Addendum Initial Environmental Examination

附录 初始环境评估

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People's Republic of China: Yellow River Basin Green Farmland and High-Quality Agriculture Development Project

中华人民共和国：黄河流域绿色农田建设和农业高质量发展项目

Yanshi District, Xiangfu District and Wuzhi County Non-core Subprojects, Henan Province

河南省偃师区、祥符区、武陟县非核心子项目

Prepared by the Ministry of Agriculture and Rural Affairs of the People's Republic of China for the Asian Development Bank (ADB). This is a supplement to the initial environmental examination originally posted in Septmber 2024 available on https://www.adb.org/projects/documents/prc54027-002-iee-10
由中华人民共和国农业农村部为亚洲开发银行（ADB）编制。本文件是对最初环境评估的补充，该环境评估最初发布于 2024 年 9 月，可在 https://www.adb.org/projects/documents/prc54027-002-iee-10 查阅。

Initial Environmental Examination

初始环境评估

UPDATED
更新

Project Number: 54027-002
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October 2025
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CURRENCY EQUIVALENTS
货币等值
(As of 18 July 2024)
（截至 2024 年 7 月 18 日）

Currency unit		Chinese Yuan (CNY)
货币单位		人民币（CNY）
CNY1.00	=	$0.1378
$1.00	=	CNY7.2554

ABBREVIATIONS
缩略语

ADB	-	Asian Development Bank 亚洲开发银行	LIEC	-	loan implementation environmental consultant 贷款执行环境顾问
BOD5	-	5-day biochemical oxygen demand 5 天生化需氧量	LDI	-	local design institute 当地设计院
CNY	-	Chinese yuan 中国元	MARA	-	Ministry of Agriculture and Rural Affairs 农业农村部
COD	-	chemical oxygen demand 化学需氧量	MEE	-	Ministry of Ecology and Environment 生态环境部
COVID-19	-	coronavirus disease 新型冠状病毒	NDRC	-	National Development and Reform Commission 国家发展改革委员会
CPMO	-	county project management office 县项目管理办公室	NPS	-	non-point source 非点源
CRVA	-	climate risk vulnerability assessment 气候风险脆弱性评估	O&M	-	operation and maintenance 操作和维护
CSC	-	construction supervision company 工程监理公司	WHO	-	World Health Organization 世界卫生组织
DEIA	-	domestic EIA 国内环评	PCC	-	public complaint center 公众投诉中心
EEB	-	ecology and environment bureau 生态环境局	PM	-	particulate matter 可吸入颗粒物
EHS	-	environment, health, and safety 环境、健康和安全	PMO	-	project management office 项目管理办公室
EIA	-	environmental impact assessment 环境影响评估	PPMO	-	provincial project management office 省项目管理办公室
EMA	-	environmental monitoring agency 环境监测机构	PIU	-	project implementation unit 项目实施单位
EMP	-	environmental management plan 环境管理计划	PPE	-	personal protective equipment 个人防护装备

FSR	-	feasibility study report 可行性研究报告	PRC	-	People's Republic of China 中华人民共和国
FYP	-	five-year plan 五年计划	SPS	-	Safeguard Policy Statement 保障政策声明
GDP	-	gross domestic product 国内生产总值	TEIA	-	tabular environmental impact assessment 环境影响评价表
GHG	-	greenhouse gas 温室气体	TrTA	-	transaction technical assistance 交易技术援助
GRM	-	grievance redress mechanism 申诉补偿机制	TSP	-	total suspended particulate 总悬浮颗粒物
GWP	-	Global warming potential 全球变暖潜势	WBG	-	World Bank Group 世界银行集团
IEE	-	initial environmental examination 初始环境评估	YREC	-	Yellow River ecological corridor 黄河生态廊道
L_{Aeq}	-	equivalent continuous A-weighted sound pressure level 等效连续 A 声级			

WEIGHTS AND MEASURES
度量衡

℃	-	degree centigrade 摄氏度	m^3	-	cubic meter 立方米
dB	-	decibel 分贝	m^3/a	-	cubic meter per annum 立方米/年
kg/d	-	kilogram per day 公斤每天	m^3/d	-	cubic meter per day 毫克/天
km	-	kilometer 公里	mg/l	-	milligram per liter 毫克/升
km^2		square kilometer 平方公里	mg/ m^3		milligram per cubic meter 毫克/立方米
kW	-	kilowatt 千瓦	t	-	metric ton 公吨
m	-	meter 米	t/a	-	ton per annum 吨/每年
mu	-	1/15 hectare 1/15 公顷	t/d	-	ton per day 吨/每天
m^2	-	square meter 平方米	time/h	-	time per hour 时间/小时

NOTES
备注

In this report, "$" refers to United States dollars.
在本报告中，“$”指美元。

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Table of Contents

SUMMARY of UPDATEs

更新摘要

In the preliminary design of non-core subprojects, the overall construction content of the project has not changed, the project area boundaries remain unchanged, only the quantities of certain construction contents have increased or decreased, and the overall construction scale, technical routes, project types, and core objectives have not undergone significant changes. The adjusted construction content does not introduce new sources of pollution or environmental risks, does not alter the existing pollution control measures, and the expected environmental impact shows no significant change. The domestic environmental impact report form for non-core sub-projects in Henan Province was approved by the Ministry of Ecology and Environment in 2023 and is still valid at this stage.
非核心子项目初步设计中项目总的建设内容没有变化，未改变项目区范围，只是个别建设内容的工程量有所增加或减少，总体建设规模、技术路线、工程类型及核心目标未发生重大变化。调整后的建设内容未新增污染源或环境风险，未改变原有污染控制措施，预期的环境影响无显著变化。包含河南省非核心子项目的国内环境影响报告表于 2023 年由生态环境部批复，现阶段仍有效。

The Xiangfu sub-project Village underwent administrative division adjustments, changing from Duliang Township to Duliang Town, and this has been updated in the IEE. It should be noted that the organic fertilizer plant project in Wuzhi County has undergone a site relocation. The new site is still within the project area, the overall environmental impact assessment of this project does not need to be updated，only a separate environmental impact assessment is required for the new site. The Environmental Impact Assessment (EIA) report for the new site has been approved by the Jiaozuo Municipal Bureau of Ecology and Environment (Jiao Huan Shen Wu [2024] No. 37). The IEE needs to be updated based on the domestic EIA of the new site.
祥符子项目项目村进行了行政区划调整，由杜良乡改为杜良镇，本次在 IEE 中进行了更新。需要关注的是武陟县子项目有机肥厂进行了厂址变更，新厂址仍在项目区范围内，因此本项目总的环评无需更新，仅需对新厂址进行单独的环境影响评估。该新厂址的环境影响评价报告表已通过焦作市生态环境局的批复（焦环审武〔2024〕37 号），需根据新厂址的国内环评对本 IEE 进行更新。

According to the environmental monitoring plan required in the EMP, the specific monitoring points will be adjusted according to the new construction content and project quantity, and the adjusted project quantity will be elaborated in the environmental monitoring report. The external environmental monitoring agency will also monitor the sensitive points according to the preliminary design, and the monitoring results will be reflected in the environmental monitoring report.
根据 EMP 里要求的环境监测计划，具体的监测点位将根据新的建设内容、工程数量进行调整，并在环境监测报告中详细阐述调整后的工程数量。环境外部监测机构也将根据初步设计对敏感点进行监测，并将监测结果体现在环境监测报告中。

The EXECUTIVE SUMMARY mainly updates the quantity of activities for non-core sub-projects based on the preliminary design. No updates in section I.
执行摘要中主要根据初步设计对非核心子项目活动内容的数量进行了更新。非核心子项目环境评估是基于当地生态环境局发布的县（区）域信息及数据，所以本章节中子项目环境基线、预期影响及缓解措施不用更新。第一章没有更新。

Section II describes the basic situation and activities of non-core sub-projects in Henan Province. This chapter mainly includes three updates: The project village names for the Xiangfu sub-project have been updated.The number of activities in sub-projects has been updated based on the preliminary design. The location of the organic fertilizer plant in the Wuzhi sub-project has changed,

and the production process of the organic fertilizer plant in this chapter has been updated according to the domestic EIA of the new plant site. No updates for due diligence of the associated/existing facilities.
第二章是对河南省非核心子项目基本情况、活动内容等进行了描述。此次本章节主要进行了三个内容的更新：对祥符子项目的项目村名称进行了更新。根据初设对子项目活动内容的数量进行了更新。武陟子项目有机肥厂厂址产生了变化，根据新厂址的国内环评对本章节中有机肥厂的生产工艺流程进行了更新。对相关/现有设施的尽职调查无需更新。

Section III updates the environmental baseline data and the satellite images of the new site of the Wuzhi sub-project organic fertilizer plant based on the domestic EIA .
第三章根据武陟子项目有机肥厂新厂址国内环评，更新了环境基线数据，更新了有机肥厂卫星图。

Section IV has been updated based on the preliminary design, including the following adjustments: the village where the organic fertilizer factory is located after the relocation, and the distance between the factory's new site and this village; the land leveling area and earthwork volume of the Yanshizi Project during the construction phase; and the implementation area of the straw return-to-field project will only be carried out in Wuzhi County. The impact description section of the Wuzhizi sub-project organic fertilizer plant has been updated based on the domestic EIA of the new factory site. No updates in section V.
第四章根据初设更新了：改址后有机肥厂所在村，及有机肥厂新址与村庄的距离；施工阶段偃师子项目土地平整面积及土方量；更新了实施秸秆还田工程的项目区，初设后仅武陟县实施。根据新厂址的国内环评更新了武陟子项目有机肥厂的影响描述段落。第五章无更新。

Section VI has added information and photos regarding the public announcement of the new address of the organic fertilizer plant, and updated the public consultation situation and interview photos for non-core sub-projects during the preliminary design phase. No updates in section VII, section VIII and IX.
第六章增加了有机肥厂厂址变更公示情况和公示照片，更新了非核心子项目在初设期间的公众咨询情况和访谈照片。第七、八、九章无更新。

Attachment 1 has been updated regarding the recruitment and payment of external environmental monitoring agencies. Since the recruit environmental monitoring agency in Henan Province are uniformly tendered by the PPMO, and the CPMOs separately sign contracts with the monitoring agencies, with monitoring fees also paid by the CPMOs, the relevant descriptions in this EMP have been updated. In addition, the total amount of cost estimates for the EMP implementation has been corrected. Regarding the last subsection of attachment 2, loan implementation environmental consultant- Provincial made corrections.
对附件 1 中的外部环境监测机构的招聘与支付进行了更新，因河南省外部环境监测机构是由省项目办进行统一招标、县（区）项目办分别与监测机构签订合同的，监测费用也由县（区）项目办支付，所以对本环境管理计划中的相关表述进行了更新。另，对环境管理计划实施成本估算的汇总金额进行了纠正。对附件 2 最后一节，省级贷款实施环境顾问进行了纠正。

EXECUTIVE SUMMARY

执行摘要

This section mainly updates the summary of activities under subprojects of Yanshi, Xiangfu and Wuzhi based on the preliminary design. The environmental assessment of non-core sub-projects is based on county (district) information and data released by the local ecological and environmental bureau, so the sub-projects environmental baseline, expected impacts and mitigation measures do not need to be updated.
本章节主要根据初步设计对非核心子项目活动内容的数量进行了更新。非核心子项目环境评估是基于当地生态环境局发布的县（区）域信息及数据，所以本章节中子项目环境基线、预期影响及缓解措施不用更新。

A. Introduction 介绍

This initial environmental examination (IEE) covers three non-core subprojects in Henan Province, namely the Yanshi District, Xiangfu District and Wuzhi County subprojects as part of the Yellow River Basin Green Farmland and High-Quality Agricultural Development Project (also referred herein as the Project). The Project will strengthen and support the sustainable green agricultural production system initiative in seven provinces in the Yellow River Basin, namely: Ningxia Hui Autonomous Region, Qinghai Province, Gansu Province, Shaanxi Province, Shanxi Province, Henan Province and Shandong Province. The overall Project has three outputs: (i) institutional, technical and management capacity and coordination strengthened; (ii) green and climate resilient agricultural production bases developed; and (iii) agricultural value chains strengthened. The executing agency of the project is the Ministry of Agriculture and Rural Affairs (MARA).
本次初始环境评估（IEE）涵盖了河南省三个非核心子项目，即黄河流域绿色农田建设和农业高质量发展项目（以下简称“项目”）的偃师区、祥符区和武陟县子项目。该项目将加强和支持黄河流域七个省份的可持续绿色农业生产体系倡议，即宁夏回族自治区、青海省、甘肃省、陕西省、山西省、河南省和山东省。整个项目有三个产出：（一）加强机构、技术、管理能力和协调；（二）发展绿色和气候适应性强的农业生产基地；（三）农业价值链得到加强。该项目的执行机构是农业和农村事务部（MARA）。

The Project is supported by a sector loan from the Asian Development Bank (ADB). A total of 24 subprojects, one in each of 24 counties within the seven project provinces. In accordance with ADB's Safeguard Policy Statement (SPS, 2009), projects under a sector lending modality require the preparation of (i) environmental assessments for a selected number of core subprojects, and (ii) an environmental assessment and review framework (EARF) to guide the environmental impact assessment for the noncore subprojects.
该项目得到了亚洲开发银行行业贷款的支持。共有 24 个子项目，7 个项目省的 24 个县各有一个。根据亚洲开发银行的保障政策声明（SPS，2009），行业贷款模式下的项目需要准备 (i)选定数量的核心子项目的环境评估，以及 (ii)环境评估和审查框架（EARF），以指导非核心子项目的环境影响评估。

In compliance, this IEE for the Yanshi, Xiangfu and Wuzhi subprojects in Henan Province has been prepared based a domestic feasibility study report (FSR), site investigations and feedback from stakeholder discussions, and information drawn from the domestic environmental impact assessment prepared for the Yellow River Basin Green Farmland and High-Quality Agricultural Development Project. The domestic EIA has been approved by the Ministry of Ecology and Environment in June 2023.

根据要求，河南省偃师区、祥符区和武陟县子项目的本初始环境评估是根据国内可行性研究报告（FSR）、现场调查和利益相关者讨论的反馈以及为黄河流域绿色农田建设和农业高质量发展项目编制的国内环境影响评价中的信息编制的。国内环评已于 2023 年 6 月获得生态环境部批复。

B. Subproject Description 子项目说明

The Yanshi, Xiangfu and Wuzhi subprojects involve financing of green farmland through various interventions, e.g., implementing water saving irrigation techniques, establishing an ecological drainage system, promoting formula fertilizer and organic fertilizer, integrated pest management. These subprojects are envisaged to contribute to non-point source (NPS) pollution control and water quality improvement of Yellow River.
偃师子项目、祥符子项目和武陟子项目涉及通过各种干预措施为绿色农田融资，如实施节水灌溉技术、建立生态排水系统、推广配方肥和有机肥、病虫害综合防治。这些子项目旨在为黄河非点源污染控制和水质改善做出贡献。

According to the preliminary design, the number of activities in non-core subprojects has changed as follows: **Wuzhi** subprojects maintenance/rehabilitation of water conveyance channel has changed from 101.4 km to 78.45 km; the number of water measuring facilities has changed from 50 sets to 43 sets; the number of gate has changed from 125 to 143; the number of pipe culvert has changed from 32 to 83; the maintenance/rehabilitation of ecological drainage channel has changed from 29.71 km to 23.64 km; the production road has changed from 5.25 km to 10.88 km; the number of farmland project signs has changed from 3 to 1; straw returning civil works have been canceled, and the number of straw returning equipment has changed from 20 sets to 6 sets; the civil works for organic fertilizer processing has changed from 3620 square m^2 to 3886.64 m^2; and the facilities and equipment of organic fertilizer processing has changed from 32 sets to 36 sest. **Xiangfu** subprojects canceled 8 grit chamber; maintenance/rehabilitation of water conveyance channel has changed from 56.72 km to 36.62 km; the number of pipe culvert has changed from 8 to 26; the maintenance/rehabilitation of ecological drainage channel has changed from 80.6 km to 25.14 km; the production road has changed from 4.2 km to 32.07 km; distribution line engineering (low voltage-0.4kV) from 3.6 km to 3.51 km; the number of farmland project signs has changed from 7 items to 1; increase the construction of newly construction of farmland shelter forest by 9.42 km. **Yanshi** subprojects, the area of land levelling decreased from 250 mu to 197.4 mu, the area irrigated by low-pressure pipelines increased from 10,000 mu to 13,300 mu, the sprinkler irrigation area decreased from 8,200 mu to 6,700 mu, the micro-irrigation (including drip irrigation) area of 1,800 mu was canceled, the production road has changed from 19.64 km to 18.49 km; increase the construction of distribution line engineering (low voltage-0.4kV) by 65.6 km; 50 km of distribution line engineering (high voltage-10kV) were canceled; 50 power distribution equipments were canceled; the number of farmland project signs has changed from 30 to 2; the straw returning area of 36,000 mu was canceled; 10 sets of straw returning equipment were canceled, the number of fertigation pumping station increased from 125 to 226; and the number of ntelligent irrigation systems increased from 125 sets to 226 sets.
根据初设，非核心子项目活动内容的数量产生了以下变化：武陟县输水渠道维护/修复从 101.4km 变为 78.45km，量水设施从 50 套变为 43 套，闸从 125 座变为 143 座，管涵从 32 座变为 83 座，生态排水渠维护/修复从 29.71km 变为 23.64km，田间硬化道路工程从 5.25km 变为 10.88km，农田工程标识标牌从 3 个变为 1 个，取消秸秆还田设施，秸秆还田设备从 20 台套变为 6 台套，有机肥加工土建面积从 3620 平方米变为 3886.64 平方米，有机肥加工设备从 32 台套变为 36 台套。祥符区取消 8 座沉砂池，输水渠道维护/修复从 56.72km 变为 36.62km，管涵从 8 座变为 26 座，生态排水渠维护/修复从 80.6km 变为 25.14km，田间硬化道路工程从 4.2km 变为 32.07km，配电线路工程（低压）从 3.6km 变为 3.51km，农田工程标识标牌从 7 个变为 1 个，增加新建农田林网 9.42km。偃师区平整土地从 250mu 变为 197.4mu，低压管道灌溉面积从 10000mu 变为 13300mu，喷灌面积从 8200mu 变为 6700mu，取消微灌（含滴灌）面积 1800mu，田间硬化道路工程 19.64km 变为 18.49km，增加配电线路工程（低压）65.6km，取消配电线路工程（高压）50km，取消配电装置工

程 50 处，农田工程标识标牌从 30 个变为 2 个，取消秸秆还田面积 36000mu，取消秸秆还田设备 10 台套，水肥一体化泵站从 125 处变为 226 处，智能灌溉系统从 125 套变为 226 套。

Table ES-1 summary of activities under subprojects of Yanshi, Xiangfu and Wuzhi
Table ES-1 偃师区、祥符区和武陟县子项目活动内容

SN	Activities 活动	Unit	Non-core Wuzhi	Non-core Xiangfu	Non-core Yanshi
1	**Institutional, technical and management capacity and coordination strengthened** **加强机构、技术和管理能力及协调**				
1.1	**Management staff - training and study tours** **管理者培训与考察**				
	National training and study tour 国内培训与考察	pm	7.5	7.5	7.5
1.2	**Training for new agri-business entities** **新型农业经营主体培训**				
	Training and study tour 培训与考察	pm	10	10	10
1.3	**Climate change mitigation and adaptation technology promotion to farmers** **农民减缓气候变化技术推广**				
a	Publicity and awareness-raising 宣传发动	pm	75	75	75
b	Technology promotion 技术推广	pm	30	30	30
1.4	**Project dissemination** **项目宣传**				
	Technical publicity (manual, video, etc.) 技术宣传（手册、影音等）	No.	4	4	4
1.5	**Monitoring system** **监测体系建设**				
	Agricultural "four conditions" monitoring 农业“四情”监测	set	0	1	0
1.6	Project management information system 项目信息管理系统	No.			
	Project implementation consulting service 项目执行咨询服务		5	5	5
2	**Green and climate resilient agricultural production bases constructed** **建设绿色、气候适应性强的农业生产基地**				
2.1	**Green Farmland Infrastructure Construction** **农田基础设施建设**				
a	Land levelling 平整土地	mu	0	0	197.4
b	**High efficiency water-saving irrigation** **灌溉工程**				
b.1	Water source engineering 水源工程				
	Electromechanical well rehabilitation 修复机电井	No.	0	0	250

SN	Activities 活动	Unit	Non-core Wuzhi	Non-core Xiangfu	Non-core Yanshi
	Grit chamber 沉砂池	No.	0	0	0
b.2	Water conveyance channel 输水渠道				
	Maintenance / rehabilitation 维护/修复	km	78.45	36.62	0
b.3	Newly built water pipeline 新建输水管道	km	0	0	0
b.4	Canal structure 渠系建筑物				
	Water measuring facilities 量水设施	set	43	7	250
	Gate 闸	No.	143	0	0
	Bridge 桥	No.	0	1	0
	Pipe culvert 管涵	No.	83	26	0
b.5	Low pressure pipeline irrigation 低压管道灌溉	mu	0	3,200	13,300
b.5.1	Sprinkler irrigation 喷灌	mu	0	0	6,700
b.5.2	Micro irrigation (including drip irrigation) 微灌（含滴灌）	mu	0	0	0
c	**Drainage facilities** **排水工程**				
c.1	Ecological drainage channel 生态排水渠				
c.2	Maintenance / rehabilitation 维护/修复	km	23.64	25.14	0
d	Production road 田间硬化道路工程	km	10.88	32.07	18.49
e	**Farmland power transmission and distribution** **农田输配电**				
e.1	Distribution line engineering (low voltage-0.4kV) 配电线路工程（低压）	km	0	3.51	65.6
e.2	Distribution line engineering (high voltage-10kV) 配电线路工程（高压）	km	0	0	0
e.3	Power distribution equipment 配电装置工程	No.	0	0	0
f	Farmland project signs 农田工程标识标牌	No.	1	1	2
2.2	**Farmland protection and ecological environment improved** **农田保护和生态环境改善工程**				
a	**Soil improvement** **土壤改良**				
	straw returning area 秸秆还田面积	mu	39,999.9	0	0

SN	Activities 活动	Unit	Non-core Wuzhi	Non-core Xiangfu	Non-core Yanshi
	Civil works 秸秆还田设施	m^2	0	0	0
	Equipment 秸秆还田设备	set	6	0	0
b	**Conservation tillage** **保护性耕作**				
	Subsoiling 深松	mu	19,999.95	0	0
c	**Fertilizer reduction and efficiency increased** **化肥减量增效**				
c.1	Soil testing and formula fertilization 测土配方施肥	mu	0	0	20,000
c.2	Organic fertilizer promotion 有机肥推广	mu	20,000	59,999.9	20,000
c.3	**Integration of water and fertilizer (fertigation)** **水肥一体化**				
	Fertigation pumping station 水肥一体化泵站	No.	0	10	226
	Intelligent irrigation system 智能灌溉系统	set	0	10	226
d	**Pesticide reduction and harm control** **农药减量控害**				
d.1	Pest control equipment 病虫害防治设备	set	400	400	200
d.2	Biological pesticide promotion 生物农药推广	mu	0	0	10,000
e	**Farmland shelter forest** **农田林网**				
e.1	Newly construction of farmland shelter forest 新建农田林网	km		9.42	
3	**Agricultural value chains strengthened** **加强农业价值链**				
3.1	New variety promotion 新品种推广	mu	0	5,250	10,000
3.2	**Facility agriculture (greenhouse)** **日光温室**				
a	Fruit and vegetable greenhouse 新建日光温室	mu	39	0	0
b	**Organic fertilizer processing** **有机肥加工**				
b.1	Civil works 土建	m^2	3,866.64	0	0
b.2	Facilities and equipments 设施设备	set	36	0	0

Note: pm=person month.

Source: Preliminary design of Henan Non-core subprojects, 2025.

数据来源：河南省非核心子项目初步设计，2025。

C. Environment Baseline 环境基线

Subprojects of Yanshi, Xiangfu and Wuzhi are in Luoyang city, Kaifeng city and Jiaozuo city respectively, of Henan Province, all located in existing cultivated area. The environmental quality baseline assessment used for the IEE report is based on the published information by the local Ecology and Environment Bureau and domestic environmental impact assessment. There are no other noise sources except for occasional traffic noise. Air quality in all locations generally meets the Class 2 standards for sulfur dioxide (SO2), nitrogen dioxide (NO2), carbon monoxide (CO), and ozone (O3) as per the results from the local Ecology and Environment Bureaus in 2022 and/or 2023. However, there is an issue with particulate matter (PM10 and PM2.5) levels, which have been recorded above the standard limits. The surface water quality of Yuni River and Luoyi River in Xiangfu and Yanshi District satisfied with the Category IV and III of Surface Water Quality Standard (GB3838-2002) respectively. The surface water quality of Wuzhi showed exccedance of ammonia nitrogen in 2021. The Wuzhi subproject will contribute to improved water quality through reduction of chemical fertilizer.

