

First Expert Group Meeting
of the
Inter-agency Expert Group on SDG Indicators: Working
Group on Geospatial Information (IAEG-SDGs: WGGI)

Discussion materials for definition of scope, quality
criteria and innovative approaches to indicator
monitoring

Mexico City, Mexico,
13 December 2016



Agenda

- Day 1: Focus on a **shared understanding**
- Day 2: Focus on the **indicators**
- Day 3: Focus on the **way forward**

What gets measured, gets changed...



Agenda Day 2

<p>9:00 – 12:00</p> <p>(coffee break at 10:45)</p>	<p>Summary of Day 1</p> <p>Focus on scope</p> <ul style="list-style-type: none"> • The indicators: what are the criteria for inclusion in the scope of the WGGI (PtH) <ul style="list-style-type: none"> ○ geospatial information definitively informs the indicator directly ○ geospatial information definitively support and augment statistical data ○ geospatial information definitively improves the production of statistical data ○ geospatial information definitively improves disaggregation of statistical data • Methodologies: identify and agree quality requirements • Short presentation of the indicators in scope <ul style="list-style-type: none"> ○ description and why could they be in scope ○ discussion on specific indicator • Decision about which 6-9 indicators to focus on for breakout sessions • Methodology for afternoon breakout sessions 	<p>Methodical approach to agree on which indicators are initially in scope of the WGGI, to focus the work.</p>
<p>12:00 – 13:00</p>	<ul style="list-style-type: none"> • Breakout in 3 groups • Agree roles: chair, rapporteur • Initial discussion on chosen indicators 	
<p>13:00 – 14:00</p>	<p>Lunch</p>	<p>Provided by hosts</p>
<p>13:30 – 17:00</p>	<p>Focus on indicators</p> <ul style="list-style-type: none"> • Breakout in 3 groups • Each group discusses methodology for 2-3 indicators (per agreed criteria) <ul style="list-style-type: none"> ○ Discuss how geospatial information helps (inform, support, augment, improve) the specific indicator ○ Evaluation of methodology based on quality indicators ○ Identify areas for improvement ○ Propose required WGGI activity for the indicator (“who, what and when”) 	<p>Subgroups moderated by Marie, Tim and Olav?</p>



Focus on the indicators

- Definition of Scope
- Quality Criteria



Selection of Indicators

- 17 Goals
- 168 Targets
- 241 Indicators (the current list)

- We must limit the scope to what is relevant for the WGGI



Initial scope

- Tier III and maybe Tier II
- Geospatial “feel”
- Original list (September 2016): 42 in scope:
 - 12 Tier I
 - 13 Tier II
 - 17 Tier III



GEO

- 32 Indicators in scope

Sustainable Development Goals										Earth Observations in Service to Agenda 2030						
Target										Goal	Indicator					
Contribute to progress on the Target yet not the Indicator per se											Direct measure or indirect support					
							1.4	1.5	1.5	1	1.4.2					
					2.3	2.4	2.4	2.c	2.c	2	2.4.1					
				3.3	3.4	3.9	3.9	3.d	3.d	3	3.9.1					
										4						
								5.a	5.a	5	5.9.1	5.a.1				
	6.1	6.3	6.4	6.5	6.6	6.a	6.a	6.b	6.b	6	6.3.2	6.4.2	6.5.1	6.6.1	6.6.1	
				7.2	7.3	7.a	7.a	7.b	7.b	7	7.1.1					
								8.4	8.4	8						
				9.1	9.4	9.5	9.5	9.a	9.a	9	9.1.1	9.4.1				
				10.6	10.7	10.8	10.8	10.a	10.a	10						
	11.1	11.3	11.4	11.5	11.6	11.7	11.b	11.c	11.c	11	11.3.1	11.6.2	11.7.1	11.1.1	11.2.1	11.5.2
				12.8	12.4	12.2	12.a	12.b	12.b	12	12.a.1					
				13.2	13.1	13.3	13.3	13.b	13.b	13	13.1.1					
	14.5	14.1	14.2	14.3	14.4	14.6	14.7	14.a	14.a	14	14.3.1	14.4.1	14.5.1			
	15.1	15.2	15.3	15.4	15.5	15.7	15.8	15.9	15.9	15	15.1.1	15.2.1	15.3.1	15.4.1	15.4.2	15.1.2
								16.8	16.8	16						
17.18	17.8	17.2	17.3	17.6	17.7	17.9	17.16	17.17	17.17	17	17.6.1	17.18.1				



Esri



Criteria for inclusion in Scope

- All Tiers
- The Computational Method (data analysis) uses or could use **geospatial information technology**;
- The methodology benefits (or could benefit) from the use (or better use) of **earth observation data**;
- The methodology benefits (or could benefit) from the use (or better use) of **official geospatial or geostatistical data**;
- The methodology benefits (or could benefit) from the use (or better use) of **crowd sourced geospatial data or volunteered geographic information (VGI)**;
- The methodology benefits (or could benefit) from national and international **institutional alignment**, such as application of knowledge held by national mapping and cadastral agencies.



Metadata Quality Criteria

- **Consistent over time:** data must be recorded and reported in a consistent way throughout the entire SDG period of 15 years. Changes in technology can be applied, but should not lead to incomparable outcomes.
- **Consistent across countries:** data must be recorded and reported in a consistent way for any country in the world, to the maximum degree possible, regardless of the level of development or income of each country.
- **Reliable:** data must be recorded and reported in such a way that results can be trusted, within a declared level of uncertainty.
- **Transparent:** the methodology used is well known, with caveats declared, and for which weaknesses, limitations and strengths are identified.
- **Verifiable:** The resulting information can be traced back to its origin. When using crowd sourced data this creates specific criteria for the methodology applied.
- **Feasible:** data must be recorded in a practical and realistic way, without imposing an extraordinary burden to countries, regions, organisations or communities.
- Taking advantage of **existing data:** there is a preference for using already collected standardized data.
- **Pragmatic:** the collected data and methodology should not only be used for monitoring the indicators but also for strategy planning, awareness raising, risk assessments and the development of policies.
- As for all information, the methodologies should be **SMART:** Specific, Measurable, Achievable, Relevant, Time Bound.



Indicators in initial scope

Tier I: 10

Tier I	Indicator	Logic for inclusion, other comments
1.1.1	Proportion of population below the international poverty line, by sex, age, employment status and geographical location (urban/rural)	Potential for GI technology in analysis of detailed census results.
6.1.1	Proportion of population using safely managed drinking water services	Currently based on surveys and censuses. EO settlement data overlaid with natural water sources (rivers/lakes) and industry/pollution can give an indication. However: hyperlocal pollution is an issue. Will require hyper-local information and local community input, specifically for detail. Strong potential for crowd sourced data and community input.
6.2.1	Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water	Very similar to 6.1.1
9.c.1	Proportion of population covered by a mobile network, by technology	Potential additional use of GI technology and crowd sourcing
11.1.1	Proportion of urban population living in slums, informal settlements or inadequate housing	EO settlement data augmented with hyper-local information and strong community input
11.6.2	Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)	Existing methodology exists, may need to be reviewed on currency. Can crowd sourced sensor information assist?
14.5.1	Coverage of protected areas in relation to marine areas	Potential additional use of GI technology, sharing data collection and additional EO data
15.1.1	Forest area as a proportion of total land area	Current methodology based on EO More current data sources are available with more modern EO technologies. Current methodology leads to potentially incorrect results
15.1.2	Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type	Similar to 14.5.1
15.4.1	Coverage by protected areas of important sites for mountain biodiversity	Similar to 14.5.1



Indicators in initial scope

Tier II: 5+9

Tier II	Indicator	Logic for inclusion, other comments
1.5.1 – 1.5.3	Target 1.5: By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters	<p>The 1.5 series indicators are equal or similar to:</p> <ul style="list-style-type: none"> • 1.5.1 is same as indicator 11.5.1/13.1.2 • 1.5.2 is almost the same as 11.5.2 • 1.5.3 is same as indicator 11.b.2/13.1.1 • 11.b.1 is a disaggregation of 1.5.3 <p>Indicators only measure impact of disasters. GI can play a significant role in prevention of natural disasters</p> <p>Discussion required to change indicators?</p>
4.a.1	Proportion of schools with access to: (a) electricity; (b) the Internet for pedagogical purposes; (c) computers for pedagogical purposes; (d) adapted infrastructure and materials for students with disabilities; (e) basic drinking water; (f) singlesex basic sanitation facilities; and (g) basic handwashing facilities (as per the Water, Sanitation and Hygiene for All (WASH) indicator definitions)	Potential for GI technology in analysis of detailed census results.
11.2.1	Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities	Strong link to geospatial Will require hyper-local information and local community input, specifically for detail. Strong potential for crowd sourced data and community input.
11.3.1	Ratio of land consumption rate to population growth rate	Significant opportunity for EO technology, combined with official geospatial data and crowd sourced data.
11.7.1	Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities	Potential additional use of GI technology and crowd sourcing
15.4.2	Mountain Green Cover Index	Significant opportunity for EO technology, potentially combined with crowd sourcing. Analysis required of suitability of toolset



Indicators in initial scope

Tier III: 13

Tier III	Indicator	Logic for inclusion, other comments
1.4.1	Proportion of population living in households with access to basic services	Potential for GI technology in analysis of detailed census results. Lacks definition of “basic services” - defer
1.4.2	Proportion of total adult population with secure tenure rights to land, with legally recognized documentation and who perceive their rights to land as secure, by sex and by type of tenure	Institutional alignment: data potentially held by national cadastral agencies or land registries
2.4.1	Proportion of agricultural area under productive and sustainable agriculture	Strong focus on paper surveys in current proposals, significant opportunity for EO technology, potentially combined with crowd sourcing
4.5.1	Parity indices (female/male, rural/urban, bottom/top wealth quintile and others such as disability status, indigenous peoples and conflict affected as data become available)	Potential for GI technology in analysis of detailed census results.
5.a.1	(a) Proportion of total agricultural population with ownership or secure rights over agricultural land, by sex; and (b) share of women among owners or rights-bearers of agricultural land, by type of tenure	Institutional alignment: data potentially held by national cadastral agencies or land registries
5.a.2	Proportion of countries where the legal framework (including customary law) guarantees women’s equal rights to land ownership and/or control	Institutional alignment: data potentially held by national cadastral agencies or land registries
6.3.1	Proportion of wastewater safely treated	Will require hyper-local information and local community input, specifically for detail. Strong potential for crowd sourced data and community input. Combine collection with 6.1.1
6.3.2	Proportion of bodies of water with good ambient water quality	Significant opportunity for EO technology
6.6.1	Change in the extent of water-related ecosystems over time	Significant opportunity for EO technology, especially highly frequent micro-satellites
9.1.1	Proportion of the rural population who live within 2 km of an all-season road	Potential additional use of GI technology and crowd sourcing
14.1.1	Index of Coastal Eutrophication (ICEP) and Floating Plastic debris Density	Opportunity for EO technology
14.2.1	Proportion of national exclusive economic zones managed using ecosystem-based approaches	“Green field indicator” with very minimal current description, clear GI potential
15.3.1	Proportion of land that is degraded over total land area	Significant opportunity for reviewing the use of EO technology and official geospatial data



1.1.1 Proportion of population below the international poverty line, by sex, age, employment status and geographical location (urban/rural)

- World Bank
- Tier I
- Well established process, based on surveys and censuses
- WGGI: should we pursue a role here? Some option for GI technology in analysis of detailed census results.



