

中国水资源管理创新与发展

Water Management in China: Innovation and Development

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中国水资源基本状况

Basic Conditions of Water Resources in China



实施最严格水资源管理制度

Implement the strictest water resources management system

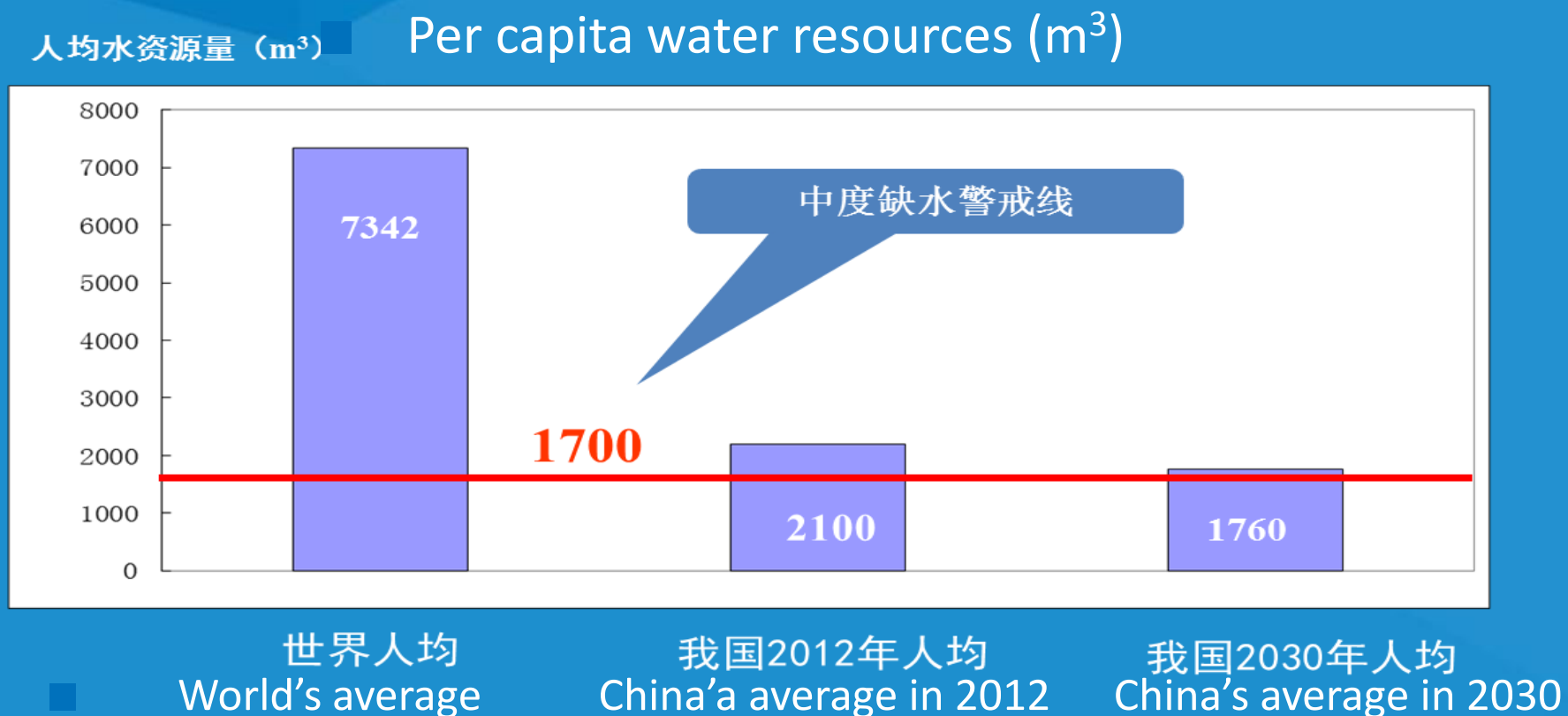


新形势下水资源管理新举措

New Measures for Water Management under a New Situation

□ 人均占有量低 Low per capita availability

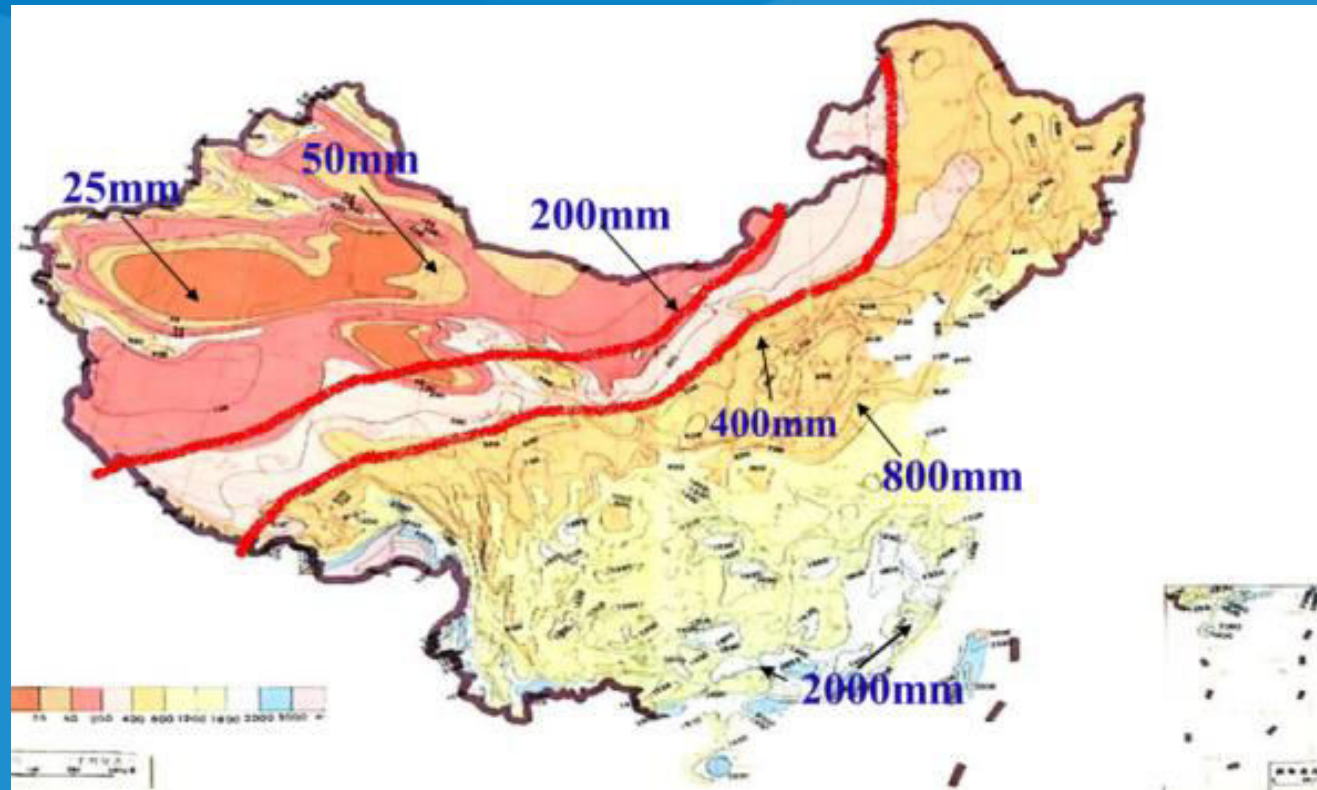
我国水资源总量2.8万亿 m^3 ，人均水资源占有量为世界人均水资源量的28%。 The total amount of water resources in China is 2.8 trillion m^3 , 28% of the world's average.



