2018 年

全国水利发展统计公报

2018 Statistic Bulletin
on China Water Activities

中华人民共和国水利部　编

Ministry of Water Resources, People's Republic of China

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2018 STATISTIC BULLETIN ON CHINA WATER ACTIVITIES

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The year of 2018 marks the beginning of implementation of missions proposed by the 19th CPC National Congress and is also crucial for taking over from the past and setting a new course for water governance in the future. According to institutional reform plan of the CPC Central Committee, the Three Gorges Office of the State Council and Office of the South-to-North Water Transfer Project Construction Committee of the State Council were merged into the Ministry of Water Resources, so as to optimize the institutional functions and make administrative operations more efficient and effective, embarking on a new journey of water undertaking. The Party Central Committee and the State Council has paid great attention on water resources management. Under the guidance of Xi Jinping's thought of socialism with Chinese characteristics for a new era, the water departments at each level had achieved tremendous development in water field over the past year, through fulfillment of duties faithfully and energetically and respond to new challenges in an effective way.

I. Investment in Fixed Assets

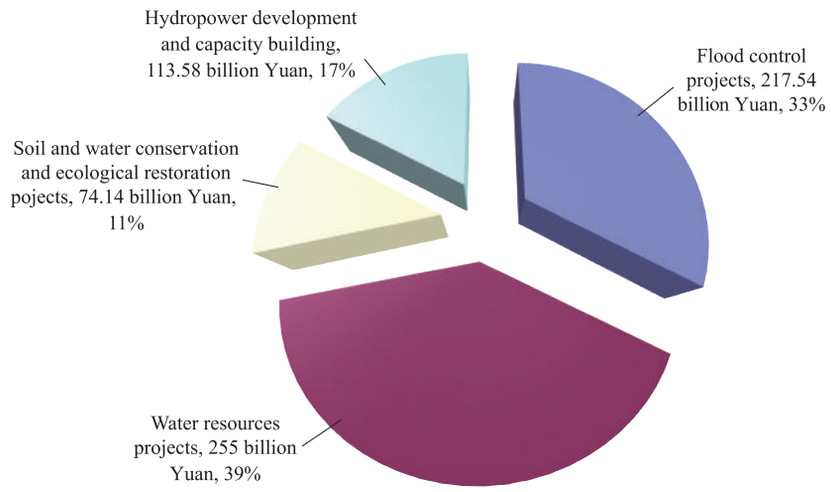
Completed investment for water project construction in 2018 amounted to 660.26 billion Yuan, with a decrease of 52.98 billion Yuan, accounting for 7.4% comparing to the year of 2017, which includes 487.72 billion Yuan put into construction project with a 3.8% decrease; 28.09 billion Yuan for installation project with an increase of 5.7%; 21.44 billion Yuan for purchase of machinery, electric equipment and instruments, with an increase of 1.3%; and 123.01 billion Yuan for other purposes (including compensation of resettlement and land acquisition), with a decrease of 22.4%.

	2011 /billion Yuan	2012 /billion Yuan	2013 /billion Yuan	2014 /billion Yuan	2015 /billion Yuan	2016 /billion Yuan	2017 /billion Yuan	2018 /billion Yuan	increase /%
Total completed investment	308. 60	396. 42	375. 76	408. 31	545. 22	609. 96	713. 24	660. 26	–7. 4
Construction project	210. 32	273. 65	278. 28	308. 64	415. 08	442. 20	506. 97	487. 72	–3. 8
Installation project	12. 17	23. 78	17. 36	18. 50	22. 88	25. 45	26. 58	28. 09	5. 7
Purchase of machinery, equipment and instruments	11. 52	17. 81	16. 11	20. 61	19. 87	17. 28	21. 17	21. 44	1. 3
Others (including compensation of resettlement and land acquisition)	74. 59	81. 18	64. 02	60. 56	87. 39	125. 03	158. 52	123. 01	–22. 4

In the total completed investment, 217. 54 billion Yuan was allocated to the construction of flood control projects, 10. 8% less than that in 2017; 255. 00 billion Yuan for the construction of water resources projects, 5. 7% less than that in 2017; 74. 14 billion Yuan for soil and water conservation and ecological restoration, 8. 6% increase than that in 2017; and 113. 58 billion Yuan for special projects of hydropower development and capacity building, decreased by 13. 0% comparing to the year before.

The competed investment for seven major river basins reached 510. 86 billion Yuan, of which 149. 4 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 233. 53 billion Yuan, 163. 88 billion Yuan, 241. 77 billion Yuan and 21. 08 billion Yuan, accounting 35. 4%, 24. 8%, 36. 6%, and 3. 2% of the total, respectively.

Completed investment of projects in 2018

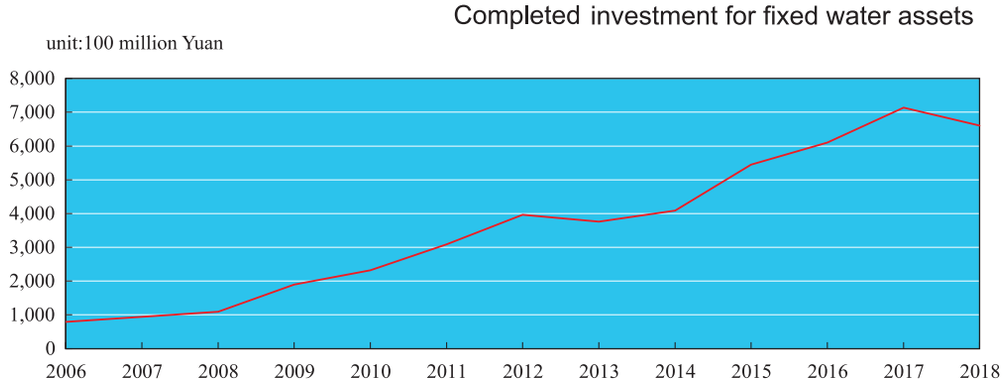


Of this total competed investment, the Central Government contributed 11. 66 billion Yuan, and local governments contributed 648. 60 billion Yuan. The completed investment of large and medium-sized projects was 118. 35 billion Yuan; the completed investment of small-sized and other projects was 541. 91 billion Yuan; the completed investment of newly-constructed project was 514. 96 billion Yuan; and the completed investment of reconstruction and expansion was 145. 30 billion Yuan.

