Data Revolution for Sustainable Development Goals and Humanitarian Action

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Pulse Lab Jakarta – UN Global Pulse

PULSE LAB JAKARTA

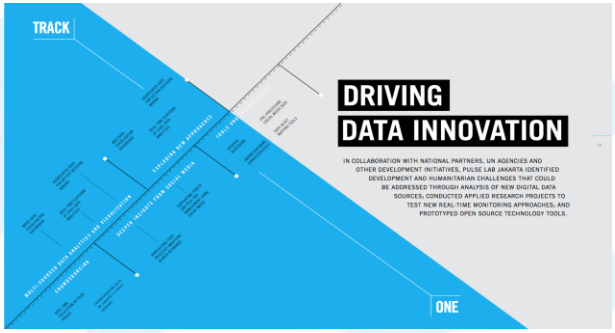
GLOBAL PULSE

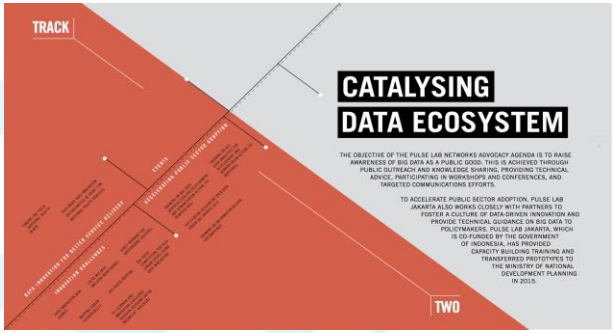
United Nations Global Pulse

A flagship innovation initiative of the United Nations Secretary-General on the data revolution

Vision Big Data harnessed responsibly as a public good

Mission Accelerate discovery and adoption of big data innovation for sustainable development and humanitarian action





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What people say

- Social media (content focus)
- Online advertisement
- Complaint system
- Radio

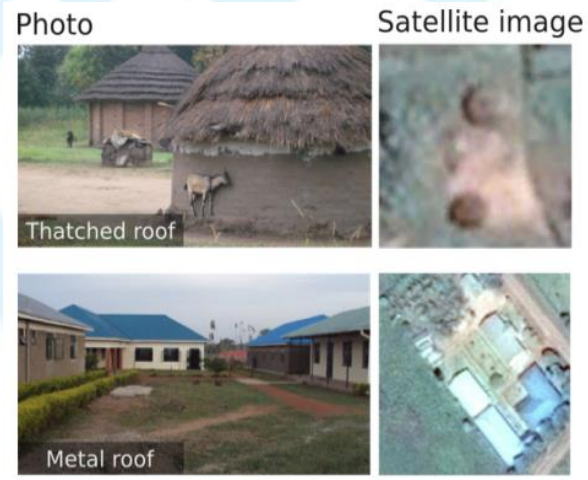
What people do

- Social media (location focus)
- Mobile data
- Utility usage data
- Postal data
- Transportation data
- Searching keywords
- On-/ offline retail data
- Remote sensing

GLOBAL PULSE

1 NO POVERTY

Remotely Sensed Satellite Imagery for Rapid Poverty Assessment

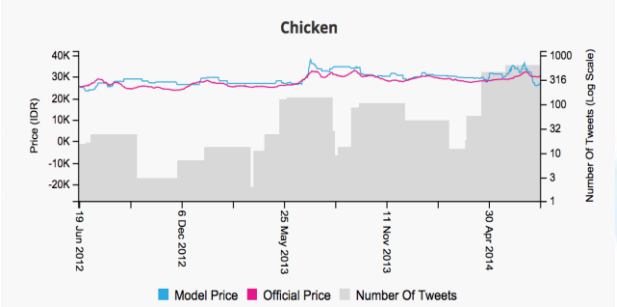


GLOBAL PULSE

2 ZERO HUNGER

Various New Sources of Data for Commodity Price Dynamics

Social Media

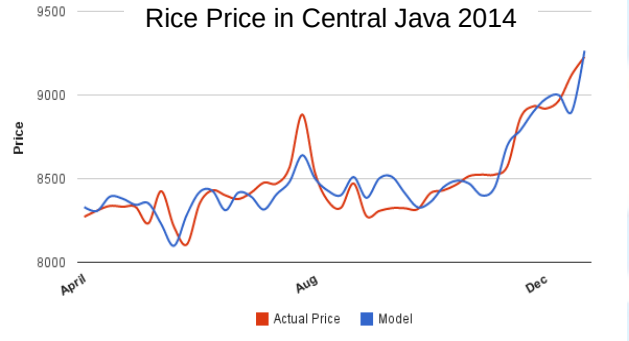


$$P_{i+1} = \frac{\alpha P_i + \beta P_{i+1}^{tweet}}{\alpha + \beta}$$

$$P_{i+1}^{tweets} = \frac{\sum_{j=1}^{[T_{i+1}]} w_{i+1}^j T_{i+1}^j}{\sum_j w_{i+1}^j} \qquad w_{i+1}^j = \begin{cases} 1 - \frac{\left|\frac{T_{i+1}^j - P_i}{P_i}\right|}{\delta} & ,\text{if } \left|\frac{T_{i+1}^j - P_i}{P_i}\right| \le \delta \\ 0 & ,otherwise \end{cases}$$

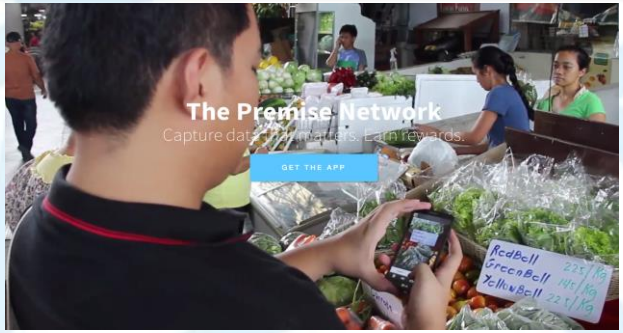
$$P_i = \frac{\sum_{j=i-k}^{i-1} P_j}{k} \text{ where no tweets over } n \text{ days}$$

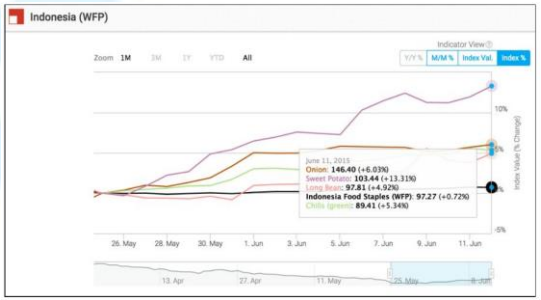
Google Search



$$P_i = \alpha + \beta_1 MoT_{i-2} + \beta_2 MoT_{i-4} + \beta_3 GT_i + \beta_4 GT_{i-1} + \beta_5 GT_{i-3}$$

