

Environmental SDGs and Putting Data to Work

Sustainable Antioquia

Medellin, 9 June 2016

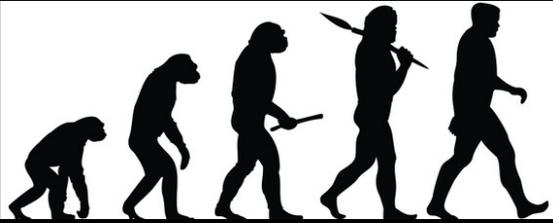
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Please turn to the person next to you

- Describe a time when you were trying to do something important, and having data helped you succeed
- Take about one minute each
- Remember your answer -- we'll be asking follow-up questions later on

Sustainable Development Goals Represent a New Stage in Social Evolution

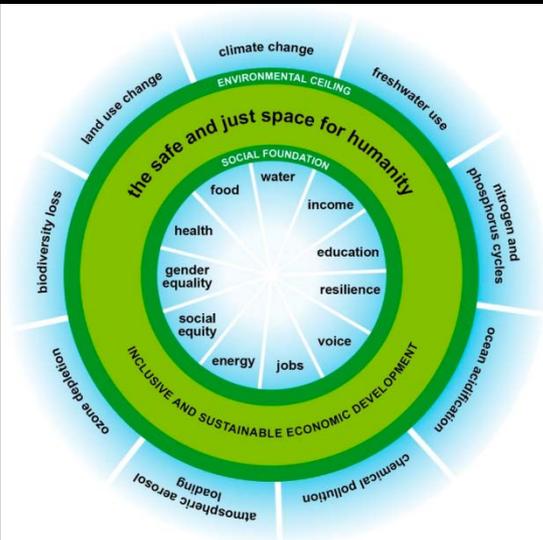


We recognize that old approaches have failed

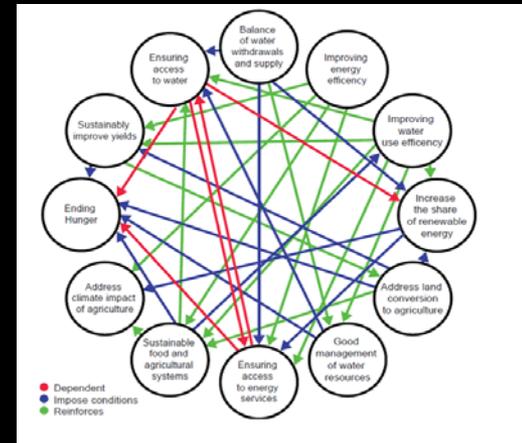


Everyone's voice matters

The planet matters



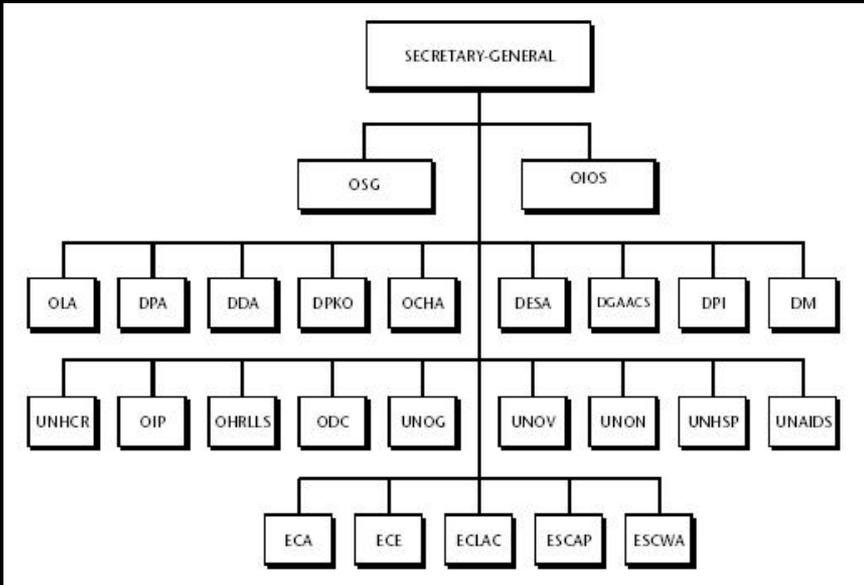
Success requires integration





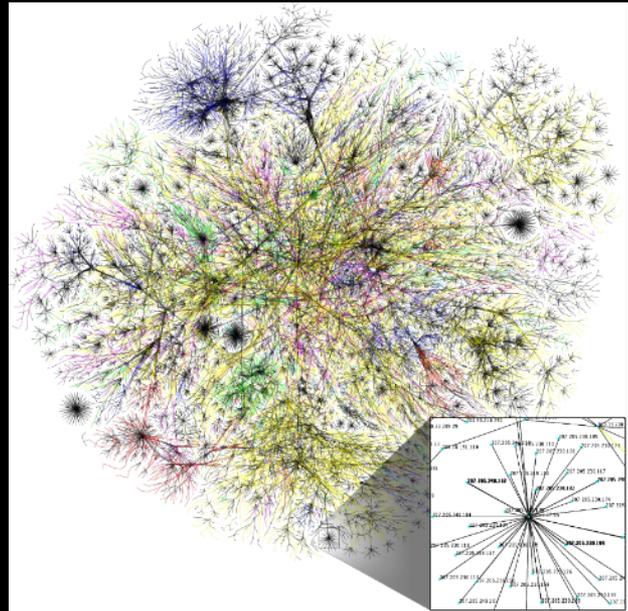
Everyone's voice matters

Old



Voices represented through hierarchy

New



Voices represented through networks

The planet matters

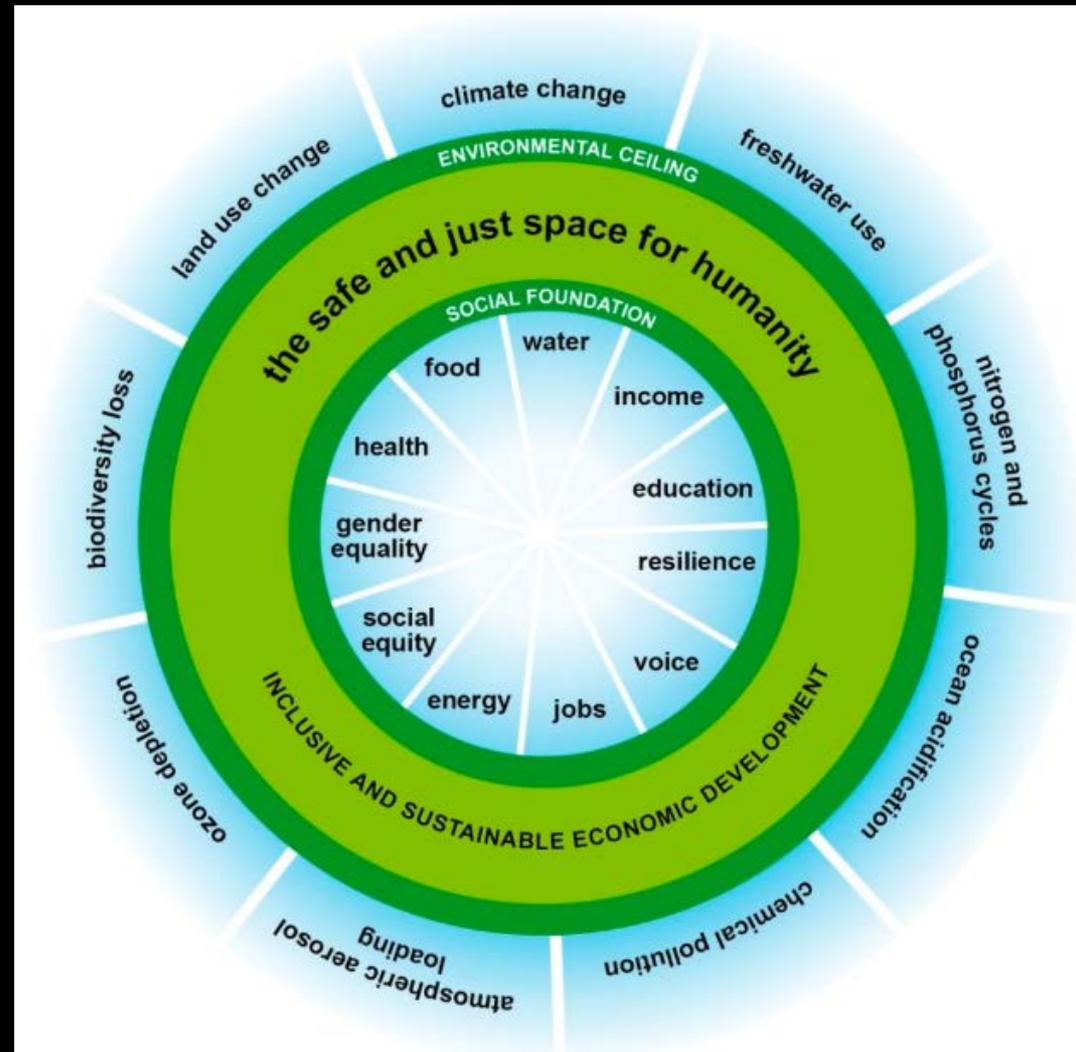
Old



Add it to the list

