

Science and Technology Trends

Science and Technology Policy to Address Social Issues in East Asia

CHINA

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1. Background

Science and technology (S&T) progress is not only an important driving force of economic growth, but also a major contributor to social development. Since the reform and opening up in 1979, China has made great achievements in S&T development, giving remarkable support and contribution to advances in economy, society, people's livelihood and national security.¹⁾ As early as the 1980s and 1990s, the Chinese government, in recognition of the role of S&T in social development, pointed out the need for sustainable development and put the S&T advancement in social fields and the continual improvement of people's living conditions as an important goal of China's S&T policy.²⁾ In practice, however, governments at various levels seemed to focus more on economic and GDP growth rather than on social progress, resulting, in a rather long period of time, in unbalanced development between economic and

social development. As a result, all kinds of social and environmental problems have gradually manifesting themselves in recent years.³⁾

At the early stage of the reform and opening up, China adopted an economy-oriented S&T strategy, represented by the basic line that "Economic construction must be based on S&T, and S&T must serve economic construction" laid down in the "*Decision on the Reform of the S&T Management System*" issued by the Central Committee of the Communist Party of China (CPC) in 1985. This basic line, which emphasized the combination of S&T and the economy and the former's support to the latter, significantly influenced the distribution of S&T resources and work priorities in this regard and played a positive role in promoting China's S&T development and supporting the rapid economic growth of the country. On the other hand, however, it also led to a situation in which S&T for social development was put in a "secondary" position in terms of government work, with relatively low government input and a weak capacity that lagged far behind the needs of social advancement.⁴⁾

In the 1990s, the Chinese government and the S&T community started to shift their attention to

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1) Wan Gang (Ed.), *Thirty Years of Science and Technology Reform and Opening-Up in China*, Science Press, 2008, p.1.

2) In 1986, Chinese authorities selected two better developed cities (towns) for pilot projects on comprehensive social development; in 1988, the state S&T authorities (then the National Committee of Science and Technology) set up its S&T Department for Social Development; in 1994, the Chinese government issued the "China 21st Century Agenda"; the "Ten-year Program for Science and Technology Development and the 8th Five-year Plan Guidelines (1991-2000) laid out general plans for S&T work addressing social issues.

3) Deng Nan, former Vice-Chairperson of China Association for Science and Technology, in a Speech at the opening ceremony of the 2007 National Conference on Science and Technology for Social Development, June 21, 2007, http://most.gov.cn/fggw/zfwj/zfwj2007/200706/t20070621_54305.htm.

4) Deng Nan, former Vice-Chairperson of China Association for Science and Technology, in a Speech at the opening ceremony of the 2007 National Conference on Science and Technology for Social Development, June 21, 2007, http://most.gov.cn/fggw/zfwj/zfwj2007/200706/t20070621_54305.htm.

S&T in the fields of population, resources and environment. In 1997, the CPC's 15th National Congress explicitly put forward the strategies for revitalizing the nation through science and education and sustainable development. The S&T management authority (then the State Scientific and Technological Commission) convened, in 1995 and 1997, the first and second national conferences on S&T for social development, launching the "*Guidelines on S&T for Social Development*" and six special programs for S&T development, as well as planning further efforts in this regard. During the Ninth Five-year Plan period (1996-2000), S&T for social development enjoyed a gradually elevated position with regard to the entirety of the country's S&T projects, with a total input of RMB5.688 billion from S&T departments and more than 14,000 individual research results achieved, laying a solid foundation for the advancement of S&T for social development.⁵⁾

Into the 21st century, China entered a new stage of building a well-off society in an all-round way while accelerating socialist modernization. Facing increasing problems concerning environmental pollution, resource shortages and social injustice, in addition to rising public calls for improved livelihood and better social undertakings, the CPC Central Committee and the State Council put forward the new concepts advocating a scientific outlook on development and the building of a harmonious society. In this spirit, China's S&T authorities continuously launched major policies regarding S&T for social development. In 2001, the Ministry of Science and Technology convened the Third National Conference on S&T Work, calling for priority to be given to S&T for Social Development in terms of the overall S&T undertaking of the nation. The Ministry also issued a series of policy documents, emphasizing S&T and institutional innovations as driving forces and the leading role of governments; they required S&T authorities at various levels to

adapt to shifts in government functions and the new situation, as well as increase their support and fund allocation to S&T for social development.⁶⁾