1.1.1 Discussion

- The case for geospatial data or analysis is not very strong.
- Geospatial data is used to decide what is urban and what is rural. Do we still use that data in the collection and analysis process or are these usually fairly straightforward statistical processes?
- Should WGGI propose a definition of Urban/Rural?



1.4.1 Proportion of population living in households with access to basic services

- Tier III
- No agreed custodian
- No agreed definition
- WGGI: Continue to monitor, defer



1.4.2 Proportion of total adult population with secure tenure rights to land, with legally recognized documentation and who perceive their rights to land as secure, by sex and by type of tenure

- Two part indicator
 - Legally recognised documentation
 - Perception of security
- UN-Habitat and World Bank
- Tier III
- Sources proposed: administrative records, surveys, censuses (and satellite images, remote sensing??)
- WGGI: institutional alignment



1.4.2 Synergies

1.4.2 has strong synergies with:

- 5.a.1 (a) Proportion of total agricultural population with ownership or secure rights over agricultural land, by sex; and (b) share of women among owners or rights-bearers of agricultural land, by type of tenure
- 5.a.2 Proportion of countries where the legal framework (including customary law) guarantees women's equal rights to land ownership and/or control



1.4.2 Alternatives

Part (b):


Omidyar, DFID, Land Alliance and Gallup created Global Property Rights Index (<http://prindex.net>)

PRIndex. About Who we are News Projects Publications Contact

The Global Property Rights Index.


Phase 1 Surveys

The development phase of PRIndex is conducting an initial set surveys of citizens' perceptions globally with Gallup and other partners to develop the approach and baseline data. Data sets will be posted here in early 2017.




India State Survey

Data was collected from 14,000 individuals in 14 states in India in 2016. Data are representative at the state level.



10 Country Surveys

Data collection is being completed in 2016 by Gallup for nationally-representative surveys in Brazil, Colombia, Egypt, Ethiopia, Greece, India, Indonesia, Nigeria, Tanzania and Peru. Data



India mobile-phone and internet-based survey

An ongoing survey will collect data from approximately 30,000 individuals using mobile-phone and internet-based methods.



1.4.2 discussion

- Does it help that the UN-GGIM Committee of Experts are primarily representatives of NMCA's? How do we utilise that institutional alignment in the collection of this data?
- We observe strong synergies between indicators: How do we avoid duplication of work?
- Can we and should we encourage collaboration with private sector / third sector initiatives (like the PRIndex)?
- The data produced by prindex.net is open data. Should that be the norm?



1.5.1 – 1.5.3 Target 1.5: By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters

- Tier II
- Indicators measure impact of disasters:
 - 1.5.1 Number of deaths, missing persons and persons affected by disaster per 100,000 people
 - 1.5.2 Direct disaster economic loss in relation to global gross domestic product (GDP)
 - 1.5.3 Number of countries with national and local disaster risk reduction strategies



UN World Conference on
Disaster Risk Reduction
2015 Sendai Japan



1.5 Synergies

The 1.5 series indicators are equal or similar to:

- 1.5.1 is same as indicator 11.5.1/13.1.2
- 1.5.2 is almost the same as 11.5.2
- 1.5.3 is same as indicator 11.b.2/13.1.1
- 11.b.1 is a disaggregation of 1.5.3



1.5 Work Plan

- Tier III work plan: Methodology developed by OEIWG, completed December 2016. SENDAI Framework.
- Data collection methods: A comparable national disaster loss database, DesInventar. By 2020, it is expected that all countries will build/adjust national disaster loss databases according to the recommendations and guidelines of the OEIWG.
- Providers: The national government in each country takes primary responsibility in data collection and reporting in collaboration within and across levels of governments.
- Frequency: Ideally hazard-by-hazard basis, at least annually.



1.5.1 – 1.5.3 Work Plan



DESINVENTAR .org

Inventory system of the effects of disasters

[\[Home\]](#) [\[About\]](#) [\[Methodology\]](#) [\[Software\]](#) [\[Databases\]](#)

<https://online.desinventar.org>

Available databases



What is Desinventar

Until the mid-1990.s, systematic information about the occurrence of daily disasters of small and medium impact was not available in Latin America, nor in the Andean Sub-region. From 1994, the creation of a common conceptual and methodological framework was begun by groups of researchers, academicians, and institutional actors linked to the Network of Social Studies in the Prevention of Disasters in Latin America (Red de Estudios Sociales en Prevención de Desastres en América Latina - LA RED). These groups conceptualised a system of acquisition, consultation and display of information about disasters of small, medium and greater impact, based on pre-existing data, newspaper sources and institutional reports in nine countries in Latin America. The developed conceptualisation, methodology and software tool is called Disaster Inventory System - Desinventar (Sistema de Inventario de Desastres . Desinventar).

The development of Desinventar, with its conception that makes visible disasters from a local scale (town or equivalent), facilitates dialogue for risk management between actors, institutions, sectors, provincial and national governments.

Desinventar is a conceptual and methodological tool for the construction of databases of loss, damage, or effects caused by emergencies or disasters. It includes:

- Methodology (definitions and help in the management of data)
- Database with flexible structure
- Software for input into the database
- Software for consultation of data (not limited to a predefined number of consultations). with selection options for search criteria.

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DESINVENTAR

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Colombia



LA RED

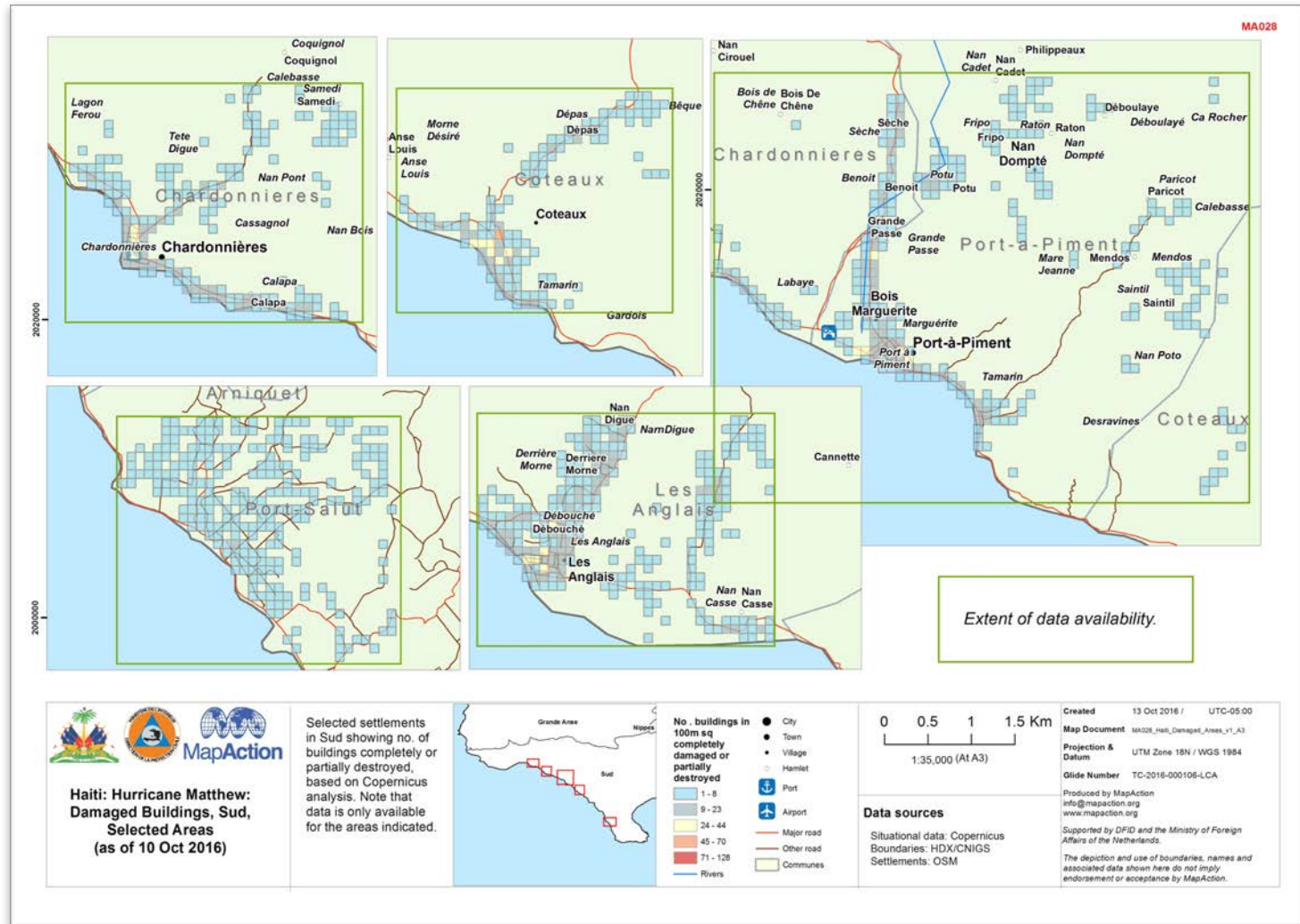


UNISDR



1.5.1 – 1.5.3 Disaster Response

Haiti, Oct. 2016:
no. of buildings
completely or
partially destroyed,
based on Copernicus
analysis



1.5.1 – 1.5.3 Discussion

- GI can play a significant role in prevention of natural disasters
 - Should the indicators be amended to focus more on prevention and disaster response?
- Should we promote collaboration with disaster response organisations?