□ 水资源时空分布不均，与土地资源 and 产业布局不相匹配

Uneven temporal and spatial distribution of water resources, mismatching spatial layout of population and economy

水资源南多北少，降水和河川径流年内集中程度高，年际变化较大。 China has abundant water resources in its southern part, eastern part and mountainous areas, and lacks water in its northern part, western part and plains. The precipitation and river runoff are highly concentrated within a year, in addition to large inter-annual fluctuations.



多年平均年降水量等值线图

Contour map of mean years annual precipitation

□ 水资源短缺问题

Water shortage

年平均缺水量500多亿 m^3 。

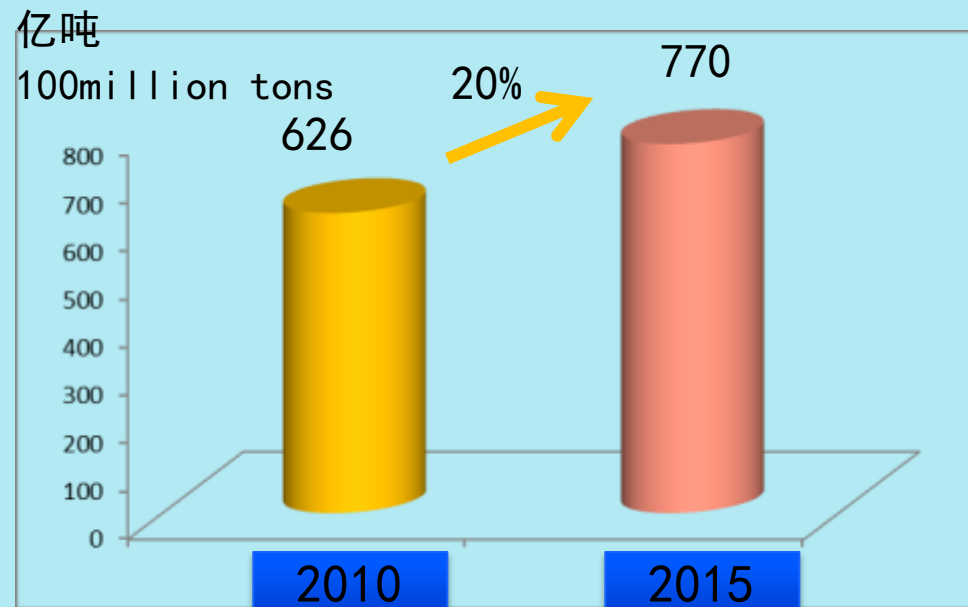
The average amount of water shortage each year is over 50 billion m^3 .

□ 水污染问题

Water pollution

废污水排放量持续维持高位。

Waste water discharge remains at a high level.

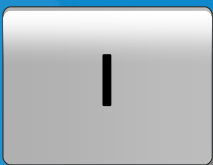


□ 水生态损害问题

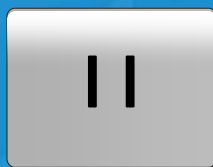
The problem of water ecological damage

- ✓ 河道断流 Depleted rivers
- ✓ 湖泊湿地萎缩 Shrinking lakes and wetlands
- ✓ 地面沉降、海水入侵 Land subsidence and saline intrusion
- ✓ 生物多样性减少 Loss of bio-diversity





中国水资源基本状况
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实施最严格水资源管理制度
**Implement the strictest water resources
management system**



新形势下水资源管理新举措
**New Measures for Water Management under a
New Situation**

新时期水利工作方针：“节水优先、空间均衡、系统治理、两手发力” Water conservancy guidelines for the new period, “to give priority to saving water, achieve harmony between development and water conservation, carry out systemic governance, and ensure that both government and market play their respective roles”,

最严格水资源管理制度：The strictest water resources management system

三条红线 Three red lines

水资源开发利用控制红线 Control red line for water resource development and utilization

用水效率控制红线 Control red line for water consumption efficiency

水功能区限制纳污红线 Control red line for limited pollutant load control for water function areas

四项制度 Four systems

用水总量控制制度 Total water consumption control system

用水效率控制制度 Water consumption efficiency control system

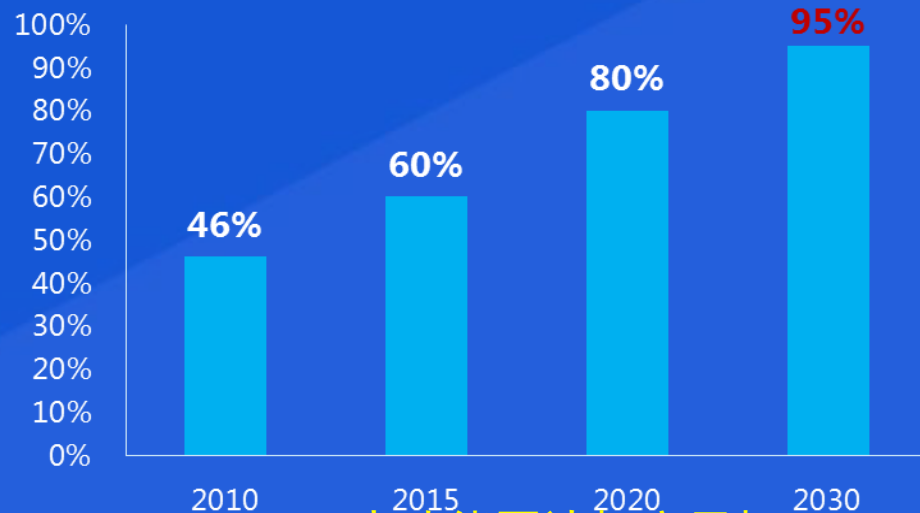
水功能区限制纳污制度 System of limited pollutant load control for water function areas

