



BIG DATA FOR ICT STATISTICS

Mobile Data for SDG Indicators

World Telecommunication/ICT Indicators Symposium 2020

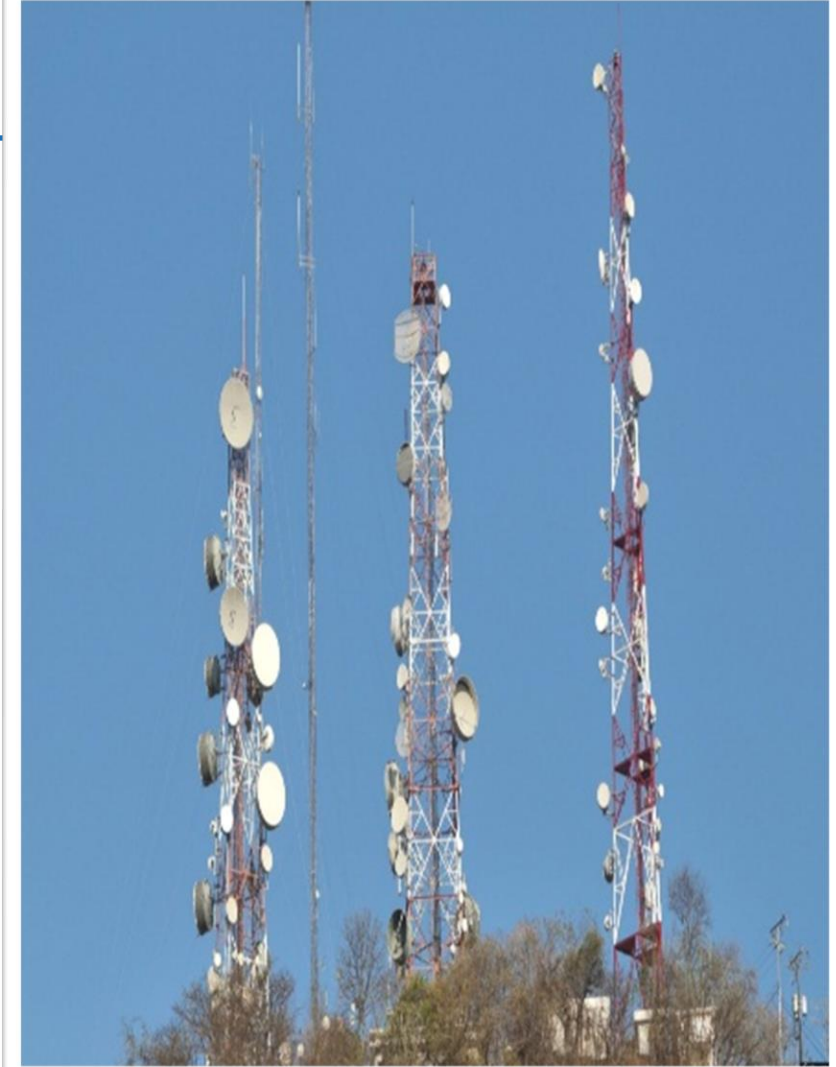
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Background

- ✓ In Indonesia, the SDG Targets have been set up to **achieve the 2030 Agenda** (there are 319 indicators).
- ✓ BPS-Statistics Indonesia contributes to 136 Indonesian SDGs Indicators
- ✓ There are three indicators of ICT in SDGs
- ✓ Household survey and administrative data (from MICT) is previously used
- ✓ There are data gaps in terms of coverage (under-coverage), bias and granularity



Previous MPD Project

- ✓ BPS Statistics Indonesia already use Mobile Positioning Data for Tourism and Commuting Statistics.
- ✓ 2016, Inbound Tourism (BPS-MoTCE-Telkom-Positium)
- ✓ 2018, Domestic Tourism (BPS-MoTCE-Telkom-Positium)
- ✓ 2018, Event Analysis of Asian Games and WB-IMF (BPS-Ministry of Planning-Telkom-Positium)
- ✓ 2019, Outbound Tourism (BPS-Telkom-Positium)

Outcome

- ✓ Domestic Tourism now use MPD instead of Household Survey.