偃师子项目、祥符子项目、武陟子项目分别位于河南省洛阳市、开封市、焦作市，均位于现有耕地区域。用于初始环境评估报告的环境质量基线评估，基于当地生态环境局发布的信息和国内环境影响评价。除了偶尔的交通噪音外，没有其他噪音源。根据当地生态和环境局 2022 年和/或 2023 年的结果，所有地点的空气质量普遍符合二氧化硫（SO2）、二氧化氮（NO2）、一氧化碳（Co）和臭氧（O3）的 2 级标准。但是，可吸入颗粒物（PM10 和 PM2.5）水平存在问题，这些水平已记录在标准限值以上。祥符区淤泥河、偃师区洛沂河地表水水质分别满足《地表水环境质量标准》（GB3838-2002）中的Ⅳ类和Ⅲ类水质标准。武陟县地表水水质显示 2021 年氨氮超标。武陟县子项目将通过减少化肥施用量来改善水质。

Regarding soil quality, monitoring will be conduducted as part of the subproject activities to assess nutrient content, organic matter levels, and the presence of pesticide residues and heavy metals and will be reported in the environmental monitoring report during loan implementation. The subproject sites of Yanshi, Xiangfu and Wuzhi are located within a modified agricultural ecosystem with planted farmland protection shelterbelt. There is no protected area or nature reserves, key biodiversity area within a 20 km radius from the subproject area of Yanshi, Xiangfu and Wuzhi. The subprojects activities of Yanshi, Xiangfu and Wuzhi do not encroach or are located within declared ecological red lines.

关于土壤质量，监测将作为子项目活动的一部分进行，以评估养分含量、有机物水平以及农药残留物和重金属的存在，并将在贷款执行期间的环境监测报告中报告。偃师区、祥符区和武陟县的子项目地点位于改良农业生态系统内，种植农田防护林。在偃师区、祥符区和武陟县的子项目区域半径 20 公里范围内，没有保护区或自然保护区、生物多样性关键区。偃师、祥符、武陟的子项目活动未侵占或位于申报的生态红线范围内。

D. Anticipated Impacts and Mitigation Measures 预期影响及缓解措施

Key environmental risks are from the proposed construction activities for levelling, installation of irrigation pipes and construction of field roads, and agricultural greenhouse, including noise, dust, soil erosion and occupational and community health and safety issues. The whole construction period will last for the first two years of subproject implementation. All construction activities will be limited to the existing cultivated land and farms. The Yanshi, Xiangfu and Wuzhi subprojects will not expand cultivation area. The construction impacts are in short term and localized and can be mitigated through good construction practices.

主要环境风险来自拟进行的平整、灌溉管道安装、修建田间道路、以及农业温室的建设活动，包括噪音、粉尘、水土流失以及职业和社区健康和安全问题。整个施工期将持续到子项目实施的前两年。所有建设活动将仅限于现有耕地和农场。偃师、祥符、武陟子项目不扩大种植面积。施工影响是短期和局部的，可以通过良好的施工规范来减轻。

Environmental risks during operation comprise: agricultural related pollution including overuse of chemical fertilizer and pesticides, unsustainable abstraction of water resources, and pollution of plastic films and pesticides package. The pesticides packages will be collected by the distributors. With application of formula fertilizer, organic fertilizer and integrated pest management techniques, the risks of pollution from overuse of chemical fertilizer and pesticides are low. The odor from the organic fertilizer plant will be treated by biological filtration to meet the Malodorous Pollutant Emission Standard (GB 14554-93).
运营期间的环境风险包括：农业相关污染，包括过度使用化肥和农药，不可持续的水资源抽取，以及塑料薄膜和农药包装的污染。农药包装将由经销商收集。通过配方肥、有机肥和病虫害综合防治技术的应用，化肥和农药过度使用造成的污染风险较低。有机肥厂臭气采用生物过滤处理，符合《恶臭污染物排放标准》（GB 14554-93）。

Project benefits. Environmental Benefits. After implementation of the Yanshi subproject, the application of chemical fertilizer (e.g., urea, potassium sulfate and phosphate diamine) will be 30.14 kg/mu and 751.8 t/a respectively, with reduction of 2.54 kg/mu and 44.0 t/a. These estimates are calculated based on the density of the fertilizer (N, P2O5, and K2O). The pesticide usage per unit area will decrease to 0.44 kg per mu. This represents a decrease of 0.08 kg per mu and 0.55 tons annually compared to the period before the project implementation. there will be a decrease in nutrient loss after project implementation, with anticipated reductions of 0.0187t/a, 0.3311t/a, and 0.0299t/a for ammonia nitrogen, total nitrogen, and total phosphorus respectively.
项目效益。环境效益。偃师子项目实施后，化肥（尿素、硫酸钾、磷二胺）施用量分别为 30.14 kg/mu、751.8 t/a，减少施用量 2.54 kg/亩、44.0 t/a。这些估计值是根据肥料的密度（N、P2O5 和 K2O）计算得出的。单位面积农药使用量将下降到每亩 0.44 公斤。与项目实施前相比，每亩减少 0.08 公斤，每年减少 0.55 吨。项目实施后，养分流失量将有所减少，预计氨氮、总氮、总磷分别减少 0.0187t/a、0.3311t/a、0.0299t/a。

Xiangfu District will make some progress in pesticide and fertilizer usage. Despite the fact that the total pesticide implementation will remain relatively stable, the per-unit area pesticide usage will decrease by 0.01kg/mu. Moreover, the per-unit area fertilizer usage will decrease by 1.66kg/ha, and the total fertilizer implementation will decrease by 33.25 t/a. These changes will suggest a concerted effort towards more sustainable agricultural practices and environmental stewardship in the region.
祥符区在农药和化肥使用方面将取得一些进展。尽管农药施用总量将保持相对稳定，但单位面积农药使用量将下降 0.01kg/mu。单位面积化肥施用量减少 1.66kg/ha，化肥总施用量减少 33.25t/a。这些变化将表明，该地区为实现更可持续的农业实践和环境管理而共同努力。

For Wuzhi subproject, the per-unit area pesticide usage and total implementation will decrease by 0.05kg/ha and 3.83t/a respectively. Similarly, the per-unit area fertilizer usage will decrease by 1.54kg/ha, and the total fertilizer implementation will decrease by 199.47t/a. Furthermore, there will be a reduction in nutrient loss after project implementation, with expected decreases of 0.0796t/a, 1.4277t/a, and 0.1123t/a for ammonia nitrogen, total nitrogen, and total phosphorus respectively.
武陟子项目单位面积农药使用量减少 0.05kg/ha，总施用量减少 3.83t/a。单位面积化肥施用量减少 1.54kg/ha，总施肥量减少 199.47t/a。此外，项目实施后养分流失量将有所减少，预计氨氮、总氮和总磷分别减少 0.0796 t/a、1.4277 t/a 和 0.1123 t/a。

After the implementation of water-saving irrigation measures in the Yanshi District, Xiangfu District, and Wuzhi County subproject areas, the irrigation water demand will decreased by 232.99 million m3, 133.55 million m3, and 265.00 million m3 respectively by 2027.
偃师区、祥符区、武陟县子项目区实施节水灌溉措施后，到 2027 年灌溉需水量将分别减少 2.3299 亿 m3、1.3355 亿 m3、2.65 亿 m3。

E. Public Consultation and Grievance Redress Mechanism 公众咨询和投诉处理机制

During the project preparation period from 2021-2022, holding face-to-face consultation workshop was not feasible due to travel restrictions and government-imposed limits on the number of people gathering because of the COVID-19 pandemic. As a result, consultations via questionnaires were carried out by the local staff from Agriculture and Rural Affairs Bureaus of Yanshi District, Xiangfu District and Wuzhi County, supervised by the TrTA consultant and domestic EIA institute. This involved conducting (i) two rounds of information disclosure using publicly accessible websites of Yanshi District, Xiangfu District and Wuzhi County governments and the use of information posters displayed in common areas around subproject villages during May to June 2022, and (ii) total of 86, 62 and 90 questionnaires were distributed to Yanshi, Xiangfu and Wuzhi respectively. All respondents expressed support to subprojects of Yanshi District, Xiangfu District and Wuzhi County. Common concerns raised by respondents focused on the potential impact on environmental aspects such as ecology, which will be minimized through implementation of the mitigation measures defined in the environmental management plan (EMP).Throughout the project implementation period, public participation will continue in various forms, including but not limited to workshops, questionnaires, and household interviews.
在 2021-2022 年的项目准备期间，由于旅行限制和政府因新冠肺炎大流行而对聚集人数的限制，举行面对面的咨询研讨会是不可行的。因此，偃师区、祥符区和武陟县农业和农村部门的当地工作人员在 TRTA 顾问和国内 EIA 机构的监督下，通过问卷进行了咨询。2022 年 5-6 月期间，（I）利用偃师区、祥符区和武陟县政府的公开网站进行两轮信息公开，并在子项目村庄周边公共区域张贴信息海报，（II）分别向偃师区、祥符区和武陟县分别发放 86 份、62 份和 90 份问卷。所有受访者均对偃师区、祥符区和武陟县的子项目表示支持。答复者提出的共同关切集中在对生态等环境方面的潜在影响，通过实施环境管理计划（EMP）中规定的缓解措施，将最大限度地减少这些影响。在整个项目实施期间，公众将继续以各种形式参与，包括但不限于研讨会、问卷调查和家庭访谈。

A project grievance redress mechanism (GRM) has been developed and will be established to receive and facilitate the resolution of complaints during the construction and operation phases. The GRM will include the procedures for receiving grievances, recording/documenting key information, and evaluating and responding to the complainants in a reasonable timeframe. Any concerns raised through the GRM will be addressed quickly and transparently, and without retribution to the affected persons.
已制定并将建立项目申诉补偿机制（GRM），以接收和促进在建设和运营阶段的投诉的解决。GRM 将包括接收申诉、录制/记录关键信息以及在合理的时间范围内评估和回应投诉人的程序。通过 GRM 提出的任何问题都将得到迅速和透明的解决，并且不会对受影响的人进行报复。

F. Environment Management Plan 环境管理计划

An EMP (Attachment 1) has been developed to ensure: (i) implementation of identified mitigation and management measures to avoid, reduce, mitigate, and compensate for anticipated adverse environmental impacts; (ii) implementation of monitoring and reporting against the performance indicators; and (iii) compliance with the relevant environmental laws, standards in the PRC, aligned with ADB's SPS requirements. The EMP includes an environmental monitoring plan to monitor the environmental impacts of the project and assess the effectiveness of mitigation measures, and a capacity building and training program focused on health, safety, and environment. Organizational responsibilities and budgets are clearly identified for implementation, monitoring, and reporting.
已制定环境管理计划（附件 1），以确保：（i）实施已确定的缓解和管理措施，以避免、减少、减轻和补偿预期的不利环境影响；（ii）根据绩效指标实施监测和报告；以及（iii）遵守中国的相关环境法律和标准，符合亚洲开发银行的 SPS 要求。环境管理计划包括一项环境监测计划，用于监测项目的环境影响并评估缓解措施的有效性，以及一项以健康、安全和环境为重点的能力建设和培训计划。明确确定了实施、监测和报告的组织职责和预算。

G. Risks and Key Assurances 风险和关键保证

The Yanshi, Xiangfu and Wuzhi subprojects management offices (CPMOs) have limited experience in the implementation of ADB-funded loan projects and knowledge of ADB safeguard procedures and requirements. This may result in the limited implementation of the project EMP and inadequate operation of the project facilities. These risks will be minimized as follows: (i) appointment of a full-time environment and social officer in the CPMO; (ii) the inclusion of a loan implementation environmental consultant in the loan consulting services; (iii) clear roles and responsibilities of all relevant agencies for EMP implementation, including contractors and construction supervision companies; (iv) capacity building for EMP implementation; and (v) the recruitment of an environmental monitoring agency to implement the external environmental monitoring described in the EMP. Environmental assurances have been developed and agreed with the executing agency and are included in the loan and project agreements.

偃师区、祥符区和武陟县子项目管理办公室（县项目办）在实施亚行资助的贷款项目方面经验有限，对亚行保障程序和要求的了解也有限。这可能导致项目环境管理计划的实施受到限制，项目设施运行不充分。这些风险将按如下方式将至最低：（i）在县项目办中任命一名全职的环境和社会专员；（ii）在贷款咨询服务中纳入一名贷款执行环境顾问；（iii）明确所有相关机构在实施环境管理计划方面的作用和责任，包括承包商和施工监理；（iv）实施环境管理计划的能力建设；（v）招募一个环境监测机构来实施环境管理计划中所述的外部环境监测。环境保证已经制定并与执行机构达成一致，并纳入贷款和项目协议中。

I. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK 政策、法律和行政框架

This IEE has been prepared following both the PRC's national and local environmental legal and institutional framework and environmental assessment requirements, and in compliance with environmental safeguards of ADB. This chapter does not need to be updated.
本初始环境评估是根据中华人民共和国国家和地方环境法律和制度框架以及环境评估要求编制的，并符合亚洲开发银行的环境保障措施。本章节无需更新。

A. PRC Environmental Legislative Framework 中国环境立法框架

The environmental protection and management system in the PRC consists of a well-defined hierarchy of regulatory, administrative and technical institutions. At the top level the People's Congress of the PRC has the authority to pass and revise national environmental laws; the Ministry of Ecology and Environment (MEE, former Ministry of Environmental Protection) under the State Council promulgates national environmental regulations; and the MEE either separately or jointly with the Administration of Quality Supervision, Inspection and Quarantine issues national environmental standards. Provincial and local governments can also issue provincial and local environmental regulations and guidelines in accordance with the national ones. In addition, national and local five-year environmental protection plans form an important part of the legal framework. The primary national laws and regulations that governed the domestic environmental impact assessment (DEIA) of the proposed project are in Table I-1.
中国的环境保护和管理体系由明确的监管、行政和技术机构组成。在最高层，中华人民共和国人民代表大会有权通过和修改国家环境法律；国务院下属的生态环境部（MEE，原环境保护部）颁布国家环境法规；由环境局单独或会同国家质量监督检验检疫总局发布国家环境标准。省级和地方政府也可以根据国家的规章制度发布省和地方的环境法规和准则。此外，国家和地方环境保护五年规划是法律框架的重要组成部分。管理拟建项目的国内环境影响评估（DEIA）的主要国家法律法规见表 I-1。

Table I-1: Applicable PRC Environmental Laws and Administrative Regulations
表 I-1：适用的中华人民共和国环境法律和行政法规

No.	Laws/Regulations 法律/法规	Year Issued/Updated 发布/更新年份
Laws 法律		
1	Environmental Protection Law 环境保护法	2015
2	Water Pollution Prevention and Control Law 水污染防治法	2017
3	Air Pollution Prevention and Control Law 大气污染防治法	2018
4	Solid Waste Pollution Prevention and Control Law 固体废物污染环境防治法	2020
5	Noise Pollution Prevention and Control Law 噪声污染防治法	2018
6	Forest Law 森林法	2009
7	Water and Soil Conservation Law 水土保持法	2010
8	Water Law 水法	2016
9	Land Administration Law 土地管理法	2019
10	Cleaner Production Promotion Law 清洁生产促进法	2012
11	Environmental Impact Assessment Law 环境影响评价法	2018
12	Urban and Rural Planning Law 城乡规划法	2019
13	Cultural Relics Protection Law 文物保护法	2017
14	Wildlife Protection Law 野生动物保护法	2018
National Administrative Regulations 国家行政法规		

No.	Laws/Regulations 法律/法规	Year Issued/Updated 发布/更新年份
1	Regulation on Prevention and Control of Pollution in Protected Areas of Drinking Water Sources 饮用水水源保护区污染防治条例	2010
2	Regulation on Urban Drainage and Sewage Treatment 城镇排水与污水处理条例	2013
3	Measures for Management of Soil Environment of Agricultural Land (trail) 农用地土壤环境管理办法（试行）	2017
4	Regulation on Environmental Protection Management of Construction Project 建设项目环境保护管理条例	2017
5	Management Measures for Environmental Protection Acceptance of Construction Project 建设项目环境保护验收管理办法	2017
6	Post-evaluation of Environmental Impact for Construction Project 建设项目环境影响后评价	2015
7	Post and In-the-event Supervision of Construction Project on Environmental Protection 建设项目环境保护的事中事后监督	2015
8	Provisions on Public Participation in Environmental Impact Assessment 环境影响评价公众参与规定	2018
9	Directory of Environmental Impact Assessment Classification for Construction Project 建设项目环境影响评价分类目录	2021
10	Decision on Partially Revise the Directory of Environmental Impact Assessment Classification for Construction Project 关于部分修改《建设项目环境影响评价分类目录》的决定	2018
11	Regulation on Nature Reserves 自然保护区条例	2017
12	Regulation on Scenic and Historic Areas 风景名胜区条例	2016
13	Regulation on Protection of Wild Plants 野生植物保护条例	2017
14	Regulation on Pollution Prevention for Large-scale Livestock and Poultry Breeding 规模化畜禽养殖污染防治条例	2013
15	Interim Measures for the Administration of Aquatic Germplasm Resources Conservation Zones 水产种质资源保护区管理暂行办法	2011
Provincial Regulations 省级条例		
1	Regulations of Henan Province on prevention and control of Soil Pollution 河南省土壤污染防治条例	2018
2	Regulations of Henan Province on the Prevention and Control of Water Pollution 河南省水污染防治条例	2019
3	Regulations of Henan Province on Air Pollution Prevention and Control 河南省大气污染防治条例	2018

Source: TrTA consultant.

The implementation of environmental laws and regulations is supported by associated management and technical guidelines (Table I-2).
环境法律法规的实施得到了相关管理和技术指南的支持（见表 I-2）。

Table I-2: Applicable Technical Guidelines for Environment

No.	Technical Guideline 技术指南	Year/Code 年份/代码
1	Technical Guideline on EIA-Outline 环境影响评价技术导则-大纲	HJ 2.1-2016
2	Technical Guideline on EIA Regarding Surface Water 地表水环境影响评价技术导则	HJ/T 2.3-2018
3	Technical Guideline on EIA Regarding Atmospheric Environment 大气环境影响评价技术导则	HJ 2.2-2018
4	Technical Guideline on EIA Regarding Acoustic Environment 声环境影响评价技术导则	HJ 2.4-2021
5	Technical Guideline on EIA Regarding Ecological Environment 生态环境影响评价技术导则	HJ 19-2022

No.	Technical Guideline 技术指南	Year/Code 年份/代码
	Technical Guidelines on EIA Regarding Groundwater 地下水环境影响评价技术导则	HJ610-2016
6	Technical Specification on Water and Soil Conservation Plan 水土保持方案技术规范	GB 50433-2008
7	Technical Guideline on Environmental Risk Assessment for Construction Project 建设项目环境风险评价技术导则	HJ/T 169-2018

Source: TrTA consultant.

In addition, the project is subject to laws, regulations and policies that related to agriculture and Yellow River environmental protection:
此外，本项目受农业和黄河环境保护相关法律法规和政策的约束：

- Agricultural Law of the People's Republic of China (2012)
- Law of the People's Republic of China on the Prevention and Control of Soil Pollution (2018)
- Regulations on the Administration of Pesticides (2017)
- Measures for the Administration of Pesticide Registration (2018)
- Measures for the Administration of Pesticide Production Licenses (2018)
- List of prohibited and restricted pesticides (2022)
- Action Plan for Zero Growth in Fertilizer Use by 2020
- Action Plan for Zero Growth in Pesticide Use by 2020
- Opinions on Promoting the Prevention and Control of Agricultural film Pollution (2019)
- Management Measures on Straw Burning and Comprehensive Utilization (2003)
- Regulations on Prevention and Control of Pollution from Livestock and Poultry Farming on a Large Scale (2013)
- Administrative Measures for the Recycling and Treatment of Pesticide Packaging Waste (2020)
- Outline of the Yellow River Basin Ecological Protection and High-Quality Development Plan (2021)
- Implementation Plan for Conservation and Intensive Utilization of Water Resources in the Yellow River Basin (2021)
- Opinions on Implementing Deep Water Saving and Water Control Actions in the Yellow River Basin
    - 中华人民共和国农业法（2012 年）
    - 中华人民共和国土壤污染防治法（2018 年）
    - 农药管理条例（2017）
    - 农药登记管理办法（2018）
    - 农药生产许可证管理办法（2018 年）
    - 禁用和限用农药目录（2022 年）
    - 到 2020 年化肥使用量零增长行动计划
    - 到 2020 年农药使用零增长行动计划
    - 关于推进农膜污染防治工作的意见（2019）
    - 秸秆焚烧与综合利用管理办法（2003 年）
    - 规模化畜禽养殖污染防治条例（2013）

- 农药包装废弃物回收处理管理办法（2020 年）
- 黄河流域生态保护和高质量发展规划纲要（2021 年）
- 黄河流域水资源节约集约利用实施方案（2021 年）
- 关于实施黄河流域深度节水治水行动的意见

B. PRC Environmental Impact Assessment Framework and Procedures 中华人民共和国环境影响评价框架和程序

EIA administrative framework. The administrative framework for EIA in the PRC consists of national, provincial, and local (city and county) environmental protection authorities. The national authority is the MEE, which promulgates laws, regulations, administrative decrees, technical guidelines, and environmental quality and emission standards on EIA and pollution prevention and control. At the provincial level, there are ecology and environmental departments (EEDs), which act as gatekeepers for EIA and pollution prevention and control in the provinces. They are delegated the authority by the MEE to review and approve EIA reports for development planning and construction projects, except for projects with national interests and which cross provincial boundaries. The local (city or county level) environmental protection bureaus (EEB) enforce environmental laws and conduct environmental monitoring within city or county limits. Local EEBs can also be delegated the authority to approve EIA reports by the provincial EEDs. EEDs and EEBs are supported by environmental monitoring stations (EMS), which are subsidiaries of EEDs or EEBs and are qualified entities to carry out environmental monitoring.
环境影响评价行政框架。中华人民共和国环境影响评价的管理框架由国家、省和地方（市、县）环境保护主管部门组成。国家主管部门是生态环境部 MEE，负责颁布有关环境影响评价和污染防治的法律、法规、行政法令、技术指南以及环境质量和排放标准。在省一级，有生态和环境部门（EEDs），为各省的环评和污染防治把关。除涉及国家利益和跨省界的项目外，他们受生态环境部授权审查和批准发展规划和建设项目的环境影响评估报告。地方（市、县）环境保护局（EEB）在市、县范围内执行环境法律并进行环境监测。省环保局也可授权地方环保局审批环境影响评价报告。生态和环境部门和环境保护局由环境监测站（EMS）提供支持，环境监测站是生态和环境部门或环境保护局的附属机构，是有资格进行环境监测的实体。

Categorization and environmental impact assessment requirements. Article 16 of the Environmental Impact Assessment (EIA) Law (2003, amended in 2018) requires classification of environmental assessment for construction projects according to the potential environmental impacts that will be caused. The MEE Directory on EIA Categories of Construction Projects (2021) classifies environmental impact assessments for construction projects into 3 categories with different due diligence and reporting requirements. It provides detailed EIA requirements for 50 sectors and 192 subsectors based on the project's size, type, and site environmental sensitivity.
分类和环境影响评估要求。《环境影响评价法》（2003 年，2018 年修订）第 16 条要求根据建设项目可能造成的环境影响，对建设项目的环境评价进行分类。《建设项目环境影响评价目录（2021）》将建设项目的环境影响评价分为 3 类，具有不同的尽职调查和报告要求。它根据项目的规模、类型和现场环境敏感性，为 50 个部门和 192 个子部门提供了详细的环境影响评估要求。

An Environmental Impact Statement (EIS) is required for construction projects with potentially significant environmental impacts.
具有潜在重大环境影响的建设项目需要环境影响报告书。

A tabular environment impact report (EIT) is required for construction projects with less significant environmental impacts.
对于环境影响较小的建设项目，需要编制环境影响报告表（EIT）。

An Environmental Impact Registration Form (EIRF) is required for construction projects with the least significant environmental impacts (generally equivalent to ADB category C).
对于环境影响最小的建设项目（一般相当于亚行 C 类），需要填写环境影响登记表（EIRF）。

Review and approval process. The draft EIA document (EIS or EIT) must be submitted to the competent ecological and environmental administration by the construction unit prior to construction. The relevant ecological and environmental protection administration approves the EIA document, and provides written notification to the construction unit within 60 days after receiving a draft EIS, within 30 days after receiving an EIT. For an EIRF, the registration process is completed after the registration form is submitted online. There is no approval process for EIRF. Construction work cannot start until the EIA document is reviewed and approved by the relevant environmental protection administration.
审查和批准程序。建设单位必须在施工前向生态环境行政主管部门提交环境影响评价文件（EIS 或 EIT）草案。相关生态环境保护管理部门批准环境影响评价文件，并在收到环境影响报告书草案后 60 日内书面通知建设单位，在收到环境影响报告书后 30 日内书面通知建设单位。对于 EIRF，在线提交注册表后，注册过程即告完成。EIRF 没有审批流程。环境影响评价文件经相关环保部门审查批准后，方可开工建设。

As required under the PRC EIA Law, an overall domestic EIA for the project has been prepared by China Overseas Consulting Company Limited and approved by the MEE in June 2023.
根据《中华人民共和国环境影响评价法》的要求，中国海外咨询有限公司已编制了该项目的总体国内环境影响评价，并于 2023 年 6 月获得了生态环境部的批准。

C. International Agreements 国际协定

The PRC is a signatory to international agreements relevant to environment protection, including:
中华人民共和国是与环境保护有关的国际协定的签署国，包括:

- Ramsar Convention on Wetlands of International Importance Especially as Waterflow Habitat, December 21, 1975, to stem the progressive encroachment on and loss of wetlands now and in the future, recognizing the wetlands' ecological functions and their economic, cultural, scientific, and recreational values;
- Montreal Protocol on Substances that Deplete the Ozone Layer, January 1, 1989, protect the ozone layer by controlling emissions of substances that deplete it;
- Conservation on Biological Diversity, December 29, 1993, to develop national strategies for the conservation and sustainable use of biological diversity;
- Kyoto Protocol to the United Nations Framework Convention on Climate Change, 23 February 2005. To further reduced greenhouse gas emissions by enhancing the national projects of developed countries aimed at this goal and by establishing percentage reduction targets for the developed countries;
- United Nations Framework Convention on Climate Change, 21 March 1994, to achieve stabilization of greenhouse gas concentrations in the atmosphere at a low enough level to prevent dangerous anthropogenic interference with the climate system;
- United Nations Convention to Combat Desertification, 1996, to combat desertification and mitigate effects of drought; and
- UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage, 1985. This convention integrates the practice of heritage conservation in the PRC with that being done around the world.
- The Paris Agreement, 2016. The overarching goal is to hold "the increase in the global average temperature to well below 2°C above pre-industrial levels" and pursue efforts "to limit the temperature increase to 1.5°C above pre-industrial levels."