责任与考核制度 Responsibility and assessment system



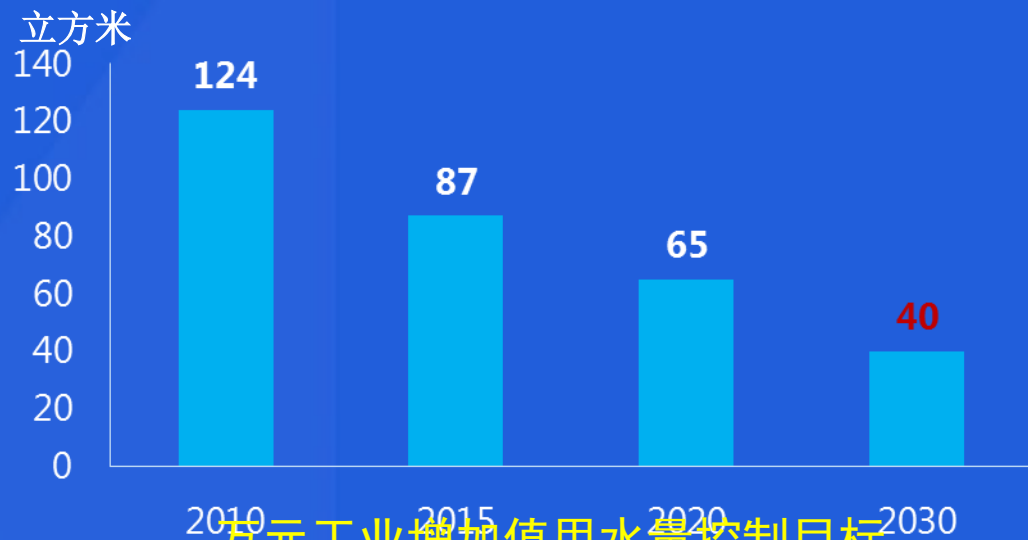
全国用水总量控制目标

Target of total water consumption volume nationwide



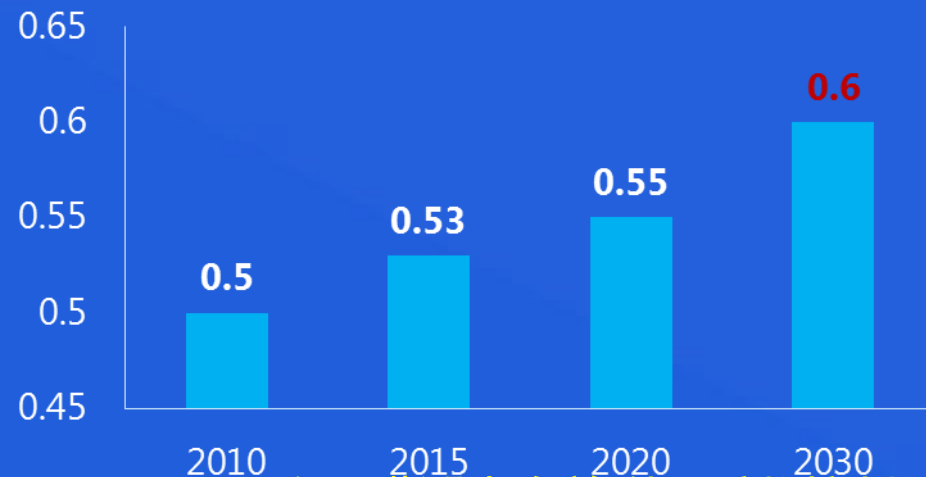
水功能区达标率目标

Target of rate of water function areas meeting standards



万元工业增加值用水量控制目标

Control target of water consumption per 10,000 yuan of industrial added value



农田灌溉水有效利用系数控制目标

Control target of effective utilization coefficients of irrigation water

严格用水总量，加强源头控制 Strictly control total amount of water

consumption and strengthen source management

逐级分解红线指标

Break down red line indexes level by level

建立覆盖流域和省市县三级行政区域的取用水总量控制指标体系。

Establish an index system for the control of total amount of water drawn and used covering basins and provincial, municipal and county levels.



指标分解示意图

Diagram of index breakdown

➤ 严格水资源论证与取水许可管理 Strictly enforce water resource demonstration and water permit management.

水资源论证 Water resource demonstration

建设项目水资源论证
Water resource
demonstration of
construction projects

规划水资源论证
Water resource
demonstration of
planning

区域经济社会发展规划
Regional economic and social
development planning

城市新区、产业园区
New districts
and industrial parks in cities

重大产业布局
Layout for major industries

.....



以水定产、以水定城、以水定发展

Determine production, urbanization and development according to water

对取用水总量已达到或超过控制指标的地区，严格限制耗水产业布局，暂停审批新增取水户。
As to areas where the total amount of water consumption has already reached or exceeded control limit, we strictly control the distribution of water-intensive industries, and suspend the approval of new water permits.

截至2016年底，有效取水许可证保有量达**32.2万**套。

By the end of 2016, 322 thousand water permits had been issued.



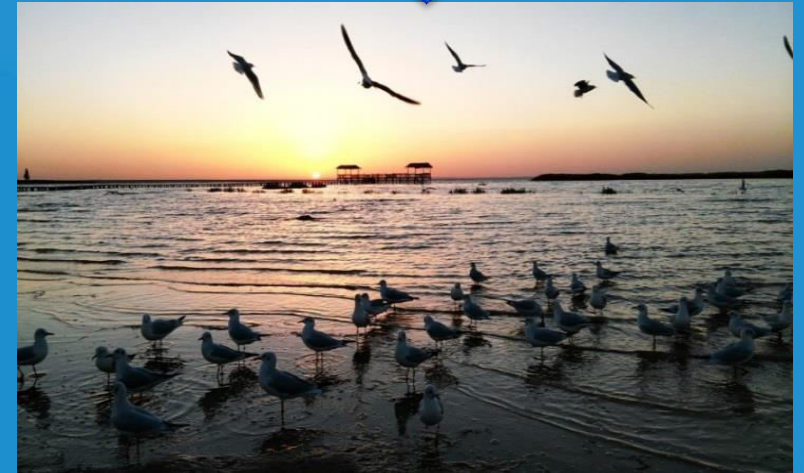
- 优化配置调度 Optimize allocation and diversion
- ✓ 开展黄河、黑河等重要河流统一调度
- ✓ Centralized water dispatching is conducted for important rivers such as the Yellow River and the Heihe River
- ✓ 南水北调东中线累计向北方五省调水**92亿m³**。 The middle and eastern routs of the South-to-North Water Diversion Project diverts **9.2 billion m³** water to five provinces in the north.