ITU Project on Big Data for Measuring ICT Development

Use of Mobile Data for SDG Indicators related to ICT



Target 9.c.1: By 2030, Proportion of Population Covered by Mobile Network, by Technology

- **Administrative data** available every year from MICT, however we did not map the data and did not know up to municipality/city. Also delay, after audit
- **Mobile Data** used to compare with and complement administrative data, increase granularity for monitoring SDGs, which area where less coverage



Target 17.8.1: Proportion of Individuals using the internet

- **Socio Economic Household Survey** available every year, however only give national and province estimation
- **Mobile Data** used to compare with and complement household survey, increase granularity for monitoring SDGs

meanwhile...



Policymakers

They need data to for monitoring SDGs and policy making.



Society

They need trusted data



Qualified and trusted statistics & indicators have to be provided

More granular, frequent & timely for monitoring SDGs and other purposes



Benefit of Using Mobile Data for ICT Indicators

Increase Coverage

Mobile phone data is used to increase the coverage and data quality.

More frequent data

Annual even quarterly data for monitoring

Less burden

Less work and respondent burden

Cost Effective

Less budget

Granular Data

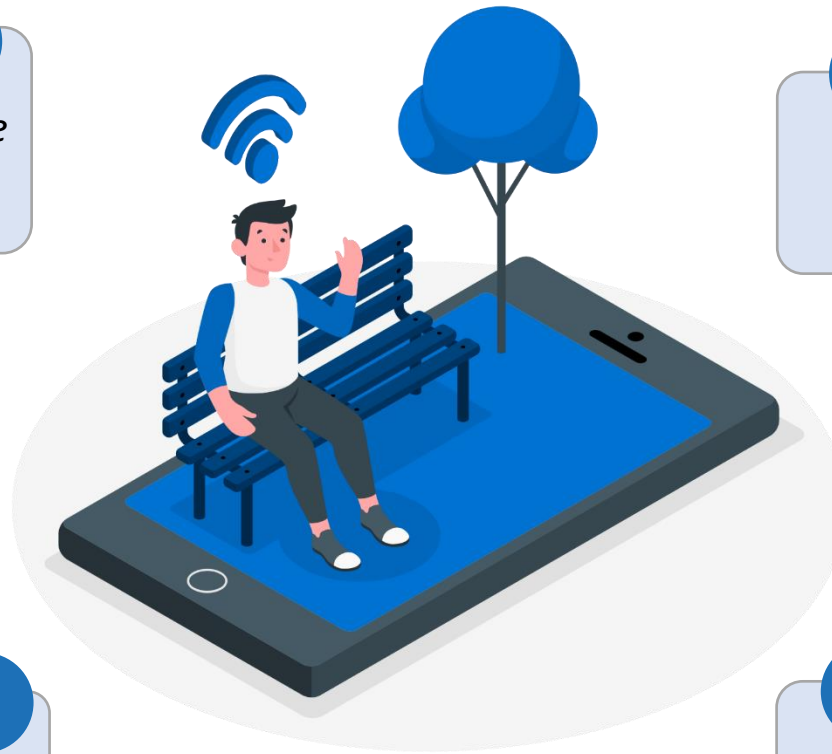
More granular data, such as municipality and sub-district

Timely

More timely data.