Find a safe path for human development

New





TRANSFORMING OUR
WORLD:
THE 2030 AGENDA FOR
SUSTAINABLE
DEVELOPMENT

1 NO
POVERTY



2 ZERO
HUNGER



3 GOOD HEALTH
AND WELL-BEING



4 QUALITY
EDUCATION



5 GENDER
EQUALITY



6 CLEAN WATER
AND SANITATION



7 AFFORDABLE AND
CLEAN ENERGY



8 DECENT WORK AND
ECONOMIC GROWTH



9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE



10 REDUCED
INEQUALITIES



11 SUSTAINABLE CITIES
AND COMMUNITIES



12 RESPONSIBLE
CONSUMPTION
AND PRODUCTION



13 CLIMATE
ACTION



14 LIFE
BELOW WATER



15 LIFE
ON LAND



16 PEACE, JUSTICE
AND STRONG
INSTITUTIONS



17 PARTNERSHIPS
FOR THE GOALS



Success requires integration

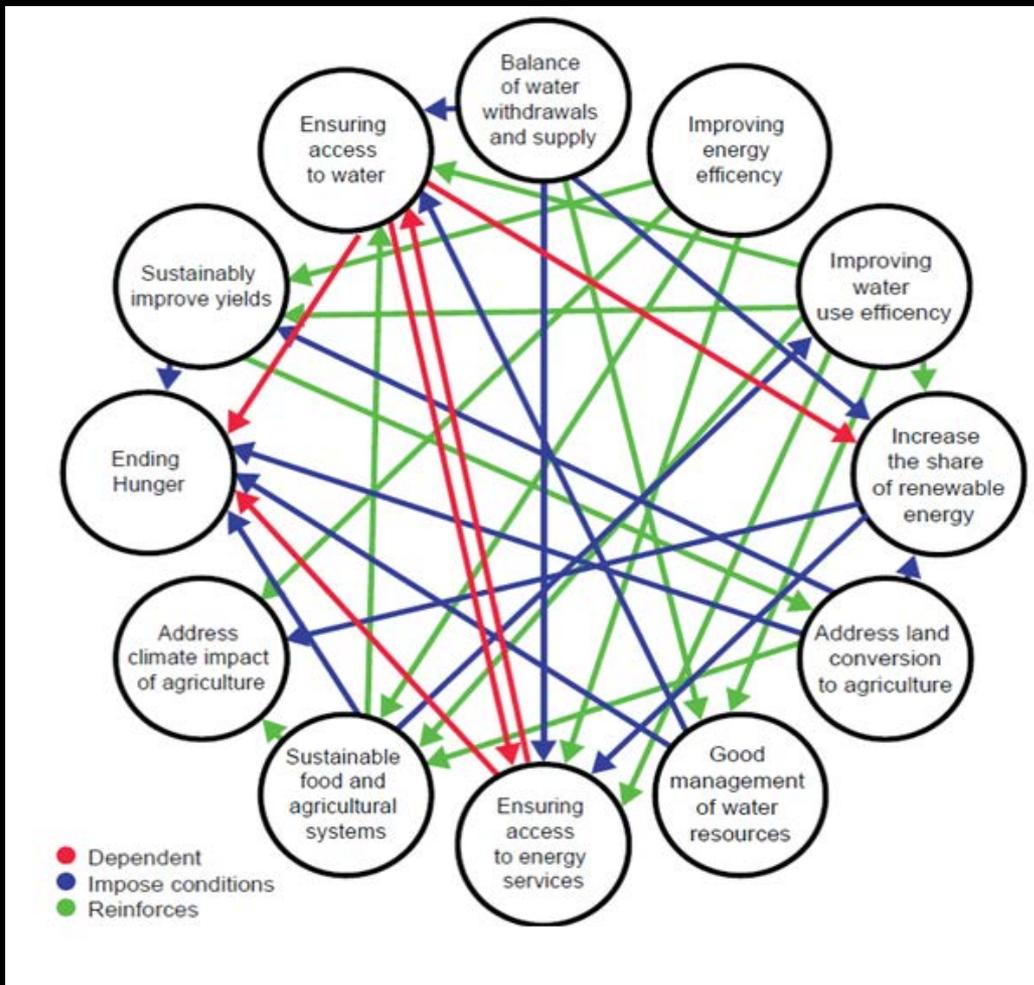
Old



Each new goal adds to the cost

Each goal needs the other goals to succeed

New



Weiss, N. et al. (2014), Cross-sectoral integration in the Sustainable Development Goals: a nexus approach, SEI Discussion Brief.

**Please take out your smart phone
or laptop**

<https://pollev.com/lidiacano030>