Crowdsourcing





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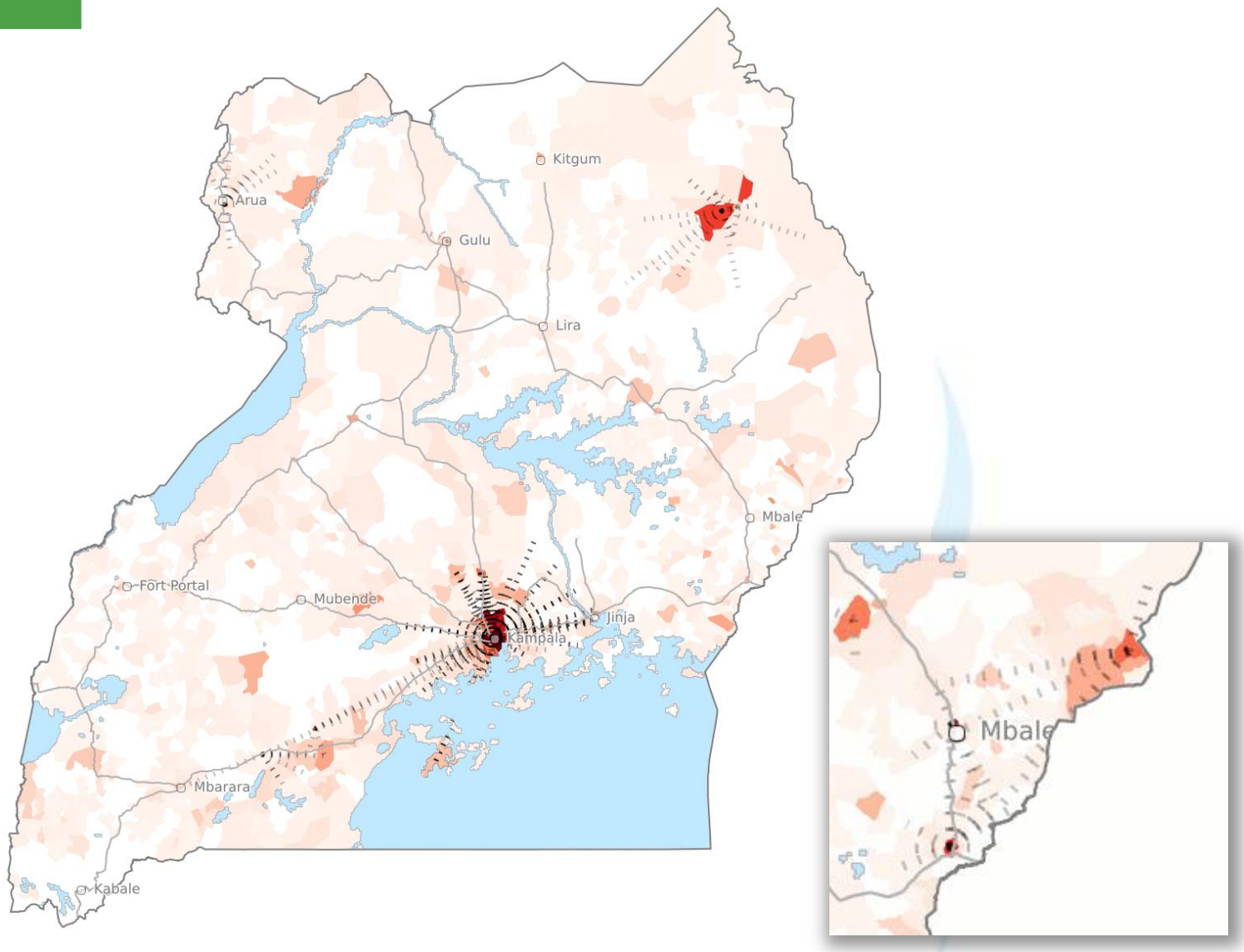
3 GOOD HEALTH AND WELL-BEING

Mobility Insights from Mobile Data for Disease Outbreak Prediction



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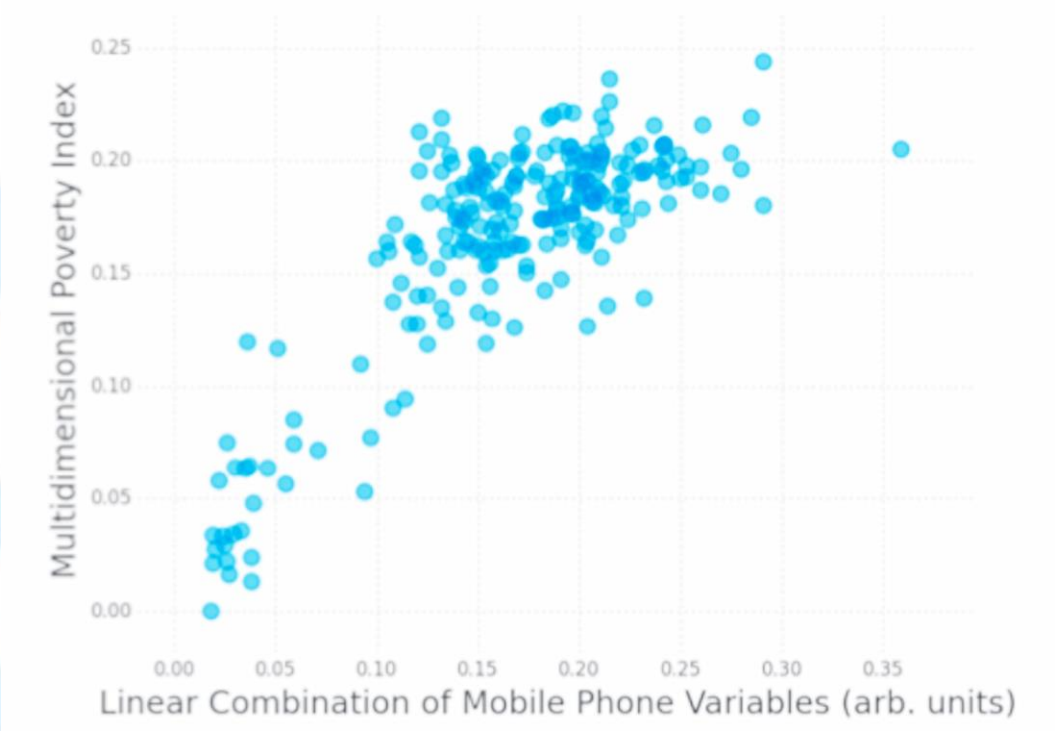
3 GOOD HEALTH AND WELL-BEING