2.4.1 Proportion of agricultural area under productive and sustainable agriculture



- Methodology Proposed by Stakeholder (FAO)
- Tier III
- Sources proposed: surveys and censuses
- WGGI: opportunities for EO, VGI and geospatial analysis



2.4.1 Work plan

- Tier III work plan: Methodological work has begun, completed by the end of 2016.
- Data collection methods: Data that are already being collected from the National Statistical System: administrative data, farm surveys (such as Agricultural Integrated Surveys, AGRIS) or similar instruments and possibly supplemented through remote sensing.
- Providers: FAO mainly harvesting existing data, validation at country level. The methodology will be piloted in selected countries. Detailed guidelines will also be developed to help support countries in their monitoring and reporting.
- Frequency: Frequency will depend on the source of data. For administrative information, data can be collected on a regular basis. For farm surveys, data will be collected according to systems that exist at country level..



2.4.1 Alternatives

- Strong focus on paper surveys in current proposals, significant opportunity for EO technology, potentially combined with crowd sourcing



2.4.1 Discussion

- What are the implications of crowd sourced data?
 - Reliability, Provenance (see quality criteria)
 - How can we overcome those limitations?
- Will require additional research on EO suitability
 - How can we promote such research?



4.5.1 Parity indices (female/male, rural/urban, bottom/top wealth quintile and others such as disability status, indigenous peoples and conflict affected as data become available)

- Tier I-II-III
- UNESCO
- WGGI: GI mainly for visualisation



4.a.1 Proportion of schools with access to: (a) electricity; (b) the Internet for pedagogical purposes; (c) computers for pedagogical purposes; (d) adapted infrastructure and materials for students with disabilities; (e) basic drinking water; (f) singlesex basic sanitation facilities; and (g) basic handwashing facilities (as per the Water, Sanitation and Hygiene for All (WASH) indicator definitions)

- Tier I-II
- UNESCO
- WGGI: GI mainly for visualisation



5.a.1 (a) Proportion of total agricultural population with ownership or secure rights over agricultural land, by sex; and (b) share of women among owners or rights-bearers of agricultural land, by type of tenure

- Tier III
- FAO/UN-Women/UNSD
- work plan: proposals made by The Evidence and Data for Gender Equality (EDGE) project, method: household survey.
- Lessons learned from the country pilots will directly inform the finalization of the methodology for indicator 5a1. Further, all NSOs will have an opportunity to comment on the guidelines (consultation planned for the period December 2016-February 2017) before they are finalised and submitted to the UN Statistical Commission in March 2017



EVIDENCE AND DATA FOR GENDER EQUALITY



5.a.1 Discussion

- Institutional alignment like 1.4.2
- Do we have role to ensure that a World Bank/UN-Habitat indicator (1.4.2) aligns efficiently with a UN-Women/UNSD/FAO indicator (5.a.1).



5.a.2 Proportion of countries where the legal framework (including customary law) guarantees women's equal rights to land ownership and/or control

- Tier III
- FAO, World Bank, UN Women
- WGGI: Institutional Alignment

- Combine efforts with 1.4.2 and 5.a.1



6.1.1 Proportion of population using safely managed drinking water services

- Tier I
- WHO, UNICEF, UN-WATER
- Currently based on surveys and censuses.
- WGGI: opportunities for EO, VGI and geospatial analysis



6.1.1 Synergies

- 6.2.1 Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water



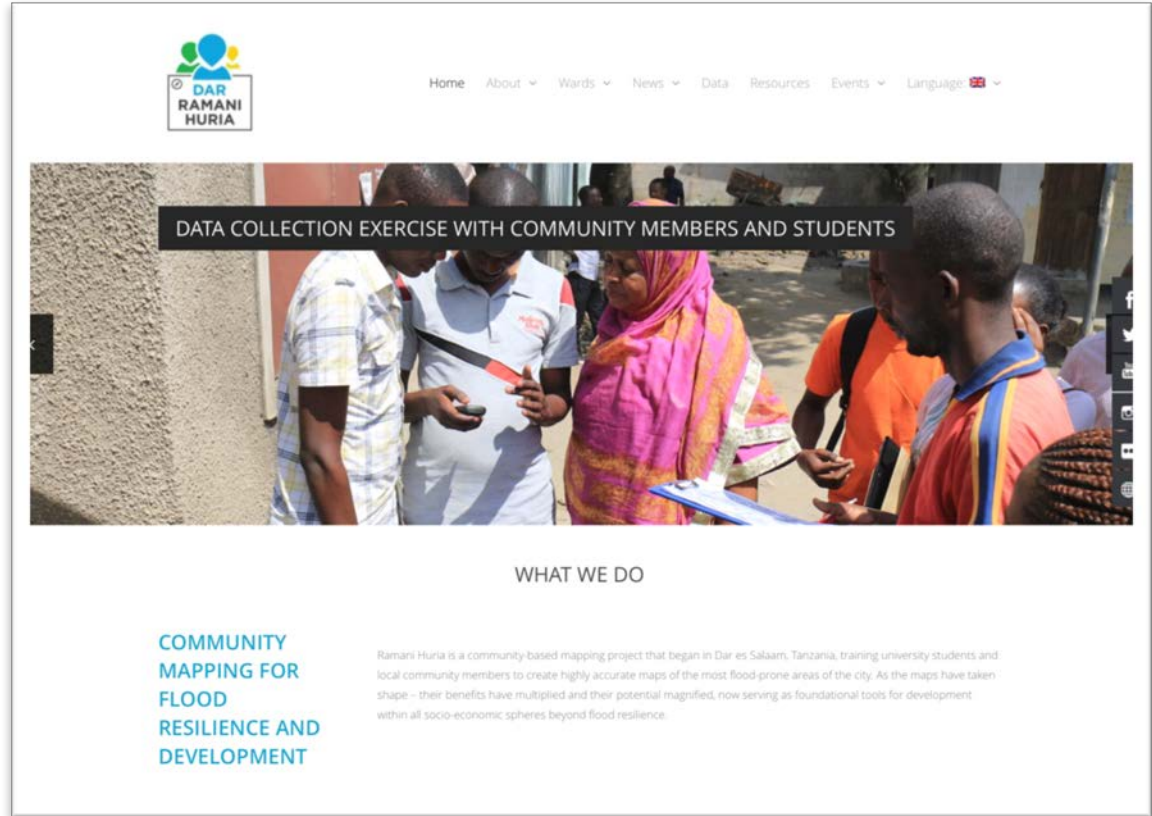
6.1.1 Alternatives

- EO settlement data overlaid with natural water sources (rivers/lakes) and industry/pollution can give an indication. However: hyperlocal pollution is an issue.
- Hyperlocal knowledge is required



6.1.1 Alternatives

Dar Ramani Huria mapped safe drinking water and hyperlocal wastewater with crowd sourced efforts (<http://ramanihuria.org>)



The screenshot shows the Dar Ramani Huria website. At the top left is the logo, which consists of three stylized human figures in blue, green, and yellow above the text 'DAR RAMANI HURIA'. To the right of the logo is a navigation menu with links for Home, About, Wards, News, Data, Resources, Events, and Language. Below the navigation is a large photograph of a group of people, including men and women, gathered around a smartphone. A black banner with white text 'DATA COLLECTION EXERCISE WITH COMMUNITY MEMBERS AND STUDENTS' is overlaid on the photo. Below the photo is the heading 'WHAT WE DO'. Underneath this heading, on the left, is the text 'COMMUNITY MAPPING FOR FLOOD RESILIENCE AND DEVELOPMENT'. On the right, there is a paragraph of text: 'Ramani Huria is a community-based mapping project that began in Dar es Salaam, Tanzania, training university students and local community members to create highly accurate maps of the most flood-prone areas of the city. As the maps have taken shape – their benefits have multiplied and their potential magnified, now serving as foundational tools for development within all socio-economic spheres beyond flood resilience.'



Humanitarian
OpenStreetMap
Team

6.1.1 Discussion

- VGI / Crowd sourced data / community projects: how can they help?
- Detailed recording of sanitation/wastewater/water flows etc can play a strong role in awareness and prevention. Should we include this in the metadata?



6.3.2 Proportion of bodies of water with good ambient water quality

- Tier III
- WGGI: opportunity for EO technology



6.3.2 Discussion

- Certain EO technologies are still under development or will require additional research



6.6.1 Change in the extent of water-related ecosystems over time

- Tier III
- Significant opportunity for EO technology, especially highly frequent micro-satellites
- Ramsar Sites Information Service (<http://rsis.ramsar.org>)



6.6.1 Opportunities

Frequent monitoring
with microsattellites



6.6.1 Discussion

- Are there indicators that warrant more frequent monitoring?

