Measuring Deqing's Progress towards 2030 SDGs

with Statistical and Geospatial Information

Jun Chen[1,2]

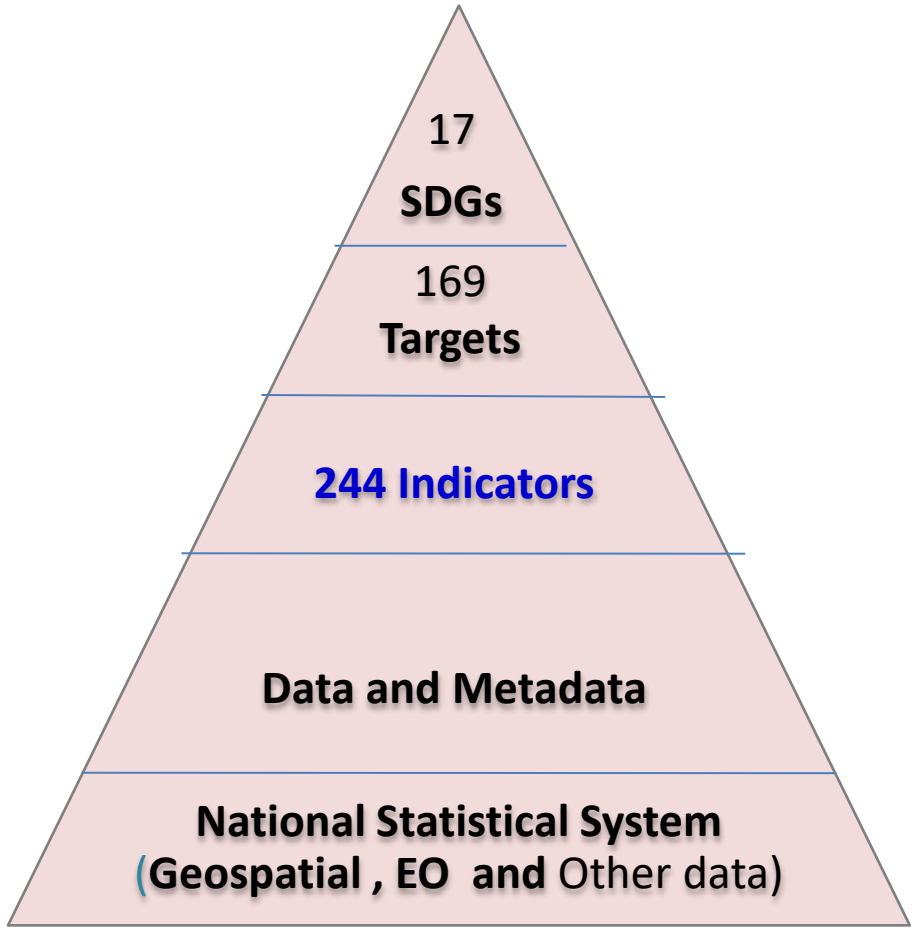
[1] National Geomatics Center of China

[2] ISPRS

April 3， 2019, Amsterdam, Neitherlands

How to Measure Progress towards SDGs

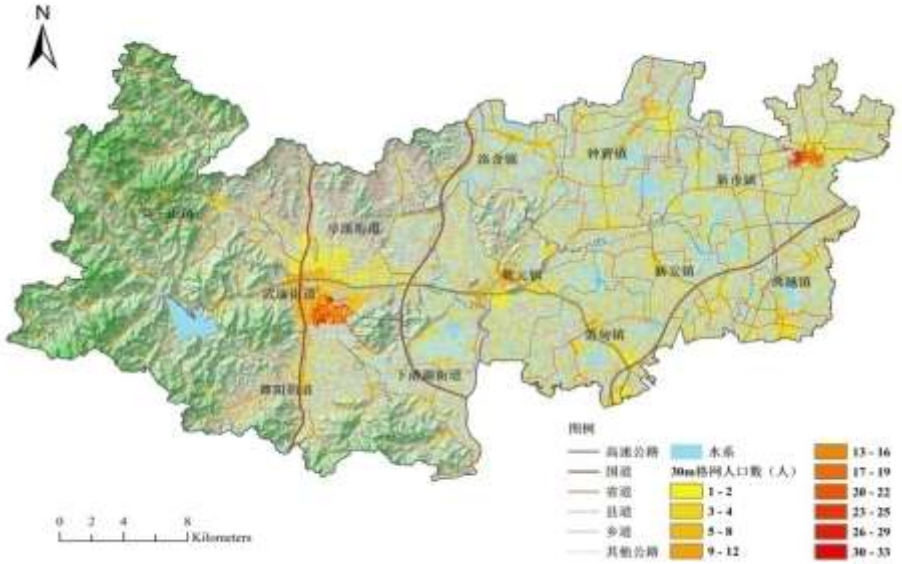
A crucial task for national / local governments in implementing 2030 Agenda



- UN called upon an indicator-based monitoring by combining geo-statistical data
- Current status
  - More in theoretical/concept than in practical
  - Some individual indicators studied
  - Lack of comprehensive efforts
- **Pilot studies needed**

A Pilot Project by China at a County Level

Deqing county, the venue of the first UN World Geospatial Information Congress (Nov.19-21,2018)



