

2017 STATISTIC BULLETIN ON CHINA WATER ACTIVITIES

Ministry of Water Resources, P. R. China

The year of 2017 is a crucial one for the implementation of Thirteenth Five-Year Plan, deepening the supply-side structural reform in a comprehensive way, and boosting of major water projects and past-disaster rehabilitation of damaged or venerable water infrastructures. Under the strong leadership of the Party Central Committee and the State Council, water departments at each level have been studying and implementing Xi Jinping's thought of socialism with Chinese characteristics in the new era and the conceptual thinking of the 19th CPC National Congress, accelerating the pace of water development and reform in an all-round manner and focusing on the mainstream of national water security. Remarkable achievements had been made in water project construction, which has provided a strong support to social and economic development and further enhancement of capacity for eco-environment protection in China.

I. Investment in Fixed Assets

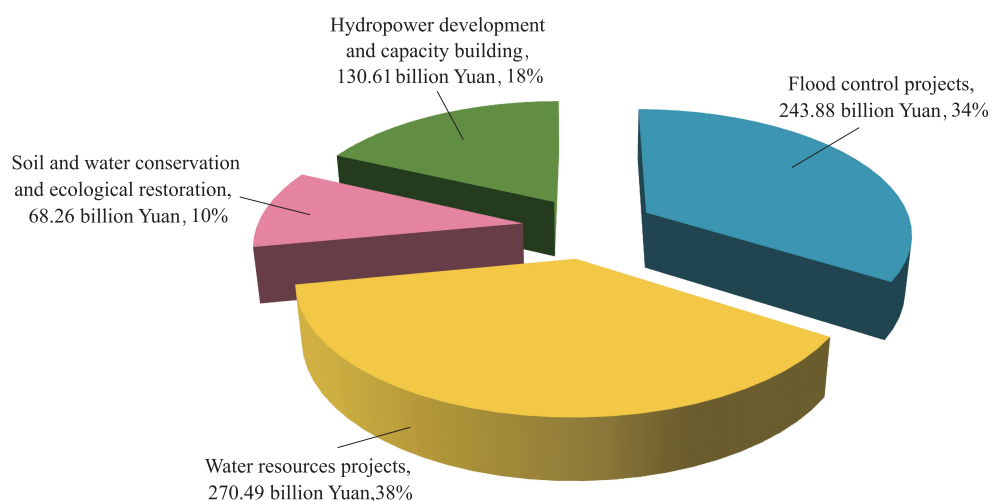
Completed investment for water project construction in 2017 amounted to 713.24 billion Yuan, with an increase of 103.28 billion Yuan or 16.9% comparing to the year of 2016. In which, 506.97 billion Yuan put into construction project with a 14.6% increase; 26.58 billion Yuan for installation with an increase of 4.4%; 21.17 billion Yuan for purchase of machinery, equipment and instruments, with a increase of 22.5%; and 158.52 billion Yuan for other purposes (including compensation of resettlement and land acquisition), with an increase of 26.8%.

	2011 /billion Yuan	2012 /billion Yuan	2013 /billion Yuan	2014 /billion Yuan	2015 /billion Yuan	2016 /billion Yuan	2017 /billion Yuan	increase /%
Total completed investment	308.60	396.42	375.76	408.31	545.22	609.96	713.24	16.9
Construction project	210.32	273.65	278.28	308.64	415.08	442.20	506.97	14.6
Installation project	12.17	23.78	17.36	18.50	22.88	25.45	26.58	4.4
Purchase of machinery, equipment and instru- ments	11.52	17.81	16.11	20.61	19.87	17.28	21.17	22.5
Others (including compensation of resettlement and land acquisition)	74.59	81.18	64.02	60.56	87.39	125.03	158.52	26.8

In the total completed investment, 243.88 billion Yuan was allocated to the construction of flood control projects, 270.49 billion Yuan for the construction of water resources projects, 68.26 billion Yuan for soil and water conservation and ecological restoration, and 130.61 billion Yuan for special projects of hydropower development and capacity building, increased by 17.4%, 4.6%, 69.1% and 26.4% respectively to the year before.

The completed investment for seven major river basins reached 547.2 billion Yuan, of which 166.04 billion Yuan was invested in river basins in the southeast, southwest and northwest of China. Completed investments in eastern, middle, western and northeast regions were 269.75 billion Yuan, 150.57 billion Yuan, 264.27 billion Yuan and 28.65 billion Yuan, accounting 37.8%, 21.1%, 37.1% and 4.0% of the total, respectively.

Completed investment of projects in 2017



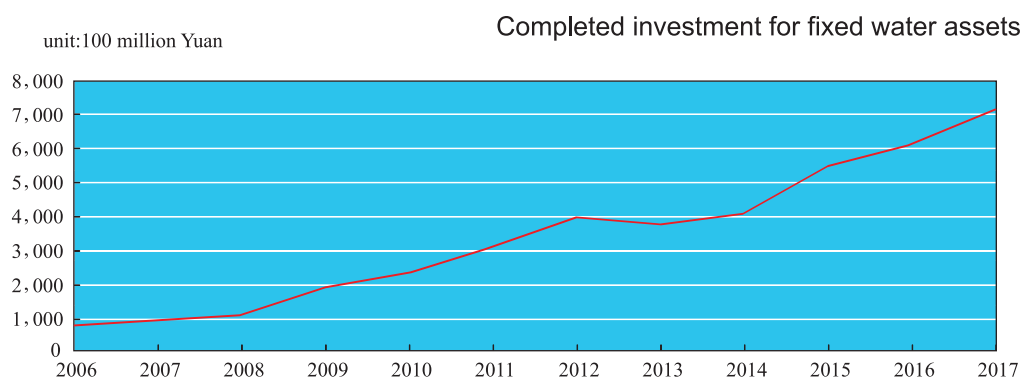
Of this total completed investment, the Central Government contributed 11.27 billion Yuan, and local governments contributed 701.97 billion Yuan. The completed investment of large and medium-sized projects was 143.05 billion Yuan; the completed investment of small-sized and other projects was 570.19 billion Yuan; the completed investment of newly-constructed project was 550.76 billion Yuan; and the completed investment of reconstruction and expansion was 162.48 billion Yuan.

