黄河勘测规划设计研究院有限公司
Yellow River Engineering Consulting Co., Ltd.

黄河下游生态廊道格局构建及试点实践

Development of Ecological Corridor Concept and Pilot Practice at Lower Yellow River

博士生导师、教授级高工
Doctoral Supervisor & Professorship Senior Engineer
河南黄河实验室总工程师
Chief engineer of Yellow River Laboratory，Henan

张金良
ZHANG
Jinliang

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1、黄河流域治理与保护面临的新形势

The New Situation Faced by the Governance and Protection of the Yellow River Basin

1 黄河流域治理与保护面临的新形势 The New Situation Faced by the Governance and Protection of the Yellow River Basin

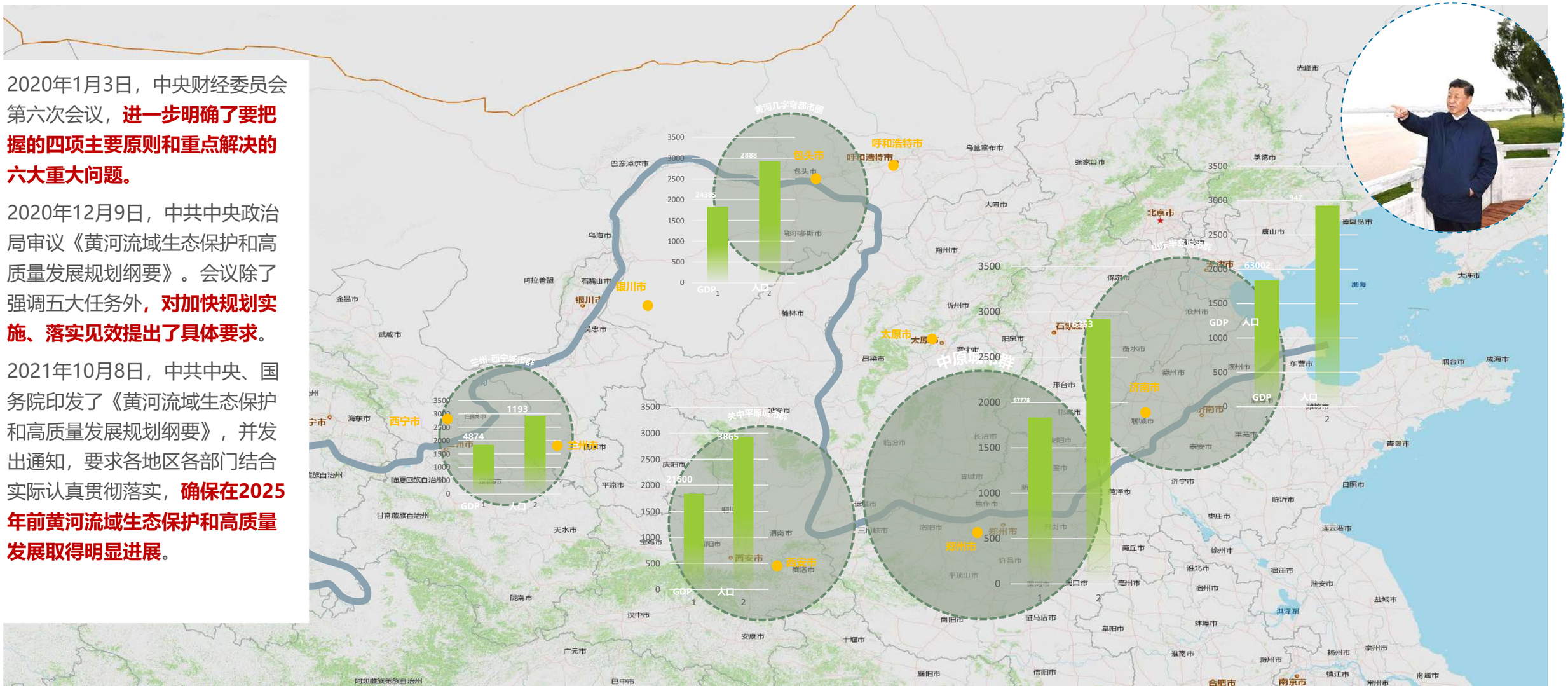
■ **2019年9月18日,习近平在黄河流域生态保护和高质量发展座谈会上， 提出了“共同抓好大保护，协同推进大治理，让黄河成为造福人民的幸福河”的伟大号召。**

■ On September 18, 2019, at the symposium on ecological conservation and high-quality development in the Yellow River Basin, the great initiation was put forward to "jointly focus on major protections, coordinate the promotion of major governances, and make the river benefit and bring happiness to the people" .

■ 2020年1月3日，中央财经委员会第六次会议，**进一步明确了要把握的四项主要原则和重点解决的六大重大问题。**

■ 2020年12月9日，中共中央政治局审议《黄河流域生态保护和高质量发展规划纲要》。会议除了强调五大任务外，**对加快规划实施、落实见效提出了具体要求。**

■ 2021年10月8日，中共中央、国务院印发了《黄河流域生态保护和高质量发展规划纲要》，并发出通知，要求各地区各部门结合实际认真贯彻落实，**确保在2025年前黄河流域生态保护和高质量发展取得明显进展。**



1 黄河流域治理与保护面临的新形势 The New Situation Faced by the Governance and Protection of the Yellow River Basin

■ 为深入推动黄河流域生态保护和高质量发展，黄河水利委员会贯彻落实多项举措，取得了重大进展和成效。

In order to further promote ecological conservation and high-quality development in the Yellow River Basin, the Yellow River Conservancy Commission has implemented multiple measures and achieved significant progress and results.

（1）、构建流域综合性防洪减灾体系，提升水灾害防御能力。

（1）、 Build a comprehensive flood control and hazard reduction system for the river basin, and enhance the ability to prevent water hazards.

紧紧抓住水沙关系调节这个“牛鼻子”，完善以骨干水库等重大水利工程为主的水沙调控体系，提高径流调节和洪水泥沙控制能力，确保河床不抬高。加快推进古贤水利枢纽前期可研审批和前期要件办理，力争早日开工建设。强力推进黑山峡河段开发治理工程可研编制工作，如期上报水利部。

（2）、全方位贯彻“四水四定”原则，提升水资源节约集约安全利用能力。

（2）、 Implement the principle of "four waters and four fixations" in all aspects, and enhance the ability to efficiently, intensively, and safely utilize water resources.

贯彻落实全面节约战略，以最严格的水资源保护利用制度倒逼流域发展方式调整和发展布局优化，以节约用水扩大发展空间。

稳妥推进“八七”分水方案优化调整，有序指导推进省级行政区内跨市、县的河流水量分配。

深化南水北调西线工程论证，加快重要水资源配置工程建设，增强互联互通。

（3）、加强水生态保护，复苏河湖水生态环境。

（3）、 Strengthen water ecology conservation and revive the eco-environment of rivers and lakes.

坚持山水林田湖草沙一体化保护和系统治理，加大重点河湖保护和综合治理力度，维护黄河健康生命，让人民群众在绿水青山中享受水之利、水之善、水之美。

突出抓好中游水土流失综合防治，推进黄土高原塬面保护、小流域综合治理和淤地坝建设等水土保持重点工程。

（4）、加强数字孪生黄河建设，提升黄河保护治理科技水平。

（4）、 Strengthen the construction of digital twin Yellow River and improve the scientific and technological level of Yellow River protection and management.

推进水资源节约集约利用、泥沙综合利用、水土保持等重大科技问题研究，取得一批突破性成果。

构建数字孪生黄河模拟仿真平台。

（5）、强化体制机制法治管理，提升流域治理能力。

（5）、 Strengthen institutional mechanisms, rule of law management, and enhance basin-wide governance capabilities.

1 黄河流域治理与保护面临的新形势 The New Situation Faced by the Governance and Protection of the Yellow River Basin

- **2019年11月1日，黄河流域生态保护和高质量发展工程技术中心也正式落户黄河设计院，中心设置了13个攻关研究方向，黄河下游生态廊道建设为其中之一，将为推进习近平总书记提出的“推动黄河下游河道和滩区综合提升治理工程”提供坚实技术支撑。**

On November 1, 2019, the Engineering Technology Center for Ecological Conservation and High Quality Development of the Yellow River Basin officially settled at YREC. 13 research directions are set up, including the construction of ecological corridors in the lower Yellow River, which will provide solid technical support for promoting the comprehensive improvement and management of the lower Yellow River and floodplains.

2、黄河下游生态廊道构建方案

Scheme of Lower Yellow River Ecological Corridor Development

2.1 黄河下游河道及滩区概况 Overview of Lower Yellow River Channel and Floodplain

- 黄河在桃花峪进入下游，于垦利县注入渤海，全长786km，是举世闻名的地上悬河。
- 黄河下游大堤之间构成了下游滩区，滩区总面积3154km^2，居住人口近190万人。
- 耕地340万亩，土、风、文化、生态资源丰富，已成贯通河南、山东的一条生态走廊。

The Lower Yellow River, 786 km long from Taohuayu (boundary of middle and lower reaches) to Kenli where it flows into the Bohai Sea, is famous worldwide for its suspension above ground. Floodplain is formed between embankments. Such floodplains with area of 3,154 km^2, population of 1.9 million and farmland of 226,700 ha have become an ecological corridor on the North China Plain.

2.1 黄河下游河道及滩区概况 Overview of Lower Yellow River Channel and Floodplain

1949年以来滩区遭受不同程度的洪水漫滩30余次，累计受灾人口900多万人次，受淹耕地2600多万亩次。

Flooded for more than 30 times since 1949, with affected population of 9 million, affected farmland of 1.7 million ha.

下游滩区既是黄河行洪滞洪沉沙的场所，也是190万群众赖以生存的家园，防洪运用和经济发展矛盾长期存在。

——9•18讲话

生态文明视角下，
黄河下游滩区治理
何去何从

In an era valuing ecological civilization, what will be the way for the lower Yellow River floodplain management ?

