Expanded Data Analysis and Policy Research for National ICT Household Survey 2019

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1. Introduction



1. Background (1)

 Information and communications technology (ICT), and other frontier technologies of the Fourth Industrial Revolution (FIRe), are disrupting our ways of doing things.

Although ICT use has grown, digital dividends have not been inclusive

Prior to the onset of COVID-19, the Philippines has had robust and broad-based economic growth, and there was expectation that reliable, accessible, and affordable ICT infrastructure would be needed to sustain economic activity, encourage investments, and lay the ground for further innovation.



1. Background (2)

ICT policy environment in PH

- PH Digital Transformation 2022
 - e-Government Master Plan: e-Gov, iGovPhil
- National Broadband Plan (NBP)
- Other policies and regulations on ICT
 - National Retail Payment System, E-Commerce Act, Data Privacy Act, Cybercrime Prevention Act



However: Lack of availability of official statistics on ICT



Incomplete picture of the **access and use of ICTs**, as well as the full impact of the ICT sector in socio-economic development



1. Background (3)

Scarce ICT statistics for benchmarking

Seven indicators on ICT are among 232 global indicators tp monitor Sustainable Development Goals (SDGs), but only one available in PH



Proportion of schools with access to the Internet for pedagogical purposes



Proportion of schools with access to computers for pedagogical purposes



who

Proportion of youth/adults with ICT skills, by type of skills

Proportion of individuals mobile own а telephone, by sex



Percentage of the population covered by a mobile network, broken down by technology

Fixed Internet broadband



of individuals using the Internet

Of required 14 indicators in PDP Results Matrix, only 3 available.

- •Of 11 indicators for ITU's Global ICT Development Index, only 5 available.
- Among 61 indicators in ITU's Core List of ICT indicators, only 25 available.



1.1. National ICT Household Survey 2019



- Involved interviewing 43,838 sample households to obtain information on ICT use of households and individuals
- Officials of all barangays where households reside were targeted also for interview
- Composed of
 - Community Questionnaire to assess barangay's current ICT infrastructure and equipment.
 - Household Questionnaire to examine household's ICT access and use
 - Individual Questionnaire to measure an individual's knowledge, access, and usage of ICT.



- What is the state of ICT access, use and infrastructure in the country, from the standpoint of household, individuals and the communities where they reside?
- Does ICT connectivity promote inclusiveness, digital skills, elivelihood and e-entrepreneurship, and online protection?
- •What policies and strategies are needed to accelerate the progress of the digital economy, while ensuring that digital dividends are spread across various groups, both urban/rural areas, among men and women, and across regions?



1.3. Conceptual Framework

Following a framework frp, 2016 World Development Report on Digital Dividends by WB (2016), we looked at ICT access of households and ICT use of individuals within households in as far as they promote inclusion, efficiency and innovation in the economy



Figure 3: How ICT promotes inclusion, efficiency and innovation among businesses, people and governments Source: World Development Report (2016), World Bank



1.4. Research Design

•3 key themes of survey data and policy analysis:

- ICT Development for Promoting a More Innovative and Inclusive Society
- ICT, Gender, e-Livelihood and e-Entrepreneurship
- Digital Infrastructure Development

Indicators of ICT access and usage, status of infrastructure, were obtained from the 2019 NICTHS data.

•Additional data from international reports and databases, e.g., World Bank, International Telecommunication Union, United Nations, were also used to support discussions



2.1. ICT Development for Promoting a More Innovative and Inclusive Society



Inclusion and Innovation with ICT

- Three fifths (60%) of world population (4.66B people) are using the Internet
- **Digital divide** remains (as twofifths of people are not connected to the net), as most of the growth



in connectivity and digital platforms is happening in developed countries; **Urban-rural, gender** and other **socio-economic disparities**, especially in less developed and developing countries

Persisting digital divide may exacerbate existing inequalities



Digital divide based on location, education and age

- According to NICTHS 2019, less than half (47%) of Filipinos used the Internet in the last 3 months; 75% of individuals own a cellphone; 24% of HHs own a computer
 - Internet use Proportions higher in urban than rural areas
 - Individuals living in rural and less metropolitan areas/regions have lower device ownership (cellphone, home computer), as well as quality of connectivity (cellular network signal)

o Less metro regions, include BARMM, V, IX, X (vs. urban; NCR, IV-A, III)

 Older adults, and individuals with less schooling have low access to ICT (ownership, use of devices and Internet)



Digital skills are low in PH

- As regards SDG indicator 4.4.1: 40% have at least one of six ICT skills for monitoring SDGs; mostly from the youth (15-24 y/o)
- Generally, more females are ICTskilled, but differs with age
 - Among the young population (10-24 y/o), more females are ICT-skilled
 - Among working-age and older adults (25 & above), more males are ICTskilled

Proportion of youth and adults with ICT skills, by sex and type of skill (SDG 4.4.1).