南水北调工程 South-to-North Water Diversion Project



调水前的东居延海 East Juyanhai Lake before water diversion



调水后的东居延海 East Juyanhai Lake after water diversion

- **严格用水效率，加强过程控制** Strictly control water-use efficiency and strengthen process management
- **实行各行业节水** Implement water conservation in all sectors
- ✓ **推进一批规模化高效节水灌溉建设** Promote the construction of a number of large-scale water-saving irrigation projects.
- ✓ **推广节水工艺、技术和设备，开展高耗水行业节水技术改造** Promote water-saving processes, technologies and equipment, and conduct water-saving technical reconstruction for water-intensive industries
- ✓ **实施公共供水管网改造，普及应用生活节水器具** Reconstruct public water supply pipelines and popularize water-saving tools for household use.



- 推行用水定额和计划用水管理 Promote water quota management and water use planning.
- ✓ 用水定额：发布了25项高耗水行业取水定额标准。31个省区市实现用水定额全覆盖 water consumption quota: 25 national standards on water drawing quota of water-intensive industries have been issued. Full coverage of water consumption quota has been realized for 31 provinces (regions and municipalities)
- ✓ 计划用水：对纳入取水许可管理的单位和其他用水大户实行计划管理，实行超计划累进加价收费 water consumption planning: water consumption planning management is conducted over units covered by water drawing permit management and other major water consumers, Cumulative pricing is implemented for extra use of water



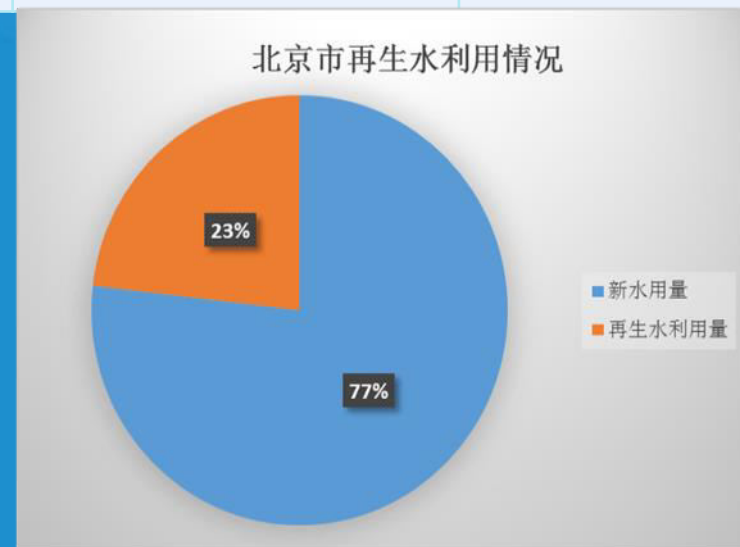
高耗水行业用水定额标准

Water use quota standards for water-intensive industries

➤ 推进非常规水源利用

➤ Promote the use of non-conventional water sources

年份 Year	城市污水处理率Urban sewage treatment rate (%)	年污水处理再生利用量 (亿 m ³) Annual amount of recycled sewage for use (100 million m ³)	年集雨工程集水量 (亿 m ³) Annual amount of rain water collected (100 million m ³)	年海水淡化量 (万 m ³) Annual amount of desalinated seawater (10 thousand m ³)
2010	82.3	27.6	5.1	4000
2015	90.2	52.2	9.6	7400



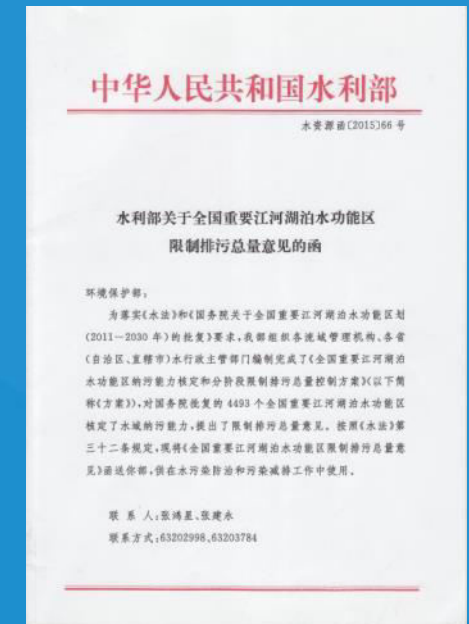
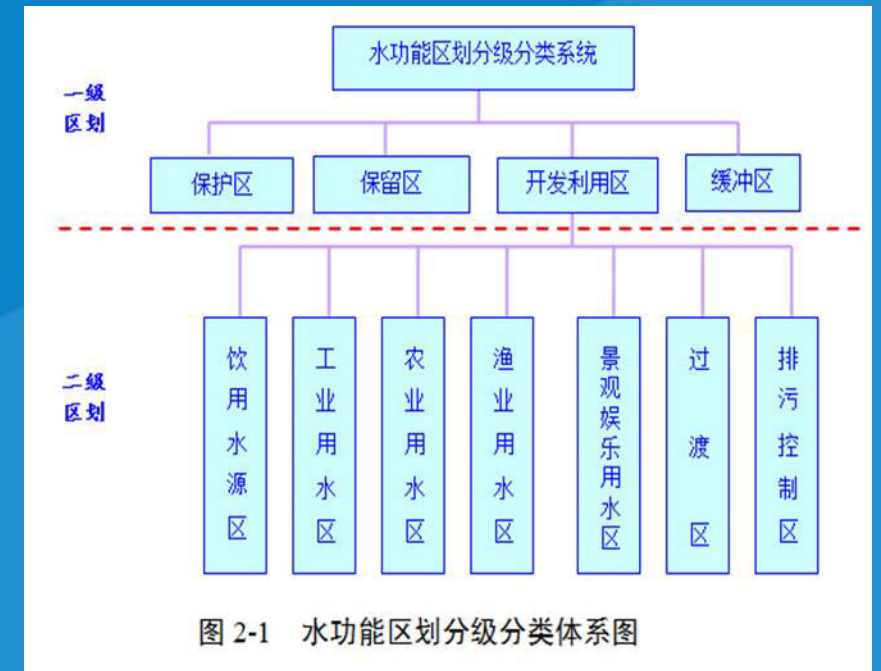
□ 严格水功能区限制排污，加强排放监管 Strictly enforce limited pollutant load control of water function areas, and strengthen sewage disposal management

➤ 严格水功能区监督管理 Strictly enforce supervision management over water function areas

✓ 明确水域功能，强化分类监管 Water area functions have been defined, and classified supervision has been strengthened

✓ 从严核定水域纳污容量，严控入河湖排污总量 Strictly verify pollutant load of water, and strictly control the total amount of pollutant discharged into rivers and lakes

✓ 加强水功能区监测体系建设 Strengthen the construction of the monitoring system for water function areas



➤ 加强饮用水水源地保护 Strengthen the protection of drinking water sources

- ✓ 公布重要饮用水水源地名录 Release the directory of important drinking water sources
- ✓ 推进饮用水水源地安全保障达标建设 Efforts have been made to guarantee the safety of standard drinking water sources and ensure their meeting with evaluation criteria
- ✓ 加强水源地应急管理体系建设 Strengthen the construction of the emergency management system for water sources,