1996年8月洪水淹没
Flood in August 1996

2017年5月李克强调研滩区
Premier LI Keqiang investigating the floodplain in May 2017

2.2 黄河下游生态廊道构建面临的形势与挑战 Current Situation and Challenges for LYR Ecological Corridor Development

（1）黄河下游防洪形势依然严峻
Lower Yellow River flood control still in tough situation

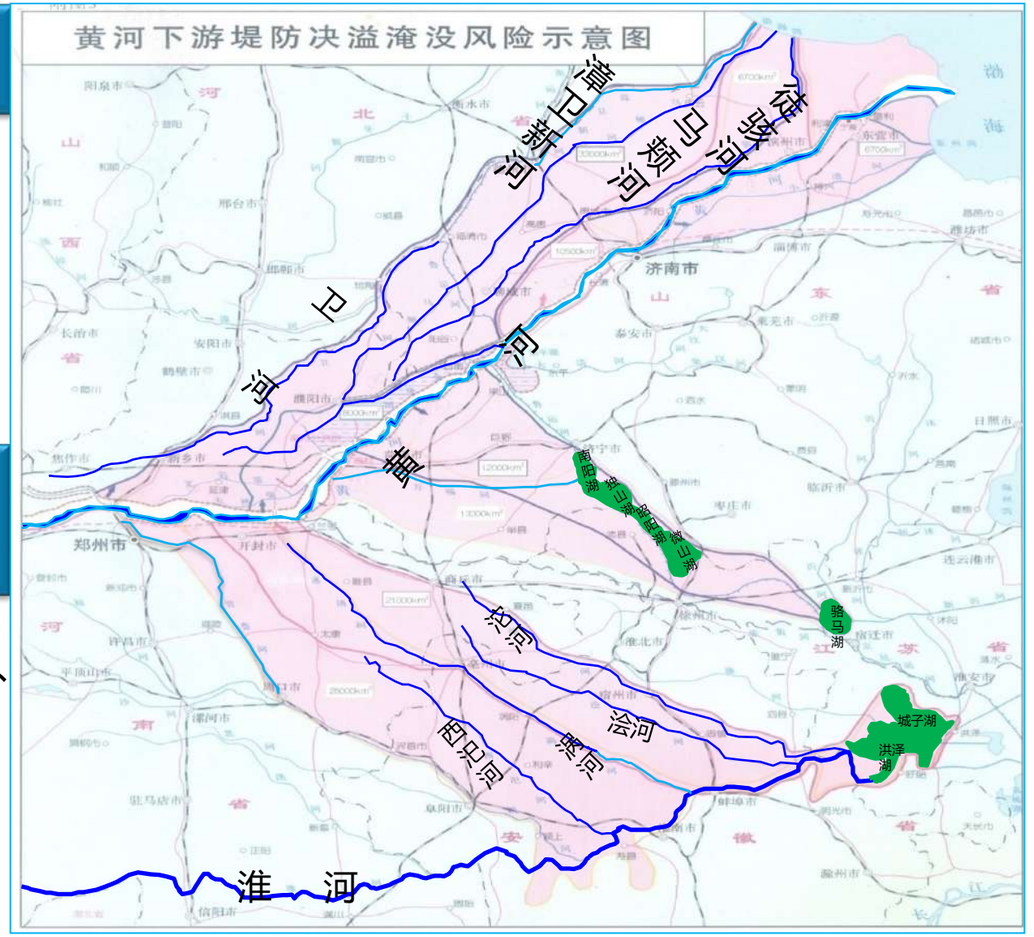
■ “二级悬河”发育，威胁黄河下游整体防洪安全
Secondary suspension threatening the whole Lower Yellow River

东坝头至陶城铺河段二级悬河发育最为严重，目前滩唇一般高于大堤临河侧地面3m左右，最大达4～5m，**滩面横比降达**$10^0/_{000}$左右，而河道纵比降为$1.4^0/_{000}$。

■ 游荡性河势尚未有效控制，威胁滩区及堤防安全
Wandering river not under effective control endangering floodplain and embankments

高村以上299km游荡性河段，目前除东坝头至高村、白鹤至神堤、马庄至武庄和柳园口至府君寺外，其余**166km河道的河势变化仍然较大。**

堤外防洪安全
Safety outside the embankment against flood



确保黄河不决口，保障黄淮海平原防洪和生态安全是新时期面临的重要任务。

It is a mission in the new era to ensure that the Yellow River is free from embankment breach and the Huang-Huai-Hai Plain is safe in aspects of flood control and ecology.

（2）滩区防洪运用和经济发展矛盾长期存在

Long-term contradiction between flood control and economic development in the floodplain

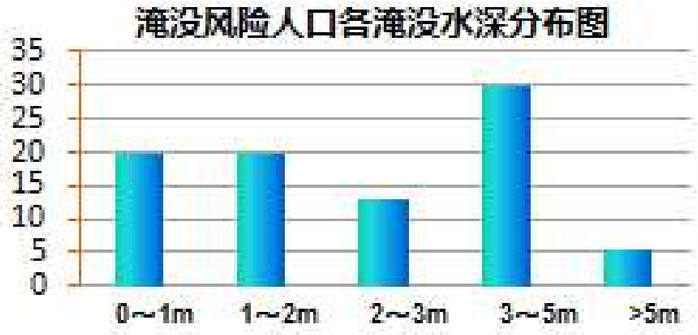
- 河南黄河滩区20年一遇洪水有淹没风险的人口为91.28万人。
- 当前滩区成为最为集中连片的贫困地区，其中封丘、范县、台前县等县巩固脱贫攻坚成果任务艰巨。
- 当前滩区人口外迁制约因素较多:

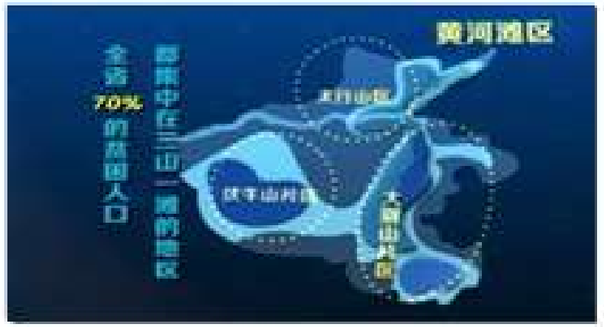
1、外迁后的群众农业生产耕作半径增大；

2、滩外生活生产生态空间有限，滩外沿黄城市用地指标容量有限；

3、外迁群众生活成本增加，就业困难，返迁风险高。

堤内人水矛盾
Contradiction between people and water inside the embankment





全面建设小康社会、滩区190万群众及地方高质量发展对滩区治理提出了新要求。

New requirements of floodplain management have come out of the goals of “Build a Moderately Prosperous Society in All Aspects” and of high-quality development of 1.9 million population and local communities in the floodplain.

（3）沿黄生态保护、空间需求与滩区现状之间矛盾突出

Prominent contradiction among ecological conservation along Yellow River, demand of space and current situation of floodplain

沿黄堤内堤外生态保护及生态空间
Ecological Protection and Ecological Space Inside and Outside of Embankments along Yellow River

- 污染严重 Severe Pollution
- 生态退化 Ecological Degradation
- 现有生态保护区有待优化

Existing Ecological Preservation Areas to be Improved

- 随着城市规模扩张，原有生态空间被不断挤压，缺乏城市生态空间。

Lack of ecological space due to urban expansion

实现人与自然和谐共生、实现新时期生态文明建设、经济发展对黄河下游滩区治理提出了新需求。
New requirements of lower Yellow River floodplain management have come out of the goals of harmonious coexistence between human and nature and of achieving ecological civilization development and economic development in the new era.

2.3 黄河下游生态廊道构建思路 Idea of Lower Yellow River Ecological Corridor Development

通过创新下游治理方略，实施滩区综合提升，保障下游和滩区防洪安全，打造黄河下游生态廊道，实现“堤防安全牢固、河槽相对稳定、滩区生态优美、群众安居乐业”，支持两岸高质量发展。

Using innovation of lower reaches management strategies to achieve comprehensive upgradation of floodplain, safety of lower reaches and floodplain against flood, development of ecological corridor, “solid embankment, stable river channel, sustainable ecosystem, peaceful living”, and to support the high-quality development of both banks.

◆ 创新方略

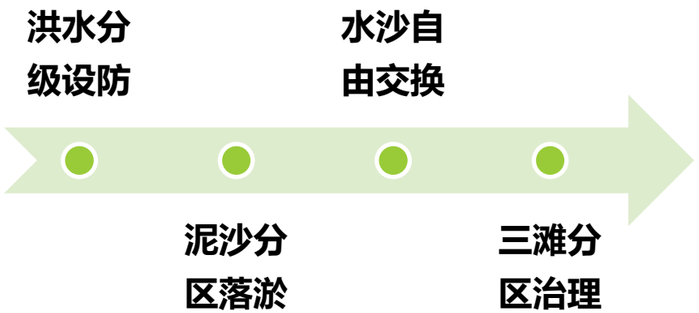
- **继续坚持：**稳定主槽、调水调沙，宽河固堤、政策补偿
- 创新提出：**宽河固堤、稳定主槽、因滩施策、综合治理**

（前提） （关键） （核心） （思路）

◆ 三滩分治，因滩施策、综合治理

Comprehensive three-level floodplain management with directed measures

思路

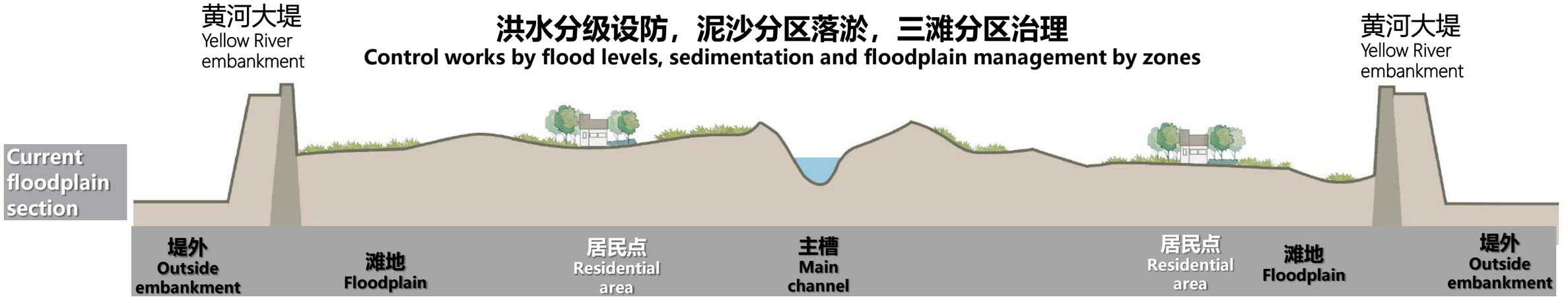


措施

- **划分“高滩”、“二滩”和“嫩滩”的空间格局，作为生活、生产、生态的基底。**
- **实施温孟滩防护堤加固和贯孟堤扩建工程，解决特殊滩区群众防洪问题。**