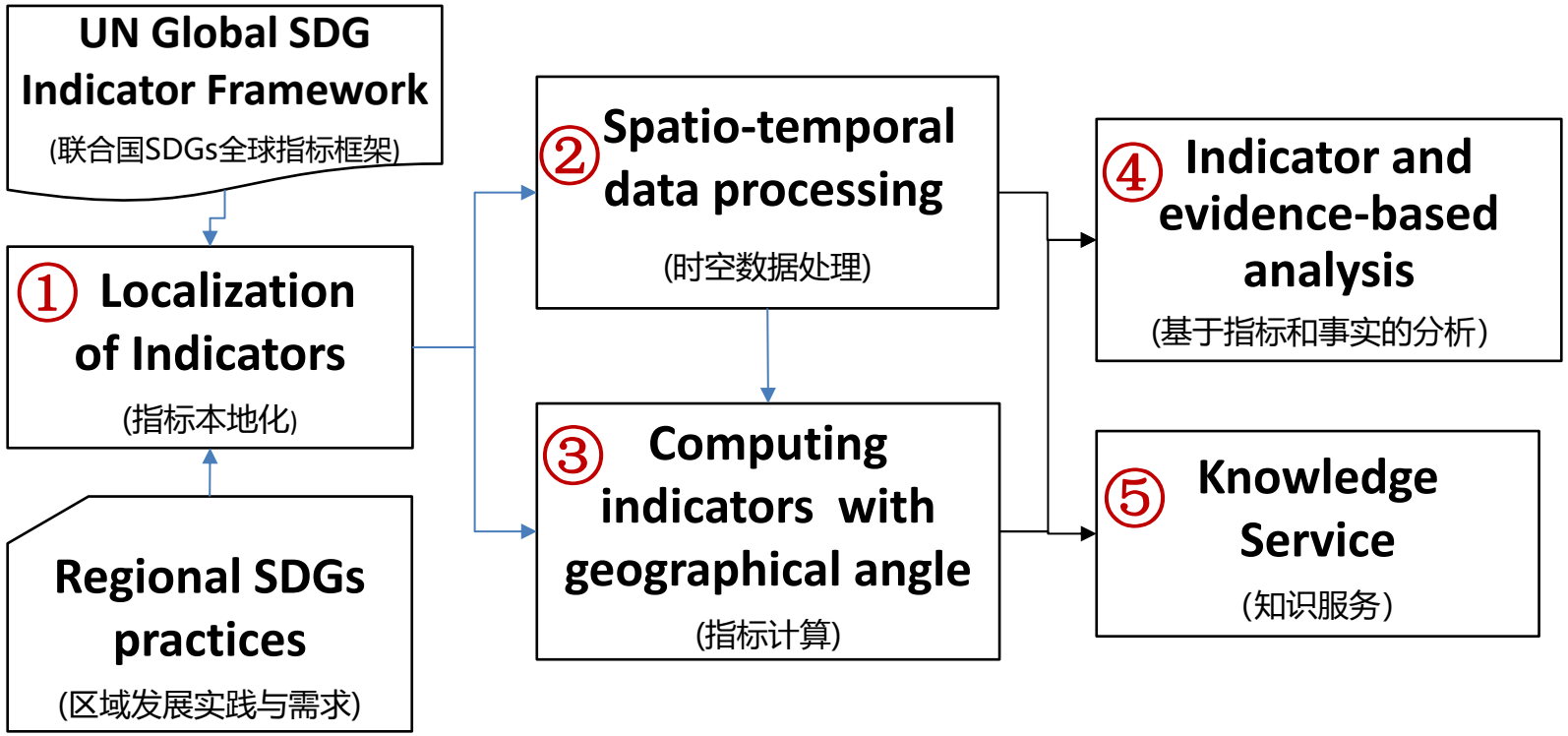
- 937.92 Km^2
- 430,000 permanent habitants
- GDP 6.91 billion US Dollars in 2017

Deqing county (德清县)

- Sustainable development concepts well accepted and implemented
- Geospatial and statistical information resources well established

A Comprehensive Measurement

In line with UN Global SDG Indicator framework and by combining geo-statistical data



① 102 SDGs Indictors Selected for Deqing

■ Examined all 232 indicators of UN SDG Global indicator framework

Three Principles

- Suits local circumstance
- Enables international and national comparison
- Data availability