Airtime Purchase Records (Top-up) for Food Consumption Statistics



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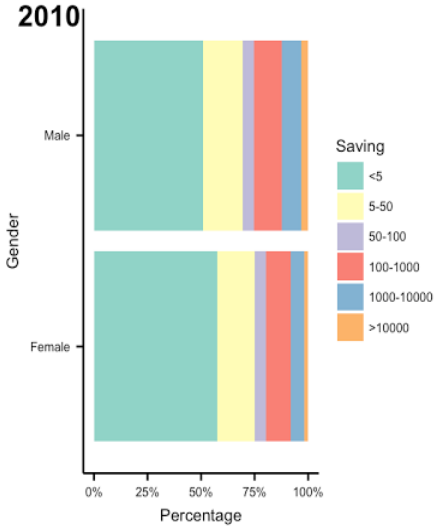
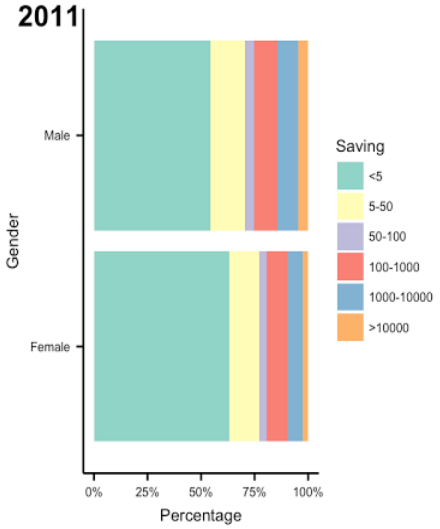
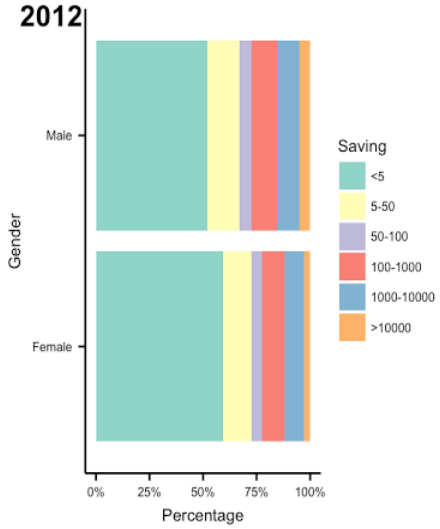
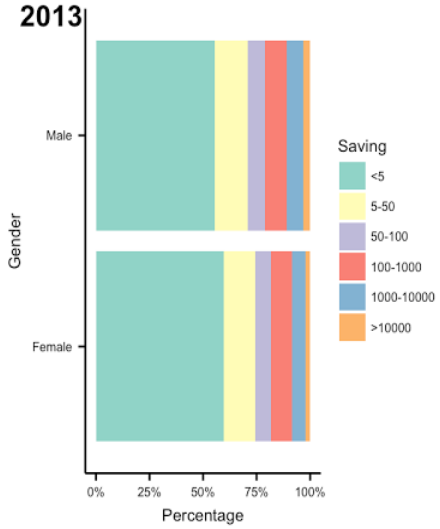
5 GENDER EQUALITY

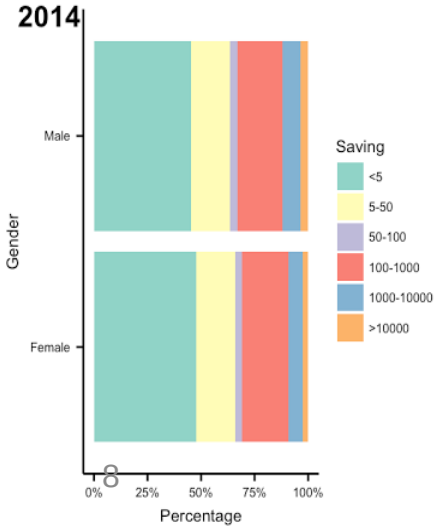
Anonymized, Aggregated Microfinance Data for Financial Inclusion by Gender