The newly-added fixed assets totaled 418.75 billion Yuan. By the end of 2017, the accumulated completed investment of projects under construction was 1,607.76 billion Yuan, and the rate of completed investment reached 57.3%. The accumulated newly-added fixed assets totaled 892.53 billion Yuan and the rate of investment transferred into fixed assets was 55.5%, an decrease of 8.8% to the

year before.

A total of 26,698 water projects were under construction in 2017, with a total investment of 2,500.62 billion Yuan, an increase of 15.6% comparing to that of the year before. The projects with Central Government finance were 15,554 with a decrease of 5.6% comparing to the year before. The total funds used by projects under construction reached 1,325.96 billion Yuan and increased 9.4% comparing to the year before. There were 19,724 newly-constructed projects in 2017 with an increase of 7.1%, and newly-added investment was 907.52 billion Yuan with an increase of 31.2% comparing to the year before.

The completed civil works of earth, stone and concrete structures were 3.52 billion m^3 , 550 million m^3 and 90 million m^3 , respectively. By the end of 2017, the ratio of complete quantity of earthwork, stonework, concrete of the under-construction projects were 67.7%, 64.4% and 59.7%, respectively.



II. Key Water Projects Construction

Harness of large rivers and lakes. In 2017, there were 5646 river harness projects under construction, including 640 flood control dyke and embankment construction, 859 projects for large river and main tributary control and 3639 medium and small river control works and 508 flood diversion and storage areas or other projects. By the end of 2017, the accumulated investment in projects under construction was 407.07 billion Yuan, with a completion rate of 67.4%. River regime control and river course training and restoration had been undertaken in the middle and lower reaches of the Yangtze River. The recent flood control works in the lower reaches of the Yellow River passed completion check and acceptance. Huai River improvement project has been accelerated, with 27 out of 38 projects under construction. Among which, 5 projects were completed and started benefit generation. Control of three rivers project in the Northeast of China were nearly completed. There were 17 out of 21 projects for Comprehensive Improvement of Water Environment of Taihu Lake started construction, among which 10 projects completed for benefit generation.

Reservoir projects. There were 1002 reservoir projects under construction in 2017. By the end of 2017, the completed investment of under-construction projects reached 273.39 billion Yuan, accounting for 66.5% of the total completed investment. Following projects started construction, namely Dashixia Multipurpose Project in Xinjiang Autonomous Region, Nasuogele Multipurpose Project in Qinghai Province, Xianghe Multipurpose Project and counterpart irrigation system in Tibet Autonomous Region, Chemabi Reservoir in Yunnan Province and Sifangjing Multipurpose Project in Jiangxi Province. Datengtxia Multipurpose project and Qianping Reservoir have been accelerating construction. Water diversion and damming were completed for Chushandian Reservoir, Jiayan Multipurpose Project in Guizhou Province and Transfer Water to Northwest of Guizhou Province and

Yuetan Reservoir in Anhui Province. Kalabelli Dam in Xinjiang Autonomous Region was impounded, and the first unit of Centianhe Hydropower Station in Hunan Province started to generate electricity after the reservoir expansion. The completion of Changtaifangyang Multipurpose Project in Fujian Province enables emergency water supply to Xiamen City. Hekoucun Reservoir in Qinhe River of Henan Province and Xiajiang Multipurpose Project in Jiangxi Province passed check and acceptance.

Water allocation projects. The yearly investment for water allocation projects reached to 637.24 billion Yuan. The completed investment had accumulated to 287.94 billion Yuan, accounting for 45.2% of the total. The projects of Jinshajiang Water Diversion Project in Yunnan Province, Zhuoer-Liaohe Water Diversion Project in Inner Mongolia Autonomous Region, Water Supply to West of Jilin Province, Yellow River Water Diversion to Middle of Shanxi Province and Jinxi Irrigation District in Heilongjiang Province started construction. Water Diversion from Yangtze River to Huai River in Anhui Province, Water Diversion from Han River to Wei River, Water Supply to North of Hubei Province, Phase-II Tao River Water Diversion in Gansu Province have accelerated construction. The main schemes of Yellow River Diversion to Baiyangdian Wetlands in Hebei Province were completed for trial operation. A total of 76 river-lake connecting systems were constructed that could improve connectivity of about 230 rivers (lakes or reservoirs).

Irrigation, drainage and rural water supply. The completed investment for strengthening and improving safe drinking water supply reached 36.86 billion Yuan, among which 3.7 billion Yuan from Central Government subsidy, with a beneficial population of 55.00 million of which 5.65 million listed in national plan for poverty reduction. By the end of 2017, the rural population access to tap water supply made up a percentage of 80.0% and the percentage of population with centralized water supply system raised to 85%. The Central Government

allocated 15.4 billion Yuan for the construction of irrigation systems and rehabilitation of irrigation districts for water saving purpose. There were 32.79 billion Yuan allocated to the construction and operation and maintenance of small-scale farmland waterworks for irrigation and drainage. The newly-added effective irrigated area reached 1,070,000 ha; new-added water-saving irrigated area was 2,100,000 ha and newly-added highly-efficient water-saving irrigated area was 1,639,000 ha.

Rural hydropower and electrification. In 2017, the completed investment of rural hydropower station construction amounted to 20.0 billion Yuan; the newly increased hydropower stations were 161, with a total installed capacity of 1.353 million kW, among which the newly increased installed capacity amounts to 1.003 million kW, and the increased installed capacity by rehabilitation accounts to 0.35 million kW. The completed investment for rural electricity network in the whole country was 5.53 billion Yuan; the newly increased capacity of 110kV substation or above was 3.512 million kVA; the newly increased capacity of 35 (66) kV substation was 0.624 million kVA; the capacity of distribution transformer was 3.185 million kVA. The newly-added high pressure transmission line and low pressure line were 24,000 km and 72,000 km, respectively.



