



# Comprehensive Measurement of Deqing's Progress towards 2030 SDGs

( 基于统计和地理信息的德清SDGs进展评估 )

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# Contents

## Motivation (目的与意义)



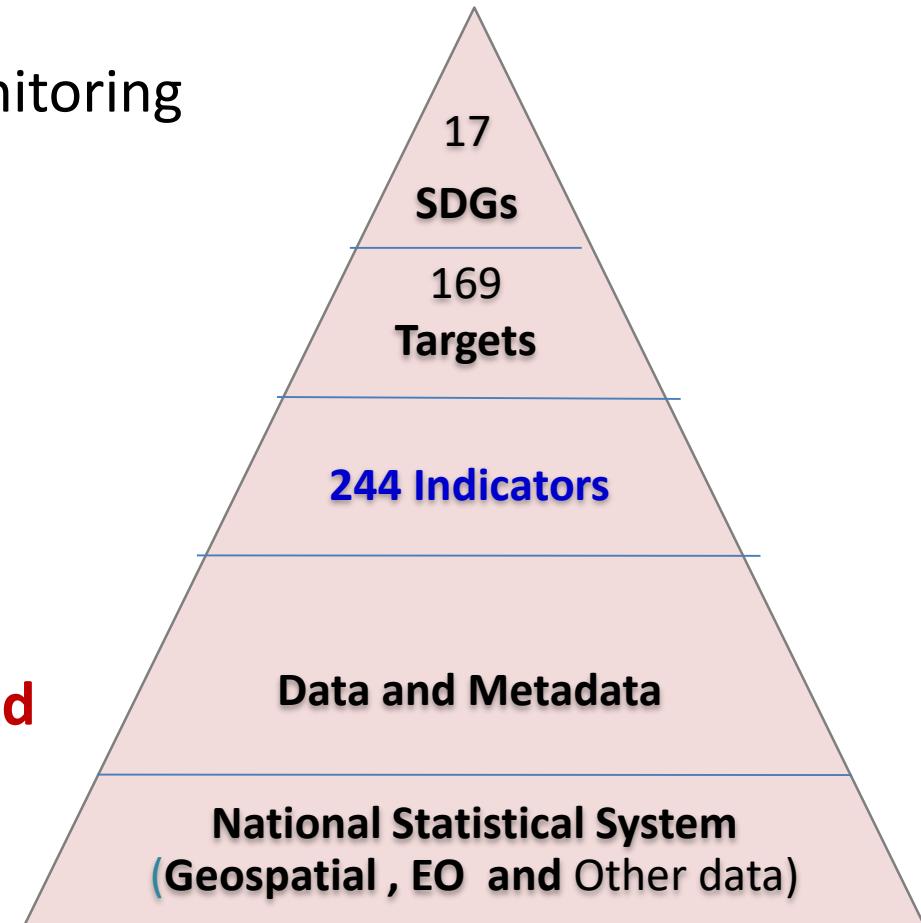
Deqing SDGs Profile (中国·德清样本)

Summary (结论)

# Tracking Progress towards SDGs: Current Status (监测评估SDGs 进展)

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

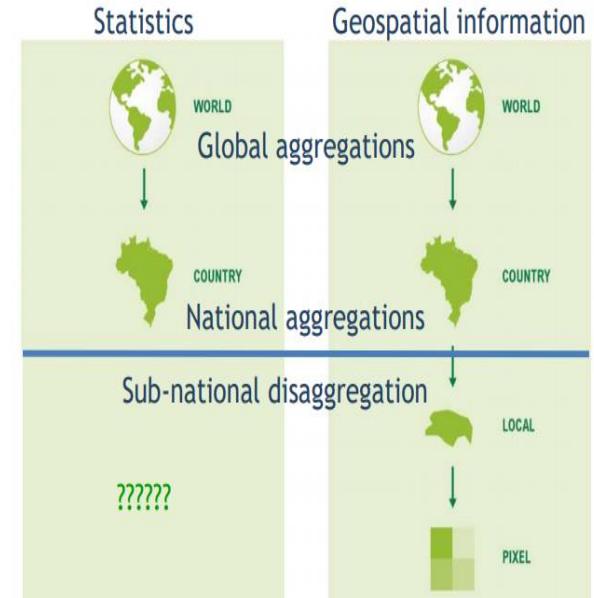
- Needs of indicator-based and data driven monitoring
- Current status
  - More in theoretical/concept than in practical
  - Some individual indicators studied
  - Isolated work reported
  - Lack of comprehensive efforts
- **Good practices needed for demonstration and discussion**