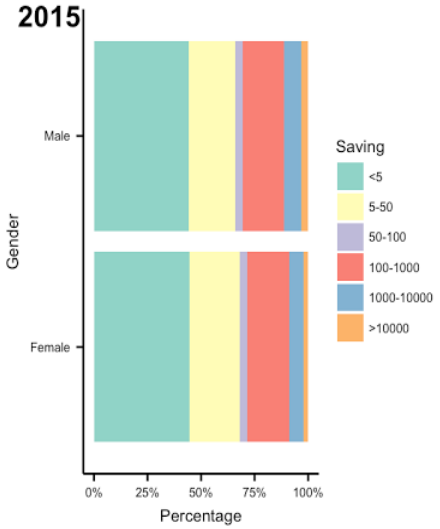


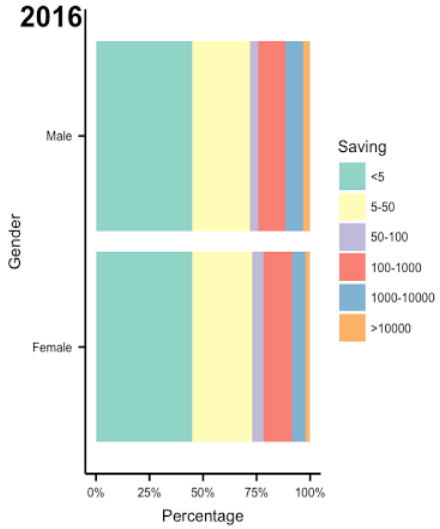








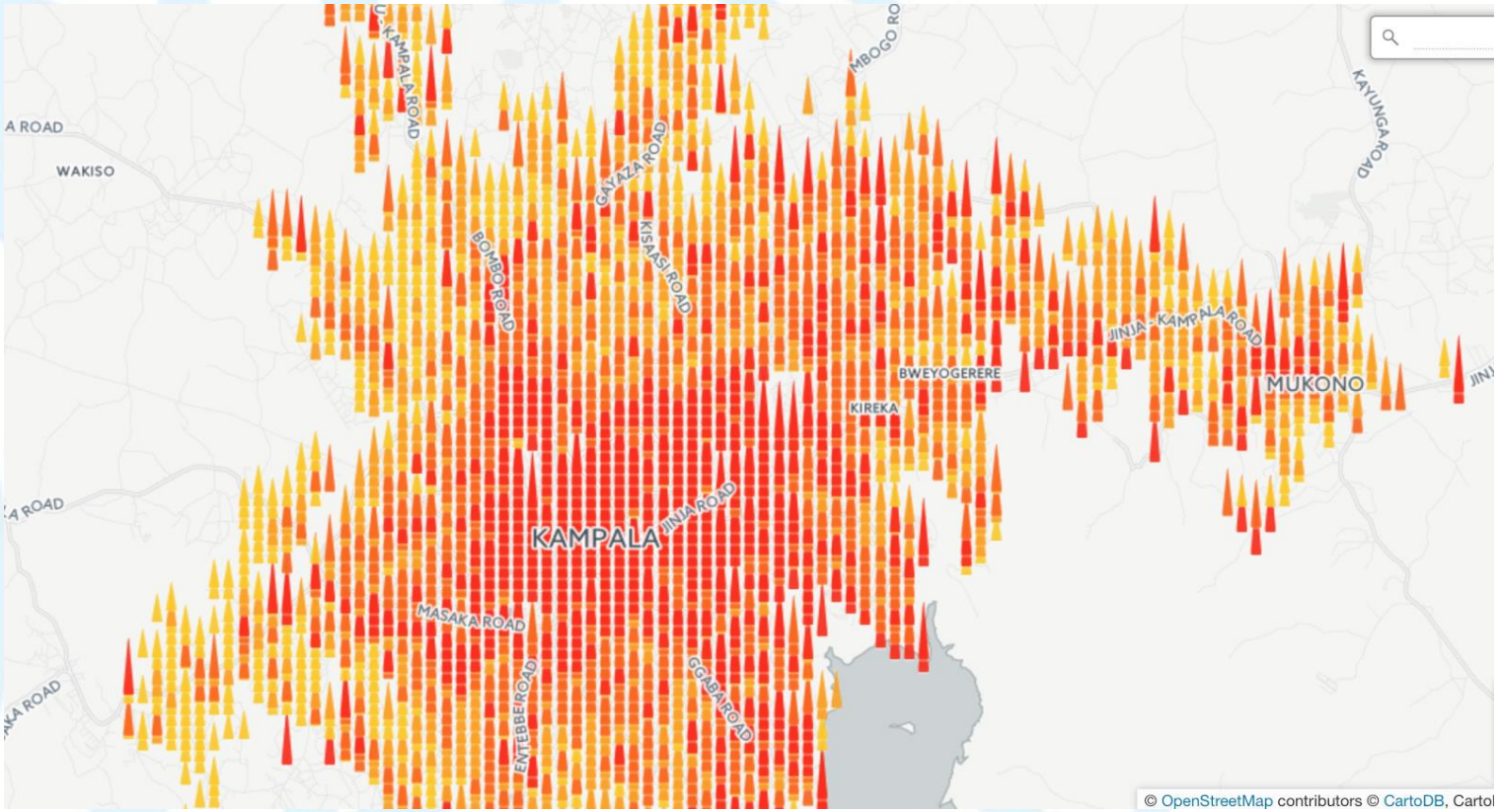




6 CLEAN WATER AND SANITATION

7 AFFORDABLE AND CLEAN ENERGY

Water (Energy) Consumption Data for Clean Water (Energy) Accessibility



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8 DECENT WORK AND ECONOMIC GROWTH

International Postal Flows for Economic Growth Tracking

Item was posted by customer ‘CY1224’

Type of event reported

International tracking ID #

Country of origin

Corresponding domestic tracking ID #

Country of destination

Date and time

Item was posted at office ‘75-243’

```
EMA+CP012374226IN::::2120001589115 2+ES+1410241030+75-243
+CY1224+274702+UTTAR PRADESH+28052+MADRID:SHP:DAVID AVENIDA:PISO
112:CLIENT_NUM:PACKSTATION_NUM:SIG+(55) 55 555 555:NAME1&AMP;DOMAIN
+(66) 66 666 666:MIGUEL@UN.ORG: MR.LUENGO:28100+1+3+A+LP+R+
0.055:0.051:0.00358+127.43:INR+DDU+0:EUR:BIC NUMBER:IBAN
NUMBER+301+MONS::43:CALLE CANALETAS
```