- 1975 年 12 月 21 日《关于特别是作为水禽栖息地的国际重要湿地公约》，旨在阻止现在和将来湿地的逐步侵蚀和丧失，承认湿地的生态功能及其经济、文化、科学和娱乐价值；
- 1989 年 1 月 1 日《蒙特利尔破坏臭氧层物质管制议定书》，通过控制消耗臭氧层物质的排放来保护臭氧层；
- 生物多样性公约，1993 年 12 月 29 日，制定保护和可持续利用生物多样性的国家战略；
- 《联合国气候变化框架公约京都议定书》，2005 年 2 月 23 日。通过加强发达国家旨在实现这一目标的国家项目和为发达国家设定百分比减排目标，进一步减少温室气体排放；
- 1994 年 3 月 21 日《联合国气候变化框架公约》，以求将大气中的温室气体浓度稳定在足够低的水平，防止气候系统受到危险的人为干扰；
- 1996 年《联合国防治荒漠化公约》，防治荒漠化和减轻干旱影响；和
- 联合国教科文组织《保护世界文化和自然遗产公约》，1985 年。该公约将中国的遗产保护实践与世界各地的遗产保护实践相结合。
- 《巴黎协定》，2016 年。总体目标是将“全球平均气温升幅控制在工业化前水平以上 2° C 以内”，并努力“将气温升幅限制在工业化前水平以上 1.5° C 以内”。

D. ADB Safeguards Requirements 亚行保障要求

Environmental safeguards requirements of ADB, including EIA requirements, are defined in the Safeguard Policy Statement (SPS, 2009). The purpose of the SPS is to ensure that projects are environmentally sound, designed to operate in line with applicable regulatory requirements, and are not likely to cause significant environment, biological, health, or safety hazards. The SPS sets out the policy objectives, scope and triggers, and principles for three key safeguard areas: (i) environmental safeguards; (ii) involuntary resettlement safeguards; and (iii) indigenous peoples safeguards. The policies seek to avoid, minimize, or mitigate adverse environmental and social impacts, including protecting the rights of those likely to be affected or marginalized by the development process.
亚洲开发银行的环境保障要求，包括环境影响评估要求，在保障政策声明（SPS，2009）中进行了定义。SPS 的目的是确保项目对环境无害，其设计符合适用的监管要求，并且不可能造成重大的环境、生物、健康或安全危害。《卫生和植物检疫措施协定》规定了三个关键保障领域的政策目标、范围和触发因素以及原则：（i）环境保障；（ii）非自愿移民安置保障措施；（iii）少数民族的保障。这些政策力求避免、尽量减少或减轻不利的环境和社会影响，包括保护那些可能受到发展进程影响或被边缘化的人的权利。

The objectives of ADB’s safeguards are to: (i) avoid adverse impacts of projects on the environment and affected people, where possible; (ii) minimize, mitigate, and/or compensate for adverse project impacts on the environment and affected people when avoidance is not possible; and, (iii) help borrowers/clients to strengthen their safeguard systems and develop the capacity to manage environmental and social risks.
亚行保障措施的目标是：（i）尽可能避免项目对环境和受影响人群造成不利影响；（ii）在无法避免的情况下，尽量减少、缓解和/或补偿项目对环境和受影响人群的不利影响；（iii）帮助借款人/客户加强其保障系统并发展管理环境和社会风险的能力。

ADB uses a classification system to reflect the significance of a project's potential environmental impacts. Projects are assigned to one of the following four categories: (i) Category A. A proposed project is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An environmental impact assessment is required. (ii) Category B. A proposed project is classified as category B if its potential adverse environmental impacts are less adverse than those of category A projects. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. An initial environmental examination (IEE) is required. (iii) Category C. A proposed project is classified as category C if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications need to be reviewed. (iv) Category financial intermediary.
亚洲开发银行使用分类系统来反映项目潜在环境影响的重要性。项目被指定为以下四个类别之一：（i）A 类。如果拟议项目可能产生不可逆转、多样或前所未有的重大不利环境影响，则该项目被列为 A 类。这些影响所影响的区域可能比实际工程所涉及的场地或设施更大。需要进行环境影响评估。（ii）B 类。如拟议工程项目的潜在不良环境影响较甲类工程项目为低，则该工程项目列为 B 类。这些影响是现场特有的，很少是不可逆转的，并且在大多数情况下，可以比 A 类项目更容易地设计缓解措施。需要进行初始环境评估（IEE）。（iii）类别 C。如建议的工程项目对环境的不良影响相当可能极微或没有不良影响，则该工程项目会列为类别 C。虽然需要审查环境影响，但不需要进行环境评估。（iv）金融中介类别。

The SPS (2009) is underpinned by the ADB Operations Manual (OM Section F1, 2010) with guidance provided by the ADB Environmental Safeguards – A Good Practice Sourcebook (2012).
SPS（2009）以《亚洲开发银行运营手册》（OM 第 F1 节，2010）为基础，并以《亚洲开发银行环境保障措施——良好实践资料手册》（2012）为指南。

According to the SPS, safeguard frameworks apply to project delivered through sector loans. The purpose of the safeguard framework is to ensure that the subprojects implemented under the framework comply with ADB safeguard objectives, principles and requirements. In addition to the EARF, an IEE, including EMP is required for each category B subprojects in accordance with the requirements of ADB SPS (2009) and PRC laws and regulations. After preliminary assessment, this non-core subproject is classified as Category B for environment. Therefore, for the Yanshi, Xiangfu and Wuzhi subprojects of Henan Province, this IEE including an environmental management plan (EMP) was prepared in compliance with the SPS requirements. The findings of the domestic feasibility studies and, site investigations and feedback from stakeholder discussions, from publicly accessible websites and the DEIA were incorporated into this IEE report.
根据 SPS，保障框架适用于通过部门贷款交付的项目。保障框架的目的是确保在该框架下实施的子项目符合亚行的保障目标、原则和要求。根据 ADB SPS（2009）和中国法律法规的要求，除 EARF 外，每个 B 类子项目还需要初始环境评估（包括环境管理计划）。经初步评估，该非核心子项目被列为环境 B 类。因此，对于河南省的偃师、祥符和武陟子项目，按照 SPS 要求编制了包括环境管理计划（EMP）的初始环境评估。国内可行性研究的结果、现场调查和利益相关者讨论的反馈、公众可访问的网站和国内环评已纳入本初始环境评估报告。

ADB's Safeguard Policy Statement (2009) requires that during the design, construction, and operation of the project the borrower/client shall apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines[1]. The applied international standards are included but not limited to:

[1] World Bank Group, 2007. Environmental, Health, and Safety General Guidelines. Washington, DC.
世界银行，2007 年。环境、健康和安全一般准则。华盛顿特区。

亚洲开发银行的保障政策声明（2009）要求，在项目的设计、施工和运营期间，借款人/客户应采用符合国际良好实践的污染预防和控制技术和实践，如世界银行的环境、健康和安全指南等国际公认标准所反映的。.适用的国际标准包括但不限于:

- IFC, Environmental, health, and safety guidelines for annual crop production (2016);
- IFC, Environmental, health, and safety general guidelines (2007);
- FAO, Guidelines for the Management of Small Quantities of Unwanted and Obsolete Pesticides, (Rome: UNEP, WHO, and FAO, 1999)
- FAO, International Code of Conduct on Pesticides Management (revised 2014)[2], (Rome: FAO, 2014).
- World Health Organization (WHO), Recommended Classification of Pesticides by Hazard and Guidelines to Classification[3]
    - IFC，《年度作物生产的环境、健康和安全指南》（2016）；
    - IFC，《环境、健康和安全通用指南》（2007）；
    - 粮农组织，《少量无用和过期农药管理准则》（罗马：环境署、卫生组织和粮农组织，1999 年）
    - 粮农组织，《国际农药管理行为守则》（2014 年修订版），（罗马：粮农组织，2014）。
    - 世界卫生组织，《建议的农药危险性分类和分类准则》。

Compared with the PRC EIA requirements, the SPS emphasizes additional requirements, including: (i) a project GRM; (ii) due diligence of associated facilities; (iii) climate change mitigation and adaptation; (iv) meaningful public consultation; (v) biodiversity conservation; and (vi) a project-specific EMP.
与中华人民共和国环境影响评价要求相比，SPS 强调了额外的要求，包括：（i）项目 GRM；（ii）相关设施的尽职调查；（iii）缓解和适应气候变化；（iv）进行有意义的公众谘询；（v）生物多样性保护；（vi）具体项目的环境管理计划。

E. Assessment Standards for Proposed Subproject 拟建子项目评价标准

ADB's SPS promotes the use of international standards, including the World Bank Group's EHS Guidelines. Where EHS standards are more stringent than national standards, efforts are made for ADB-funded projects to target the EHS standards. Relevant standards applied to this project are based on comparison of national and EHS thresholds. In cases where no EHS standards are available, or the PRC standards are the same or higher than the EHS standards, the national standards are applied.
亚洲开发银行的 SPS 促进国际标准的使用，包括世界银行的 EHS 指南。在 EHS 标准比国家标准更严格的地方，亚洲开发银行资助的项目努力以 EHS 标准为目标。适用于本项目的相关标准基于国家和 EHS 阈值的比较。如果没有可用的 EHS 标准，或中华人民共和国标准与 EHS 标准相同或高于 EHS 标准，则适用国家标准。

[2] http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/Code/CODE_2014Sep_ENG.pdf

[3] http://www.who.int/ipcs/publications/pesticides_hazard/en/

1. Ambient Environmental Quality Evaluation Standards 周围环境质量评价标准

a) Ambient Air Quality Standard 环境空气质量标准

The PRC ranks air quality into two classes according to its Ambient Air Quality Standard (GB 3095-2012). Class 1 standards apply to special areas such as nature reserves and environmentally sensitive areas, and Class 2 standards apply to all other areas, including urban and industrial areas. The PRC standards for Class 2 areas are applicable to the Project.
中华人民共和国根据《环境空气质量标准》（GB 3095-2012）将空气质量分为两个等级。一级标准适用于自然保护区和环境敏感区等特殊区域，二级标准适用于所有其他区域，包括城区和工业区。2类区域的中华人民共和国标准适用于本项目。

The World Bank Group adopted the World Health Organization (WHO) standards for its EHS standards for air quality.[4] The WHO Global Air Quality Guidelines offer global guidance on thresholds and limits for key air pollutants that pose health risks. In addition to guideline values, the WHO Global Air Quality Guidelines provide interim targets aimed at promoting a gradual shift from high to lower concentrations. Table I-3 compares the PRC's GB 3095-2012 Class II standards with the World Bank Group's EHS standards.
世界银行的 EHS 空气质量标准采用了世界卫生组织（WHO）的标准。世卫组织《全球空气质量指南》为构成健康风险的主要空气污染物的阈值和限值提供了全球指导。除指导值外，世卫组织《全球空气质量指南》还提供了旨在促进从高浓度向低浓度逐步转变的临时目标。表 I-3 比较了中国 GB 3095-2012 II 类标准和世界银行 EHS 标准。

Class 2 standards of 24-hour SO_2 (0.15 mg/m3) is higher than the upper limit of the World Bank Group's interim standards (0.125 mg/m3); while 24-hour PM_{10} (0.15 mg/m3) and $PM_{2.5}$ (0.075 mg/m3), 1-year NO_2 (0.04 mg/m3) and PM2.5 (0.035 mg/m3) are the same as the upper limit of the WHO's upper limit of interim standard, respectively. Overall, the PRC standards show a high degree of equivalency to the WHO guidelines or interim target values and are adopted for use in the Project.
24 小时二氧化硫二级标准 $_2$（0.15 mg/m^3）高于世界银行暂行标准的上限（0.125 mg/m^3）；而 24 小时 PM_{10}（0.15 mg/m^3）和 $PM_{2.5}$（0.075 mg/m^3）、1 年 NO_2（0.04 mg/m^3）和 PM2.5（0.035 mg/m^3）分别与 WHO 暂行标准上限相同。总体而言，中华人民共和国标准与世界卫生组织指南或临时目标值具有高度的等效性，并在本项目中采用。

Table I-3: Comparison of the PRC's GB 3095-2012 and World Bank Group EHS Ambient Air Quality Standards (Unit: mg/m^3)

Table I-3:中国 GB 3095-2012 与世界银行集团 EHS 环境空气质量标准对比（单位：mg/m^3）

No.	Item 项目	Averaging Period 平均周期	GB 3095-2012 Class 2 第 2 类	WHO's global air quality guidelines 世卫组织全球空气质量指南	
				Interim Targets 临时目标	AQG
1	SO_2	1-year	0.06	n/a	n/a
		24-hour	0.15	0.05-0.125	0.04
		1-hour	0.50	n/a	n/a

[4] World Health Organization. WHO global air quality guidelines (particulate matter, ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide), 2021.
世界卫生组织。《世卫组织全球空气质量指南（可吸入颗粒物、臭氧、二氧化氮、二氧化硫和一氧化碳）》，2021 年。

No.	Item 项目	Averaging Period 平均周期	GB 3095-2012 Class 2 第 2 类	WHO's global air quality guidelines 世卫组织全球空气质量指南	
				Interim Targets 临时目标	AQG
2	PM_{10}	1-year	0.07	0.02-0.07	0.015
		24-hour	0.15	0.05-0.15	0.045
3	$PM_{2.5}$	1-year	0.035	0.01-0.035	0.005
		24-hour	0.075	0.025-0.075	0.015
		1-hour	n/a	n/a	n/a
4	NO_2	1-year	0.04	0.02-0.04	0.010
		24-hour	0.08	0.05-0.12	0.025
		1-hour	0.20	n/a	n/a
5	CO	24-hour	4.0	7.0	4.0
		1-hour	10.0	n/a	n/a
6	O_3	Daily maximum 8-hour average 每日最大 8 小时平均值	0.16	0.12-0.16	0.10
		1-hour	0.20	n/a	n/a

AQG = air quality guideline.空气质量指南。

Source: WHO Global Air Quality Guidelines (2021), and PRC GB 3095-2012.来源：WHO 全球空气质量指南（2021）和中国 GB 3095-2012。

b) Surface Water 地表水

For water quality assessment, the determining standard is PRC's Environmental Quality Standards for Surface Water (GB 3838-2002). It defines five water quality categories for different environmental functions. Category I is the best suitable for headwaters and National Nature Reserves. Category II is suitable for drinking water sources in Class I protection areas, habitats for rare aquatic organisms, breeding grounds for fish and crustaceans, and feeding grounds for juvenile fish. Category III is suitable for drinking water sources in Class II protection areas, wintering grounds for fish and crustaceans, migration. Category IV is mainly applicable to general industrial water use areas and recreational water use areas where the human body is not in direct contact; Category V is mainly applicable to agricultural water use areas and landscape. There are no applicable World Bank EHS guidelines for water quality. In this context, and the PRC standard is adopted for use in the project IEEs.

水质评价的判定标准为中华人民共和国《地表水环境质量标准》（GB 3838-2002）。它为不同的环境功能定义了五个水质类别。I 类最适合水源和国家级自然保护区。II 类适用于一类保护区内的饮用水源、珍稀水生生物栖息地、鱼类和甲壳类动物繁殖地、幼鱼索饵场。III 类适用于 II 类保护区内的饮用水源、鱼类和甲壳类动物的越冬地、洄游。IV 类主要适用于人体非直接接触的一般工业用水区域和娱乐用水区域；V 类主要适用于农业用水区域和景观。没有适用于水质的世界银行 EHS 指南。在这种情况下，项目初始环境评估采用中华人民共和国标准。

Table I-4: Surface Water Ambient Quality Standard

Table I-4:地表水环境质量标准

Parameter 参数	GB 3838-2002 Category 类别				
	I	II	III	IV	V
pH	6 – 9	6 – 9	6 – 9	6 – 9	6 – 9

Parameter 参数	GB 3838-2002 Category 类别				
	I	II	III	IV	V
Dissolved oxygen (DO) [mg/L] 溶解氧（DO）[mg/L]	90% saturation or ≥7.5 90%饱和度或≥7.5	≥6	≥5	≥3	≥2
Permanganate index (Imn) [mg/L] 高锰酸盐指数（IMN）[mg/L]	≤2	≤4	≤6	≤10	≤15
Chemical oxygen demand (COD) [mg/L] 化学需氧量（COD）[mg/L]	≤15	≤15	≤20	≤30	≤40
5-day Biochemical oxygen demand (BOD_5) [mg/L] 5 天生化需氧量（BOD_5）[mg/L]	≤3	≤3	≤4	≤6	≤10
Ammonia nitrogen (NH_3-N) [mg/L] 氨氮（NH_3-N）[mg/L]	≤0.15	≤0.5	≤1.0	≤1.5	≤2.0
Total phosphorus (as TP) [mg/L] 总磷（以 TP 计）[mg/L]	≤0.02	≤0.1	≤0.2	≤0.3	≤0.4
Lakes & reservoirs 湖泊和水库	≤0.01	≤0.025	≤0.05	≤0.1	≤0.2
Total nitrogen (lakes, reservoirs, as TN) [mg/L] 总氮（湖泊、水库，以 TN 计）[mg/L]	≤0.2	≤0.5	≤1.0	≤1.5	≤2.0
Copper (Cu) [mg/L] 铜（Cu）[mg/L]	≤0.01	≤1.0	≤1.0	≤1.0	≤1.0
Zinc (Zn) [mg/L] 锌（Zn）[mg/L]	≤0.05	≤1.0	≤1.0	≤2.0	≤2.0
Fluoride (as F-) [mg/L] 氟化物（以 F-计）[mg/L]	≤1.0	≤1.0	≤1.0	≤1.5	≤1.5
Selenium (Se) [mg/L] 硒（Se）[mg/L]	≤0.01	≤0.01	≤0.01	≤0.02	≤0.02
Arsenic (As) [mg/L] 砷（As）[mg/L]	≤0.05	≤0.05	≤0.05	≤0.1	≤0.1
Mercury (Hg) [mg/L] 汞（Hg）[毫克/升]	≤0.0005	≤0.0005	≤0.0001	≤0.001	≤0.001
Cadmium (Cd) [mg/L] 镉（CD）[mg/L]	≤0.001	≤0.005	≤0.005	≤0.005	≤0.01
Chromium (Cr, hexavalent) [mg/L] 铬（六价铬）[mg/L]	≤0.01	≤0.05	≤0.05	≤0.05	≤0.1
Lead (Pb) [mg/L] 铅（Pb）[毫克/升]	≤0.01	≤0.01	≤0.05	≤0.05	≤0.1
Cyanide (CN) [mg/L] 氰化物（CN）[mg/L]	0.005	≤0.05	≤0.2	≤0.2	≤0.2
Volatile phenol [mg/L] 挥发酚[mg/L]	≤0.002	≤0.002	≤0.005	≤0.01	≤0.1
Total petroleum hydrocarbon (TPH) [mg/L] 总石油烃（TPH）[mg/L]	≤0.05	≤0.05	≤0.05	≤0.5	≤1.0
Anionic surfactant [mg/L] 阴离子表面活性剂[mg/L]	≤0.2	≤0.2	≤0.2	≤0.3	≤0.3
Sulfide [mg/L] 硫化物[mg/L]	≤0.05	≤0.1	≤0.2	≤0.5	≤1.0
Fecal coliform bacteria [number/L] 粪大肠菌群[个/L]	≤200	≤2000	≤10000	≤20000	≤40000

Source: PRC GB3838-2002.

c) Acoustic Environment 声环境

The Ambient Acoustic Environment Standard (GB 3096-2008) categorizes five functional areas

based on their tolerance to noise pollution: from Class 0 to Class 4. Class 0 is for areas with convalescent facilities that are the least tolerant of noisy environments and therefore have the most stringent day and night-time noise standards. Class 1 is for areas predominated by residential areas, hospitals and clinics, educational institutions and research centers. Class 2 is for areas with mixed residential and commercial functions. Class 3 is for areas with industrial production and storage and logistics functions. Class 4 is for regions adjacent to traffic noise sources such as major roads and highways and is subdivided into 4a and 4b with the former applicable to road and marine traffic noise and the latter applicable to rail noise. Standards for various functional area categories and are compared with the World Bank Group's EHS guidelines, as listed in Table I-6. This shows that the World Bank Group has lower noise limits for residential, commercial and industrial mixed areas but higher noise limits for industrial areas and nighttime noise near trunk roads. The Yanshi, Xiangfu and Wuzhi subprojects are in rural area and the applicable PRC standard is Class 1 that equivalent with WBG EHS standard.