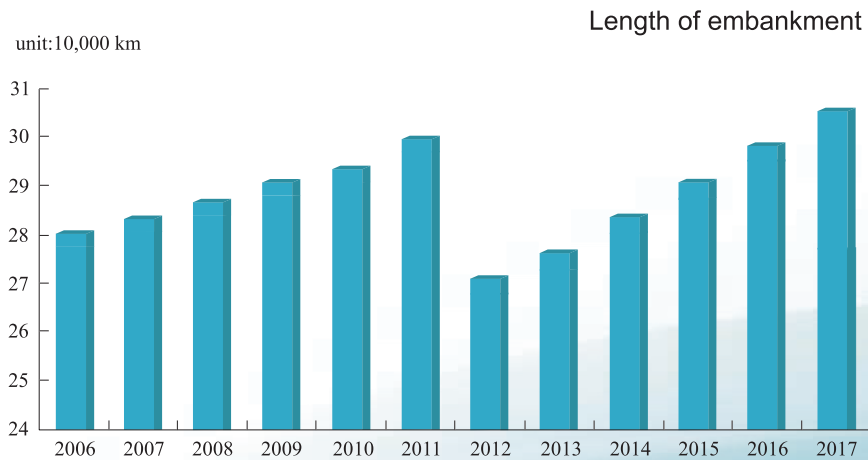
Soil and water conservation. A total of 72.71 billion Yuan was allocated to construction of soil and water conservation and ecological restoration project in 2017, with an accumulated investment of 42.21 billion Yuan. The newly-added areas with soil conservation measures reached 59,000 km², of which the area under National Major Project for Soil Conservation was 7,900 km². 433 silt-retention dam on Loess Plateau at high risk were strengthened and rehabilitated.

Capacity building. The completed investment for capacity building in 2017 was 4.18 billion Yuan, of which 0.44 billion Yuan spent on procurement of communication equipment for flood control, 1.11 billion Yuan for hydrological facilities, 0.2 billion Yuan for scientific research and education facilities and 2.43 billion Yuan for others.

III. Key Water Facilities

Embankments and water gates. In 2017, the completed river dykes and embankments ranging at Grade-V or above had a total length of 306,000 km^①. The accumulated length of dykes and embankments meeting the standard reached 210,000 km, with a percentage of 68.6% of the total, among which the Grade-I and Grade-II dykes and embankments up to the standard reached 33,000 km, with a reaching standard rate of 80.1%. These embankments can protect 610 million people and 41,000 ha of cultivated land. The number of water gates with a flow of 5 m³/s increased to 103,878, of which 893 were large water gates. Divided by types of water gates, there were 8,363 flood diversion sluices, 18,280 drainage/return water sluices, 5,130 tidal barrages, 14,435 water diversion intakes and 57,670 controlling gates.

① The length of embankment before 2011 includes embankment below Grade-V.

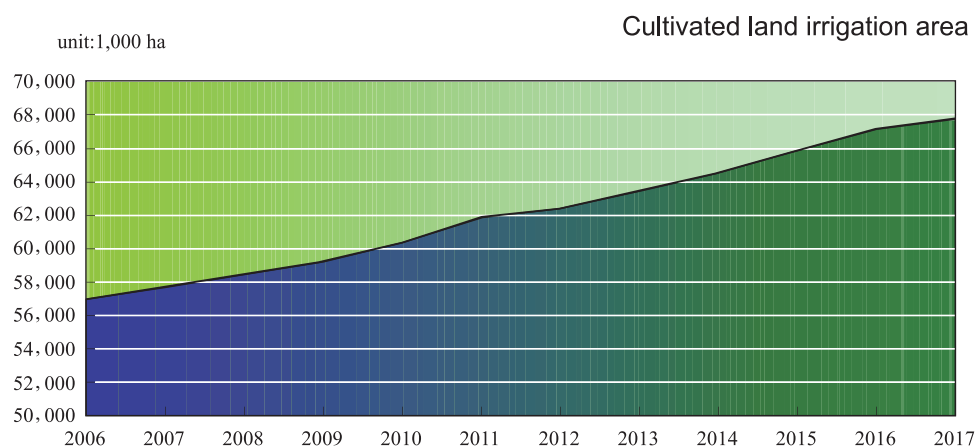


Reservoirs and water complexes. The number of reservoir in China reached 98,795, with a total storage capacity of 903.5 billion m^3 . Of which 732 belong to large reservoirs with a total capacity of 721.0 billion m^3 , accounting 79.8% of the total; 3,934 medium-sized reservoirs with a total capacity of 111.7 billion m^3 , accounting 12.4% of the total.

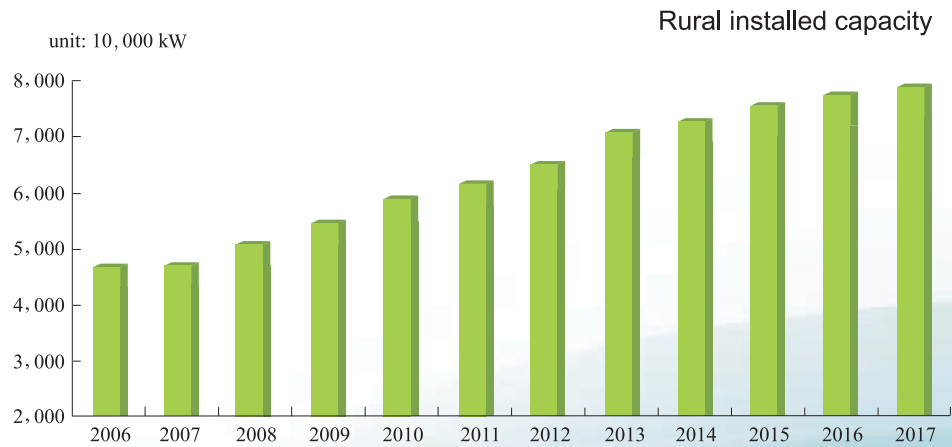
Tube wells and pumping stations. A total of 4.96 million tube wells, with a daily water abstraction capacity equal or larger than 20 m^3 or an inner diameter larger than 200 mm, were employed for water supply in the whole country. A total of 95,077 pumping stations that have an installed flow of 1 m^3/s or installed voltage above 50 kW were in operation, among which 375 categorized as larger pumping stations, 4,255 medium-sized and 90,447 small-sized pumping stations.