Less labour

Less manual labour (enumerators)



ITU Pilot Scope in Indonesia

- ✓ Coverage: Indonesia area (514 municipalities/cities).
- ✓ Data type: Signaling (UPCC) and CDR (Charge)
- ✓ Data: 2019 and 2020
- ✓ One MNO with market share 60 percent on average
- ✓ BPS Working Map, Digital Elevation Map (DEM)
- ✓ WorldPop data, Population Projection, MPD Home



Pilot on Information Society

- ✓ Comparing various data source for population (WolrdPop, Population Projection, MPD)
- ✓ Comparing Various Data Sources for Cell ID location (OpenCell ID, MICT, MNO)
- ✓ Comparing and complement with household survey for SDGs indicators
- ✓ Lesson Learned for other countries





Quality Assurance

Quality Assurance

- In-line with BPS QAF Handbook (for Census, Survey and Administrative data)
- In-line with UN QAF and Unece QAF for Big Data
- Quality check (Input, Throughput, Output)

Input Quality Checking (First gate)

- Data gaps
- Missing data
- Incorrect timestamps
- Duplicate record

Throughput Quality Checking (Second gate)

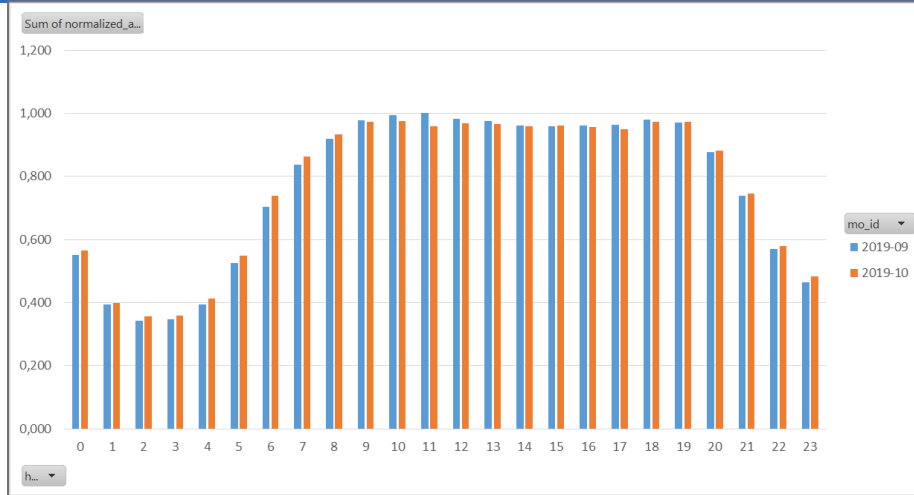
- Errors in data processing
- Overwrites

Output Quality Checking (Third gate)

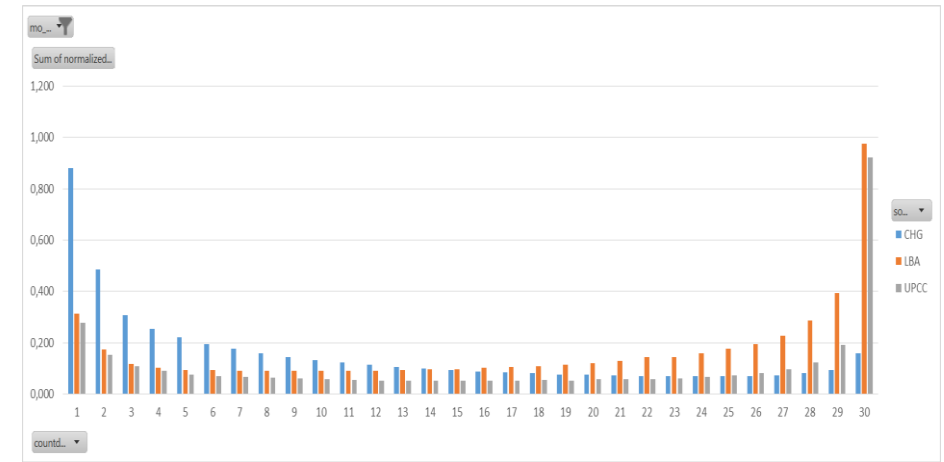
- Anomalies checking
- Coherence with other data
- New phenomena