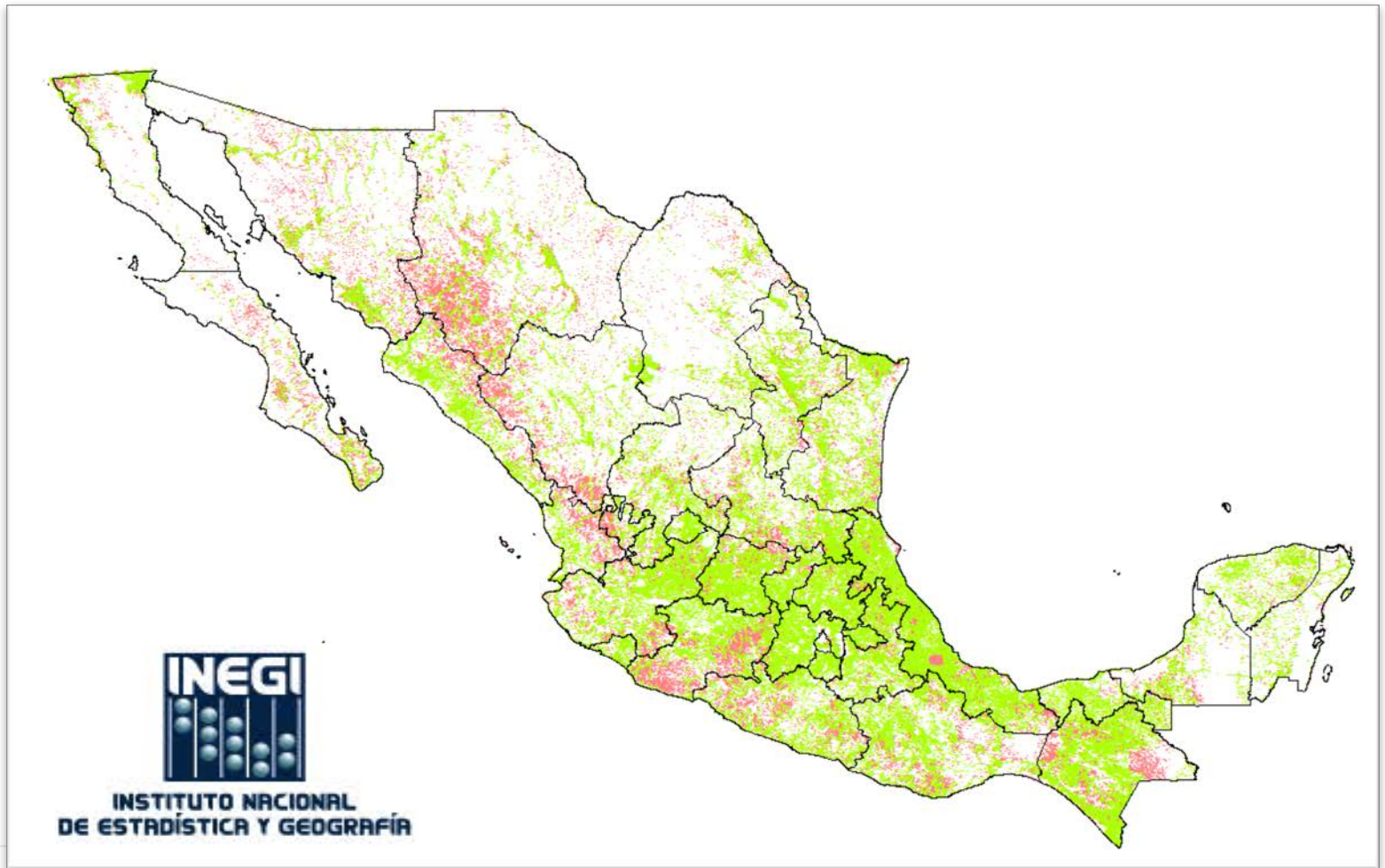


9.1.1 Proportion of the rural population who live within 2 km of an all-season road

- Tier III
- Potential additional use of EO technology and crowd sourcing
- Draft methodology developed by World Bank



9.1.1 Methodology



9.1.1 Methodology

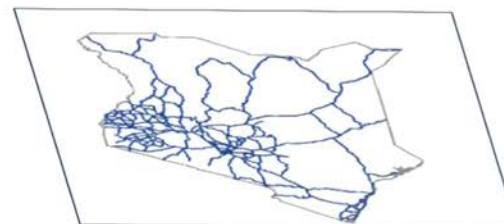
Where do rural people live?

Censuses, but new global population datasets available e.g. WorldPop, Landscan of OakRidge, GRUMP (rural population, by CEISN)



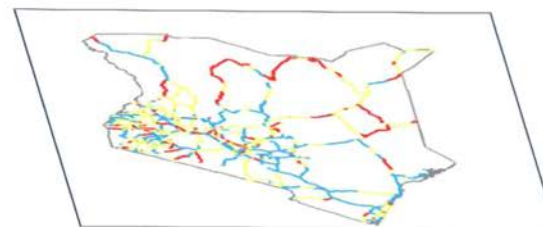
Where are roads?

Georeferenced road network: government datasets, supplemented with other mapping sources e.g. Openstreetmap.



Are they in good condition?

Data available, but fragmented: road asset management systems, road inventory surveys. Weakest area, possible to supplement with satellite data, other tools e.g. RoadLab app.



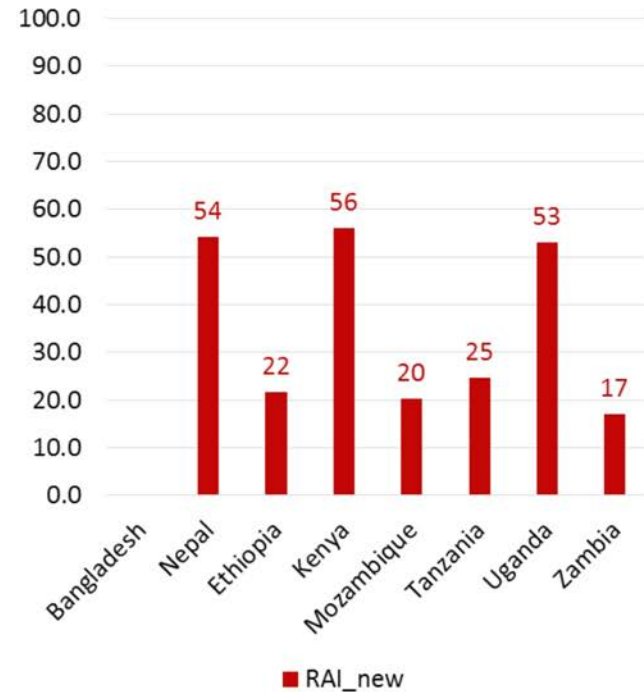
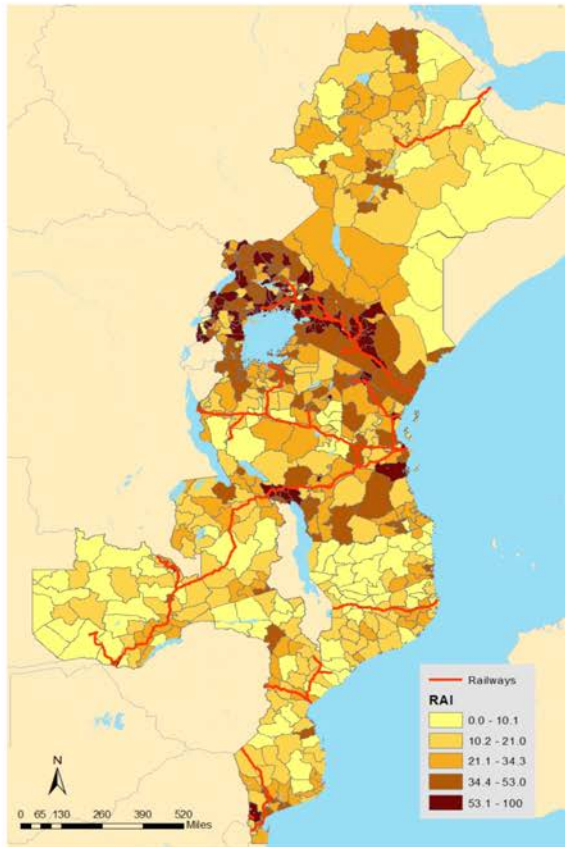
Combine these datasets with GIS

GeoData Institute
UNIVERSITY OF
Southampton



9.1.1 Results

Provides national and sub-national estimates: very important for planning road investments



9.1.1 Discussion

- Clear link with investments into improvement: how do we ensure monitoring is not its own goal
- How do we get NMCA's to provide data to these efforts?
- At the WB this is still clearly a pilot: should we actively support pilots or always aim straight for a permanent solution?



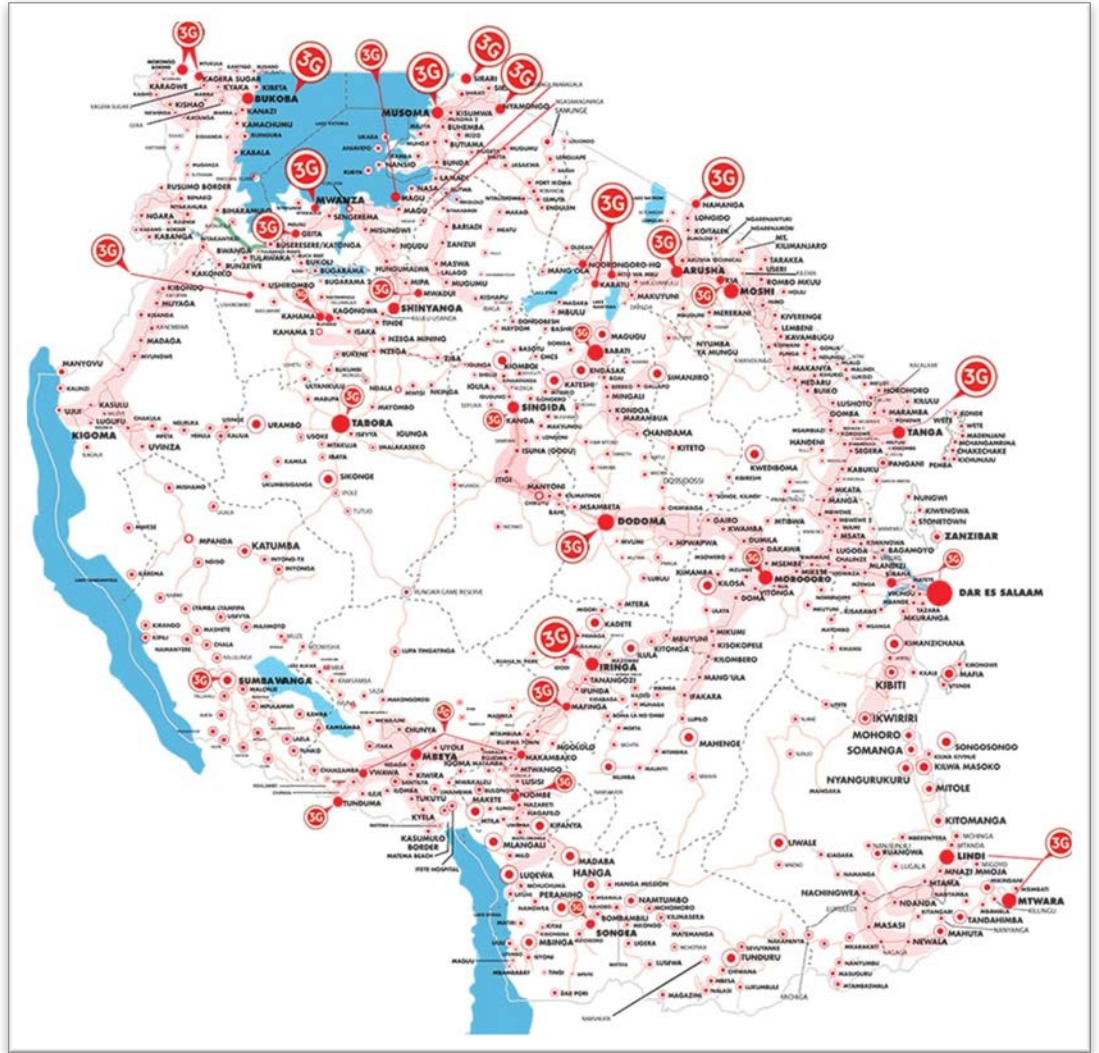
9.c.1 Proportion of population covered by a mobile network, by technology