Irrigation systems. The irrigation districts with an area equal or above 2,000 mu added to 22,780, with a total effective irrigated area of 37.483 million ha. In which, the irrigation districts equal or above 500,000 mu reached 177, with a

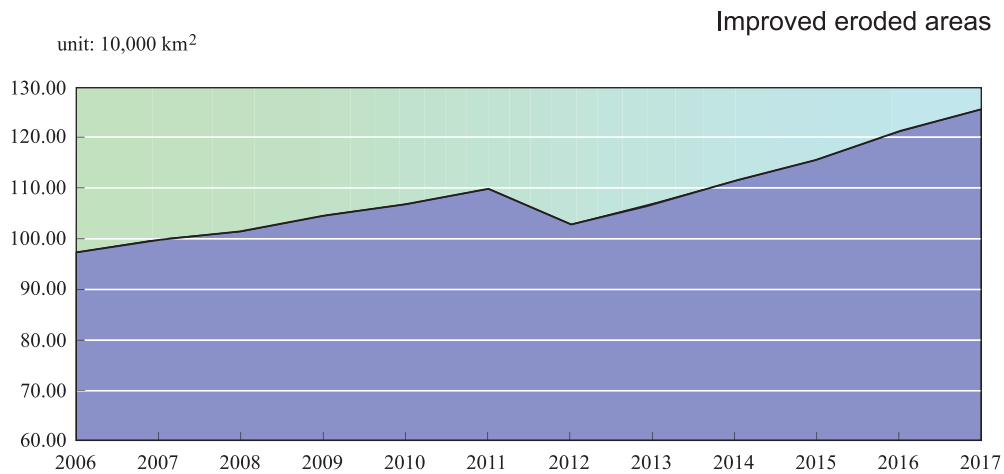
total irrigated area of 12.416 million ha; the irrigation districts covering an area from 300,000 ~500,000 mu was 281, with a total irrigated area of 5.425 million ha. By the end of 2017, the total irrigated area and irrigated area of cultivated land reached to 73.946 million ha and 67.816 million ha respectively, taking 50.3% of the total cultivated land in China. The areas with water-saving irrigation facilities totaled 34.319 million ha, among which 10.561 million ha equipped with sprinkler or micro irrigation systems and 9.99 million ha installed low-pressure pipes.



Rural hydropower and electrification. By the end of 2017, hydropower stations built in rural areas totaled 47,498, with an installed capacity of 79.27 million kW, accounting for 23.2% of the national total. The annual power generation by these hydropower stations reached to 247.72 billion kW·h, accounting for 20.7% of the national total.



Soil and water conservation. By the end of 2017, the restored eroded areas reached 1.258 million km²^❶; and the forbidden area for ecological restoration accumulated to 0.2185 million km². Dynamic monitoring for soil and water loss had been conducted in 16 protection and control areas of national importance and 19 key areas of national importance, with a total monitored area of about 764,300 km².



❶ Statistical data in 2012 is integrated with the data of first national census for water.

Hydrological station networks. In 2017, the number of hydrological stations of all kinds was totaled 113,245 in the whole country, including 3,148 national basic hydrologic stations, 3,954 special hydrologic stations, 13,579 gauging stations, 54,477 precipitation stations, 19 evaporation stations, 2,751 soil moisture monitoring stations, 16,123 water quality stations, 19,147 groundwater monitoring stations and 47 experimental stations. There were 59,104 various kinds of hydrological monitoring stations that provide hydrological information to flood control commanding headquarters at and above the county level; 1565 various kinds of hydrological monitoring stations for early warning and forecasting. A total of 333 water environment monitoring centers (sub-centers) in operation. The networks of water quality monitoring stations could cover nearly all surface water bodies and major groundwater bodies in water function zones of all major rivers and lakes or reservoirs and administrative boundaries at provincial level.

Water networks and information systems. By the end of 2017, water resources departments at and above the provincial level equipped 7,213 varied kinds of servers. The total storage capacity of various kinds of online storage equipment reached 3.3PB, with a total of 1.9PB storage of various kinds of data and information. The water resources departments at and above the county levels had installed 2731 various kinds of satellite equipment, 7,900 flood forecasting station for short message transmission from Beidou Satellite, 68 vehicles for emergency communication, 409 Unmanned Aerial Vehicle (UAV) and 5767 cluster communication terminals in operation. In terms of data collection and video monitoring, a total of 420,000 gathering points were available for water departments at and above the provincial level to receive various kinds of water-related information, among which 196,000 points were used for collecting data of hydrology, water resources and soil and water conservation. There were 224,000 gathering points for monitoring safety of large and medium reservoirs.

IV. Water Resources Utilization and Protection

Water resources conditions. The total national water resources in 2017 was 2876.12 billion m^3 , 3.8% more than the normal years. Mean annual precipitation was 664.8 mm that was 3.5% more than the normal years and 8.9% less than the year before. By the end of 2017, total storage of 660 large and 3,547 medium-size reservoirs were 407.98 billion m^3 , 8.26 billion m^3 more than that in early 2017.

Water supply capacity. In 2017, the newly-increased water supply capacity reached 9.21 billion m^3 . By the end of 2017, the total water supply capacity in China reached 856.24 billion m^3 , including 58.17 billion m^3 of water supplied by utilities at county level, 233.78 billion m^3 by reservoirs, 205.14 billion m^3 by river-lake diversion schemes, 168.65 billion m^3 by river-lake pumping stations, 138.52 billion m^3 by tube wells, 35.48 billion m^3 by ponds, weirs and cellars, and 16.5 billion m^3 by unconventional water sources.