**Choose the main reasons that data made a
difference**

It helped understand a problem better

It helped design a good solution

It helped evaluate a response

It helped get people talking about an issue

“... this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the moon and returning him safely to the Earth.”

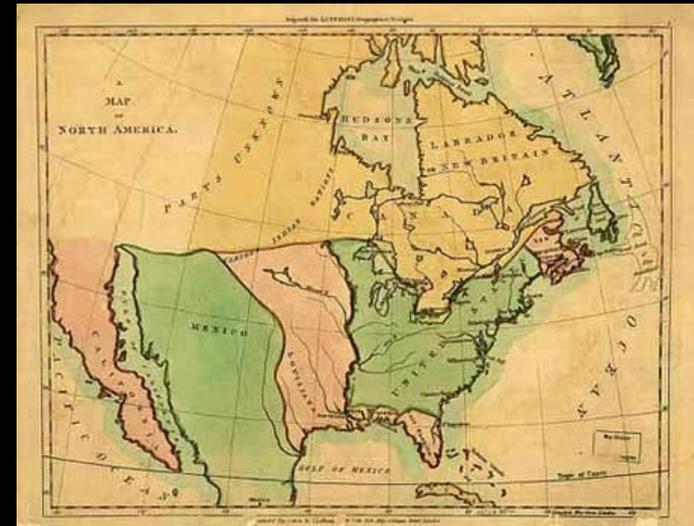
John F. Kennedy 1961,
address to Congress



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"The object of your mission is to explore the Missouri river, & such principal stream of it, as, by it's course & communication with the water of the Pacific ocean may offer the most direct & practicable water communication across this continent, for the purposes of commerce."

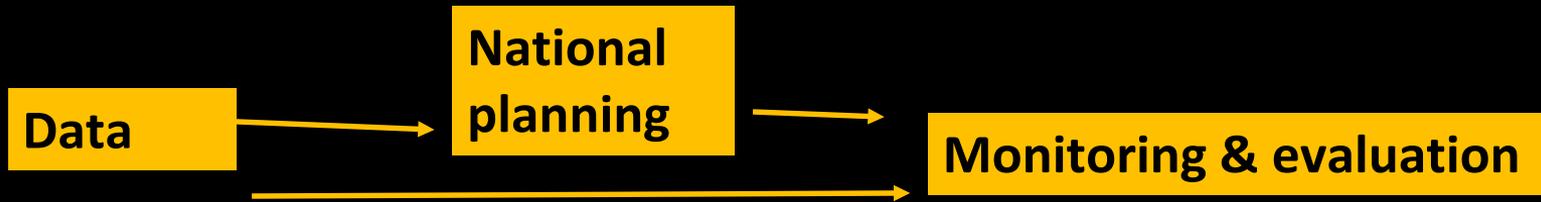
Thomas Jefferson, 1803, instructions to Meriwether Lewis



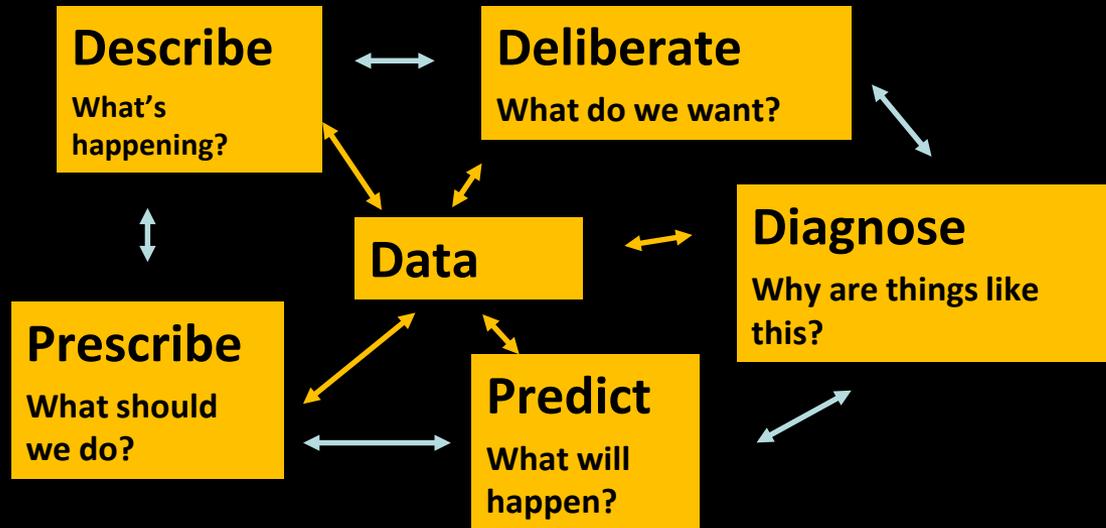
2400 words, dozens of additional goals and instructions

Both goal-oriented missions, but radically different in form.

