Preface

On the 70th anniversary of the United Nations (UN) in September 2015, heads of state and delegates gathered at the UN headquarters in New York and adopted the 2030 Agenda for Sustainable Development. This comprehensive sustainability framework was built on the basis of the historical experiences of human society and a shared expectation for the future. It presents a blueprint for countries to pursue global sustainable development in the next 15 years. The 17 Sustainable Development Goals (SDGs) incorporate various social, economic, environmental, and developmental targets and indicators, and have been endorsed by all countries with respective national implementation plans.

With the advancement of science, technology, and innovation (STI) accelerating, there is a growing international consensus that STI must play a key role in facilitating the implementation of SDGs. To this end, the UN established the "Technology Facilitation Mechanism" to bring together scientific communities, policy makers, business sectors, and other stakeholders for their collective ideas, insights, knowledge, and wisdom to build societies that are harmonious with the environment. The Chinese Academy of Sciences (CAS), being a member of the international scientific community, has been

mobilizing its research capacities for action.

The SDGs consist of 17 goals, 169 targets, and over 230 indicators. Countries have different and very diverse development contexts. The key to success for one goal is often linked to solving issues associated with other goals. The SDGs thus constitute a vast development system that is complicated, diverse, dynamic, and interconnected. This makes effective assessment and monitoring of each and all SDG targets and indicators essential to ensure the implementation of the SDGs. Currently, only about 45% of indicators are supported by both methods and data, about 39% have methods but lack data, and some 16% have neither standard methods nor data. The full implementation of the SDGs will be hampered if these problems are not effectively resolved.

CAS addresses these challenges through its Big Earth Data Science Engineering Program (CASEarth) and concentrates on six SDGs, including: SDG 2 (Zero Hunger), SDG 6 (Clean Water and Sanitation), SDG 11 (Sustainable Cities and Communities), SDG 13 (Climate Action), SDG 14 (Life below Water) and SDG 15 (Life on Land). CASEarth thus works on 20 associated indicators of these SDGs, especially the indicators that are relatively weak in data or methods. The case studies presented in this report, for instance the assessments of food productivity, urbanization, and land degradation, demonstrate that Big Earth Data and related technologies can provide new analytical tools and data infrastructures for understanding the

complex and interconnected sustainability issues. The continued effort to develop a Big Earth Data system will provide robust and complementary data services to support and improve SDG indicators. Furthermore, China's effort on Big Earth Data applications in service of SDGs will likely be of interest to some other developing countries, particularly those lacking technological capabilities.

CASEarth research on SDGs is an important contribution of China toward the 2030 Agenda for Sustainable Development. It is a new platform for Chinese scientists and international scientific communities to work together. I would like to thank the CASEarth team led by Prof. GUO Huadong for their efforts towards implementing the SDGs, and I expect them to bring new and more exciting results in coming years.

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of Sciences