The newly-added-fixed assets for water conservancy construction totaled 361.08 billion Yuan in 2018. By the end of 2018, the accumulated completed investment of projects under construction was 1,674.59 billion Yuan, and the rate of completed investment reached 63.0%. The newly-added fixed assets totaled 945.92 billion Yuan and the rate of investment transferred into fixed assets was 56.5%, an increase of 1.0% to the year before.

A total of 27,930 water projects were under construction in 2018, with a total investment of 2,749.98 billion Yuan, an increase of 10.0% comparing to that of the year before. The projects with Central Government finance were 16,928 with an increase of 8.8% comparing to the year before. The total funds used by projects under construction reached 1,420.47 billion Yuan and increased 7.1% comparing to the year before. There were 19,786 newly-constructed projects in 2018 with an increase of 0.3%, and newly-added investment was 606.02 billion Yuan with a decrease of 33.2% to the year before. The completed civil works of earth, stone and concrete structures were 3.38 billion m^3, 450 million m^3, and 100 million m^3, respectively. By the end of 2018, the ratio of completed quantity of earthwork, stonework, and concrete of the under-construction projects were 78.2%, 67.7% and 63.4%, respectively.

Completed investment for fixed water assets



II. Key Water Projects Construction

Harness of large rivers and lakes. In 2018, there were 5,406 river harness projects under construction, including 535 flood control dyke and embankment construction, 658 projects for large river and main tributary control, and 3,677 medium and small river control works, 536 flood diversion and storage areas or other projects. By the end of 2018, the accumulated investment in projects under construction was 338.63 billion Yuan, with a completion rate of 64.9%. 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 have been quickened. Huai River improvement project has been accelerated, with 29 out of 38 projects under construction, among which, 6 projects were completed and started benefit generation. Control of three rivers project in the Northeast of China were nearly completed. There were 18 out of 21 projects for Comprehensive Improvement of Water Environment of Taihu Lake started construction, among which 12 projects completed for benefit generation.

Reservoir projects. There were 1,033 reservoir projects under construction in 2018. By the end of 2018, the completed investment of under-construction projects reached 294.26 billion Yuan, accounting for 58.1% of the total completed investment. Following large reservoirs started construction, namely Dongzhuang in Shaanxi, Nianpanshan in Hubei, Bailai in Fujian, Dongtaizi in Inner Mongolia, Niuling in Anhui, as well as 7 medium reservoirs, namely Qinjing and Yujian. There were 34 medium reservoir projects, including Shuangxi Reservoir and Huangsha Reservoir, have been accelerating construction. Damming of reservoir were completed for Huangzangsi in the Heihe River Basin, Huokou in Fujian Province, Huangjiawan in Guizhou Province, Chemabi in Yunnan Province and Duoying in Guangxi Autonomous Region. Houshan Reservoir in Liaoning Province was impounded.

Water allocation projects. The yearly investment for water allocation projects under construction reached to 732. 78 billion Yuan. The completed investment had accumulated to 409. 5 billion Yuan, accounting for 55. 9% of the total. A total of 71 river-lake connecting systems were constructed, in order to improve connectivity of about 379 rivers (lakes or reservoirs).

Irrigation, drainage and rural water supply. The completed investment for strengthening and improving safe drinking water supply reached 57. 36 billion Yuan, among which 7. 63 billion Yuan from central government subsidy, with a beneficial population of 78 million of which 4. 36 million listed in national plan for poverty reduction. By the end of 2018, the rural population access to tap water supply made up a percentage of 81% and the percentage of population with centralized water supply system raised to 86%. The Central Government allocated 13. 756 billion Yuan for the construction of large and medium irrigation and drainage systems and rehabilitation of irrigation districts for water saving purpose. There were 22. 5 billion Yuan allocated to the construction of highly-efficient water-saving farmland waterworks. The newly-added effective irrigated area reached 828, 000 ha; new-added water-saving irrigated area was 2, 022, 000 ha and newly-added highly-efficient water-saving irrigated area was 1, 536, 000 ha.

Rural hydropower and electrification. In 2018, the completed investment of rural hydropower station construction amounted to 10. 01 billion Yuan; the newly increased hydropower stations were 194, with a total installed capacity of 1. 643 million kW, among which the newly increased installed capacity amounted to 1. 161 million kW, and the increased installed capacity by rehabilitation accounts to 0. 482 million kW.

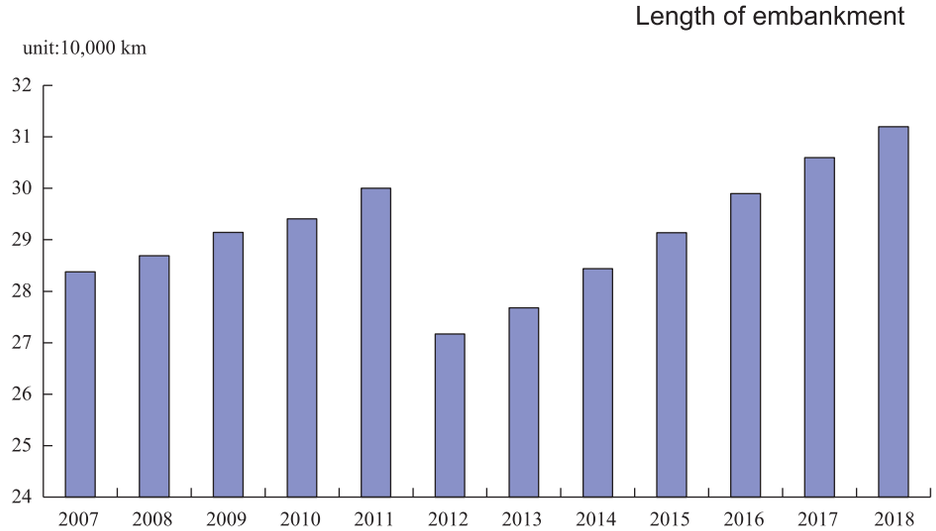
Soil and water conservation. A total of 88.63 billion Yuan was allocated to construction of soil and water conservation and ecological restoration project in 2018, with an accumulated investment of 51.19 billion Yuan. The newly-added areas with soil conservation measures reached 64,000 km^2, of which the area under National Major Project for Soil Conservation was 12,500 km^2. There were 560 silt-retention dam on Loess Plateau at high risk were strengthened and rehabilitated.