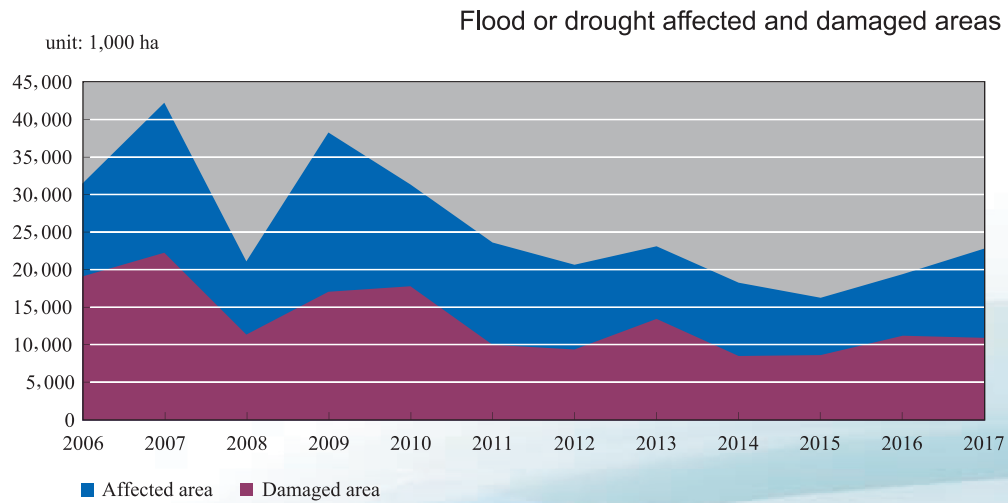
Water resources utilization. In 2017, the total water supply amounted to 604.34 billion m^3 , among which 81.8% came from surface water, 16.8% from underground water and 1.4% from other water sources. The total water consumption amounted to 604.34 billion m^3 , of which domestic use amounted to 83.81 billion m^3 or 13.9% of the total; industrial use 127.7 billion m^3 or 21.1% of the total; agricultural water use 376.64 billion m^3 or 62.3% of the total; artificial recharge for environmental and ecological use 16.19 billion m^3 or 2.7% of the total. Comparing to that of the year before, water consumption increased by 0.32 billion m^3 , in which agricultural water use decreased by 0.16 billion m^3 , industrial use decreased by 3.1 billion m^3 , and domestic water use and environmental flow increased by 1.65 billion m^3 and 1.93 billion m^3 respectively. Water consumption per capita in 2017 was 436 m^3 in average. The coefficient of effective irrigated

water use was 0.548. Water use of 10,000 Yuan GDP (at comparable price of the same year) was 73 m³. Water use of industrial production value added per 10,000 Yuan (at comparable price of the same year) was 45.6 m³. At the comparable price of the same year, water use of 10,000 Yuan GDP and water use of industrial production value added per 10,000 Yuan decreased by 6.4% and 8.2% less comparing to 2016. The rates of metering for domestic and industrial water uses were larger than 85%. The rate of metering for irrigation water use was 61%.

Water quality of rivers and lakes. According to water quality assessment on 245,000 km long of rivers, 78.5% of the river met the class-I to class-III water quality standard and 76.9% of the total complied with the water quality standard for national water function zones of major rivers and lakes.

V. Flood Control and Drought Relief

In 2017, the overall damage caused by flood and water-logging disasters was relatively less than other years, with an average loss rate was 0.26% of the year. A total of 5.196 million ha of cultivated land were affected by floods, 2.781 million ha of farmland had no harvest, 55 million people affected, 316 people died, and 39 were missing. A total of 140,000 houses were destroyed and 104 cities suffered from inundation. The disasters resulted in 214.3 billion Yuan of direct economic losses, among which the losses with water infrastructures reached 34.5 billion Yuan. Provinces suffered from severe flooding include Hunan Province, Jilin Province, Guangdong Province, Guangxi Autonomous Region, Jiangxi Province, Hubei Province and Shaanxi Province. Death toll or people missing caused by mountain flood took 64% of the total. The direct economic loss caused by typhoons took 16% of the total loss as a result of flood and waterlogging disasters.



In 2017, no large scale drought occurred in the whole country and the percentage of annual losses caused by drought disasters was 0.05%. The seriously affected areas include provinces or autonomous region of Inner Mongolia Autonomous Region, Heilongjiang Province, Shanxi Province, Liaoning Province, Shandong Province, Hubei Province and Gansu Province. The affected farmland was 9.946 million ha and areas with no harvest reached 4.49 million ha, with a direct economic losses of 43.8 billion Yuan. A total of 4.78 million urban and rural population and 5.14 million man-feed big animals and livestock suffered from temporary drinking water shortage.

In 2017, the funds allocated to defense extraordinary floods and droughts amounted to 3.84 billion Yuan, among which 3.29 billion Yuan for extraordinary floods and 0.55 billion Yuan for extraordinary droughts. Thanks to the efforts of flood control, 1.904 million ha of cultivated land were prevented from inundation and 139 times of flooding in cities were avoided, resulting in economic benefits amounting to 67.2 billion Yuan. Drinking water was provided to 4.04 million people

in rural and urban areas as well as 3.15 million big animals and livestock in order to alleviate temporary water shortage. The area with anti-drought measures reached 18.521 million ha that prevented a loss of 22 billion kg of grain. The accumulative inputs for flood disaster relief include 5.7 million person-time, 39,000 vessel-time, 253,000 shifts of transportation and 225,000 shifts of mechanical equipment. The consumed materials valued 2.15 billion Yuan. The person-time of emergency evacuation was 7.13 million. There were 2.67 million tube wells, 43,000 pumping stations, 4.56 million mobile devices and 0.69 million various kinds of water transporting vehicle employed for drought relief.



VI. Water Management and Reform

River (Lake) chief system. By the end of 2017, river chief system had been fully implemented in 25 provinces, autonomous regions or municipalities such as Beijing and Tianjin and also sped up pace of establishment in 6 provinces or autonomous regions of Liaoning Province, Guangxi Autonomous Region, Tibet Autonomous Region, Shaanxi Province, Gansu Province and Xinjiang Autonomous Region. More than 300,000 river chiefs were named at four levels of province, city, county and township. In some provinces, river chiefs were appointed for villages and more than 600,000 river chiefs including river inspectors and river guards were assigned at the village level. All provinces, autonomous regions or municipalities set up river chief offices at provincial, municipal, county levels, and counterpart management systems with a working pattern of taking responsibilities by the government leaders, taking the lead by water resources departments, coordinated by other governmental departments and participated by the whole society.