2.3 黄河下游生态廊道构建思路 Idea of Lower Yellow River Ecological Corridor Development

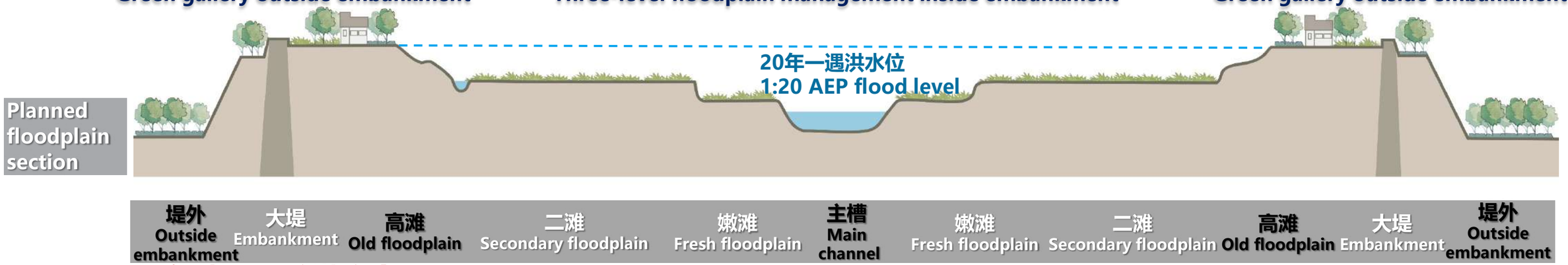
洪水分级设防，泥沙分区落淤，三滩分区治理
Control works by flood levels, sedimentation and floodplain management by zones



堤外绿廊
Green gallery outside embankment

堤内三滩分治
Three-level floodplain management inside embankment

堤外绿廊
Green gallery outside embankment



解决居民防洪安全

解决地方经济发展和生态空间

解决生态修复和连续性

“高滩”— 特色小镇
生活空间：宜居舒适

“二滩”— 田园综合体
生产空间：集约高效

“嫩滩”— 湿地生态系统
生态空间：滩绿水清

2.4 黄河下游生态廊道构建格局 General Plan of LYR Ecological Corridor Development

黄河下游生态廊道
Eco-corridor in lower Yellow River

高效行洪输沙廊道	High-efficiency Corridor of Flood Discharge and Sediment Transport	Function of flood control and deposition reduction	River dredging Reshape the section morphology
生态乡村廊道	Corridor of Rural Ecology	Function of living in peace	Ecological resettlement in old floodplain
生态产业廊道	Corridor of Ecological Industry	Function of green production	Eco-agriculture in secondary floodplain
生态保育涵养廊道	Corridor of Ecological Conservation	Function of eco-conservation	Eco-wetland in fresh floodplain
生态文化景观廊道	Corridor of Ecological Landscape and Culture	Function of cultural heritage	Integration of rivers and towns
生态航道	Ecological Waterway	Function of golden waterway	Interaction of river and economy

→ Eco-safety barrier

↕

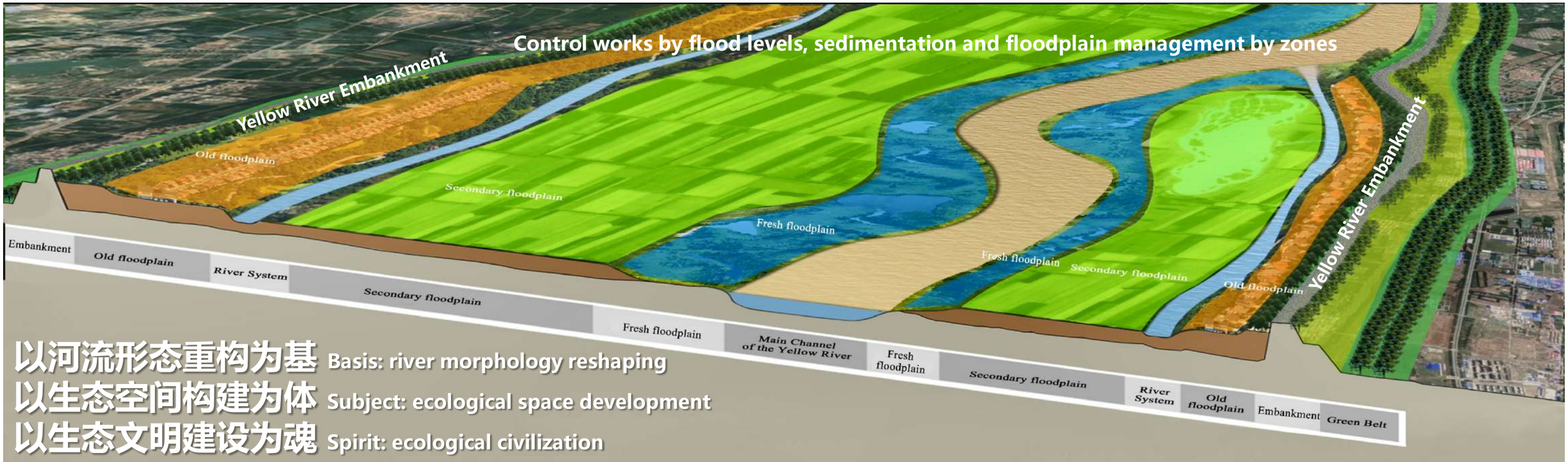
→ Corridors with integration of production, living and ecology

↕

→ Eco-civilization space

↕

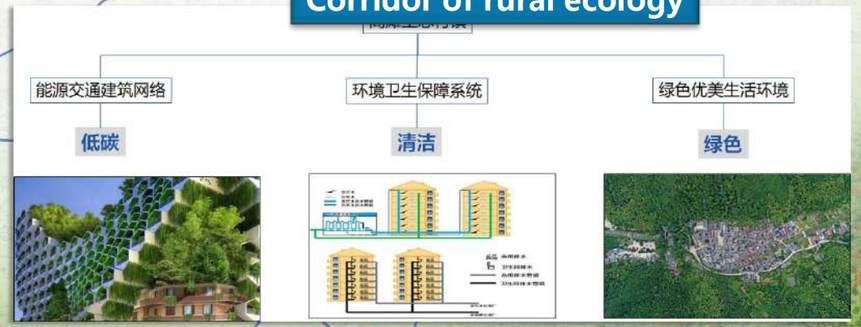
→ Economic belt along Yellow River



2.4 黄河下游生态廊道构建格局 General Plan of LYR Ecological Corridor Development

高效行洪输沙廊道
High-efficiency corridor of flood discharge and sediment transport

生态乡村廊道
Corridor of rural ecology



生态航道Ecological waterway

生态农业 观光农业 万亩花海 高滩特色小镇 嫩滩 三滩 生态农业 高滩特色小镇 观光农业 嫩滩 二滩 嫩滩 生态观光农业

生态产业廊道
Corridor of ecological industry

生态保育涵养廊道
Corridor of ecosystem conservation

生态景观文化廊道
Corridor of ecological landscape and culture

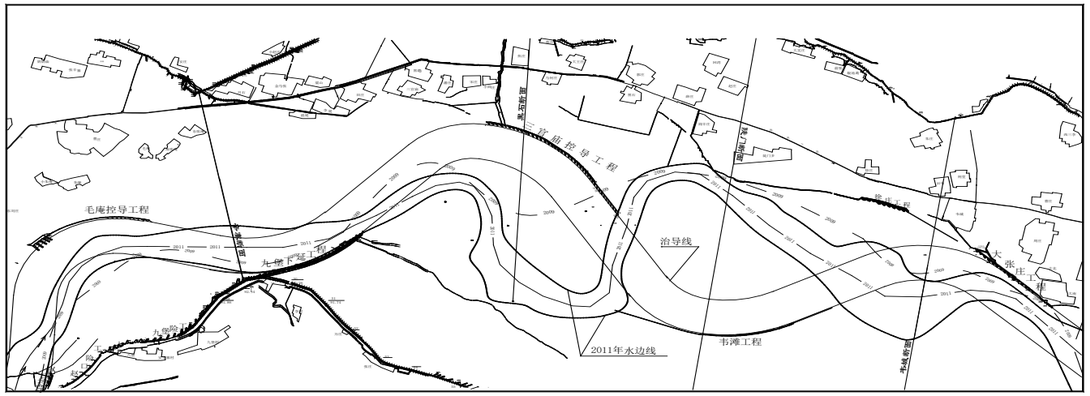
（1）河道整治 River Training

为控制横河、斜河发生，需进行河道整治，稳定河槽，控制河势。

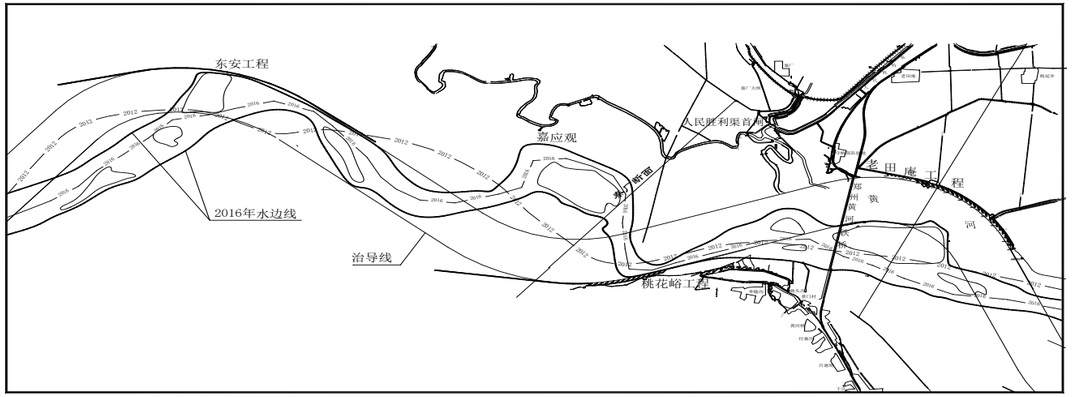
River training is required to avoid mainstream of the river being lateral or oblique to the river channel, to stabilize the river channel and harness the river regime.