Capacity building. The completed investment for capacity building in 2018 was 4.53 billion Yuan, of which 710 million Yuan spent on procurement of communication equipment for flood control, 1.31 billion Yuan for hydrological facilities, 190 million Yuan for scientific research and education facilities and 2.32 billion Yuan for others.

III. Key Water Facilities

Embankments and water gates. By the end of 2018, the completed river dykes and embankments ranging at Grade-V or above had a total length of 312,000 km❶. The accumulated length of dykes and embankments met the standard reached 218,000 km, with a percentage of 69.8% of the total, among which the Grade-I and Grade-II dykes and embankments up to the standard reached 34,000 km, with a reaching standard rate of 80.5%. These embankments can protect 630 million people and 41,000 ha of cultivated land. The number of water gates with a flow of 5 m^3/s increased to 104,403, of which 897 were large water gates. Divided by types of water gates, there were 8,373 flood diversion sluices, 18,355 drainage/return water sluices, 5,133 tidal barrages, 14,570 water diversion intakes and 57,972 controlling gates.

Length of embankment



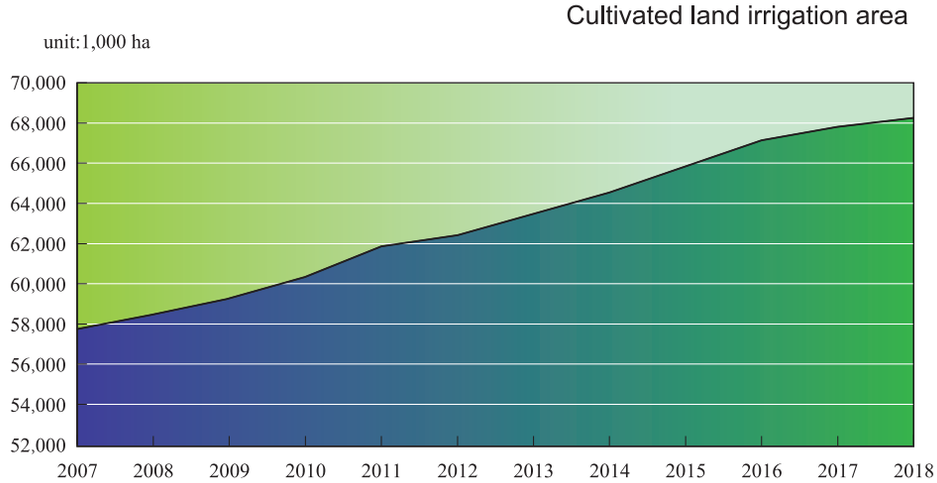
❶ The length of embankment before 2011 includes embankment below Grade-V.

Reservoirs and water complexes. The number of reservoirs in China reached 98, 822, with a total storage capacity of 895. 3 billion m^3, of which 736 reservoirs belong to large reservoirs with a total capacity of 711. 7 billion m^3, accounting 79. 5% of the total; 3, 954 medium-sized reservoirs with a total capacity of 112. 6 billion m^3, accounting 12. 6% of the total.

Tube wells and pumping stations. A total of 5. 101 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, 468 pumping stations that have an installed flow of 1 m^3/s or installed voltage above 50 kW were in operation, among which 376 categorized as larger pumping stations, 4, 276 medium-size and 90, 816 small-size pumping stations.

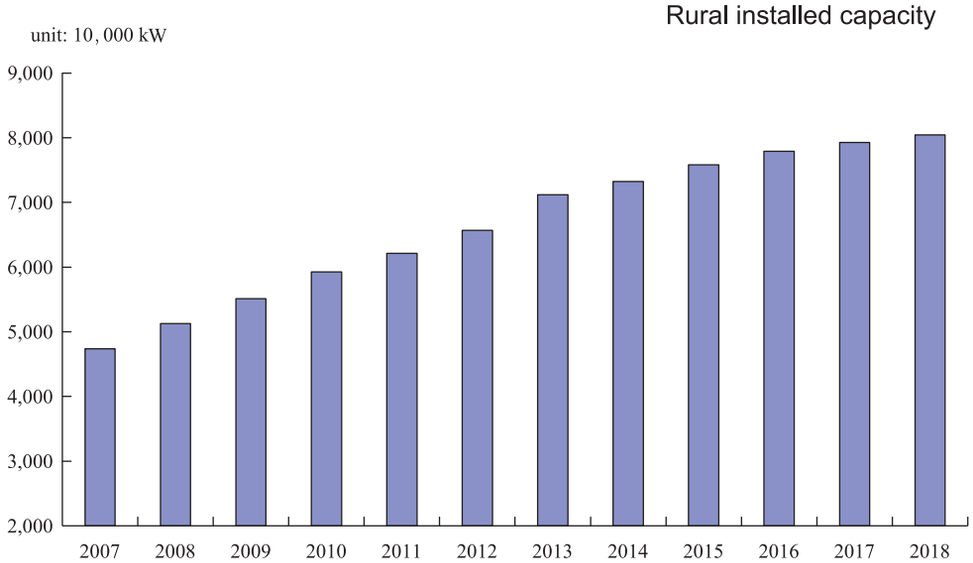
Irrigation systems. The irrigation districts with an area equal or above 2, 000 mu added to 22, 873, with a total effective irrigated area of 37. 752 million ha, in which the irrigation districts equal or above 500, 000 mu reached 175, with a total irrigated area of 12. 399 million ha; the irrigation districts covering an area from 300, 000 – 500, 000 mu was 286, with a total irrigated area of 5. 4 million ha. By the end of 2018, the total irrigated area and irrigated area of cultivated land reached to 74. 542 million ha and 68. 272 million ha respectively, taking 50. 7% of the total cultivated land in China. The areas with water-saving irrigation facilities totaled 36. 135 million ha, among which 11. 338 million ha equipped with sprinkler or micro irrigation systems and 10. 566 million ha installed low-pressure pipes.