# Challenges Faced at sub-nation level: (面临的主要挑战)

- Indicators— suitability?
  - Definition and interpretation
  - localization
- Data – available/ reliable?
  - geospatial
  - EO data
- Computing— geographical viewpoint?
- Assessment- translating into actions?

Disaggregation by geographic location?



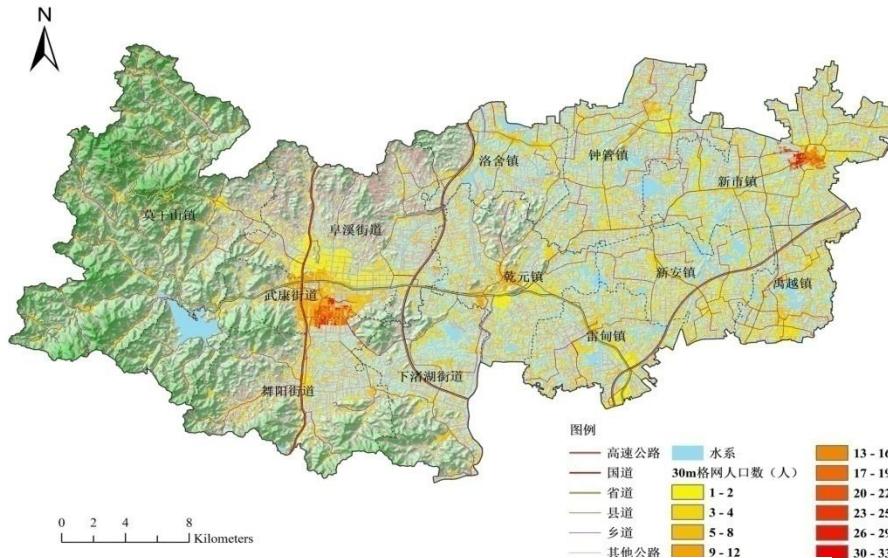
UN-GGIM

United Nations Secretariat  
Global Geospatial Information Management

Positioning geospatial information to address global challenges  
ggim.un.org

# Deqing Case Study (德清试点)

A pilot project was conducted to measure Deqing's progress towards 2030 SDGs using geo-statistical data in line with UN Global SDG Indicator framework



- 937.92 Km<sup>2</sup>
- 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

# Major achievement(主要成果)

This pilot project has achieved three major results:

- A data-driven and evidence-based approach  
(基于统计和地理信息的区域SDGs综合评估方法)
- Deqing's SDGs progress report-2017  
(德清践行2030议程进展报告)
- Online SDGs knowledge portal  
(基于互联网的SDGs知识服务系统 )

**China (Deqing)**  
**SDGs profile**  
**(中国德清样本)**

# Contents

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Motivation ( 目的与意义)

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**China · Deqing SDGs Profile (中国· 德清样本)**