The 2006 National S&T Conference marked a new starting point in China's S&T for social development. The objective of implementing an independent innovation strategy and building an innovation-oriented country by 2020 has been put forward. Among the 11 key fields given priority in the "*Guidelines on the National Medium- and Long-Term Program for S&T Development (2006-2020)*" ("*Guidelines on S&T Program (2006-2020)*"), special attention was given to sectors closely related to social development, including energy, water and mineral resources; environment, population and health; urbanization and urban development; and public security. To increase support for the research and development of major technologies for the public good or shared by industries, the Ministry of Science and Technology, based on the National Program for S&T Breakthroughs, set up the National S&T Support Program in 2006. In April 2007, the Ministry convened a national conference on S&T for social development and spelt out the Initiative on S&T for Regional Sustainable Development (2007-2010). The implementation of the Support Program and the Initiative, being important strategies by the Ministry in the field of S&T for social development, improved the policy guidance on the S&T undertaking of the country and marked a new stage in the advancement of S&T for social development.

Entering the 12th Five-year Plan period (2011-2015), people's livelihood has occupied a more prominent position in China's S&T efforts addressing social issues. In July 2011, at the Fourth National S&T Conference, the Ministry of Science and Technology put forward the Initiative on S&T for Better Livelihood. According to the "*Suggestions on Accelerating the Development of S&T for Better Livelihood*"⁷⁾ released at the conference, S&T inno-

5) Commentary, Opening New Situations on Science and Technology for Social Development, Science and Technology Daily, December 21, 2001, p.1.

6) The Ministry of Science and Technology, 2001, Key Points in Science and Technology Work for Social Development (2001-2005); the Ministry of Science and Technology, 2002, Several Suggestions by the Ministry of Science and Technology on Further Strengthening Science and Technology Work for Social Development.

7) According to suggestions, science and technology for better livelihood refers to "scientific researches, product development, results transformation and S&T services related to major social development needs that are most relevant to the general public."

vation will be strengthened and industries fostered to give a larger role to S&T in the improvement of people's livelihood. During this five-year period, efforts will focus on six aspects: innovation in S&T management systems, state S&T major programs, special S&T programs and plans, state S&T initiatives, experimental zones for sustainable development and international cooperation. Four major projects are spelt out to guide S&T work in the fields of public health, public security, ecological environment in addition to disaster prevention and reduction. The notion of S&T for better livelihood and the implementation of state projects in this regard represent a major strategy during the 12th Five-year Plan period, which reflects increased attention in China's S&T policy to social development.⁸⁾

2. Basic Framework of China's Policies for S&T for Social Development

After years of evolution, China's S&T management authorities have gradually formed a basic framework consisting of policy means including development guidelines, technology policies, S&T programs, special initiatives and demonstrative zones to guide the advancement of S&T for social development.

2.1 S&T Development Guidelines: determining the basic direction and major policies of China's S&T development in a certain period of time

As an important policy means for the Chinese government, S&T development guidelines are leading documents that determine the general objective, direction, key tasks and major policy measures in the years to come, within a certain period of time; playing a critical role in guiding resource distribution, enhancing inter-department coordination, enhancing public awareness and promoting the country's S&T development. Since the founding of the People's Republic of China in 1949, an S&T planning system

has been formed through the successive formulation of five comprehensive medium- and long-term programs for S&T development, several five-year plans and numerous special programs. When so required by circumstances, some government departments also formulated programs targeting specific fields and key subject matters. Usually they focus on a certain sector or technological field to promote S&T development within.

2.2 Technological Policies: guiding or regulating S&T development in relevant fields

Technological policies serve as an important means for the Chinese government to guide or regulate the development of certain specific technologies. They usually offer suggestions or contain provisions on technology directions in some specific fields, and serve as guiding instruments in key fields. For instance, the "*Pharmaceutical S&T Policy (2002-2010)*", issued by the Ministry of Science and Technology, National Economic and Trade Committee and State Administration of Traditional Chinese Medicine in 2002, spelt out the objectives, strategy and priorities for the development of Chinese medicine S&T for 2002-2010. More specific technological policies are issued by relevant departments for important technology issues encountered in reality.