Postcode of sender

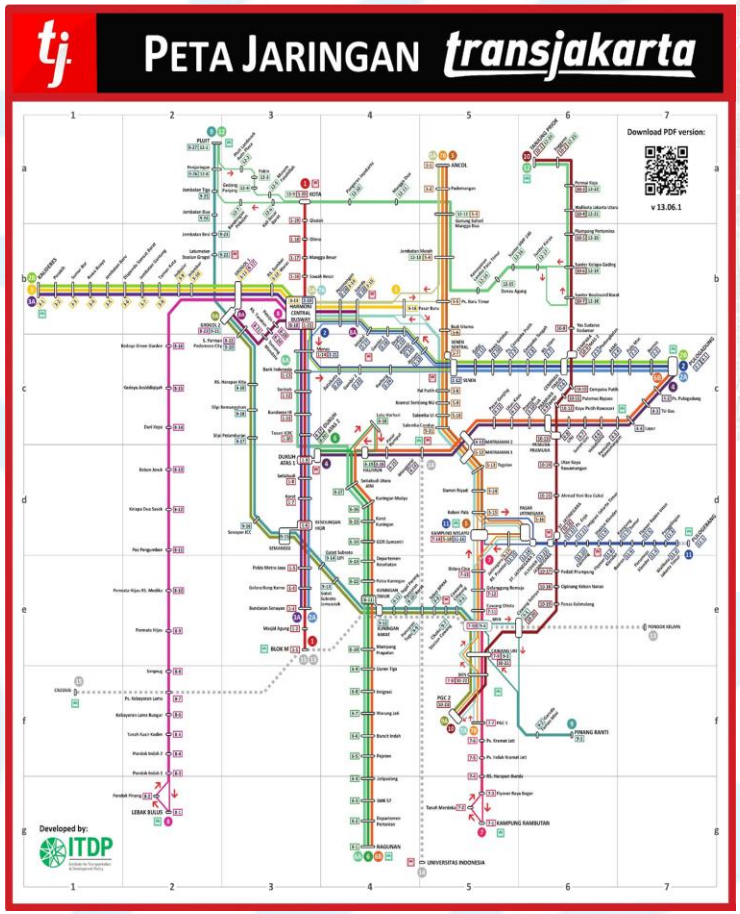
Gross and net weight of item

Amount paid for postage and currency

Place of sender

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

Public Transportation (Usage) Data for Better Infrastructure Planning



Tengah Malam 0-4	Pagi 4-8	Siang 8-12	Tengah Hari 12-16	Sore 16-20	Malam 20-24

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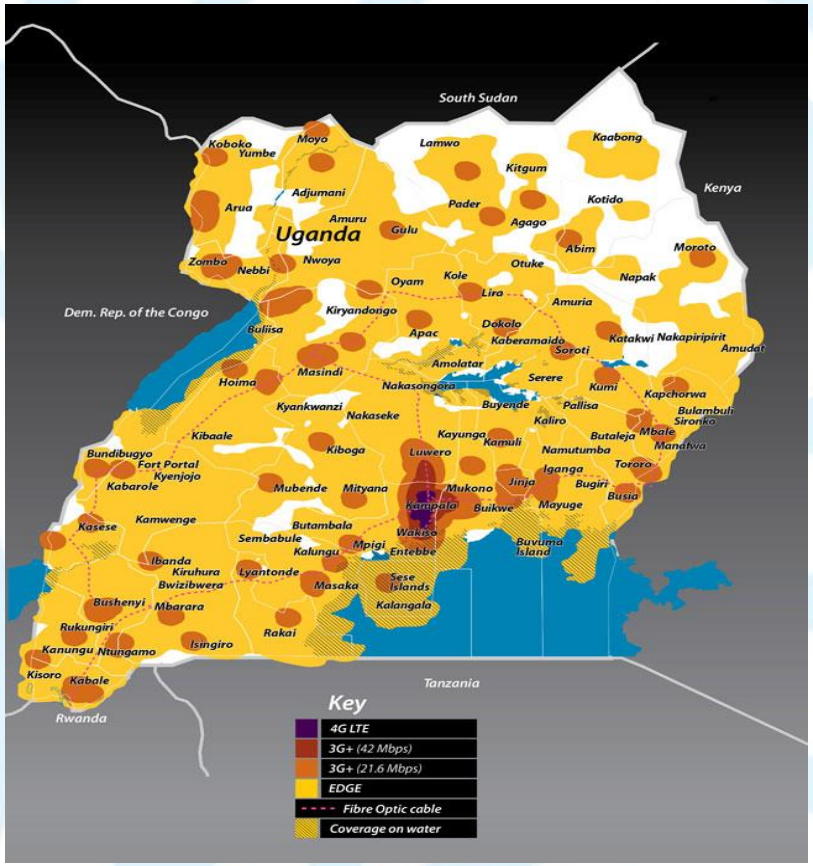
10 REDUCED INEQUALITIES

Community Radio Mining for Timely Information from Rural



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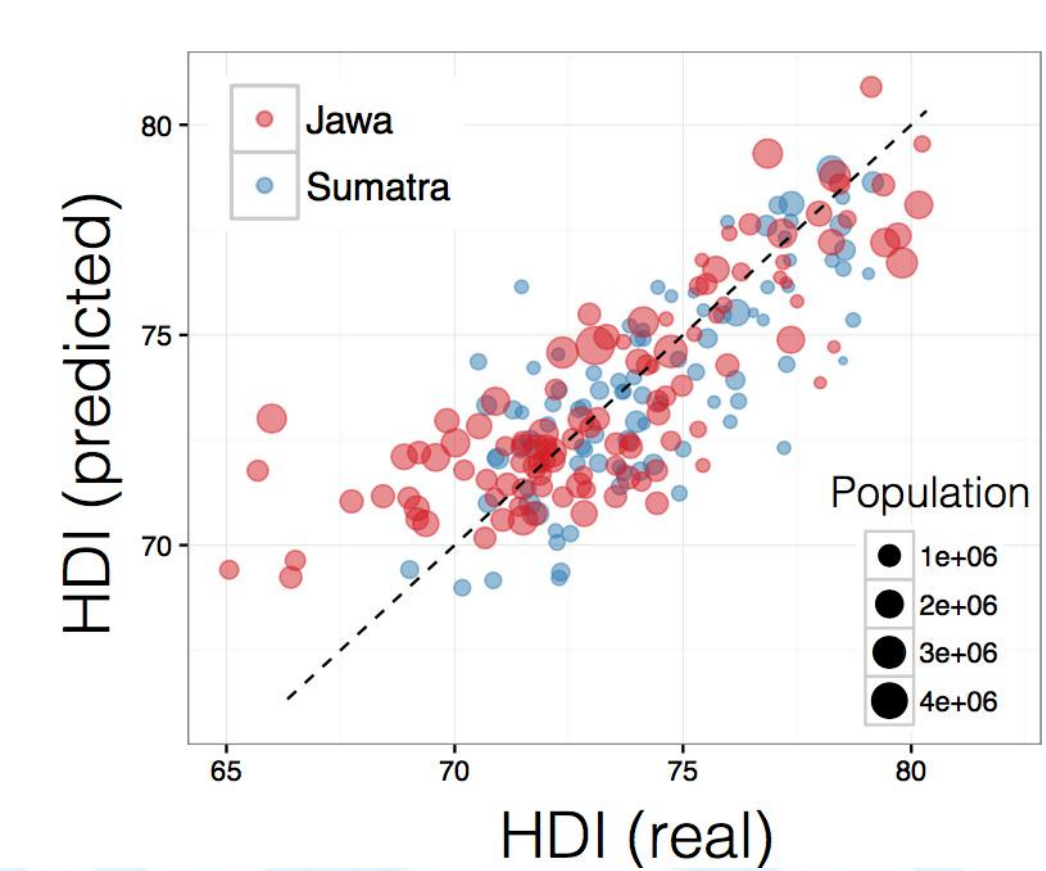
10 REDUCED INEQUALITIES