Cultivated land irrigation area



Rural hydropower and electrification. By the end of 2018, hydropower stations built in rural areas totaled 46, 515, with an installed capacity of 80. 435 million kW, accounting for 22. 8% of the national total. The annual power generation by these hydropower stations reached to 234. 56 billion kW · h, accounting for 19. 0% of the national total.

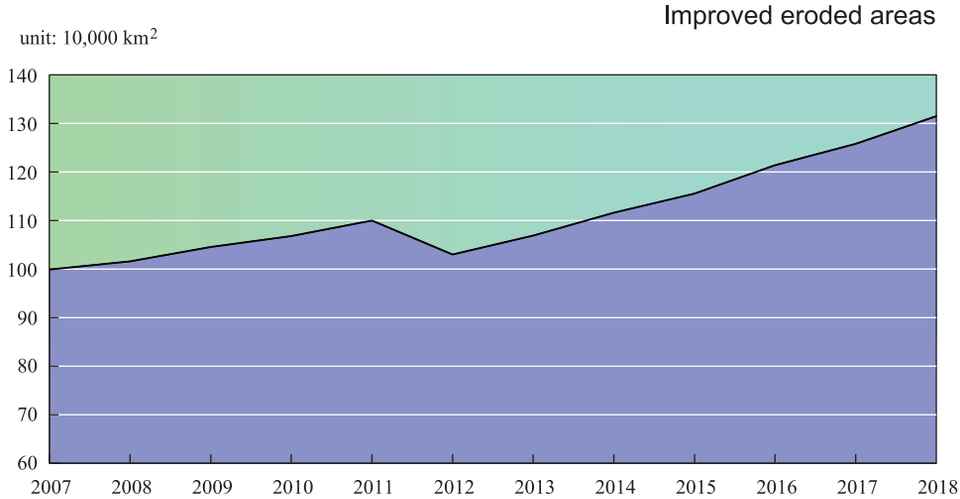
Rural installed capacity



Soil and water conservation. By the end of 2018, the restored eroded areas reached 1.315 million km^2[1]; and the forbidden area for ecological restoration accumulated to 234,300 km^2. Dynamic monitoring for soil and water loss had been conducted by central and local authorities in a collaborated manner, so as to cover the whole area of the country. With a total area of about 9.6 million km^2 being monitored, dynamic changes of soil and water loss in county-level administrative areas and key areas were well understood.

[1] Statistical data in 2012 is integrated with the data of first national census for water.

Improved eroded areas



Hydrological station networks. In 2018, the number of hydrological stations of all kinds was totaled 121, 097 in the whole country, including 3, 154 national basic hydrologic stations, 4, 099 special hydrologic stations, 13, 625 gauging stations, 55, 413 precipitation stations, 19 evaporation stations, 26, 550 soil moisture monitoring stations, 14, 286 water quality stations, 3, 908 groundwater monitoring stations and 43 experimental stations. There were 66, 439 various kinds of hydrological monitoring stations that provide hydrological information to flood control commanding headquarters at and above the county level; 1, 887 various kinds of hydrological monitoring stations for early warning and forecasting. A total of 1, 616 hydrological monitoring stations were equipped for online flow measurement. A water quality monitoring system, including 332 monitoring centers at central, basin, provincial and local levels, had been formed and spread over major rivers, lakes, reservoirs and aquifers.

Water networks and information systems. By the end of 2018, water resources departments at and above the provincial level equipped 5, 764 sets of varied kinds

of servers, forming the storage capacity of 18PB, with a total of 2. 4PB storage of various kinds of data and information. The water resources departments at and above the county levels had installed 3, 895 sets of various kinds of satellite equipment, 6, 549 flood forecasting stations for short message transmission from Beidou Satellite, 48 vehicles for emergency communication, 819 Unmanned Aerial Vehicle (UAV) and 5, 313 cluster communication terminals in operation. In terms of data collection and video monitoring, a total of 450, 000 gathering points were available for water departments at and above the provincial level to receive various kinds of water-related information, among which 227, 600 points were used for collecting data of hydrology, water resources and soil and water conservation. There were 225, 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 2018 was 2,746.25 billion m^3, remained almost the same as the normal years. Mean annual precipitation was 682.5 mm that was 6.2% more than the normal years and 2.7% more than the year before. By the end of 2018, total storage of 669 large and 3,602 medium-size reservoirs were 410.43 billion m^3, 3.8 billion m^3 less than that in early 2018.

Water resources development. In 2018, the newly-increased water supply capacity of water projects above designated size❶ reached 10.16 billion m^3. By the end of 2018, the total water supply capacity in China reached 867.68 billion m^3, including 56.71 billion m^3 of water supplied by utilities at county level, 232.37 billion m^3 by reservoirs, 210.51 billion m^3 by river-lake diversion schemes, 175.47 billion m^3 by river-lake pumping stations, 140.09 billion m^3 by tube wells, 35.79 billion m^3 by ponds, weirs and cellars, and 16.84 billion m^3 by unconventional water sources.