《环境声环境标准》（GB 3096-2008）根据对噪声污染的容忍度划分了五个功能区:0 级至 4 级。0 级是指有疗养设施的区域，对噪声环境的容忍度最低，因此昼夜噪声标准最严格。1 类是以住宅区、医院和诊所、教育机构和研究中心为主的地区。2 类为居住和商业功能混合的区域。3 类为具有工业生产和仓储物流功能的区域。第 4 级适用于邻近交通噪声源（如主要道路和高速公路）的区域，并细分为 4A 和 4B，前者适用于道路和海上交通噪声，后者适用于铁路噪声。各种职能领域类别的标准，并与世界银行的 EHS 指南进行比较，如表 I-6 所列。这表明，世界银行对住宅、商业和工业混合区的噪声限值较低，但对工业区和主干路附近的夜间噪声限值较高。偃师子项目、祥符子项目和武陟子项目位于农村地区，适用的中华人民共和国标准为 1 级，相当于世界银行集团的 EHS 标准。

Table I-5: Environmental Quality Standards for Noise

Table I-5:噪声环境质量标准

(Equivalent Sound Level 等效声级: LAeq: dB)

Noise Functional Area Category 噪声功能区类别	Applicable Area 适用区域	GB 3096-2008		World Bank Group EHS[5] 世界银行	
		Day 白天	Night 晚上	Day 白天	Night 晚上
0	Areas needing extreme quiet, such as convalescence areas 需要极度安静的区域，如疗养区	50	40	55	45
1	Area mainly for residence, cultural and educational institutions 以居住、文化教育机构为主的区域	55	45		
2	Residential, commercial and industrial mixed area 居住、商业和工业混合区	60	50		
3	Industrial area 工业区	65	55	70	70
4a	Area on both sides of urban road traffic trunk line 城市道路交通干线两侧区域	70	55		

EHS = Environment, Health and Safety.
Source: WHO Noise Quality Guidelines (1999) in IFC EHS Guidelines (2007), and PRC GB3096-2008.
EHS=环境、健康和安全。
来源：世界卫生组织（WHO）噪声质量指南（1999）、国际金融公司（IFC）EHS 指南（2007）、中华人民共和国 GB3096-2008。

d) Soil 土壤

In 2018, the MEE released two standards for soil contamination risk management based on usage. The GB 15618-2018 replaced the previous GB15618-1995 that setting threshold to safeguard agroforestry production. The WBG does not have EHS standards for soil quality. The soil within the project sites implements the "Soil Environmental Quality Soil Contamination

5 World Bank Group 2007, ibid.
世界银行集团，2007 年，同上。

Risk Control Standard for Agricultural Land (Trial)" (GB15618-2018) sets soil contamination risk screening limits and control limits. If the content of pollutants in soil exceeds this value, there may be risks to the quality and safety of agricultural products, crop growth or soil ecological environment.
2018 年，生态环境部发布了两项基于使用的土壤污染风险管理标准。GB 15618-2018 取代了之前的 GB15618-1995，即设置阈值以保障农林业生产。世界银行没有土壤质量的环境、健康和安全标准。项目用地范围内土壤执行《农用地土壤环境质量土壤污染风险管控标准（试行）》（GB15618-2018）规定的土壤污染风险筛查限值和管控限值。如果土壤中污染物含量超过这一数值，可能对农产品质量安全、农作物生长或土壤生态环境存在风险。

Table I-6: Soil contamination risk screening limit for agricultural land (mg/kg)

Table I-6:农用地土壤污染风险筛选值（mg/kg）

Item 项目			**pH≤5.5**	**5.5<pH≤6.5**	**6.5<pH ≤7.5**	**pH > 7.5**
Basic item 基本项目	cadmium 镉	paddy 水田	0.3	0.4	0.6	0.8
		others 其他	0.3	0.3	0.3	0.6
	mercury 汞	paddy 水田	0.5	0.5	0.6	1.0
		others 其他	1.3	1.8	2.4	3.4
	arsenic 砷	paddy 水田	30	30	25	20
		others 其他	40	40	30	25
	lead 铅	paddy 水田	80	100	140	240
		others 其他	70	90	120	170
	chromium 铬	paddy 水田	250	250	300	350
		others 其他	150	150	200	250
	copper 铜	paddy 水田	150	150	200	200
		others 其他	50	50	100	100
	nickel 镍	/	60	70	100	190
	zinc 锌	/	200	200	250	300
Additional item 附加项	BHC (C6H6Cl6) 六六六总量	0.10				
	DDT 滴滴涕总量	0.10				
	benzopyrene 苯并芘	0.55				

2. Discharge Standards for Construction and Operation Activities 建设经营活动排放标准

a. Air Pollutant Emissions 大气污染物排放

Fugitive emission of particulate matter (such as dust from construction sites) is regulated under

PRC ‘s Integrated Air Pollutants Emission Standard (GB 16297-1996), which sets 120 mg/m3 as the maximum allowable emission concentration and ≤ 1.0 mg/m3 as the concentration limit at the boundary of construction sites, with no specification on the particular matter’s particle diameter. There are no equivalent EHS targets.
中国《大气污染物综合排放标准》（GB 16297-1996）规定了可吸入颗粒物（如建筑工地产生的粉尘）的无组织排放，该标准规定建筑工地边界的最高允许排放浓度为 120 mg/m3，浓度限值为≤1.0 mg/m3，但未规定特定物质的粒径。没有相应的 EHS 目标。

b. Wastewater Discharge 废水排放

Discharge of wastewater from construction sites is regulated under PRC ‘s Integrated Wastewater Discharge Standard (GB 8978-1996). Class I standards apply to discharges into Category III water bodies under GB 3838-2002. Class II standards apply to discharges into Categories IV and V water bodies. Class III standards apply to discharges into municipal sewers going to municipal wastewater treatment plants (WWTPs) with secondary treatment. The sections of Yellow River in Henan Province is category III water body. the Class I is applicable to the assessment. Except for SS, the Class I standard is more stringent than WBG EHS guideline. The subprojects are subject to the stricter standards.
中国《污水综合排放标准》（GB 8978-1996）规定了施工现场的废水排放。一级标准适用于向 GB 3838-2002 中 III 类水体的排放。第二类标准适用于向第四类和第五类水体的排放。三级标准适用于进入二级处理城市污水处理厂（WWTP）的城市下水道的排放。黄河河南段为III类水体。I 类适用于评估。除 SS 外，I 类标准比 WBG EHS 指南更严格。子项目执行更严格的标准。

Table I-7: Integrated Wastewater Discharge

Table I-7:综合废水排放

Parameter 参数	**Class I 一类**	**Class II 第二类**	**Class III 第三类**	**WBG EHS Guideline WBG EHS 指南**
	For discharge into Category III water body 排入 III 类水体	**For discharge into Category IV and V water bodies 排放至第 IV 及 V 类水体**	**For discharge into municipal sewer 用于排入市政下水道**	**For discharge into surface water 用于排入地表水**
pH 酸碱度	6–9			6-9
SS mg/L	70	150	400	50
BOD_5 mg/L	20	30	300	30
COD mg/L	100	150	500	125
TPH mg/L	5	10	20	/
Volatile phenol mg/L	0.5	0.5	2.0	/
NH_3-N mg/L	15	25	---	/
PO_4^{2-} (as P) mg/L	0.5	1.0	---	2
LAS (= anionic surfactant) mg/L	5.0	10		/

Source: PRC GB 8978-1996 and WBG EHS Guideline-General.

来源：中华人民共和国 GB 8978-1996 和世界银行 EHS 指南-总则。

c. Noise Emissions 噪音排放

The noise will be assessed against the standards in Emission Standards of Ambient Noise for Boundary of Construction Site (GB 12523-2011) during construction period and Class II of Emission Standard for Industrial Enterprises Noise at Boundary (GB 12348-2008) during operation period (Table I-8). In addition, the WBG EHS guideline requires the noise impacts should not result in a maximum increase in background levels of 3 dB at the nearest receptors location off-site.

噪声评价按照《建筑施工场界环境噪声排放标准》（GB 12523-2011《施工期）》和《工业企业厂界环境噪声排放标准》2 类（GB 12348-2008《营运期）》（进行 表 I-8）。此外，WBG EHS 指南要求噪声影响不得导致场外最近受体位置的背景水平最大增加 3 dB。

Table I-8: Noise limits for Construction and Operation Activities

Table I-8:施工作业活动噪声限值

(Unit: LAeq [dB (A)])

Period **期限**	**Major Noise Source** **主要噪声源**	**Noise Limit** **噪音限制**	
		Day **白天**	**Night** **晚上**
Construction 施工期	Bulldozer, excavators and loader; pile driving machines; concrete mixer, vibrator and electric saw; hoist and lifter 推土机、挖掘机、装载机；打桩机；混凝土搅拌机、振捣器、电锯；起重机和升降机	70	55
Operation 运行期	Pumps 水泵	60	/

Source: GB 12348-2008.

d. Vibration 震动

Construction activities are likely to cause vibration impact, and should comply with the Standard for Urban Area Environmental Vibration (GB 10070-88). The details are shown in Table I-9. The project works are located on villages and communities, where standard 2 applies.
施工活动可能引起振动影响，应符合《城市区域环境振动标准》（GB 10070-88）。详情见表 I-9。项目工程位于标准 2 适用的村庄和社区。

Table I-9: Vertical Vibration Standard Value for Various Urban Areas (Unit: dB)

Table I-9:城市各区域垂直振动标准值（单位：dB）

Scope of applicable area **适用区域范围**	**Day** **白天**	**Night** **晚上**
	Class 2 of GB10070-88 GB10070-88 中的 2 类	
Special residential area 特殊居住区	65	65
Residential, cultural and educational area 居住文教区	70	67
Mixed area and commercial center 混合区和商业中心	75	72
Industrial centralized area 工业集中区	75	72
Both sides of traffic trunk line 交通干线两侧	75	72
Both sides of railway main line 铁路正线两侧	80	80

Source: PRC GB 10070-88.

e. Solid Waste 固体废弃物

The General Industrial Solid Waste Storage and Landfill Pollution Control Standards (GB18599-2020) is applicable for the storage and disposal of common industry waste. The package and container of pesticides are classified as hazardous waste. For the hazardous waste, the Hazardous Waste Storage Pollutant Control Standards (GB18597-2023) and its revised list and the Technical Specification for the Collection, Storage and Transport of Hazardous Waste (HJ2025-2012) will be applied.
《一般工业固体废物贮存和填埋污染控制标准》（GB18599-2020）适用于一般工业废物的贮存和处置。农药的包装和容器属于危险废物。危险废物执行《危险废物贮存污染物控制标准》（GB18597-2023）及其修改单和《危险废物收集、贮存、运输技术规范》（HJ2025-2012）。

3. Other Applicable Standards 其他适用标准

Standard for Irrigation Water Quality (GB5084-2021) is applicable to the surface water and groundwater as the source of farmland irrigation. When urban sewage (except for industrial wastewater and medical sewage), livestock and poultry breeding wastewater, agricultural product processing wastewater and rural domestic sewage entering farmland irrigation channels, the water quality of the nearest downstream irrigation water intake point shall satisfy with this standard.

《灌溉水质标准》（GB5084-2021）适用于作为农田灌溉水源的地表水和地下水。城镇污水（工业废水、医疗污水除外）、畜禽养殖废水、农产品加工废水、农村生活污水进入农田灌溉渠道时，其下游最近的灌溉取水点水质应符合本标准。

Table I-10: Standard for Irrigation Water Quality (GB5084-2021)

Table I-10:灌溉水质标准（GB5084-2021）

Item 项目	Paddy 水田	Dry land 旱地	Vegetable 蔬菜
pH	5.5-8.5		
Temperature (℃)	35		
SS(mg/L)	80	100	60[a], 15[b]
BOD5(mg/L)	60	100	40[a], 15[b]
CODcr(mg/L)	150	200	100[a], 60[b]
Anionic surfactant(mg/L) 阴离子表面活性剂（mg/L）	5	8	5
chloride(mg/L) 氯化物（mg/L）	350		
Sulfide(mg/L) 硫化物（mg/L）	1		
Total salt(mg/L) 总盐量（mg/L）	1000(non-saline area 非盐水区),2000 (saline area 盐水区)		
Pb(mg/L)铅（毫克/升）	0.2		
Cd(mg/L)镉（mg/L）	0.01		
Cr6+(mg/L) 六价铬（mg/L）	0.1		
Hg(mg/L)汞（毫克/升）	0.001		
As(mg/L)砷（mg/L）	0.05	0.1	0.05
Fecal coliform count (MPN/L) 粪大肠菌群数（MPN/L）	40000	40000	20000[a],10000[b]
Ascaris eggs(number/10L) 蛔虫卵（个/10L）	20		20[a],10[b]

Note: “a” is applicable for processed, cooked and peeled vegetables; “b” is applicable for b raw vegetables, melons and herbal fruits.

Source: GB5084-2021.

注：“ A ”适用于加工、煮熟和去皮的蔬菜；“ B ”适用于 B 生蔬菜、瓜类和草本水果。

II. DESCRIPTION OF HENAN NON-CORE SUBPROJECTS 河南省非核心子项目说明

This section describes the basic situation and activities of non-core sub-projects in Henan Province. This chapter mainly includes three updates: Because Duliang Township will be reorganized into a town in November 2025, the name of the Xiangfu sub-project village is updated to Duliang Town. The number of activities in sub-projects has been updated based on the preliminary design. The location of the organic fertilizer plant in the Wuzhi sub-project has changed, and the production process of the organic fertilizer plant in this chapter has been updated according to the domestic EIA of the new plant site. No updates for due diligence of the associated/existing facilities.

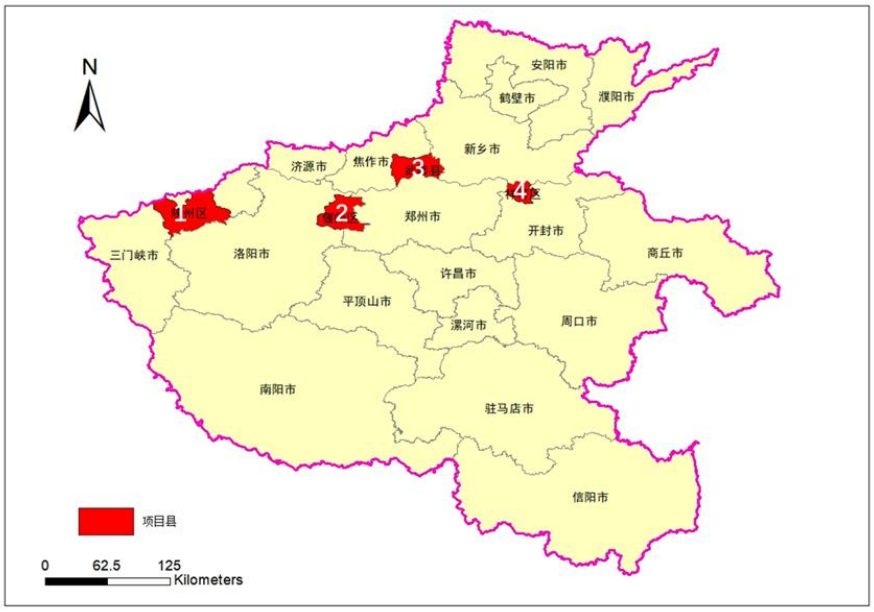
本章节是对河南省非核心子项目基本情况、活动内容等进行了描述。此次本章节主要进行了三个内容的更新：对祥符子项目的项目村名称进行了更新，杜良乡于 2025 年 11 月撤乡改镇，现为杜良镇。根据初设对子项目活动内容的数量进行了更新。武陟子项目有机肥厂厂址产生了变化，根据新厂址的国内环评对本章节中有机肥厂的生产工艺流程进行了更新。对相关/现有设施的尽职调查无需更新。

There are four subprojects in Henan Province (Figure II-1). The four subprojects represent different geographical environments and agricultural industry structures in the middle and lower reaches of Yellow River. These areas include Xiangfu District of Kaifeng City and Wuzhi County of Jiaozuo City, located in the lower reaches of the Yellow River irrigation area, as well as Yanshi District of Luoyang City and Shanzhou District of Sanmenxia City, situated in the mountainous and hilly areas of the middle reaches of the Yellow River. Among of them, the Shanzhou District is determined as core subproject, and the remainings are non-core subprojects of Henan Province. All construction activities will be undertaken in the existing farmland.

河南省有四个子项目（Figure II-1）。四个子项目代表了黄河中下游地区不同的地理环境和农业产业结构。这些地区包括位于黄河下游灌区的开封市祥符区、焦作市武陟县，以及地处黄河中游山地丘陵区的洛阳市偃师区、三门峡市陕州区。其中，陕州区确定为核心子项目，其余为河南省非核心子项目。所有施工活动将在现有农田内进行。

Figure II-1: Location map of subprojects in Henan Province

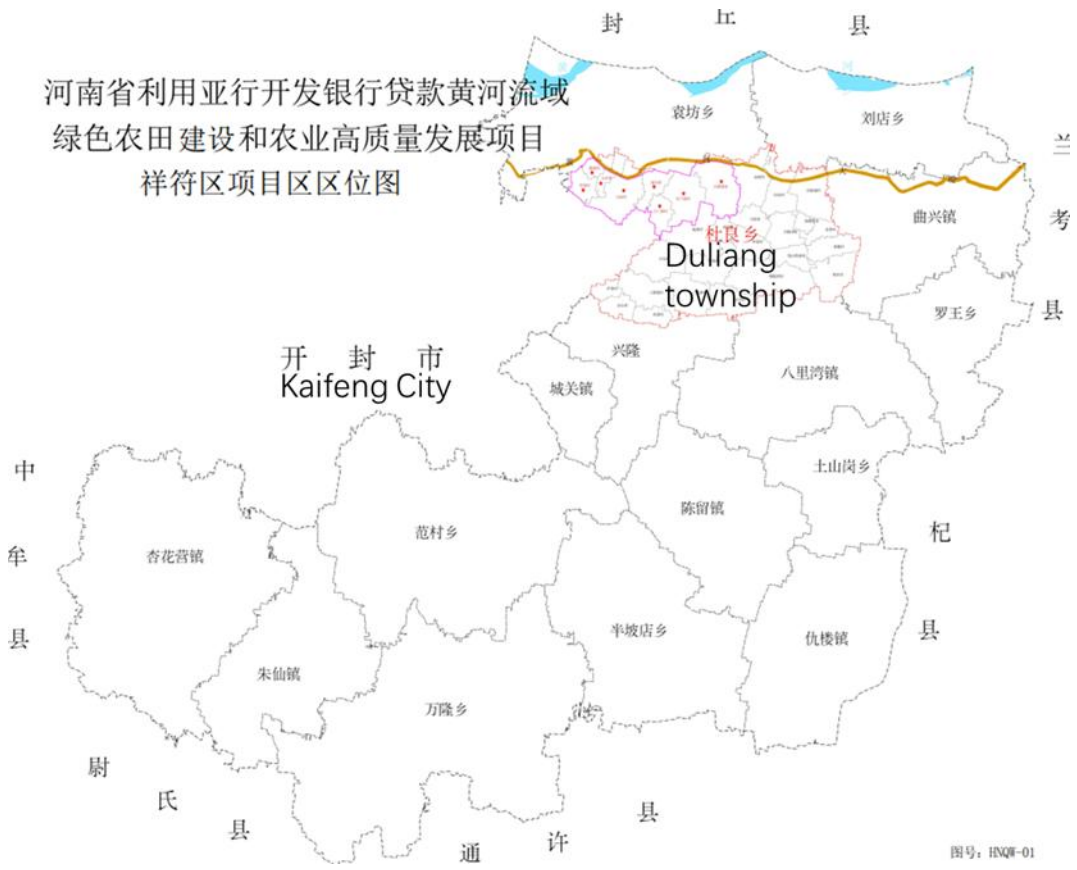
Figure II-1:河南省子项目位置图



Note: red area=subproject area; purple line=boundary of Henan province; 1=Shanzhou District; 2=Yanshi District; 3=Wuzhi County; 4=Xiangfu District.
Source: Feasibility Study Report, October 2022.
注：红色区域=子项目区域；紫线=河南省界；1=陕州区；2=偃师区；3=武陟县；4=祥符区。
来源：可研报告，2022 年 10 月。

In Yanshi District of Luoyang City, the subproject area encompasses 10 administrative villages in Guxian and Gaolong Townships, including Guxian Village, Miaowan Village, Duan Dong Village, Duan Xi Village, Liwan Village, and Gaolong Township's Puliu Village, Taohua Village, Zuocun Village, Guotun Village, and Datun Village. In Wuzhi County of Jiaozuo City, the subproject area covers 11 administrative villages in Qiaomiao Township: Dihe Village, Fengzhang Village, Huang Village, Liuzhuang Village, Maxuanzhai Village, Meng Village, Songling Village, Yangwa Yi Street, Yangwa Er Street, Yangwa San Street, and Zhang Village. In Xiangfu District of Kaifeng City, the subproject area includes 8 administrative villages in Duliang Town: Lizhai Village, Chenzhai Village, Xiaozhuang Village, Jiazhuang Village, Madian Village, Xiaomenzhai Village, Damengzhai Village, and Dakangzhai Village.
本项目位于洛阳市偃师区，涉及顾县镇、高龙镇的顾县村、苗湾村、段东村、段西村、李湾村和高龙镇的铺刘村、陶化村、左村村、郭屯村、大屯村共 10 个行政村。焦作市武陟县乔庙镇 11 个行政村邸郃村、冯丈村、黄村、刘庄村、马宣寨村、孟村、宋陵村、杨洼二街、杨洼三街、杨洼一街、张村。开封市祥符区杜良镇 8 个行政村陈寨村、大康寨村、大门寨村、家庄村、李寨村、马店村、小门寨村、小庄村。

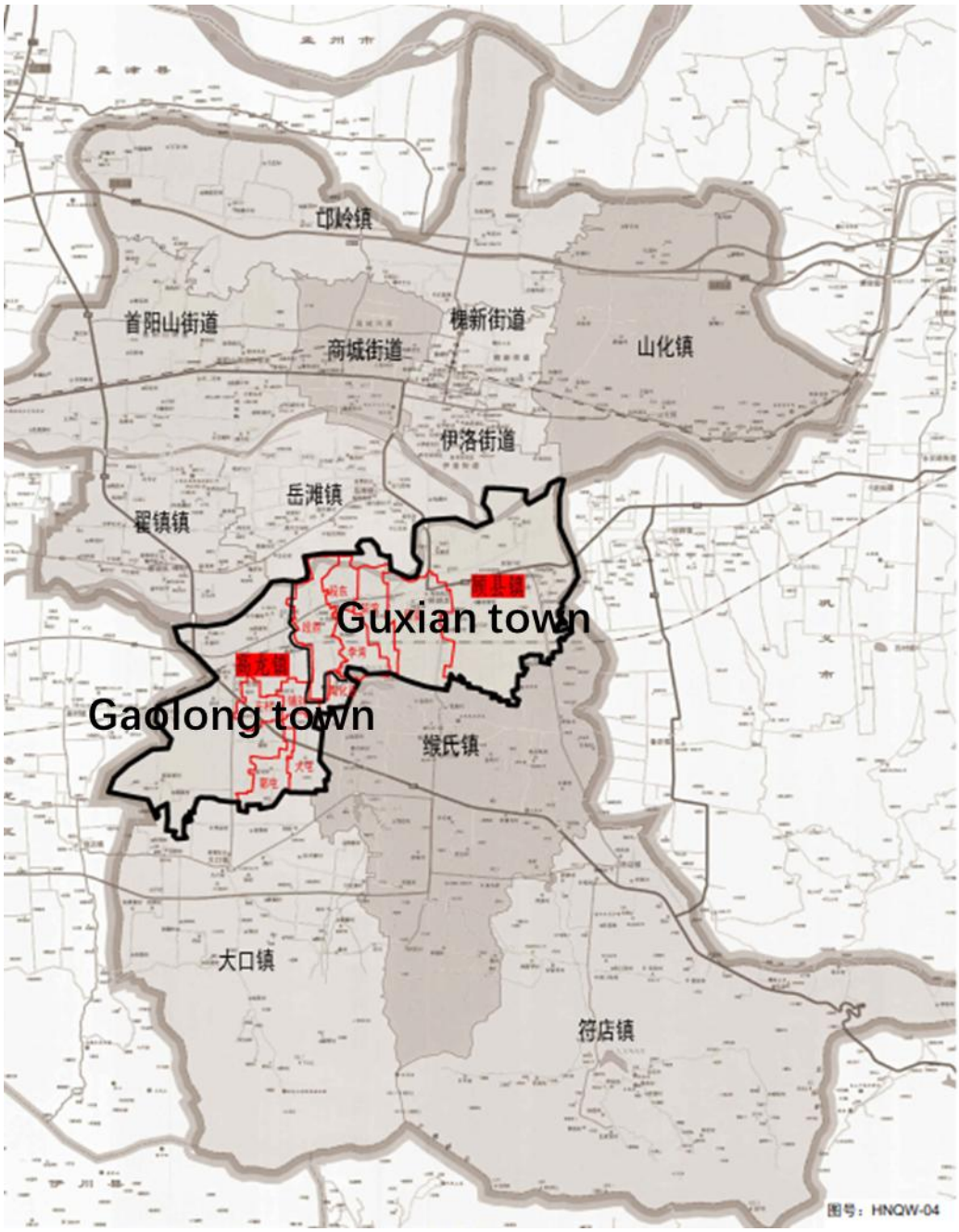
Figure II-2: Location map of Xiangfu subproject
Figure II-2:祥符子项目位置图



Note: purple line=subproject area　注：紫色线=子项目区域

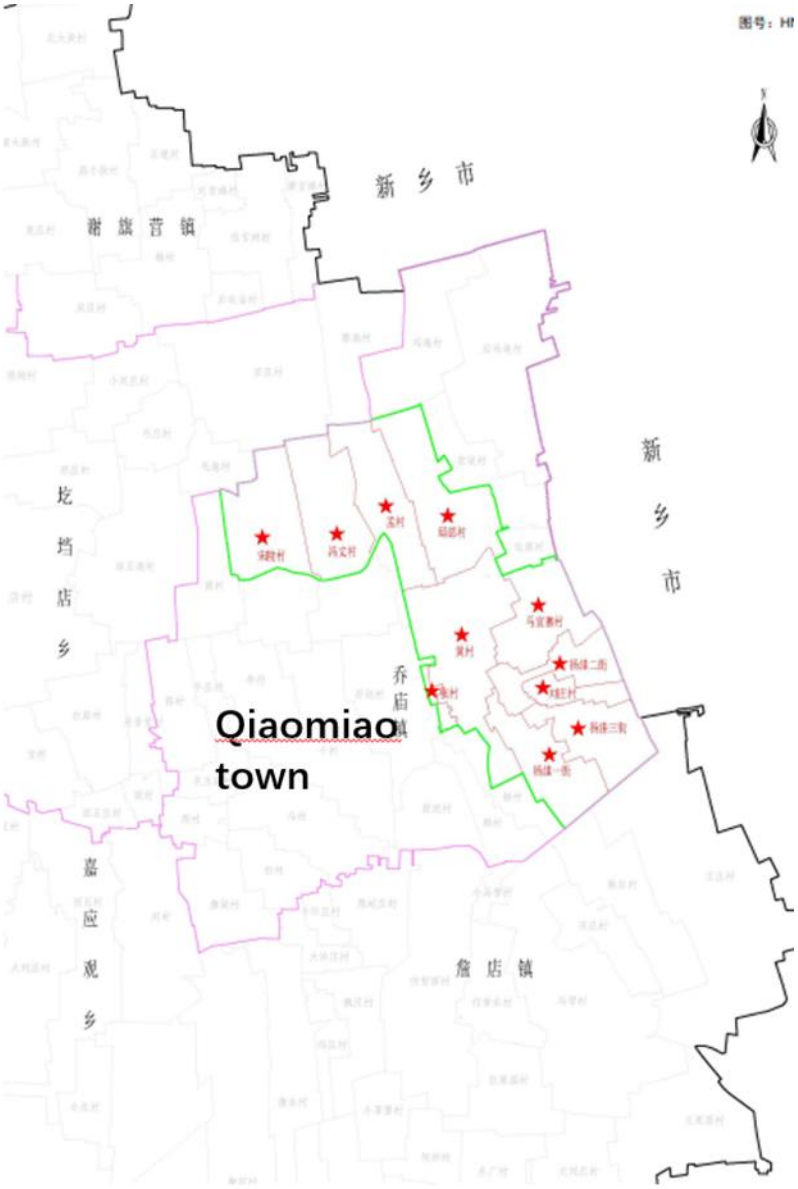
Source: local design institute (LDI), 2022.　资料来源：地方设计机构，2022 年。