Social Media Usage Pattern for Human Development Index



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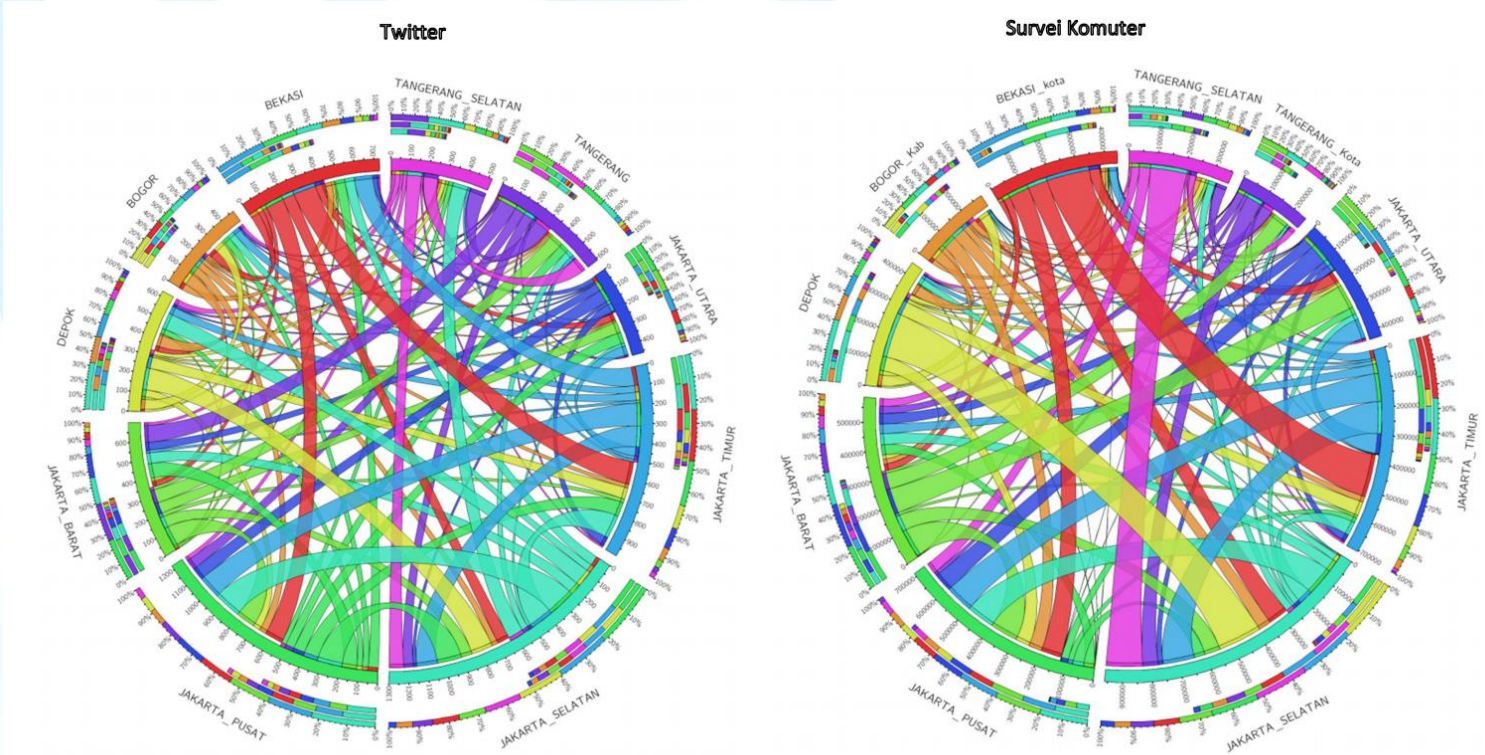
11 SUSTAINABLE CITIES AND COMMUNITIES

Social Media Location Mining for Inter-city Commuting Statistics



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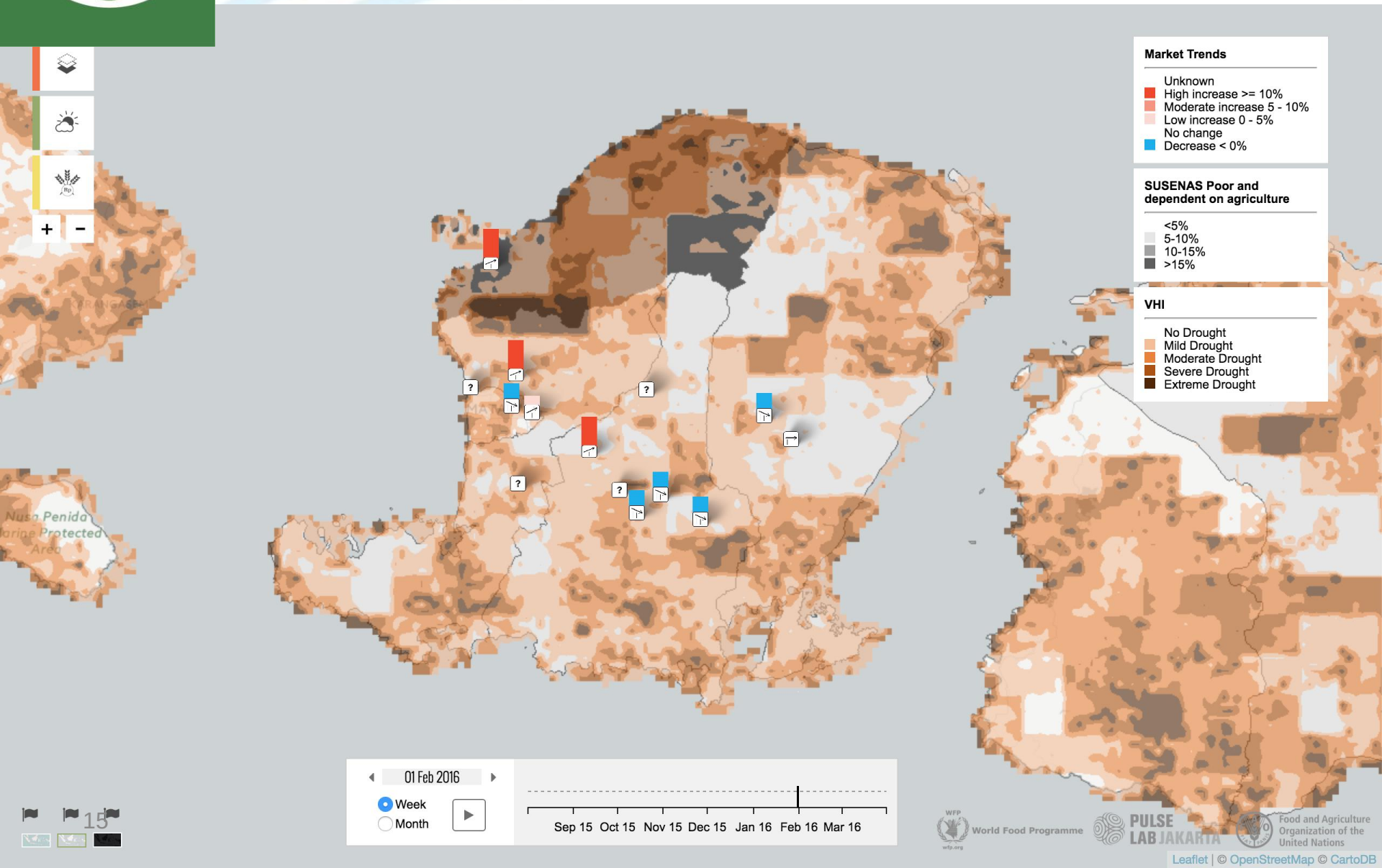
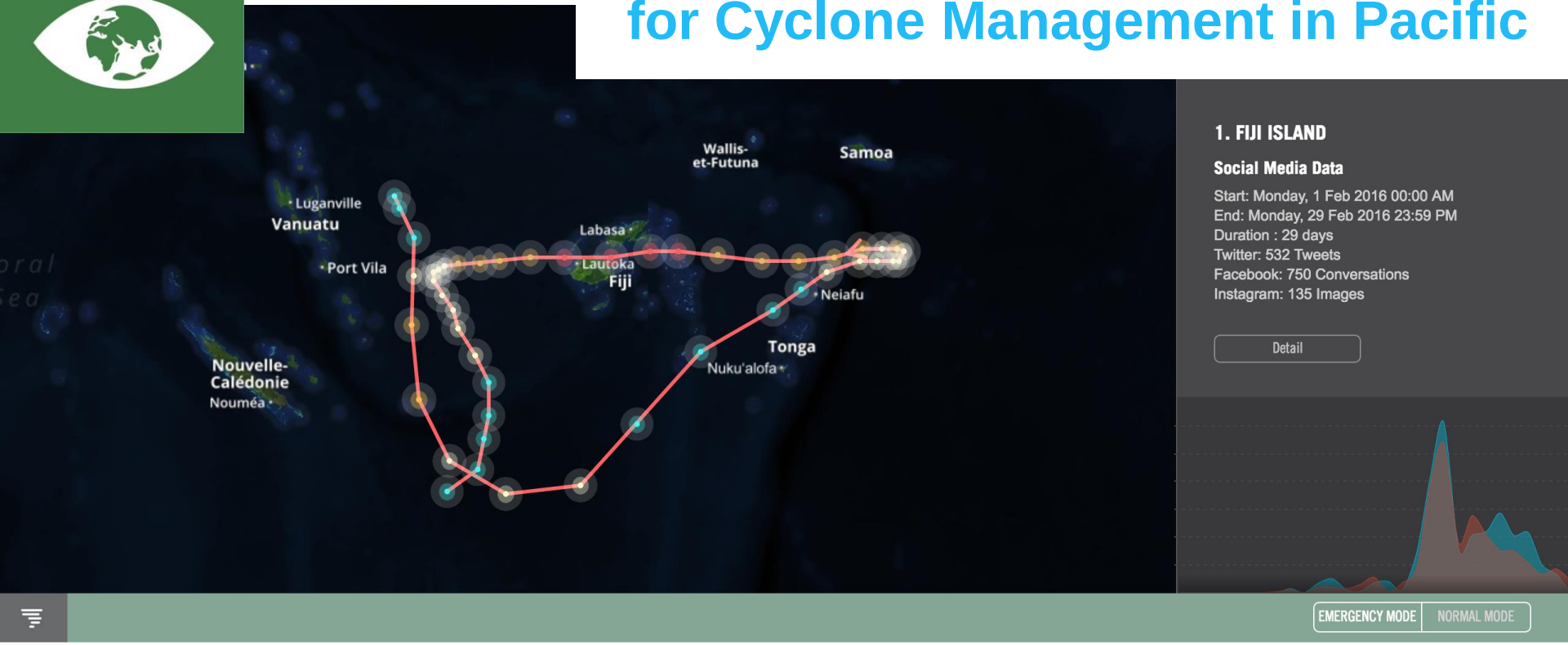
13 CLIMATE ACTION

