and (5) critical thinking and problem-solving. Each of these dimensions can be further divided into four proficiency levels, namely basic or foundational, intermediate, advanced, and highly specialized. Additional models have included elements of digital competencies related to human and socioemotional skills. See Lyons et al. (2019a) for further details.

The aforementioned work provides several well-developed frameworks for measuring digital performance at the country level and digital competencies at the individual citizen level. While elements of the frameworks vary, they encompass a wide range of dimensions and indicators that are needed to achieve livelihood, resilience, and sustainable development in the digital age. Figure 1 presents a simplified digital livelihood framework that incorporates these layers. At its core is the foundational infrastructure and skills needed for society to function in the digital age. This is followed by the digital performance measures needed to create and support a well-functioning digital economy and society. To participate in this digital economy and society, individuals need a core set of human capital and digital skills. Those who are able to effectively access, use, and apply these competencies within the fast-changing digitalized economy and society (such as telework, telemedicine, virtual education, and digital finance) are positioned to achieve better livelihood outcomes (e.g., better health, education, work, finance, civic, and social outcomes). The achievement of these higher levels of livelihood within the digital ecosystem serves as the catalyst to ultimately attain sustainable development as measured by the SDGs.[1]

1. For example, improving financial inclusion for the world's two billion unbanked via mobile access to financial services has been found to directly lead to reductions in poverty (Lyons, Kass-Hanna, and Greenlee, forthcoming).

The G20 is well-positioned to support the creation of a digital livelihood framework and index as described above. The DLI could first identify the required levels of digital infrastructure, access, knowledge, and skills to achieve targeted outcomes across key domains of livelihood, such as those proposed in Figure 1 (health, education, work, finances, personal security, civic engagement, social inclusion, and personal well-being). Indicators would be developed for each dimension of the index. Data would then be collected for each indicator, where indicators expressed in different units would be normalized and transformed into indices on a scale of 0 to 1, using a min-max method (OECD 2008; UNDP 2019). Once normalized, the indicators would be aggregated into the key dimensions needed to compute the overall DLI.

For comparison purposes, member countries could use a standardized methodology similar to the HDI to collect data for a core set of DLI indicators to ensure consistency in measurement across countries. Data for a more comprehensive set of indicators could also be collected. Member countries would use these data and their respective policymakers could conduct more customized analyses. The indicators and/or dimensions of the index could be weighted according to a country's digital policy priorities and to make cross-country and regional comparisons. The weighting scheme for the more simplified version of the DLI might follow that adopted by the HDI, which would assign equal weighting to each dimension. Alternatively, it might follow a scheme used by DESI and others, which would assign weights based on the importance and relevance of each dimension to the overall index (European Commission 2019; OECD 2008; UNDP 2019). Besides analyzing the scores for the composite DLI, dimensional scores could be examined to better evaluate each area of digital participation and identify critical gaps and potential intervention initiatives.

Proposal 3: Using the DLI to address the needs of vulnerable populations

In an increasingly digital world, it is ever more important to measure digital divides across vulnerable segments of the population. These segments' lack of access to and usage of ICTs, digital technologies, and e-services can affect their ability to reap the digital dividends. This would leave them further behind and undermine livelihoods and sustainable development within societies. Barriers related to language and literacy, physical limitations, mental capacities, and employment and income instability further widen these gaps. Economic and social inequalities have been further exacerbated by the ongoing COVID-19 pandemic (Lansiti and Richards 2020). Massive shifts to online solutions for work, education, and healthcare have simultaneously deepened the disparities across and within countries at an incredible rate, as those lacking digital access and skills are lagging behind in terms of digital readiness and ability to cope with the crisis (World Economic Forum 2020).

The G20 must ensure that the most digitally vulnerable are not left behind, socially or economically. Therefore, it is critical that efforts to foster "digital livelihood" empower disadvantaged populations with the digital "know-how" needed to achieve and sustain a basic level of livelihood that is attainable by all global citizens. The G20 and its member countries can use the DLI to identify those who are digitally disadvantaged so that policies and programs can be better targeted to reduce digital divides and minimize the impacts on their livelihoods and human development outcomes.