2.3 Government S&T Programs and Major Projects: addressing important S&T issues

After years of exploration, the Chinese government has gradually established a complete set of S&T planning systems. Presently it consists of "National S&T Major Projects", "State High-Tech Development Plan" (the "863 Program"), "National S&T Support Program" and "National Basic Research Program" (the "973 Program"), "Construction of National S&T Infrastructure Platform" as well as a series of policy guidelines and special programs. Projects

8) News report. China's Science and Technology for Social Development Focuses on People's Livelihood for the 12th Five-year Plan Period - the Fourth National Conference on Science and Technology for Social Development Opens, Science and Technology Daily, July 19, 2011, p.1.

funded by these programs more or less involve S&T development for social development. Of these, the “Major Projects”, being top priority of China’s S&T development, involve strategic products, key common technologies and key projects achieved within a timeframe by way of breakthroughs in core technologies and resource integration to serve national goals. The “Support Program” focuses on the research, development and application of major technologies for public welfare or shared by industries. Combined with major engineering construction and equipment development, it targets comprehensive, cross-trade and cross-region technologies to provide support to the coordinated development of the economy and society. In terms of a breakdown by sector of the annual funding under the 2006-2010 S&T Support Program, the energy, resources and environment sectors accounted for 16-22%, population and health 8-13%, urbanization and urban development 5%, and public security and other social undertakings 5-12%. These four fields took more than 40% of the total fund allocated. (See Table 1)

2.4 Special S&T Initiatives: adopting comprehensive means targeting at major issues encountered in reality

Entering the new century, the Chinese government has launched a number of special S&T initiatives (*zhuanxian Keji Xingdong*) to tackle important bottlenecks in economic and social development. They are of large or small scale, but mostly take the form of comprehensive policy measures, touching many aspects including research, technology promotion and demonstration. Many are large-scale initiatives involving coordination among several departments, such as the 14-department program addressing climate change in 2007, led by the Ministry of Science and Technology; and the 16-department program for energy saving and emissions reduction for the 12th Five-year Plan period, led by the National Development and Reform Commission in 2011. There are also some more specific programs, for example the “S&T Ambassadors for Start-ups at the Grassroots Level” started in 2002 by the Ministry of Science and Technology, the “S&T for Well-off Homes and

Table 1 Number of projects approved and total amount of state-allocated funds under the National S&T Support Program (by sector)

	2006 (first batch)		2007		2008		2009	
	Number of projects	Fund (RMB100 million)	Number of projects	Fund (RMB100 million)	Number of projects	Fund (RMB100 million)	Number of projects	Fund (RMB100 million)
Total	147	73.5	259	79.37	140	50.66	111	50
Distribution								
Energy, resources, Environment	40 (27%)	21.8%	43 (17%)	16%	35 (25%)	20%	21 (19%)	19%
Population, health	17 (12%)	8.2%	37 (14%)	13%	14 (10%)	9%	22 (20%)	9%
Urbanization and urban development	10 (7 %)	4.2%	12 (5%)	6%	9 (6%)	5%	1 (1%)	5%
Public security, other social undertakings	21 (14%)	12.3%	15 (6%)	5%	16 (11%)	11%	11 (10 %)	8%
Transportation	5 (3%)	5.7%	3 (1%)	11%	3 (2%)	6%	4 (4%)	14%
Agriculture	37 (25%)	28.7%	65 (25%)	20%	31 (22%)	20%	29 (26%)	19%
Material, manufacturing, information, modern service industry	17 (12%)	19.3%	84 (33%)	29%	32 (23%)	28%	23 (21%)	25%

Source: Annual Report on the National S&T Support Program (2006-2010), <http://www.most.gov.cn/ndbg/>.

Stronger Counties” started in 2005 and the “2006-2012 National Campaign against Measles” started in 2006 by the Ministry of Health.

