

治水辩证法

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*Dialectics on
Water
Conservancy*



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治水成功与否,思维方式极其重要。治水应遵循唯物辩证法,牢固树立其系统观和发展观,正确处理人与自然的关系,努力实现生态效益、经济效益和社会效益的统一。

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水利建设和发展是一个复杂的、开放的巨系统,在这个系统中,存在着若干方面的重大关系,如整体与局部、除害与兴利、近期与长远、规划与建设、预防与抢险、硬件与软件、开源与节流、利用与保护等。对这些关系处理得正确与否,事关今后水利建设和发展的成功与失败。

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我国的水利建设取得了举世瞩目的成就。但受生产力发展水平和认识水平的制约,在一定程度上忽视了生态系统建设和环境保护对水资源的要求,以致于不少地方以牺牲环境、占用生态用水来满足经济用水的需要。进入 21 世纪,在全国范围进行大规模的生态建设和环境保护已成为当务之急,水利建设和发展必须立足于经济社会可持续发展的高度,确保生态、环境用水,实现水资源的可持续利用。

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我国 21 世纪发展战略的唯一选择是可持续发展,而实现经济社会可持续发展最为重要的基本条件是水资源的可持续利用。现行的水资源管理是多部门分割管理,造成管水源的不管供水,管供水的不管排水,管排水的不管治污,管治污的不管污水回用。不仅违背了水循环的自然规律,而且也无法按照市场经济原则建立从供水、排水到污水处理回用的合理价格体系和经济调节机制。因此,为了确保水资源的可持续利用,必须对水资源管理体制进行改革,改革的目标是实现水务一体化。

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现阶段,我国农业和农村工作的中心任务,就是积极推进农业和农村经济结构的战略性调整。水利是农业和农村经济结构这一大系统中最为活跃的因素之一,灌溉工程布局要适应农业生产结构调整的变化,供水工程布局要满足小城镇和乡镇企业发展的需要,水土保持措施要立足于创造更加适合于人民生存与发展的自然环境。

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随着我国农业和农村经济结构的战略性调整,小城镇建设将会有一个大的发展,供水设施建设成为小城镇发展极其重要的组

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成部分,甚至要成为“先导”。为加速城镇供水工程建设,可采用 BOT 方式。这种方式,对政府而言,最大的吸引力就是不需要负责项目的资金计划和准备,引进资金用于项目建设而政府却无债务负担。对项目的运营公司而言,可以获得相对长期稳定的经济效益。

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我国主要江河的泥沙淤积情况日趋严重,随之而来的防洪问题也愈加突出。为了解决这一问题,必须遵循标本兼治和近期与长远相结合的原则,采取“拦、排、疏、用”等综合治理措施,坚持长期不懈的治理。据初步分析,每年用于治理主要江河泥沙的投资应不少于 10 亿~13 亿元。

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我国是世界上水土流失最为严重的国家之一。制定水土保持工作指导思想和战略方针的重要基础,是如何处理生态效益、经济效益和社会效益三者之间的关系。水土保持绝非传统意义上的群众运动,其中蕴含着至今尚未得到解决的技术问题。因此,要因地制宜地研究、示范、推广有效的综合治理模式,加速“3S”技术在水土保持中的应用研究,建立完善的水土保持工程评价体系。为加速水土保持的治理进程,必须进一步拓宽投入渠道,加大国家政策性扶持力度,强化政府对市场的组织行为。

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为了实现综合利用水利枢纽项目决策科学化,必须进行社会评价。其主要内容应包括宏观的经济、环境和社会影响,并据此建立切实可行的评价指标体系。为了给决策者在评价指标量纲不一条件下提供方案“优”、“劣”的明确概念,社会评价可采用系统模糊分析方法。

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国际水利水电工程建设管理的核心内容是合同管理。国际水利水电工程建设的合同管理者,必须要树立强烈的合同意识和法律意识,熟悉国际上普遍采用的标准合同条款和国际惯例,应将“后继法规”、“合同变更”和“不利的自然条件”等索赔处理作为我国国际水利水电工程建设合同管理的重要内容。为满足工程建设和管理的需要,应尽快造就一支称职的监理工程师队伍并相应规范其运作机制。