Researchers have previously constructed livelihood vulnerability indices to measure households' socioeconomic vulnerabilities to shocks. Some of these indices utilize household characteristics to determine vulnerabilities to climate change and identify the resource and programming needs of specific geographical locations (Hahn, Rieder, and Foster 2009; Rajesh, Jain, and Sharma 2018). Similarly, the DLI can be used to identify groups that are the most digitally disadvantaged and to design targeted policies and programs aimed at empowering them.

When designing the DLI, the digital dimensions and indicators most relevant to and needed by vulnerable populations must be specifically identified to ensure that they are fully able to participate in the digital economy and society. These mainly include: (1) connectivity metrics to capture public access to technology infrastructure, (2) human capital and digital skills metrics, (3) and metrics for digital public services that not only include digital opportunities for education, health and wellness, workforce and employment education, but also personal security, civic engagement, and social inclusion.

Finally, the DLI must be adjusted to account for general inequalities within countries. The UNDP's inequality-adjusted HDI (IHDI) and gender development index (GDI) are commonly used to capture the level of inequality and gender disparity within a country's population. Similar approaches could be used to assess gender and socio-demographic inequalities in digital livelihood by calculating the DLI separately for women and men and for other vulnerable groups to facilitate comparisons.

Proposal 4: Establishing a globally coordinated approach to digital livelihood development

Finally, an overarching framework is required to operationalize the above-mentioned activities under a unified, systematic scheme. To this end, the G20 should assist in establishing a globally coordinated system to measure and report the progress in achieving digital access and skills and the corresponding livelihood outcomes. This system would be responsible for collecting and tracking respective data on the selected parameters. Given the sensitivity of the data, security protocols and data property rights should be established to ensure that the data are used only for the intended and agreed-upon purposes.

The main objectives of this globally coordinated approach are:
(1) assessing individual countries' performance by observing their dimensional and overall index scores,
(2) identifying gaps in digital access, skills, and livelihoods where performance could be improved based on these scores,
(3) assessing countries' progress over time,
(4) conducting cross-country comparisons and ranking countries according to the stage of digital livelihood development, and
(5) setting national and international benchmarks and policy standards related to digital livelihood development, especially for the most vulnerable populations.

Implementing such a globally coordinated approach is not without challenges. The operationalization of the index relies heavily on the ability to collect consistent and reliable data within and across countries. As Lyons et al. (2019a) indicate, each country starts from a different baseline and faces different economic, social, cultural, political, and regulatory barriers. Metrics to construct the DLI and assess "digital livelihood" would need to be collected regularly, preferably yearly (or at least at pre-defined intervals). To ensure that the metrics remain relevant to the rapidly-changing technological advancements, revisions to the index should become an essential part of the data collection process each year, along with a review of the data security protocol. The benefits of the DLI, which would be a more holistic, coordinated, and strategic measurement of digital progress for human development and the SDGs, are well worth the challenges. These efforts have the potential to revolutionize the provision of more targeted insights into how resources can be better allocated and public policies better designed, especially for those populations most at risk.

Conclusion

To date, most existing digital competency frameworks focus on identifying the digital access, knowledge, and skills needed to participate in a digital economy and society. However, few of them adequately capture the role of digital transformations in people's livelihoods and human development in terms of tangible outcomes. The onset of the COVID-19 pandemic stresses the urgent need for global digital cooperation to leverage digital responses to unprecedented challenges, bridge digital divides, and assess progress toward digital inclusion (Bogdan-Martin 2020; World Bank et al. 2020). The G20 is the international organizing body best positioned to lead a new narrative on "Digital Livelihood" that bridges existing disconnects between digital competencies and human development outcomes closely aligned with the SDGs. Developing a more globally coordinated and holistic approach to livelihoods within the context of digitalization assists governing bodies in setting local and national agendas that result in more efficient and effective allocation of resources. Further, it helps achieve more targeted outcomes and reduce critical gaps for those populations most vulnerable to digital transformation.

Disclaimer

This policy brief was developed and written by the authors and has undergone a peer review process. The views and opinions expressed in this policy brief are those of the authors and do not necessarily reflect the official policy or position of the authors' organizations or the T20 Secretariat.