Water resources utilization. In 2018, the total water supply amounted to 601.55 billion m^3, among which 82.3% came from surface water, 16.2% from underground water and 1.5% from other water sources. The total water consumption amounted to 601.55 billion m^3, among which domestic water use

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❶ Water projects above designated size include: reservoirs with a total storage capacity greater than or equal to 100,000 m^3, river and lake water intake pumping stations with an installed flow greater than or equal to 1 m^3/s or with an installed capacity greater than or equal to 50 kW, river and lake water intake sluices with water discharge through sluice greater than or equal to 1 m^3/s, irrigation tube wells with a wellhead & sidewall pipe inner diameter greater than or equal to 200 mm, and tube wells with a daily supply capacity greater than or equal to 20 m^3.

amounted to 85.99 billion m^3 or 14.3% of the total; industrial water use 126.16 billion m^3 or 21.0% of the total; agricultural water use 369.31 billion m^3 or 61.4% of the total; artificial recharge for environmental and ecological use 20.09 billion m^3 or 3.3% of the total. Comparing to that of the year before, water consumption decreased by 2.79 billion m^3, in which agricultural water use decreased by 7.33 billion m^3, industrial water use decreased by 1.54 billion m^3, and domestic water use and artificial recharge for environmental and ecological use increased by 2.18 billion m^3 and 3.9 billion m^3 respectively. Water consumption per capita in 2018 was 432 m^3 in average. The coefficient of effective irrigated water use was 0.554. Water use of 10,000 Yuan GDP (at comparable price of the same year) was 66.8 m^3. Water use of industrial production value added per 10,000 Yuan (at comparable price of the same year) was 41.3 m^3. 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 6.6% and 6.9% comparing to 2017.

Water quality of rivers and lakes. According to water quality assessment on 262,000 km long of rivers, 81.6% of the river met the class-I to class-III water quality standard.

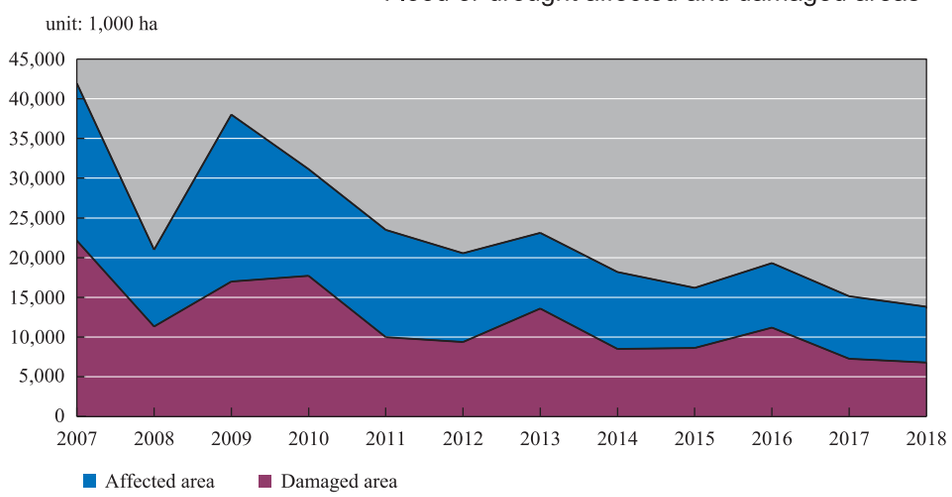
V. Flood Control and Drought Relief

In 2018, the overall damage caused by flood and water-logging disasters was relatively less than other years, and the direct economic loss of flood disaster accounted for 0.18% of GDP in the year. A total of 6.42 million ha of cultivated land were affected by floods, 3.13 million ha of farmland had no harvest, 56 million people affected, 187 people dead, and 32 people missing. A total of 85.1 million houses were destroyed and 83 cities suffered from inundation. The disasters resulted in 161.547 billion Yuan of direct economic losses, among which the direct losses with water infrastructures reached 25.798 billion Yuan. Provinces suffered from severe flooding include Sichuan, Shandong, Guangdong, Gansu, Inner

Mongolia, and Yunnan. Death toll or people missing caused by mountain flood took 73.52% of the total. The direct economic loss caused by typhoons took 41.71% of the total loss as a result of flood and waterlogging disasters.

In 2018, no large scale drought occurred in the whole country. The seriously affected areas include provinces or autonomous region of Inner Mongolia and Liaoning. The affected farmland was 7.38 million ha and areas with no harvest reached 3.67 million ha, with a direct economic losses of 48.362 billion Yuan. A total of 3.07 million urban and rural population and 4.623 million man-feed big animals and livestock suffered from temporary drinking water shortage.

Flood or drought affected and damaged areas



In 2018, the funds allocated to defense extraordinary floods and droughts amounted to 3. 506 billion Yuan, among which 3. 099 million Yuan for extraordinary floods and 0. 406 billion Yuan for extraordinary droughts. Thanks to the efforts of flood control, 3. 18 million ha of cultivated land were prevented from inundation and 75 times of flooding in cities were avoided, resulting in economic benefits amounting to 23. 998 billion Yuan. Drinking water was provided to 4. 77 million people in rural and urban areas as well as 2. 44 million big animals and livestock in order to alleviate temporary water shortage. The area with anti-drought measures reached 23. 42 million ha that prevented a loss of 22. 138 billion kg of grain. The accumulative inputs for flood disaster relief include 4. 68 million person-time, 17, 800 vessel-time, 200, 000 shifts of transportation and 146, 800 shifts of mechanical equipment. The consumed materials valued 1. 315 billion Yuan. The person-time of emergency evacuation was 8. 07 million. There were 4. 68 million tube wells, 36, 600 pumping stations, 5. 69 million mobile devices and 936, 500 vehicle-time of various kinds of water transporting vehicle employed for drought relief.

