Data for the Global Goals & National Priorities

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Data Challenges

Two big global challenges for the current state of data:

1. **Invisibility** (gaps in what we know from data, and when we find out)

2. **Inequality** (gaps between those who with and without information, and what they need to know make their own decisions)

3. **Complexity: 17 Goals, 169 Targets, 230 Indicators**
“The future is now. It is about a healthy nation, built on equal opportunity, dignity and the pursuit of material prosperity for all. During the next 5 years, I will dedicate the energy, time and resources of my Administration to the Big Four.”

- H.E. President Uhuru Kenyatta unveiling the Big Four;
- December 12, 2017.
The Big 4

- 20% of GDP from the manufacturing sector
- 100% Food and Nutrition Security
- 1 million affordable new houses for Kenyan families
- 100% Universal Health Coverage (UHC)

Transforming the nation
Transforming lives
Transforming societies

Enabled by macro-economic stability

- Targeted infrastructure investments
- Affordable & reliable Energy
- Governance
- Security
- Technology innovation

Youth in jobs through vocational training and education
“You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete.”

- Buckminster Fuller
Our Design Mindset

Leadership in design to solve problems

Challenge and empower all levels of Government to adopt a design mentality

Keep a nimble pace focused on continuous improvement

Engage with ALL: university, private sector, innovators, civil society, communities

Take risks and use lessons to design new iterations

Welcome opportunities to be a full-service testing ground
Our Mission

“Make co-creation and collaboration the new normal, where public sector operates more like private sector and private sector more like innovators. Government as a Start-up.”

“Things get done only if the data we gather can inform and inspire those in a position to make [a] difference.”

~ Mike Schmoker, Author.
Earth Observations for SDGs

Earth Observations are contributing to SDG processes, more specifically 8 out of 17 and directly impact the Big 4 Agenda.
Food Systems Transformation in Kenya
Challenges that constrain output and productivity

<table>
<thead>
<tr>
<th>Kenya’s food security system faces several performance challenges…</th>
<th>…which are further under threat from issues of climate change and unsustainable resource use…</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.5 mn Kenyans</strong> chronically food insecure</td>
<td><strong>6 of 7</strong> water catchment areas to be under severe stress² by 2030, and therefore will not be able to match Vision 2030 proposed target for 1.2mn ha under irrigation target</td>
</tr>
<tr>
<td>~30% lack sufficient income for food</td>
<td><strong>~50%</strong> rainfall variability Amongst the highest in Africa makes drought periods severe</td>
</tr>
<tr>
<td>2x price volatility</td>
<td><strong>9 of 10</strong> major crops production and prices at risk</td>
</tr>
<tr>
<td>~26% stunting rate</td>
<td>9 / 10 crops will experience reduced growth rates (10-20%) with dramatic price increases (45-90%) by 2030 in part to climate change³</td>
</tr>
<tr>
<td>~37% Vit A supplements available compared to 96% in Rwanda and 87% in Tanzania</td>
<td><strong>~40%</strong> maize production at risk up to 40% of maize production (~320k tonnes) is at risk for army worm in the coming decade. 2016 attacked ~7% of production</td>
</tr>
<tr>
<td>KES 35-70bn domestic crop production lost</td>
<td><strong>~7.4%</strong> yield reduction in maize for every 7 degrees C of temperature increase (~3.2c anticipated by 2080)</td>
</tr>
<tr>
<td>~60% of calories from carb heavy staples</td>
<td><strong>~26%</strong> maize production at risk</td>
</tr>
</tbody>
</table>

1 Measured by standard deviation in consumer price food indices. Kenya is at 7, EAC is at 4 | 2 Average of 6% of ministry budget (~2.4 bn) for food security, but varies: as low as 1% in 2012/2013, as high as 28% in 2016/2017 | 3 Growth rates: price increase -> maize (12%-90%), Rice (23%,-89%); wheat (13% 75%), others (8%-83%) | 4 droughts that occurred past 10yrs have had 3.4-3.7m food insecure populations. Need coverage just over food insecure population not full country for 3 months until can import | 5 OECD defines “under secure water stress” where ratio exceeds 40%. Only Lake Victoria North Catchment Areas will have ratio of <40% at 2016 | 6 Sept 2015 Gazette for maize, beans, wheat, rice, powder, milk and fish