Most stringent water resources management. Performance evaluation of 31 provinces, autonomous regions or municipalities on implementation of stringent water resources management system during the year of 2017 had been conducted by 9 ministries including Ministry of Water Resource and NDRC. The approvals for water allocation of 20 trans-boundary rivers were implemented. Assessment on water resources bearing capacity of Yangtze Economic Belt was completed. 889 million m³ were diverted by Phase-I of Eastern Route Scheme to Shandong Province, 4515 million m³ were diverted by Phase-I of Middle Route Scheme to Beijing、Tianjin、Hebei Province and Henan Province. The water supply capacity of these areas have been significantly improved. Integrated regulation of water resources of major rivers including Yellow River and Heihe has been strengthened that prevented drying up of Yellow River mainstream for 18 consecutive years and Juyanhai East in the downstream of Heihe River for 13 consecutive years. By taking

county area as the basic assessment unit, we began to construct of water-saving society. There were 65 counties (districts) in 8 provinces or autonomous regions or municipalities of Beijing and Inner Mongolia Autonomous Region passed the final evaluation. The pilot project of 105 water ecological civilization cities has made smooth progress, among which 41 pilots passed check and acceptances. Control of groundwater abstraction had been proceeded in Hebei Province that reduced 2.02 billion m^3 of groundwater withdrawal in rural areas. The reduced groundwater abstraction in water-receiving areas of Phase-I of Eastern and Middle routes of South-to-North Water Diversion was 1.523 billion m^3 that takes 69.2% of the recent target. There were 7 pilot projects completed for water entitlement trading. 6 pilot counties of water property right were advanced, and their pilot scheme had been completed to be implemented. China Water Exchange completed 31 entitlement trading with an amount of 807 million m^3 . 41 deals were completed with a total trading volume of 1443 million m^3 of water and trading investment of 0.899 billion Yuan.

Water affairs management. By the end of 2017, a total of 2626 water authorities or water resources bureaus being in charge of water affair management established in the whole country, accounting for 81.65% of the total administrative regions above the county level. Among 1531 established water authorities, there were 4 at provincial level, 9 at sub-provincial level, 216 at prefecture or city level, and 1302 at county level. There were 2360 water plants operated by utilities under these water authorities, with 496,000 km of water supply pipes, a daily self-water supply capacity of 164 million m^3 , among which the daily surface water supply capacity was 143 million m^3 and daily groundwater supply was 21 million m^3 . The total quantity of water supply was 33.9 billion m^3 with a service population of 317 million.

Construction and management. By the end of 2017, there were 14,366 water

utilities included in the list for water management system reform, and adjusted and streamlined to 13,991 water utilities through cancel and merger, with a reduction of 2.6% comparing to the number of organizations before the reform. A total of 29.62 billion Yuan had been allocated to 13,991 water utilities for covering cost of managerial staff and operation and maintenance, which covered 88.4% of the total. Among which, 17.52 billion Yuan were allocated to cover the staff expenses of public service, which accounted 95.6% of the total; 12.10 billion Yuan allocated to cover operation and maintenance of public service facilities, which accounted 79.6% of the total. Reform of management system by separating functions of administration with operation had been implemented in 13,014 utilities, accounted for 93% of the total. By the end of 2017, the approved national water scenery spots reached 832, including 362 reservoirs, 182 natural rivers and lakes, 175 lake or riverine cities, 47 wetlands, 30 irrigation districts and 36 soil conservation areas.

Reform in rural water resources management. In 2017, the funding from private sector to high-efficient water-saving irrigation and provision of safe drinking water amounted to 13% and 30% of the total investments respectively. About 55% of small irrigation and drainage systems and drinking water supply facilities had clarified proper rights with awarding of property certificates, utilization permits and operation and maintenance responsibility agreements. Focusing on three types of projects and 13 reform measures, the pilot projects in 100 counties that implemented reform of property right of farmland waterworks and innovative operation and maintenance mechanism had completed. The coverage rates of cost of basic personal expenses in large irrigation districts and pumping station as well as operation and maintenance of public-good waterworks were 70% and 56% respectively.

Water pricing reform. In 2017, NSDC, Ministry of Finance (MOF), MWR, MOA

and Ministry of National Land and Water resources had boosted water pricing reform of agricultural water use and issued the legal documents of *Notice on Promoting Agricultural Water Pricing Reform* and *Methods for Performance Evaluation of Agricultural Water Pricing Reform*. The reform of pricing system for agricultural water use has been incorporated into the Stringent Water Resources Management System and accountability evaluation of governors being responsible for grain safety. By the end of 2017, there had been 700 counties and 100 irrigation districts carried out reform of pricing system for agricultural water use, with an area of 52 million mu, among which about 32 million mu were newly-added in 2017. Great achievements had been made in the areas of implementing reform, with an average water-saving of 100 m³ per mu and 20% shorten of irrigation time in average.

Water resources planning and early-stage work. In 2017, there were 12 water resources plans approved by central government agencies, among which three plans including *Special construction Scheme for Erosion Control of National Slope Farmland in 13th Five-Year Plan* were approved by National Development Reform Commission (NDRC), 9 plans approved by the Ministry of Water Resources (MWR). The third national water resources survey and assessment was initiated. Steady progress had been made by major water project planning at the national level. Comprehensive planning for major river basins and tributaries has been accelerated. Water plans in key national strategies has been proceeded. In 2017, a total of 21 projects were delivered to NDRC for approved by the Ministry of Water Resources, with a total investment of 105.337 billion yuan. In 2017, a total of 21 projects were approved by NDRC, including 18 feasibility study reports and 3 project plans, with a total investment of 198.085 billion Yuan. There were 9 preliminary designs approved by MWR, with a total investment of 187.697 billion Yuan.

Soil and water conservation. In 2017, a total of 32,300 soil and water conservation plans of construction projects being examined and approved, covering a scope of 531.01 km² for protection and control. A total of 7,900 soil and water conservation projects completed check and acceptance. By the end of 2017, there were 31 provinces (autonomous regions or municipalities) promulgated the implementing provisions or regulations of Soil and Water Conservation Law; and 25 provinces (autonomous regions or municipalities) made public the methods (standards) for the collection, utilization and management of compensation fee for soil and water conservation.

Rural hydropower management system. In 2017, *Evaluation Standard for Green Small Hydropower* (SL 752-2017) was promulgated. In 2017, there were 44 small hydropower projects in 12 provinces (autonomous regions, municipalities) awarded the title of green small hydropower station. By the end of 2017, the plans for water energy resources development of 3200 small and medium rivers were revised and completed, which covered nearly all proposals before 2025. Standardization for safety production of rural hydropower stations had been advocated and 2100 hydropower station of the kind has been completed.