- Tier I
- Methodology: surveys and censuses, well established
- Potential additional use of GI technology, crowd sourcing and use of network operator's data
- Potential use of sensors



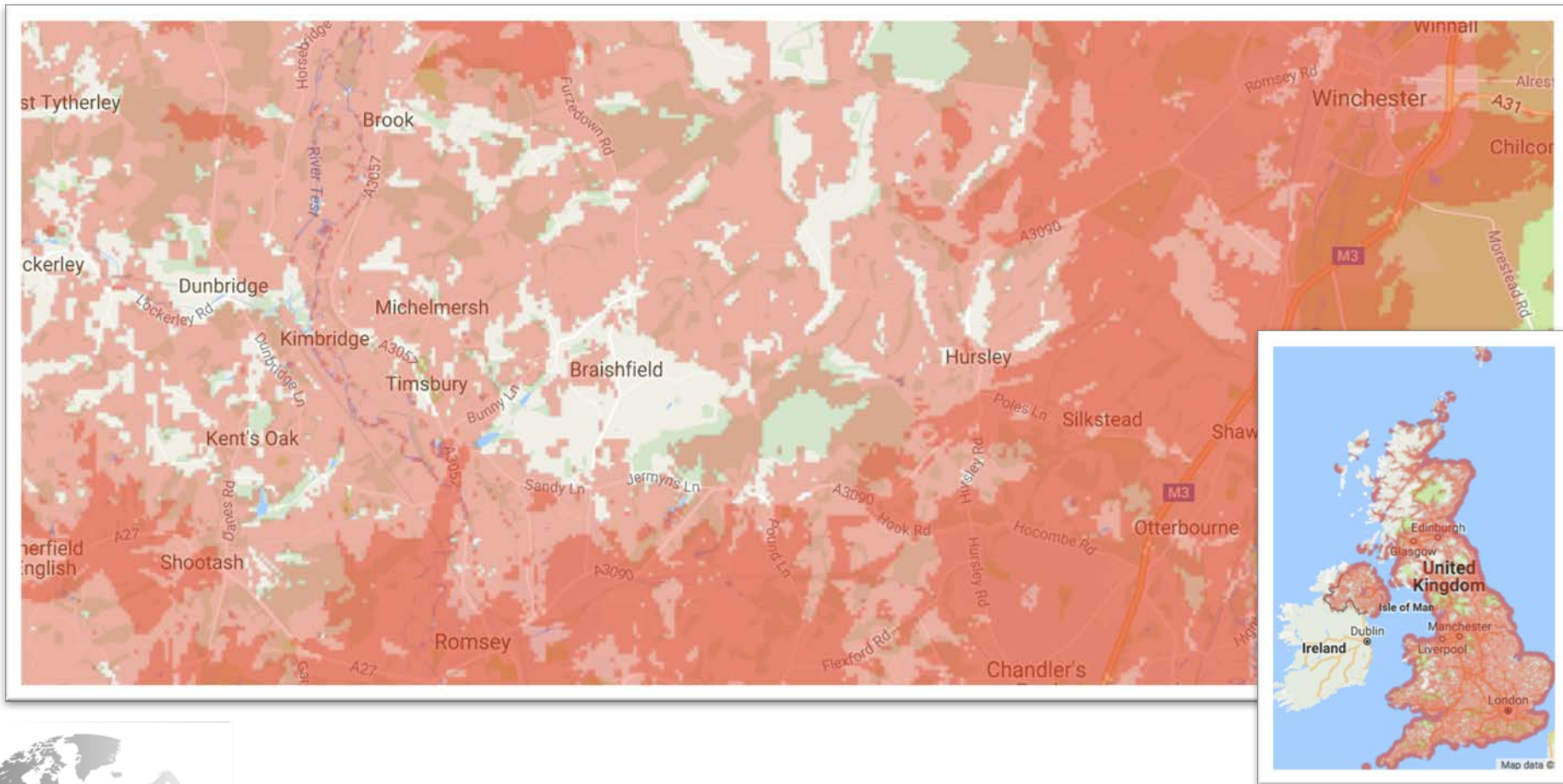
9.c.1 Real impact of location

Tanzania



9.c.1 Real impact of location

The UK has 99% coverage, yet many villages have poor connection



9.c.1 Discussion

- Most mobile operators use network coverage (geospatial) data for customer service and network planning. Should we strive that this data is made available?



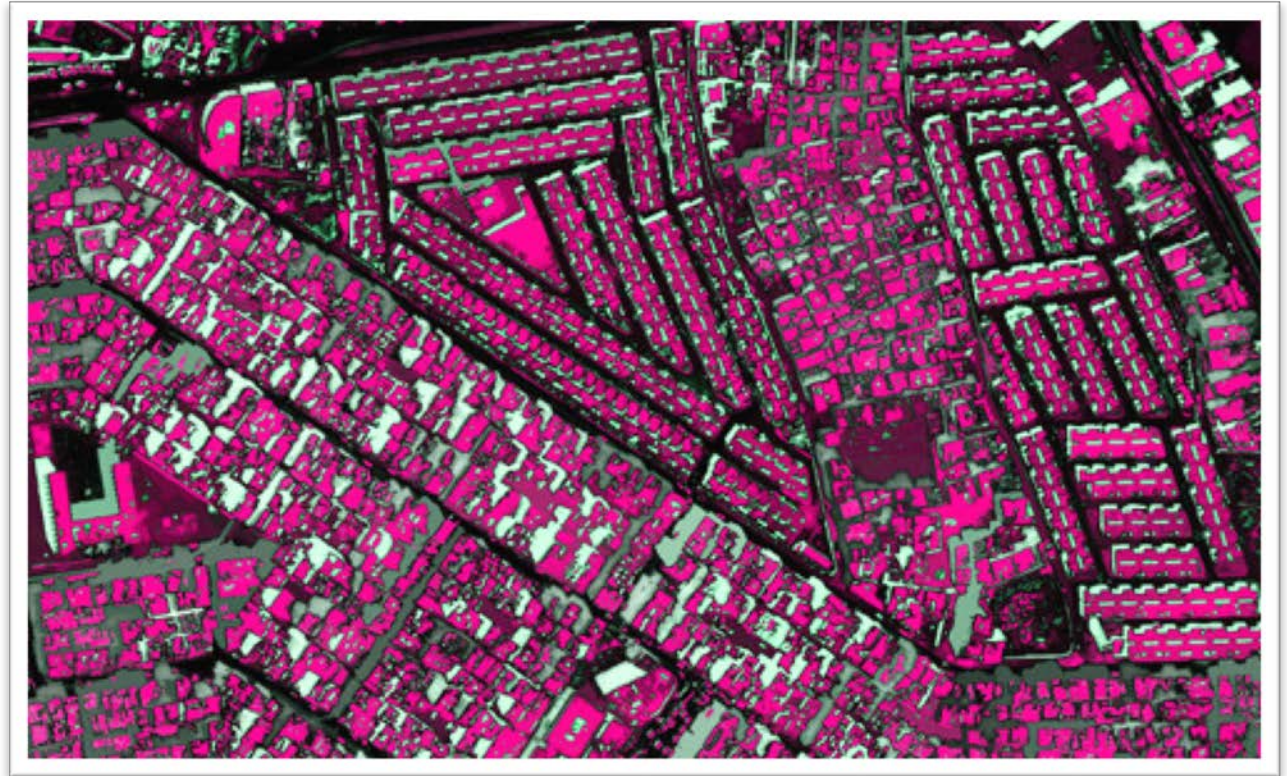
11.1.1 Proportion of urban population living in slums, informal settlements or inadequate housing

- Tier I
- UN-Habitat
- Methodology: surveys and censuses
- WGGI: EO settlement data augmented with hyper-local information and community input



11.1.1 Solutions

Overlay EO data
with official geodata



11.1.1 Change detection



Targeted surveys



11.2.1 Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities

- Tier II
- UN Habitat
- Methodology: surveys, geospatial data, geospatial analysis
- Data availability: limited
- WGGI: strong geospatial link; will require hyper-local information and local community input, specifically for detail



11.2.1 Alternatives

Collaboration with private sector.