A	Adopted	47
E	Extended	6
R	Revised	42
S	Substituted	7

SDG	UN	Deqing	
1	14	**5**	1.1.1；1.3.1；1.4.1；1.a.1；1.b.1
2	13	**7**	2.1.2；2.1.2；2.2.1；2.3.2；2.4.1；2.a.1；2.c.1
3	27	**15**	3.1.1；3.1.2；3.2.1；3.2.2；3.3.1；3.3.2；3.3.3；3.3.4；3.4.1；3.6.1；3.7.1；3.8.1；3.b.1；3.b.2；3.c.1
4	11	**8**	4.1.1；4.2.2；4.3.1；4.4.1；4.5.1；4.6.1；4.a.1；4.c.1
5	14	**4**	5.1.1；5.5.1；5.5.2；5.c.1
6	11	**7**	6.1.1；6.2.1；6.3.1；6.3.2；6.4.1；6.4.2；6.6.1
7	6	**3**	7.1.1；7.1.2；7.3.1
8	17	**6**	8.1.1；8.2.1；8.5.2；8.6.1；8.9.1；8.9.2
9	12	**10**	9.1.1；9.1.2；9.2.1；9.2.2；9.3.1；9.4.1；9.5.1；9.5.2；9.b.1；9.c.1
10	11	**2**	10.1.1；10.2.1
11	15	**9**	11.1.1；11.2.1；11.3.1；11.4.1；11.5.1；11.5.2；11.6.1；11.6.2；11.7.1；
12	13	**5**	12.2.2；12.4.2；12.5.1；12.6.1；12.7.1
13	8	**4**	13.1.1；13.1.3；13.3.1；13.3.2
15	14	**7**	15.1.1；15.1.2；15.2.1；15.3.1；15.4.1；15.4.2；15.a.1
16	23	**6**	16.1.1；16.1.3；16.3.2；16.5.1；16.6.1；16.1.a
17	25	**5**	17.1.1；17.2.1；17.3.1；17.8.1；17.11.1
总计	234	102	

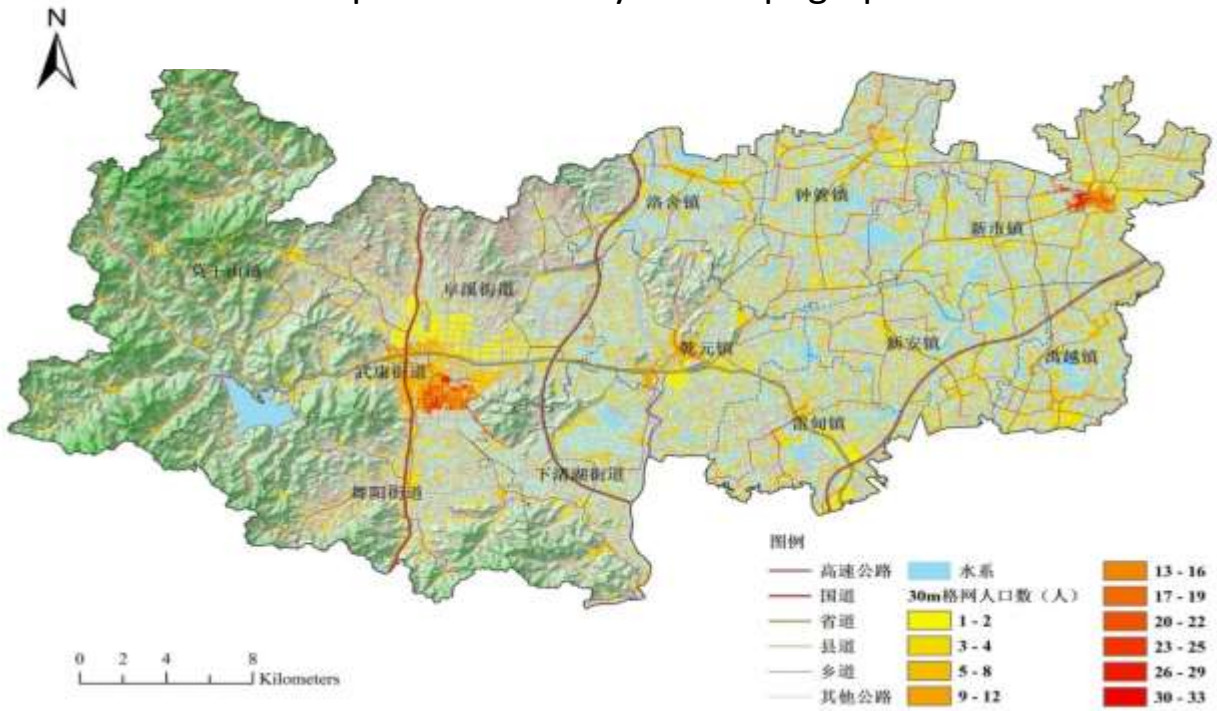
All the 16 SDGs are covered that is essential for a comprehensive measurement

② Spatio-temporal Data Handling

200 types of data were collected and processed, including topographic/ LC maps, EO images, disaggregated socio-economic statistics, as well as some from social media.

镇名 Town names	人口 population
武康街道	89944
阜溪街道	26008
下渚湖街道	23999
舞阳街道	52180
洛舍镇	20553
钟管镇	43856
莫干山镇	31643
乾元镇	49644
雷甸镇	37592
新安镇	31730
新市镇	72395
禹越镇	33297