Reservoir resettlement. There were 266 concentrated relocation sites constructed and centralized newly-constructed housing of 5.19 million km². The resettled population was 147,315, among which 144,329 were relocated rural residents and 2986 relocated urban residents. A total of 165,552 of resettled people were arranged



for production activities, among which 79,534 arranged for agricultural production, 11,591 people compensated on a yearly basis, 50,686 compensated by monetary means (arranged by themselves), 14165 people joined pension plans, 1082 people seeking help from their relatives and friends and 8494 people with other arrangements.

Safety supervision. In 2017, there were 12 production accidents with 19 people dead. MWR, river basin authorities and water resources departments at provincial level organized 1824 inspection teams and 8258 experts for on-site inspection and overall investigation of safe production situation, and also inspections during flood season and highly-hazard chemicals as well as special inspections on electric fire risks. A total of 37,682 potential hazard were properly handled. It was announced that 60 enterprises approved to meet the level-1 evaluation standard for water safety production, including 38 water and hydropower constructing companies, 9 legal persons of water projects and 13 water project management units. Evaluation of about 8600 project leaders and peoples in charge of safe production management had been taken. MWR sent 10 batches or groups including 159 missions for inspection of 347 projects. There were 144 feedbacks of inspection and rectification comments that were delivered one by one to each province regarding prominent problems. Self-inspection of provincial water administrative departments had been encouraged and a total of 449 inspection groups were sent out for reviewing 1342 projects and 773 announcements were delivered for rectification.

Legislation and administrative law enforcement. In 2017, revision of 4 water administrative laws and regulations were completed. Through evaluations on 43 ministerial norms and standards, and about 200 normative documents, MWR abolished 3 and amended 17 ministerial norms and standards; abolished 13, expire 14 and amended 13 normative documents. In 2017, the investigated illegal

cases totaled 14, 413 and 12, 070 or 83. 74% resolved. A total of 942 water disputes were mediated and 903 resolved. There were 21 administrative review cases and 28 administrative responses settled by the Ministry of Water Resources.

Administrative permits. There were 2005 applications accepted by MWR and 1840 water-related administrative approvals or permits authorized or extended, including 35 project plan approvals, 9 preliminary design reports of water construction projects, 126 water abstraction licenses, 10 approvals for newly-constructed, rehabilitated or expanded pollution discharge outlets in rivers and lakes, 17 evaluation reports of flood impact by non-flood control project, 291 plans of construction projects within the jurisdiction of river courses, approval of 1 within the river channel management (not including sand mining in river channel), 20 licenses of sand excavation, 61 approvals of soil and water conservation plan of production and construction projects, 37 check and acceptance of soil and water conservation plans of construction projects, approval of establishment or reorganization of 4 national hydrological stations, approval of 1 special hydrological stations, 18 hydrological monitoring projects for impact of construction at upper and lower of National Basic Hydrological Stations, 751 qualification approvals (including new application, extension, adding of new items or promotion) for construction supervisors of water resources projects; 194 qualification identifications (including application and extension) for quality supervisors of water-related projects.

Water science and technology. A total of 430 million Yuan had been allocated to science and technology projects, including 22 special-subject and water-related scientific research projects listed in the National Key Research and Development Plan-Effective Development and Utilization of Water Resources, and 36 demonstration project for water technologies. There were 3 water technological achievements won the National Sci-Tech Advance Award (all second prize) and 2

project won the second prize of National Technological Innovation Award. By the end of 2017, the numbers of national level or ministerial level labs were 12, and technical research centers were 15. Special funds for procurement and repairing of equipment of national scientific institutions amounted to 118.35 million Yuan. A total of 107.44 million Yuan had been allocated from central government finance as operation expenses for basic scientific studies of public research institutes. The currently effective ministerial norms and standards was totaled 845 and under draft water-related technical standard reached 137.

International cooperation. In 2017, a total of 4 water-related international cooperation agreements were signed. There were 9 multilateral and bilateral high-level round-table meetings and technical exchange symposiums or seminars held. There were 5 foreign funded projects financed by the World Bank, Asian Development Bank, Global Environment Fund under smooth implementation. Bilateral cooperation project between China and Switzerland, Denmark and France as well as 8 international science and technology cooperation projects were steadily progressed.

VII. Current Status of Water Sector

Water-related institutions. By the end of 2017, the legal entities engaged in water activities within the administrative jurisdiction at county level or above were totaled 24,371 that had 1.072 million employers. Among which governmental organizations was 2720 with 129,000 public services; public organizations 17,393 with 577,000 employers, 3,902 enterprises with 360,000 employers, 356 societies and other institutions with 6,000 employers. There were 25 general construction contractors awarded highest qualification for water resources and hydropower project construction; 239 general construction contractors awarded grade-I qualification.

Employees and salaries. By the end of 2017, the employees of water sector were totaled 932, 000, a 2. 1% decrease comparing to that the year before. Of which the employees with long-term post amounted to 904, 000, a 2. 3% decrease. In the employees with long-term post, the staff working in the agencies directly under the Ministry of Water Resources was 64, 000, a 0. 7% decrease over the year before; the staff working in local agencies was 840, 000, a 2. 4% decrease. The total salary for the employees with long-term post in the whole country was 73. 91 billion Yuan, and the annual average salary per employee with long-term post was 83, 534 Yuan.

Employees and Salaries

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Number of in service staff/10 ⁴ persons	106. 8	105. 6	103. 7	106. 6	102. 5	103. 4	100. 5	97. 1	94. 7	92. 5	90. 4
Of which, staff of MWR and agencies under MWR/10 ⁴ persons	7. 2	7. 2	7. 2	7. 4	7. 5	7. 4	7. 0	6. 7	6. 6	6. 4	6. 4
Local agencies /10 ⁴ persons	99. 6	98. 4	96. 5	96. 3	95. 0	96. 0	93. 5	90. 4	88. 1	86. 1	84
Salary of in-service staff/10 ⁸ Yuan	211. 3	234. 4	264. 7	297. 9	351. 4	389. 1	415. 3	451. 4	529. 4	640. 5	739. 1
Average salary / (Yuan/person)	19, 573	22, 143	25, 633	28, 816	34, 283	37, 692	41, 453	46, 569	55, 870	69, 377	83, 534

Local water service systems. By the end of 2017, there were 29,351 water stations established at the township (river basin or district) level. There were 83,000 farmer water users cooperative organizations established for management of 360 million mu of irrigated land that accounted to 35.3% of the total effective irrigated areas of national farmland.