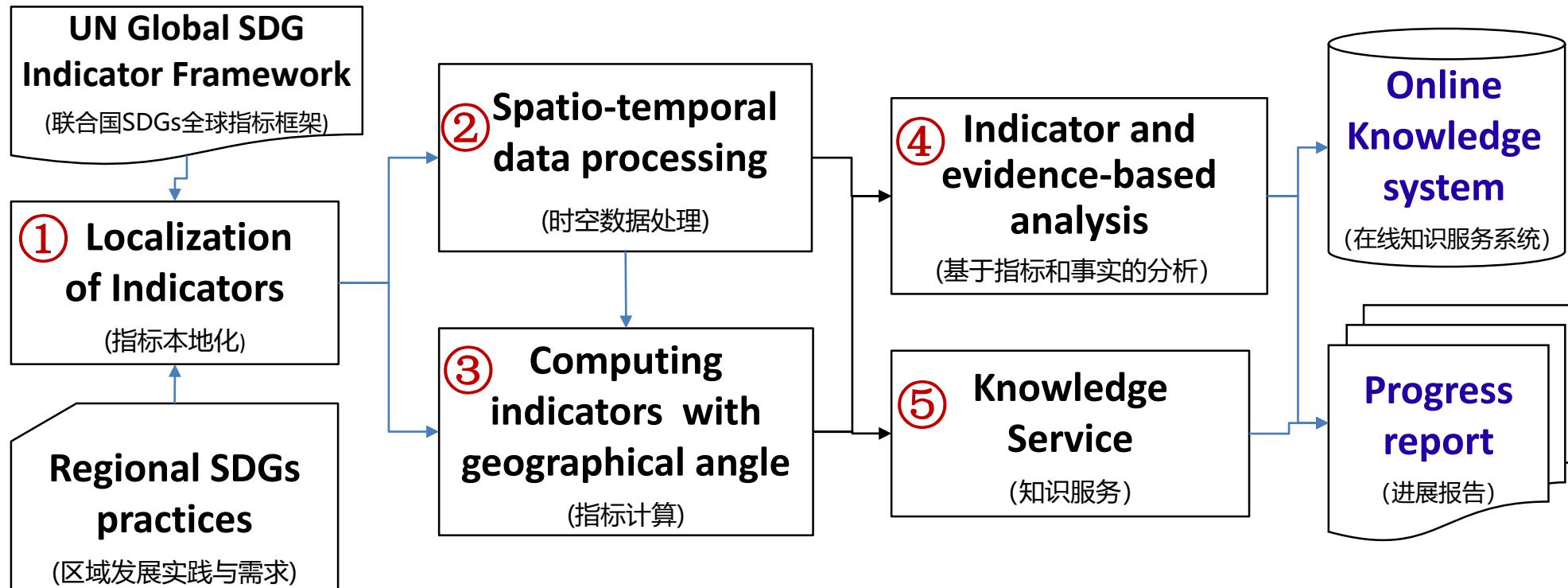
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Summary ( 结论)

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## 2.1 A data-driven and evidence-based approach (定量评估方法)

