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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Motivation (目的与意义)

Deqing SDGs Profile (中国·德清样本)

Summary (结论)
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?
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

Deqing county (德清县)

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

- 937.92 Km²
- 430,000 permanent habitants
- GDP 6.91 billion US Dollars in 2017
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)
Motivation (目的与意义)

China・Deqing SDGs Profile (中国・德清样本)

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

This approach has five elements

1. Localization of Indicators (指标本地化)
2. Spatio-temporal data processing (时空数据处理)
3. Computing indicators with geographical angle (指标计算)
4. Indicator and evidence-based analysis (基于指标和事实的分析)
5. Knowledge Service (知识服务)

UN Global SDG Indicator Framework (联合国SDGs全球指标框架)
Regional SDGs practices (区域发展实践与需求)
Indicator and evidence-based analysis (基于指标和事实的分析)
Online Knowledge system (在线知识服务系统)
Progress report (进展报告)
### Method for examining all 244 indicators of UN SDG Global indicator framework

#### Three Principles
- Suits local circumstance
- Enables international and national comparison
- Data availability

<table>
<thead>
<tr>
<th>SDG</th>
<th>UN</th>
<th>Deqing</th>
</tr>
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<tbody>
<tr>
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<td>5</td>
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<td>17</td>
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| 总计 | 234 | 102   |

- ◼ Data availability
- ◼ Suits local circumstance

All the 16 SDGs are covered that is essential for a comprehensive measurement.
Methodology for processing 200 types of data, including topographic/LC maps, EO images, disaggregated socio-economic statistics, as well as some from social media.

<table>
<thead>
<tr>
<th>镇名</th>
<th>人口</th>
</tr>
</thead>
<tbody>
<tr>
<td>武康街道</td>
<td>89944</td>
</tr>
<tr>
<td>阜溪街道</td>
<td>26008</td>
</tr>
<tr>
<td>下渚湖街道</td>
<td>23999</td>
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<tr>
<td>舞阳街道</td>
<td>52180</td>
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<tr>
<td>洛舍镇</td>
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<tr>
<td>钟管镇</td>
<td>43856</td>
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<tr>
<td>莫干山镇</td>
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<td>乾元镇</td>
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<td>雷甸镇</td>
<td>37592</td>
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<tr>
<td>新安镇</td>
<td>31730</td>
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<tr>
<td>新市镇</td>
<td>72395</td>
</tr>
<tr>
<td>禹越镇</td>
<td>33297</td>
</tr>
</tbody>
</table>

30-m Population density with topographic information

Enabling integrated geospatial and statistical analysis.
Data-driven Indicator Measurement

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

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.4.1</td>
<td>Proportion living in households with access to basic services</td>
</tr>
<tr>
<td>2.4.1</td>
<td>Proportion of agricult. area under productive/ sustainable agriculture</td>
</tr>
<tr>
<td>3.8.1</td>
<td>Coverage of essential health services</td>
</tr>
<tr>
<td>3.8.2</td>
<td>Proportion of bodies of water with good ambient water quality</td>
</tr>
<tr>
<td>6.6.1</td>
<td>Change in the extent of water-related ecosystems over time</td>
</tr>
<tr>
<td>6.6.1.1</td>
<td>Proportion of rural population living within 2 km of an all-season road</td>
</tr>
<tr>
<td>11.2.1</td>
<td>Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities</td>
</tr>
<tr>
<td>11.3.1</td>
<td>Ratio of land consumption rate to population growth rate</td>
</tr>
<tr>
<td>11.7.1</td>
<td>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</td>
</tr>
<tr>
<td>15.1.1</td>
<td>Forest area as a proportion of total land area</td>
</tr>
<tr>
<td>15.1.2</td>
<td>Proportion of important sites for terrestrial and freshwater biodiversity covered by protected areas, by ecosystem type</td>
</tr>
<tr>
<td>15.2.1</td>
<td>Proportion of forest change</td>
</tr>
<tr>
<td>15.2.1.1</td>
<td>Proportion of land that is degraded over total land area</td>
</tr>
<tr>
<td>15.4.1</td>
<td>Protected area coverage of import. sites for mountain biodiversity</td>
</tr>
</tbody>
</table>

#### Forest Change

- Image showing forest change from 2013 to 2017 with labeled locations such as "Naked Heart Holiday Village" and "Building Road (Famu Town)."
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)

<table>
<thead>
<tr>
<th>Content</th>
<th>Indicators</th>
<th>Quantitative result</th>
<th>Evaluation reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean Water</td>
<td>6.1.1 Proportion of population using safely managed drinking water services</td>
<td>Urban: 100% Rural: 99.6%</td>
<td>Green≥98%</td>
</tr>
<tr>
<td></td>
<td>6.2.1.a Penetration rate of sanitary toilets in rural areas</td>
<td>98%</td>
<td>Green≥95%</td>
</tr>
<tr>
<td></td>
<td>6.2.1.b Service convenience of urban public toilets</td>
<td>From all parts of town, the nearest public toilet can be reached within 16 minutes</td>
<td></td>
</tr>
<tr>
<td>Volume, quality and efficiency of water resources</td>
<td>6.3.1 Proportion of wastewater safely treated</td>
<td>Urban domestic sewage: 91.06% Rural domestic sewage: 80.68%; trade effluent: N/A;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.3.2 Proportion of bodies of water with good ambient water quality</td>
<td>68.75%,100%**</td>
<td>76.9%</td>
</tr>
<tr>
<td>Sustainability of water-related ecosystems</td>
<td>6.4.1 Change in water-use efficiency over time</td>
<td>The water consumption per 10,000 CNY of GDP in 2017 was 67.5m³, dropped 23.52% from 2015</td>
<td>By 2020, the efficiency of water use will be 23% lower than at 2015</td>
</tr>
<tr>
<td></td>
<td>6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources</td>
<td>25.08%</td>
<td>Greens25% Yellow:25%&lt;x≤75%</td>
</tr>
<tr>
<td></td>
<td>6.5.1 Change in the extent of water-related ecosystems over time</td>
<td>6.47%; High sustainable</td>
<td>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.</td>
</tr>
</tbody>
</table>

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

Metrics Used for Comparing/ ranking
- I -- SDGs Dashboard
- II -- National plan
- III -- Multiple evaluation
- IV-- others

Corrective actions are strongly recommended; 61-100%; Unsustainable. Urgent renewal is required.
2.2 Deqing's SDGs Progress Report-2017 (德清践行2030议程进展报告)

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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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)

In order to improve the ecological environment, Deqing County has actively carried out the construction of beautiful pastoral.  

1. As of 2017, sewage treatment terminals has covered 99.25% of administrative villages.  

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.  

3. In 2017, all of the major monitored river water quality reached the standard.  

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.

http://47.99.207.114/deqing/
Contents

Motivation（目的与意义）

China(Deqing) SDGs Profile（中国·德清样本）

Summary（结论）
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 combing 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.
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)
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

http://47.99.207.114/deqing/