	Age Group				
				65 and	
Sex	10-14	15-24	25-64	above	Total
Male	16.1	40.7	45.2	30.8	37.8
Female	30.4	52.3	37.4	13.4	41.4
Total	23.1	46.7	40.3	18.0	39.8

Covers 6 of 9 skills identified for SDG indicator 4.4.1, viz., Using basic arithmetic formula in a spreadsheet; Using copy and paste tools to duplicate or move information within a document; Sending e-mails with attached files, Creating electronic presentations with presentation software, Finding, downloading, installing and configuring software, Transferring files between a computer and other devices



Digital skills are low in PH

SDG Indicator 4.4.1 :

PH lags among many ASEAN member states in digital skills

• It fares slightly better than TH in all digital skills measured, except on "Using basic arithmetic formula in a spreadsheet"

Proportion (%) of youths and adults in select ASEAN member states with ICT skills (SDG 4.4.1), by type of skill, recent year



Source: Global SDG Indicators Database (https://unstats.un.org/sdgs/indicators/database/), except for Philippines-2019 NICTHS (DICT and PSRTI).

Notes: Three ICT skills listed in SDG 4.4.1 are not available for the Philippines; data covers youth and adults (PH: 15 years old and above).



Internet used mostly for communication/social media



 Older adult males and females (65 y/o & above) are into communications, while working age females (25-64 y/o) and young males (10-24 y/o) are into entertainment/gaming



E-commerce common, but not e-payment/online banking

- Most common online transaction is purchase of goods and services (21%) : urban(23%) vs rural (16%)
- Online selling, one of the least common transactions, at 4%
- Payments used by online buyers (80%) and accepted by online sellers (72%) were largely in cash (COD), consistent with the Global Findex database 2017 report
 - Digital financial inclusion objective of government not achieved

Types of e-commerce transactions done in the last 12 months*	Urban	Rural	Total
Payment of bills online (electricity, water,			
Internet, credit card)	7.7	3.7	6.2
Online banking (checked account balance,			
transferred/received funds)	6.8	4.6	5.9
Online booking of delivery services (delivery of			
food, gadgets, packages, etc.)	6.0	3.2	4.9
Online booking of transportation services			
(flights, car)	3.7	1.3	2.8
Online booking of accommodation services			
(booked hotels, airbnb)	1.8	1.4	1.6
Purchase of goods/services online	23.5	15.9	20.6
Stock trading and online investments	0.3	0.2	0.3
Selling of goods/services online	3.9	3.4	3.7
Others	0.3	1.6	0.8



Security & lack of awareness hinders use of e-payment

 Majority of Filipinos (42%) do not use electronic payments (online banking or electronic money) in online purchases because of security concerns, particularly, in giving personal and card details

Note: NICTHS data are prior to pandemic (as Google and Temasek e-Conomy SEA 2020 report suggests rise in use of digital services in South-east Asia, including PH.

•For those with little or no schooling, lack of awareness about electronic payment is a major bottleneck for not using such a platform (77%)



2.2. ICT, Gender, e-Livelihood and e-Entrepreneurship



Gender Dimensions in ICT

 GSMA Mobile Gender Gap Report 2020: substantial gender gap in mobile Internet use in low- and middle-income countries, particularly in South Asia and Sub-Saharan Africa

- Empirical studies also find disparities in skills: ICT specialist skills more present among male than female workers, with variation depending on industry
- ICT gender equality paradox: where level of gender equality is high, there is lower share of women pursuing advanced ICT degrees (esp. STEM) [UNESCO, West et al. 2020]
 - PH case: while gender gap in total number of people who finished ICT degrees is minimal, labor participation of women (70%) with ICT degrees is lower compared to men (93%) (Albert *et al*. 2020)

Relationship between gender and online entrepreneurship is not consistent

• For women – flexibility as incentive vs time-related stress and intra-family conflicts as disincentive.