VI. Water Management and Reform

River (Lake) chief system. By the end of 2018, river (lake) chief system had been fully implemented across the country. More than 300,000 river (lake) chiefs were named at four levels of province, city, county and township. More than 900,000 river (lake) 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. The Ministry of Water Resources, in collaboration with the National Development and Reform Commission, completed performance evaluation of implementing most stringent water resources management system in 31 provinces and autonomous regions in 2017. Seven provinces (municipalities directly under the Central Government) of Jiangsu, Shandong, Anhui, Chongqing, Beijing, Zhejiang and Shanghai were rated as excellent. Water allocation plans of 13 trans-provincial river basins, including Taihu Lake and Songhua River, were approved. Water allocation was completed for river basins across border of city or county in 13 provinces and autonomous regions, including Hebei and Liaoning. In 2017–2018 of water diverted year, the Phase-I of Eastern Route of South-to-North Water Diversion diverted 1.088 billion m^3 water to Shandong; the Phase-I of Middle Route of South-to-North Water Diversion diverted 7.458 billion m^3 water to Beijing, Tianjin, Hebei and Henan provinces. As a result, water security in the receiving areas has been greatly enhanced. Water resources has been regulated in an integrated way in major river basins, which ensured continuous flow at the mainstream of the Yellow River for 19 consecutive years, and no dry up of the East Dongjuyan Lake in the lower reaches of the Heihe River for 14

years. Evaluation Criteria of Water-saving Society was issued that formed a base for overall assessment of water efficiency increase by using county as a unit. There were 65 counties (districts) in 8 provinces or autonomous regions or municipalities such as Beijing passed the final evaluation. The pilot project of 105 water ecological civilization cities has made smooth progress, among which 96 pilots passed check and acceptances. Pilot projects of groundwater recharge in river and lake areas were conducted, with a total recharge of 627 million m^3 water into three rivers in Hebei Province, by using diverted water from the Middle Route of South-to-North Water Diversion and reservoirs in Hebei Province. Phase-I of Eastern Route Scheme of South-to-North Water Diversion has deducted 1.9 billion m^3 for groundwater withdrawal in the water receiving area. Seven pilot projects for water right trading in Ningxia, Inner Mongolia, Guangdong, Henan, Gansu, Jiangxi, and Hubei were completed and passed check and acceptance. In 2018, China Water Exchange completed 51 entitlement trading with an amount of 1.331 billion m^3, with a total of 92 entitlements and trading of 2.774 billion m^3 accumulatively since it went into operation.

Operation and management. By the end of 2018, there were 14,325 water utilities included in the list for water management system reform, and adjusted and streamlined to 12,908 water utilities through cancel and merger, with a reduction of 10% comparing to the number of organizations before the reform. A total of 30.14 billion Yuan had been allocated for covering cost of managerial staff and operation and maintenance, which covered 88.1% of the total, among which, 17.77 billion Yuan were allocated to cover the staff expenses of public service, which accounted 94.9% of the total; 12.37 billion Yuan allocated to cover operation and maintenance of public service facilities, which accounted 79.9% of the total. Reform of management system by separating functions of administration with operation had been implemented in 9,563 utilities, accounted for 79.1% of the total. By the end of 2018, the approved national water scenery spots reached 878, including 373 reservoirs, 195 natural rivers and lakes, 195 lake or riverine cities, 47

wetlands, 31 irrigation districts and 37 soil conservation areas.

Reform in rural water resources management. In 2018, the funding from private sector to high-efficient water-saving irrigation and provision of safe drinking water amounted to 8.4% and 16.8% of the total investments respectively. 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 84% and 35% respectively.

Water pricing reform. In 2018, *Notice on Vigorously Promoting Comprehensive Agricultural Water Pricing Reform* was jointly issued by NSDC, Ministry of Finance (MOF), MWR, and Ministry of Agriculture and Rural Affairs. It clearly specifies the yearly tasks of reform, which had been allocated to each province based on newly-added areas defined by the plan. By the end of 2018, the area carrying out water pricing reform reached 160 million mu, among which about 110 million mu were newly added area in 2018. Great achievements had been made in water conservation thanks to the implementation of reform, which greatly improved operation and maintenance of waterworks in these regions.

Water resources planning and early-stage work. In 2018, there were 14 water resources plans approved by central government agencies, among which *the Comprehensive Plan of Water Environment Restoration in Dongting Lake* was approved by NDRC; 13 plans approved by MWR. The mid-term evaluation of implementation of 13*th Five-Year Plan for Water Resources Reform and Development* was completed. The third national water resources survey and

assessment was accelerated. Supplementary technical guidelines on water ecology investigation and evaluation for national water resources survey and assessment was released. Steady progress had been made by major water project planning at the national level. *Implementation Plan for Construction Upgrading of Flood Control and Drought Relief Projects*, *Overall Plan for making up shortfall of water works and General Plan for Water Ecology Recovery and Restoration in National Key Regions* was compiled and approved by the State Council. *Action Plan for Comprehensive Control of Groundwater Overexploitation in North China* was jointly issued by MWR and other relevant departments. Comprehensive planning for major river basins and tributaries has been accelerated. Water plans in key national strategies has been proceeded. Preliminary results have been obtained in the advancement of strategic plan of water for rural revitalization, according to the decisions made by the Chinese government. In 2018, a total of 11 projects subject to NDRC approval were finalized, including 10 feasibility study reports and 1 project plan, with a total investment of 75. 13 billion Yuan. There were 5 preliminary designs approved by MWR, with a total investment of 90. 822 billion Yuan.

Soil and water conservation. In 2018, a total of 37,900 soil and water conservation plans of construction projects being examined and approved, covering a scope of 10,586.33 km^2 for protection and control. A total of 9,100 soil and water conservation projects completed check and acceptance. There were 13,600 official notices were given to order the cessation of illegal activities, and issue dates and deadlines for going through necessary procedures or making payment within a time limit.

Reform of hydropower management system. By the end of 2018, there were 165 small hydropower projects in 19 provinces awarded the title of green small hydropower station. Standardization for safety production of rural hydropower stations had been advocated and 2,505 hydropower stations of the kind have been completed, including 68 Class-I hydropower stations. Regulatory documents on ecological flow monitoring and supervision were issued for managing hydropower stations in more than 10 provinces and cities, including Fujian, Zhejiang, Jiangxi, Henan, Hubei, Guangdong, Chongqing, Sichuan, Shaanxi and Gansu. It stipulates the methods of verifying ecological flow, water release as well as monitoring and supervision. Rehabilitation was completed for 571 rivers, with 1,191 ecological restoration projects and 1,368 capacity expansion projects. The recovered river sections with low water level or drying-up accumulated to more than 1,000 km.