Figure II-3: Location map of Yanshi subproject
Figure II-3:偃师子项目位置图



Note: Red line=subproject area　注：黄线=子项目区域
Source: LDI, 2022.　来源：地方设计机构，2022

Figure II-4: Location map of Wuzhi subproject
Figure II-4:武陟子项目位置图



Note: Red star=subproject village 注：红星=子项目村
Source: LDI, 2022. 来源：地方设计机构，2022

The subproject activities can be grouped into four components: (i) green and climate resilient farmland development; (ii) improvement of ecological environment; (iii) agricultural value chain development; and (iv) institutional capacity building. According to the preliminary design, the updates for the subproject activities are mainly as follows: (i) green and climate resilient farmland development. The land leveling area in Yanshi District has become 197.4 mu; The land leveling in Xiangfu District has been canceled; The the ecological drainage channel of Wuzhi has been changed to 23.64 km; The low-pressure pipeline irrigation area of the Yanshi District subproject has changed to 13,300 mu, and the sprinkler irrigation has changed to 6,700 mu; The length of concrete roads has been updated to18.49 km in Yanshi District, 10.88 km in Wuzhi, 32.07 km in Xiangfu ; The length of low-voltage power transmission lines (0.4 kV) has been updated to 65.6 km in Yanshi District and 3.51 km in Xiangfu District; The number of green farmland signs has been updated to 2 in Yanshi, 1 in Xiangfu, and 1 in Wuzhi.; The straw

returning area in Wuzhi has changed to 39,999.9 mu, and subsoiling area has changed to 19,999.95 mu. (ii) improvement of ecological environment. The number of fertigation pump stations and smart irrigation system in Yanshi District has both changed to 226 units. (iii) agricultural value chain development. The construction area of the organic fertilizer factory has been changed to 3866.64 m², and the production process has been updated.
子项目活动可分为四个部分：（i）绿色和具有气候适应性农田开发；（ii）改善生态环境；（iii）农业价值链发展；(iv)机构能力建设。根据初设，对三部分活动的更新主要如下：（i）绿色和具有气候适应性农田开发。偃师区土地平整面积变为 197.4 亩，祥符区取消土地平整；武陟子项目修复生态排水渠改为 23.64 公里；偃师区子项目低压管道灌溉面积变为 13300 亩，喷灌变为 6700 亩；田间道路更新为偃师区 18.49km、武陟 10.88km、祥符 32.07km；农田配电工程低压输电线路（0.4kv）更新为偃师区 65.6km、祥符区 3.51km；绿色农田标牌更新为偃师 2 块、祥符 1 块、武陟 1 块；农田质量提升变为武陟秸秆还田 39999.9 亩、深松 19999.95 亩。（ii）改善生态环境。偃师区水肥一体化泵站和智能灌溉系统均变为 226 套。（iii）农业价值链发展。有机肥厂土建工程面积变为 3866.64m²，对生产工艺进行了更新。

A. Green and climate resilient farmland development 绿色和气候适应性农田发展

- Land leveling: The subproject areas will adopt a localized leveling approach using field units as the basis, primarily utilizing mechanical leveling supplemented by manual labor. The leveled fields will achieve a relative height difference of no more than 5cm within each ridge, making the plots suitable for both gravity irrigation and mechanized operations. Land leveling will be conducted in a concentrated and contiguous manner. In plain areas, fields will be structured into square plots based on existing forest roads or larger drainage ditches to accommodate agricultural mechanization and field management requirements. In Xiangfu District and Wuzhi County, square plot areas will range from 200 to 400 mu, while in Yanshi District, they will range from 50 to 100 mu. In Wuzhi County, there is no land leveling involved. In Yanshi District, land leveling will cover an area of 197.4 mu.
  土地平整：子项目区采用以现场单元为基础的局部平整方式，以机械平整为主，人工为辅。平整后的田块，每垄相对高差不超过 5 厘米，既适合自流灌溉，也适合机械化作业。土地平整采取集中连片的方式进行。在平原地区，将根据现有的森林道路或较大的排水沟，将田地组织成正方形地块，以适应农业机械化和田间管理的要求。祥符区和武陟县的方形地块面积将在 200 至 400 亩之间，偃师区则在 50 至 100 亩之间。武陟县没有涉及土地平整。偃师区土地平整面积为 197.4 亩。
- Ecological irrigation and drainage channels: For Wuzhi subproject, the existing abandoned channels covering a length of 23.64 km will be restored. Following the standard of ecological permeable and green drainage channels, the drainage flow through culverts will be ≤1m³/s. The section will be equipped with ecological slope protection or grass brick slope protection, and the drainage standard will meet a frequency of 3 to 5 years for drainage events. In Xiangfu District, dredging will be carried out on existing channels covering a length of 25.14 kilometers. These channels will be designed with a uniform trapezoidal section to meet both the drainage requirements of once in ten years (five years for branch and feeder ditches) and the irrigation demands
  生态灌排渠道：武陟子项目恢复现有废弃渠道 23.64 公里。按照生态型透水绿化排水通道

标准，涵洞排水流量≤1m³/s。该路段将设置生态护坡或草砖护坡，排水标准将满足 3 至 5 年的排水事件频率。在祥符区，将对 25.14 公里长的现有渠道进行疏浚。这些渠道将设计为统一的梯形截面，以满足十年一遇的排水要求（支沟和支沟为五年）和灌溉需求。

- Water-saving irrigation: Yanshi District subproject will improve and upgrade 250 existing irrigation wells. Xiangfu District subproject will develop low-pressure irrigation pipes for 3200 mu farmland. Yanshi District subproject will develop low-pressure irrigation pipes for 13300 mu farmland, 6700 mu sprinkle irrigation.
  节水灌溉：偃师区子项目将改善和升级 250 眼现有的灌溉井。祥符区子项目将为 3200 亩农田开发低压灌溉管道。偃师区子项目将发展低压管道灌溉 13300 亩，喷灌 6700 亩
- Field roads: Constructing 18.49 km concrete roads in Yanshi, 10.88 km in Wuzhi and 32.07km in Xiangfu.
  田间道路：建设偃师硬化道路 18.49 公里，武陟 10.88 公里，祥符 32.07 公里。
- In Xiangfu District, one bridge is designed to be constructed. It is located over an irrigation branch canal southeast of Lizhai New Village and is intended for agricultural machinery operations. The bridge will have a span of 3 meters.
  祥符区设计待建桥梁 1 座。它位于李寨新村东南的一条灌溉支渠上，用于农业机械作业。这座桥将有 3 米的跨度。
- Rural power distribution: Constructing new low-voltage transmission lines (0.4kV) 65.5km in Yanshi, low-voltage transmission lines (0.4kV) 3.51 km in Xiangfu;
  农村配电：新建偃师低压输电线路（0.4KV）65.5 公里，祥符低压输电线路（0.4KV）3.51 公里；
- Green farmland signs: 2 sets in Yanshi, 1 sets in Xiangfu and 1 sets in Wuzhi.
  绿色农田标牌：偃师 2 块，祥符 1 块，武陟 1 块。

Improvement of farmland quality: straw returning for 39999.9 mu and subsoiling 19999.95 mu in Wuzhi.
农田质量提升：武陟秸秆还田 39999.9 亩，深松 19999.95 亩。

B. Improvement of ecological environment 改善生态环境

- Promotion of organic fertilizer 20,000 mu in Wuzhi, 59999.85 mu in Xiangfu and 20000 mu in Yanshi;
  推广有机肥武陟 2 万亩、祥符 59999.85 亩、偃师 2 万亩；
- Water and fertilizer integrated irrigation system: 10 sets of fertigation pump stations and smart irrigation system for Xiangfu; and 226 fertigation pump stations and 226 sets of smart irrigation system for Yanshi.
  水肥一体化灌溉系统：祥符 10 套水肥一体化泵站及智慧灌溉系统；为偃师建设 226 座水肥一体化泵站和 226 套智能灌溉系统。
- Pest control devices: 400 sets of solar insecticidal lamp for Wuzhi, 400 sets for Xiangfu and 200 sets for Yanshi; and promotion of biological pesticide control of 10000 mu fofr Yanshi.
  病虫害防治装置：武陟太阳能杀虫灯 400 套，祥符 400 套，偃师 200 套；并在偃师推广生物农药防治 1 万亩。

C. Agricultural value chain development 农业价值链发展

- Promotion of new wheat and rice varieties: 5250 mu for Xiangfu and 10000 mu for Yanshi.
  小麦和水稻新品种推广：祥符 5250 亩，偃师 1 万亩。
- Fruit and vegetable greenhouse: 39 mu for Wuzhi.
  果蔬大棚：武陟 39 亩。
- Qiaomiao organic fertilizer plant: 3866.64 m^2. This project's products include powdered and cylindrical granular bio-organic fertilizers. The processing involves two stages: harmless aerobic fermentation and organic fertilizer production. Aerobic fermentation uses a large-span turntable mixer, and the moisture content of the material after fermentation and maturation will be reduced to below 30%. Purchased raw materials and auxiliary materials are transported to the fermentation workshop in the factory using sealed transport vehicles for direct mixing. The processing is as below:
  乔庙有机肥厂:3866.64 平方米。本项目产品包括粉状和圆柱颗粒生物有机肥，处理过程分为无害化好氧发酵及有机肥加工两个阶段。好氧采用大跨度轮盘翻抛机，经发酵陈化后的物料水分将至 30%以下。外购原材料和辅料由密闭运输车运至厂区发酵车间直接卸货。处理过程如下:

  Powdered Bio-Organic Fertilizer Production Process:
  粉状生物有机肥生产工艺：
  a. Proportioning. Purchased animal manure is transported to the factory fermentation workshop by a sealed transport vehicle and directly processed. Purchased mushroom residue, rice bran, straw, sawdust, and other auxiliary materials are temporarily stored in the auxiliary material storage area of the aging workshop. A loader is used to deliver animal manure and auxiliary materials into the fermentation trough.
     配料。外购动物粪便由密闭运输车运至厂区发酵车间直接开始加工。外购的蘑菇渣、稻糠、秸秆、锯末等辅料暂存在陈化车间辅料暂存区。利用铲车将动物粪便和辅料送入发酵槽内。
  b. Turn and toss for fermentation. A large-span trough-type rotary Turner is used for the harmless aerobic fermentation and aging of materials. In the first 1 to 3 days of the initial stage of composting, because the oxygen content of the material itself can meet the needs of the microbial bacteria, the aerobic microbial bacteria first decompose the perishable matter, then absorb the carbon/nitrogen nutrients of the decomposed organic matter, regardless of the nutrients for bacterial reproduction, the rest of the nutrients are decomposed into carbon dioxide and water, and at the same time, the heat is released to raise the temperature of the compost. When the temperature is 25-45 ℃, the mesophilic bacteria and microorganisms are more active; with the continuous increase of the pile temperature, when the temperature is 45-65 ℃, the thermophilic microorganisms such as thermophilic bacteria and actinomycetes gradually occupy the dominant position and are decomposed, and humus begins to form. Practice has proved that when the composting temperature is above 60 ℃ for three days, the parasitic eggs and pathogenic bacteria in the compost can be killed, and the purpose of harmless composting can be achieved. The process of temperature rising gradually from low temperature to high temperature is the harmless treatment process of composting. The compost was maintained at high temperature (45-65 ℃) for 10 days, and the pathogenic bacteria and insect eggs were killed. When the temperature of compost rises to above 60 ℃, it shall be kept for 48 hours before turning and throwing (but when the temperature exceeds 70 ℃, it shall be turned and thrown immediately, and the temperature of compost shall not exceed 70 ℃, otherwise it will cause the dormancy or even death of beneficial microorganisms). When turning and throwing, it must be uniform and thorough, so as to fully decompose. Generally, it can be turned over once every two

days to provide oxygen, dissipate heat and make the material ferment evenly. At the same time, the fermentation workshop is equipped with a segmented intelligent aeration system, which can aerate in stages according to the needs in the process of turning, increase the oxygen content and improve the fermentation effect. The oxygen content of the pile weight is kept between 5 and 15%. The fermentation process (including turning and throwing) of this project is about 10 days, and the moisture content of materials will be about 32% after fermentation.

翻抛发酵。采用大跨度槽式轮盘翻抛机进行物料的无害化好氧发酵及陈化。在堆肥初始阶段的 1-3 天，由于物料自身含氧基可以满足微生物菌需要，好氧微生物菌首先分解易腐质，然后吸取其分解有机物的碳/氮营养成分，不分营养成分用于细菌自身繁殖，其余营养成分被分解为二氧化碳和水，同时放出热量使堆温上升。当温度处于 25-45℃时，中温菌微生物比较活跃；随着堆温不断升高，当温度处于 45-65℃时，高温微生物如嗜热菌、放线菌等逐渐占据主导地位，被分解，腐殖质开始形成。实践证明，堆肥温度在 60℃以上三天，就能杀死无聊中寄生虫卵、病原菌，达到堆肥无害化目的。温度由低温向高温逐渐升高的过程是堆肥无害化的处理过程。堆肥在高温（45-65℃）维持 10 天，病原菌、虫卵等均被杀死。堆肥温度上升到 60℃以上，保持 48 小时后开始翻抛（但当温度超过 70℃时须立即翻抛，堆肥温度不宜超过 70℃，否则就会造成有益微生物菌的休眠甚或死亡），翻抛时务必均匀彻底，以便充分腐熟。一般每二天可翻抛一次，以提供氧气、散热和使物料发酵均匀。同时发酵车间配有分段智能曝气系统，在翻抛过程中根据需要进行分阶段曝气，增加氧气含量，改善发酵效果。堆体重的含氧量保持在 5-15%之间。本项目发酵过程（含翻抛）约为 10 天，发酵结束后物料含水率将至 32%左右。

c. Aging (secondary fermentation). On the basis of fermentation, with the decrease of compost temperature, the mesophilic microorganisms begin to be active again, the compost enters the secondary fermentation, and the fermented mixture is moved to the aging workshop by forklift. The aging period is about 10-15 days, during which the forklift is used to turn over once a day. After aging, the temperature will gradually drop. When the temperature drops to about 40 ℃, the compost will be decomposed and the secondary fermentation will end. The characteristics of the decomposed organic compost are as follows: the temperature drops naturally in the later stage of composting, there is no odor, the texture is soft, the volume is reduced, the color is dark brown or black brown, and the insect eggs are dead; the moisture content of the decomposed organic fertilizer is about 27%.

   陈化（二次发酵）。在发酵基础上，随着堆肥温度的下降，中温微生物菌又开始活跃起来，堆肥进入二次发酵，将发酵好的混合料利用铲车移至陈化车间堆放。陈化期为 10-15 天左右，期间每天利用铲车翻动一次。陈化后温度会逐渐下降，当温度下降到 40℃左右，堆肥腐熟，二次发酵结束。腐熟的有机堆肥的表现特征为：堆肥后期温度天然下降，无臭味，质地松软，体积缩小，呈深褐色或黑褐色，虫卵死亡；腐熟的有机肥水分含水量约为 27%。

d. Crush. The aged materials are sent to the belt frequency conversion silo in the workshop by forklift. The feeding port of the silo is arranged underground and enclosed on three sides. After passing through the iron removal device, the materials are sent to the vertical crusher through the fully sealed belt conveyor, and the large granular fertilizer is crushed into fine particles by the vertical crusher.

   粉碎。利用铲车将陈化好的物料送至车间的皮带变频料仓上，料仓给料口地下布置，三面围挡。物料通过全密封皮带输送机经过除铁装置后送入立式粉碎机，通过立式粉碎机将大颗粒肥料粉碎为细小颗粒。

e. Screening. Aft being crus, that fertilizer is conveyed to a roller screen machine through a fully-sealed belt conveyor to screen out large particles and return to a vertical crusher to be crushed again, and the fertilizer with qualified particle size (the particle size is less than 8mm) is conveyed to a batching cabin body through the

fully-sealed belt conveyor.
筛分。经过粉碎后肥料通过全密封皮带输送机送入滚筒筛分机将大颗粒筛出并返回立式粉碎机再次粉碎，粒径合格肥料（粒径小于 8mm）通过全密封皮带输送机送入配料舱体。

f. Proportioning. The purchased bacteria powder is added into the biological bacteria adding device, and the self-proportioning is carried out according to a certain proportion by the belt continuous proportioning scale.
配料。将外购的菌粉投加至生物菌添加装置内，通过自带的皮带连续配料秤按照一定比例进行自行配料。
g. Blend. The prepared materials are conveyed to a double-shaft mixer through a belt to be uniformly mixed, and are conveyed to a finished product bin through a fully-sealed belt conveyor.
混合。将配好的物料通过皮带输送至双轴混合机内混合均匀，通过全密封皮带输送机送入成品仓。
h. Packaging. Packing is carried out by a packing machine according to 40kg/bag, and the packed finished products are put into storage for sale.
包装、成品。通过包装机进行打包，按照 40kg/袋进行打包，打包好的成品入库待售。

Production process of cylindrical granular bio-organic fertilizer(The production process for cylindrical granular bio-organic fertilizer is consistent with that of powdered organic fertilizer from steps a to e, so it will not be elaborated here. The following describes the process from proportioning to packaging.):
圆柱颗粒状生物有机肥生产工艺（圆柱颗粒状生物有机肥前段生产工艺与粉状有机肥生产工艺的 a-e 一致，因此不再阐述。以下从配料至包装的工艺）：

f. Proportioning. The purchased N, P and K fertilizers and humic acid are put into the bin bodies of the four groups of batching scales, and the batching is carried out by the belt continuous batching scale of the equipment according to a certain proportion according to the product requirements.
配料。将外购的 N、P、K 肥和腐殖酸投入至四组配料秤的仓体，通过设备自带的皮带连续配料秤根据产品需求按照一定比例进行配料。
g. Blend. The prepared materials are conveyed to a double-shaft mixer through a belt to be uniformly mixed.
混合。将配好的物料通过皮带输送至双轴混合机内混合均匀。
h. Granulation. The mixed materials are conveyed to a drum screening machine by a belt conveyor to be screened. After screening, the qualified materials (particle size 2-4mm) are conveyed to the packaging machine by the closed belt, and the unqualified materials (particle size > 4 mm or particle size < 2 mm) are returned to the crusher by the closed belt conveyor for re-crushing.
造粒。将混合好的物料通过皮带输送机送至滚筒筛分机内对物料进行筛分。筛分后的合格物料（粒径 2-4mm）经密闭皮带输送至包装机内，不合格物料（粒径＞4mm 或粒径＜2mm）通过密闭皮带输送机返回粉碎机内重新粉碎。
i. Packaging. Packing is carried out by a packing machine according to 40kg/bag, and the packed finished products are put into storage for sale.
包装、成品。通过包装机进行打包，按照 440kg/袋进行打包，打包好的成品入库待售。

D. Institutional capacity building 机构能力建设

This non-structural component will comprise: training and study tour; technology promotion for farmers; publicity (e.g., information dissemination) and promotion through media and

publications; and establishment of monitoring system, including farmland quality monitoring, water and soil conservation monitoring, irrigation water monitoring, agricultural pollution source monitoring and agricultural pest monitoring.
这一非结构性部分将包括：培训和考察旅行；农民技术推广；通过媒体和出版物进行宣传（如信息传播）和推广；建立耕地质量监测、水土保持监测、灌溉用水监测、农业污染源监测、农业有害生物监测等监测体系。

E. Due Diligence of the Associated/Existing Facilities 相关/现有设施的尽职调查

The project due diligence considered two types of facilities per ADB's SPS: (i) associated facilities – those which are not funded by the project but whose viability and existence depend exclusively on the project and whose operation and services are essential for the successful operation of the project; and (ii) existing facilities – those which are already established and will be necessary for the project operations, but whose operation does not depend on the project and therefore do not meet the SPS definition of associated facility. These existing facilities are not part of the project scope and will not be subject to any ADB-funded construction, operation, upgrade, rehabilitation, or other activities.
根据亚洲开发银行的 SPS，项目尽职调查考虑了两种类型的贷款：（i）相关贷款-不是由项目提供资金，但其可行性和存在完全取决于项目，并且其运营和服务对项目的成功运营至关重要；和（ii）现有设施——那些已经建立并将为项目运营所必需的设施，但其运营不依赖于项目，因此不符合 SPS 对相关设施的定义。这些现有设施不属于项目范围的一部分，也不会受到亚洲开发银行资助的任何建设、运营、升级、修复或其他活动的影响。

The current earth roads will be paved with concrete. Commercial concrete will be purchased. No quarry will be involved. The waste agricultural film and plastic irrigation pipes generated during operation will be collected and sold to domestic recycling companies/agencies.The facilities provide gravels and waste plastics recycling services are identified as existing facilities. In this phase of the project, it's not feasible to determine specific sources for sand and gravel or identify recycling vendors for plastic agricultural film due to the wide availability and variety of these goods and services in the market. For the farmland power transmission lines, the design of the transmission and distribution lines for the project requires expertise from a specialized electrical engineering institute. Currently, the specifics of how these lines will connect to the existing power grid remain unclear. Due to this uncertainty, it is not possible at this stage to definitively identify any facilities related to the transmission lines as either associated facilities or existing facilities as defined under the relevant guidelines. During the detailed design stage, the in deep due diligence will be conducted on that matter and the findings will be reflected in the EMR, as needed.
目前的土路将用混凝土铺设。将购买商品混凝土。不涉及采石场。运营期间产生的废旧农膜和塑料灌溉管道将被收集并出售给国内回收公司/机构。提供砾石和废塑料回收服务的设施被确定为现有设施。在项目的这一阶段，由于市场上这些商品和服务的广泛可用性和多样性，确定沙子和砾石的具体来源或确定塑料农膜的回收供应商是不可行的。对于农田输电线路，项目的输电和配电线路设计需要专业电气工程研究所的专业知识。目前，这些线路将如何连接到现有电网的具体细节仍不清楚。由于这种不确定性，现阶段不可能明确地将与输电线路有关的任何设施确定为相关指南中定义的关联设施或现有设施。在详细设计阶段，将对该事项进行深入尽职调查，调查结果将根据需要反映在环境监测报告中。

III. DESCRIPTION OF THE ENVIRONMENT 环境描述

This section updates the environmental baseline data and the satellite images of the new site of the Wuzhi sub-project organic fertilizer plant based on the domestic EIA .
本章节根据武陟子项目有机肥厂新厂址国内环评，更新了环境基线数据，更新了有机肥厂卫星图。

A. Xiangfu Subproject 祥符子项目

1. Physical Setting 地理位置

Location. Xiangfu District is located in the eastern part of Henan Province and the central-northern part of Kaifeng City, between 34° 30′ to 34° 55′ north latitude and 114° 08′ to 114° 44′ east longitude. It borders 7 counties (districts): to the east are Lankao County and Qi County, to the south are Weishi County and Tongxu County, to the west are Yuwangtai District and Zhongmu County of Zhengzhou City, and to the north it faces the Yellow River and Feixiu County of Xinxiang City. The total area of the district is 1302 square kilometers, with the longest north-south distance being 40.8 kilometers and the longest east-west distance being 55 kilometers

位置。祥符区位于河南省东部，开封市中北部，地处北纬 34° 30′ ~34° 55′ ，东经 114° 08′ ~114° 44′ 之间。与 7 个县（区）接壤：东与兰考县、淇县接壤，南与尉氏县、通许县接壤，西与禹王台区、郑州市中牟县接壤，北与黄河、新乡市飞秀县相望。全区总面积 1302 平方公里，南北最长 40.8 公里，东西最长 55 公里。

Topography and Terrain. Xiangfu District is located in the central part of the Eastern Henan Plain, south of the Yellow River. It belongs to the alluvial fan plain of the Yellow River, covered by the loose layers of the fourth generation, with sediment reaching depths of 300-500 meters. The terrain slopes from northwest to southeast, with the area north of the Yellow River dyke being high terraces and the area south being backwater depressions. The western and southern parts are depressions, while the central and eastern parts have flat terrain. The landforms include Yellow River accumulation terraces, wind-blown sand dunes, Yellow River alluvial plains, and Yellow River alluvial lowlands. The highest point is located in the former sandbank, at an elevation of 89.3 meters; the lowest point is located south of Goucun, at an elevation of 62.5 meters.