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APPENDIX

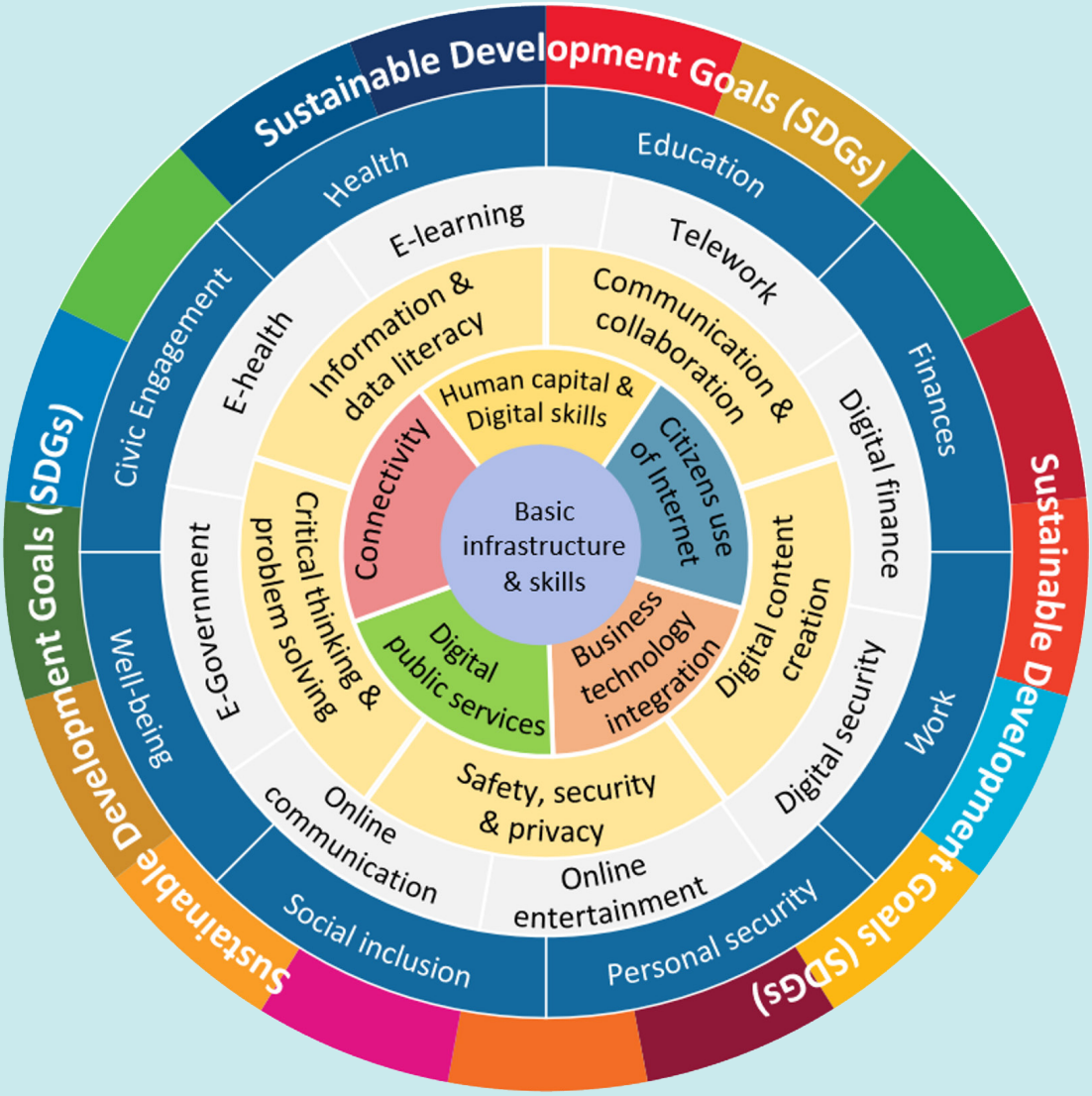

Figure 1: **Human Development Approach to Digital Livelihood**

Source: **Carretero, Vuorikari, and Punie (2017); European Commission (2016); Lyons et al. (2019a).**

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