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基于1998年长江抗洪抢险中的经验和暴露出的有关问题,黄河防洪方案的制定,一定要立足于最不利情况;及时准确的水文预报至关重要,要下大力气研究黄河流域的产汇流规律;要着力建设完善的防洪体系;在防洪工作中,要时刻树立“防重于抢”的意识;防洪工作一定要做到有法可依,执法必严。

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黄河近期治理的问题包括：(1) 黄河径流量能否被“吃干喝净”；(2) 下游河道控导工程建设问题；(3) 艾山以下河道淤积问题；(4) 北金堤滞洪区问题。回答黄河能否长治久安的问题，必须要研究回答：(1) 黄土高原治理问题；(2) 中游干流水库的作用问题；(3) 南水北调与黄河治理的关系问题；(4) 黄河下游改道问题。

黄河下游断流的主要影响、成因及对策..... 171

黄河下游频繁断流，给沿黄两岸特别是河口地区城镇居民生活造成了多次用水危机，工农业生产遭受严重损失，下游河道特别是主河槽淤积加剧，泄洪能力降低，生态系统趋于恶化。断流不仅是黄河流域水资源供需矛盾日益激化的必然产物，而且也越来越强烈地反映出黄河水资源传统管理体制所存在的弊端。为解决这一问题，必须改革现行的管理体制，赋予流域机构应有的管理职能；制定和细化包括枯水年和特枯水年在内的水量分配方案，严格统一调度，强化分级负责；用经济杠杆调控引黄水量；国家及各级政府应尽快出台鼓励节水的优惠政策等。从长远看，解决黄河断流的根本措施，是实施南水北调工程。

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海河流域治理的三大技术难题，一是河口淤积问题，二是延长洪水预见期问题，三是水库如何实现防洪与抗旱并举问题。研究解决这三大技术难题的基本思路是，通过研究入海河流泥沙淤积机理，运用潮汐泥沙运动规律，借助海洋潮汐动力，充分利用潮水自然资源将泥沙排泄入海。延长洪水预见期的主要途径，除近期借助测雨雷达等现代化的技术手段外，应抓紧大力开展水文气象预报的应用研究，力求尽快付诸实施。水库实现防洪与抗旱并举的关键技术问题是汛限水位的合理拟定，这一问题应在确保水库防洪安全的前提下通过研究洪水预报调度、分期洪水调度、汛期洪水随机模拟分析、汛期模糊分析等多种途径加以解决。

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松花江流域的防洪问题，最终要通过构建完整的防洪体系来解决。在工程体系的构建中，除认真做好河道堤防建设外，还应着眼于上下游、左右岸的整体关系，进行以防止塌岸为中心的河道整治。同时，对干流上具有控制性的水库规模的确定，应在不造成重大淹没的情况下，充分发挥其防洪作用。对处于暴雨区的主要支流，应研究在其干流上布设水库的可能性。在非工程体系构建中，应主要做好防汛指挥系统建设和加强以清障为中心的河道管理。

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新中国成立以来,黑龙江省的水利建设取得了长足的进步。但目前仍存在着防洪体系不健全、抗御洪水的能力依然偏低;水资源开发利用率低,配置不合理,水体污染加剧;国境界河岸边冲刷造成国土严重流失;水土流失治理进度缓慢等问题,它们已成为制约黑龙江省当前及今后一个时期经济社会发展的重要因素。因此,必须有的放矢地制定黑龙江省水利发展的指导思想,采取切实有效的措施,下大力气解决这些问题。

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由于历史的原因,黑龙江省大规模的水资源开发利用滞后于全国平均水平,但对目前已暴露出来的问题及其继续发展可能产生的后果是不容忽视的。为实现 21 世纪黑龙江省水资源的可持续利用,必须制定科学规划并履行严格的审批手续,凡不符合规划的水稻灌区一律不准擅自上马;在水资源超载的河流沿岸,坚持“以供定需”,大力推行“水改旱”和节水灌溉;将水稻种植面积分布向水资源丰富的黑龙江、乌苏里江和兴凯湖沿岸进行战略转移;积极开展跨流域调水方案研究,远景实施“北水南调”工程,实现水资源的合理配置。

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水利规划是为开发利用水资源、防治水旱灾害而制定的总体措施安排，水利建设和发展应在正确的水利规划指导下进行。因此，水利规划至关重要。要做好新形势下的水利规划，必须正确处理整体与局部、近期与长远、硬件与软件等方面的关系，认真把握好调查研究、方案拟定、影响评价和方案论证四个环节，在此基础上，构建完整的水利规划体系，实施水利规划的动态管理。

DIALECTICS ON WATER CONSERVANCY

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Dialectics on water conservancy 1

The thinking mode is very important in water conservancy. The water conservancy shall comply with materialistic dialectics and one shall firmly establish a systematic and developing viewpoint, correctly deal with the relation between human and nature and strive to realize an integration of ecological, economic and social benefits.