30-m Population density with topographic information



Enabling integrated geospatial and statistical analysis

③ Data-driven Measurement of the Indicators

Three different ways to measure the 102 indicators

A **Direct calculation with statistical data** **85**

- using ratio (or proportion), rate of change, index or other calculations

B **Direct derivation from geospatial data** **10**

- using spatial density calculation, coverage classification and others

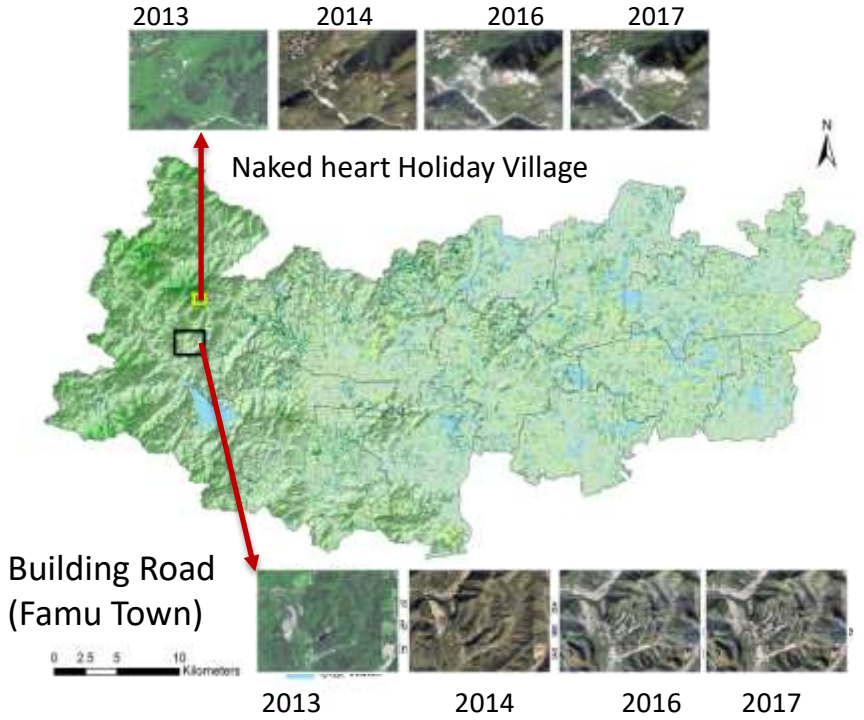
C **Integrated utilization of statistical and geospatial information** **7**

- based on quantitative measurement of spatial accessibility, coverage, spatial relations

17 Indicators Measured with Geospatial Data

Indicator	Contents
1.4.1	population Proportion living in households with access to basic services
2.4.1	Proportion of agricult. area under productive/ sustainable agriculture
3.8.1	Coverage of essential health services
6.3.2	Proportion of bodies of water with good ambient water quality
6.6.1	Change in the extent of water-related ecosystems over time
9.1.1	Proportion of rural population living within 2 km of an all-season road
11.2.1	Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities
11.3.1	Ratio of land consumption rate to population growth rate
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
15.1.1	Forest area as a proportion of total land area
15.1.2	Proportion of important sites for terrestrial and freshwater biodiversity covered by protected areas, by ecosystem type
15.2.1	Proportion of forest change
15.3.1	Proportion of land that is degraded over total land area
15.4.1	protected area coverage of import. sites for mountain biodiversity

Forest change



④ Hierarchical Assessment with three levels

- **Level I** (Indicators): **79/102** were Contracted and ranked

  - with SDGs Index and Dashboard, National Plan mandate requirements etc.

- **Level II** (individual SDG): **16** were assessed

  - through grouped focused analysis with quantified indicators and evidences

- **Level III** （SDGs clusters): **3** , economy, society and environment

  - coherency analysis with degree of coordination, coefficient of variation

Level II : SDG 6 as an Example

Grouping targets into sub-groups for focused analysis

- Safe drinking water and sanitation ***6.1, 6.2***
- Water resource utilization ***6.3 6.4 6.5 6.a 6.b***
- Protection of water-related ecosystems ***6.6***