2.5 Experimental Zones, Demonstrative Projects and Pilot Projects: spreading advanced, applicable technologies

It is a widely used policy means for China to promote advanced, applicable technologies through experimental sites, zones or demonstrative projects, for which government support is forthcoming in the forms of preferential policies, funds, staff and financial guidance. For instance, the “National Pilot on Sustainable Development”, a project of wide influence, has seen an increase from two pilot zones (at the city, county, district or town level) in 1986 to 116 by the second half of 2011, covering almost all provinces, autonomous regions and municipalities across China. The pilot zones have become the bases for the implementation of the “China 21st Century Agenda” and the sustainable development strategy of the country.⁹⁾ Most major projects under the “National S&T Support Program” are combinations of technology research and application demonstration. Many demonstrative projects are found under the S&T Support Program for the 11th Five-year Plan period, including those on technologies for the “Reconstruction of Typically Vulnerable Eco-systems”, “Integration of Renewable Energy and Buildings”, “Biogas Project with Mixed Materials in Less Developed Areas of West China”, “Integrated Safe Water Supply in Rural Areas” and “Special Service of Digital Communities”. These projects, which push forward technological innovation through the application and spread advanced technologies through demonstration, have proven to be effective ways to address major economic and social problems.

3. Key Areas of Attention and Related Topics in Policy-Making for S&T for Social

Development in China

Society-related S&T work covers a wide range of fields, including population, medicine and health; rational utilization and preservation of natural resources; ecological protection and environmental treatment; development and protection of marine resources; protection from natural disasters; living and construction in rural and urban areas; as well as culture, sports, tourism and cultural relic protection.¹⁰⁾ The followings are some of the key fields and topics covered in recent years.

3.1 Resources and Environment

Resources and environment constitute one of the most important bottlenecks in China’s social development, in addition to a focus of attention in the country’s S&T policy. Since the 10th Five-year Plan period, China has been faced with an ever increasing pressure on resources, environment and ecology. In response, China has increased funding for and achieved breakthroughs in a large batch of key technologies, focusing on increasing resource reserves and resource efficiencies along with promoting a cycling economy and emissions reduction through major S&T plans as well as sustainable development pilot projects. Funds were increased in the Support Programs; Program 863 and Program 973, in the fields of oil and gas exploration, rational allocation of water resources, treatment of lake pollution, disposal of industrial discharge and residential sewage, treatment and recycling of sewage water, clean production and sea water utilization. The Guidelines on S&T Program (2006-2020) have put energy, water and mineral resources along with the environment on the very top of the list of 11 key areas for S&T development; and identified 16 priority topics including “industrial energy conservation” and several special projects including one on the “control and treatment of water body pollution”. The S&T Support Program for the 11th Five-year

9) News report, Science and Technology for Social Development Focuses on People's Livelihood for the 12th Five-year Plan Period, Science and Technology Daily, July 19, 2011, p.1.

10) Xu Guanhua, former Minister of Science and Technology, in a speech at the opening ceremony of the National Conference on Science and Technology for Social Development, December 21, 2001, <http://www.pykj.gov.cn/zcfg/ShowArticle.asp?ArticleID=54>.

Plan period spelt out efforts in ecological protection, featuring 17 key projects covering restoration of typical deteriorated eco-systems, eco-protection in major construction zones, comprehensive assessment of eco-systems, urban eco-planning and construction, protection of biological diversity and bio-safety, with a total investment of RMB960 million.¹¹⁾ For more than two decades, thousands of S&T projects have been organized or executed in the national pilot zones for sustainable development. During the 11th Five-year Plan period, demonstrative projects were implemented by single or multiple departments to reduce emissions and develop the new-energy industry.