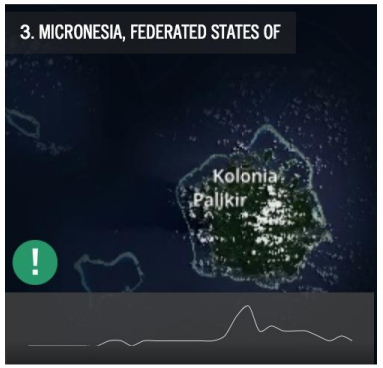
Public and Private Sector Data for El Nino Impact in Indonesia

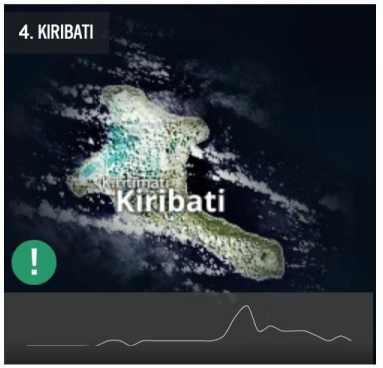


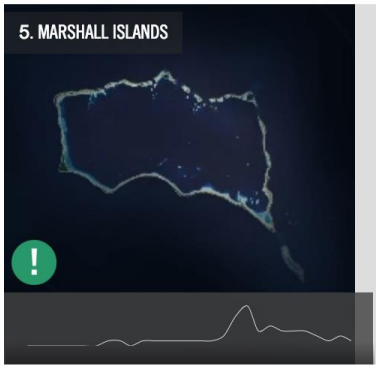
13 CLIMATE ACTION

Public and Private Sector Data for Cyclone Management in Pacific









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15 LIFE ON LAND

Public and Private Sector Data for Haze Crisis in SEA

http://unglobalpulse.org/blog/haze-gazer-crisis-analysis-tool

16 PEACE, JUSTICE AND STRONG INSTITUTIONS

Citizens' Active and Passive Voices for Enhanced Decision Making

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How data science and analytics can contribute to sustainable development

1 NO POVERTY
Spending patterns on mobile phone services can provide proxy indicators of income levels

2 ZERO HUNGER
Crowdsourcing or tracking of food prices listed online can help monitor food security in near real-time

3 GOOD HEALTH AND WELL-BEING
Mapping the movement of mobile phone users can help predict the spread of infectious diseases

4 QUALITY EDUCATION
Citizen reporting can reveal reasons for student drop-out rates

5 GENDER EQUALITY
Analysis of financial transactions can reveal the spending patterns and different impacts of economic shocks on men and women

6 CLEAN WATER AND SANITATION
Sensors connected to water pumps can track access to clean water

7 AFFORDABLE AND CLEAN ENERGY
Smart metering allows utility companies to increase or restrict the flow of electricity, gas or water to reduce waste and ensure adequate supply at peak periods

8 DECENT WORK AND ECONOMIC GROWTH
Patterns in global postal traffic can provide indicators such as economic growth, remittances, trade and GDP

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
Data from GPS devices can be used for traffic control and to improve public transport

10 REDUCED INEQUALITY
Speech-to-text analytics on local radio content can reveal discrimination concerns and support policy response

11 SUSTAINABLE CITIES AND COMMUNITIES
Satellite remote sensing can track encroachment on public land or spaces such as parks and forests

12 RESPONSIBLE CONSUMPTION AND PRODUCTION
Online search patterns or e-commerce transactions can reveal the pace of transition to energy efficient products

13 CLIMATE ACTION
Combining satellite imagery, crowd-sourced witness accounts and open data can help track deforestation

14 LIFE BELOW WATER
Maritime vessel tracking data can reveal illegal, unregulated and unreported fishing activities

15 LIFE ON LAND
Social media monitoring can support disaster management with real-time information on victim location, effects and strength of forest fires or haze