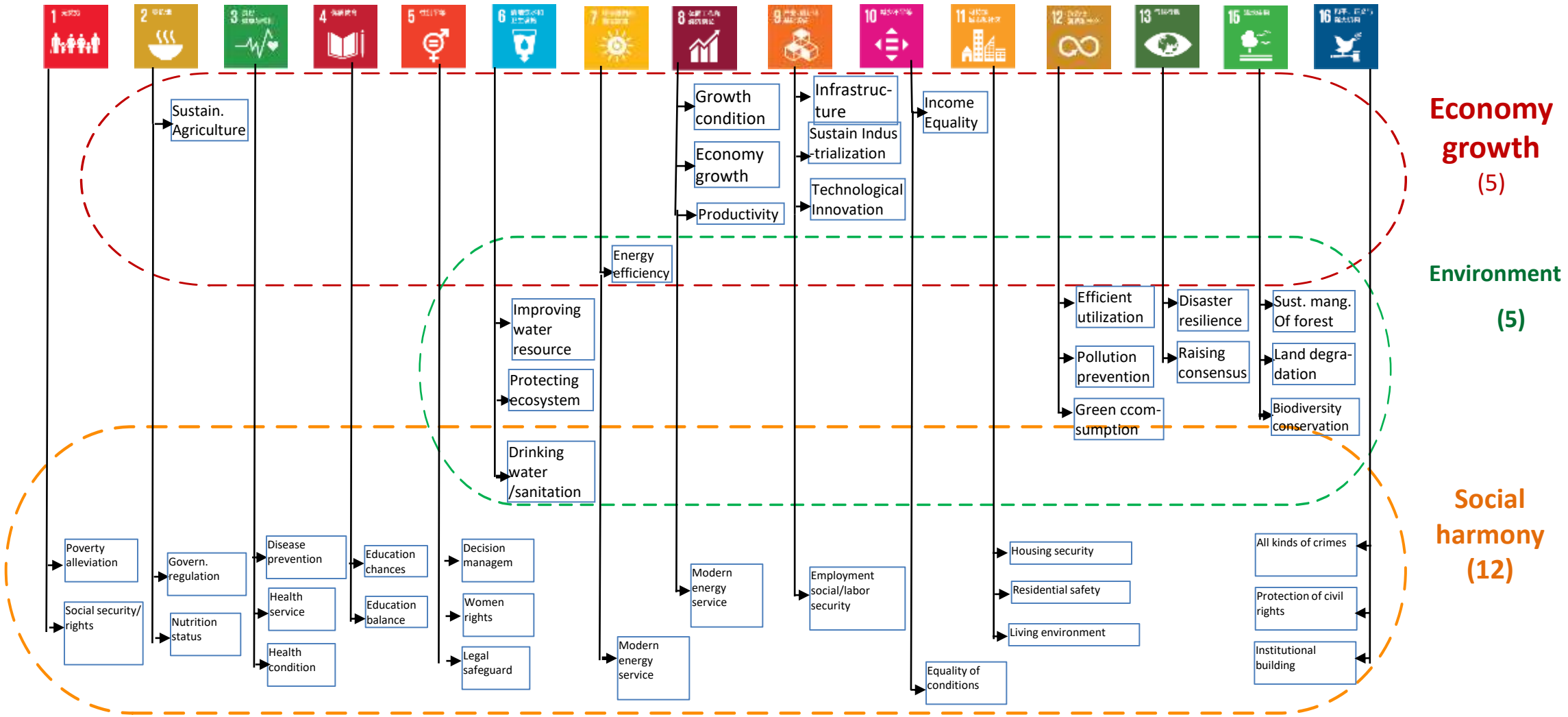
Content	Indicators	Quantitative result	Evaluation reference	
Clean Water	**6.1.1** Proportion of population using safely managed drinking water services	Urban：100% Rural：99.6%	Green≥98%	I
	6.2.1.a Penetration rate of sanitary toilets in rural areas **6.2.1.b** Service convenience of urban public toilets	98% From all parts of town, the nearest public toilet can be reached with in 16 minutes	Green≥95%	I
Volume, quality and efficiency of water resources	**6.3.1** Proportion of wastewater safely treated	Urban domestic sewage: 91.06%	Municipal domestic sewage:92.4%	IV
		Rural domestic sewage: 80.68%;	Coverage rate of the treatment of domestic wastewater (upper- middle-income countries) :59%	III
		trade effluent: N/A;		
	6.3.2 Proportion of bodies of water with good ambient water quality	68.75%,100%**	76.9%	IV
	6.4.1 Change in water-use efficiency over time	The water consumption per 10,000 CNY of GDP in 2017 was 67.5m³, dropped 23.52% from 2015	By 2020, the efficiency of water use will be 23% lower than at of 2015	II
	6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	25.08%	Green≤25% Yellow:25%<x≤75%	I
Sustainability of water-related ecosystems	**6.6.1** Change in the extent of water-related ecosystems over time	6.47%; High sustainable	0-20%:High sustainable; 21-40%:Local sustainable but threatens global stability; 41-60%:Border-line sustainability. Corrective actions are strongly recommended; 61-100%Unsustainable. Urgent renewal is required.	III
	6.6.1.a Rate of change in the spatial extent of water-related ecosystems	11.14%		
	6.6.1.b Rate of change in the water quantity characteristic of water-relate ecosystems	8.26%		
	6.6.1.c Rate of change in the water quality of water-relate ecosystems	0%		
	6.6.1.d Health state of the typical wetland ecosystems	Xiazhuhu wetland: well		

Metrics Used for Comparing/ ranking

- I -- SDGs Dashboard
- II -- National plan
- III-- Multiple evaluation
- IV--- others