ITO World is strongly rooted in open data community



Home Products ▾ Our Work ▾ About Us ▾ Contact Login

Ito Transit Data

Ito World. Data in Motion

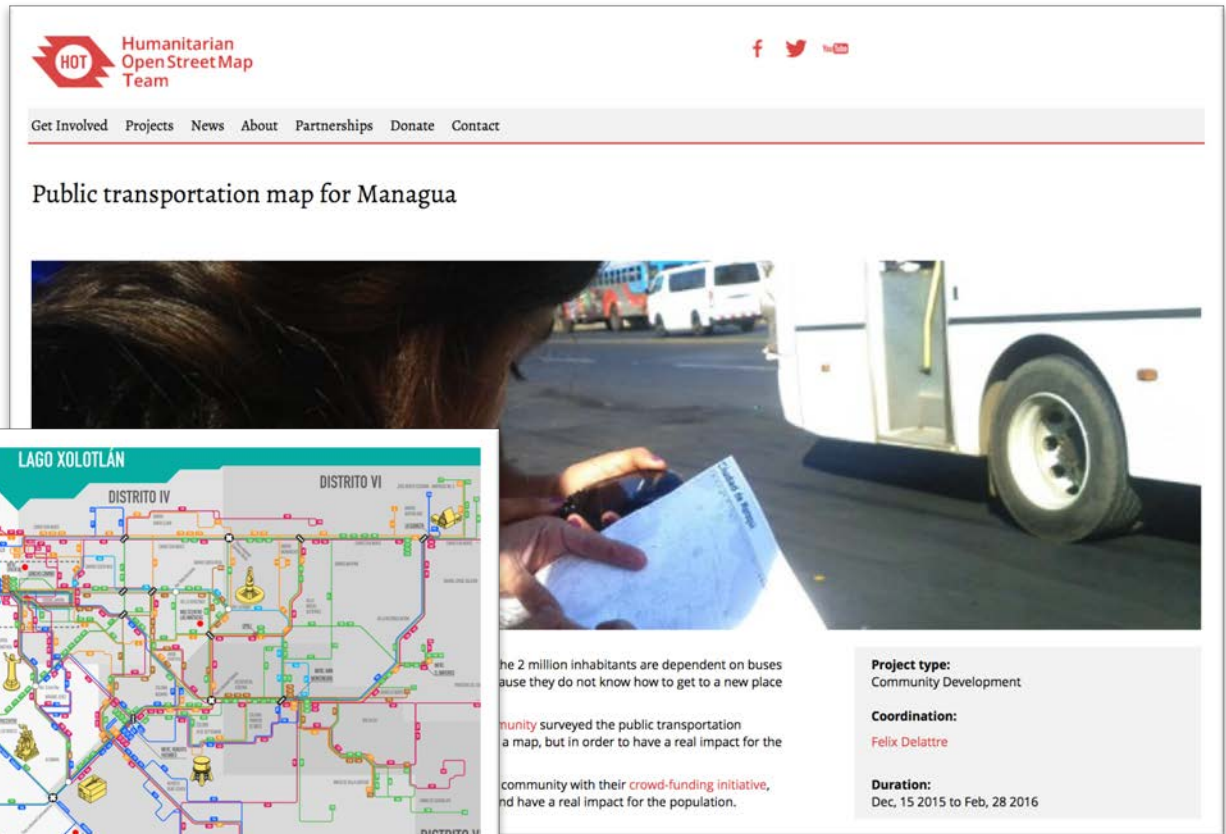
Better public transport information, for everyone

We provide high quality, schedule and real-time public transit data that is comprehensive, enhanced and accurate. Our data powers leading journey planning and navigation applications, and underpins urban mobility solutions used by millions of travellers.



11.2.1 Alternatives

HOTOSM project in Managua: also available as geospatial data



The screenshot shows the website for the Humanitarian Open Street Map Team. The header includes the HOT logo and the text "Humanitarian Open Street Map Team" along with social media icons for Facebook, Twitter, and YouTube. A navigation menu contains links for "Get Involved", "Projects", "News", "About", "Partnerships", "Donate", and "Contact". The main heading reads "Public transportation map for Managua". Below the heading is a photograph of a person looking at a smartphone, with a white bus in the background. To the left of the photo is a detailed, colorful map of Managua's public transportation routes, divided into six districts (DISTRITO I to DISTRITO VI) and labeled "LAGO XOLOTLAN". The map includes a legend with categories such as "CATEGORIAS" (Buses, Taxis, etc.) and "PUNTOS DE TRANSBORDO IMPORTANTES" (Important Transfer Points). A table at the bottom lists various bus lines and their routes, including "GANCHO DE CAMINO", "LINDA JETA", "PLAZA INTER", "METROCENTRO", and "MERC. MAYORADO".

Project type:
Community Development

Coordination:
Felix Delattre

Duration:
Dec, 15 2015 to Feb, 28 2016



11.3.1 Ratio of land consumption rate to population growth rate

- Tier II
- UN-Habitat
- WGGI: EO opportunities, Geospatial processing



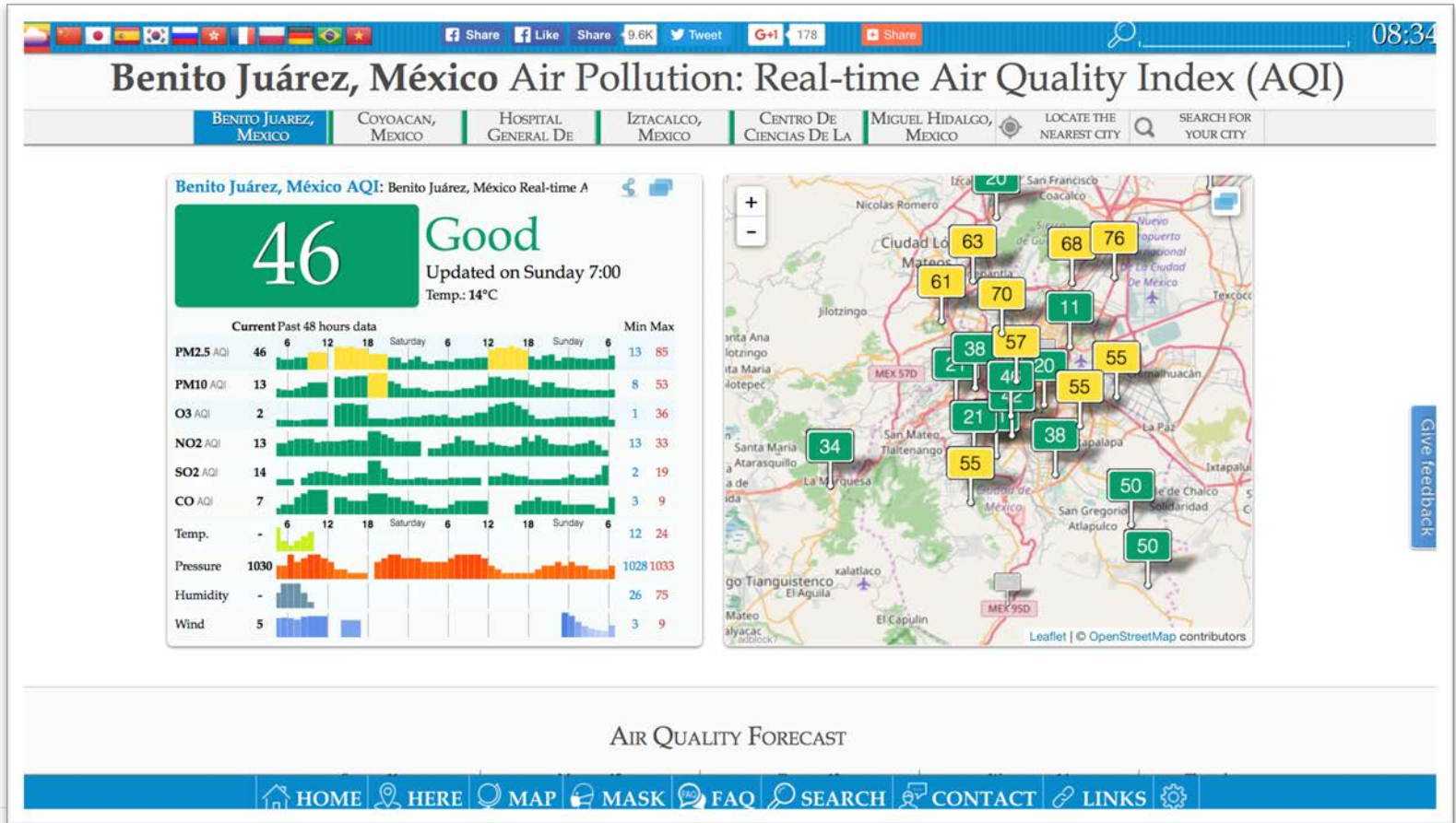
11.6.2 Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)

- Tier I
- World Health Organisation
- Existing methodology, may need to be reviewed on currency.
- WGGI: Can citizen science assist?



11.6.2 Alternatives

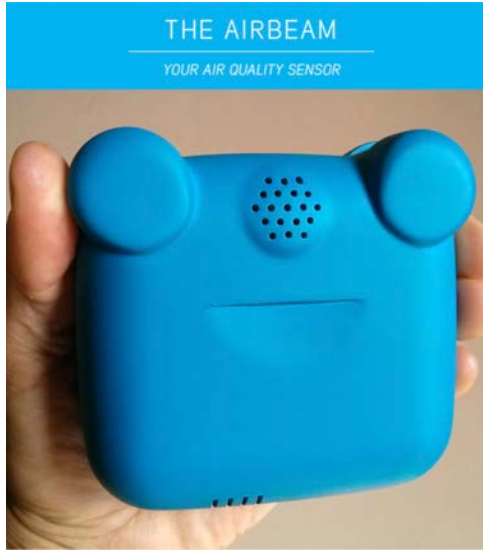
Citizen Science: the World Air Quality Index project



<http://aqicn.org>



11.6.2 Alternatives



smartcitizen.me

<p>Plantower PMS 7003 Laser based PM_{2.5}/PM₁₀ sensor 20USD (130CNY)</p> 	<p>Plantower PMS 5003 Laser based PM_{2.5}/PM₁₀ sensor 18USD (120CNY)</p> 	<p>Plantower PMS 3003 Laser based PM_{2.5}/PM₁₀ sensor 14USD (90CNY)</p> 	<p>Plantower PMS 1003 Laser based PM_{2.5}/PM₁₀ sensor 14USD (90CNY)</p> 
<p>Plantower PMS A003 Laser based PM_{2.5}/PM₁₀ sensor 24USD (160CNY)</p> <p><i>Coming soon</i></p> 	<p>Novafitness SD011 Laser based PM_{2.5}/PM₁₀ sensor 23USD (150CNY)</p> 	<p>Novafitness SD018 Laser based PM_{2.5}/PM₁₀ sensor 19USD (128CNY)</p> <p><i>Coming soon</i></p> 	<p>Novafitness SD021 Laser based PM_{2.5}/PM₁₀ sensor 23USD (155CNY)</p> 
<p>Yuntong YT-001 Laser based PM_{2.5}/PM₁₀ sensor 20USD (130CNY)</p> 	<p>Sharp DN7C3JA001 Virtual Impactor for Sharp GP2Y1051AU0F 20USD (135CNY)</p> <p><i>Coming soon</i></p> 	<p>Shinyei PPD42NS LPO Optical PM sensor 5USD (35CNY)</p> 	<p>Samyoung DSM501 LPO Optical PM sensor 4USD (24CNY)</p> 
<p>Modified Shinyei PPD42NS Analog Optical PM sensor 5USD (35CNY)</p> 	<p>Dylos DC1100 Laser based PM_{2.5}/PM₁₀ integrated monitor 300USD (2000CNY)</p> 	<p>Alphasense OPC-N2 Laser based PM_{2.5}/PM₁₀ sensor 500USD (3333CNY)</p> <p><i>Coming soon</i></p> 	