Correctly deal with some important relations in construction and development of water conservancy 13

The construction and development of water conservancy is a huge, open and sophisticated system. There exist some important relations, as between whole and part, short term and long term, planning and construction, prevention and emergency treatment, hardware and software, opening-up of the sources and regulation of the flow, utilization and protection etc. The dealings of these relations definitely affect the future

success or failure of the construction and development of water conservancy.

Ecological outlook of the development of water

conservancy in China in the 21st century 36

The construction of water conservancy in China has achieved a great success that attracts a worldwide attention. The construction of ecological system and the demand of environmental protection to water resources are comparatively neglected due to a limitation of productivity development and relevant knowledge. It resulted to meet the water requirement for economic purposes by using water for ecological purposes and causing pollution to the environment. When entering into the 21st century, it has been an urgent affair to conduct a nationwide large-scale ecological construction and environmental protection. The construction and development of water conservancy should be based on the economic and social sustainable development, guaranteeing the water requirement for ecological and environmental protection purposes and realizing a sustainable utilization of water resources.

On sustainable development strategy and water

conservancy integration 49

Sustainable development is the only choice for China as its development strategy in the 21st century. For this strategy, the most important fundamental condition is to realize a sustainable utilization of water resources. The current water resources administration adopts a system of separated administration by several departments. This not only violates the natural law of wa-

ter circulation but also affects the establishment of a rational price system and economic regulation mechanism from water supply and water drainage to treatment and recovery of used water according to the marketing economic rules and regulations. The water resources administration system should be reformed to realize an integration of water conservancy as to guarantee a sustainable utilization of water resources.

Development of water conservancy based on the strategic adjustment of agriculture and rural economic structure 58

The central task at present of agriculture and rural work in China is to actively promoting the strategic adjustment of agriculture and rural economic structure. Water conservancy is one of the most active factors in the big system of agriculture and rural economic structure. The layout of irrigation works shall adapt to the changes of adjustment of agricultural production structure and the layout of water supply works shall meet the requirement for the development of small towns and township enterprises. Measures of water and soil conservancy shall be taken to create a natural environment that is more suitable for existence and development of people.

Urban water supply and BOT 68

With the strategic adjustment of agriculture and rural economic structure, the construction in small towns and cities will have a large development and the construction of water supply facilities will become an extremely important part and even a "leading" part. The BOT mode can be adopted to expedite the

construction of water supply works in towns and cities. The biggest attraction of this mode to the government is the non-responsibility of funds, and the introduction of foreign funds used for the construction of projects without the debts of government. And the operating corporation of the project can obtain a relatively long term and stable economic benefit.

Sedimentation situation in the major rivers of China and its treatment measures 76

The sedimentation situation in the major rivers of China becomes worsened and its consequent flood prevention problem also becomes serious day by day. To solve this problem, one shall look into both its root causes and outward signs and integrate short term with long term, take comprehensive treatment measures, and adhere to a long term and persistent treatment. According to a preliminary analysis, the annual investment for treatment of sedimentation in the major rivers of China shall be no less than RMB¥ 1 to 1.3 billion.

Some points of consideration for soil and water conservation in China 91

China is one of the countries occurring the most serious loss of soil and water. The important factor for drafting a guiding policy of soil and water conservation is the balance among ecological, economic and social benefits. The soil and water conservation, with an unsolved technical problem, shall never be a mass movement. An effective treatment mode in a comprehensive way for local conditions shall be studied, exemplified and spread, quickening the applied research of "3S" technology and

establishing a perfect conservation evaluation system. To speed up the progress of treatment, the investment channels shall be further broadened to render more assistance by the national policy, and strengthening the organizing behavior of the government towards the markets.