Water conservancy resettlement. There were 760 concentrated relocation sites constructed and centralized newly-constructed housing of 6.788 million km^2 in 2018. The resettled population was 188,000, among which 183,000 were relocated rural residents and 5,000 relocated urban residents. A total of 236,000 resettled people were arranged for production activities, among which 112,000 arranged for agricultural production, 37,000 people compensated on a yearly basis, 69,000 compensated by monetary means (arranged by themselves), 10,000 people

joined pension plans, 1, 000 people seeking help from their relatives and friends and 7, 000 people with other arrangements. According to approved estimation of the central government, the resettled people in rural areas, who received government support due to the newly-built large and medium reservoirs, reached 69, 000 in the previous year.

Safety supervision. In 2018, there were 8 production accidents with 14 people dead. MWR, river basin authorities and water resources departments at provincial level organized 10, 795 inspection teams 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 67, 896 potential hazards were properly handled. It was announced that 82 enterprises approved to meet the level-1 evaluation standard for water safety production, including 62 water and hydropower constructing companies, 7 legal persons of water projects and 11 water project management units. Evaluation of about 10, 929 project leaders and peoples in charge of safe production management had been taken. MWR sent 6 batches including 106 missions for inspection of 285 projects in 2018. There were 104 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 458 inspection groups were sent out for inspection of 1, 875 projects, with 790 rectification announcements issued. In 2018, the ministry sent out 385 missions in 9 groups to inspect 4, 702 small reservoirs for safety operation. The ministry circulated 99 correction notices that delivered to each province one by one. There were 148 inspection teams were dispatched to inspect South-to-North Water Project, realizing the full coverage of Eastern and Middle routes. There were 9 consultation conferences or special meetings were held for consultation and decision making, regarding issues found out during inspection of South-to-North Water Diversion Project. Accountability investigations were made on 6 cases of serious breach of duty, so as to ensure safe and stable operation of

South-to-North Water Diversion Project.

Legislation and administrative law enforcement. In 2018, there was no revision cleaned up or abolishment to water-related administrative regulations, ministerial norms and standards and normative documents. In 2018, the investigated illegal cases totaled 23, 578 and 19, 612 or 83. 2% resolved. A total of 27 water disputes were mediated and 8 resolved at all levels. There were 45 administrative review cases and 12 administrative responses settled by the Ministry of Water Resources.

Administrative permits. There were 1, 615 applications accepted by MWR and 1, 563 water-related administrative approvals or permits authorized or extended, including 27 project plan approvals, 5 preliminary design reports of water construction projects, 311 water abstraction licenses (99 approvals for new application, 154 for renewal and 58 for modification), 30 evaluation reports of flood impact by non-flood control project, 319 plans of construction projects within the jurisdiction of river courses, 62 approvals of soil and water conservation plan of production and construction projects, 5 approvals for establishment and adjustment of National Basic Hydrological Stations, 29 approvals of hydrological monitoring projects for impact of construction at upper and lower of National Basic Hydrological Stations, 521 qualification approvals (including new application, extension, adding of new items or promotion) for construction supervisors of water resources projects; 250 Class-A qualification identifications (including new application, extension, adding of new items or promotion) for quality supervisors of water-related projects.

Water science and technology. A total of 395 million Yuan had been allocated to science and technology projects, including 19 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 84

demonstration projects for water technologies. There were 4 water technological achievements won the National Sci-Tech Advance Award (second prize) and 2 projects won the second prize of National Technological Innovation Award. By the end of 2018, 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 119.85 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. There were 29 water-related technical standards were made public and 126 standards were under drafting. The effective water-related technical standard reached 856 in total.

International cooperation. In 2018, a total of 5 water-related international cooperation agreements were signed. There were 14 multilateral and bilateral high-level round-table meetings and technical exchange symposiums or seminars held. There were 4 foreign funded projects financed by the Asian Development Bank and Global Environment Fund under smooth implementation. Bilateral cooperation project between China and Switzerland, Denmark, France and Finland as well as international science and technology cooperation projects were steadily progressed.

VII. Current Status of Water Sector

Water-related institutions. By the end of 2018, the legal entities with separate accounts that had engaged in water activities within the administrative jurisdiction at county level or above were totaled 25,602 that had 1.074 million employees. Among which governmental organizations was 2,724 with 126,000 employees, decreased by 2.3% than last year; public organizations 17,682 with 588,000 employees, increased by 1.9% than last year; 4,139 enterprises with 344,000 employees, decreased by 4.4% than last year; 1,057 societies and other institutions with 16,000 employees, increased by 166.7% than last year. There

were 27 general construction contractors awarded highest qualification for water resources and hydropower project construction; 263 general construction contractors awarded grade-I qualification.

Employees and salaries. By the end of 2018, the employees of water sector were totaled 903, 000, 3. 2% lower than that the year before, of which in-service staff amounted to 879, 000, 2. 7% lower than last year. In the in-service staff, the staff working in the agencies directly under the Ministry of Water Resources was 66, 000, 3. 4% higher than last year; the staff working in local agencies was 813, 000, 3. 2% lower than last year. The total salary of nationwide in-service staff was 80. 27 billion Yuan, and the annual average salary per in-service staff was 91, 000 Yuan.

Employees and Salaries

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Number of in service staff /10^4 persons	105. 6	103. 7	106. 6	102. 5	103. 4	100. 5	97. 1	94. 7	92. 5	90. 4	87. 9
Of which: staff of MWR and agencies under MWR/10^4 persons	7. 2	7. 2	7. 4	7. 5	7. 4	7. 0	6. 7	6. 6	6. 4	6. 4	6. 6
Local agencies/10^4 persons	98. 4	96. 5	96. 3	95. 0	96. 0	93. 5	90. 4	88. 1	86. 1	84. 0	81. 3
Salary of in-service staff/10^8 Yuan	234. 4	264. 7	297. 9	351. 4	389. 1	415. 3	451. 4	529. 4	640. 5	739. 1	802. 7
Average salary /(Yuan/person)	22, 143	25, 633	28, 816	34, 283	37, 692	41, 453	46, 569	55, 870	69, 377	83, 534	91, 307