Today data serve many purposes



Copyright © 2009 by David Soren



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or laptop**

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Rank these goals in importance

Clean air

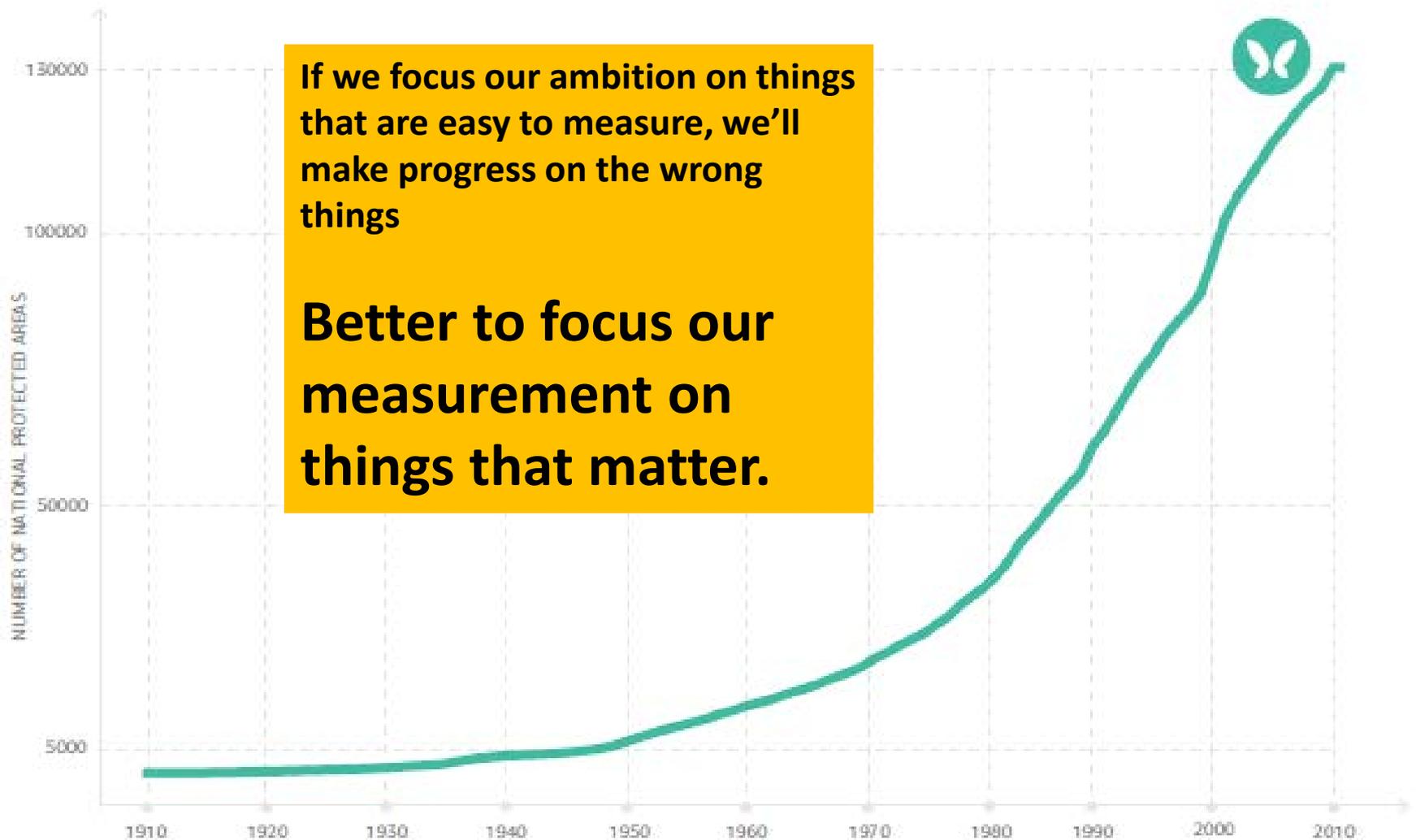
Clean water

Protected areas

Sustainable energy

Sustainable fisheries

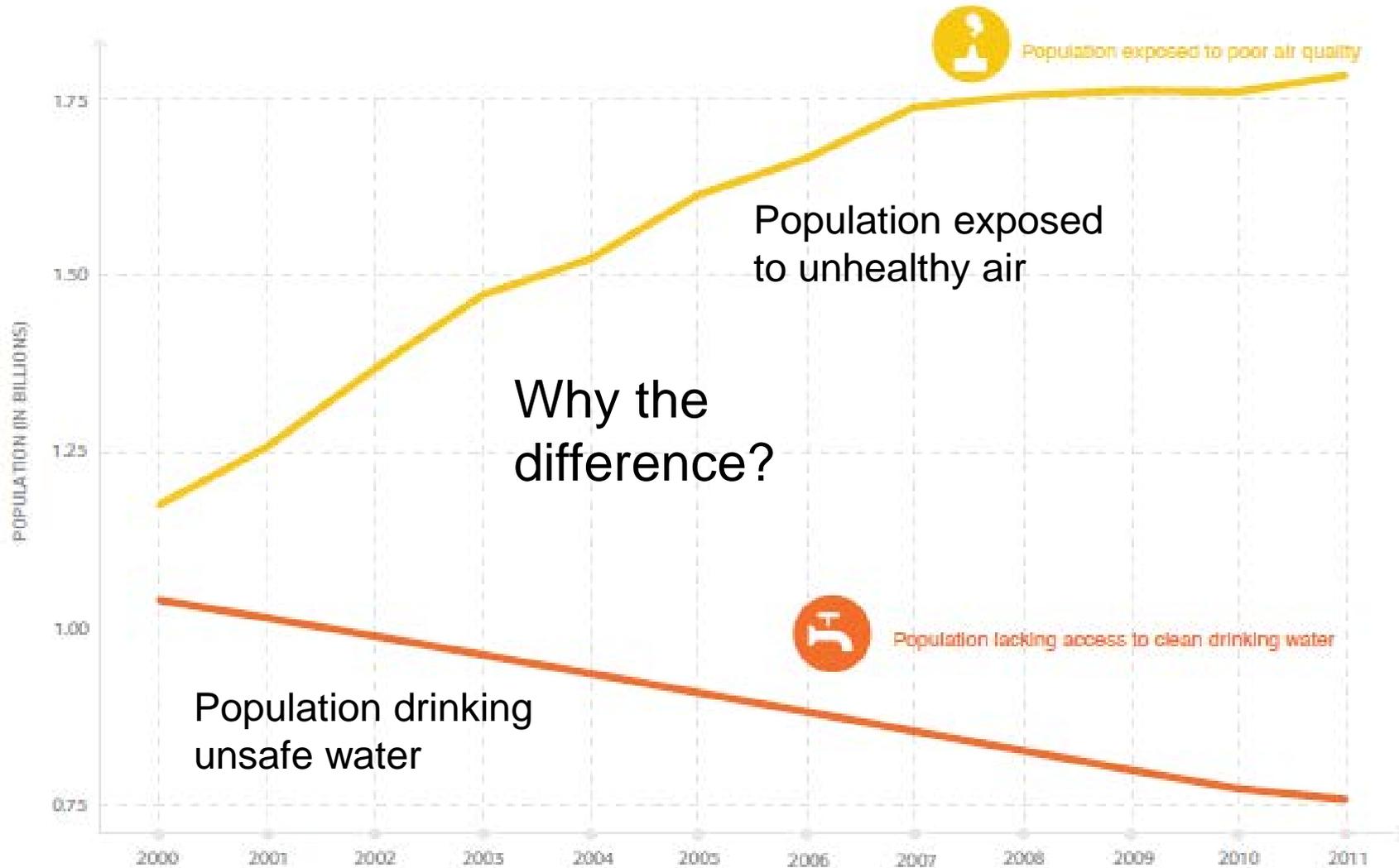
Sustainable cities

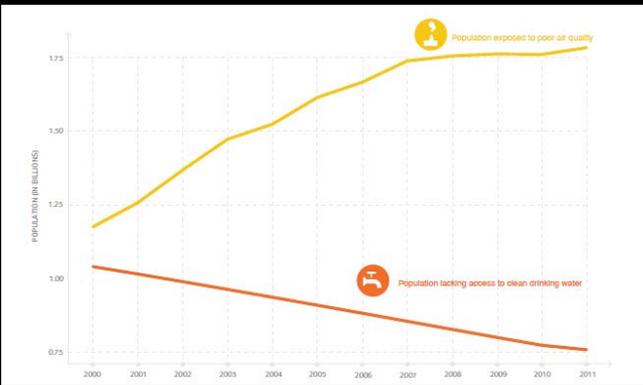


If we focus our ambition on things that are easy to measure, we'll make progress on the wrong things

Better to focus our measurement on things that matter.

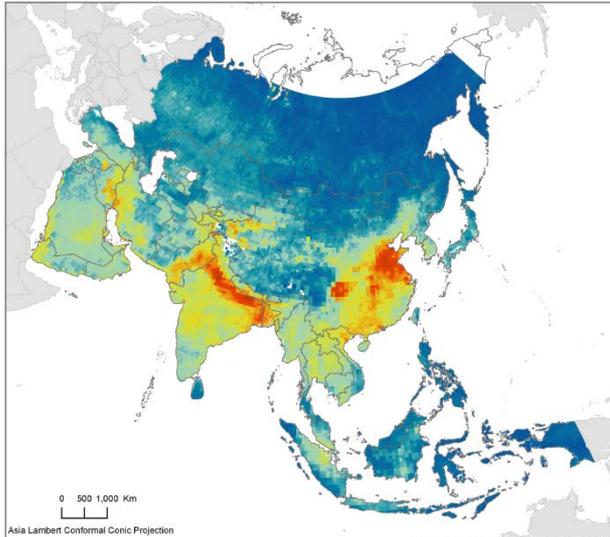
Figure 3. Trend in number of national protected areas from 1910 to 2011. (Source: IUCN and UNEP-WCMC, 2012)



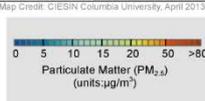


Global Annual Average PM_{2.5} Grids from MODIS and MISR Aerosol Optical Depth (AOD), 2010: Asia

Satellite-Derived Environmental Indicators



Global Annual Average PM_{2.5} Grids from MODIS and MISR Aerosol Optical Depth (AOD) data sets provide annual "snap shots" of particulate matter 2.5 micrometers or smaller in diameter from 2001–2010. Exposure to fine particles is associated with premature death as well as increased morbidity from respiratory and cardiovascular disease, especially in the elderly, young children, and those already suffering from these illnesses. The grids were derived from Moderate Resolution Imaging Spectroradiometer (MODIS) and Multi-angle Imaging Spectro-Radiometer (MISR) Aerosol Optical Depth (AOD) data. The raster grid cell size is approximately 50 sq. km at the equator, and the extent is from 70°N to 60°S latitude.



Data Source: Battelle Memorial Institute, and Center for International Earth Science Information Network (CIESIN)-Columbia University, 2013. Global Annual Average PM_{2.5} Grids from MODIS and MISR Aerosol Optical Depth (AOD), 2001–2010. Palisades, NY. NASA Socioeconomic Data and Applications Center (SEDAC). <http://sedac.ciesin.columbia.edu/data/set/ndei-global-annual-avg-pm2-5-2001-2010>.