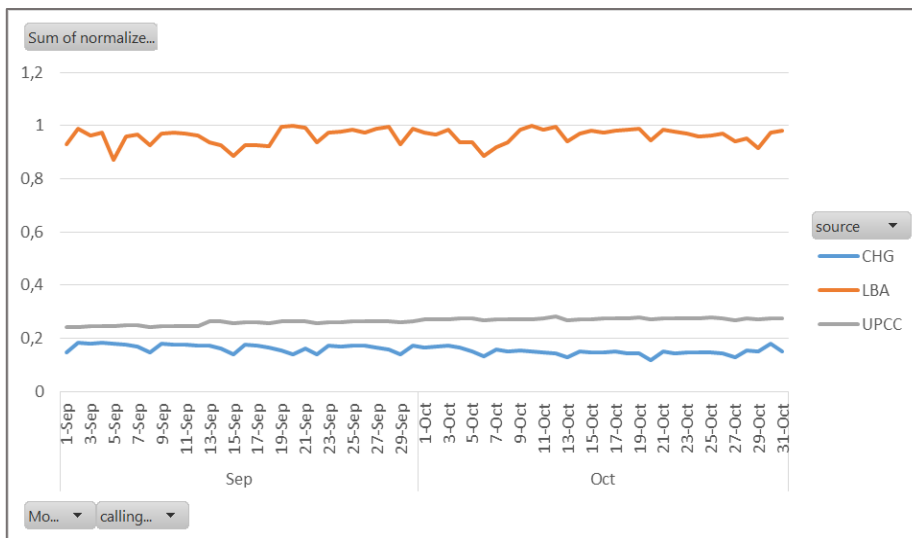
Some Quality Assurance Results



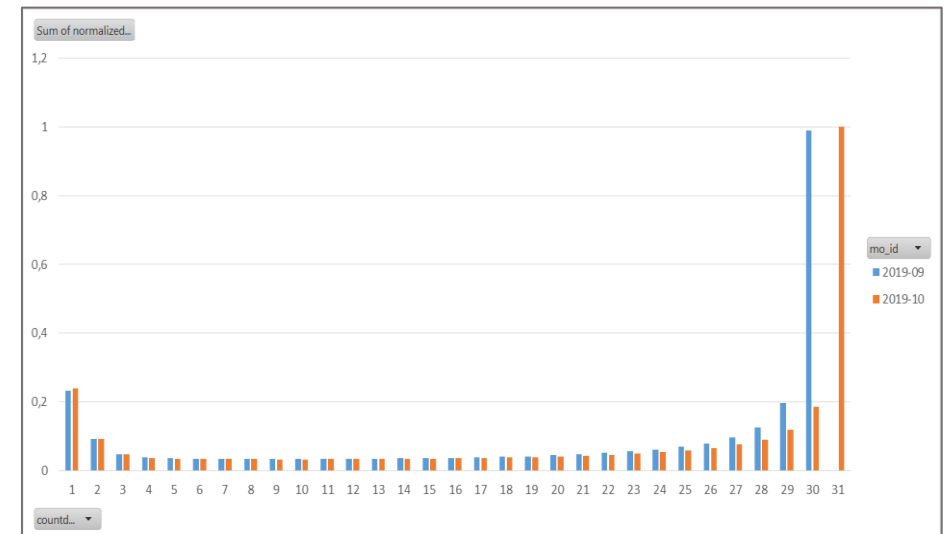
Natural hourly rhythm