Women outdo if not at par with men in ICT use

- Relatively more women (81%) than men (77%) using a cellular phone.
- No disparities between men and women in internet usage.
- Slightly more women 20.00 (51%) who are more aware_{10.00} of online business transactions compared to men (47%).



■ Female ■ Male ■ Both



Online buying and selling of women vs men

- The proportion of women internet users (11%) who have online buying and selling accounts is slightly higher than that of men (9%).
- Share of female internet users (5%) engaged in online selling slightly more than men (4%)
- However, male online sellers earned more income in 2019 than female online sellers.





Women online sellers are self-employed/homemakers

- Among women online sellers, majority are employed workers (25%).
- Self-employed women and homemakers/housewives together comprise 36% of online sellers.





Education and training: correlates of online selling

Results of econometric modeling: All other factors held constant,

- □Online selling is more likely among women, married individuals, and more educated persons. Holders of ICT degrees also more likely to engage in online selling.
- Likelihood of online selling increases with age, though decreases at a certain threshold.
- □ Filipinos in rural areas less likely to engage in online selling.
- Controlling for education, age, and marital status, the unemployed, self-employed workers, and students more likely to sell online (than employed persons).

Homemakers less likely to engage in online selling, in comparison to employed workers.



2.3. Digital Infrastructure Development



How PH connects to the internet



IXPs = internet exchange points; CDNs = content delivery networks; FOBN = fiber optic backbone network; DFON = domestic fiber optic network; TELECPHIL = Telecom Infrastructure Corporation of the Philippines Source: World Bank (2020, p.32) with author's edits



Community access to Digital Infra

Acc to NICTHS 2019:

- Cellular signal reaches 92% of all surveyed barangays; urban with 10% more access than rural areas
- Near-universal access to electricity, but some communities have low access to telecom towers, fiber optic cable, and free Wi-Fi.

Barangay Access to ICT Infrastructure



Barangays with poorest access

Telecoms Tower	Fiber Optic Cable	Free Wi-Fi
Eastern Visayas – 16.0%	MIMAROPA – 9.6%	CAR – 3.3%
Bicol – 15.8%	Cagayan Valley – 8.6%	MIMAROPA – 1.6%
BARMM – 12.8%	BARMM – 0.9%	BARMM – 0.9%



Telecommunication tower

Barangay Access to Telecom Towers



•A third (36%) of barangays with a telecom tower; those that do have 2 towers, while those some that do not still have access to a cellular signal.

- Wide gap between urban (61.3%) & rural (18.9%) barangays
- Almost all (95%) of these towers privately owned.
- •4G reaches 61% of barangays, with urban (83%) having twice more access than rural (44%)

•3G still prevalent in rural areas

 Bicol (48%), Zamboanga Peninsula (46%) and Eastern Visayas (44%) having most barangays with 3G as highest signal available



- Only a tenth (12%) of barangays have free Wi-Fi; 70% of which is public, 32.7% privately provided.
- Thus government's Free Wi-Fi for All program is far from achieving its goal "to provide internet access nationwide".
 - Relatively low number of free Wi-Fi sites is a symptom of ICT infrastructure gap



Barangay Access to Free Wi-Fi

Fiber Optic Cable (FOC)

Barangay Access to FOC



- •FOC network only in 3 out of 10 barangays; 53 % urban, 12% rural
 - Although FOC, being a wired technology, offers highest bandwidth and reliability, fiber is expensive to deploy in areas with lower population density (and this is why fiber is primarily concentrated in urban centers



Internet Service Providers (ISPs)

- A fifth of (20%) barangays have no ISPs.
 - Income levels in some barangays are likely not sufficient for households to subscribe to broadband and support an ISP's return on investment
- Nearly all regions, except llocos, have more ISPs in urban than in rural areas.
- A tenth (8%) of barangays in NCR do not have ISPs, which suggests a digital divide even within cities.



ISP presence in the barangays per region



Household access to Digital Infra

- Nearly universal (95%) access to electricity
- A significant portion (40%) of households (HHs) use analog TV signal
- Less than 2 Million HHs use a fixed telephone
- A fourth (24%) of HHs have a computer; communal cell phone at home
- Less than a fifth (18%) of HHs have own Internet access at home, majority use fixed wired broadband connection
 - low access and wide disparities in regions: NCR (33 %), BARMM (4 %)
- •HH monthly spending of PHP 300 for Internet services, HH with home Internet connection spend about PHP 1,280 monthly.