➤ 推进水生态文明建设 Promote progress in the water ecological system

✓ 推进生态脆弱河流和地区水生态修复

Water ecological rehabilitation of rivers and regions with fragile ecology

✓ 开展超采区综合治理

Comprehensive rehabilitation of areas with excessive extraction of ground water

✓ 开展105个水生态文明城市试点建设

Pilot for water ecological projects in 105 cities

✓ 打造“海绵家园”“海绵城市”

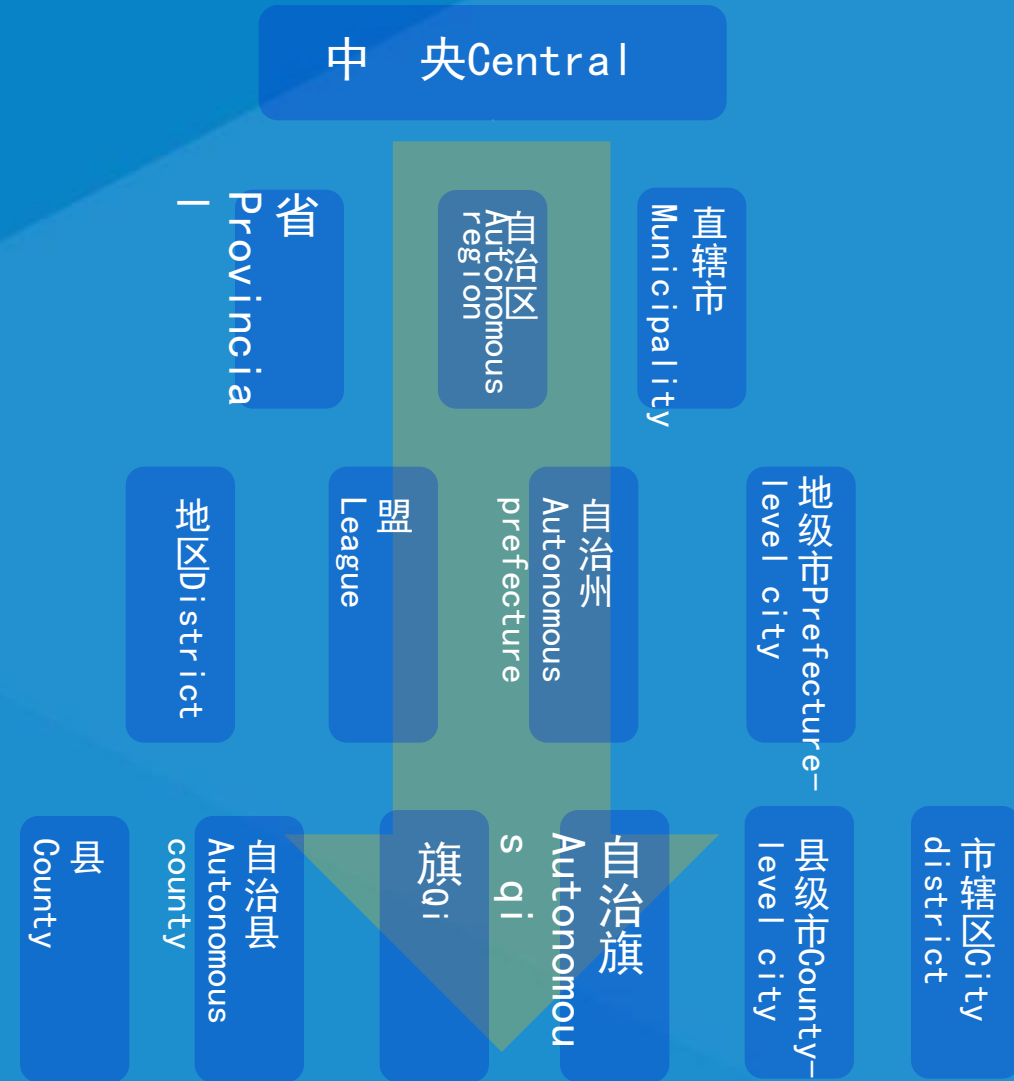
“Sponge homes” and “sponge cities”



水生态文明城市建设试点
Pilot cities of water ecological
progress

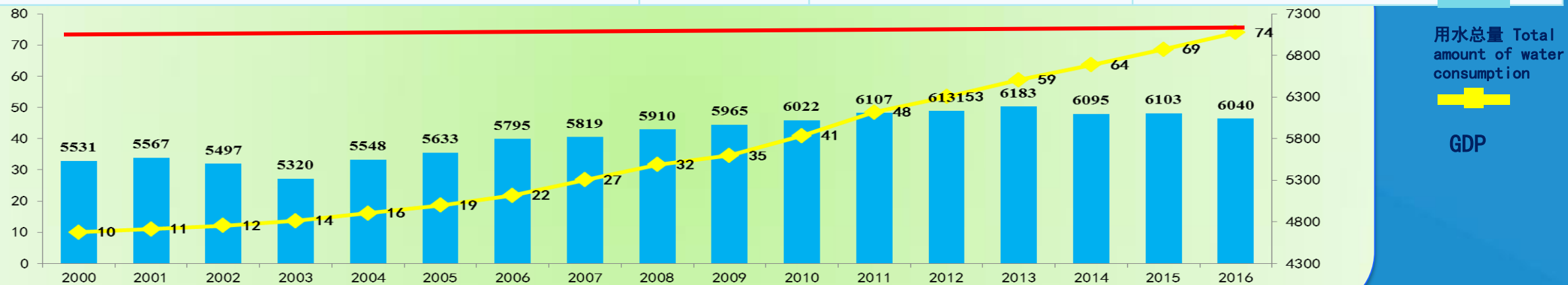
□ 实施考核，强化责任追究 Implement assessment and strengthen accountability

- 中央和地方各级政府出台实行最严格水资源管理制度考核政策文件 The Central Government and local governments at various levels have launched and implemented policy documents for the assessment of the implementation of the system for the strictest possible management for water resources
- 建立省、市、县三级水资源管理行政首长负责制 Establish an administrative accountability system for water resource management at provincial, municipal and county levels
- 逐级考核 Conduct level-by-level assessment,



□ 实施成效 Effect of implementation

“三条红线”指标 “Three redline” indexes	2015	2015年控制目标值 Control target in 2015	2016年（初步估算） 2016 (preliminary estimation)
用水总量（亿m ³ ） Total water consumption volume (100 million m ³)	6103.5	6350	6040
万元国内生产总值用水量比2010年下降 Water consumption per 10,000 yuan of GDP reduced from that of 2010	30%	--	35.5%
万元工业增加值用水量较2010年下降 Water consumption per 10,000 yuan industrial added value reduced from that of 2010	37%	30%	41.5%
农田灌溉水有效利用系数 Effective use coefficient of farmland irrigation water	0.536	0.53	0.542
水功能区达标率（%） Water function area qualification rate (%)	70.8%	60%	73.4%



“十二五”期间，**用水结构**得到初步优化 During the period of the “Twelfth Five-Year Plan” 2011–2015, **water consumption structure** was preliminarily optimized

- 全国发展高效节水灌溉面积800多万公顷 Over 8 million hectares of farmland with water-efficient irrigation has been developed
- 耗水量较高的谷物播种面积占谷物播种总面积的比重由60.2%下降为56.8%
The share of rice and wheat acreage with higher water consumption in crop acreage has been reduced from 60.2% to 56.8%
- 耗水量相对高的工业在国内生产总值中的比重降低了5.5%。 The share of industrial with relatively high water consumption in GDP has been reduced by 5.5%.

