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**Working Paper**

## Information technology and sustainability in developing countries: An introduction

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# A G D I Working Paper

WP/22/028

## **Information Technology and Sustainability in Developing Countries: An Introduction**

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**Information Technology and Sustainability in Developing Countries: An Introduction****Simplice A. Asongu & Nicholas M. Odhiambo****Abstract**

The purpose of this special issue is to contribute to the growing body of literature on the externalities of information technology within the specific remit of the relationship between information technology and sustainability outcomes in developing countries, not least because of the sparse scholarship on the subject focusing on developing countries. Each of the seven selected contributions to knowledge solidly stands on its own merits, as summarized in three main strands, notably: (i) information technology usage; (ii) the nexus between ICT and growth outcomes at the urban and national levels and (iii) leveraging on ICT for poverty reduction.

*Keywords:* Information technology; sustainability; developing countries

*JEL Classification:* D10; D14; D31; D60; O30

There are two main scholarly and policy insights that motivate this special issue. First, the importance of sustainable development outcomes in the post-2015 development agenda of sustainable development goals (SDGs) and the importance of information technology in the accomplishment of most SDGs targets. Accordingly, consistent with the extant literature on the nexus between information technology and sustainable development outcomes (Asongu & Boateng, 2018; Tchamyou, 2019), one of the most pressing policy challenges in this era is the achievement of the SDGs of the United Nations. To put this point in more perspective, according to some policy and scholarly reports, the wealth owned by the top 1% of the world's population exceeds that owned by the bottom 99% of the corresponding population of the world (Oxfam, 2018; Asongu & Boateng, 2018). This tendency has been exacerbated by the recent Covid-19 crisis, resulting in the rich growing richer and the poor growing poorer (Diop et al., 2021a, 2021b). At the backdrop of the underlying exclusive development,

the negative externalities of neoliberal capitalism are increasingly apparent in the environment, especially with regard to the consequences such as global warming and environmental (oil, war and air) pollution (Tchamyou, 2019; Asongu & Odhiambo, 2020).

Second, over the past decades, the liberalization of the information and communication technology (ICT) sector has engendered a plethora of both favorable and unfavorable consequences for human and economic developments (Tchamyou, 2017; Asongu & Tchamyou, 2020). Accordingly, there is a growing literature building on the motivation that ICT can be employed to address outstanding challenges, especially those pertaining to the SDG targets (Nchofoung & Asongu, 2022a, 2022b). Moreover, according to the attendant literature, while information technology penetration levels in developed countries have almost reached saturation levels, developing countries are still characterized by substantial room for such ICT penetration (Tchamyou *et al.*, 2019; Uduji *et al.*, 2019a, 2019b). It is also apparent that compared to developing countries, developed countries are collectively in the driver's seat in the achievement of the 2030 SDGs targets (Nchofoung *et al.*, 2021, 2022). In the light of the underlying insights, this special issue builds on the double premise of the high penetration potential of information technology in developing countries on the one hand and, on the other, the importance of leveraging on the underlying technology for developing countries to catch up with their developed counterparts in the achievement of sustainable development targets.

Building on the above premises, the purpose of this special issue is to contribute to the growing body of literature on the externalities of information technology within the specific remit of the relationship between information technology and sustainability outcomes in developing countries, not least because of the sparse scholarship on the subject focusing on developing countries. The concept of sustainability underlying the special issue is also consistent with contemporary sustainable development literature, notably: that for sustained development to be sustainable, it should be inclusive, and for inclusive development to be sustainable, it must be sustained (Amavilah *et al.*, 2017).

The articles selected for this special issue have gone through a rigorous process of peer review, and the surviving manuscripts have constructively and positively accommodated critical recommendations for various referees to improve the original submission so that they are theoretically-informed, empirically-robust and policy-relevant. We, therefore, take this opportunity to thank the editorial board of

Telecommunications Policy and the anonymous referees for their criticisms and suggestions, which were consistently acknowledged and taken on board by the corresponding authors in the spirit of constructive consideration. The individual attendant contributions are eloquent evidence of unwavering commitment from the editorial services and referees. Moreover, each of the seven selected contributions to knowledge solidly stands on its own merits, as summarized in three main strands, notably: (i) information technology usage; (ii) the nexus between ICT and growth outcomes at the urban and national levels and (iii) leveraging on ICT for poverty reduction.

In the first stand on information technology usage, Naito and Yamamoto (2022) have examined whether better access to mobile networks is linked with enhanced mobile adoption using data at the microeconomic level from six developing countries. Using household Global Positioning System (GPS) information and network maps, the study finds that 70% of households have access to multiple mobile networks. Moreover, while in four countries, network accessibility does not impact the use of mobile money, in Tanzania and Pakistan, however, being 10 km nearer a network enhances mobile money usage by 10%. Kant et al. (2022) are concerned about the sustainability of mobile information technology in industrially developing nations by means of supporting reparability. They posit that sustainability in the mobile ICT sector can be improved and developed by supporting the repairs of mobile phones that already exist. Ahmed and Hussain (2022) complete this strand by assessing how machine learning algorithms can be used to predict wheat production in northern areas of Pakistan. Their findings confirm the predictive ability of machine learning algorithms on a dataset on crops recorded in an environment that is localized and can be replicated on other regions and crops.

Concerning the second strand on the nexus between ICT and growth outcomes at the urban and national levels, Odhiambo (2022) has examined the nexuses between ICT, income inequality, and economic growth in sub-Saharan Africa (SSA) and concluded that while ICT increases economic growth in the sub-region, income inequality mitigates the positive incidence of ICT on economic growth. The author has provided critical policy thresholds that should not be exceeded in order to maintain the positive effect of ICT on economic growth. Goel and Vishnoi (2022) have assessed the nexus between urbanization and sustainable development for inclusiveness by means of ICT in order to understand how ICT is essential for technological and holistic developments. The authors posit that re-introducing

malfunctioning institutions should be avoided for inclusiveness to be achieved. Convergence in digital technology dynamics boosts sustainable urban growth.

In the third strand on ICT and poverty reduction, Lechman and Popowska (2022) have examined how digital technologies can be leveraged upon to mitigate poverty in 40 low-income and lower-middle income countries. The authors have found that ICT affects poverty reduction via education and income shifts and reduces vulnerability in the labor market. Zhu et al. (2022) have considered technology empowerment as a path to alleviating poverty among Chinese women within the remit of development communication by putting forth three typical models for the women left behind in the rural areas to escape from poverty in China. It is established that digital improvements and empowerment by means of technologies reduce poverty and improve women's status. Moreover, the process of poverty alleviation in China represents important policy lessons for other developing countries.

Concluding Remarks: the main objective of this special issue is to articulate interdisciplinary research of high quality that is relevant in advancing extant knowledge on the nexus between information technology and sustainable development outcomes. It is also with a perspective to educate and inspire students, researchers, and policy makers on the fundamental role that information technology plays in achieving sustainable development targets, especially those set by the United Nations for the year 2030. It is, therefore, our hope that articles that have survived the peer review process in this special issue would motivate policy makers and academics to engage in more research on the opportunities and challenges that information technology can offer in driving processes of achieving sustainable development for the betterment of humankind.

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