This approach has five elements



# ① 102 SDGs Indictors Selected for Deqing (德清102指标)

## ■ Method for examining all 244 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

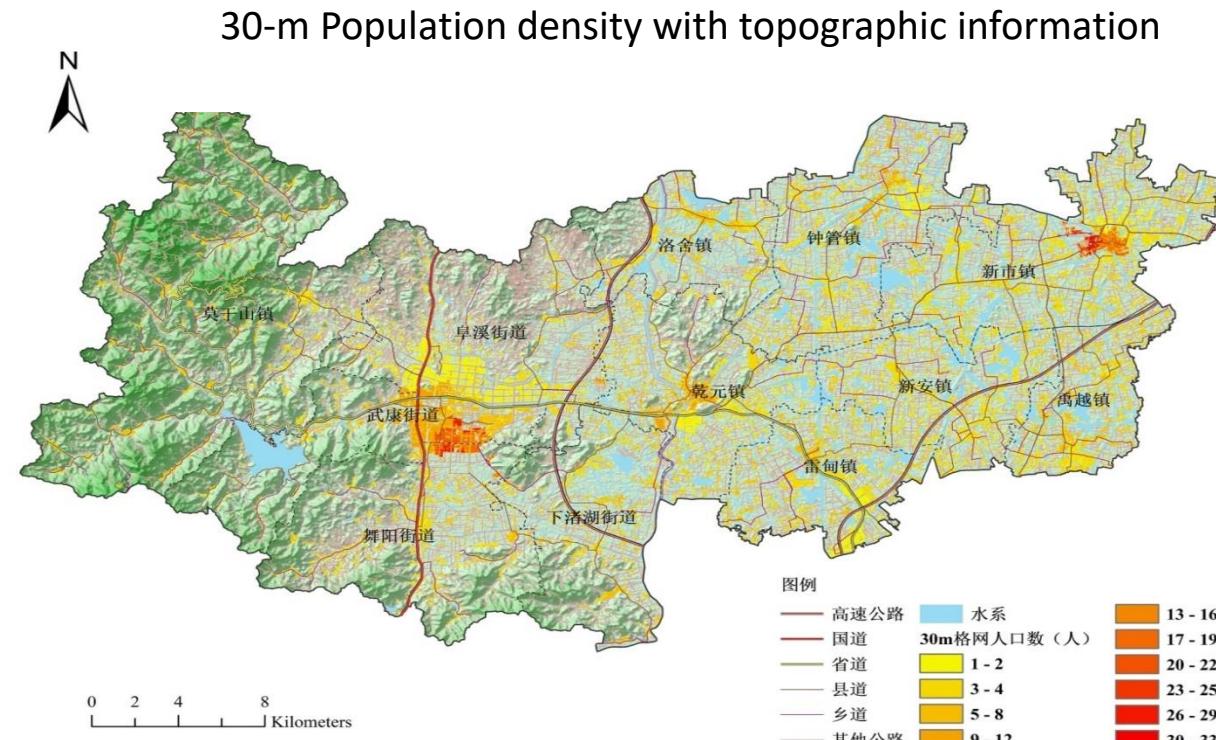
SDG	UN	Deqing	
1	14	5	1.1.1; 1.3.1; 1.4.1; 1.a.1; 1.b.1
2	13	7	2.1.2; 2.1.2; 2.2.1; 2.3.2; 2.4.1; 2.a.1; 2.c.1
3	27	15	3.1.1; 3.1.2; 3.2.1; 3.2.2; 3.3.1; 3.3.2; 3.3.3; 3.3.4; 3.4.1; 3.6.1; 3.7.1; 3.8.1; 3.b.1; 3.b.2; 3.c.1
4	11	8	4.1.1; 4.2.2; 4.3.1; 4.4.1; 4.5.1; 4.6.1; 4.a.1; 4.c.1