- 1st Quarter
- 2nd Quarter
- 3rd Quarter
- 4th Quarter
- No ranking

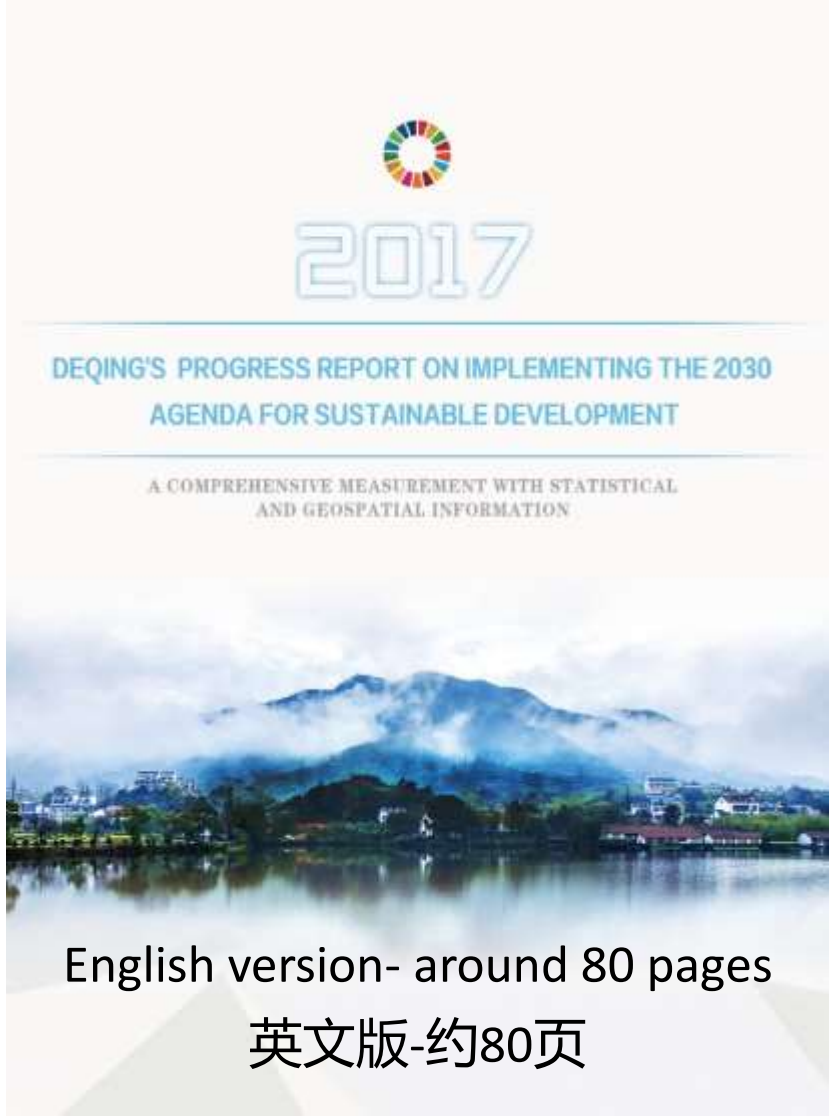
Level III : Three SDGs Clusters Analysis



Progress Report Resulted

Chinese version- around 70 pages

中文版-约70页



English version- around 80 pages

英文版-约80页

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Approach briefing

Assessment of each Single SDG

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SDGs Cluster analysis

Answer three questions

1) How to measure progress towards 2030 SDGs ?

2) How far is Deqing from 2030 SDGs ?

3) What are next steps ?

⑤ SDGs Knowledge Portal

http://Deqing-SDGs.net

Released Officially at UN-WGIC

Nov. 20, 2018，Deqing, China

Received numerous positive comments from the international community

"A good practice for implementing and measuring SDGs at local level"

"A pioneering project whose experiences is helpful and available for people both from within and outside China"

—— Mr. Liu Zhenmin, USG for Economic and Social Affairs of UN

nature

CORRESPONDENCE – 07 NOVEMBER 2018

Chinese pilot project tracks progress towards SDGs

China's progress in meeting the United Nations Sustainable Development Goals (SDGs) is being successfully monitored using geospatial and statistical information in a pilot scheme running in Deqing county, Zhejiang province.

A team of 20 researchers, led by the National Geomatics Center of China, measured 100 SDG indicators over the 938-square-kilometre county. In line with the UN Global SDG Indicator Framework, multi-scale and multi-type geospatial and statistical data were integrated for comprehensive measurement and evidence-based progress analysis. These data included topographic and land-cover maps, aerial and satellite images, disaggregated socio-economic information and environment statistics, as well as some from social media.

Reported by the world top scientific magazine

Explore the latest news and perspectives from the GEO community.

all news / observations blog

China completes first comprehensive SDG assessment using Earth observations

GEO's three priority engagement areas overlap with China's Belt and Road initiative objectives, facilitating effective collaboration on the UN 2030 Agenda for Sustainable Development, the Sendai Framework for Disaster Risk Reduction and the Paris Climate Agreement.

In support of the Paris Agreement, China has worked to account for climate change in medium and long term national economic and social development planning, and has used its first dedicated carbon monitoring mission, TanSat, to promote the use of meteorological and oceanic satellites for monitoring climate change. In support of the Sendai Framework, the country is distributing satellite data for disaster response through the China GEOSS Data Sharing Network (DSNET).

As a major global contribution to the 2030 Agenda Sustainable Development Goals (SDGs) process, China recently completed the world's first comprehensive measurement of progress towards the SDGS at the county level using geospatial and statistical data. The pilot was carried out in Deqing, a county in Zhejiang province of 923km2 that is home to 430,000 people.

Mr. Chen Jun, professor at the National Geomatics Centre of China and leading scientist on the project presented the results and significance at the GEO-XV Plenary in Kyoto, Japan (view presentation and video from 1:16).

"Countries still rely heavily on statistical data for SDG monitoring, rather than using remotely sensed data. We combined Earth observations with statistical data for comprehensive assessment of all indicators," he said. "The overall progress towards the SDGs of an entire region can be measured by combining geospatial and statistical information. [Earth observations] play a number of important roles in this process."

Shared with the Global Earth Observation community

Official Release at the first UN World Geospatial Congress, officiated by Mr. Liu Zhenmin, USG of UN for Economic and Social Affairs

Winner of the Geospatial World Excellence Awards 2019

Winner Notification: Geospatial World Excellence Awards 2019

Dear Chen Jun,

I am happy to inform you that the project id: **10873**, titled **China (Deqing) SDGs Profile: A Comprehensive Measurement of Progress towards 2030 SDGs with Geospatial and Statistical Information,** which was nominated by you, has been selected for the **Geospatial World Excellence Awards 2019**.

