ITU Multi-Country Workshop for National Focal Points on ICT Indicators and Measurements

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ICT Development Index

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Measuring the Information Society Report 2015

2

- **1. Monitoring global ICT goals and targets**
  - ITU Connect2020 Agenda
  - WSIS targets and SDGs
- **2. and 3. The ICT Development Index (IDI)**
  - Top and dynamic performers; digital divide; regional analyses
  - Comparing IDI 2010 with IDI 2015
- **4. Monitoring the price and affordability of ICTs**
  - Fixed and mobile, voice and data
  - ICT Price Basket and sub-baskets
- **5. The Internet of Things: data for development**
  - Size and development impact; opportunities and challenges

**Launched on 30 November 2015 (at WTIS 2015)
Available online: full report, executive summaries in 6 languages, visualization tools**

Background

3

- □ Conceptual framework:
  - ◘ Stage 1: ICT readiness
  - ◘ Stage 2: ICT intensity
  - ◘ Stage 3: ICT impact
- □ Developed by ITU in 2008
- □ Response to requests by Member States to develop an overall ICT index
- □ First published in 2009, annually since then
- □ Used by governments, analysts, researchers and other users of ICT data

Objectives of the IDI

4

To measure:
- □ the level and evolution over time of ICT developments in countries and the experience of those countries relative to other countries;
- □ progress in ICT development in both developed and developing countries;
- □ the digital divide, i.e. differences between countries in terms of their levels of ICT development; and
- □ the development potential of ICTs and the extent to which countries can make use of them to enhance growth and development.

The ICT Development Index (IDI)

5

ICT access	Reference value	(%)
1. Fixed-telephone subscriptions per 100 inhabitants	60	20
2. Mobile-cellular telephone subscriptions per 100 inhabitants	120	20
3. International Internet bandwith (bit/s) per internet user	962'216*	20
4. Percentage of households with a computer	100	20
5. Percentage of households with Internet access	100	20

ICT use	Reference value	(%)
6. Percentage of Individuals using the Internet	100	33
7. Fixed-broadband subscriptions per 100 inhabitants	60	33
8. Active mobile-broadband subscriptions per 100 inhabitants	100	33

ICT skills	Reference value	(%)
9. Adult literacy rate	100	33
10. Secondary gross enrolment ratio	100	33
11. Tertiary gross enrolment ratio	100	33

40 — **40** — **20**

ICT Development Index

Note: *This corresponds to a log value of 5.98, which was used in the normalization step.
Source: ITU.

Korea (Rep.)

Indicators		2014
ICT access	**Ideal value***	
a Fixed-telephone subscriptions per 100 inhabitants	60	59.5
b Mobile-cellular telephone subscriptions per 100 inhabitants	120	115.5
c International Internet bandwidth per Internet user**	962'216	43'356
d Percentage of households with a computer	100	78.3
e Percentage of households with Internet access	100	98.5
ICT use		
f Percentage of individuals using the Internet	100	87.9
g Fixed-broadband Internet subscriptions per 100 inhabitants	60	38.8
h Active mobile-broadband subscriptions per 100 inhabitants	100	108.6
ICT skills		
i Adult literary rate	100	99.0
j Secondary gross enrolment ratio	100	97.2
k Tertiary gross enrolment ratio	100	98.4

Normalized values	Formula	Weight	
ICT access			
z1 Fixed-telephone subscriptions per 100 inhabitants	$a/60$	0.20	0.99
z2 Mobile-cellular telephone subscriptions per 100 inhabitants	$b/120$	0.20	0.96
z3 International Internet bandwidth per Internet user	$\log(c)/5.90$	0.20	0.79
z4 Percentage of households with a computer	$d/100$	0.20	0.78
z5 Percentage of households with Internet access	$e/100$	0.20	0.98
ICT use			
z6 Percentage of individuals using the Internet	$f/100$	0.33	0.88
z7 Fixed-broadband Internet subscriptions per 100 inhabitants	$g/60$	0.33	0.65
z8 Active mobile-broadband subscriptions per 100 inhabitants	$h/100$	0.33	1.00
ICT skills			
z9 Adult literary rate	$i/100$	0.33	0.99
z10 Secondary gross enrolment ratio	$j/100$	0.33	0.97
z11 Tertiary gross enrolment ratio	$k/100$	0.33	0.98

Sub-indices	Formula	Weight	
ICT access sub-index (L)	**y1+y2+y3+y4+y5**	**0.40**	**0.90**
y1 Fixed-telephone subscriptions per 100 inhabitants	$z1*.20$		0.20
y2 Mobile-cellular telephone subscriptions per 100 inhabitants	$z2*.20$		0.19
y3 International Internet bandwidth per Internet user	$z3*.20$		0.16
y4 Percentage of households with a computer	$z4*.20$		0.16
y5 Percentage of households with Internet access	$z5*.20$		0.20
ICT use sub-index (M)	**y6+y7+y8**	**0.40**	**0.84**
y6 Percentage of individuals using the Internet	$z6*.33$		0.29
y7 Fixed-broadband Internet subscriptions per 100 inhabitants	$z7*.33$		0.22
y8 Active mobile-broadband subscriptions per 100 inhabitants	$z8*.33$		0.33
ICT skills sub-index (N)	**y9+y10+y11**	**0.20**	**0.98**
y9 Adult literary rate	$z9*.33$		0.33
y10 Secondary gross enrolment ratio	$z10*.33$		0.32
y11 Tertiary gross enrolment ratio	$z11*.33$		0.33
IDI ICT Development Index	**((L*.40)+(M*.40)+(N*.20))*10**		**8.93**

*The ideal value for indicators a, b, c and g was computed by adding two standard deviations to the mean value of the indicator.