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sed to average air pollution levels exceeding world health organisation

CAPITAL BREATHES UNEASY

Tops global cities with worst air pollution



- 1 NEW DELHI, INDIA
- 2 BEIJING, CHINA
- 3 CAIRO, EGYPT
- 4 SANTIAGO, CHILE
- 5 MEXICO CITY, MEXICO

INDIA SLIPS IN RANK TOO
Is second most polluted among its neighbours

	2014	2010
Bangladesh	169	139
India	155	123
Pakistan	148	125
Nepal	139	38
China	118	121
Sri Lanka	69	58

Ranking based on 9 parameters: Health impact, air pollution, water & sanitation, water resources, agriculture, fisheries, forests, biodiversity & habitat, climate change & energy

On list of 178 countries, India ranks as low as 174 on air pollution, 127 on health impact

5 CLEANEST COUNTRIES: Switzerland, Luxembourg, Australia, Singapore and Czech Republic



Air Quality China

Liu Qiang Weather

★★★★★ 2,373

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★★★★★ FREE

Bono and Jesse Helms
discuss poverty and
health MDGs, 2005



**If data helps
people think
about things in
a new way,
that's valuable**

**Is this the most powerful impact that data can
have?**

Development goals should enable decision-making

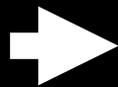
Gathering data that answer particular questions is the most effective way to support the Sustainable Development Goals, say **Keith Shepherd** and colleagues.

Nature,
2015

What major investments are anticipated?

What major policy innovations are considered?

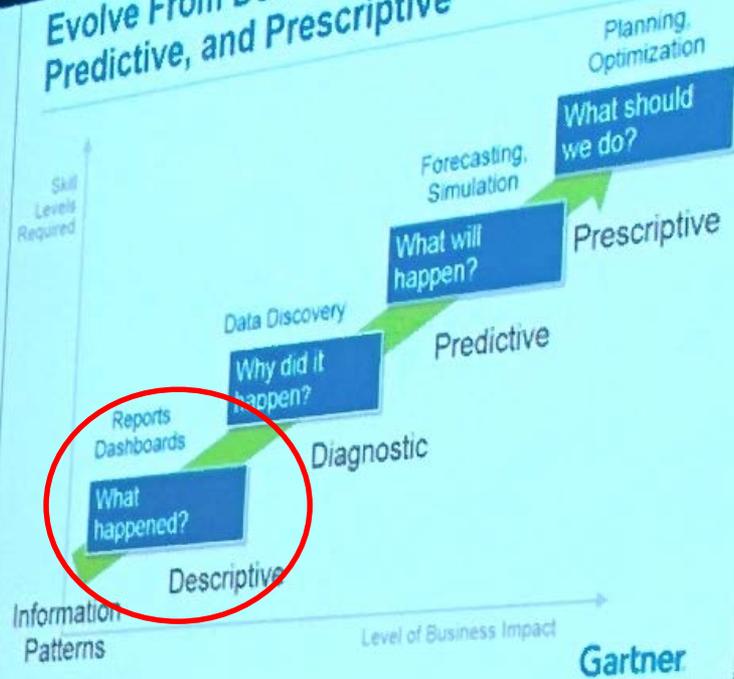
What major actions are considered?



What information adds the most value to these decisions?

- What is good for reporting is not always good for decision making
- What people think is most important is often not the most important
- Cataloging the decision points is hard and requires hard work to do well

Evolve From Descriptive and Diagnostic to Predictive, and Prescriptive



Research shows a hierarchy of impact through the use of analytics

Jack Levis, UPS

A CIO can intervene to make the whole system deliver.

If your country lacks a CIO, you may need to drive some of the innovation

Do you want to report on failure or drive success?



Chukwudozie Ezigbalike, yesterday right here

NIGERIA MDG INFORMATION SYSTEM (NMIS)



[Explore Data](#) [MDGs in Nigeria](#) [2012 Baseline Data](#) [Download Data](#) [About](#)

COMMISSIONED BY THE OFFICE OF THE SENIOR SPECIAL ASSISTANT TO THE PRESIDENT ON MDGS

Nigeria's health, education and water facility inventory

Explore data collected to inform policy and planning for poverty reduction.