Logical daily present



Steady data flow



Logical daily present





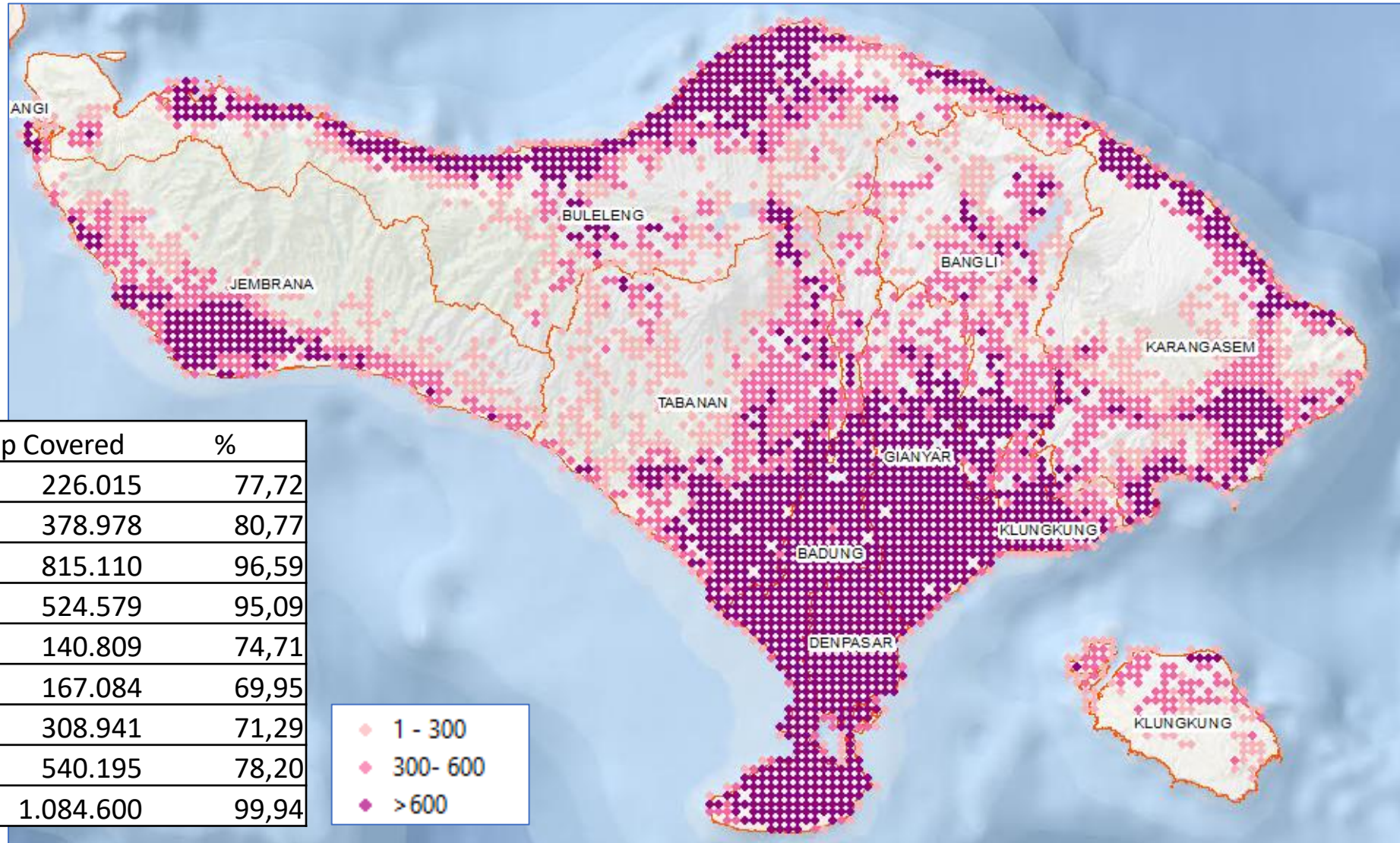
Cell ID Distributions (Open Cell ID Data)