11.6.2 Discussion

- Can citizen science assist in monitoring?
 - Accuracy
 - Reliability
 - Political expedience



11.7.1 Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities

- Tier II
- UN Habitat
- Methodology: strong base of geospatial information
- Data: data availability is an issue
- WGGI: Potential additional use of crowd sourcing



11.7.1 Progress



11.7.1 Discussion

- Best practice examples and knowledge sharing



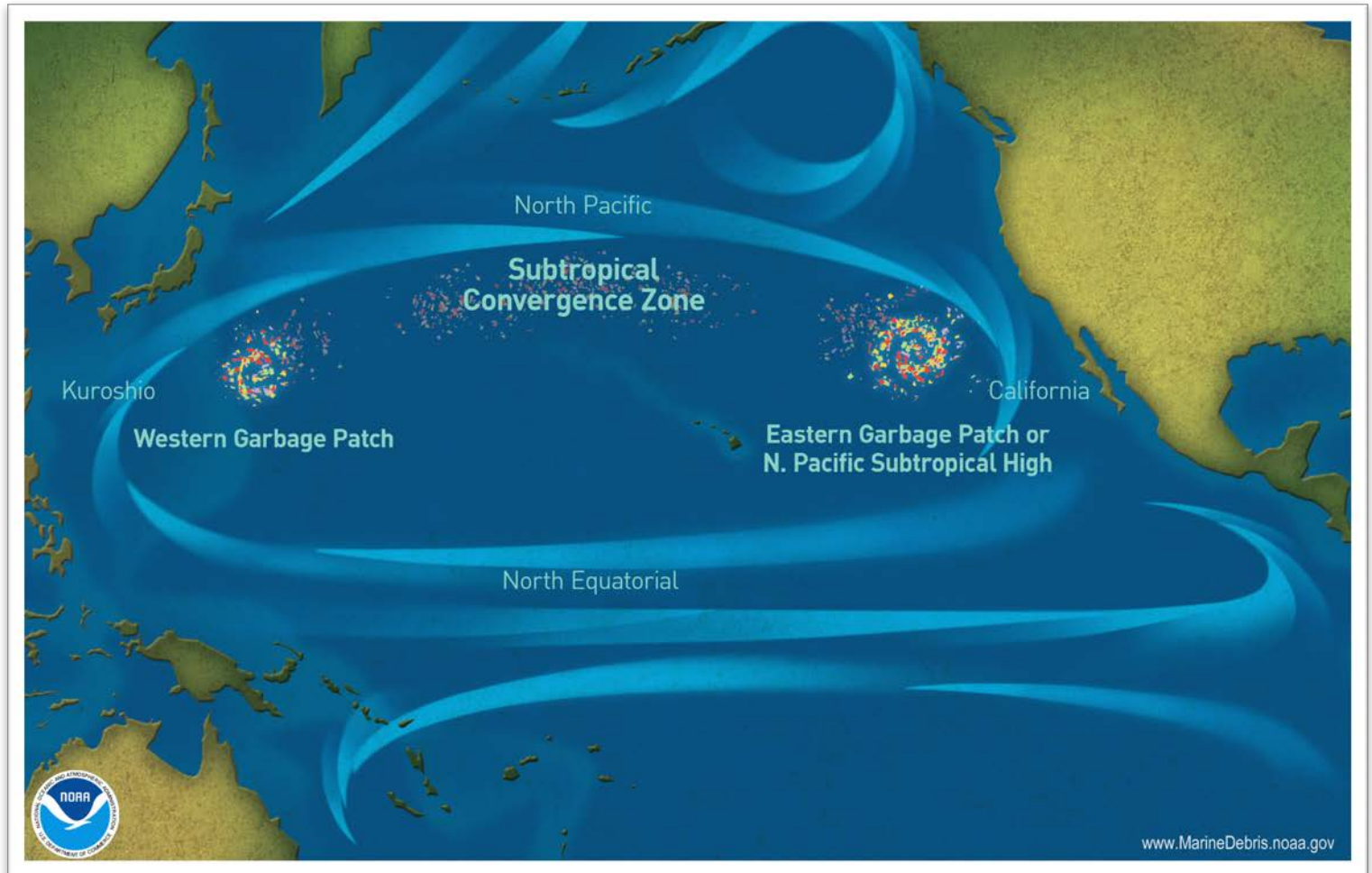
14.1.1 Index of Coastal Eutrophication (ICEP) and Floating Plastic debris Density



- Tier III
- UNEP
- Most debris consists of small plastic particles suspended at or just below the surface, making it difficult to accurately detect by aircraft or satellite.
- Tier III work plan: An ongoing discussion is led by the University of Hawaii and NASA involving e.g. UNEP on **remote sensing technologies** that could be relevant for marine litter. The methodology on beach litter will be ready by 2017, and the final indicator on Floating Plastics debris Density will be made ready by 2020.



14.1.1 Work Plan



14.1.1 Discussion

- “work on methodology until 2020”: should we strive for quicker results



14.2.1 Proportion of national exclusive economic zones managed using ecosystem-based approaches



- Tier III
- UNEP
- Work plan: Identification and validation of markers to assess implementation of ecosystem-based management frameworks building on existing national plans related to integrated coastal zone management, marine spatial planning, marine protected areas, marine resource management plans and other related area-based management initiative. In a second step, the development of spatially derived tracking system to assess changes in national/regional adoption and implementation of agreed defined principles of ecosystem approach.
- Work on methodology until 2020.
- Data collection: proposed reporting on national progress towards Regional Seas ICZM protocols; need marker of actual implementation of ICZM plans.
- Inputs will be required from other maritime sectors, e.g. fisheries (FAO), transport (IMO), national planning agencies.



14.2.1 Discussion

- “work on methodology until 2020”: should we strive for quicker results



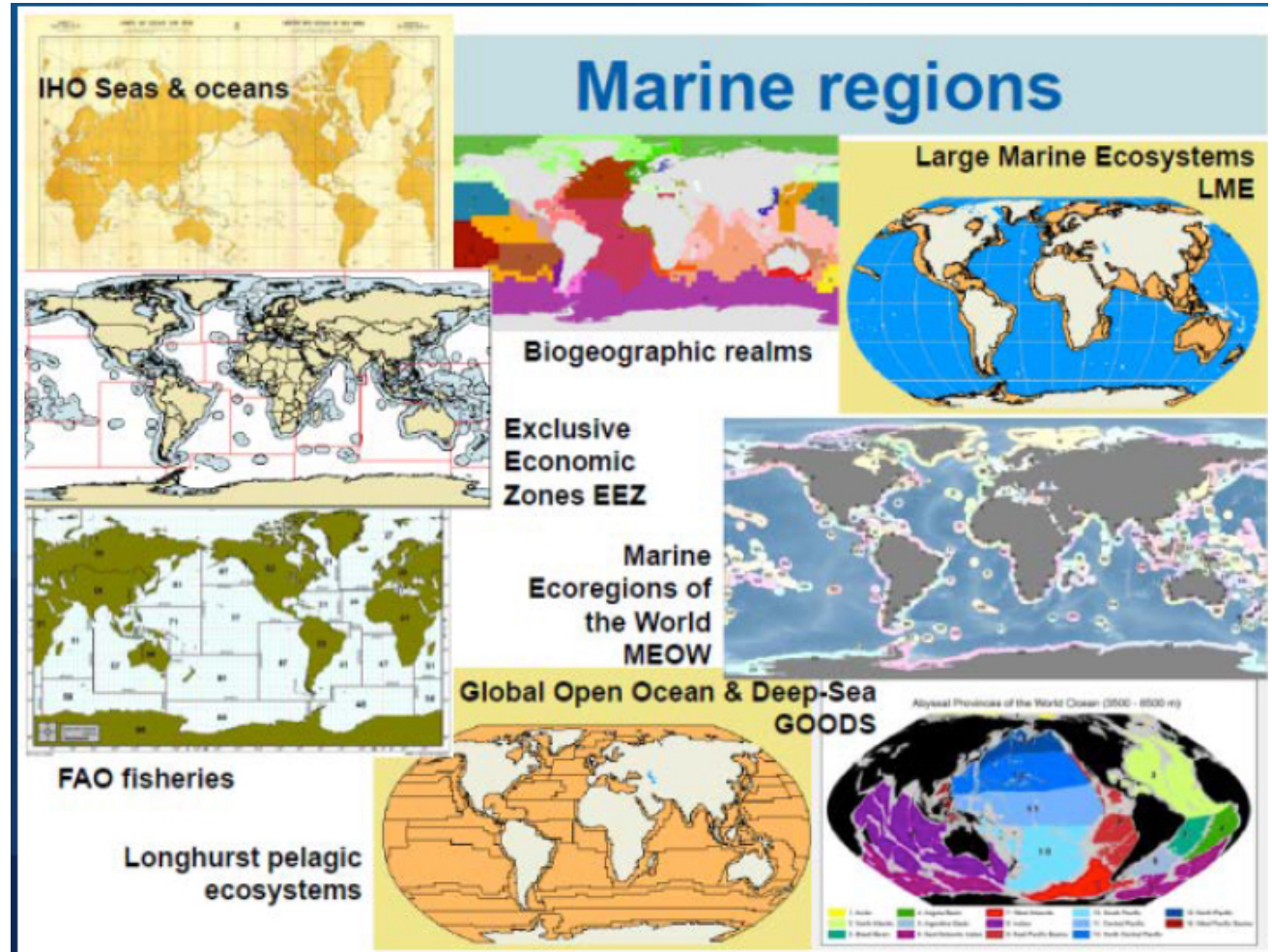
14.5.1 Coverage of protected areas in relation to marine areas

- Tier I
- Potential additional use of GI technology, sharing data collection and additional EO data



14.5.1 Data sources

Many existing data sources in the marine field



14.5.1 New initiatives

Ecological Marine Units

Main Educate Research Collaborate

How EMU's work

EMUs are comprised of an aggregation and computation of an unprecedented 3D point mesh framework spanning 52 million points and global measurements of six key variables over a 50-year period of the ocean's water column. To build the EMUs, climatology data was extracted at 1/4° by 1/4° (approximately 27 km x 27 km at the equator) intervals at variable depths before being spatially analyzed and clustered using a multivariate statistical method and then verified by leading oceanographers. The result is a standardized, rigorous, and ecologically meaningful set of ocean ecosystem units which may be used as a basemap alongside an organization's own GIS overlays for climate change impacts studies, biodiversity priority-setting, economic and social valuation studies, research, and marine spatial planning.