I

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II

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III

新形势下水资源管理新举措 New Measures for
Water Management under a New Situation

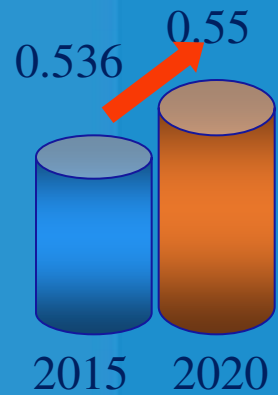
中国经济发展进入新常态，加快推进供给侧结构性改革，大力推进资源节约集约利用，促进经济结构和发展方式转型升级。
China's economic development has entered a new normal. We should promote supply-side structural reform, vigorously boost efficient and intensive use of resources and promote the transformation and upgrading of economic structure and development patterns.



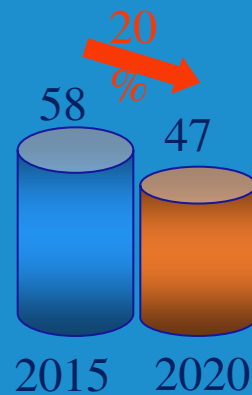
➡ 双控行动的关键突出一个“控”字 “Control” should be emphasized for double control action

双控行动增加万元GDP用水量控制指标，做到水资源管控全领域覆盖。The dual control action has further improved the management index system, with the addition of the 10000 yuan GDP water consumption control index, and the full coverage of all sectors by water control indexes has been achieved.

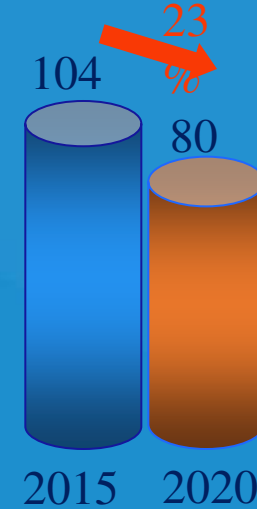
- ✓ 总量控制目标：全国年用水总量控制在6700亿立方米以内。Total quantity control objective: The total amount of water used should be controlled within 670 billion m³.
- ✓ 强度控制目标Intensity control objective



农田灌溉水有效利用系数Effective utilization coefficients of farmland irrigation water



万元工业增加值用水量 (m³)
Water consumption per 10,000 yuan of industrial added value (m³)



万元GDP用水量 (m³) Water consumption per 10,000 yuan of GDP (m³)

- 在总量控制方面 In terms of quantity control
- ✓ 强化水资源承载能力刚性约束，严控区域用水超载 Strengthen the rigid constraint of water resource carrying capacity, and strictly control overloaded regional water consumption
- 开展水资源承载能力评价 The evaluation of water resource carrying capacity is conducted with counties as units
- 提出与水资源相适应的开发利用控制上限 Set up control upper limits for development and utilization commensurate with water resources
- 建立预警体系 Establish a precautionary system

- 已启动：地、县两级评价 Started evaluation at prefecture and county levels
- 完成京津冀和湖州市等8个试点地区评价 Completed evaluation of 8 pilot areas including Beijing, Tianjin, Hebei and Huzhou etc.
- 宁夏完成全区评价 Completed evaluation for the whole region of Ningxia

- ✓ **强化水资源配置调度，严控河湖开发超限** Strengthen water resource allocation and dispatching, and strictly control river and lake development
 - 加快江河流域水量分配 Accelerate the allocation of water across river basins
 - 优化水资源配置调度 Optimize water allocation and dispatching
- ✓ **强化地下水管理与保护，严控地下水超采** Strengthen ground water management and protection and strictly control excessive extraction of ground water
 - 严格地下水取用水量和水位控制 Strictly control water drawing quantity and water level of ground water
 - 划定地下水禁采、限采范围 Delimit the scope of forbidden and restricted extraction of ground water
 - 制定并实施地下水压采方案 Formulate and implement reduced ground water withdrawal plans for areas with excessive extraction of ground water
 - 完善地下水监测网络 Improve the ground water monitoring network



- ✓ **强化非常规水资源利用，构筑多元用水格局** Strengthen the utilization of non-conventional water resources and construct a pattern of diversified water for use
- **把非常规水源纳入区域水资源统一配置** Include non-conventional water resources into regional centralized allocation
- **积极利用再生水** Actively utilize recycled water
- **大力发展海水淡化和直接利用** Vigorously develop seawater desalination and direct utilization
- **科学利用雨洪资源** Scientifically use rain and rain-flood resources



➤ 在强度控制方面 In terms of intensity control

✓ 严格定额管理控强度 Control intensity by strict quota management

建立覆盖主要农作物、工业产品和服务业的用水定额体系，采用先进的定额标准核定取用水量。

Establish a water consumption quota system covering main crops, industrial products and life service sector, adopt advanced quota standards to define the amount of water drawn and used, and bring into play the constraining and guiding role of quota.



✓ **强化行业节水控强度** Control intensity by strengthening water saving in all sectors

- **农业**：大力发展高效节水灌溉、优化调整种植业结构
Agriculture: Vigorously develop water-saving irrigation, and optimize and adjust the structure of the planting industry
- **工业**：严控新上或扩建高耗水、高污染项目
Industry: strictly control new or expanded projects with high water consumption
- **生活服务业**：推动高耗水服务业、建筑节能和园林绿化节水
Life service: Promote water conservation in water-intensive service industries, and implement water saving in buildings and landscaping.