5	14	4	5.1.1; 5.5.1; 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 (时空数据处理)

Methodology for processing 200 types of data, 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



Enabling integrated geospatial and statistical analysis ,

# ③ Data-driven Indicator Measurement (指标量测)

## 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

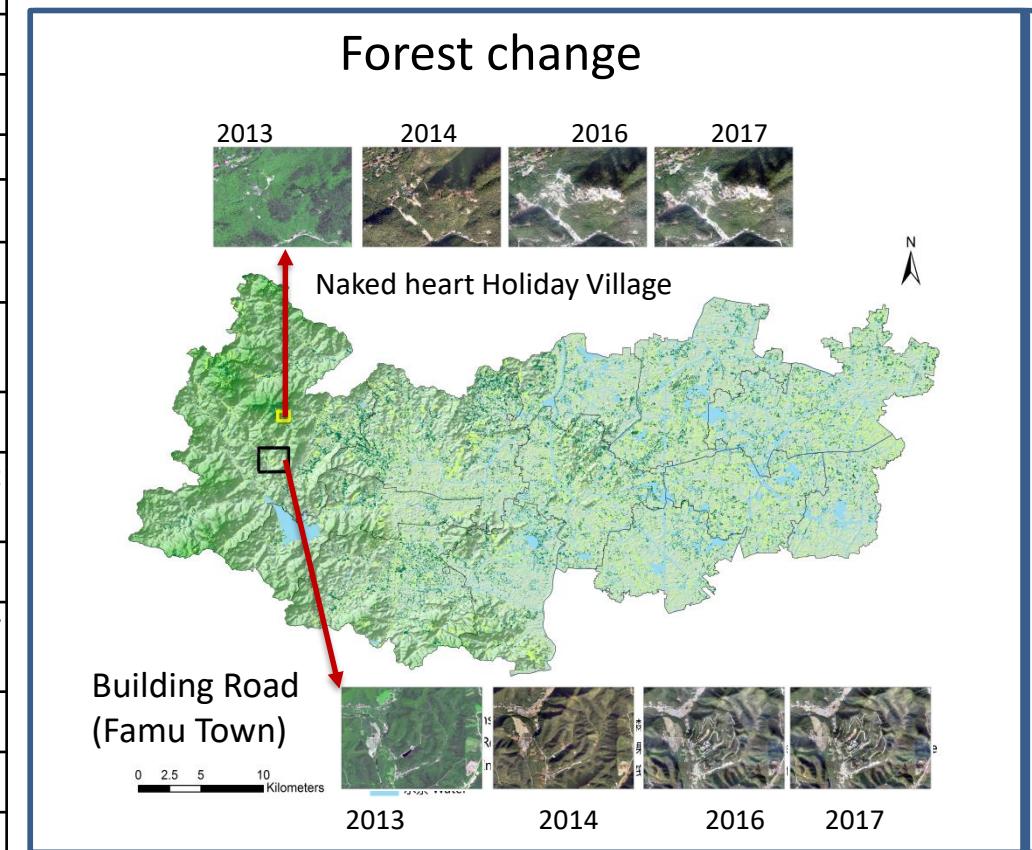
- using spatial density calculation, coverage classification and others