Comprehensive utilization of multipurpose dam projects and its social evaluation 104

To realize a scientific policy-making for comprehensive utilization of the multipurpose dam projects, a social assessment and evaluation shall be conducted, including macroscopically economic, environmental and social effects. Based on these contents, a reasonable and practical evaluation system shall be established. To give the policy-maker a clear concept of "good" or "poor" about the scheme when the evaluation has no identical dimension, the said social evaluation shall adopt a systematic fuzzy analysis method.

Management of contracts for the construction of international hydraulic and hydroelectric projects 129

The management of construction of international hydraulic and hydroelectric projects shall be focused on the management of contracts. The managing persons of the relevant contracts must establish intense contract sense and law sense, familiar with the standard contract terms and international practice. The claim treatments shall be listed as the important contents in management of contracts for construction of international hydraulic and hydroelectric projects in China. To meet the re-

quirement of construction and management of projects, a highly qualified supervision engineer's contingent shall be built up and its operation mechanism shall be standardized.

**Enlightenment towards the Yellow River flood
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flood fighting and emergency treatment 144**

From the experience of Yangtze River flood fighting and emergency treatment in 1998 and the revealed relevant problems, the drafting of the Yellow River flood prevention scheme must be based on the most adverse conditions. A timely and exact hydrological prediction is of a vital importance and a great effort shall be made to build up a perfect flood prevention system. In the flood prevention work, "prevention is more important than emergency treatment" shall be always in mind. The flood prevention work shall be done with existing laws to be followed and to be strictly executed.

**Several important problems in the Yellow River
treatment and utilization 157**

The existing problems in the recent Yellow River treatment and utilization can be listed as follows: 1) capability of the runoff flow rate to fulfill the demands; 2) problem of construction of control and guiding projects at the downstream; 3) problem of the deposits and sedimentation of the river bed after Aishan; 4) problem of the flood detention area at Beijin Dyke. Whether or not the Yellow River can be harnessed for a long time with safety relates to the dealings of following problems: 1) problem of the treatment of Loess Plateau; 2) problem of

functions of the main stream reservoir at the middle reach of the river; 3) problem of the relation between transferring water from South to North and the Yellow River treatment; 4) problem of the change of river course at the lower reach of the Yellow River.

Main effects, causes and countermeasures of the dry-out at the downstream of the Yellow River 171

Frequent dry-out at the lower reach of the Yellow River has led to frequent water crises of the residents along the banks, especially those in outfall region, causing serious damages to the industrial and agricultural production. The deposits and sedimentation in the river bed at the lower reach especially in the main river course are increased, making the flood discharge capacity be lowered and the ecological system get worsened. The said dry-out is not only the inevitable outcome of the contradiction between supply and demand of water resources, but also a reflection of the existing shortcomings in the traditional administration system. To solve this problem, the current administration system must be reformed, giving the organizations their due administrative functions, working out a detailed water distribution scheme for the low flow years and particularly low flow years, strictly implementing an uniform control and distribution, strengthening the responsibility at various levels, regulating the amount of water introduced by using economic levers. The state and the governments at all levels should issue the preferential policies to encourage practicing economy in using water, too. In the long run, the ultimate solution to the dry-out in the Yellow River shall be to implement the pro-

ject of transferring water from South to North.

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The three difficult technical problems in treatment of Haihe River basin can be listed as follows: 1) problem of the sedimentation at the outfall; 2) problem of the extension of flood prediction period; 3) problem of realizing both functions of reservoirs to prevent floods and fight droughts. The basic thoughts to solve these problems shall be given as follows: through a study of sedimentation mechanism, to discharge sedimentation into the sea with the help of ocean tiding drive. The main approaches to extend the flood prediction period shall be given as follows: in addition to the current modern technical means, a great effort shall be made in applied research of weather forecast on a hydrological basis. The key technical problem to realize both functions of reservoirs to prevent floods and fight a drought is to rationally determine the water level limit at floods. This problem can be solved under the prerequisite of guaranteeing the reservoirs safe in flood prevention through a study of flood prediction and control, installment flood control, flood random analogue analysis in flood seasons, fuzzy analysis in flood seasons etc. several approaches.

**Establishment of a complete flood prevention
system in the Songhuajiang River basin 197**

The problem to prevent floods in the Songhuajiang River basin shall be finally solved by building up a complete flood pre-