河道整治工程规模初步安排表
Preliminarily Proposed River Training Works

治理措施 Items	工程规模 Quantity
一、险工改建加固(道) I Strengthening of Existing Vulnerable Works (pcs)	60
二、控导工程新续建（m） II New Guiding & Control Works (m)	23070
三、控导工程加高加固（道） III Heightening and Strengthening of Existing Guiding & Control Works (pcs)	295
四、防护坝工程（道） VI Guard Dams (pcs)	116



2011年郑州韦滩河势图
River Regime at Weitan, Zhengzhou City in 2011

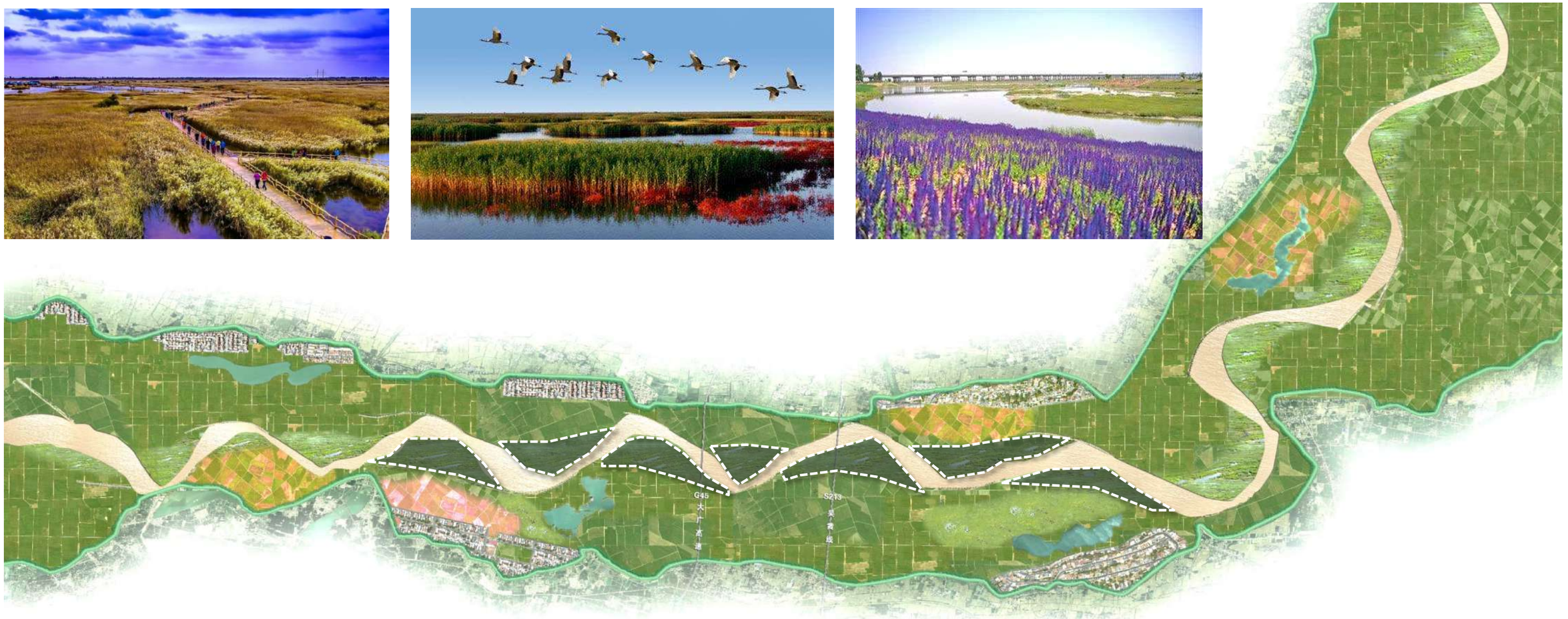


2016年焦作嘉应观河势图
River Regime at Jiayingguan, Jiaozuo City in 2016

（2）嫩滩改造 Fresh Floodplain Upgrading

黄河下游滩区共分布有嫩滩1056km^2，其中河南611km^2。结合已有的湿地自然保护区范围，重构黄河下游湿地生态系统，发展湿地旅游、科普教育、观光摄影等产业，由过去单纯的生态保护转变为修复、保护和多元利用。

重新布局湿地自然保护区，优化生态空间。Rearrange the wetland natural reserve and improve the ecological space.



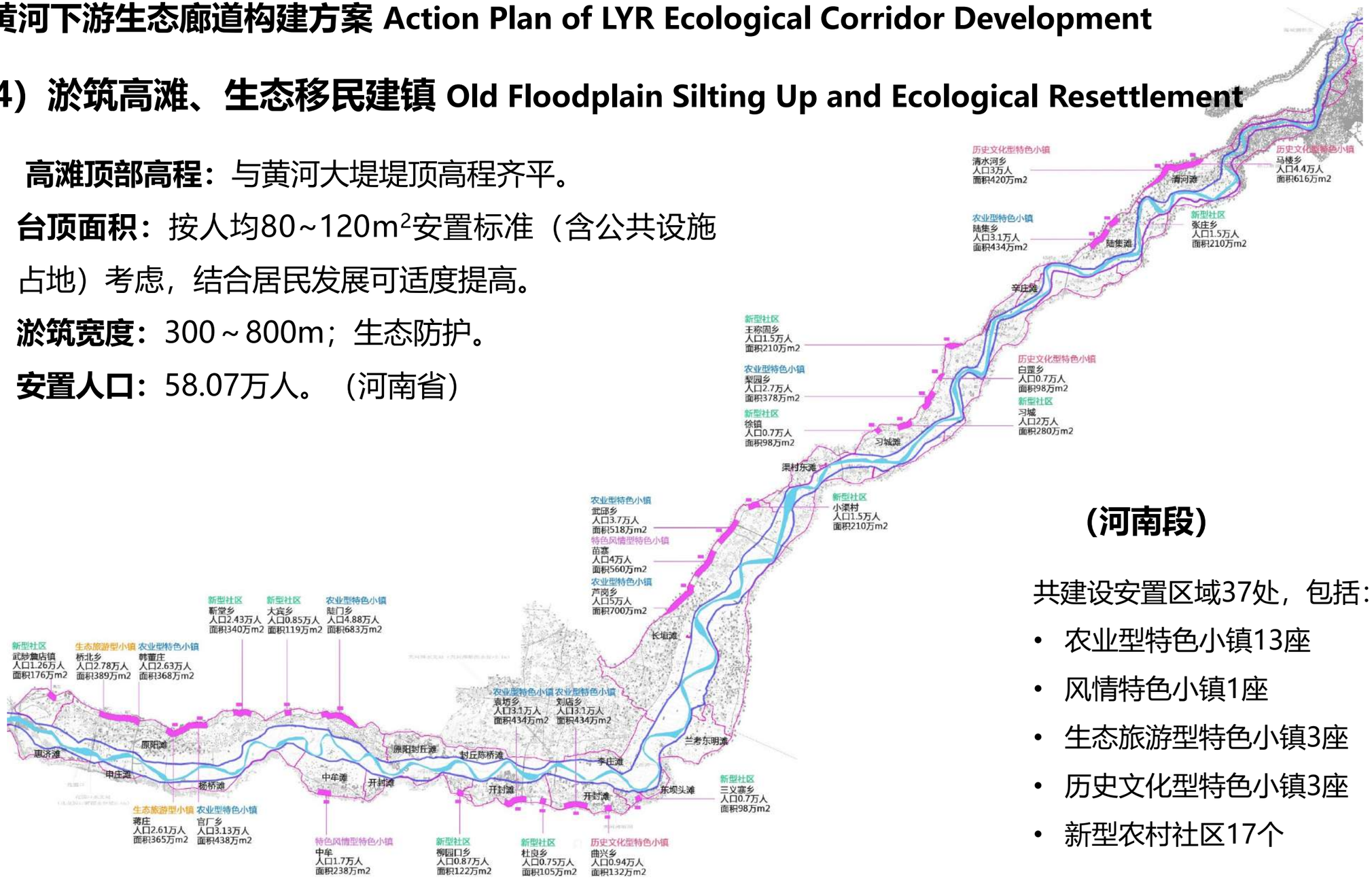
（3） 二滩塑造与生态治理 Building and Ecological Management of Secondary Floodplain

二滩为高滩（台）至黄河控导工程之间的区域。结合二级悬河治理，对搬迁后的村庄进行土地整治，调整滩区农业生产结构，发展高效生态农业（旅游观光）。

治理原则：宜水则水、宜田则田，宜泽则泽。

（4）淤筑高滩、生态移民建镇 Old Floodplain Silting Up and Ecological Resettlement

- **高滩顶部高程：**与黄河大堤堤顶高程齐平。
- **台顶面积：**按人均80~120m²安置标准（含公共设施占地）考虑，结合居民发展可适度提高。
- **淤筑宽度：**300～800m；生态防护。
- **安置人口：**58.07万人。（河南省）



（河南段）

共建设安置区域37处，包括：

- 农业型特色小镇13座
- 风情特色小镇1座
- 生态旅游型特色小镇3座
- 历史文化型特色小镇3座
- 新型农村社区17个

生态效益估算（河南滩区）

Estimate of Ecological Benefits (Floodplain in Henan Province)