Public Private Partnership



14.5.1

- Sometimes new initiatives seem to be capturing new insights, leading to true global (independent from national) insights. Should we encourage those?
- Public Private Partnerships may speed up processes



15.1.1 Forest area as a proportion of total land area

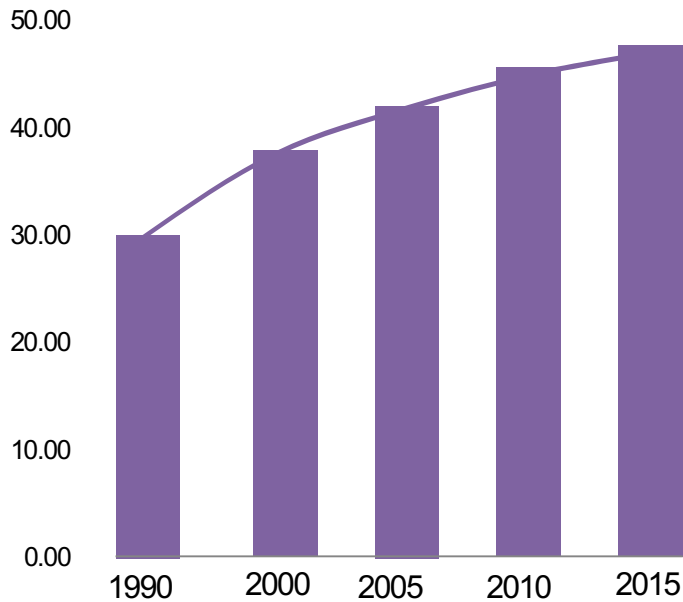
- Tier I
- FAO
- Current methodology based on EO
- More current data sources are available with more modern EO technologies. Current methodology leads to potentially incorrect results



15.1.1 Quality issues

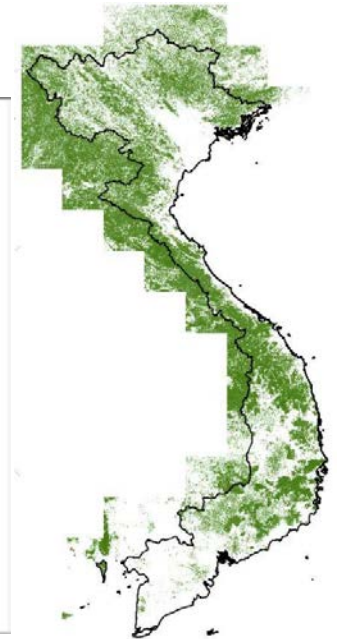
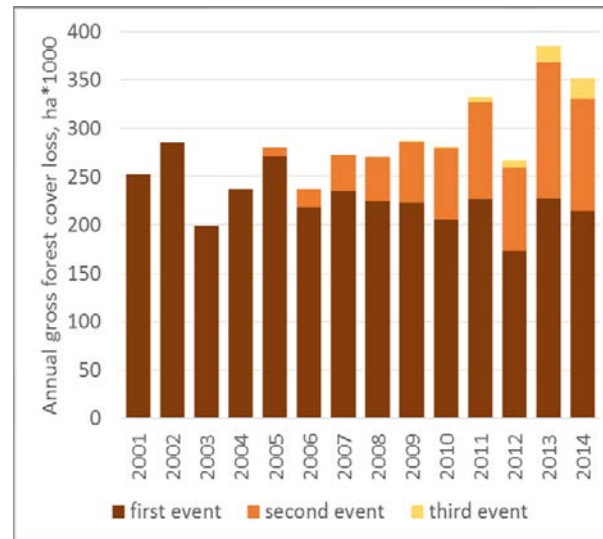
Different methodologies give very different results

15.1.1 Forest area as a proportion of total land area



VS

Total annual gross forest cover loss
2001-2014: **3.2 million ha.**



<http://unstats.un.org/sdgs/indicators/database/?indicator=15.1.1>

Credit: Matthew C. Hansen, Univ. Maryland, et al.



15.1.1 Discussion

- Should we review methodologies if they appear to be developed for different purposes?



15.1.2 Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type

- Tier I
- UNEP
- Similar to 14.5.1



15.3.1 Proportion of land that is degraded over total land area



- Tier III
- UNCCD (UN Convention to Combat Desertification)
- WGGI: Significant opportunity for the use of EO technology and official geospatial data: LU/LC



15.4.1 Coverage by protected areas of important sites for mountain biodiversity

- Tier I
- Similar to 14.5.1



15.4.1 Education

A story map

Explore a Tapestry of World Ecosystems

Sierra Del Carmen MEXICO

Bioclimate: Warm Semi-Dry
Landform: Breaks/Foothills
Rock Type: Siliclastic Sedimentary Rock
Land Cover: Mosaic Vegetation/Cropland
Return to Ecological Land Unit map

Most of the Sierra del Carmen area is warm and semi-dry, and dominated by breaks, foothills, and siliclastic sedimentary rock. It consists of a mosaic of vegetation with some cropland.

POWERED BY esri
Esri, GEBCO, DeLorme, NaturalVue | Source: USGS, Es...

<http://esriurl.com/elu>



15.4.2 Mountain Green Cover Index

- Tier II
- FAO
- Methodology: strong focus for a specific toolset (Collect Earth), based on Google Earth technology
- Significant opportunity for EO technology, potentially combined with crowd sourcing. Analysis required of suitability of toolset



15.4.2 Toolset & Data

Collect Earth toolset: (risk: Google Earth API “end of life” by 31/12/2016)

The screenshot displays the Collect Earth toolset interface. On the left, there is a search bar and a 'Places' list containing 'My Places' (Sightseeing Tour) and 'Temporary Places' (Collect Earth Data, demodylandsmonitorin, grid_0.csv). Below this is a 'Layers' panel with various map layers like 'Primary Database', 'Voyager', 'Borders and Labels', 'Places', 'Photos', 'Panoramio', '360 Cities', 'Roads', '3D Buildings', 'Ocean', 'Weather', 'Gallery', 'Global Awareness', and 'More'. The main map area shows a satellite image with a yellow grid of 25 sampling points. A 'Next' button is visible in the bottom right of the map area. On the right, a configuration panel titled 'Elements(A)' is open, showing options for 'Vegetation' and 'Water bodies'. The 'Vegetation' section includes a table with columns for 'Vegetation type' and 'Vegetation cover', with values set to 0% for Tree, Shrub, Palm, Bamboo, and Crop. The 'Water bodies' section includes a table with columns for 'Water body' and 'Water body cover', with values set to 0% for Lake and River. The 'opentopos COLLECT EARTH' logo is at the bottom of the panel.

Vegetation type	Vegetation cover
Tree	0%
Shrub	0%
Palm	0%
Bamboo	0%
Crop	0%

Water body	Water body cover
Lake	0%
River	0%



15.4.2 Discussion

- Methodology leans on specific toolkit: Collect Earth:
 1. Provenance of Google data is unknown (how old is the data that is used?)
 2. Google Earth API “end of life” announced for end of 2016
- Q: is the toolkit important or should the focus be on the quality of the data?



SUMMARY



Custodians (14)



Indicators in scope

For discussion in breakout groups



Discussion Topics

1. Review the “short list” of the indicators as presented and suggested and discuss how GI helps, supports, informs the indicators.
2. Is the list appropriate, or should others be considered? Can we agree on a first definitive list? Can we reach a landing point?
3. How should we approach them? Tier III or what?
4. What are the first 5-10 low hanging ones that we should target for best examples?
5. Do we have the required methodologies, or do they need to be evaluated, established, and modified/improved?
6. Who do we need to partner with to achieve them?
7. Do we consider levels of data aggregation and disaggregation? How?
8. Periodicity of data – baselines, synthesis, refresh rates, annual, biennial, etc.
9. Do we have the data? Is it consistent – national, global, a mix?
10. What data resolution, accuracy, currency is required?
11. Where do we get the data from? By when?
12. Are we able to provide more rigor to the process?



Group 1

- Sweden (co-Chair): Ms Marie Haldorson
- Botswana: Mr. Thapelo Maruatona
- France: Mr. Frederic Vey
- Uganda: Mr. Justus Bernard Muhwezi
- INEGI, Mexico: Ms Ana de Lara
- UN-GGIM: Europe (Germany): Mr. Pier-Giorgio Zaccheddu
- GEO: Mr. Giovanni Rum
- Wageningen University: Mr. Martin Herold
- INEGI, Mexico: Jose Luis Ornelas



Group 2

- Denmark: Mr. Olav Eggers
- Cabo Verde: Mr. Clodomir Pereira
- Colombia: Mrs. Sandra Liliana Moreno Mayorga
- South Africa: Lawrence Modise
- INEGI, Mexico: Mr. Eduardo de la Torre
- UN-GGIM: Asia Pacific (China): Dr. Chen Jun
- GEO: Mr. Bill Sontag
- INEGI, Mexico: Jesarela Lopez



Group 3

- UN-GGIM: Americas: Mr. Tim Trainor
- Brazil: Mr. Claudio Stenner
- Germany: Mr. Stephan Arnold
- Jamaica: Mr. Mirko Morant
- UN-GGIIM: Africa (Ethiopia): Mr. Sultan Mohammed Alya
- GEO: Dr. Chu Ishida
- Hong Kong Polytechnic University: Prof. John Shi
- IMEGI Mexico: Arturo Flores



Materials

- Documentation:
 - Document on Scope
 - Document on Quality Criteria
 - Document with Issues / Discussion topics raised
- Flipcharts, paper, etc



Discussion Outcomes

- Scope (5-6 primary and others)
- Examples & best practice
- Opinion
- Programme
- Activities/Tasks (who, what, when)
- Planning