3.2 Population and Health

China has been facing ever increasing pressure from its population and an aging society. By 2011, China's total population had approached 1.34 billion, including 8.87% aged 65 or above.¹²⁾ To address the issue, China has given priority in its S&T policy for social development to the curbing of the fast growth of population while raising population quality and safeguarding public health. The Guidelines on S&T Program (2006-2020) includes population and health as a key area, identifies five priority topics including "prevention and treatment of common diseases in rural and urban communities" and sets out two special programs, one on "innovation in major, new medicines" and the other on "prevention and treatment of major infectious diseases including AIDS and viral hepatitis". According the health strategy of putting prevention first and emphasizing development efforts at grassroots levels, China has strengthened research on the prevention of common and frequently occurring diseases and intensified the promotion of applicable technologies in rural areas. During the 10th Five-year Plan period, five departments, including the Ministry of Science and Technology, jointly launched "demonstrative research of applicable technologies for health in rural

areas" at a cost of RMB30 million. A batch of low-cost, high-efficient projects were promoted in 20 counties of ten provinces or municipalities. During the 12th Five-year Plan period, along with the start of the S&T project for the health of the entire population, China will significantly increase input in the field of population and health to drive forward related S&T developments.

3.3 Urbanization and Urban Development

China has been undergoing a period of rapid urbanization in the last 30 years. In 2010, the urban population in the Chinese mainland approached 666 million, accounting for 49.68% of the national population.¹³⁾ As the urban population increases drastically and the urbanization process gathers pace, many cities have experienced disorderly expansion, and large numbers of farmers have lost their land and jobs. In many localities, serious urban illnesses, such as housing shortage, inadequate social security, traffic congestion and environmental pollution, have occurred. To address these challenges, the Chinese government, for the first time ever, incorporated "urbanization and urban development" as a key area of endeavor in the Guidelines on S&T Program (2006-2020), and in this connection, designated five priority tasks, including "urban zoning and dynamic monitoring", etc. The S&T Support Program also specified "urbanization and urban development" as a key area requiring support during the Eleventh Five-Year Plan period when three major projects, including the "Research and Pilot Project on Key Technologies for Well-off Homes in Villages and Towns"; and a number of key projects, including the "Research Project on Key Technologies for Zoning and Urban Land Conservation and Utilization", etc., were to be implemented. So far a number of key technologies have been developed. The Chinese government has also promoted innovation in green technologies and management models through pilot

11) Wan Gang (Ed.), *Thirty Years of Science and Technology Reform and Opening-Up in China*, Science Press, 2008, pp.501-520.

12) National Bureau of Statistics, *Bulletin on Main Data of 2010 Sixth National Population Census* (No.1), http://www.stats.gov.cn/tjgb/rkpcgb/qgrkpcgb/t20110428_402722232.htm

13) National Bureau of Statistics, *Bulletin on Main Data of 2010 Sixth National Population Census* (No.1), http://www.stats.gov.cn/tjgb/rkpcgb/qgrkpcgb/t20110428_402722232.htm.

and demonstration projects, policy incentives as well as other means. Over recent years, the government has undertaken many technology demonstration, pilot and promotional activities in the areas of urban zoning and planning, urban traffic, urban construction, urban green habitat, and integrated urban management information platform building.

3.4 Disaster Prevention and Reduction and Public Security

With rapid social and economic development and continuous improvement of people's livelihoods, the Chinese people in general are requiring better guarantees for public safety and security and greater effectiveness in the prevention of natural disasters and hazards. To meet such requirements, the Chinese government has strengthened S&T support for production safety, food safety, public security, disaster prevention and reduction to enhance the national capacity in this regard. "Public security" has been designated as one of the 11 key areas in the Guidelines on S&T Program (2006-2020), with six priority tasks identified, including those in connection with the "national public security emergency response information platform", "early warning and rescue for major production accidents" and "food safety and entry/exit inspection and quarantine". During the Tenth and Eleventh Five-Year Plan periods, China also implemented special projects on "key technologies for food safety" and "research and demonstration of key technologies for national public security emergency response platform", together with a series of S&T breakthrough projects, within the framework of the National Program for S&T Breakthroughs and National Program for S&T Support. In 1998, the Ministry of Public Security started to implement the Public Security Communication Network and Computer Information System Building Project ("Golden Shield Project") in order to strengthen S&T support for public security. Upon completion of Phase I (1999-2002) and Phase II (2002-2004) of the project, a nationwide public security information network connecting public

security organs at all levels across China was in place, introducing multimedia communication, information sharing and comprehensive IT support in public security work across China.