The award will be presented at Geospatial World Forum 2019, to take place in **Taets Art & Event Park, Amsterdam from 2-4 April 2019**. I request the officially designated person from **Deqing County Government** to be present to accept the same.

Dr. Wang Keran, Chief of Space Applications Section (SAS), IDD of UN ESCAP

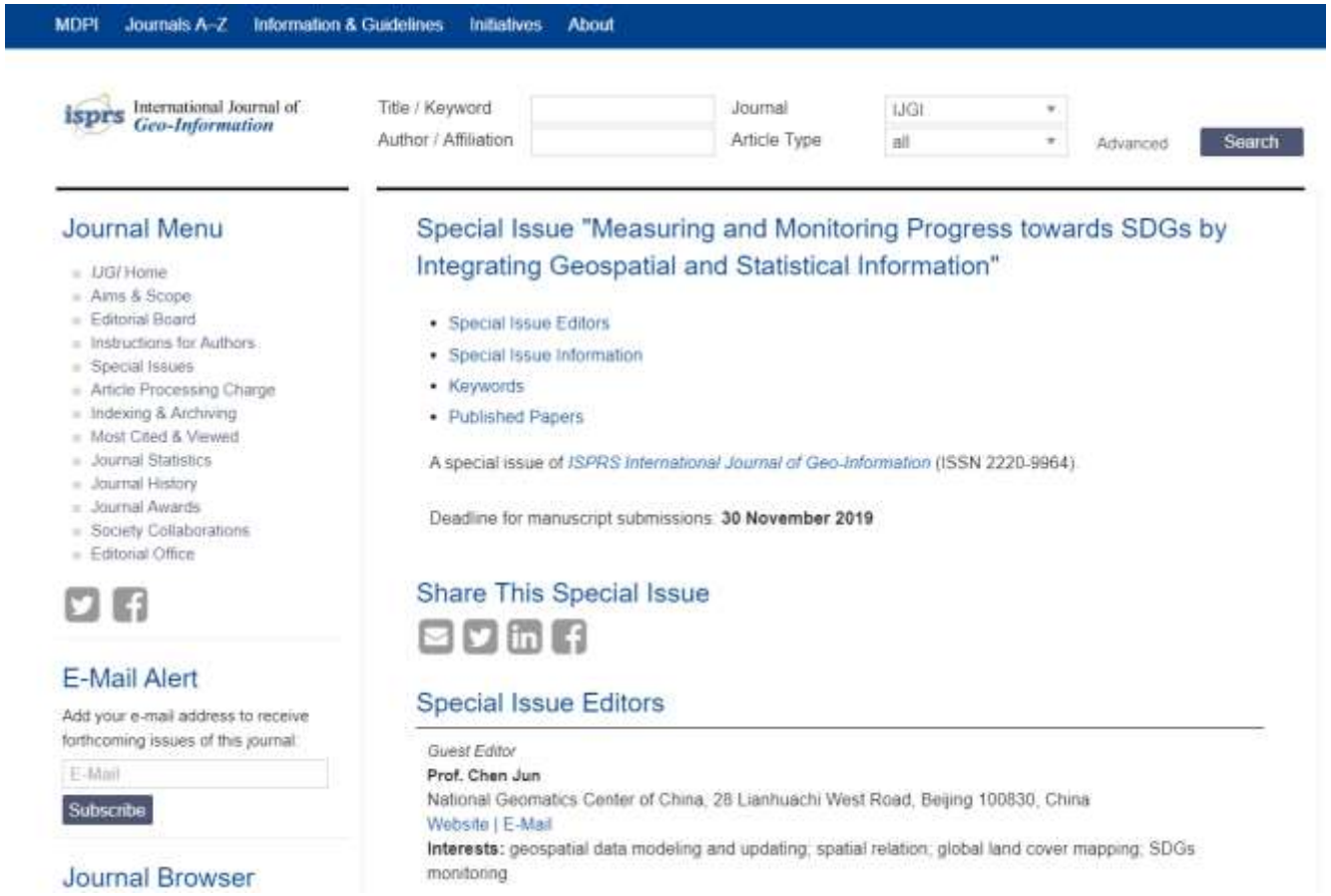
"The experience of this practice has been shared with relevant agencies in Asia-Pacific countries and received positive feedback and requests on capacity building towards using geo-statistical data to support monitoring progress of the SDGs."

Mr. Jack Dangermond, ESRI president

"We must show tangible impact and results beyond convening technical meetings and conferences and go further to 'implement' and achieve development results required to address the challenges ahead. Your work provides a very valuable contribution to this process and we would like to support the amplification of your effort."