### 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 (基于地理数据的17项指标)

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 D.5.2	Coverage of essential health services
	Proportion of bodies of water with good ambient water quality
6.6.1	Change in the extent of water-related ecosystems over time
	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
	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
15.2.1	Proportion of land that is degraded over total land area
15.4.1	protected area coverage of import. sites for mountain biodiversity



## ④ Hierarchical Assessment (三层次评估)

### A hierarchical assessment with three levels

- **Indicator Level:** **79/102** were Contracted and ranked
  - with SDGs Index and Dashboard, National Plan mandate requirements etc.
- **Single SDG level:** **16** were assessed
  - through grouped focused analysis with quantified indicators and evidences
- **SDGs cluster Level:** **3**, economy, society and environment
  - coherency analysis with degree of coordination, coefficient of variation

# Indicator and Single SDG Assessment - SDG 6 as an Example

(指标和单目标评估-以SDG 6为例)

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**

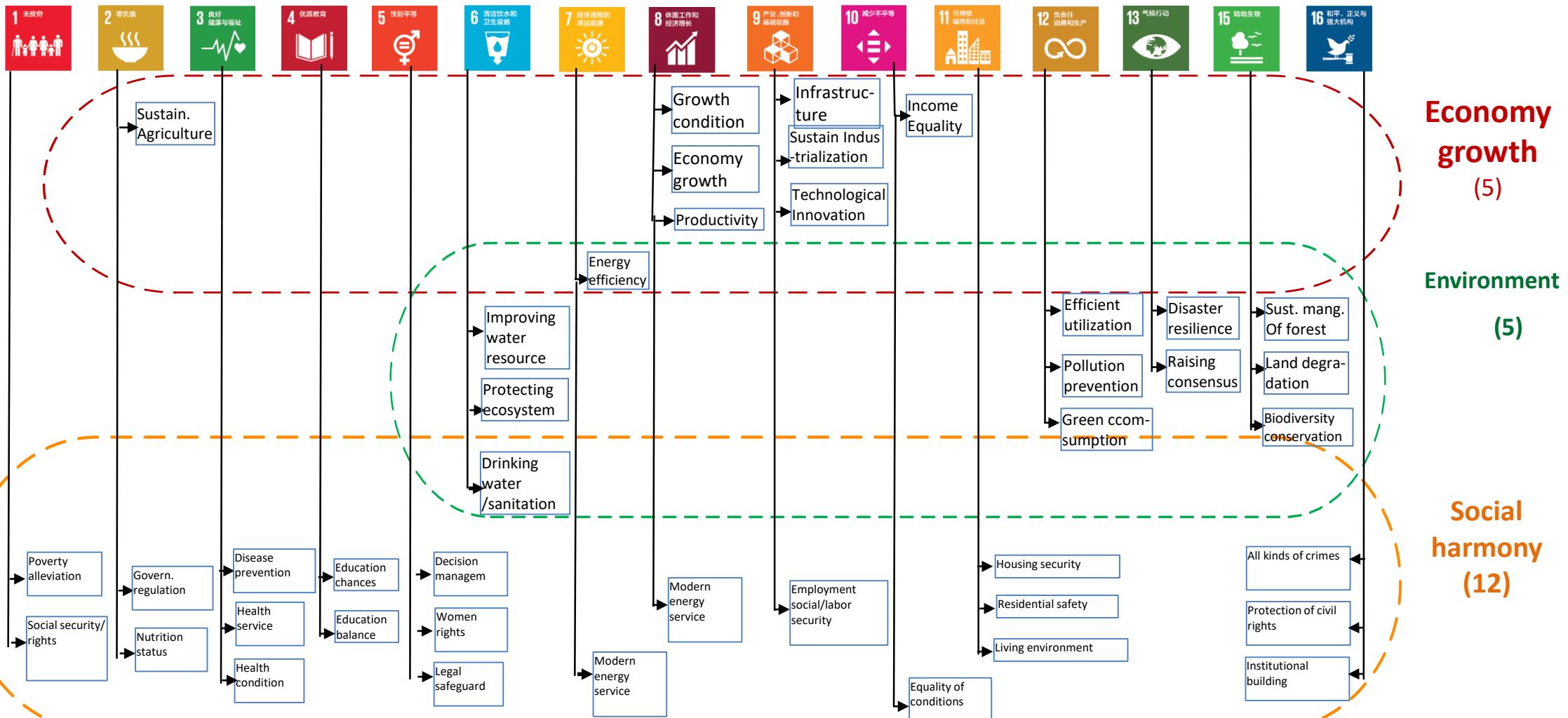
Content	Indicators	Quantitative result	Evaluation reference	
Clean Water	<b>6.1.1</b> Proportion of population using safely managed drinking water services	Urban: 100% Rural: 99.6%	Green≥98%	I
	<b>6.2.1.a</b> Penetration rate of sanitary toilets in rural areas <b>6.2.1.b</b> Service convenience of urban 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	<b>6.3.1</b> Proportion of wastewater safely treated	Urban domestic sewage: 91.06%	Municipal domestic sewage:92.4%	IV
		Rural domestic sewage: 80.68%; trade effluent: N/A;	Coverage rate of the treatment of domestic wastewater (upper-middle-income countries) :59%	III
	<b>6.3.2</b> Proportion of bodies of water with good ambient water quality	68.75%,100%**	76.9%	IV
<b>6.4.1</b> Change in water-use efficiency over time		The water consumption per 10,000 CNY of GDP in 2017 was 67.5m <sup>3</sup> , dropped 23.52% from 2015	By 2020, the efficiency of water use will be 23% lower than at of 2015	II
	<b>6.4.2</b> 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	<b>6.6.1</b> 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;	III
	<b>6.6.1.a</b> Rate of change in the spatial extent of water-related ecosystems	11.14%	41-60%:Border-line sustainability. Corrective actions are strongly recommended;	
	<b>6.6.1.b</b> Rate of change in the water quantity characteristic of water-related ecosystems	8.26%	61-100%Unsustainable. Urgent renewal is required.	
	<b>6.6.1.c</b> Rate of change in the water quality of water-related ecosystems	0%		
	<b>6.6.1.d</b> Health state of the typical wetland ecosystems	Xiaozhuo wetland: well		

Metrics Used for Comparing/  
ranking

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



# SDGs Clusters Analysis (社会-经济-环境目标集分析)



## 2.2 Deqing's SDGs Progress Report-2017 (德清践行2030议程进展报告)



# Report Contents (报告内容)

## Directory

### Approach briefing (方法简介)

### Assessment of each Single SDG (单目标评估结果)

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SDGs Cluster analysis  
(社会-经济-环境  
目标群评估)  
Answer three  
questions

- 1) How to measure progress towards 2030 SDGs ?
- 2) How far is Deqing from 2030 SDGs ?
- 3) What are next steps ?