（1）滩区生态治理效益主要包括增加旅游收入及提高土地收益两部分。

- **旅游收入**
  Tourism income

河南滩区通过建设生态旅游带、特色小镇20余处、观光农业等年接待游客数将达到近6500万人次，年直接旅游收入约260亿元。

带动服务业发展、解决居民就业岗位34万个，收入204亿元

- **土地产出收入**
  Land output income

1、高标准生态观光农业（田园综合体等）效益约46亿元。

2、移民建生态特色小镇，可整理土地约19万亩。

（2）年均效益总计700亿元（土地效益按十年折算）。

（3）滩区居民人均年收入增加到约4万元，直奔小康。

（4）按照环保部“水十条”实施影响预测评估结果，直接贡献与间接贡献比例为13:87。本项目直接效益700亿元，则可拉动GDP增长约5000亿元。

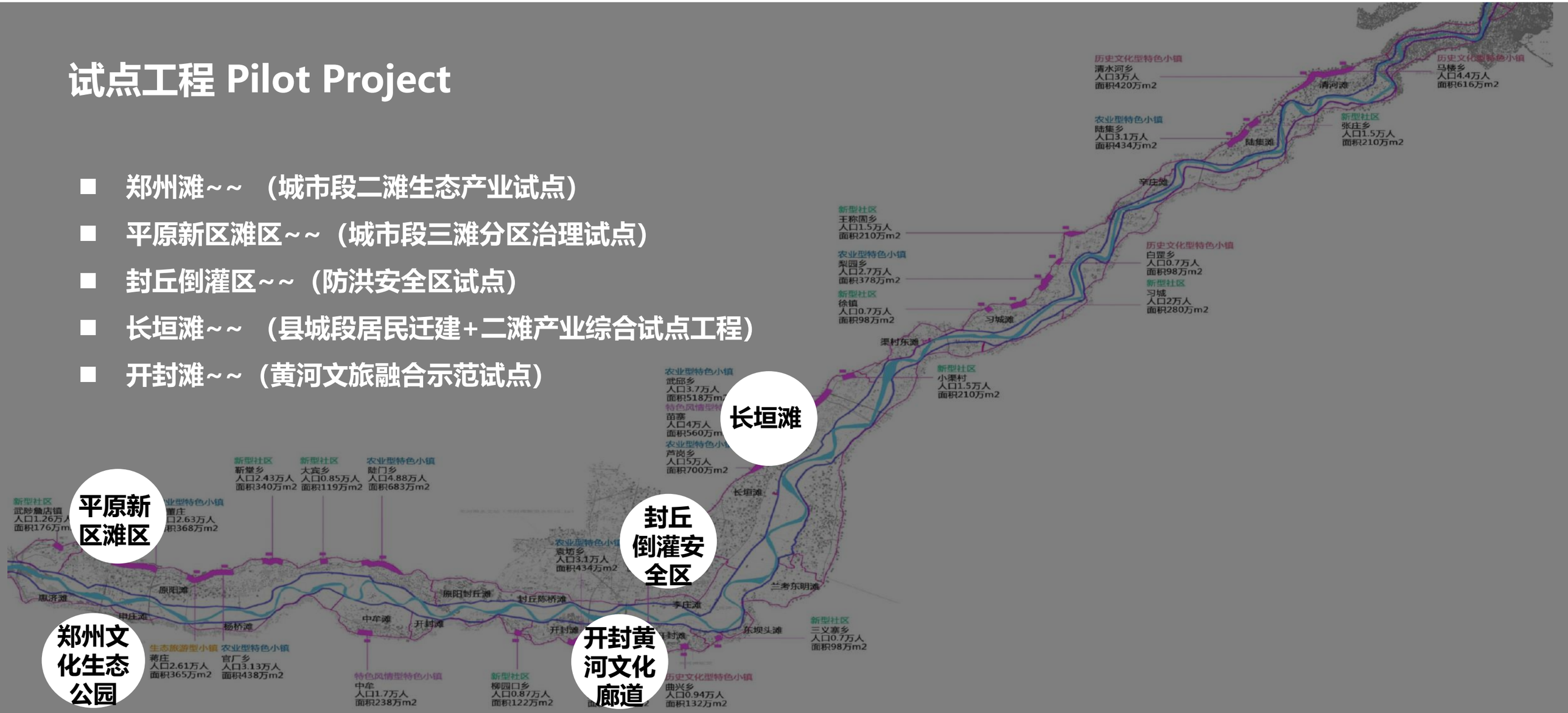
3、黄河下游生态廊道试点实践

Pilot Practice of Lower Yellow River Ecological Corridor

黄河下游生态廊道试点推广 Pilot Practice of Lower Yellow River Ecological Corridor

试点工程 Pilot Project

- 郑州滩~~ （城市段二滩生态产业试点）
- 平原新区滩区~~（城市段三滩分区治理试点）
- 封丘倒灌区~~（防洪安全区试点）
- 长垣滩~~ （县城段居民迁建+二滩产业综合试点工程）
- 开封滩~~（黄河文旅融合示范试点）



3.1 平原新区试点 Pilot Project in Pingyuan New District in Xinxiang City

平原新区滩区紧邻桃花峪，为黄河下游左岸第一滩，滩地高程相对较高，二级悬河发育不明显。

区位优势极佳，发展潜力巨大！滩区的国土、耕地面积和人口都大约是平原新区的三分之一，滩区问题能否解决，决定着整个平原新区发展的成败。

The floodplain in Pingyuan New District, adjacent to Taohuayu (the boundary of middle and lower reaches of Yellow River), is the first floodplain on the left bank of lower Yellow River, where the elevation is relatively high and secondary suspension of river is not obviously developed.

It has an excellent location advantage and a huge development potential! The land area, cultivated area and population of the floodplain are approximately one-third of those of Pingyuan New District. The successful development of Pingyuan New District depends on the problem solving of the floodplain.

3.1

平原新区试点 Pilot Project in Pingyuan New District in Xinxiang City

以韧性发展理念 Resilient Development

进行了“三滩分治”试点布局 Pilot Arrangement Following “Three-level Floodplain Management”

3.1

平原新区试点 Pilot Project in Pingyuan New District in Xinxiang City

解决居民防洪安全
Protect residents from flood

“高滩” 约8.68km²，安置人口5.88万人，人均建设用地120m²。滩外安置1.4万人。

Old floodplain: 8.68km² in area, resettlement population of 588,000 (including 14,000 resettled outside the floodplain), development land of 120m² per capita.

解决地方经济发展和生态空间
Support local economic development and provide ecological space

“二滩” 约85.77km²。现状村庄拆除后土地复垦，发展生态农业、旅游业等。

Secondary floodplain: 85.77km² in area, demolishing the existing villages for land recovery and development of ecological agriculture and tourism.

解决生态修复和连续性
Support ecological restoration and sustainability

“嫩滩” 约15.58km²。洪水漫滩自然滞洪沉沙，在保护修复的基础上多元利用。

Fresh floodplain: 15.58km² in area, multiple utilization based on protection and restoration under the function of flood overflowing and natural sedimentation.

3.1 平原新区试点一期工程 Phase I of Pilot Project in Pingyuan New District

- **一期工程范围为G107以西的平原新区黄河滩区，约58km²。涉及桥北乡大张庄、杨庄等十四个行政村，现状人口约2.6万人。**
- The scope of the first phase of the project is the Yellow River floodplain area in the Pingyuan New District west of G107, with an area of approximately 58km². It involves fourteen administrative villages including Dazhangzhuang and Yangzhuang in Qiaobei Township, with a current population of approximately 26000 people.
- **工程建设内容包括高滩建设工程、灌溉水系连通工程。**
- The construction content of the project includes old floodplain construction and irrigation water system connection.

- **高滩建设工程：解决桥北乡群众的防洪安全和安居问题。西至阿尔泰山路，东至G107。高滩东西长2.73km，南北宽800m，大致呈梯形，面积2.13km²，可安置群众1.5万人。**
- **灌溉水系连通工程：满足高效节水灌溉需求，兼顾提升滩内生态、文旅等产业整体品质。通过修建沉沙池、蓄水池，并对107国道以西灌区范围内的干支渠进行改建或恢复，形成“三横四纵多点”的水系连通总体布局。**

3.1 平原新区试点一期工程 Phase I of Pilot Project in Pingyuan New District

- **工程静态总投资294433.37万元。其中：工程部分静态总投资206477.80万元，建设征地移民补偿投资76070.52万元，环境保护工程投资1953.93万元，水土保持工程投资9931.12万元。**
- **经济内部收益率为9.63%，大于社会折现率8%； 效益费用比为1.07，大于1；经济净现值18930.34万元。**
- The total static investment of the project is 2944333700 yuan. Among them, the total static investment for the engineering worlks is 2064.778 million yuan, the compensation investment for land acquisition and resettlement for construction is 760.7052 million yuan, the investment for environmental protection worksis 19.5393 million yuan, and the investment for soil and water conservation works is 99.3112 million yuan.
- The economic internal rate of return is 9.63%, higher than the social discount rate of 8%; the cost-benefit ratio is 1.07, greater than 1; the economic net present value is 189.3034 million yuan.