地形和地势。祥符区位于豫东平原中部，黄河以南。属黄河冲积扇平原，第四代松散层覆盖，泥沙深达 300-500 米。地势自西北向东南倾斜，黄河大堤以北为高阶地，以南为回水洼地。西部和南部为洼地，中部和东部地势平坦。地貌类型有黄河堆积阶地、风积沙丘、黄河冲积平原、黄河冲积低地等。最高点位于前沙洲，海拔 89.3 米；最低点位于苟村以南，海拔 62.5 米。

Climate. Xiangfu District has a warm temperate continental monsoon climate. Its characteristics include dry and windy springs, hot and rainy summers, cool autumns with large temperature differences, and cold winters with little rain or snow.The district has an average annual frost-free period of 214 days, an average annual sunshine duration of 2267.6 hours, and an average annual sunshine rate of 51%. The total annual solar radiation is 114.8 kcal/cm², with a photosynthetically active radiation of 50.2 kcal/cm².The average annual temperature in Xiangfu District is 14°C, with extreme minimum temperatures reaching -16°C and extreme maximum temperatures reaching 42.9°C. The continuous period with temperatures above 0°C is 305 days per year, and the continuous period with temperatures above 5°C is 255 days per year.The average annual precipitation in Xiangfu District is 627.5 millimeters, with summer precipitation accounting for 64.9% of the total annual precipitation.

气候。祥符区属暖温带大陆性季风气候。其特点包括春季干燥多风，夏季炎热多雨，秋季凉爽温差大，冬季寒冷少雨少雪。全区年均无霜期 214 天，年均日照时数 2267.6 小时，年均日

照率 51%。年太阳辐射总量为 114.8 千卡/平方厘米，光合有效辐射为 50.2 千卡/平方厘米。祥符区年平均气温为 14°C，极端最低气温可达-16°C，极端最高气温可达 42.9°C，气温在 0°C 以上的持续天数为 305 天/年，气温在 5°C 以上的持续天数为 255 天/年。祥符区年平均降水量为 627.5 毫米，夏季降水量占全年降水量的 64.9%。

Hydrology. The rivers in Xiangfu District belong to the Yellow River and Huai River basins. The Yellow River basin covers an area of 284.7 square kilometers, accounting for 4.5% of the total basin area, while the Huai River basin covers an area of 5984.3 square kilometers, accounting for 95.5% of the total basin area. The main rivers include the Yellow River, Huai River, Jialu River, and Yunliang River, among others.
水文学。祥符区境内河流属黄淮流域。黄河流域面积 284.7 平方公里，占全流域面积的 4.5%，淮河流域面积 5984.3 平方公里，占全流域面积的 95.5%。主要河流有黄河、淮河、贾鲁河、运粮河等。

Soil. In the eastern and northeastern parts of Xiangfu District, the predominant soil type is tidal soil, accounting for 81.16% of the total soil area. Due to multiple floods of the Yellow River, the soil is characterized by alternating layers of sand and clay. Brown soil transitional to tidal soil is mainly distributed in areas like Xijiangzhai, Zhuxian Town, Wanlong, and Fancun. The western and southwestern sandy areas are primarily composed of wind-blown sand soil, with poor fertility and mainly low to medium-yield fields.
土壤。祥符区东部和东北部以潮土为主，占土壤总面积的 81.16%。由于黄河多次泛滥，土壤呈现出砂土和粘土交替的特点。向潮土过渡的棕壤主要分布在西姜寨、朱仙镇、万龙、樊村等地区。西部和西南部沙区以风沙土为主，肥力较差，以中低产田为主。

2. Social and Economic Conditions 社会经济状况

In 2022, the total gross domestic product (GDP) of Xiangfu District reached 318.55 billion CNY, marking a growth of 4.4% compared to the previous year. The value added of the primary industry amounted to 71.56 billion CNY, with a growth rate of 5.2%. The secondary industry contributed 121.77 billion CNY, showing an increase of 6.2%. Meanwhile, the value added of the tertiary industry was 125.21 billion CNY, indicating a growth of 2.3%. The structure of the three industries stood at 22.5:38.2:39.3.

By the end of 2022, the permanent resident population of the entire district reached 662,000, with a marginal increase of 0.01 million compared to the previous year, among which the urban permanent population amounted to 273,400. The urbanization rate of the permanent population was 41.30%.

The total planting area for grains in the district was 10.8 million hectares. This included 63.50 thousand hectares for wheat, 31.70 thousand hectares for corn, and 120 hectares for cotton. Additionally, the planting area for oil crops was 27.61 thousand hectares, with peanuts accounting for 26.93 thousand hectares. The vegetable planting area was 39.26 thousand hectares.

Du Liang Town covers a total area of 102.04 square kilometers and is administratively divided into 31 villages with 76 natural villages, accommodating a total population of 72,693 people. The township boasts 83,000 mu (5,533.33 hectares) of arable land, primarily situated in the Yellow River Liuyuankou Irrigation District, benefiting from the intricate network of irrigation channels from the Yellow River. The main crops cultivated include rice and wheat, with rice being particularly renowned, making it the primary source of Kaifeng's rice production.

The subproject area is distributed across eight villages: Chenzhai Village, Dakangzhai Village, Damengzhai Village, Jiazhuang Village, Lizhai Village, Madian Village, Xiaomenzhai Village, and Xiaozhuang Village. These villages collectively house a resident population of 17,321

people and cultivate a total arable land area of 25,610 mu (1,707.33 hectares), along with 268.01 mu (17.87 hectares) of forest land. The area dedicated to cereal crops covers 1,838 mu (122.53 hectares), while aquaculture occupies 345 mu (22.97 hectares).

2022 年，祥符区实现地区生产总值（GDP）3185.5 亿元，同比增长 4.4%。第一产业增加值 715.6 亿元，增长 5.2%。第二产业 1217.7 亿元，增长 6.2%。第三产业增加值 1252.1 亿元，增长 2.3%。三次产业结构为 22.5:38.2:39.3。

截至 2022 年底，全区常住人口达到 66.2 万人，比上年增加 1 万人，其中城镇常住人口 27.34 万人。常住人口城镇化率 41.30%。

全区粮食种植面积达 1080 万公顷。其中小麦种植面积为 63.5 万公顷，玉米种植面积为 31.7 万公顷，棉花种植面积为 120 公顷。此外，油料作物种植面积 27.61 千公顷，其中花生种植面积 26.93 千公顷。蔬菜种植面积 39.26 千公顷。

杜良镇总面积 102.04 平方公里，辖 31 个村，76 个自然村，总人口 72693 人。全乡耕地面积 8.3 万亩（5533.33 公顷），主要位于黄河柳园口灌区，受益于黄河灌溉渠道的复杂网络。种植的主要作物包括水稻和小麦，其中水稻尤为著名，是开封水稻生产的主要来源。

子项目区分布在陈寨村、大康寨村、大门寨村、贾庄村、李寨村、马店村、小门寨村、小庄村 8 个村。这些村庄共有常住人口 17321 人，耕地总面积 25610 亩（1707.33 公顷），林地 268.01 亩（17.87 公顷）。粮食作物面积 1838 亩（122.53 公顷），水产养殖面积 345 亩（22.97 公顷）。

3. Physical Cultural Resources 物质文化资源

No physical cultural resources have been documented in the subproject area of influence as confirmed by the Bureau of Cultural Relics of Kaifeng City. Should buried artifacts of archaeological significance be uncovered during the construction stage within the subproject areas, construction will be immediately stopped and reported to the local cultural bureau.
经开封市文物局确认，子项目影响区内无物质文化资源记载。如果在施工阶段，在子项目区域内发现具有考古意义的埋藏文物，应立即停止施工，并向当地文化局报告。

4. Environmental Baseline 环境基线

The environmental monitoring data was cited from publicly accessible information published in the Environmental Quality Bulletin by the Kaifeng City Ecology and Environment Bureau for the yearsof 2022 and 2023[6].
环境监测数据引自开封市生态环境局 2022 年和 2023 年环境质量公报中公开发布的信息。

Surface water. The largest river in Duliang Town is the Yuni River. According to the water quality evaluation results[7], the permanganate index, ammonia nitrogen, and total phosphorus of the Yuni River are 4.84 mg/L, 0.60 mg/L and 0.14 mg/L, meeting the Class III water quality standard stipulated in GB3038-2002, which are 10 mg/L, 2 mg/L and 0.2 mg/L respectively .
地表水。杜良镇最大的河流是淤泥河。根据水质评价结果 6F6F 淤泥河高锰酸盐指数为 4.84mg/L，氨氮为 0.60mg/L，总磷为 0.14mg/L，满足 GB3038-2002 中Ⅲ类水质标准，分别为 10mg/L、2mg/L、0.2mg/L。

Acoustic environment. The Xiangfu District subproject is located in rural areas. There are no other sources of acoustic environmental pollution except occasional traffic noise. Based on

[6] http://sthjj.kaifeng.gov.cn/
[7] http://sthjj.kaifeng.gov.cn/uploads/files/2024-02-19/65d2b00460eef.pdf

these existing conditions and the relatively limited scope and short-term duration of works under Xiangfu District subproject, quantitative baseline sampling was not necessary.
声环境。祥符区子项目位于农村地区。除偶尔出现的交通噪声外，无其他声环境污染源。基于这些现有条件以及祥符区子项目下相对有限的工程范围和短期持续时间，无需进行定量基线取样。

Air quality. According to the results of regular air quality monitoring conducted by the Xiangfu District Ecology and Environment Bureau, in 2022, the average annual concentrations of sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), and ozone (O_3) over 24 hours met the requirements of the Class 2 standards. However, the annual average concentrations of particulate matter (PM_{10} and $PM_{2.5}$) exceeded the Class 2 standard requirements. The subproject area is in the rural area of Xiangfu District. No industrial pollution source in the subproject area.
空气质量。根据祥符区生态环境局空气质量定期监测结果，2022 年，二氧化硫（SO2）、二氧化氮（NO2）、一氧化碳（Co）、臭氧（O3）24 小时年均浓度均符合二级标准要求。但可吸入颗粒物（PM10 和 PM2.5）的年均浓度超过二级标准要求。子项目区位于祥符区农村。子项目区域内无工业污染源。

Table III-1: Air quality of Xiangfu District (2022)
Table III-1: 祥符区空气质量状况（2022）

Year 年	PM_{10} ($\mu g/m^3$) Annual average 年平均值	$PM_{2.5}$ ($\mu g/m^3$) Annual average 年平均值	SO_2 ($\mu g/m^3$) Annual average 年平均值	NO_2 ($\mu g/m^3$) Annual average 年平均值	CO (mg/m^3) 95th percentile of the daily mean 日平均值的第 95 个百分位数	O_3 ($\mu g/m^3$) 90th percentile concentration of the daily maximum 8-hour mean 日最大 8 小时平均值的第 90 个百分位数浓度
2022	114	55	9	30	0.7	97
Class 2 of GB3095-2012	70	35	60	40	4	160

Source: Xiangfu District Ecology and Environment Bureau
来源：祥符区生态环境局

Soil. Soil quality monitoring will be conducted as part of the subproject activities. Monitoring indicators include soil nutrient content, organic matter, pesticide residues and heavy metals.
土壤。土壤质量监测将作为子项目活动的一部分进行。监测指标包括土壤养分含量、有机质、农药残留和重金属等。

5. Ecological Environment 生态环境

The subproject sites are located within a modified agricultural ecosystem with planted farmland protection shelterbelt. There is no protected area or nature reserves, key biodiversity area within a 20 km radius from the subproject area of Xiangfu. Xiangfu District Subproject activities do not encroach or are located within declared ecological red lines.
子项目地点位于改良的农业生态系统内，种植了农田防护林。在祥符子项目区域 20 公里半径范围内，没有保护区或自然保护区、生物多样性关键区。祥符区的子项目活动未侵占或位于已宣布的生态红线内。

Figure III-1 Current status of the subproject site (Xiangfu County Subproject)

Figure III-1 子项目现场现状（祥符区子项目）

	
Existing farmland 现有农田	Existing farmland 现有农田

Source: LDI, 2022. 来源：地方设计机构，2022

B. Yanshi District Subproject 偃师区子项目

1. Physical Settings 地理位置

Location. Yanshi District is located in the eastern corner of the Luoyang Basin in the central-western part of Henan Province, between 112°26'15" to 113°00'00" east longitude and 34°27'30" to 34°50'00" north latitude. It borders Gongyi City to the east, and is adjacent to Luolong District and Mengjin District of Luoyang City to the west. It leans against Mount Song in the south, connecting with Dengfeng City and Yichuan County, and faces Mengzhou City across the Yellow River to the north. The total area of the district is 668.58 square kilometers.
位置。偃师区位于河南省中西部洛阳盆地东隅，地处东经 112° 26'15 “至 113° 00'00 ”，北纬 34° 27'30 “至 34° 50'00 ”之间。东与巩义市接壤，西与洛阳市洛龙区、孟津区毗邻。南倚嵩山，与登封市、伊川县相连，北与孟州市隔黄河相望。全区总面积 668.58 平方公里。

Topography and Terrain. Yanshi District features high terrain in the north and south, with lower elevation in the middle, and is divided into four types: mountainous areas, hills, slopes, and plains. In the south is Wanan Mountain, with its elevation gradually decreasing from east to west, ranging from 300 to 900 meters, with the highest peak reaching 1302 meters, covering 16.72% of the total area. To the north of Wanan Mountain are hills and alluvial slopes, with elevations ranging from 150 to 400 meters, covering 35.71% of the total area. In the central part is the alluvial plain of the Yi and Luo rivers, with flat terrain and elevations ranging from 115 to 135 meters, covering 31.37% of the total area. In the north is Mangshan Hills, running east-west with prominent ridges, elevations ranging from 140 to 300 meters, and the highest peak reaching 403.9 meters, covering 16.2% of the total area.
地形和地势。偃师区地势南北高，中部低，分为山地、丘陵、坡地、平原四种类型。南部是万安山，海拔由东向西逐渐降低，从 300 米到 900 米不等，最高峰达 1302 米，占总面积的 16.72%。万安山以北为丘陵和冲积坡地，海拔 150—400 米，占总面积的 35.71%。中部为伊、洛河冲积平原，地势平坦，海拔 115—135 米，占总面积的 31.37%。北部是邙山丘陵，东西走向，山脊突出，海拔 140-300 米，最高峰 403.9 米，占总面积的 16.2%。

Climate. Yanshi District is located in the transitional zone from the northern subtropical zone to the warm temperate zone, with distinct four seasons. The average annual temperature ranges from 12.2°C to 24.6°C, with a frost-free period of more than 210 days. The annual

precipitation ranges from 528 mm to 800 mm, with annual sunshine hours of 2200 to 2300, and average humidity of 60% to 70%.

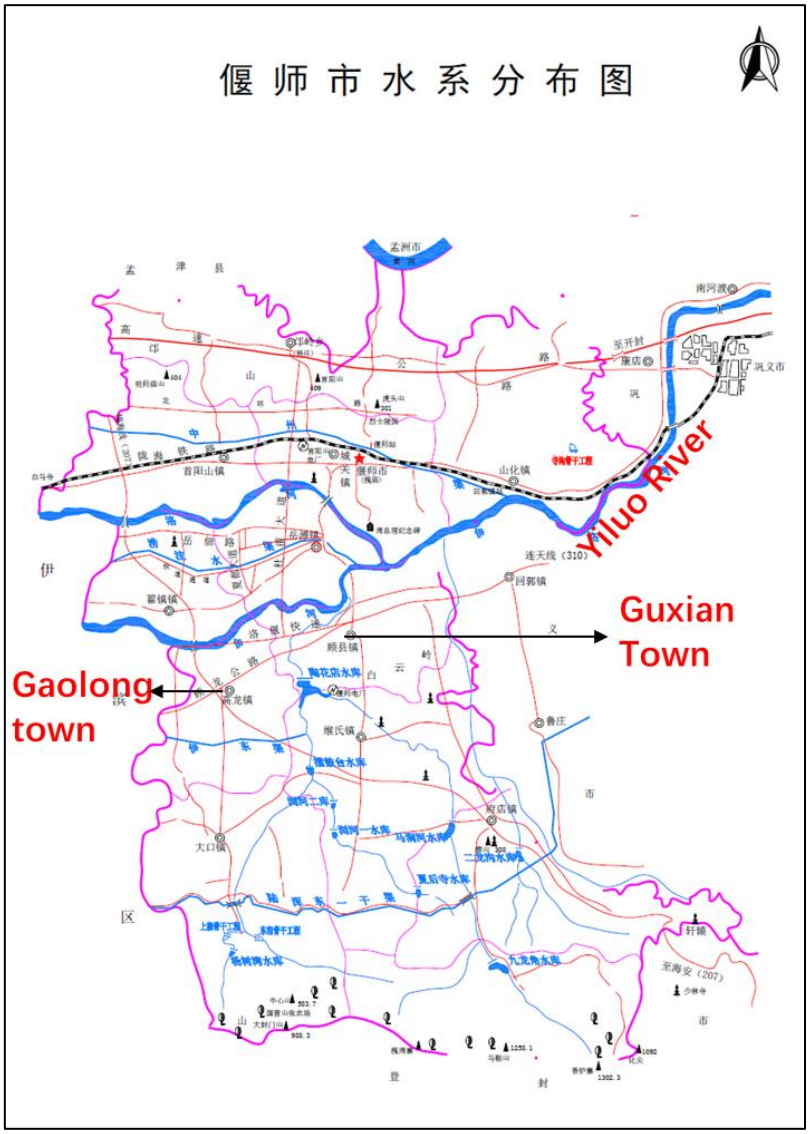
气候。偃师区地处北亚热带向暖温带过渡地带，四季分明。年平均气温在 12.2° C 至 24.6° C 之间，无霜期超过 210 天。年降水量 528~800 毫米，年日照时数 2200~2300 小时，平均湿度 60%~70%。

Hydrology. The district's rivers belong to the Yellow River system, with the Yellow River flowing along the northern foothills of the Mangshan Mountains. The Yi River and Luo River are the longest rivers in the area, with lengths of 18.51 kilometers and 34.48 kilometers, respectively. Additionally, there are seasonal rivers such as Majian River, Liujian River, and Huacheng River.

水文学。区内河流属黄河水系，黄河流经邙山北麓。伊河和洛河是区内最长的河流，长度分别为 18.51 公里和 34.48 公里。此外，还有马涧河、流涧河、花城河等季节性河流。

Figure III-2: Water system of Yanshi District

Figure III-2: 偃师区水系



Note: Purple line=administrative boundary; Blue line=water system. *注：紫线=行政界线；蓝线=水系统。*

Source: Yanshi District Water Resources Bureau, 2022 *来源:2022 年偃师区水利局*

2. Social and Economic Conditions 社会经济概况

In 2023, the GDP of Yanshi District reached 43,603.38 million yuan, representing a year-on-year growth of 0.4%. The breakdown by sectors is as follows: the output of the primary industry was 1,713.90 million CNY, with a year-on-year growth of 1.0%; the output of the secondary industry was 20,201.64 million CNY, experiencing a year-on-year decrease of 1.6%; and the output of the tertiary industry was 21,687.83 millionCNY, showing a year-on-year growth of 2.7%.

2023 年，偃师区地区生产总值完成 4360338 万元，同比增长 0.4%。分产业看，第一产业产值 171390 万元，比上年增长 1.0%；第二产业产值 2020164 万元，同比下降 1.6%；第三产业产值 2168783 万元，同比增长 2.7%。

Guxian Town is located in the eastern part of Yanshi District, adjacent to Gongyi City to the east, and serves as the eastern gateway from Zhengzhou to Luoyang. It is 80 kilometers east of the provincial capital Zhengzhou and 23 kilometers west of the ancient capital Luoyang, situated in the central area of the Zhengzhou-Luoyang economic belt. The town administers 15 administrative villages and 257 villagers' groups, with a total population of approximately 60,100 people. Covering a total area of 43.69 square kilometers, it has 42,300 mu of arable land. The urban area of the town covers 2.5 square kilometers, with a population of 23,000.Guxian Town is located in the eastern part of Yanshi District, adjacent to Gongyi City to the east, and serves as the eastern gateway from Zhengzhou to Luoyang. It is 80 kilometers east of the provincial capital Zhengzhou and 23 kilometers west of the ancient capital Luoyang, situated in the central area of the Zhengzhou-Luoyang economic belt. The town administers 15 administrative villages and 257 villagers' groups, with a total population of approximately 60,100 people. Covering a total area of 43.69 square kilometers, it has 42,300 mu of arable land. The urban area of the town covers 2.5 square kilometers, with a population of 23,000.

顾县镇位于偃师区东部，东邻巩义市，是郑州通往洛阳的东部门户。东距省会郑州 80 公里，西距古都洛阳 23 公里，处于郑洛经济带的中心地带。全镇辖 15 个行政村，257 个村民小组，总人口约 6.01 万人。总面积 43.69 平方公里，耕地面积 4.23 万亩。城镇面积 2.5 平方公里，人口 23000 人，古县镇位于偃师区东部，东邻巩义市，是郑州通往洛阳的东部门户。东距省会郑州 80 公里，西距古都洛阳 23 公里，处于郑洛经济带的中心地带。全镇辖 15 个行政村，257 个村民小组，总人口约 6.01 万人。总面积 43.69 平方公里，耕地面积 4.23 万亩。城镇面积 2.5 平方公里，人口 2.3 万人。

Gaolong Town, located in the southwest of Yanshi District, Luoyang City, Henan Province, borders Guxian Town to the east. It covers an administrative area of 42.61 square kilometers. Gaolong Town has 38,000 mu of arable land.

高龙镇位于河南省洛阳市偃师区西南部，东与顾县镇接壤。行政区域面积 42.61 平方公里。高龙镇有 3.8 万亩耕地。

3. Physical Cultural Resources 物质文化资源

No physical cultural resources have been documented or recorded within the subproject area of influence as confirmed by the Bureau of Cultural Relics of Luoyang City. Should buried artifacts of archaeological significance be uncovered during the construction stage, construction shall be stopped and immediately reported to the local cultural bureau.

经洛阳市文物局确认，子项目影响范围内没有记载或记录任何物质文化资源。施工过程中如发现有考古意义的埋藏文物，应停止施工，并立即报告当地文化局。

4. Environmental Baseline 环境基线

The environmental monitoring data was cited from the publicly accessible information disclosed by the Luoyang City EEB[8] in 2022.
环境监测数据引自洛阳市生态环境局 2022 年公开信息。

Surface water. The major river in the Guxian town and Gaolong town is the Yiluo River. According to the water quality evaluation results in February 2024, the permanganate index, ammonia nitrogen, and total phosphorus of the Yiluo River are 2.8 mg/L, 0.13 mg/L and 0.064 mg/L, meeting the Class II water quality standard stipulated in GB3038-2002, which are 6 mg/L, 1.0 mg/L and 0.2 mg/L respectively .
地表水。古县镇和高龙镇的主要河流是伊洛河。根据 2024 年 2 月水质评价结果，伊洛河高锰酸盐指数为 2.8 mg/L，氨氮为 0.13 mg/L，总磷为 0.064 mg/L，满足 GB3038-2002 规定的 II 类水质标准，分别为 6 mg/L、1.0 mg/L 和 0.2 mg/L。

Acoustic environment. There are no other sources of acoustic environmental pollution except occasional traffic noise. Based on these existing conditions and the relatively limited scope and short-term duration of works under Yanshi Subproject, quantitative baseline sampling was not necessary.
声环境。除偶尔出现的交通噪声外，无其他声环境污染源。基于这些现有条件以及偃师子项目下相对有限的工程范围和短期持续时间，无需进行定量基线取样。

Air quality. The subproject area is in the rural area of Yanshi District. Based on environmental data from the Luoyang City EEB ambient air quality (in February 2024), the annual average concentrations of particulate matter (PM10 and PM2.5) exceeded the Class 2 standard requirements of Ambient Air Quality Standard (GB3095-2012) and the other indicators are within the limits of the standard. No industrial pollution source in the subproject area.
空气质量。子项目区位于偃师区农村地区。根据洛阳市环境空气质量监测数据（2024 年 2 月），可吸入颗粒物（PM10 和 PM2.5）年均浓度超过《环境空气质量标准》（GB3095-2012）二级标准要求，其余指标均在标准范围内。子项目区域内无工业污染源。

Table III-2: Air quality of Yanshi District (Feb, 2024)
Table III-2:偃师区空气质量状况（2024 年 2 月）

Year 年	PM_{10} (μg/m³) Annual average 年平均值	$PM_{2.5}$ (μg/m³) Annual average 年平均值	SO_2 (μg/m³) Annual average 年平均值	NO_2 (μg/m³) Annual average 年平均值	CO (mg/m³) 95th percentile of the daily mean 日平均值的第 95 个百分位数	O_3 (μg/m³) 90th percentile concentration of the daily maximum 8-hour mean 日最大 8 小时平均值的第 90 个百分位数浓度
Feb 2024 2024 年 2 月	104	76	7	24	1.4	102
Class 2 of GB3095-2012	70	35	60	40	4	160

Soil. Soil quality monitoring will be conducted as part of the subproject activities. Monitoring indicators include soil nutrient content, organic matter, pesticide residues and heavy metals.
土壤。土壤质量监测将作为子项目活动的一部分进行。监测指标包括土壤养分含量、有机质、农药残留和重金属等。

[8] http://sthj.ly.gov.cn/Article/Index/?page=1&cateID=78

5. Ecological Environment 生态环境

The Yanshi Subproject site is within the existing cultivated arean. Shelterbelts are planted around channels and farmland. There are no protected area or nature reserves, key biodiversity area within a 20 km radius from the subproject area of Yanshi. Yanshi subproject activities do not encroach or are located within declared ecological red lines.
偃师子项目位于现有耕地范围内。在渠道和农田周围种植防护林带。在偃师区子项目区 20 公里半径范围内，没有保护区或自然保护区、生物多样性关键区。偃师区子项目活动未侵占或位于已宣布的生态红线范围内。

Figure III-3: Current status of the subproject site (Yanshi Subproject)
Figure III-3: 子项目现场现状（偃师子项目）

Canal 渠道

Earth road 土路

Farmland 农田

Source: LDI, 2022. 来源：地方设计机构，2022

C. Wuzhi County Subproject 武陟县子项目

1. Physical Settings 地理位置

Location. Wuzhi County is located in the northwest part of Henan Province, southeastern part of Jiaozuo City, at the confluence of the Yellow River and Qin River. It is situated between 34° 56′ to 35° 10′ north latitude and 113° 10′ to 113° 39′ east longitude. It borders Huojia County and Yuanyang County of Xinxiang City to the east, Bo'ai County and Wen County to the west, Xiuwu County to the north, and faces Xingyang City of Zhengzhou City across the Yellow River to the south. With a length of 50 kilometers from east to west and a width of 25 kilometers from north to south, it resembles a butterfly with a narrow middle. The total area is 797.9 square kilometers.