**To diminish the effect of the large number of outliers at the high end of the value scale, the data were first transformed to a logarithmic (log) scale. The ideal value of 962'216 bit/s per Internet user is equivalent to 5.98 if transformed to a log scale.

Analysis

- ☐ Top IDI countries
- ☐ Dynamic countries (value, rank)
- ☐ Digital Divide
- ☐ Regional analysis
- ☐ Top 5 countries per region

7

IDI 2015 top ten

1. Korea (Rep.)
2. Denmark
3. Iceland
4. United Kingdom
5. Sweden
6. Luxembourg
7. Switzerland
8. Netherlands
9. Hong Kong, China
10. Norway

- ☐ The Republic of Korea leads the IDI rankings for both 2010 and 2015

- ☐ There has been relatively little change in the highest performers in the Index since 2010

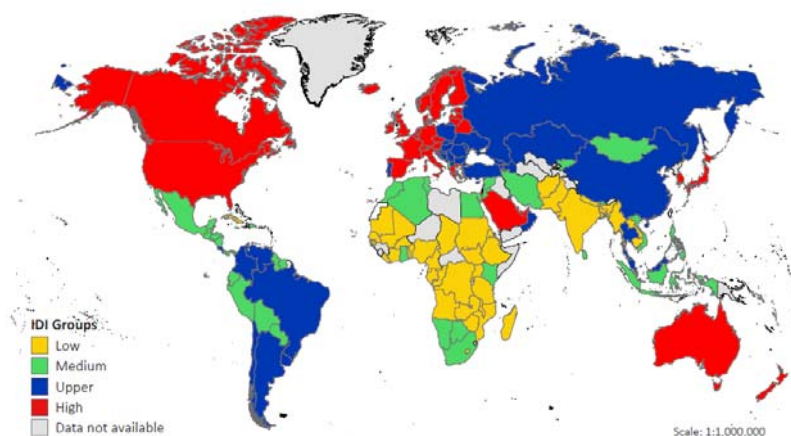- ☐ Top IDI performers have high income levels, competitive markets and a skilled population

Dynamic IDI improvements are found at all levels of the ranking…

Change in IDI ranking				Change in IDI value			
IDI rank 2015	Country	IDI rank change (2010-15)	Region	IDI rank 2015	Country	IDI value change (2010-15)	Region
57	Costa Rica	23	Americas	27	Bahrain	2.22	Arab States
27	Bahrain	21	Arab States	57	Costa Rica	2.14	Americas
56	Lebanon	21	Arab States	56	Lebanon	2.12	Arab States
109	Ghana	21	Africa	41	Saudi Arabia	2.09	Arab States
74	Thailand	18	Asia & Pacific	32	United Arab Emirates	1.94	Arab States
32	United Arab Emirates	17	Arab States	54	Oman	1.92	Arab States
41	Saudi Arabia	15	Arab States	109	Ghana	1.92	Africa
85	Suriname	15	Americas	36	Belarus	1.88	CIS
97	Kyrgyzstan	15	CIS	74	Thailand	1.74	Asia & Pacific
36	Belarus	14	CIS	61	Brazil	1.74	Americas
54	Oman	14	Arab States				

Source: ITU.

IDI values by quartiles

IDI Groups
- Low
- Medium
- Upper
- High
- Data not available

Scale: 1:1,000,000

Source: ITU.

… but disparities in IDI values remain
LDCs are falling behind

11

Group	IDI 2010					IDI 2015				
	Countries	Average*	Min.	Max.	Range	Countries	Average*	Min.	Max.	Range
High	42	7.02	5.82	8.64	2.82	42	7.90	7.00	8.93	1.93
Upper	41	4.74	3.91	5.80	1.88	41	5.95	5.05	6.93	1.88
Medium	42	3.19	2.14	3.82	1.69	42	4.13	2.93	5.00	2.08
Low	42	1.61	0.88	2.09	1.22	42	2.16	1.17	2.93	1.76
World	**167**	**4.14**	**0.88**	**8.64**	**7.76**	**167**	**5.03**	**1.17**	**8.93**	**7.76**

Note: * Simple averages.
Source: ITU.

34 countries out of the 42 LCCs are LDCs

Review and assessment of the IDI

12

- Request from Members States, 2010
- Item for discussion in the Expert Group on Telecom/ICT indicators (EGTI) forum since 2011
  - Indicators
  - Methodology
- Joint Research Centre (JRC) of the European Union assessed the IDI in 2015
  - Objective: Assess the statistical properties of the IDI to ensure the transparency and reliability of the results
- Presentation of results in ITU meetings (EGTI and WTIS 2015)

JRC statistical assessment

13

Ensuring the conceptual and statistical coherence of an index can be synthesized into five main steps:

1. Consideration of the conceptual framework with respect to existing literature
2. Data quality checks (missing data and outliers)
3. Assessment of the statistical coherence (correlation analysis, dimensionality and grouping of variables)
4. Assessment of the impact of modeling assumptions (weighting scheme and aggregation method) on the rankings
5. Qualitative confrontation with experts in order to get feedback on choices made during the index development

Statistical assessment of the IDI 2015 focused on the second, third and fourth steps

JRC assessment – conclusions

14

- ☐ The IDI is and should remain open to refinements
  - ◘ considering the evolving conditions of ICT-related indicators
- ☐ The three-level structure of the IDI 2015 is statistically sound, coherent and balanced, robust to changes in the weights and aggregation rules
- ☐ IDI is a credible summary measure to be used as a tool for improved policy making

Ongoing work

☐ Discussion item in the Expert Group on Telecom/ICT Indicators (EGTI) – meeting October 2016

☐ IDI 2016 to be released in November 2016

15

New: IDI data visualization tool

http://www.itu.int/net4/ITU-D/idi/2015/

17

Thank you for your attention!

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