Current Works (1)

- Document the methodology and prepare training seminars

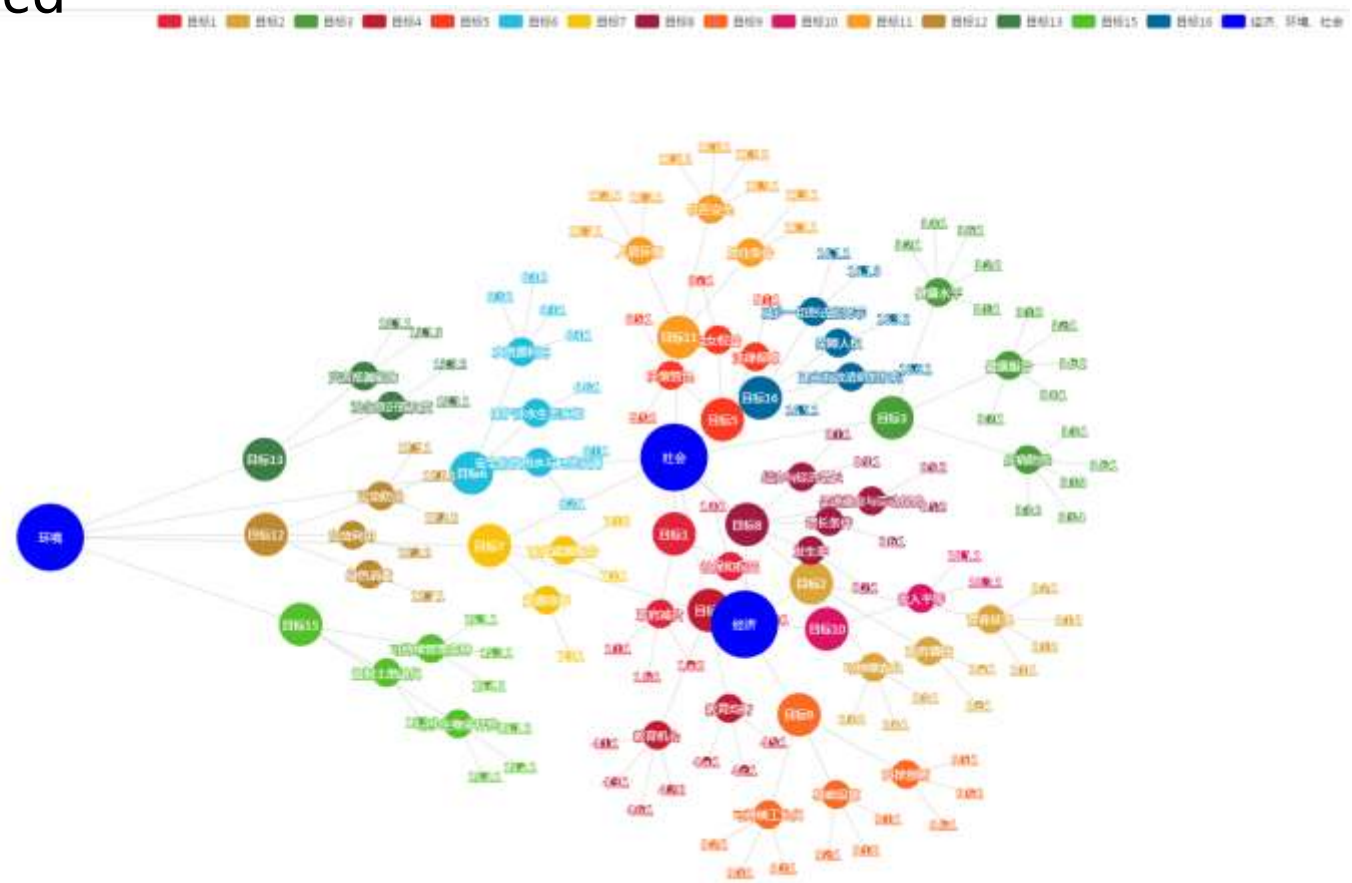


- Organize a special issue in ISPRS Int. J GIS
- Prepare seminar(s) with UN-GGIM and UN- ESCAP

Current Works (2)

- Convey Deqing SDGs Profile website into UN Open SDGs Data Hub
- Knowledge-graph based

With four level nodes



SUSTAINABLE DEVELOPMENT GOALS

Welcome to the Open SDG Data Hub

To fully implement and monitor progress on the Sustainable Development Goals, decision makers everywhere need data and statistics that are accurate, timely, sufficiently disaggregated, relevant, accessible and easy to use. The Open SDG Data Hub promotes the exploration, analysis, and use of authoritative SDG data sources for evidence-based decision-making and advocacy. Its goal is to enabl data providers, managers and users to discover, understand, and communicate patterns and interrelationships in the wealth of SDG data and statistics that are now available.

Featured Open Data Sites by Country

Ireland | Phillipines | Mexico | State of Palestine | China (Deqir

Current Works (3) Transforming the assessment into Actions

- Transforming the assessment results into actions of local decision makers by formulating an action plan for the period 2019-2023

System Knowledge
- Current state and trends

Transformation Knowledge
- Facilitating pathways

Goal Knowledge
- Desirable future

Comprehensive assessment Results

List of actions

Local SDGs for the next five years

Summary

- **SDGs progress can be well monitored in a local context**, through establishing a cooperative partnership among all stakeholders to mobilize resources, developing a set of data driven and evidence-supported approach with a geographic perspective.

- **An overall picture was derived about local SDGs status, gaps and challenges**. The local government is therefore able to develop concrete implementation strategies and allocate resources accordingly, to address the issues identified in the monitoring.

- **A practical and replicable approach was provided**. UNSD (UN-GGIM Secretariat) has decided at the end of 2018 to “showcase the work as a flagship example on how countries can practically measure their progress using statistical and geospatial information, especially at the sub-national level”.

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