位置。武陟县位于河南省西北部，焦作市东南部，地处黄河与沁河交汇处。位于北纬 34°56′至 35°10′，东经 113°10′至 113°39′之间。东与新乡市获嘉、原阳两县接壤，西与博爱、温县毗邻，北与修武县相连，南与郑州市荥阳市隔黄河相望。东西长 50 公里，南北宽 25 公里，酷似一只蝴蝶，中间较窄。总面积 797.9 平方公里。

Topography and Terrain. Wuzhi County's terrain slopes from west to east and from south to north. Due to the influence of the Yellow River and Qin River, the topography is complex, featuring terraces, plains, depressions, and sandy areas. The county is naturally divided into three regions: Qin South, Qin North, and County East, with the Qin River traversing the western part. The county's overall topography includes Yellow and Qin River floodplains, riverine lowlands, sand dunes and inter-dune areas, Qingfeng Ridge, and Xunfengling Plateau.
地形和地势。武陟县地势自西向东、自南向北倾斜。由于受黄河和沁河的影响，地形复杂，有阶地、平原、洼地和沙区。该县自然分为三个区域：秦南、秦北和县东，秦河横贯西部。该县的整体地形包括黄河和秦河漫滩、河流低地、沙丘和沙丘间地区、青峰岭和寻风岭高原。

Hydrology. There are a total of 15 natural rivers, including the Yellow River, Qin River, Ji River, Mang River, Jianggou River, and Dashilao River. The Yellow River flows through the southern boundary of the county, entering the Yuanyang border at Zhandian Town, traversing a distance of 46.6 kilometers with a width of 6-12 kilometers. The Qin River enters the county from Xiaodong Township and flows into the Yellow River at Jiayingguan, with a total length of 33 kilometers within the county. The county has six main drainage channels, belonging to the Yellow River and Hai River basins.
水文。境内有黄河、秦河、济河、蟒河、姜沟河、大石涝河等 15 条自然河流。黄河流经县境南部，在詹店镇进入原阳边界，全长 46.6 公里，河宽 6-12 公里。沁河从小东乡进入县境，在嘉应关注入黄河，境内全长 33 公里。全县有 6 条主要排水河道，分属黄河、海河两大流域。

Soil. The soil in Wuzhi County is divided into two major types (coarse-grained soil and fine-grained soil) and four subtypes (gravelly soil, sandy soil, loamy soil, and clayey soil). The soil originates from the Yellow River alluvial parent material, with deep layers, good properties, and a slightly alkaline nature. The soil fertility is medium to low.
土壤。武陟县土壤分为粗粒土、细粒土两大类和砾质土、砂质土、壤质土、粘质土四个亚类。土壤来源于黄河冲积母质，土层深厚，性状良好，呈微碱性。土壤肥力中等偏下。

2. Social and Economic Conditions 社会经济概况

As of June 2023, Wuzhi County comprises 4 streets, 7 towns, and 4 townships, with a total population of 740,000 (as of 2023). In 2021, the GDP of Wuzhi County reached 30.88 billion CNY.
截至 2023 年 6 月，武陟县辖 4 个街道、7 个镇、4 个乡，总人口 74 万（截至 2023 年）。2021 年，武陟县 GDP 达到 308.8 亿元。

Qiaomiao Town is located in the eastern part of Wuzhi County, serving as a leading town for agricultural development in the county. It borders Huojia County of Xinxiang City to the north and east, neighbored by Zhandian Town to the south, and connected to Jiayingguan Township and Gedangdian Town to the west. The town covers a total area of 55 square kilometers, administratively comprising 29 villages with a total population of 44,000 people. The Wu Zhi Subproject involves 11 project villages including Dihe Village, Fengzhang Village, Huang Village, Liuzhuang Village, Maxuanzhai Village, Meng Village, Songling Village, Yangwa Er Street, Yangwa San Street, Yangwa Yi Street, and Zhang Village, with a resident population of 21,490 people. The cultivated land area is 24,842 mu, and the pond area is 4.28 million mu, with a fruit orchard area of 235 mu. Main crops include wheat, rice, corn, and soybeans, with a sown area of 45,603 mu for grain crops, 253 mu for economic crops, 490.1 mu for vegetable

planting, and 1,696.5 mu for aquaculture in 2020.
乔庙镇位于武陟县东部，是全县农业发展的龙头乡镇。北、东与新乡市获嘉县接壤，南与詹店镇为邻，西与嘉应观乡、圪垱店镇相连。全镇总面积 55 平方公里，辖 29 个村，总人口 4.4 万人。武直子项目涉及 11 个项目村，包括邸郃村、冯丈村、黄村、刘庄村、马宣寨村、孟村、宋陵村、杨洼二街、杨洼三街、杨洼一街、张村，常住人口 21490 人。耕地面积 24842 亩，水塘面积 428 万亩，果园面积 235 亩。主要农作物有小麦、水稻、玉米、大豆等，2020 年粮食作物播种面积 45603 亩，经济作物播种面积 253 亩，蔬菜种植面积 490.1 亩，水产养殖面积 1696.5 亩。

3. Physical Cultural Resources 物质文化资源

No physical cultural resources have been documented or recorded within the subproject area of influence as confirmed by the Bureau of Cultural Relics of Jiaozuo City. Should buried artifacts of archaeological significance be uncovered during the construction stage, construction shall be stopped and immediately reported to the local cultural bureau.
经焦作市文物局确认，子项目影响范围内无实物文化资源记载或记录。施工过程中如发现有考古意义的埋藏文物，应停止施工，并立即报告当地文化局。

4. Environmental Baseline 环境基线

Surface water. In 2021, the compliance rate of the Dongbei Village section of surface water in Wuzhi County was 75% for the whole year, up 12.4% year-on-year, with ammonia nitrogen as the main pollutant. The compliance rate of the Jianggou Yingbin Road Bridge section for the whole year was 37.5%, showing a 106% year-on-year increase, with ammonia nitrogen as the main pollutant. The compliance rate of the channel head section for the whole year was 100%, up 9.05% year-on-year. The Wuzhi subproject will contribute to reduction of ammonia nitrogen through application of organic fertilizer and reduction of chemical fertilizer.
地表水。2021 年，武陟县地表水东北村断面达标率全年为 75%，同比上升 12.4%，主要污染物为氨氮。江沟迎宾路桥段全年达标率为 37.5%，同比增长 106%，主要污染物为氨氮。全年渠首段达标率 100%，同比增长 9.05%。武陟子项目将通过施用有机肥和减少化肥来减少氨氮。

Acoustic environment. There are no other sources of acoustic environmental pollution except occasional traffic noise. Based on these existing conditions and the relatively limited scope and short-term duration of works under Wuzhi Subproject, quantitative baseline sampling was not necessary.
声环境。除偶尔出现的交通噪声外，无其他声环境污染源。基于这些现有条件以及武陟子项目工程相对有限的范围和短期持续时间，无需进行定量基线取样。

Air quality. The subproject area is in the rural area of Wuzhi County. Based on environmental data provided by the Wuzhi EEB ambient air quality, the annual average concentrations of particulate matter (PM_{10} and $PM_{2.5}$) exceeded the Class 2 standard requirements of Ambient Air Quality Standard (GB3095-2012) and the other indicators are within the limits of the standard. No industrial pollution source in the subproject area.
空气质量。子项目区位于武陟县农村。根据武陟环保局环境空气质量提供的环境数据，可吸入颗粒物（PM10 和 PM2.5）年均浓度超过《环境空气质量标准》（GB3095-2012）二级标准要求，其余指标均在标准限值内。子项目区域内无工业污染源。

Table III-3: Air quality of Wuzhi County (2022)

Table III-3: 武陟县空气质量状况（2022 年）

Year 年	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_2($\mu g/m^3$)	CO (mg/m^3)	O_3 ($\mu g/m^3$)
	Annual average 年平均值	Annual average 年平均值	Annual average 年平均值	Annual average 年平均值	95th percentile of the daily mean 日平均值的第 95 个百分位数	90th percentile concentration of the daily maximum 8-hour mean 日最大 8 小时平均值的第 90 个百分位数浓度
2022	106	59	10	34	0.89	99
Class 2 of GB3095-2012	70	35	60	40	4	160

Source: Wuzhi county EEB, 2023　来源：武陟环保局，2023

Soil. Soil quality monitoring will be conducted as part of the subproject activities. Monitoring indicators include soil nutrient content, organic matter, pesticide residues and heavy metals.

土壤。土壤质量监测将作为子项目活动的一部分进行。监测指标包括土壤养分含量、有机质、农药残留和重金属等。

5. Ecological Environment 生态环境

The Wuzhi Subproject site is within the existing cultivated arean. Shelterbelts are planted around channels and farmland. There are no protected area or nature reserves, key biodiversity area within a 20 km radius from the subproject area of Wuzhi. Wuzhi subproject activities do not encroach or are located within declared ecological red lines.

武陟子项目现场位于现有耕地范围内。在渠道和农田周围种植防护林带。武陟子项目区域半径 20km 范围内无保护区或自然保护区、生物多样性关键区。武陟子项目活动未侵占或位于已宣布的生态红线范围内。

Figure III-4: Current status of the subproject site (Wuzhi Subproject)

Figure III-4: 子项目现场现状（武陟子项目）

Canal 渠道

Earth road 土路

Farmland 农田

Drainage 排水

Organic fertilizer plant site satellite map 有机肥厂卫星地图

Source: Design Institute 2025 来源：设计机构 2025

IV. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES 预期环境影响及缓解措施

This section has been updated based on the preliminary design, including the following adjustments: the village where the organic fertilizer factory is located after the relocation, and the distance between the factory's new site and this village; the land leveling area and earthwork volume of the Yanshizi Project during the construction phase; and the implementation area of the straw return-to-field project will only be carried out in Wuzhi County. The impact description section of the Wuzhizi sub-project organic fertilizer plant has been updated based on the domestic EIA of the new factory site.
本章节根据初设更新了：改址后有机肥厂所在村，及有机肥厂新址与村庄的距离；施工阶段偃师子项目土地平整面积及土方量；更新了实施秸秆还田工程的项目区，初设后仅武陟县实施。根据新厂址的国内环评更新了武陟子项目有机肥厂的影响描述段落。

A. Subproject Area of Influence and Sensitive Receptors 子项目影响区域和敏感受体

The project area of influence was defined as the total area which might be subjected to impacts (both positive and adverse) due to subproject implementation. This was based on the locations of sensitive receptors, defined as settlements and/or environmental values that might be affected by the subproject construction and/or operation. The receptors (also considered as subproject beneficiaries) includes the villages inside of the subproject farmland area, namely.
项目影响区域被定义为由于子项目实施而可能受到影响（正面和负面）的总面积。这是基于敏感受体的位置，定义为可能受子项目施工和/或运营影响的沉降和/或环境价值。受体（也被视为子项目受益人）包括子项目农田区域内的村庄，即。

- The Yanshi sub-project comprises 10 villages, including Guxian Village, Miaowan Village, Duandong Village, Duanxi Village, Liwan Village in Guxian Town, and Puliucun Village, Taohua Village, Zuocun Village, Guotun Village, and Datun Village in Gaolong Town, with a total resident population of 36,197 people.
- The Xiangfu subproject consists of 8 villages: Chenzhai Village, Dakangzhai Village, Damenzhai Village, Jiazhuang Village, Lizhai Village, Madian Village, Xiaomenzhai Village, and Xiaozhuang Village, with a combined population of 17,321 residents.
- Qiaomiao town of Wuzhi County: 11 project villages, namely Dihe Village, Fengzhang Village, Huang Village, Liuzhuang Village, Maxuanzhai Village, Meng Village, Songling Village, Yangwa Er Street, Yangwa San Street, Yangwa Yi Street, and Zhang Village, with a total population of 21,490 people.
- 偃师子项目包括顾县镇顾县村、苗湾村、段东村、段西村、李湾村，高龙镇铺刘村、陶化村、左村村、郭屯村、大屯村等 10 个村，常住总人口 36197 人。
- 祥符子项目包括 8 个村：陈寨村、大康寨村、大门寨村、贾庄村、李寨村、马店村、小门寨村、小庄村，总人口 17321 人。
- 武陟县乔庙镇:11 个项目村，分别为邸郜村、冯丈村、黄村、刘庄村、马宣寨村、孟村、宋陵村、杨洼二街、杨洼三街、杨洼一街、张村，总人口 21490 人。

For the Qiaomiao organic fertilizer plant of Wuzhi subproject, in accordance with the "Technical Guidelines for the Preparation of Environmental Impact Report Forms for Construction Projects (Pollution Impact Category)," the project's environmental protection objectives are set as follows: for atmospheric environment protection, the target is villages within a 500-meter radius. For acoustic environment protection, the target is villages within a 50-meter radius of these industrialized projects. The nearest village is Maxuanzhai village, which is about 585 m to the organic fertilizer plant.
武陟子项目乔庙有机肥料厂，根据《建设项目环境影响报告表编制技术导则（污染影响类）》，项目环境保护目标为：大气环境保护目标为周边 500 米范围内的村庄。声环境保护的目标是这些工业化项目 50 米半径范围内的村庄。最近的村庄是马宣寨村，距离有机肥厂约 585 米。

B. Anticipated Subproject Benefits and Positive Impacts 子项目预期效益和积极影响

In general, the subprojects of Xiangfu, Yanshi and Wuzhi will implement science based application of pesticides and fertilizers, water-saving irrigation and other measures that will help reduce pollution from agricultural non-point sources. It is envisaged that excessive fertilization, inappropriate fertilizer structure and fertilization methods will be minimized. This will improve site conditions against loss of nitrogen, phosphorus and other nutrients, and excess nitrogen and phosphorus nutrients migrating to water bodies, causing water body eutrophication.
总体而言，祥符区、偃师区和武陟县的子项目将实施科学施用农药和化肥、节水灌溉和其他有助于减少农业面源污染的措施。设想尽量减少过量施肥、不适当的肥料结构和施肥方式。这将改善立地条件，防止氮、磷等营养盐的流失，以及过量的氮、磷营养盐向水体迁移，造成水体富营养化。

Environmental Benefits. After implementation of the Yanshi subproject, the application of chemical fertilizer (e.g., urea, potassium sulfate and phosphate diamine) will be 30.14 kg/mu and 751.8 t/a respectively, with reduction of 2.54 kg/mu and 44.0 t/a. These estimates are calculated based on the density of the fertilizer (N, P2O5, and K2O). The pesticide usage per unit area will decrease to 0.44 kg per mu. This represents a decrease of 0.08 kg per mu and 0.55 tons annually compared to the period before the project implementation. there will be a decrease in nutrient loss after project implementation, with anticipated reductions of 0.0187t/a, 0.3311t/a, and 0.0299t/a for ammonia nitrogen, total nitrogen, and total phosphorus respectively.
环境效益。偃师子项目实施后，化肥（尿素、硫酸钾、磷二胺）施用量分别为 30.14 kg/亩、751.8 t/a，减少施用量 2.54 kg/亩、44.0 t/a。这些估计值是根据肥料的密度（N、P2O5 和 K2O）计算的。单位面积农药使用量将下降到每亩 0.44 公斤。与项目实施前相比，每亩减少 0.08 公斤，每年减少 0.55 吨。项目实施后，可减少营养盐流失，预计氨氮、总氮、总磷流失量分别减少 0.0187t/a、0.3311t/a、0.0299t/a。

Xiangfu District will make some progress in pesticide and fertilizer usage. Despite the fact that the total pesticide implementation will remain relatively stable, the per-unit area pesticide usage will decrease by 0.01kg/mu. Moreover, the per-unit area fertilizer usage will decrease by 1.66kg/ha, and the total fertilizer implementation will decrease by 33.25 t/a. These changes will suggest a concerted effort towards more sustainable agricultural practices and environmental stewardship in the region.
祥符区将在农药和化肥使用方面取得一些进展。尽管农药施用总量将保持相对稳定，但单位面积农药使用量将下降 0.01kg/亩。单位面积化肥施用量减少 1.66kg/hm2，总施肥量减少 33.25t/a。这些变化将表明，需要共同努力，在该地区实现更可持续的农业做法和环境管理。

For Wuzhi subproject, the per-unit area pesticide usage and total implementation will decrease by 0.05kg/ha and 3.83t/a respectively. Similarly, the per-unit area fertilizer usage will decrease by 1.54kg/ha, and the total fertilizer implementation will decrease by 199.47t/a. Furthermore, there will be a reduction in nutrient loss after project implementation, with expected decreases of 0.0796t/a, 1.4277t/a, and 0.1123t/a for ammonia nitrogen, total nitrogen, and total phosphorus respectively.
武陟子项目单位面积农药使用量减少 0.05kg/ha，总施用量减少 3.83t/a。单位面积化肥施用量减少 1.54kg/ha，总施肥量减少 199.47t/a。此外，项目实施后还将减少营养盐流失，预计氨氮、总氮和总磷流失量分别减少 0.0796 吨/年、1.4277 吨/年和 0.1123t/年。

Table IV-2: Estimated chemical fertilizer and pesticide usage

Table IV-2: 预计化肥、农药使用量

Subproject Name 子项目名称		Unit fertilizer usage 单位肥料用量 (kg/mu)				Total fertilizer usage (t/a) 总施肥量				Unit pesticide usage 单位农药使用量 (kg/mu)	Total pesticide usage 农药总使用量 (t/a)
		N	P_2O5	K_2O	subtotal 小计	N	P_2O5	K_2O	subtotal 小计		
Yanshi 偃师	Before the project 项目前(2020)	11.30	10.70	10.70	32.69	282.56	256.62	256.62	795.80	0.52	12.04
	After the project 项目后(2027)	10.70	9.72	9.72	30.14	259.80	246.00	246.00	751.80	0.44	11.49
	Reduction 减少	0.59	0.98	0.98	2.54	22.76	10.62	10.62	44.00	0.08	0.55
Xiangfu 祥符	Before the project 项目前(2020)	16.37	5.15	6.75	28.28	589.40	185.50	243.00	1017.90	0.38	13.53
	After the project 项目后(2027)	15.42	4.81	6.38	26.61	570.58	178.13	235.94	984.65	0.37	13.53
	Reduction 减少	0.95	0.34	0.37	1.66	18.82	7.37	7.06	33.25	0.01	0
Wuzhi 武陟	Before the project 项目前(2020)	17.68	5.48	5.36	28.52	677.43	209.91	205.33	1092.67	0.42	15.99
	After the project 项目后(2027)	16.65	4.93	5.40	26.98	551.08	163.23	178.88	893.20	0.37	12.16
	Reduction 减少	1.03	0.55	0.04	1.54	126.35	46.67	26.45	199.47	0.05	3.83

Source: Domestic EIA, June 2023. 来源：国内环评，2023 年 6 月。

C. Pre-Construction Phase 施工前阶段

Prior to construction, the following measures will be implemented.
施工前，将采取以下措施。

(i) Institutional strengthening. (a) The county project management office (CPMO) will assign at least one full-time, qualified environment and social officer within the CPMO team. This officer will lead the coordination of the EMP; and (b) under the loan consulting services, the provincial project management office (PPMO) will hire a loan implementation environment specialist (LIEC) to provide intermittent external support.

(ii) Climate adaptation. During preliminary and detailed design stage, the design institute should incorporate the recommendations presented in the Table 7 of the climate risk and vulnerability report (CRVA) on climate adaptation measures into the design.

(iii) Updating the EMP. The EMP will be updated as needed, including mitigation measures and monitoring. This will be the responsibility of the PPMO, CPMO and LIEC.

(iv) Training in environmental management. The LIEC and personnel from the county EEB will give training in the implementation and supervision of environmental mitigation measures to contractors and the construction supervision companies ().

(v) Grievance Redress Mechanism (GRM). A project GRM has been prepared (Section F of Attachment 1). The CPMO and PPMO will implement the project GRM at least two months before the start of construction to ensure that the village communities are well informed and provided the opportunity to discuss any concerns. This is further to the public consultations already conducted during project preparation (Section VII).

(vi) Bidding document and contract documents. The project environmental management plan (EMP; Attachment 1) will be included in the bidding documents and contracts for the procurement of civil works, goods and services. All contractors and subcontractors will be required to comply with the EMP.

(vii) Contractor obligations. Contractors, in their bids, will respond to the environmental clauses in the bidding documents for EMP requirements. Prior to construction, each contractor will develop a site EMP, based on the attached project EMP, and assign at least one person responsible for environment, health, and safety (EHS). The site EMP shall include the following: (a) surface water protection; (b) spill control and management; (c) site drainage and soil erosion protection; (d) health and safety; and (e) temporary traffic management. The site EMPs will be submitted to the environmental officer of the CPMO for approval, with support of the local EEB.

(i) 加强体制。（a）县项目管理办公室（县项目办）将在县项目办团队中指派至少一名全职、合格的环境和社会官员。该官员将领导环境管理计划的协调工作；（b）根据贷款咨询服务，省项目管理办公室（省项目办）将雇用一名贷款实施环境专家（LIEC），以提供间歇性外部支持。

(ii) 气候适应。在初步和详细设计阶段，设计院应将气候风险和脆弱性报告（CRVA）Table 7 中关于气候适应措施的建议纳入设计中。

(iii) 更新环境管理计划。环境管理计划将根据需要进行更新，包括缓解措施和监测。这将是省项目办、县项目办和贷款实施环境顾问的责任。

(iv) 环境管理培训。贷款实施环境顾问和县生态环境局人员将向承包商和施工监理公司（CSCs）提供环境缓解措施实施和监督方面的培训。

(v) 申诉补偿机制（GRM）。已编制项目申诉补偿机制（附件 1 第 F 节）。县项目办和省项目办将在施工开始前至少两个月实施项目申诉补偿机制，以确保村庄社区充分知情，并提供讨论任何问题的机会。这是对项目准备期间已经进行的公众咨询的补充（第 VII 节）。

(vi) 招标文件和合同文件。项目环境管理计划（EMP；附件 1）将包含在土建工程、货物和服务采购的招标文件和合同中。所有承包商和分包商都必须遵守环境管理计划。

(vii) 承包商义务。承包商在其标书中将响应招标文件中的环境条款，以满足环境管理计划要求。施工前，各承包商将根据所附的项目环境管理计划制定现场环境管理计划，并指定至少一名环境、健康和安全（EHS）负责人。现场环境管理计划应包括以下内容：（a）地表水保护；（b）溢漏控制和管理；（c）场地排水和土壤侵蚀防护；（d）健康和安全；（e）临时交通管理。现场环境管理计划将提交给县项目办的环境官员批准，并得到当地生态环境局的支持。

D. Construction Phase 施工阶段

1. Soil Erosion and Spoils 土壤侵蚀和弃土

The subproject activities for land leveling in Yanshi District cover a combined area of 197.4 mu, with an earth excavation volume of 38000 m³, and an earth backfill volume of 50100 m³ resulting in a balanced earthwork with no spoil.The current earth roads will be paved with concrete. Commercial concrete will be purchased. No quarry will be involved.

子项目偃师区的土地平整活动总占地面积超过 197.4 亩。其中表土剥离量 3.8 万 m³，土方回填量 5.01 万 m³，土方均衡，无弃土。目前的土路将用混凝土铺设。将购买商品混凝土。不涉及采石场。

The risk of soil erosion will be mitigated through typical good construction practice as set out in EHS Guidelines, erosion controls and site maintenance, as follows.

土壤侵蚀的风险将通过 EHS 指南、侵蚀控制和现场维护中规定的典型良好施工实践来缓解，如下所示。

(i) At each construction site, prior to works the site-specific potential for stormwater runoff will be assessed and appropriate stormwater drainage systems to minimize soil erosion will be implemented, including perimeter bunds and establishment of temporary detention and settling ponds to control topsoil runoff.
(ii) Land excavation and filling will be balanced so as minimize the requirement for fill material transportation.
(iii) During earthworks, the area of soil exposed to potential erosion at any time will be minimized through good project and construction management practices.
(iv) Waste construction material such as residual concrete and asphalt will be properly handled for reuse or disposal.
(v) Construction and material handling activities will be limited or halted during periods of rains and high winds.
(vi) Any planned paving or vegetating of areas will be done as soon as practical after the materials are removed to protect and stabilize the soil.
(vii) During construction and excavation, the topsoil layer shall be separately collected and stacked, and soil erosion prevention and control measures shall be taken. Land temporarily compacted during construction shall be ploughed immediately after completion of construction.