SOURCE: FAO; Kenyan demographic and health survey 2014; UMGES data Africa; IFPR; APHTACIS; Kenya market trust; PAO start; Regemeo; National water master plan
Interventions

Enhance large scale production

Drive Small holder productivity

Reduce Cost of Food
Prioritized interventions based on a three-pronged approach prioritized to achieve four key outcomes for 100% food security

<table>
<thead>
<tr>
<th>Key outcomes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Economic Growth (GDP)</strong></td>
<td>We increase national output; income share of value added exports</td>
</tr>
<tr>
<td><strong>Incomes</strong></td>
<td>Small scale farmers achieve higher incomes sustainably, with higher output and productivity</td>
</tr>
<tr>
<td><strong>Jobs</strong></td>
<td>Primary (on-farm) and secondary off-farm) jobs are created with a focus on youth &amp; women</td>
</tr>
<tr>
<td><strong>Food &amp; nutrition security</strong></td>
<td>Quality &amp; nutritious food is always available and accessible to all Kenyans, and food crisis are fully mitigated</td>
</tr>
</tbody>
</table>

**BIG 4: 100% food security approach**
- Increase small farm-holder incomes
- Increase agricultural output & value added
- Ensure 100% availability of food (including price & nutrition)

**Note:** *5 key Ministries* including Agriculture and Irrigation; Industrialisation; Environment; Devolution; Lands given direct influence on emerging flagships. By comparison, *ASDSP included 10 sector ministries*: Agriculture, Livestock Development, Fisheries, Cooperative Development and Marketing, Land, Water and Irrigation, Regional Development, Environment and Mineral Resources, Forestry & Wildlife, Development of Northern Kenya and other Arid/Lands.
100% Food and Nutrition Security
The Ministry of Agriculture, Livestock, and Fisheries has its fundamental goal and purpose of conserving, protecting and managing agricultural, livestock, and fisheries resources for socio-economic development.
Kenya Population trend (2009-2014)

This graph shows the population trend in Kenya between 2009 and 2014. This indicates that there is a continuous upward trend in population growth.

Current Drought Hotspots

This map shows drought status in different Counties:
- **Alarm Drought Status**: High drought stress counties and are worsening. They include Isiolo, Kajiado, Tana River, Garissa, Kilifi, and Wajir Counties.
- **Alert Drought Status**: Medium drought stress areas and are also worsening. They include Mandera, Marsabit, Taita Taveta, Kitui, and Samburu East.
- **Normal Drought Status**: Generally stable with some localized drought stress. They include Baringo, Embu, Kwale, Nandi, Meru (North), Narok, Nyeri (Kieni), Samburu, Tharaka Nithi, Turkana, and West Pokot.
- **No Drought Status**: These are areas that received enough rainfall.

Wool and Mutton production per County in 2016

This chart shows the wool and mutton production per county in 2016. The difference shows the lack of value addition for the wool by most of the Counties.

Maize production per County in 2016 versus population

This map shows the production of maize in 2016 versus the different Counties by population.

Milk production per county

This map shows the production of milk per county.
Kenya’s highest productivity zones have notable access to water, roads, and high populations to support both demand and supply:

**Farmer segments**
- Qualitative analysis

**Crop yields, 2016**
- tonnes/ha

**Population by county, 2016**
- mn

**Highest crop yield areas (bold >50 tonnes/ha) are in Western, Central Highlands, Rift Valley and Coast**
- **Western:** Trans Nzoia, Bungoma, Kisii, Elgeyo Marakat, Nandi, Busia, Kakamega, Vihiga, Kisumu, Bomet, Kericho
- **Central Highlands:** Nyeri, Kiambu, Kirinyaga, Nairobi, Nyandarua, Tharaka Nithi
- **Rift Valley:** Narok, Nakuru
- **Coast:** Kilifi, Lamu
- **Central ASAL:** West Pokot, Laikipia, Taita Taveta
- **Semi-arid uplands:** Kajiado, Tana River
SMEs focused on ~40 high potential zones based that were identified based on demand and productivity

SMEs will be promoted in 3 phases, in 40 high potential zones\(^1\) providing improved market access for ~1-1.5mn farmers in these areas once fully rolled out:

- Phase 1: in 8 Tier 1 locations, for 320,000 farmers
- Phase 2: in 13 Tier 2 locations, reaching a further 120,000 farmers
- Phase 3: in 19 Tier 3 locations, reaching a further 85,000 farmers
- **Timing TBD:** irrigation facilities reaching ~600,000 – 1mn farmers, overlap with above phases TBD

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### High potential zones for SMEs

1. Kapenguria
2. Kitale
3. Busia
4. Malaba
5. Kimili
6. Mumias
7. Bungoma
8. Eldoret
9. Kapsabet
10. Kisumu

11. Nandi
12. Kisii
13. Kericho
14. Litein
15. Bomet
16. Homa Bay
17. Migori
18. Molo
19. Narok

20. Ol Kalou
21. Naivasha
22. Outer Nbi
23. Thika
24. Taveta

25. Meru
26. Runyenjes
27. Mwingi
28. Makuyu
29. Taveta
30. Embu

31. Nyeri
32. Nakuru
33. Mwingi
34. Machakos
35. Kilihi

36. Kitui
37. Garissa
38. Wajir
39. Wundanyi
40. Naivasha

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\(^1\) Methodology to find zones:: Use yield maps and farmer segments to identify the most productive farmer segments (proxy for supply); Identify Tier 1- Tier 3 secondary and tertiary cities based on population thresholds that capture ~65% of population (proxy for demand); Geolocate a 15km or 25km radius for each city, to identify sub-county level zones
Regions should select infrastructure based on criteria, such as water table depth and population density, combined with predictive modelling.

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Criteria</th>
<th>Region of focus</th>
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<tbody>
<tr>
<td>Canals</td>
<td>Access to surface water • High population density</td>
<td>Western Rift</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Central</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Semi-arid uplands</td>
</tr>
<tr>
<td>Rainwater harvesting &amp;</td>
<td>Applicable in all areas</td>
<td>Western Rift</td>
</tr>
<tr>
<td>catchment dams</td>
<td></td>
<td>Central</td>
</tr>
<tr>
<td></td>
<td></td>
<td>North ASALs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Central ASALs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Semi-arid uplands</td>
</tr>
<tr>
<td>Borehole</td>
<td>Deep water table • Low access to surface water</td>
<td>North ASALs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Central ASALs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Semi-arid uplands</td>
</tr>
<tr>
<td>Shallow wells (50:50 with</td>
<td>High water table</td>
<td>Western</td>
</tr>
<tr>
<td>small-holders)</td>
<td></td>
<td>Rift</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Coast</td>
</tr>
</tbody>
</table>

Rivers, depth of water resource and estimated population with access

Minimum total dynamic head
- <10m
- 10 - 25m
- 25 - 50m
- >50m

KAVES counties

Estimated population in agricultural areas
- 100
- 1,000
- 10,000
- 100,000
There is heavy concentration of donors in the ASAL regions – pointing to a need for coordination and sharing of information.
A data cube provides analytically ready data across decades allowing for easily accessible geospatial analysis on key environmental issues. The initial focus for the data cube will be on algorithms to address agriculture and food security and will be implemented for Sierra Leone, Ghana, Senegal, Kenya and Tanzania. Launched in May 2018 in Kenya.
Showcase Geo-Spatial Data & Mobility
Visualizations compare average weekday travel times in **February** to travel times during the rainstorms on **March 6th and 15th, 2018** respectively.

Zones are determined by Hex Clusters, a set of geographic boundaries drawn by Uber, for use in statistical and travel analysis.

**Red areas depict an increase in travel times**, while **green indicates a decrease in travel times**.
Average travel time to destination zone:

13.0% shorter
First date-time range

28min 6sec vs. 32min 17sec
First vs. second date-time range
SAUTI YETU

online portal for real-time information sharing on service delivery by county governments.
Global Partnership for Sustainable Development Data

USING DATA TO JOIN UP DEVELOPMENT EFFORTS
1. **Fostering and promoting innovation to fill data gaps.** New technologies offer new opportunities to improve data, if they are used for the common good.

2. **Mobilizing resources to overcome inequalities** between developed and developing countries and between data-poor and data-rich people.

3. **Leadership and interoperability** to enable the data revolution to play its full role in the realization of sustainable development.

4. **Design mindset** and readiness to fail-fast, learn-fast and continuous ideation. Good Enough, not Perfection.

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**Takeaways**
Thank you.