经济效益 Economic Benefits

- **防洪效益**：受益区人口1.5万人，人均家庭财产价值27814元。经估算，多年平均防洪效益为2270万元。
- **堤河治理效益**：通过实施高滩淤筑工程，有效解决了堤河问题，采用替代法进行估算，项目区堤河治理需土方575万m^3，按照45元/m3的单价进行考虑，可带来的堤河治理效益为25875万元。
- **灌溉效益**：增加灌溉面积0.3万亩，按照每亩增产500元进行估算，平均每年可带来的灌溉效益是150万元。
- **土地效益**：增加耕地面积0.3万亩，按照每亩20万元的交易价格，可产生6亿元指标交易费；另外，高滩建设后，激活了土地价值，按照260万/亩（新乡平原示范区2018年出让价格）进行估算，激活土地价值24.57亿元。
- **旅游效益**：接待游客63.23万人次，对标郑州黄河风景区，年旅游收入3793.8万元。

社会效益 Social Benefits

- 优化农业、生活、生产空间；
- 助力资源整合、盘活村庄闲置资产；
- 促进项目辐射区域劳动力就业。

生态效益 Ecological Benefits

- 一是可通过高标准基本农田建设，减少对土地资源的污染；
- 二是增加了水域面积，一定程度上能够推进区域气候的良性循环；
- 三是重塑滩区地貌，恢复自然河流健康的断面形态。

3.2 开封滩区试点 Kaifeng Floodplain Pilot Project

黄河开封段是豆腐腰河段，历史上决口改道频繁，现在游荡性河势尚未得到完全控制。

开封黄河历史文化遗存丰富，是华夏文明都城与大河、人河关系最紧密的代表。

开封滩区是探索生态保护修复、黄河长治久安、城乡融合发展、乡村振兴的重要实践区！

The Kaifeng section of the Yellow River is a vulnerable section, which has been breached frequently in history.

Kaifeng Yellow River is rich in historical and cultural relics. It is the representative of the closest relationship between the capital of ancient China, the river and the people.

Kaifeng floodplain area is an important practice zone for exploring ecological conservation and restoration, long-term stability of the Yellow River, integrated development of urban and rural areas, and rural revitalization

3.2 开封滩区试点 Kaifeng Floodplain Pilot Project

- **在祥符区王庵控导处新建移动泵站一座，新建沉砂池1处、调蓄池7处。在兰考县改造提升现有泵站，新建沉砂池1处、调蓄池3处。规划新增渠系面积共211hm²，其中调蓄池、沉砂池面积196hm²。**
- **开展兰考县二级悬河治理，对排洪河槽线至堤防之间的滩区进行淤填平整。**
- In Xiangfu District, a new mobile pumping station, 1 sedimentation basin and 7 storage ponds were built. In Lankao County, the existing pumping station has been upgraded, and 1 sedimentation basin and 3 storage ponds have been built. A total of 211hm² is planned to be added to the canal system, of which the storage pond sedimentation basin are 196hm².
- To carry out the treatment of secondary suspension river in Lankao County, the floodplain area between the flood channel line and the levee should be filled and levelled because the cross section of the floodplain area within the reach of the second reach has a large cross section and the floodplain area outside the floodplain and between the levee (except the levee) has relatively small cross section silting characteristics.

3.2 开封滩区试点 Kaifeng Floodplain Pilot Project

以水定产，调整农业种植结构，形成了以农为主、科技创新与文旅赋能的高质量发展特色产业体系，为滩区脱贫攻坚和乡村振兴注入发展动力。其中，推广油莎豆种植，面积1746公顷。

Based on water supply, considering the nature of cultivated land and the economic value of crops, the agricultural planting structure has been adjusted to promote the cultivation of tiger nut bean. The total area is 1,746 hectares, and a high-quality industrial system with agriculture as the main feature and enabled by scientific and technological innovation and cultural tourism has been formed, being impetus to poverty alleviation and rural revitalization in the floodplain area.

生态修复体验

特色蔬菜种植区

研学教育

序号	作物种植区	主要分布区域	规模（公顷）	占比（%）
1	粮油作物种植	祥符区、兰考县	11723	53.7
2	油料种植区（油莎豆）	祥符区、龙亭区	1746	8.0
3	果蔬种植区	祥符区	1310	6.0
4	中药材种植区	祥符区	2423	11.1
5	饲草种植区	祥符区、兰考县	2205	10.1
6	花卉种植区	龙亭区、一体化示范区	2423	11.1
	合计		21830	100

油莎豆是科技部主推的大豆替代油料作物，能够破解中国大豆进口困境，是落实黄河战略农业产业发展和保障粮食安全的主要作物选择，黄河滩区地处北方、土壤沙性，优良自然禀赋非常适宜油莎豆种植，同时油莎豆地上部分可做饲料，地下根茎可榨油，能够与动物养殖形成上游产业链，也给作为油料作物，服务乡村振兴。

油莎豆种植区

药材种植区

饲草种植区

3.2 开封滩区试点 Kaifeng Floodplain Pilot Project

工程包括水资源节约集约利用、产业高质量发展、二级悬河治理和文化保护弘扬传承，总投资60.66亿元。

The project includes the conservation and intensive use of water resources, high-quality industrial development, secondary suspension river management and cultural protection, with a total investment of 6.066 billion yuan.

序号	项目名称	分期投资		合计（亿元）
		近期（2020-2025）投资（亿元）	远期（2025-2035）投资（亿元）	
1	一、水资源节约集约利用	8.6		8.6
2	二、产业高质量发展	15.68	13.61	29.29
3	三、二级悬河治理	12.27		12.27
4	四、文化保护弘扬传承	10.5		10.5
合计		47.05	13.61	60.66

总收益398.5亿元。

产业经济收益：到2035年，形成31万亩优质种植农田，预估年产量3.9亿千克，年收益约8.1亿元，累计收入121.5亿元。

文旅经济收益：推算开封黄河滩区旅游人数（2035年）为537.1万人次，到2035年文旅运营累计收入（15年）约277亿元。

The total revenue is 39.85 billion yuan.

Industrial economic benefits: It is preliminarily estimated that by 2035, 310,000 mu of high-quality planted farmland will be formed in Kaifeng floodplain area, with an estimated annual output of 390 million kg and annual income of about 810 million yuan, and a cumulative income of 12.15 billion yuan by 2035. Cultural and tourism economic benefits: Combining the number of tourists and tourism income in Kaifeng City, it is estimated that the number of tourists in the Yellow River floodplain area in 2035 will be 5.371 million, and the accumulated cultural and tourism operation income in 2035 (15 years) will be about 27.7 billion yuan.

3.3 中国水道试验城（黄河实验室） China Waterway Experimental City（Yellow River Laboratory ）

- **中国水道试验城以黄河实验室为依托；**
- **黄河实验室建设以“国际一流、国内领先、中原文化、黄河特色”为目标；**
- **围绕黄河实验室重点研究方向，建设中国水道足尺试验基地，打造国际一流的开放共享试验平台；**
- **着力打造黄河流域生态保护与高质量发展学术高地，**
- **推动黄河实验室进入国家实验室行列和成为国家战略科技力量，**
- **对支撑黄河流域生态保护和高质量发展、长江经济带发展等一系列重大国家战略实施意义重大。**

- The China Waterway Experimental City is based on the Yellow River Laboratory;
- The construction of the Yellow River Laboratory aims to be "internationally first-class, domestically leading, with Central Plains culture and characteristics of the Yellow River";
- Build a full-scale testing base for Chinese waterways around the key research direction of the Yellow River Laboratory, and create an internationally first-class open and shared testing platform;
- Efforts will be made to build an academic highland for ecological protection and high-quality development in the Yellow River Basin;
- Promote the Yellow River Laboratory to join the ranks of national laboratories and become a national strategic scientific and technological force;
- It is of great significance for the implementation of a series of major national strategies to support ecological protection and high-quality development in the Yellow River Basin, as well as the development of the Yangtze River Economic Belt.

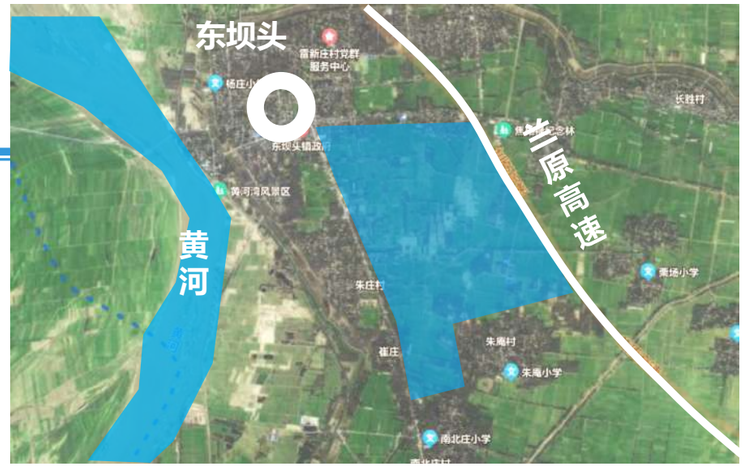
项目选址

Project site selection

兰考东坝头镇

Dongbatou Town, Lankao

优势：
政治地位独特，地理位置适中可充分利用现有引水渠道，减少工程投资退水便利，利于同周边湖体形成调蓄体系可与选址周边上合田园公园形成联动体系泥沙沉淀后可综合利用，产生经济效益



平原新区盐店庄、老孟庄

Yandianzhuang and Laomengzhuang in Pingyuan New District

优势：
盐店庄现状以耕地为主，其余为设施农用地、园林地，场区20年一遇洪水无淹没风险。场区试验引水条件较好。
老孟庄土地性质为村民宅基地（农村集体建设用地），目前村民已搬迁完毕。场区20年一遇洪水无淹没风险。场区周边配套及交通条件较好。

3.3 中国水道试验城（黄河实验室） China Waterway Experimental City（Yellow River Laboratory ）

以水为媒，构建水道试验新高地。以水网为本底依托，紧扣试验核心，打造世界上最大的水道试验城。

Using water as medium to build a new site for waterway testing.

以博为媒，带动区域产业集群全面发展。

实现科学试验、科普展览、文旅娱乐、培训教育的集群化、规模化、现代化发展，实现区域协同建设。

Drive the comprehensive development of regional industrial clusters.