✓ **运用市场机制控强度Control intensity by using the market mechanism**

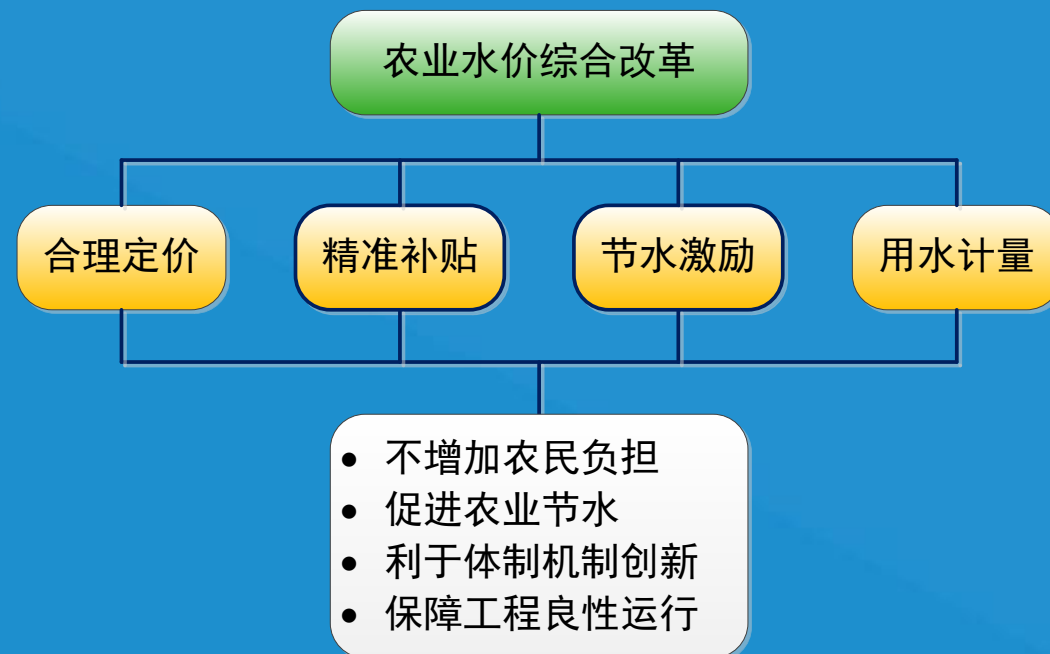
- **加快推进水权制度建设：明晰初始水权。开展多种形式的水权交易Accelerate the construction of the water right system, define the initial water rights of areas and water users, and develop various forms of water right transaction.**

水权交易形式Forms of water right transaction

区域间、流域间、流域上下游、行业间、用水户间Among regions, basins, upper reaches and lower reaches of one basin, industries and water users



- **稳步推进水价和水资源税费改革：推行农业水价综合改革、建立可持续的精准补贴和节水奖励机制Steadily promote the reform of water price and water resource taxes: Promote the comprehensive reform of agricultural water price, and establish a sustainable mechanism of accurate subsidies and water-saving**



✓ 创新机制控强度 Control intensity by innovative mechanisms

- 加快节水技术研发和推广应用 Accelerate the R & D, promotion and application of water-saving technologies
- 推行合同节水管理 Promote water saving contract management
- 积极开展水效领跑者引领行动 Bring into play the guiding role of water-saving pacesetters

合同节水重点领域

Key water-saving areas by contracting



公共机构 Public institutions



高效节水灌溉 Water-saving irrigation



高耗水工业 Water-intensive industries



高耗水服务业 Water-intensive service industries 其他工作 Other work

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✓ **达标建设控强度** Control intensity by meeting water-saving criteria

全面启动**以县域为单元**的节水型社会达标建设。到2020年，北方地区40%以上、南方地区20%以上的县级行政区，达到节水型社会标准的目标。
Comprehensively start the construction of a water-saving society **based on counties**. Strive to make over 40% of county administrative areas in the northern part and over 20% of county administrative areas in the southern part reach the criteria of a water-saving society by 2020.



□ 全面推行河长制 **Comprehensively implement the river chief system**

2016年，中国政府出台了《关于全面推行河长制的意见》，提出每条河流都要设立河长，明确管河护水的职责要求。In 2016, the Chinese Government issued the Opinions on Comprehensively Implementing the River Chief System, which put forward the a river chief be assigned for each river and defines the responsibilities of river management and protection.



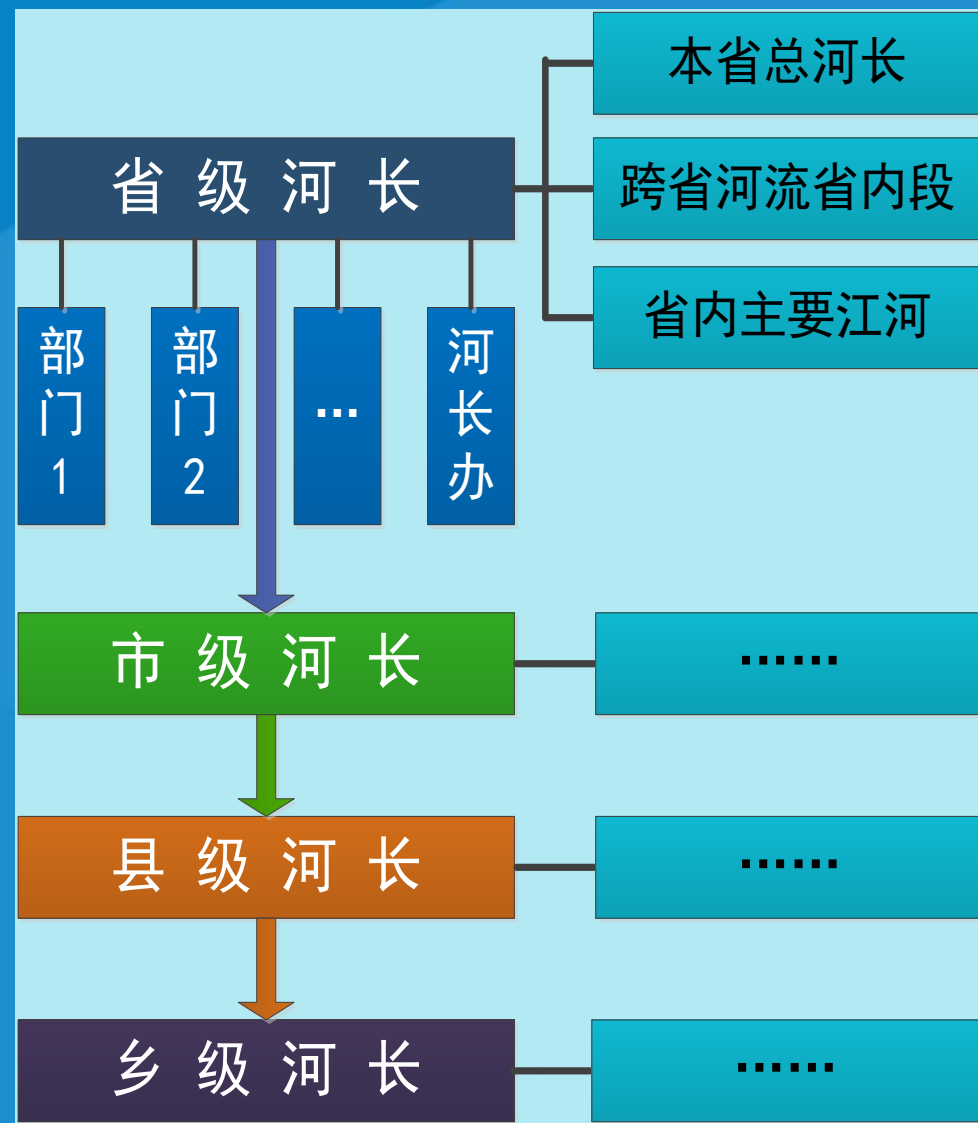
河长制在解决水资源问题上，强调了“管”字，明

→ 确了江河湖泊谁来管、管什么、怎么管

The word “**manage**” is stressed in the river chief system in resolving water problems, which defines who should manage rivers and lakes, what to manage and how to manage them.