## 2.3 Online SDGs Knowledge Portal (在线知识服务系统)

The screenshot displays the homepage of the Deqing Sustainable Development Knowledge Service System. At the top, there is a logo of the United Nations Sustainable Development Goals (SDGs) and the text "德清·可持续发展·知识服务系统" (Deqing · Sustainable Development · Knowledge Service System). Below the logo is a QR code. The top navigation bar includes links for "简介 INTRODUCTION", "指标 INDICATORS", "目标 GOALS", and "故事 STORIES". The "故事 STORIES" link is highlighted with a blue background. On the left side, there is a sidebar titled "Deqing Story" with a video camera icon. It lists five stories with small thumbnail images: "Story of Lucrative Leaf" (a building on a hill), "Peasant made Piano" (two people working on a piano), "The fabulous school bus" (a row of yellow school buses), "Consultant Committee" (a meeting room), and "Home Coming of Zhu Huan" (birds on a lake). The main content area features a large title "Deqing Story" and a subtitle: "In order to improve the ecological environment, Deqing County has actively carried out the construction of beautiful pastoral." To the right of this subtitle are four numbered points (1, 2, 3, 4) each accompanied by a green arrow pointing right. Point 1: "As of 2017, sewage treatment terminals has covered **99.25%** of administrative villages." Point 2: "Deqing upgraded the aquaculture industry, implemented the "beautiful pasture" project, and adjusted the industrial structure of the polluted farms to achieve **100% zero emission** and **100% resource utilization.**" Point 3: "In 2017, all of the major monitored river water quality **reached the standard.**" Point 4: "Xiaozhu Lake is the **largest wetland in the south of the Yangtze River.** The improvement of its ecological environment is the key project of Deqing." The background of the main content area shows a blurred image of a lake and mountains.

<http://47.99.207.114/deqing/>

# Contents

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## Motivation ( 目的与意义)

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China(Deqing) SDGs Profile (中国· 德清样本)

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## Summary ( 结论)

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# Conclusions (结论)

- As a pilot project at sub-nation level, it is the first comprehensive measurement of an entire administrative region's progress towards SDGs by combining geospatial and statistical information.
- Its outcomes is "China (Deqing) SDGs Profile"
  - A suit of methodology
  - A progress report
  - A on-line SDG knowledge portal
- The "China (Deqing) SDGs Profile"
  - To be shared with international community, and
  - To be an example (or a candidate) of good practices.

# Nature Reported this Work



CORRESPONDENCE · 07 NOVEMBER 2018

## Chinese pilot project tracks progress towards SDGs

Jun Chen & Zhilin Li

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.

The conclusion is that the county, which has a population of around 430,000, has made significant economic and social advances and maintained a good ecological environment over the past 5 years.  
Challenges such as inadequate public transport in some regions have been drawn to the attention of policymakers.

The world top scientific magazine reported this work on the 7<sup>th</sup> this month

(本月7号，国际著名科学杂志Nature以“**中国开展SDGs评估试点**”为题，介绍了此项工作)

The conclusion is that...the country has made significant economic and social advances and maintained a good ecological environment over the past five years. (德清在过去5年里经济建设、社会发展和环境美好方面均取得了很大成绩)

An online public information service charts Deqing's progress towards achieving the SDGs. The pilot scheme's findings will be discussed at the UN's first World Geospatial Information Congress later this month.

# Outlooks (展望)

- Experiences gained
  - Needs of experts from different fields to work together
  - Needs of coordination among government departments
  - Needs of collaboration between government departments and technical experts
- More efforts need to be devoted to
  - the criteria and guidelines on localizing Global SDGs indicator framework,
  - development of adequate action-oriented and measurable indicators for sub-nations,
  - objective evaluation criteria for indicator and SDGs, as well as
  - operational approaches for big data-based SDGs monitoring, diagnosis and simulation.



# Comprehensive Measurement of Deqing's Progress towards 2030 SDGs

( 基于统计和地理信息的德清SDGs进展评估 )

<http://47.99.207.114/deqing/>