Main Index of National Water Resources Development (2012 – 2017)

Indicators	unit	2012	2013	2014	2015	2016	2017
1. Irrigated area	10 ³ ha	67,780	69,481	70,652	72,061	73,177	73,946
2. Farmland irrigated area	10 ³ ha	62,491	63,473	64,540	65,873	67,141	67,816
Newly-increased in 2017	10 ³ ha	2,151	1,552	1,648	1,798	1,561	1,070
3. Water-saving irrigated area	10 ³ ha	31,217	27,109	29,019	31,060	32,847	34,319
Highly-efficient water-saving irrigated area	10 ³ ha	14,126	14,271	16,114	17,923	19,405	20,551
4. Irrigation districts over 10,000 mu	Unit	7,756	7,709	7,709	7,773	7,806	7,839
Irrigation districts over 300,000 mu	Unit	456	456	456	456	458	458
Farmland irrigated areas in irrigation districts over 10,000 mu	10 ³ ha	30,087	30,216	30,256	32,302	33,045	33,262
Farmland irrigated areas in irrigation areas over 300,000 mu	10 ³ ha	11,260	11,252	11,251	17,686	17,765	17,840
5. Rural population accessible to safe drinking water	%				76	79	80
Centralized water supply system	%				82	84	85
6. Flooded or waterlogging area under control	10 ³ ha	21,857	21,943	22,369	22,713	23,067	23,824
7. Controlled or improved eroded area	10 ⁴ km ²	103.0	106.9	111.6	115.5	120.4	125.8
Newly-increased	10 ⁴ km ²	4.4	5.3	5.5	5.4	5.6	5.9
8. Reservoirs	Unit	97,543	97,721	97,735	97,988	98,460	98,795
Large-sized	Unit	683	687	697	707	720	732
Medium-sized	Unit	3,758	3,774	3,799	3,844	3,890	3,934
Total storage capacity	10 ⁸ m ³	8,255	8,298	8,394	8,581	8,967	9,035
Large-sized	10 ⁸ m ³	6,493	6,529	6,617	6,812	7,166	7,210
Medium-sized	10 ⁸ m ³	1,064	1,070	1,075	1,068	1,096	1,117

Continued

Indicators	unit	2012	2013	2014	2015	2016	2017
9. Total water supply capacity of water projects in a year	10 ⁸ m ³	6, 142	6, 183	6, 095	6, 103	6, 040	6, 043
10. Length of dikes and embankments	10 ⁴ km	27. 2	27. 7	28. 4	29. 1	29. 9	30. 6
Cultivated land under protection	10 ³ ha	42, 597	42, 573	42, 794	40, 844	41, 087	40, 946
Population under protection	10 ⁴ people	56, 566	57, 138	58, 584	58, 608	59, 468	60, 557
11. Total water gates	Unit	97, 256	98, 192	98, 686	103, 964	105, 283	103, 878
Large-sized	Unit	862	870	875	888	892	893
12. Total installed capacity by the end of the year	10 ⁴ kW	24, 881	28, 026	30, 183	31, 937	33, 153	34, 168
Yearly power generation	10 ⁸ kWh	8, 657	9, 304	10, 661	11, 143	11, 815	11, 967
13. Installed capacity of rural hydropower by the end of the year	10 ⁴ kW	6, 569	7, 119	7, 322	7, 583	7, 791	7, 927
Yearly power generation	10 ⁸ kWh	2, 173	2, 233	2, 281	2, 351	2, 682	2, 477
14. Completed investment of water projects	10 ⁸ Yuan	3, 964. 2	3, 757. 6	4, 083. 1	5, 452. 2	6, 099. 6	7, 132. 4
Divided by different sources							
(1) Central Government investment	10 ⁸ Yuan	2, 033. 2	1, 729. 8	1, 648. 5	2, 231. 2	1, 679. 2	1, 757. 1
(2) local government investment	10 ⁸ Yuan	1, 464. 5	1, 542. 0	1, 862. 5	2, 554. 6	2, 898. 2	3, 578. 2
(3) domestic loan	10 ⁸ Yuan	265. 6	172. 7	299. 6	338. 6	879. 6	925. 8
(4) foreign funds	10 ⁸ Yuan	4. 1	8. 6	4. 3	7. 6	7. 0	8. 0
(5) enterprises and private investment	10 ⁸ Yuan	113. 4	160. 7	89. 9	187. 9	424. 7	600. 8
(6) bonds	10 ⁸ Yuan	5. 2	1. 7	1. 7	0. 4	3. 8	26. 5
(7) other sources	10 ⁸ Yuan	78. 3	142. 1	176. 5	131. 7	207. 1	235. 9
Divided by different purposes							
(1) flood control project	10 ⁸ Yuan	1, 426. 0	1, 335. 8	1, 522. 6	1, 930. 3	2, 077. 0	2, 438. 8
(2) water resources project	10 ⁸ Yuan	1, 911. 6	1, 733. 1	1, 852. 2	2, 708. 3	2, 585. 2	2, 704. 9
(3) soil and water conservation and ecological recovery	10 ⁸ Yuan	118. 1	102. 9	141. 3	192. 9	403. 7	682. 6

Continued

Indicators	unit	2012	2013	2014	2015	2016	2017
(4) hydropower projects	10 ⁸ Yuan	117.2	164.4	216.9	152.1	166.6	145.8
(5) capacity building	10 ⁸ Yuan	59.6	52.5	40.9	29.2	56.9	31.5
(6) early-stage work	10 ⁸ Yuan	40.7	40.7	65.1	101.9	174.0	181.2
(7) others	10 ⁸ Yuan	291.1	328.2	244.2	337.5	636.2	947.5

Notes:

1. The data in this bulletin do not include those of Hong Kong, Macao and Taiwan.
2. Water-saving Irrigated area in 2013 is integrated with data of first national census for water. Other key indicators for water development and statistical data in 2012 is also integrated with the data of first national census for water. Among which, the length of embankment is further clarified as grade-V or above after the data is integrated with that of first national census for water.
3. The statistics of the number of irrigation districts over 10,000 mm from 2012 is based on designed irrigated area.
4. Statistics of rural hydropower refer to the hydropower stations with an installed capacity of 50,000 kW or lower than 50,000 kW.



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