➤ 谁来管 Who

全面建立省、市、县、乡四级河长体系。
Comprehensively establish a four-tier river chief system
(provincial, municipal, county and township).



➤ 管什么 What

加强水资源保护

Strengthen water resource protection

切实监管入河湖排污口，落实污染物达标排放要求，严控入河湖排污总量
Effectively monitor pollutant outlets to rivers and lakes, implement requirements on pollutant discharge, and strictly control the total amount of pollutants discharged into rivers and lakes

加强水域岸线管理

Strengthen coastline management

划定河湖管理范围，对侵占河道、围垦湖泊、非法采砂等问题进行清理整治，恢复河湖水域岸线生态功能
Define the scope of management for rivers and lakes, remedy problems such as occupation of watercourse, enclosure of lakes for cultivation, and illegal sand mining, and restore the ecological functions of coastal lines of rivers and lakes

加强水污染防治

Strengthen water pollution control

统筹水上、岸上污染治理，优化入河湖排污口布局，实施入河排污口整治
Coordinate pollution treatment on water and shore, and rectify pollutant discharge outlets into rivers

加强水环境治理

Strengthen rehabilitation of water environment

保障饮用水水源安全，加大黑臭水体治理力度，综合整治农村水环境
Guarantee the safety of drinking water sources, step up efforts in rehabilitating black and smelly water bodies, and comprehensively rehabilitate rural water environment

加强水生态修复 Strengthen
rehabilitation of water ecology

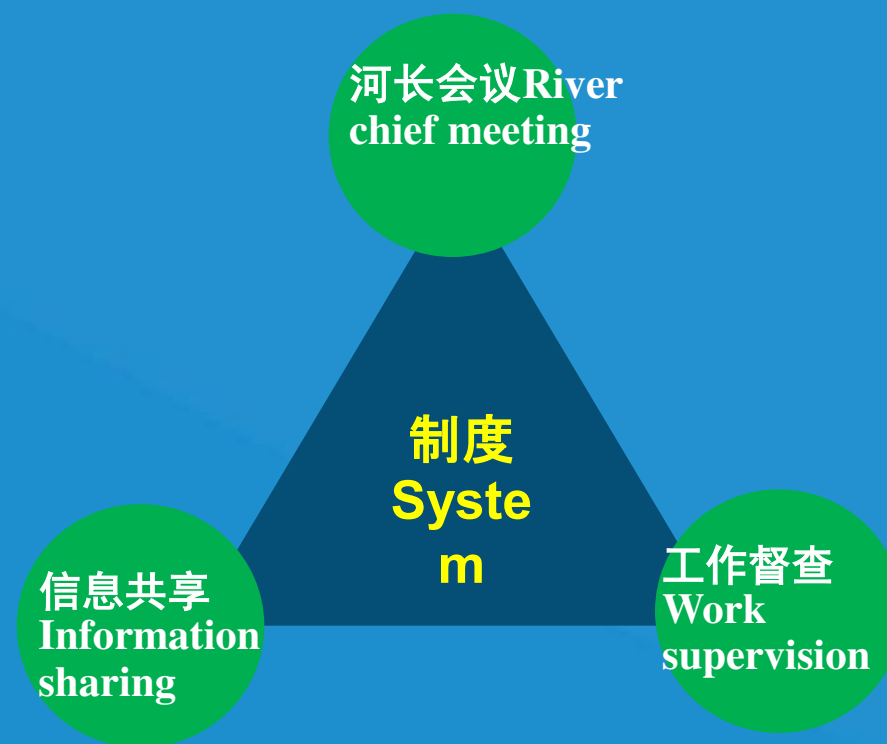
禁止侵占自然河湖、湿地等水源涵养空间 Forbid the occupation of
water conservation spaces such as natural rivers and lakes and
wetland

加强执法监管 Strengthen law
enforcement supervision

严厉打击涉河湖违法行为 Crack down on any illegal action
concerning rivers and lakes

➤ 怎么管 How to manage

- ✓ 制定工作方案，确定河湖分级名录 Prepare work plans, and determine the classified directory of rivers and lakes.
- ✓ 建立河长会议制度、信息共享制度、工作督察制度 Establish a river chief meeting system, information sharing system, and work supervision system
- ✓ 以问题为导向，制订“一河一策”“一湖一策” Oriented by problems, prepare “one policy for one river”, and “one policy for one lake”.



- **严格考核问责** Strictly enforce evaluation and accountability
- ✓ **实行差异化绩效评价考核** Conduct differentiated performance evaluation
- ✓ **考核结果作为地方党政领导干部综合考核评价的重要依据** The results of assessment will be taken as an important basis for the comprehensive assessment of local party and political cadres

水利部
发展和改革委员会
工业和信息化部
财政部
国土资源部
环境保护部
住房和城乡建设部
国家统计局

文件

水资规〔2016〕463号

水利部等9部门关于印发《“十三五”实行最严格
水资源管理制度考核工作实施方案》的通知

各省、自治区、直辖市人民政府：

根据《国务院办公厅关于印发实行最严格水资源管理制度考
核办法的通知》（国办发〔2013〕2号）要求，现将《“十三五”实行最

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全国31个省均着手开展河长制相关工作。有20个省份已经明确了省级总河长，14个省已成立了省级河长办公室。2018年将全面建立河长制。 Currently, 31 provinces across China have started the relevant work on the river chief system. 20 provinces have defined their provincial general river chief, and 14 provinces have established provincial river chief offices. By 2018, the river chief system will be established on an all-round basis.

我们真诚希望加强与世界各国的交流与合作，分享经验，交流做法，共同应对各种挑战，为经济社会可持续发展提供更加有力的水资源保障！ We sincerely wish to strengthen communication and cooperation with countries all over the world to share experience and practices and jointly cope with various challenges, thus providing more powerful water guarantee to sustainable economic and social development!



谢谢!

Thank you!