Households Without Own Internet

Top 3 Reasons	Urban	Rural	Total
High cost of Internet subscription	60.3	45.4	52.5
High cost of equipment	33.0	34.6	33.8
Internet is not available in the area	11.3	26.6	19.4

High Cost of Internet	%	Ave monthly cost	РНР
CALABARZON	69.6	NCR	554.29
CENTRAL LUZON	65.5	CALABARZON	417.01
SOCCSKSARGEN	59.8	CAR	375.44
NCR	59.1	CENTRAL LUZON	374.11
WESTERN VISAYAS	58.5	ILOCOS	265.65



Individual access to and use of Digital Infra

Nine out of ten (91%) Filipinos have access to a *television*

•Four out of five (79%) have used a *cell phone*, highest in 18-34 age group

One of three Filipinos have used a *computer;* Half (47%) have used the internet through a mobile device (85%), a desktop (30%), and a laptop (19%). Internet usage is highest in Luzon (54%) among major islands, in NCR (66%) among regions, and it is higher in urban areas (57%).

Type of Computer-Related Activities	%	Proportion (%) of Individuals using internet last 3 mos.
COMMUNICATION	69.0	60.00 <u>54.6</u> 40.00 <u>39.3</u>
ENTERTAINMENT AND GAMING	63.4	20.00
SENDING EMAILS (plain text)	23.1	0.00 Luzon Visavas Mindanao



3. Key Policy Insights & Ways Forward

Bring Policy to the Digital Age



Policy and regulation



Technology we use



Enhance ICT access

- Continuously and urgently reform policies/programs to substantially improve digital coverage and quality of connectivity
 - Widespread connectivity needed to for e-education, telemedicine, efinance and e-commerce to grow in use, and for other digital systems to be implemented successfully

Programs such as the NBP and Free WiFi in Public Places should include a sub-project or component with monitoring that focuses on areas that are prone to exclusion from ICT such as rural and remote communities



Improve digital literacy among Filipinos

- DICT can partner with other government agencies and the private sector in a national campaign to spread information about ICT and FIRe technologies, cyber security and business/consumer protection
 - encourage Filipinos to get engaged in e-commerce, digital finance (and not just social media);
 - inform the public about safe use of the internet, cybersecurity, etc.



Reskill workforce and enhance educational capacity.

- It would be beneficial for the government to create programs that can re-skill the population (and train older people especially) on use of ICT, and improve awareness of its usefulness.
- It is essential that the gap of ICT skills and usage between the youth and older people, between the educated and less educated be bridged.
- Programs can also be geared towards capacitating people in using online platforms for transactions such as bank payments, online booking and others.



Examine ICT skills gaps and how skills can be harnessed

Behavioral research instrumental to further explore issue of incentivizing ICT utilization and addressing digital skill gaps. NICTHS data shows the potential of digital platforms to offer e-livelihood opportunities, especially for women who have been unable to participate in the formal economy.

The case of women warrants further exploration as their economic potential may not be maximized because of unpaid care work (Note that data from the Labor Force Survey identifies unpaid care work as main bottleneck to women's participation in labor market).

Training programs must focus on increasing capabilities of both men and women with regard to online business and online jobs.



Address bottlenecks on use of online platforms

Data on digital platform utilization of both men and women show the potential of such platforms in disseminating welfare-enhancing information.

Efforts must be made to streamline access to formal institutions and its processes such as banking and government transactions in an online setting.

Infrastructural improvements, essentially ICT-related ones, across the country will further enable greater ICT-usage for both men and women, maximizing the benefits they can reap from the digital platforms available.



Improve digital infra

- Updates laws will help improve our digital infrastructure.
 - Open Access in Data Transmission Act
 - Better Internet/ Faster Internet Act
 - Spectrum Management Act
- Digital infrastructure is a combination of many different technologies, not just mobile.

 Government investment in digital infrastructure must be limited and targeted at network segments and areas where the market fails to deliver.



Regularly conduct NICTHS, and improve design

- Conduct NICTHS every 2 or 3 years
- Improve survey design and implementation
 - Collect asset data
 - Interview more than one individual per surveyed household
 - Involve more parties/experts in questionnaire design
- Keep track of international standards in ICT statistics
 - NICTHS 2019 only asks 6 out of 9 skills for SDG indicator 4.4.1
 - New recommendations for SDG indicator 4.4.1 in 6th and 7th Expert Group Meetings on ICT Household Indicators
- Integrate digital skills with functional literacy measurement in PSA's Functional Literacy, Education and Mass Media Survey (FLEMMS)





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