To improve its capacity to cope with natural disasters, China has, in recent years, increased its input in such areas as meteorological S&T research, survey, monitoring and control of geological disasters, earthquake monitoring and forecast, related defensive and emergency rescue technologies, basin and river control, as well as flood control and disaster reduction. In connection, a series of major and key S&T programs and projects have been implemented, with major breakthroughs having been achieved. Significant progress has been made in the areas of simulation, GIS, remote sensing and GPS, computer network and database, along with video monitoring system building.¹⁴⁾ In 2011, the General Office of the State Council issued the *National Program for Integrated Disaster Prevention and Reduction (2011-2015)*, calling for increased financial support for a well-developed national system and supporting mechanisms for integrated disaster prevention and reduction, to be put in place during the Twelfth Five-Year Plan period. The Program also envisaged the building of an information platform for national integrated disaster reduction and risk management in addition to the establishment of 5,000 pilot communities for integrated disaster reduction in China in the same period. Focusing on capacity building in the areas of natural disaster monitoring and early warning; disaster prevention and reduction information management and services; natural disaster risk management; natural disaster engineering defense; regional, urban and rural grassroots disaster prevention and reduction; natural disaster emergency response, recovery and reconstruction; S&T support for disaster prevention and reduction; China has started to implement eight key projects including the nationwide risk survey for natural disasters. With the implementation of the National Program for Integrated Disaster Prevention and Reduction (2011-2015), China is expected to set up a highly developed natural disaster monitoring and early warning system during

14) Wan Gang (Ed.), *Thirty Years of Science and Technology Reform and Opening-Up in China*, Science Press, 2008, pp.581-595.

the Twelfth Five-Year Plan period. This will greatly improve the country's capacity to protect against and respond to major natural disasters.

3.5 Rural Development and Social Equality

The huge development gap between urban and rural areas and between eastern, central and western regions in China has long been a difficult problem to tackle. To narrow the urban-rural gap, promote coordinated regional development and achieve social equality, China has long pursued a policy of relying on S&T to help eliminate poverty, promote sustainable regional development and strengthen the role of S&T in supporting the development of agriculture and the building of a new countryside.

Since the reform and opening-up of the country, the Chinese government has taken a full range of moves to promote the development of agriculture and the building of a new countryside. Specifically it has steadily pushed forward agricultural S&T system reforms; strengthened the R&D and promotion of key technologies for superior new variety breeding, high-efficiency plantation and breeding, agricultural product processing and logistics, agricultural disaster prevention and reduction, high-efficiency farming materials and equipment, agricultural water conservation, and biomass engineering; implemented a series of special projects and programs, such as the "S&T Ambassadors for Rural S&T Start-ups" project, the Special Spark Program for the Building of Rural S&T Service System, the Pilot Project of Bringing S&T to Farming Households, the "S&T in Support of New Countryside" project and the "S&T for a Better Livelihood in the New Countryside" project; built a number of Spark industry zones and national agricultural S&T parks; as well as established and provided key support for a number of national engineering technology centers in the agricultural field. Science and technology has made increasing contributions to agriculture and provided powerful support for China in its effort to continuously increase

the grain output, safeguard national food security and push forward the agricultural modernization drive.¹⁵⁾

To implement the national strategy for the development of western regions and to promote the coordinated social and economic development in underdeveloped areas, the Ministry of Science and Technology issued *Several Opinions on Strengthening S&T Work in the Development of Western Regions* in August 2000 and made extensive arrangements for the role of S&T in the development of the western regions. In connection, the Special S&T Action for the Development of Western Regions was launched.¹⁶⁾ Over the past 10 years, the Ministry of Science and Technology has successfully strengthened its S&T work in the western regions through policy incentives, project support, targeted assistance and interactive cooperation; and contributed to coordinated regional development in the country. Under the National Program for S&T Development, the government has continued to increase its support for western regions, with inputs up 5.3 times from RMB417 million in 2000 to RMB2.615 billion in 2008. In the fields of agriculture, energy, resources, equipment manufacturing, electronic information, ecological environment, health and safety and modern service industries, the Ministry of Science and Technology has implemented a large number of S&T projects in western regions, earmarking funds totaling RMB11.48 billion. Meanwhile, the Ministry has also helped western China to nurture local feature and advantageous industries as well as push forward local economic development through the continuous support and guidance of various S&T programs. The priority support from the central government as received in the western regions has to a considerable extent eased the problems faced by them in terms of the lack of basic capacity for independent innovation and shortage of resources for innovation. It has proven to be extremely effective in promoting coordinated development of all regions in China.¹⁷⁾

15) Wan Gang (Ed.), *Thirty Years of Science and Technology Reform and Opening-Up in China*, Science Press, 2008, pp.432-500.