项目			单位	数量
总用地面积			亩	9000
其中	建设用地面积		亩	6000
	非建设用地面积		亩	3000
	其中	水域	亩	1200
		农林用地	亩	1800

3.3 中国水道试验城（黄河实验室） China Waterway Experimental City（Yellow River Laboratory ）

五大水利试验分区
Five major water experimental zones

1 流域生态环境保护试验场
Watershed Ecological Environment Protection Test Site

黄土高原生态治理保护

河湖环境保护与修复

2 长治久安试验场
Sustainability Experimental Site

水库群联合调控

黄河下游河道与滩区综合提升治理

泥沙资源化利用

溃坝灾害防治、堤防监测预警、堤坝防冲加固

3. 水资源节约集约利用试验场
Experimental Site for Conservation and Intensive Utilization of Water Resources

水循环演变

深度节水控水

跨流域调水

非常规水源利用

4. 流域高质量发展试验场
Experimental Site for High Quality Development of Watershed

流域水沙碳能多要素耦合机制

流域水沙碳能多过程协同模拟

能源产业结构优化调控

5. 数字孪生试验场
Digital twin testing

智能感知监测技术与装备

孪生黄河数据底座

可视化仿真

人工智能识别

水利业务“四预” 应用

五大水利试验区分布在水网体系四周，形成水道试验城核心功能区划，并依托试验功能延展出水利科普、水利科技、文旅产业，面向九洲客源，构建全域体验集群。

3.3 中国水道试验城（黄河实验室） China Waterway Experimental City（Yellow River Laboratory ）

总投资约100亿，十年期分期投资。

The total investment is about 10 billion yuan, with a 10-year installment investment.

一期投资10亿，为财政扶持资金，用于水利试验场建设、园区水网建设；二期投资90亿，为财政扶持资金及企业资本投资，用于园区及延伸产业建设。

初期收益较少，主要为实验功能，中期为科研成果转化与博览文旅。十年内可撬动社会资金约为：300亿。

试验城项目效益

水利博览

试验场景展示、微缩模型展览、实景演艺、政府补贴、文创收益

文旅消费

在园区内参观展览、购物餐饮、度假休闲

会展经济

通过学术会议、成果发布期间来发展会展经济、带动区域发展

科技成果转化

科技成果初期便会吸引社会资本进入，后期可通过孵化平台，孵化小型初创企业

场地使用费用

后期实验场可通过租赁给其他实验室来进行相关实验以及户外场地短期出租

土地出让

试验城带动周边经济发展，提质增效，后续可作为商业、旅游开发

3.4

河南黄河下游及滩区生态保护修复示范工程实施方案

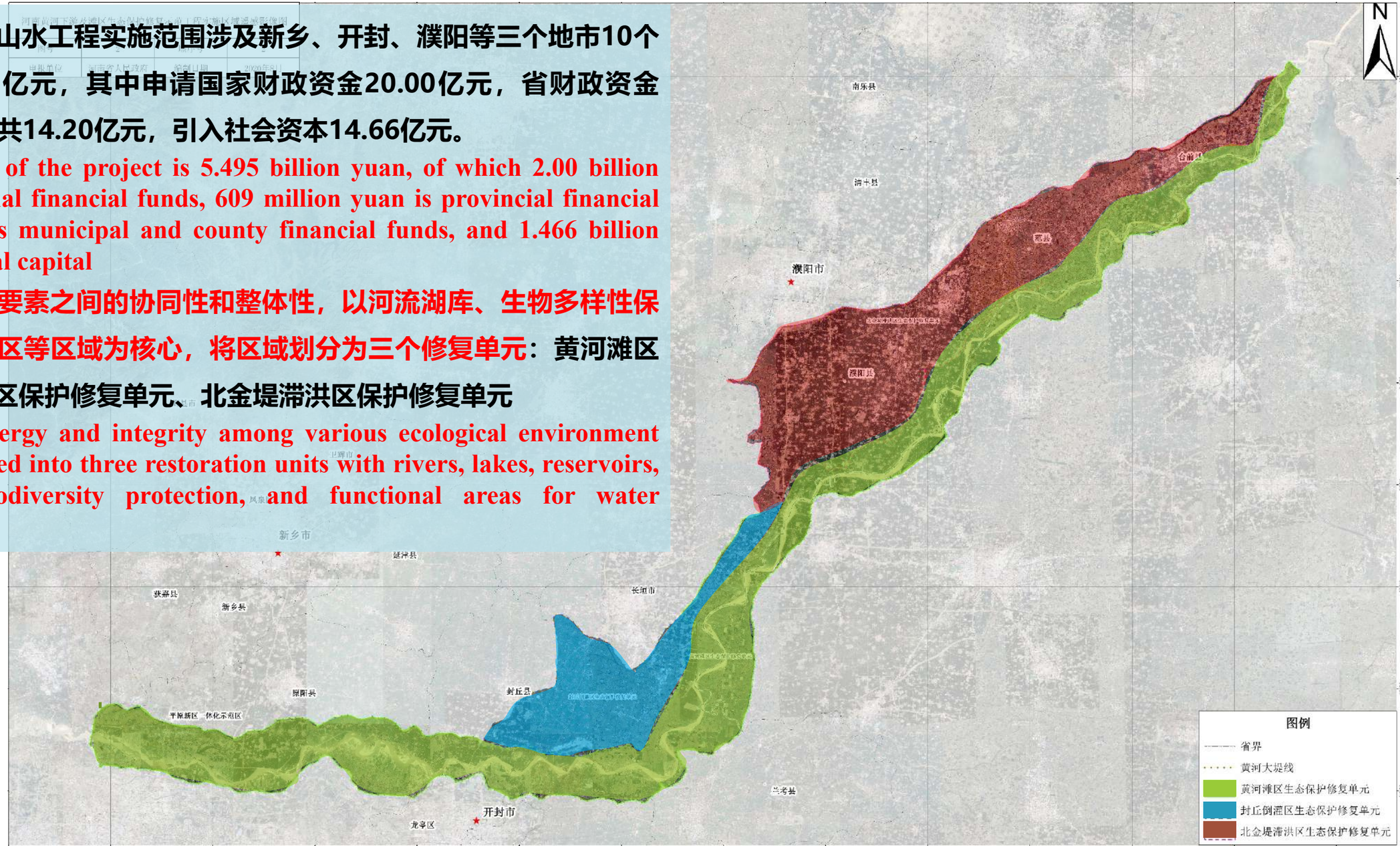
Implementation Plan for Ecological Conservation and Restoration Demonstration Project in the Lower Yellow River and Floodplain Areas of Henan Province

河南黄河下游及滩区山水工程实施范围涉及新乡、开封、濮阳等三个地市10个县区。工程总投资54.95亿元，其中申请国家财政资金20.00亿元，省财政资金6.09亿元，市县财政资金共14.20亿元，引入社会资本14.66亿元。

The total investment of the project is 5.495 billion yuan, of which 2.00 billion yuan is applied for national financial funds, 609 million yuan is provincial financial funds, 1.42 billion yuan is municipal and county financial funds, and 1.466 billion yuan is introduced as social capital

充分考虑各生态环境要素之间的协同性和整体性，以河流湖库、生物多样性保护重要区和水源涵养功能区等区域为核心，将区域划分为三个修复单元：黄河滩区保护修复单元、封丘倒灌区保护修复单元、北金堤滞洪区保护修复单元

Fully considering the synergy and integrity among various ecological environment elements, the area is divided into three restoration units with rivers, lakes, reservoirs, important areas for biodiversity protection, and functional areas for water conservation as the core.



3.4

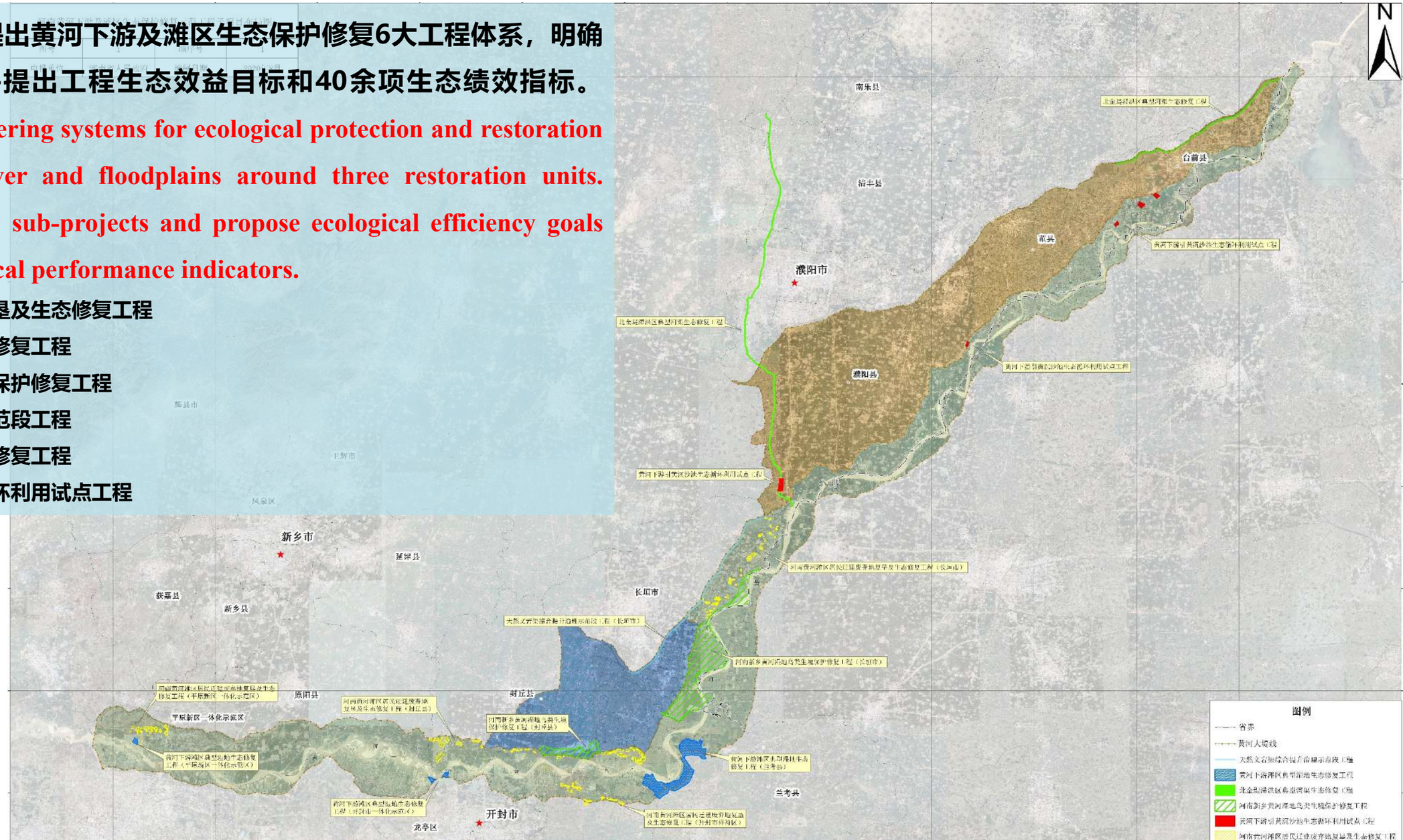
河南黄河下游及滩区生态保护修复示范工程实施方案

Implementation Plan for Ecological Conservation and Restoration Demonstration Project in the Lower Yellow River and Floodplain Areas of Henan Province

围绕三个修复单元提出黄河下游及滩区生态保护修复6大工程体系，明确22个子项目工程内容并提出工程生态效益目标和40余项生态绩效指标。

Propose six major engineering systems for ecological protection and restoration in the lower Yellow River and floodplains around three restoration units. Clarify the content of 22 sub-projects and propose ecological efficiency goals and more than 40 ecological performance indicators.