 **26,000+**
Health Facilities

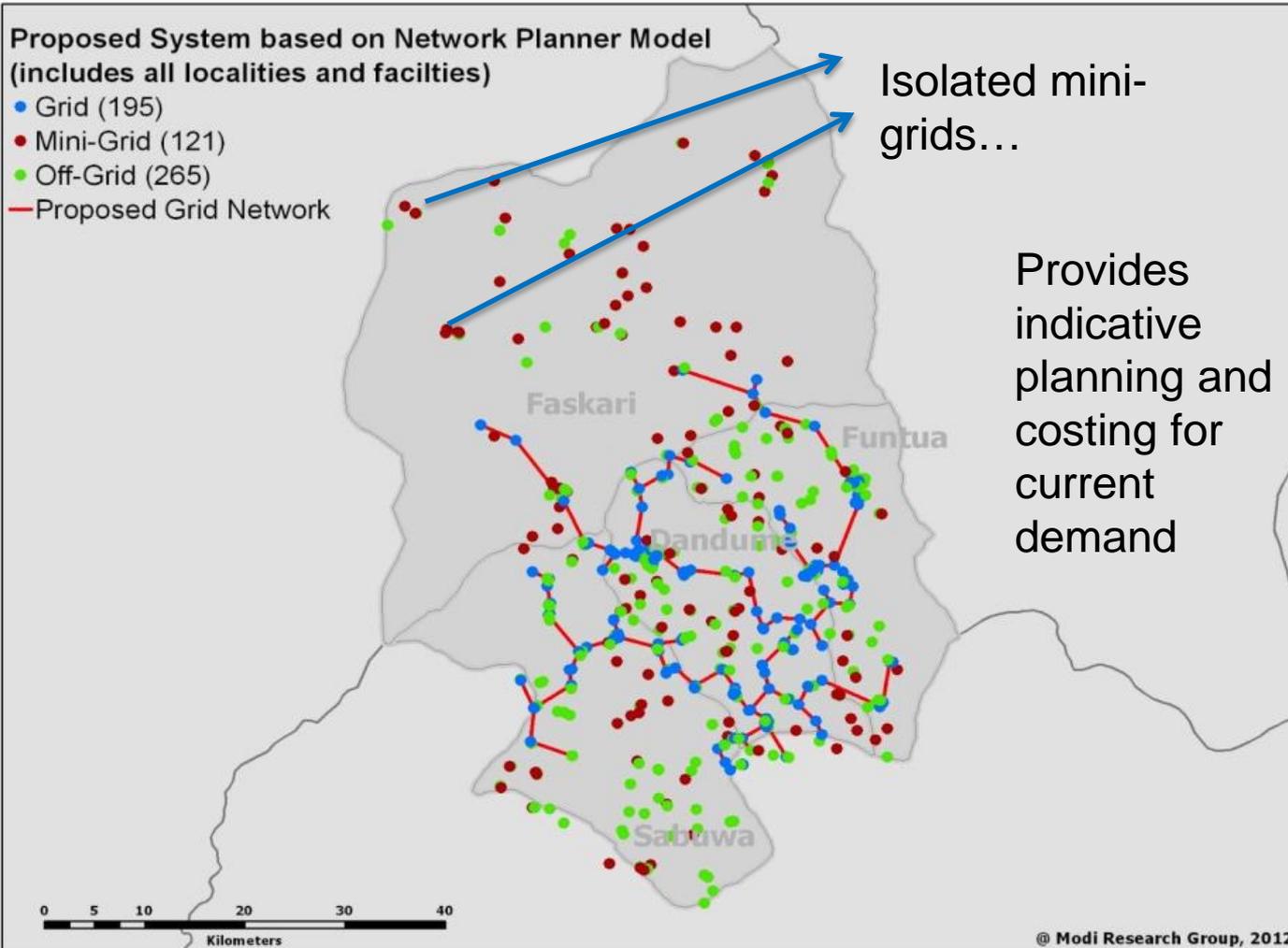
 **73,000+**
Education Facilities

 **132,000+**
Water Facilities

[EXPLORE DATA](#)

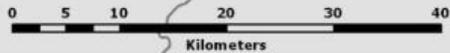
**Proposed System based on Network Planner Model
(includes all localities and facilities)**

- Grid (195)
- Mini-Grid (121)
- Off-Grid (265)
- Proposed Grid Network



Isolated mini-grids...

Provides indicative planning and costing for current demand



Examples of SDG-relevant decisions

How much sewage treatment capacity does my city need?

Should we meter and price water?

What is the best way to prevent conflicts over land from becoming violent?

Should we privatize water supply?

What transportation infrastructure will best meet the needs of this region?

Where is best place to invest in intensified agriculture?

What policies will best meet health care needs in rural communities?

What products should my company develop to meet sustainable consumption and production demands in the future

What is the right balance between redistribution and growth in order to reduce inequality?

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or laptop**

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**Choose the key characteristics of
the data that were most important
in making the data useful**

Relevance

Accuracy

Timely

Geographic disaggregation

Official status

Accessibility

Trustworthy source

What do we know about making data relevant for decision-making?

It is not easy at first, but it is possible to get good at it

The data people think is important often turns out not to be important

Focusing on the value of data helps prioritize

Clarify the decision that matters

Clarify the consequences of getting it right, compared to getting it wrong

Identify the data that will most efficiently enable you to make the right choice

Collect the data as cost-effectively as possible

Examples

How much should Tanzania intensify agriculture on existing farmland and extend agriculture into new land?

No-data decision: do both

What the data showed later: there was no need to extend

Disaster Risk Management

Insurance companies funded the creation of catastrophic risk modeling industry, which generated new data and new analytics that have driven down disaster losses in wealthy countries

Illegal fishing

Sea Around Us integrates official statistics from multiple domains with satellite data to recalculate national fleet behavior.

Human Rights

Harvard Humanitarian Initiative uses high-resolution satellite imagery to track abuses and to anticipate abuses.

Sustainable Development

Planet Labs providing 1-meter imagery of entire earth every day

Asian Air Pollution

\$13m startup now largest satellite fleet

Network of citizen science activists and transnational data analysts reversed Chinese policy within three years and sparked new movement in India.



Data Systems should be Technologically Efficient

Design Data Collection from a Portfolio Perspective



POPULATION SURVEY									
Region	Sub-region	Population	Gender	Ethnicity	Age Group	Education	Employment	Income	Health
North	North East	1,234,567	50%	60%	20%	10%	15%	25%	30%
South	South West	987,654	45%	55%	15%	8%	12%	20%	25%
West	West Central	765,432	40%	50%	10%	5%	8%	15%	20%
East	East South	543,210	35%	45%	5%	3%	5%	10%	15%

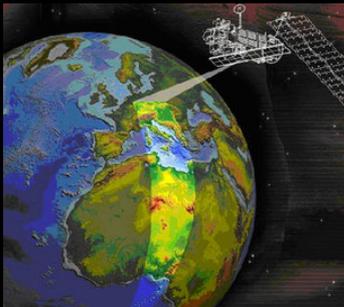


Old

Each platform competes to show how valuable and cost-effective it can be. Decision-makers invest to point of diminishing returns within each platform.

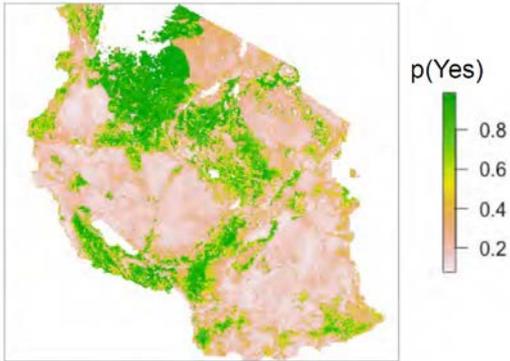
New

Each platform offers array of values, along a cost curve. Decision-makers combine to get most bang for the buck overall



Each information need can be best met with a portfolio of data technologies.