Main Index of National Water Resources Development（2013－2018）

Indicators	unit	2013	2014	2015	2016	2017	2018
1. Irrigated area	10^3 ha	69, 481	70, 652	72, 061	73, 177	73, 946	74, 542
2. Farmland irrigated area	10^3 ha	63, 473	64, 540	65, 873	67, 141	67, 816	68, 272
Newly-increased in 2018	10^3 ha	1, 552	1, 648	1, 798	1, 561	1, 070	828
3. Water-saving irrigated area	10^3 ha	27, 109	29, 019	31, 060	32, 847	34, 319	36, 135
Highly-efficient water-saving irrigated area	10^3 ha	14, 271	16, 114	17, 923	19, 405	20, 551	21, 903
4. Irrigation districts over 10, 000 mu	Unit	7, 709	7, 709	7, 773	7, 806	7, 839	7, 881
Irrigation districts over 300, 000 mu	Unit	456	456	456	458	458	461
Farmland irrigated areas in irrigation districts over 10, 000 mu	10^3 ha	30, 216	30, 256	32, 302	33, 045	33, 262	33, 324
Farmland irrigated areas in irrigation areas over 300, 000 mu	10^3 ha	11, 252	11, 251	17, 686	17, 765	17, 840	17, 799
5. Rural population accessible to safe drinking water	%			76	79	80	81
Centralized water supply system	%			82	84	85	86
6. Flooded or waterlogging area under control	10^3 ha	21, 943	22, 369	22, 713	23, 067	23, 824	24, 262
7. Controlled or improved eroded area	10^4 km^2	106. 9	111. 6	115. 5	120. 4	125. 8	131. 5
Newly-increased	10^4 km^2	5. 3	5. 5	5. 4	5. 6	5. 9	6. 4
8. Reservoirs	Unit	97, 721	97, 735	97, 988	98, 460	98, 795	98, 822
Large-sized	Unit	687	697	707	720	732	736
Medium-sized	Unit	3, 774	3, 799	3, 844	3, 890	3, 934	3, 954
Total storage capacity	10^8 m^3	8, 298	8, 394	8, 581	8, 967	9, 035	8, 953
Large-sized	10^8 m^3	6, 529	6, 617	6, 812	7, 166	7, 210	7, 117
Medium-sized	10^8 m^3	1, 070	1, 075	1, 068	1, 096	1, 117	1, 126

Continued

Indicators	unit	2013	2014	2015	2016	2017	2018
9. Total water supply capacity of water projects in a year	10^8 m^3	6, 183	6, 095	6, 103	6, 040	6, 043	6, 016
10. Length of dikes and embankments	10^4 km	27. 7	28. 4	29. 1	29. 9	30. 6	31. 2
Cultivated land under protection	10^3 ha	42, 573	42, 794	40, 844	41, 087	40, 946	41, 351
Population under protection	10^4 people	57, 138	58, 584	58, 608	59, 468	60, 557	62, 785
11. Total water gates	Unit	98, 192	98, 686	103, 964	105, 283	103, 878	104, 403
Large-sized	Unit	870	875	888	892	892	897
12. Total installed capacity by the end of the year	10^4 kW	28, 026	30, 183	31, 937	33, 153	34, 168	35, 226
Yearly power generation	10^8 kWh	9, 304	10, 661	11, 143	11, 815	11, 967	12, 329
13. Installed capacity of rural hydropower by the end of the year	10^4 kW	7, 119	7, 322	7, 583	7, 791	7, 927	8, 044
Yearly power generation	10^8 kWh	2, 233	2, 281	2, 351	2, 682	2, 477	2, 346
14. Completed investment of water projects	10^8 Yuan	3, 757. 6	4, 083. 1	5, 452. 2	6, 099. 6	7, 132. 4	6, 602. 6
Divided by different sources							
(1) Central government investment	10^8 Yuan	1, 729. 8	1, 648. 5	2, 231. 2	1, 679. 2	1, 757. 1	1, 752. 7
(2) Local government investment	10^8 Yuan	1, 542. 0	1, 862. 5	2, 554. 6	2, 898. 2	3, 578. 2	3, 259. 6
(3) Domestic loan	10^8 Yuan	172. 7	299. 6	338. 6	879. 6	925. 8	752. 5
(4) Foreign funds	10^8 Yuan	8. 6	4. 3	7. 6	7. 0	8. 0	4. 9
(5) Enterprises and private investment	10^8 Yuan	160. 7	89. 9	187. 9	424. 7	600. 8	565. 1
(6) Bonds	10^8 Yuan	1. 7	1. 7	0. 4	3. 8	26. 5	41. 6
(7) Other sources	10^8 Yuan	142. 1	176. 5	131. 7	207. 1	235. 9	226. 3
Divided by different purposes:							
(1) Flood control	10^8 Yuan	1, 335. 8	1, 522. 6	1, 930. 3	2, 077. 0	2, 438. 8	2, 175. 4
(2) Water resources	10^8 Yuan	1, 733. 1	1, 852. 2	2, 708. 3	2, 585. 2	2, 704. 9	2, 550. 0
(3) Soil and water conservation and ecological recovery	10^8 Yuan	102. 9	141. 3	192. 9	403. 7	682. 6	741. 4

Continued

Indicators	unit	2013	2014	2015	2016	2017	2018
(4) Hydropower	10^8 Yuan	164.4	216.9	152.1	166.6	145.8	121.0
(5) Capacity building	10^8 Yuan	52.5	40.9	29.2	56.9	31.5	47.0
(6) Early-stage work	10^8 Yuan	40.7	65.1	101.9	174.0	181.2	132.0
(7) Others	10^8 Yuan	328.2	244.2	337.5	636.2	947.5	835.8

Notes:

1. The data in this bulletin do not include those of Hong Kong, Macao and Taiwan.
2. Key indicators for water development and statistical data in 2012 and in 2013 is also integrated with the data of first national census for water.
3. Statistics of rural hydropower refer to the hydropower stations with an installed capacity of 50,000 kW or lower than 50,000 kW.