Base Tranceiver Station





Population Covered by mobile cellular network (4G) in Bali

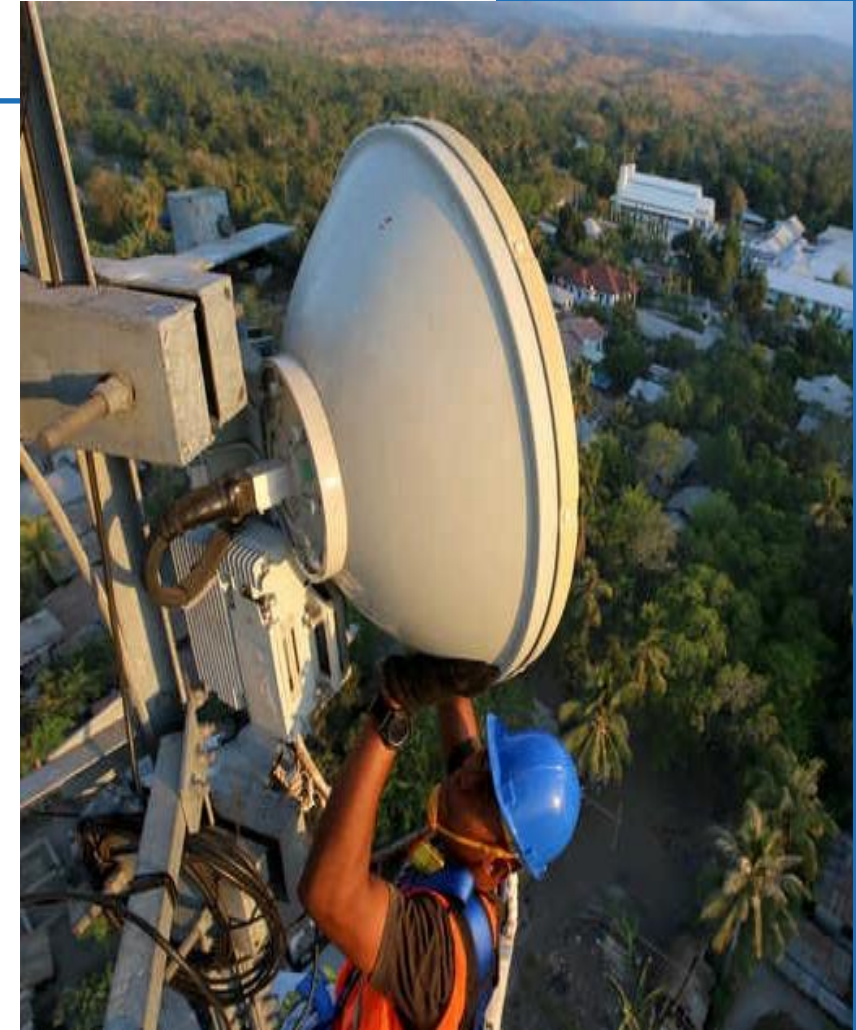


LAU2 (Kabkota)	Population	Pop Covered	%
JEMBRANA	290.803	226.015	77,72
TABANAN	469.225	378.978	80,77
BADUNG	843.897	815.110	96,59
GIANYAR	551.645	524.579	95,09
KLUNGKUNG	188.463	140.809	74,71
BANGLI	238.865	167.084	69,95
KARANGASEM	433.385	308.941	71,29
BULELENG	690.769	540.195	78,20
DENPASAR	1.085.290	1.084.600	99,94

CHALLENGES

“Easier to climb a mobile antennae than to get the data from telcos”

- Data access (No rule or regulation yet).
- Administrative and legal process (adm review, contract etc)
- Keeping the MNO Commitment.
- MNOs staffs/data scientist lack of understanding on Statistics
- Data processing (quite big data), PostGIS processes, create mosaic of Digital Elevation Map (DEM)



Way Forward



Results:

- *Get the result in January (hopefully)*
- *Report in February*

What next:

- *Training/Workshop for BPS and MNO (?)*
- *Workshop for stakeholders (Ministry of Planning, MICT, BRTI)*



THANK YOU

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