- **黄河滩区居民迁建废弃地复垦及生态修复工程**
- **黄河下游滩区典型湿地生态修复工程**
- **河南新乡黄河湿地鸟类生境保护修复工程**
- **天然文岩渠综合提升治理示范段工程**
- **北金堤滞洪区典型河渠生态修复工程**
- **黄河下游引黄沉沙池生态循环利用试点工程**



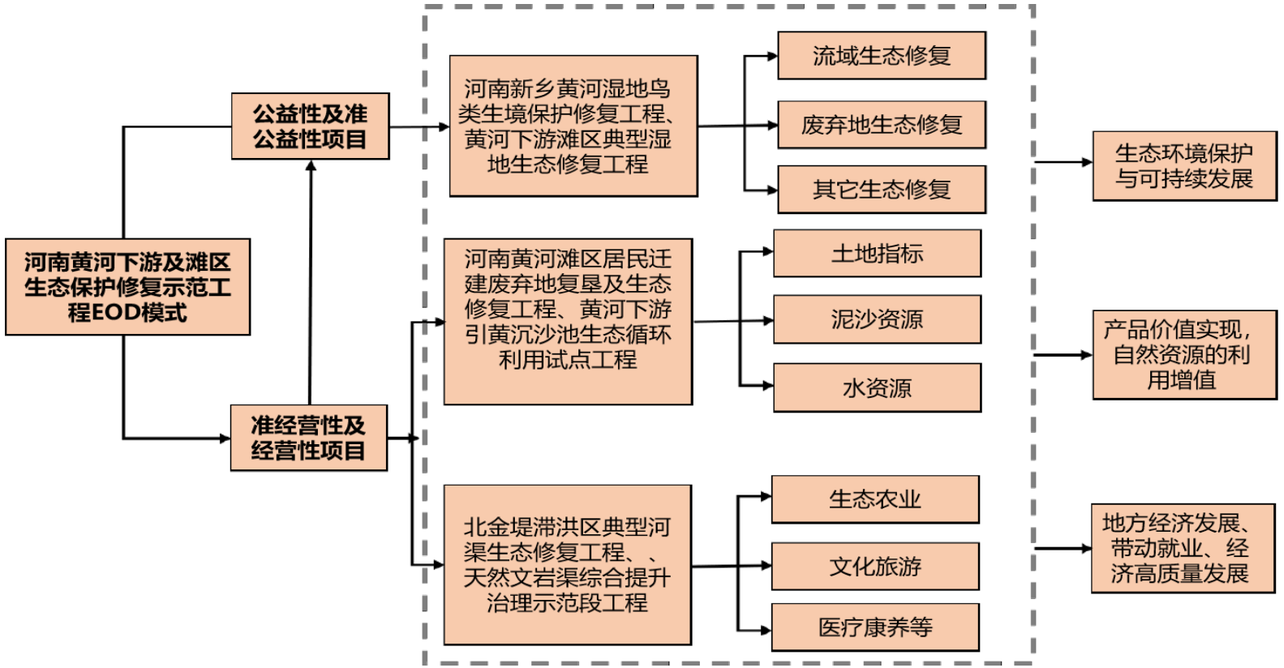
3.4

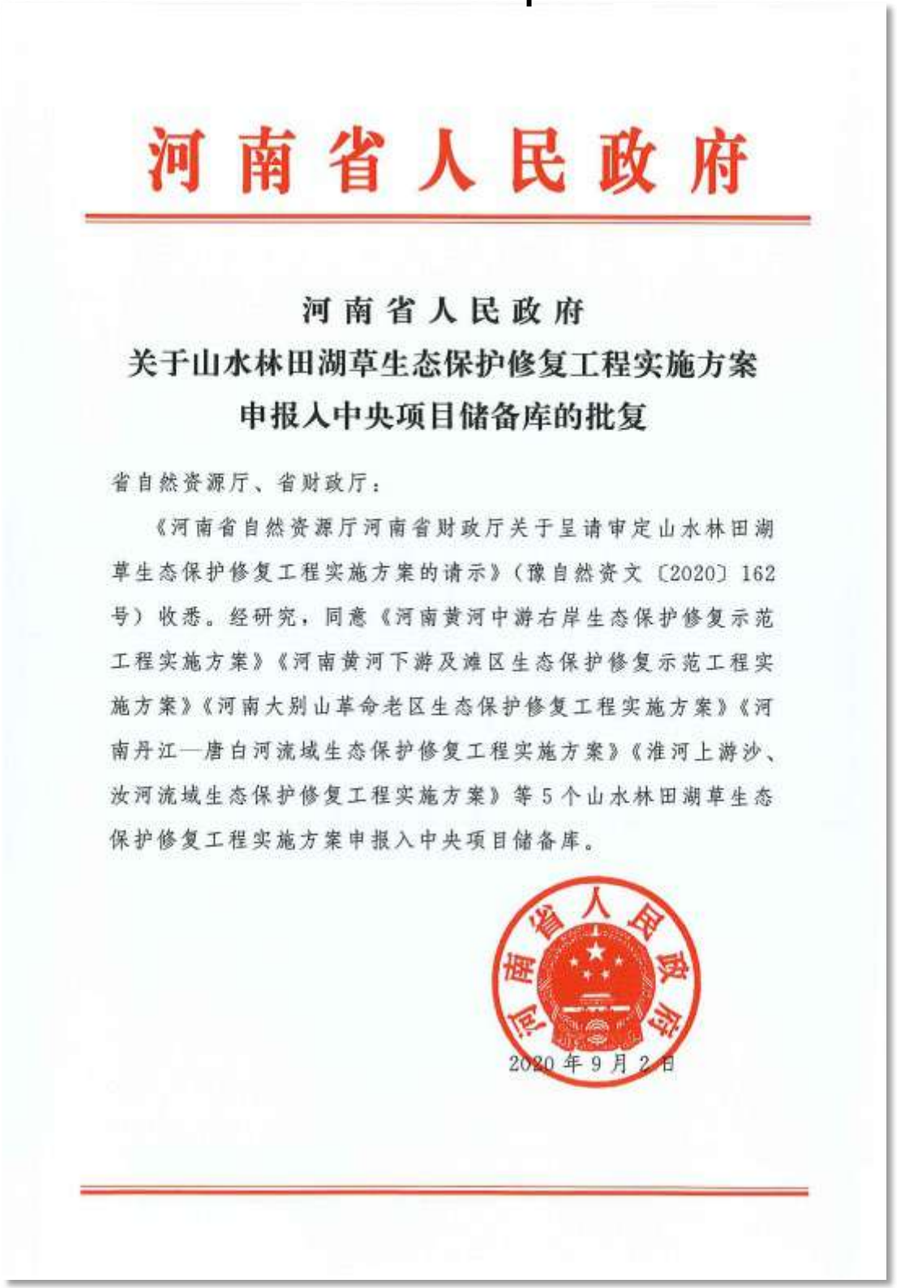
河南黄河下游及滩区生态保护修复示范工程实施方案

Implementation Plan for Ecological Conservation and Restoration Demonstration Project in the Lower Yellow River and Floodplain Areas of Henan Province

河南黄河下游及滩区山水工程紧紧围绕黄河下游及滩区生态保护与社会发展的目标与重大需求，工程的实施有利于构建黄淮海平原生态安全屏障，保障区域生态安全，进一步缓解人地矛盾，极大的改善周边居民的生产条件，加快小康社会建设进程。**工程基于EOD模式,通过生态环境治理与资源、产业开发项目有效融合，产生良好经济效益，有力的推动区域生态产品价值实现和生态修复产业高质量发展。**

该工程方案于2020年8月通过河南省自然资源厅、财政厅的组织的验收，受到业主和专家的一致好评。2021年9月，工程方案通过河南省人民政府批复，工程目前已经列入山水项目储备库。In September 2021, the engineering plan was approved by the People's Government of Henan Province, and the project has now been included in the key project reserve.





河南省人民政府

河南省人民政府
关于山水林田湖草生态保护修复工程实施方案
申报入中央项目储备库的批复

省自然资源厅、省财政厅：

《河南省自然资源厅河南省财政厅关于呈请审定山水林田湖草生态保护修复工程实施方案的请示》（豫自然资文〔2020〕162号）收悉。经研究，同意《河南黄河中游右岸生态保护修复示范工程实施方案》《河南黄河下游及滩区生态保护修复示范工程实施方案》《河南大别山革命老区生态保护修复工程实施方案》《河南丹江—唐白河流域生态保护修复工程实施方案》《淮河上游沙、汝河流域生态保护修复工程实施方案》等5个山水林田湖草生态保护修复工程实施方案申报入中央项目储备库。

河南省人民政府

2020年9月2日

共同抓好大保护　协同推进大治理
让黄河成为造福人民的幸福河

Make Yellow River the “Happiness River of the People” through Collaborative Protection and Management

黄河勘测规划设计研究院有限公司
Yellow River Engineering Consulting Co., Ltd.