16) News: Special S&T Initiative for the Development of Western Regions Kicks Off, *Guangming Daily*, February 20, 2000.

17) News: Ministry of Science and Technology Records Achievements in Developing Western Regions in China over Past 10 Years, [www.people.com.cn](http://news.sohu.com/20091209/n268817943.shtml), December 9, 2009. <http://news.sohu.com/20091209/n268817943.shtml>.

4. Summary

Looking back at S&T development in the general context of China's social development since the reform and opening-up, especially in the past 10 years, we can clearly see the following trends:

(1) The power of S&T has penetrated every aspect of social development, and S&T is playing an increasingly important role in promoting social development;

(2) Science and technology for social development is gaining importance in government work on S&T, and receiving more policy support;

(3) Taking a systematic and coordinated approach, China has adopted a variety of measures within the overall policy framework for promoting social development through S&T, by combining resources from all channels, encouraging coordinated development of all players, and embarking on a path of integrated development.

To a considerable extent, China's S&T policy for social development embodies the combination between government guidance and market mechanism as well as between central and local governments. It is also a reflection of the integration of scientific research with technology and product development, application, demonstration and promotion, and industrialization. China has formed an integrated and all-embracing policy system that supports basic research and technological innovation through government S&T programs and major projects; encourages pilot application and promotion through "projects", "initiatives", "experimental zones" and "pilot schemes"; and guides the development of relevant science and technologies through administrative measures or preferential policies. Just as an official from the Ministry of Science and Technology said at the 2007 National Conference on S&T for Social Development, the guiding thought for S&T work for social development in the Eleventh Five-Year Plan period is to achieve "five organic combinations", i.e. the organic combination between

central and local S&T forces; the organic combination of the government, industries, academia, research institutions and private sector, with enterprises as the leading force; the organic combination of S&T innovation, institutional innovation, forward-looking strategic research, scientific methodology research and innovation capacity building; the organic combination of projects, bases, forces and brands; and the organic combination of the National Support Program, Program 863, the S&T Infrastructure Platform Building Program, the Policy Guidance Programs and other S&T programs in the social development field. The goal is to form an S&T planning system of mutual support and resources integration that drives social development.¹⁸⁾ This is a feature of China's S&T policy for social development. It is also a successful experience that China has gradually gained from practical work.

The coming 10 years will be a key period for China, during which time it endeavors to push forward its modernization drive, build itself into an innovation-oriented country and achieve the goal of a well-off society. It will also be a critical period of drastic changes in social structure and frequent occurrence of social conflicts. China faces a series of grave challenges as it sets out to upgrade its industries, change the mode of economic growth and achieve the coordinated development of economy, society and nature. As the urban population continues to expand, China will witness a speedup in its urbanization process, resulting in an intensified population, scarcity of resources and environmental pressures in addition to major changes in the supply and demand structure and consumption structure. There will be an increasingly urgent demand for public health, public security, ecological improvement, environmental protection as well as disaster prevention and reduction. While continuing to pay attention to economic growth, China will more and more shift the focus of its S&T policy to the social development field. Science and technology will have to play a

18) Liu Yanhua, Former Vice Minister of Science and Technology, Be People-Centered, Innovative and Pragmatic, and Actively Push Forward S&T Work for Social Development - Report at the National Conference on S&T for Social Development, June 21, 2007. http://most.gov.cn/fggw/zfwj/zfwj2007/200706/t20070621_54305.htm.

greater role in supporting and leading the development of the social causes, and in this regard, more challenges lie ahead. Speeding up S&T advancement for social development in addition to strengthening

the role of S&T in supporting and leading social development, will all become an integral part of the focus of China's S&T policy and the related work in the future to come.