Designing the right portfolio is an emerging science.

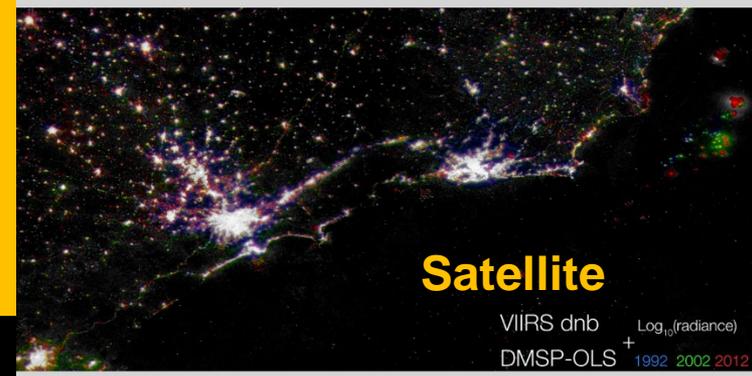
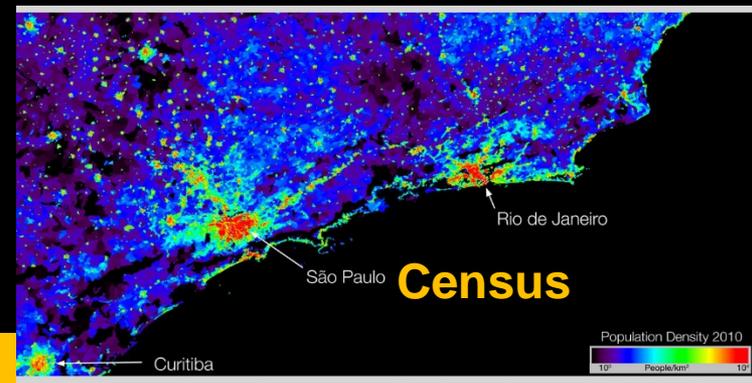


Combine crowd sourcing with ag census and satellite data for more accurate crop mapping

Question Examples

- How much new farmland do I need to meet food goals?
- What land can tolerate heavy fertilizer use without environmental damage?
- Where is the fastest population growth?
- Which cities are growing or shrinking fastest?

Combine population census with satellite data for better spatial and temporal resolution



Data systems should be programmatically integrated

Design data programs to be synergistic, not additive

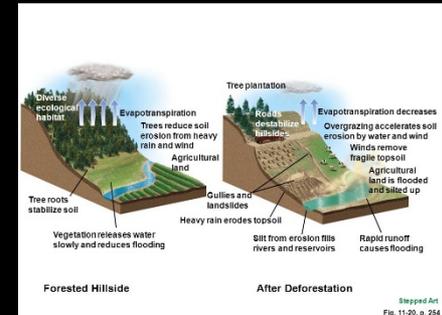


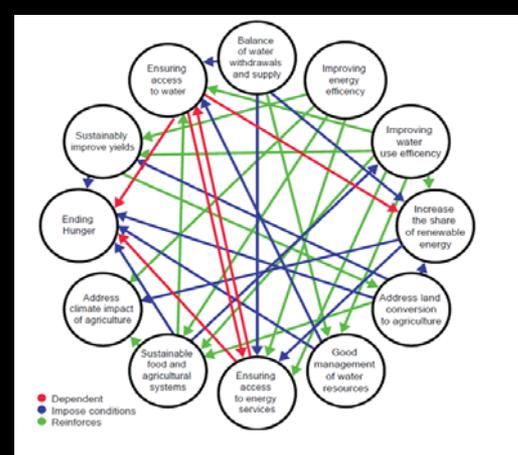
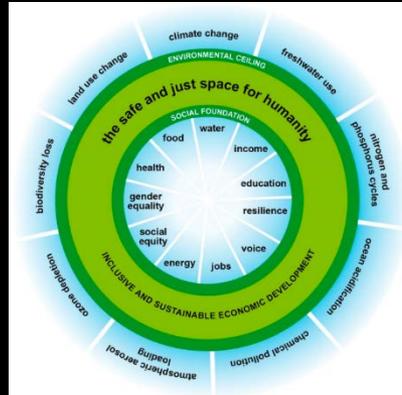
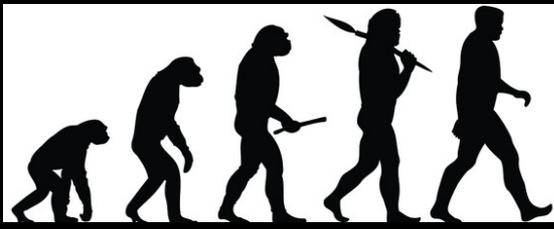
Old

Each data program serves a few constituencies. Requests to serve more create crippling burdens.

New

Data programs are co-designed and co-implemented, so that tradeoffs are reduced, and managed from perspective of the whole.





Traditional institutional arrangements are adapting

New institutions are emerging

New partnerships are forming

Some institutional change needs more attention

Distinction between official and unofficial statistics becoming less rigid

Distinction between observed and modeled data becoming less rigid

Transition underway from thinking of data as product to data as service / therefore data stewards are transitioning to data service providers

Public sector / private sector divide transitioning to partnership approach. Mobile phone data / public benefit commercial data collectors.

Search for bridge-building / boundary organizations that meet these needs is actively underway

Do you want to participate?

Sustainable Development Solutions Network

Thematic Network on Data for
Sustainable Development

<http://unsdsn.org/what-we-do/thematic-networks/data-for-sustainable-development/>

Producing a *Living Manual* on how to put data to work for sustainable development

Global Partnership for Sustainable Development Data

<http://www.data4sdgs.org/>

Producing a *Toolkit*

<http://ciesin.columbia.edu/o> support effective data-for-SDG roadmaps

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Solving practical challenges to unlock the power of data for development