



**Asia-Pacific  
Economic Cooperation**

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**2018/CSAE/006**  
Agenda Item: 6

## **Improving Public Understanding of Science to Ensure Innovation-Driven and Sustainable Development**

Purpose: Consideration  
Submitted by: China



**5<sup>th</sup> Chief Science Advisors and Equivalents  
Meeting  
Brisbane, Australia  
25-26 October 2018**

**Title:** Improving public understanding of science to ensure innovation-driven and sustainable development

**Submitted by:** China

**Agenda item:** Day-2, Thematic discussion 1: Public Understanding of Science

**Purpose:** for consideration

**Access:** Public

**Contact person:** ZHANG, Xian-En, [zhangxe@ibp.ac.cn](mailto:zhangxe@ibp.ac.cn)

“Knowledge is power” (“scientia potentia est”) is commonly attributed to British philosopher Sir Francis Bacon (1597) [1]. He also added “the power of knowledge depends not only on the value of its won, but also depends on whether it can be spread, as well as the depth and breadth of dissemination”, which could be interpreted as “Popularization and dissemination of science have the same strategic value as innovation” [2]. It is no doubt that scientific and technological innovation has become the most active force in the development of contemporary civilization.

#### **Public understanding of science - a new indicator of development stage of an economy**

Public scientific understanding is the root and guarantee of an innovation-driven economy, which has been proved by a wide range of public science literacy surveys [3-6].



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Last month (September 18, 2018), the China Association for Science and Technology (CAST) released the sampling survey results on China citizens' science literacy [7]. The survey covered 31 regions in mainland China, targeting Chinese adult citizens aged from 18 to 69. The main findings are as follows,

- Level of civic scientific literacy (CSL) has improved significantly, with the proportion of Chinese citizens qualified as scientifically literate reaching 8.47% in 2018, 2.27% higher than in 2015, laying a solid foundation for accomplishing the strategic goal of increasing the rate of CSL to 10% by 2020.
- The level of CSL increased substantially and rapidly in all regions, with 10 provinces and municipalities outperforming the average, and the development of scientific literacy became more balanced among different population groups. However, the level of CSL is matched with the level of regional economic and social development. For example, the CSL of Shanghai and Beijing exceeds 20%, and many other regions remained low.
- As important as TV, Internet became one of the main sources from which citizens accessed S&T information (64.6%) and the proportion of citizens using science popularization facilities and participating in science popularization activities also increased significantly.



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- Chinese citizens showed strong concern for and rendered active support to the development of S&T, and were full of confidence in the development of STI in China. S&T professions enjoyed a higher prestige in the minds of Chinese citizens.
- The most popular S&T information for the public is in order of environmental technology (85.1%), computer and internet (68.9%), new energy technology (66.9%), space technology (56.2%), biotechnology (56%), nanotechnology and new materials (49.5%).

In the past 40 years, China's socio-economic development stage has shifted from factor-driven to efficiency-driven, and now is moving towards innovation-driven. Recognizing the importance of the public science quality, for the first time China uses Civic Science Literacy as one of indicators in its 13<sup>th</sup> five-year Plan for Science, Technology and Innovation. By 2020, the proportion of Chinese citizens with scientific quality aims to exceed 10%.

### **Role of science communication in a digital age**

The development of information technology has pushed mankind into a digital age. We are experiencing Moore's law for data growth: data is doubling every 18 months. According to the Internet Data Center (IDC)'s statistics, the total global data in 2017 was 21.6 ZB (1 ZB = 1 trillion bytes), and is expected to reach 40 ZB by 2020 [8].

In the digital age, the way people live, travel, socialize, work and study are undergoing



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profound changes. Digital social media such as WeChat, Micro-blog, QQ, Facebook and Twitter are booming and become the main tools of public communication. Among which, WeChat is one of the most powerful tools. The number of active accounts of WeChat reached 1.04 billion per month, accounting for 34% of the total data traffic of mobile communication users [9]. It even becomes a potential competitor to Visa and Mastercard [10]. These disruptive technologies enable ubiquitous interconnection worldwide. With the technologies, scientists can exchange the latest research progress in a moment, and the public can receive scientific knowledge vividly in the multimedia environment. It would be interesting if could build appropriate models to predict how such rapid growth and dissemination of knowledge will affect the future of human society.

### **Integrity in science communication**

Inevitably, massive information is mixed with low quality and pseudoscience information. It is very difficult to distinguish them effectively. People more and more frequently received sorts of "scientific findings" through mobile communication platform, such as "32 days to detoxify a packet of instant noodles", "carcinogens from microwave-heated food", etc. The information is closely related to people's daily life, easy to cause panic. Yesterday, for example, I received a WeChat message from a friend group, it entitled "Cells paper: Dietary fiber intake may cause liver cancer". I immediately checked the paper and found it was



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titled “Dysregulated microbial fermentation of soluble fiber induces cholestatic liver cancer”. The research was actually an experiment on inulin (菊粉) feeding in mice and showed potential tumorigenicity. The title of the message confuses and frightens the public, because dietary fibers, including soluble and insoluble, many kinds, are widely distributed in everyday foods. If the title of the message and the paper clearly defined the experimental materials, it should very good, otherwise causes public scare. So, the scientists must be responsible for transmitting integrated knowledge.

To this end, the WeChat public platform has set up a WeChat anti-rumor center. The center jointly dispelled rumors by introducing more than 800 third-party authoritative agencies, including 289 agencies of former National Food and Drug Administration System, 5 state-level media, and 32 online correspondence accounts in China. In 2017, the Wechat Anti-rumor Center punished about 180,000 Wechat public addresses, and transmitted about 490 million of popular science messages, an average of about 1.4 million times a day<sup>[11]</sup>.

### **Beijing Declaration on world public scientific literacy**

The World Conference on Science Literacy was held in Beijing from 17<sup>th</sup> to 19<sup>th</sup> of September 2018, with the theme "Science Literacy for a Shared and Better Future" and the UN Sustainable Development Goals (SDGs\*). The conference was participated by 23 international organizations, 60 organizations and agencies, and over 1000 participants



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from various regions. The participants fully exchanged their views, reached the consensus, and issued Beijing Declaration: promoting positive interactions between society and science and technology in their broadest sense, understanding our mission and responsibilities, working together to narrow the gap in science literacy, persistently promoting universal benefit and fairness, and building a mechanism for collaboration and exchanges. The declaration promised to actively promote the upgrading of public scientific literacy to the UN's sustainable development agenda. [12]

### **Suggestions to CSAE**

The primary goal of APEC is to support sustainable economic growth and prosperity in the Asia-Pacific region. 2018 APEC Da Nang Declaration reaffirmed the longstanding commitment to APEC's mission and pledged to work together to "promoting Innovative growth, inclusion and sustainable employment, quality growth, structural reform and innovation" [13]. The implementation of innovation-driven development puts forward the need for promoting the public science literacy, because the level of which directly affects the formulation of policies, S&T quality, technology readiness, and the ability to solve problems in the sustainable development of society. It could be concluded that the public science literacy constitutes an economic or region's cultural roots and deposits, and decides its development and influences its future [14].



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We therefore suggest,

- conduct a survey on public science literacy in APEC region. The findings will be provided as reference to all member economies. The survey could be carried out by the working group of Policy Partnership on Science, Technology & Innovation (PPSTI).
- promote application of advanced IT technology in the popularization of science by supporting the cooperation between information network enterprises and the scientific community. This could be carried out cooperatively across the APEC's working groups, for example, PPSTI and Telecommunication and Information (TI).

**Conclusion.....**

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