16 PEACE, JUSTICE AND STRONG INSTITUTIONS
Sentiment analysis of social media can reveal public opinion on effective governance, public service delivery or human rights

17 PARTNERSHIPS FOR THE GOALS
Partnerships to enable the combining of statistics, mobile and internet data can provide a better and real-time understanding of today's hyper-connected world

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http://unglobalpulse.org/blog/big-data-development-action-global-pulse-project-series

Value for sustainable development

New insights

New sources provide data historically unavailable, yielding new insights

Cost of data collection

Digital systems can be significantly less resource intensive than traditional statistics

Risk of data collection

Allows remote analysis, allowing data to be tracked in risky or unstable locations

Speed of response

Response can significantly improve on lag in traditional statistics

Adaptive execution

Continuous real-time feedback allows strategy to evolve with changing realities on the ground

“THE DATA REVOLUTION IS GIVING THE WORLD POWERFUL TOOLS THAT CAN HELP USHER IN A MORE SUSTAINABLE FUTURE.”

- BAN KI-MOON, UN SECRETARY-GENERAL

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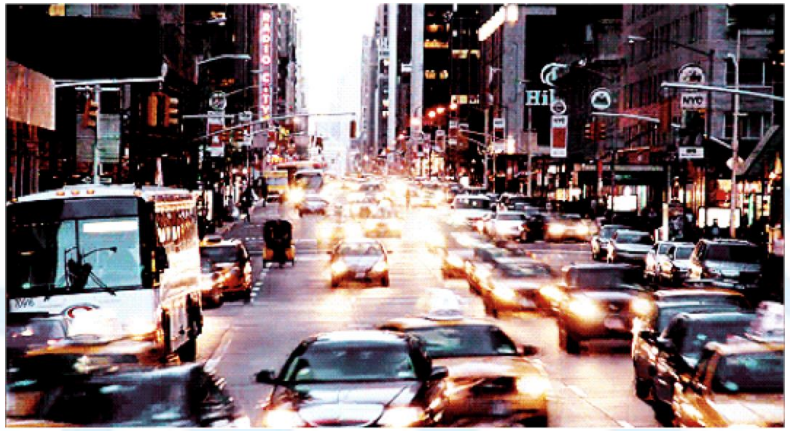
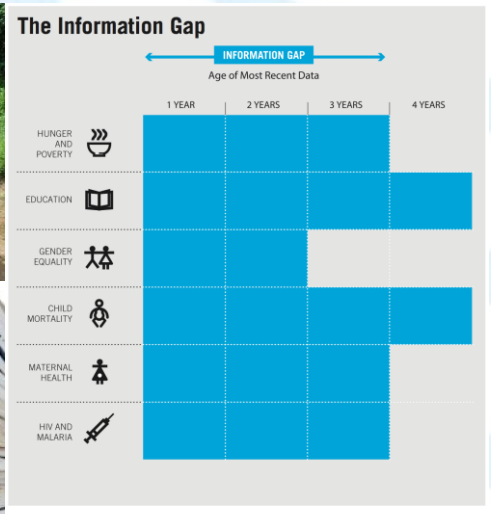
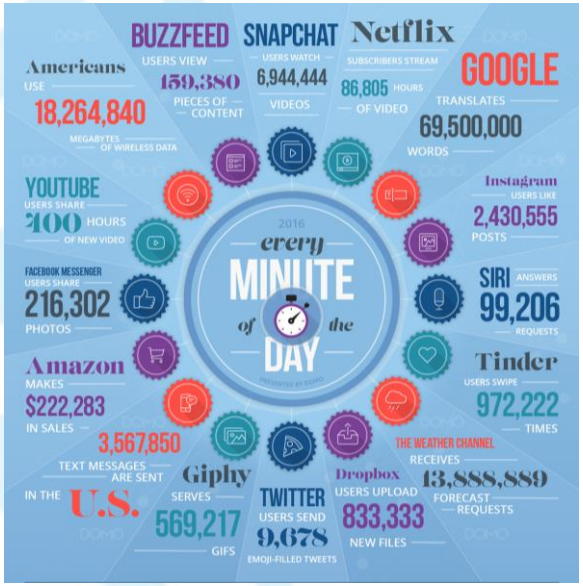




Household-level data is challenging to collect on a real-time basis, making development progress difficult to track. (Source: Millennium Development Goals Report, 2011)



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https://www.domo.com/learn/data-never-sleeps-4-0

Whether using our phones, shopping online or posting on social media, the activities that we undertake everyday generate an ocean of digital data. Once anonymised to protect privacy, this 'big data' can reveal insights on changes in human well-being, as well as real-time feedback on the efficacy of public policy, development programmes and humanitarian action.

BIG DATA AS SOCIAL AND PUBLIC GOOD

What people say

- Social media (content focus)
- Online advertisement
- Complaint system
- Radio

What people do

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HOME

DATA PRIVACY

DATA PRIVACY ADVISORY GROUP
DATA PRIVACY AND PROTECTION

Global Pulse is a United Nations innovation initiative that explores how new, digital data sources and real-time analytics technologies can provide a better understanding of changes in human well-being and emerging vulnerabilities. However, legitimate concerns about privacy and data protection present challenges to harnessing Big Data sets for public benefit.

GLOBAL PULSE

UNITED
Harnessing big dat

Search SEARCH

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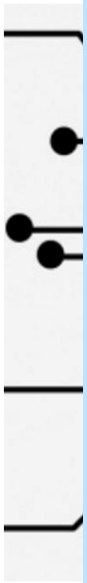

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change
concer
sets for

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DATA PRIVACY AND PROTECTION

OUR PRIVACY & DATA PROTECTION PRINCIPLES

We access, analyze, store, transmit or otherwise use only data that has been obtained by lawful and fair means, including, where appropriate, with the knowledge or consent of the data subject

We do not access data containing personal information on any individual, without the knowledge or proper consent of the data subject

We never access the content of private communications, without the knowledge or proper consent of the data subject

We never attempt to re-identify anonymised data, without the knowledge or proper consent of the data subject

We will only access, analyse, store, transmit or otherwise use data in accordance with the purposes for which the data has been properly and lawfully obtained

We ensure reasonable and appropriate technical and organisational safeguards are in place to prevent unauthorised disclosure or breach of data

We design, carry out, report and document our activities with accuracy and transparency

We employ even stricter standards of care while conducting research among vulnerable populations and persons at risk, children and young people, and any other sensitive data

We perform due diligence when selecting data or service provider partners and ensure their activities comply with the United Nations' global mandate

We ensure that our research partners are acting in compliance with relevant law, privacy and data protection standards

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