(i) 在每个施工现场，在工程开始之前，将对现场特定的雨水径流可能性进行评估，并实施适当的雨水排水系统，以最大限度地减少土壤侵蚀，包括周边堤岸和建立临时滞留池和沉淀池，以控制表土径流。
(ii) 土地开挖和填筑将保持平衡，以尽量减少对填料运输的需求。
(iii) 土方工程期间，通过良好的项目和施工管理实践，将随时暴露于潜在侵蚀的土壤面积降至最低。
(iv) 废弃的建筑材料，如剩余的混凝土和沥青，将被妥善处理，以供再用或处置。
(v) 在下雨和大风期间，施工和材料处理活动将受到限制或停止。
(vi) 在移除材料以保护和稳定土壤后，将尽快进行任何计划的铺路或植被区域。
(vii) 施工开挖时，应将表土层单独收集堆放，并采取水土流失防治措施。施工中临时压实的土地，应在施工结束后立即翻耕。

Measures for soil contamination. To reduce the risk of soil contamination from construction machinery, contractors will do the following.

土壤污染措施。为降低施工机械造成土壤污染的风险，承包商应采取以下措施。

- Store petroleum products, hazardous materials and wastes on impermeable surfaces in

secured and covered areas, at a minimum of 200 meters from the nearest canal or drainage ditch.
- Remove all construction wastes from the site to approved waste disposal sites.
- Establish emergency preparedness and response actions.
- Provide spill cleanup measures and equipment at each construction site.
- Train contractors and crews in emergency spill response procedures.
  - 将石油产品、危险材料和废物储存在安全和覆盖区域的不透水表面上，距离最近的运河或排水沟至少 200 米。
  - 将所有建筑垃圾从现场运至经批准的垃圾处理场。
  - 建立应急准备和响应行动。
  - 在每个施工现场提供泄漏清理措施和设备。
  - 对承包商和员工进行紧急泄漏响应程序的培训。

2. Wastewater 废水

Construction wastewater. Wastewater will be produced from the maintenance and cleaning of mechanical equipment and vehicles, drainage water from intercepting ditches. It is estimated that each construction site will generate an estimated 1.0-2.0 m3/day construction wastewater, with suspended solids (about 300 mg/L) and petroleum (20 mg/L). The construction wastewater will be pre-treated through oil trap and sedimentation tank, to a minimum treatment standard of at least Class 1 of Integrated Sewage Discharge Standard (GB8978-1996) then reused for dust control on-site.

施工废水。机械设备和车辆的维护和清洗、截水沟排水等将产生废水。据估计，每个施工现场将产生 1.0-2.0 m3/天的施工废水，其中含有悬浮固体（约 300 mg/L）和石油（20 mg/L）。施工废水经隔油池、沉淀池预处理后，达到《污水综合排放标准》（GB8978-1996）一级标准以上，回用于现场扬尘治理。

Wastewater from construction workers. No construction camps will be located on site. A canteen and accommodation for workers will be rented from the existing houses of local villagers or the existing facilities in the town. The number of construction workers in peak period is 30, and the domestic wastewater is calculated as 0.05 m3 per person per day, so the production of domestic wastewater is 1.5 m3/d. The concentration of main pollutants is: CODcr 350 mg/L, BOD_5 200 mg/L, NH_3-N 150 mg/L, and SS 250 mg/L respectively. The domestic sewage will be discharged to the septic tank and reused as fertilizer after composting. This mode is promoted in the PRC's Guide to Harmless Treatment and Resource Utilization of Rural Toilet Feces and Typical Model of Rural Toilet feces Treatment and Resource Utilization (2020) released the Ministry of Agricultural and Rural Affairs, MEE and National Health Commission. The process is applied in much of rural PRC and is as follows: (i) initial passive treatment in the septic tanks; (ii) transfer of the wet solid waste to drums, for composting, (iii) composting for at least 10-15 days. The composting process generates high temperatures (50–60°C) which kill pathogens and parasites. Disinfection with chemicals is not required; and (iv) application of the composted fertilizer to fields. These tasks are conducted by the rural households that manage the septic tanks and fields and who use safety gloves and sealed containers to minimize health risks or spillage.

建筑工人产生的废水。现场不设施工营地。工人的食堂和住宿将租用当地村民的现有房屋或镇的现有设施。高峰期施工人数为 30 人，生活污水按每人每天 0.05m^3 计，则生活污水产生量为 1.5m^3/d。主要污染物浓度分别为：COD_{Cr} 350 mg/L，BOD_5 200 mg/L，NH_3-N 150 mg/L，SS 250 mg/L。生活污水排入化粪池，经堆肥处理后作为肥料回用。该模式在农业农村部、生态环境部和国家卫生健康委员会发布的《农村厕所粪便无害化处理与资源化利用指南》和《农村厕所粪便处理与资源化利用典型模式（2020）》中得到推广。该工艺应用于中国大部分农村地区，具体如下：（i）在化粪池中进行初步被动处理；（ii）将湿固体废物转移到桶中进行堆肥，（iii）堆肥至少 10-15 天，堆肥过程会产生高温（50–60° C），从而杀死病原体和寄生虫，不需要

用化学药品消毒；和（iv）将堆肥肥料施用到田地中。这些工作由管理化粪池和田地的农村家庭进行，他们使用安全手套和密封容器，以尽量减少健康风险或溢出物。

Some of the farmland is close to **the canals**. In the construction beside the canals if there is a large number of raw and auxiliary materials piled beside the river, and no protective measures are taken, or the oil produced by construction machinery and vehicles is not properly collected, the water will enter the river during the rainy season and pollute the water environment.
一些农田靠近**渠道**。在渠道旁施工时，如有大量原辅材料堆放在渠道旁，且未采取防护措施，或施工机械、车辆产生的油污未妥善收集，将在雨季时进入河道，污染水环境。

To prevent pollution of water resources, the following mitigation measures and construction good practice as set out in EHS Guidelines will be implemented.
为防止水资源污染，将实施 EHS 指南中规定的以下缓解措施和施工良好实践。

- Most of the workers will live in rented apartments in the towns and villages; therefore, the majority of domestic sewage will be discharged and disposed to the septic tank and reused as fertilizer after composting.
- Fuel storage and vehicle cleaning areas must be stationed at least 500 m away from canals.
- Equip machine wash-down sites with water collection basins and sediment traps.
- Install oil-water separators before the sedimentation tank for oily wastewater treatment.
- Equip all sites for washing of construction equipment with water collection basins and sediment traps.
- Install portable toilets at work sites. After treatment by septic tank and composting, the manure will be reused as fertilizer.
- All necessary measures will be undertaken to prevent construction materials and waste from entering the canals.
- Maintenance of construction equipment and vehicles will not be allowed on sites to reduce wastewater generation.
- All construction machinery is repaired and washed at special repairing shops. No on-site machine repair, maintenance, and washing shall be allowed so as to reduce wastewater generation;
- Storage facilities for fuels, oil, and other hazardous materials are within secured areas on impermeable surfaces with 110% volume of the materials stored, and provided with bunds and cleanup kits;
- The contractors' fuel suppliers are properly licensed, follow proper protocol for transferring fuel, and are in compliance with Transportation, Loading and Unloading of Dangerous or Harmful Goods (JT 3145-88).
    - 大多数工人将住在城镇和乡村的出租公寓里。因此，大部分生活污水将排入化粪池处理，堆肥后作为肥料再利用。
    - 燃料储存区和车辆清洗区必须距离渠道至少 500 米。
    - 为机器冲洗场地配备集水池和沉积物收集器。
    - 含油废水处理沉淀池前设置油水分离器。
    - 为所有清洗施工设备的场地配备集水池和沉积物收集器。
    - 在工地安装移动厕所，粪便经化粪池处理、堆肥后，作为肥料再利用。
    - 将采取一切必要措施，防止施工材料和废物进入运河。
    - 现场不允许维护施工设备和车辆，以减少废水的产生。
    - 所有施工机械均在专门的维修车间进行维修和清洗。不得在现场维修、保养、清洗机器，以减少废水的产生；
    - 燃料、石油和其他危险材料的储存设施位于不透水表面上的安全区域内，储存材料的体积为 110%，并配有堤岸和清理工具；
    - 承包商的燃料供应商持有适当的许可证，遵守适当的燃料运输协议，并遵守《危险或有

害货物的运输、装卸》（JT 3145-88）。

3. Solid Waste 固体废弃物

The solid waste generated will comprise construction and domestic waste, and include packaging materials and waste generated during equipment and pipeline installation and cleaning. An estimate of 0.2 kg/day per worker of domestic waste will be generated from construction workers. The sites will generate 6 kg/d municipal solid waste each. Inappropriate waste storage and disposal could affect soil, groundwater and surface water resources, and hence, public health and sanitation. The following solid waste management measures and construction good practices will be implemented.

产生的固体废物将包括施工和生活垃圾，还包括包装材料以及设备和管道安装和清洗过程中产生的废物。建筑工人产生的生活垃圾估计为每人每天 0.2 公斤。每个场地将产生 6 公斤/天的城市固体废物。不适当的废物储存和处置可能影响土壤、地下水和地表水资源，从而影响公共健康和卫生。将实施以下固体废物管理措施和施工良好做法。

- Littering by workers will be prohibited.
- Wastes will be reused or recycled to the extent possible.
  - All other waste will be collected in on-site waste containers.
  - The municipal solid waste will be cleaned by the township sanitation department and sent to the centralized landfill site or incineration plant of the county.
  - There will be no final waste disposal on site. Waste incineration at or near the site is strictly prohibited.
  - Contractors will provide adequate waste bins at work site be held responsible for proper removal and disposal of any significant residual materials, wastes, spoil that remain on the site after construction.
- 禁止工人乱扔垃圾。
- 废物将尽可能再利用或回收。
  - 所有其他废物将收集在现场废物容器中。
  - 城市生活垃圾由乡镇环卫部门统一清运，送至县集中垃圾填埋场或焚烧厂。
  - 现场不进行最终废物处理。严禁在现场或附近焚烧垃圾。
  - 承包商将在施工现场提供足够的废物箱，并负责适当清除和处理施工后留在现场的任何重要残余材料、废物和弃土。

4. Air Pollution 空气污染

The pollution sources which affect the air quality during the construction period mainly come from the fugitive dust caused by installation of irrigation pipes and filed road construction, the exhaust gas of transportation trunks, and construction machinery (gaseous CO, CH, and NO_2). The quantity of dust generated will depend on wind, humidity of the material and earth, and state of site. For the subproject area, it is estimated that under general onsite conditions (average wind speed 2.5 meters per second, and average humidity of 50%) dispersion distance is 200 m downwind without mitigation measures. For dust generated by transporting earth and other construction materials, the impact zone may exceed 60 m on each side of the route.

施工期影响空气质量的污染源主要来自灌溉管道安装和田间道路施工产生的扬尘、运输干线和施工机械产生的废气（气态 CO、CH 和 NO_2）。产生的粉尘量取决于风、材料和土壤的湿度以及现场状况。对于子项目区域，估计在一般现场条件下（平均风速 2.5 米/秒，平均湿度 50%），在无缓解措施的情况下，扩散距离为下风向 200 米。对于运输泥土和其他建筑材料产生的灰尘，影响范围可能超过路线每侧 60 米。

The following measures will be taken to control fugitive dust from the construction site:

将采取以下措施控制施工现场扬尘:

- Dust-prone materials such as residual soil and sand at the construction site shall be covered with dust-proof nets (cloth) and sprayed. Cement and other fine materials shall be stored in the warehouse or fully covered. The loading height of residual soil, sand, and construction waste shall not exceed the guardrail of the vehicle.
- Spray water at least twice a day where fugitive dust is generated.
- Cover trucks carrying earth, sand, or stone with tarps or other suitable covers to avoid spilling and dust generation.
- Undertake regular air quality monitoring around the construction site in accordance with the monitoring plan.
- Regularly consult the nearby residents to identify concerns and implement additional dust control measures, as necessary.
- Turn off equipment/vehicles when not in use and limit engine idling to 5 minutes to reduce air pollution onsite.
    - 施工现场的残土、砂土等易产生扬尘的物料，应覆盖防尘网（布）并进行喷洒。水泥等细料应入库或全覆盖存放。残土、砂土、建筑垃圾等装载高度不得超过车辆护栏。
    - 在产生扬尘的地方，每天至少喷水两次。
    - 用防水布或其他合适的覆盖物覆盖装载泥土、沙子或石头的卡车，以避免溢出和产生灰尘。
    - 根据监测计划，定期对施工现场周围的空气质量进行监测。
    - 定期咨询附近居民，以确定问题并在必要时实施额外的粉尘控制措施。
    - 不使用时关闭设备/车辆，并将发动机怠速时间限制为 5 分钟，以减少现场空气污染。

The straw returning activities in Wuzhi and Yanshi are designed to improve soil quality and sustainability through the incorporation of crushed straw back into the fields. However, the process of crushing and handling the straw can potentially generate dust, which may impact air quality, especially in dry and windy conditions. To mitigate this, the straw crushing equipment must be equipped with dust suppression systems such as water spray systems, baghouse dust collectors, or electrostatic precipitators.
武陟和偃师的秸秆回收活动旨在通过将粉碎的秸秆放回田地来改善土壤质量和可持续性。然而，粉碎和处理秸秆的过程可能会产生灰尘，这可能会影响空气质量，尤其是在干燥和多风的条件下。为了缓解这种情况，秸秆粉碎设备必须配备抑尘系统，如喷水系统、袋式除尘器或静电除尘器。

5. Noise and Vibration 噪音和振动

Construction will involve excavators, rollers, bulldozers, scrapers, trucks and other heavy machinery. Noise emissions will not include rock-crushing, as any rock materials will be purchased off-site by contractors and transported to the sites. Noise will be temporary and localized.
施工将涉及挖掘机、压路机、推土机、铲运机、卡车和其他重型机械，噪音排放将不包括岩石破碎，因为任何岩石材料将由承包商在场外购买并运输到现场，噪音将是暂时的和局部的。

Estimating noise levels. Construction equipment is a point sound source. The predictive model applied in this project is:
估计噪声级。施工设备是点声源。本项目采用的预测模型为:

$$L_i = L_0 - 20\lg\frac{R_i}{R_0} - \Delta L$$

Where, L_i and L_0 are equipment noise sound levels at R_i and R_0, respectively. ΔL is additional diffusion attenuation produced by barriers, vegetation and air. As for the impact of multiple construction machinery on a certain future position, sound level superposition is needed:
其中，L_i 和 L_0 分别为 R_i 和 R_0 处的设备噪声声级。ΔL 是由屏障、植被和空气产生的附加扩散衰减。对于多台施工机械对未来某一位置的影响，需要进行声级叠加:

$$L = 10 \lg \Sigma 10^{0.1 \times L_i}$$

Noise levels at different distances were derived after calculating the impact scope of equipment noise during construction, as defined in Table IV-1. The PRC Standard of Noise Limits for Construction Sites (GB12523-2011, revised) specifies the noise limit in Class II areas as 70 dB (A) during daytime and 55 dB (A) during nighttime.
在计算施工期间设备噪声的影响范围后，得出不同距离的噪声级，如 Table IV-1 所示。中华人民共和国《建筑施工场界噪声限值标准》（GB12523-2011，修订）规定，2 类区的噪声限值为昼间 70 dB（A），夜间 55 dB（A）。

Table IV-3: Noise Values of Construction Machineries at Different Distances dB (A)
Table IV-3: 不同距离施工机械噪声值 dB（A）

Machinery Name 机械名称	Distance to Machinery 到机器的距离									
	5m	10 m	20 m	30 m	40 m	50 m	100 m	150 m	200 m	300 m
Loader 装卸工	90	84	78	74	72	70	64	60	58	54
Pump 泵	85	79	73	69	67	65	59	55	53	49
Excavator 挖掘机	84	78	72	68	66	64	58	54	52	48
Air compressor 空气压缩机	92	86	80	76	74	70	66	62	60	56
Transport vehicles 运输车辆	88	82	76	72	72	68	62	58	56	52
Applicable Standard (GB12523-2011) 执行标准（GB12523-2011）	70 (daytime 白天)									
	50 (nighttime 夜间)									

The village communities are within the project site. Some residential houses are within 50 m to the farmland, where the noise level would exceed daytime noise levels of 70 dB(A), the threshold applied to this project under PRC standard GB12523-2011 or 3dB at the nearest receptors. Extended exposure to such noise levels could cause physical hearing injury to residents and workers, in addition to general stress and disturbance. The construction of major works will be arranged in the first two years of subproject implementation. The duration of each civil work packages are about three months to one year. The impacts will be localized and in short term.
村庄社区位于项目现场内。一些居民房屋距离农田 50 米以内，其噪声级将超过 70 dB（A）的昼间噪声级，这是根据中华人民共和国标准 GB12523-2011 适用于本项目的阈值或最近受体的 3dB。除了一般的压力和干扰外，长时间暴露在这种噪音水平下可能会对居民和工人的身体听力造成伤害。主要工程的建设将安排在子项目实施的前两年进行。每个土建工程包的持续时间约为三个月至一年。这些影响将是局部的和短期的。

Vibration is mainly from road roller during construction of field roads. While the distance from the village will minimize the impact on residents' daily life and building structures, it is necessary to restrict the routes of road rollers to designated areas to avoid uncessary soil compaction on cultivable land.
场区道路施工时，振动主要来自压路机。虽然与村庄的距离将尽量减少对居民日常生活和建筑结构的影响，但有必要将压路机的路线限制在指定区域，以避免对耕地进行不必要的土壤压实。

The following measures will be implemented to comply with PRC construction site noise limits and to protect sensitive receptors.

将采取以下措施，以符合中华人民共和国施工现场噪音限制，并保护敏感受体。

- Ensure that noise levels from equipment and machinery conform to the PRC standard of GB12523-2011 and shall not result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site.
- Properly maintain construction vehicles and machineries to minimize noise.
- Apply noise reduction devices and methods for high noise equipment operating within 200 m of the sensitive sites, e.g., schools, villages, residential areas.
- Prohibit operation of high-noise machinery, and movement of heavy vehicles along urban and village roads, between 20:00 and 07:00.
- Take special caution at construction sites that are close to such sensitive sites as schools and hospitals. When construction activities are unavoidable during the school seasons, the use of heavy equipment (such as excavator and bulldozer) will be restricted to weekends and non-class hours.
- Place temporary hoardings or noise barriers around noise sources during construction.
- Monitor noise at sensitive areas at regular intervals. If noise standards are exceeded, equipment and construction conditions shall be checked, and mitigation measures shall be implemented to rectify the situation.
- Conduct regular interviews with residents/villagers adjacent to construction sites to identify noise disturbance. Community feedback will be used to adjust the work hours of noisy machinery.
- For the households that adjacent to construction works, particular attention will be provided. This will include: (a) follow-up consultations with all of these households prior to the start of any works, to specify the exact planned dates and schedule of works, nature of works, equipment to be used, safety measures, and public access around the works during construction; (b) installation of noise barriers to reduce as much of the emissions as possible, and/or installation of additional layers on the windows of the affected homes, pending assessment of the most technically effective method and feedback from the community consultations; (c) agreement on the duration of daily works; and (d) provision of temporary housing if required.
    - 确保设备和机械的噪声级符合中华人民共和国 GB12523-2011 标准，并且不得导致场外最近接收位置的背景噪声级最大增加 3 分贝。
    - 妥善维护施工车辆和机械，尽量减少噪音。
    - 对在学校、村庄、居民区等敏感场所 200 米范围内运行的高噪声设备，采用降噪装置和方法。
    - 在 20:00 至 07:00 之间，禁止高噪音机械运行，禁止重型车辆在城市和乡村道路上行驶。
    - 在靠近学校和医院等敏感场所的施工现场要特别小心。当施工活动在开学期间不可避免时，重型设备（如挖掘机和推土机）的使用将仅限于周末和非上课时间。
    - 施工期间，在噪声源周围设置临时围板或隔音屏障。
    - 定期监测敏感区域的噪音。如果超过噪音标准，应检查设备和施工条件，并采取缓解措施进行整改。
    - 定期访问建筑工地附近的居民/村民，以确定噪音干扰。社区反馈将用于调整高噪音机器的工作时间。
    - 对于邻近建筑工程的住户，将给予特别关注。这将包括：（a）在任何工程开始之前，与所有这些住户进行后续协商，以具体说明工程的确切计划日期和时间表、工程性质、使用的设备、安全措施以及施工期间工程周围的公共通道；（b）在评估技术上最有效的方法和社区协商的反馈之前，安装隔音屏障，以尽可能减少排放，和/或在受影响房屋的窗户上安装附加层；（c）关于日常工作期限的协议；（d）如有需要，提供临时住房。

6. Impacts on flora and fauna 对动植物的影响

The construction activities will be within the existing farmland or farms, which has been heavily disturbed by human activities. The subprojects of Yanshi, Xiangfu and Wuzhi will not expand the farming area. Small patches of modified vegetation comprising secondary regrowth are present in some sites. There are no documented records of protected or rare species from the subproject area, no areas of natural or critical habitat, and no protected areas (Section III.E). Activities conducted include installation of irrigation facilities and upgrading of field roads are within the farmland that will cause limited damage or clearance of modified vegetation. All transmission lines will be installed along existing roads in the subproject area, and no access aroads will be constructed. For all subproject civil works, the temporary works sites will be re-vegetated. To minimize impacts on the ecological environment, the contractors will be required to:

施工活动将在受人类活动严重干扰的现有农田或农场内进行。偃师、祥符、武陟子项目不扩大养殖面积。在一些地点出现了包括次生再生在内的小块改良植被。子项目区域没有受保护或稀有物种的文件记录，没有自然或关键栖息地，也没有保护区（第 III.E 节）。所开展的活动包括在农田内安装灌溉设施和升级田间道路，这将对改造后的植被造成有限的破坏或清除。所有输电线路将沿着子项目区域内的现有道路安装，不会修建道路。对于所有子项目土建工程，临时工程场地将重新植被。为了尽量减少对生态环境的影响，承包商必须:

- Construction workers are prohibited from capturing any wildlife in the project areas;
- Prior to construction, demarcate vegetation, e.g., vegetated roadsides, trees, riverbanks.
- As far as possible, avoid the clearance of any vegetation.
- In the event that non-native seedlings are required for rapid stabilization of exposed soils and sites, only sterile seedlings will be used to prevent the spread of weeds.
- No plant species will be used that are classified in the PRC as weeds, as defined by the China National Invasive Plant Database (www.iplant.cn/ias); 229 species) and by the MEE and Chinese Academy of Sciences (19 species).
- To avoid pollution of the canals and drainage ditches, no top-dressing fertilizers will be used for any of the re-vegetation, planting, afforestation. For all planting activities, fertilizer will be applied at the root mass of each plant.
- No pesticides or agricultural chemicals listed as hazardous under Classes I or II by the WHO or listed as prohibited or strictly controlled use under the PRC's national regulations for pesticide management will be used for the project activities.
    - 禁止施工人员在项目区内捕捉任何野生动物；
    - 施工前，划定植被界线，如植被覆盖的路边、树木、河岸。
    - 尽可能避免清除任何植被。
    - 如果需要非本地幼苗来快速稳定暴露的土壤和场地，则只能使用无菌幼苗来防止杂草蔓延。
    - 根据中国国家入侵植物数据库（www.iplant.cn/IAS）的定义，不会使用在中国被归类为杂草的植物物种；229 种）和生态环境部和中国科学院（19 种）。
    - 为避免污染水渠和排水沟，任何植被恢复、种植、造林都不会使用追肥。对于所有种植活动，将在每株植物的根块上施肥。
    - 项目活动中不得使用世界卫生组织（WHO）列为第一类或第二类有害物质或中国国家农药管理条例列为禁止或严格控制使用的农药或农用化学品。

7. Community and worker health and safety 社区和工人健康与安全

Traffic congestion and risk of accidents in the Guxian town, Gaolong town, Qiaomiao town and Duliang town will increase with construction traffic, causing temporary inconvenience to traffic, residents, commercial operations, and institutions. Construction may cause unexpected interruptions in municipal services and utilities because of damage to pipelines for water supply and drainage, as well as to underground power cables and communication cables (including

optical fiber cables). Contractors will implement the following EMP measures to reduce risks to community health.
顾县镇、高龙镇、乔庙镇和杜良镇的交通拥堵和事故风险将随着施工交通的增加而增加，对交通、居民、商业运营和机构造成暂时的不便。施工可能会因给排水管道、地下电力电缆和通信电缆（包括光缆）的损坏而导致市政服务和公用设施的意外中断。承包商将实施以下环境管理计划措施，以降低社区健康风险。

Traffic management. Negotiating haulage truck and machinery movements with village committees to ensure that village activities (market days etc.) and residential roads are minimally impacted by construction traffic.
交通管理。与村委会协商运输卡车和机械移动，以确保村庄活动（集市日等）和住宅区道路受施工交通的影响最小。

Information disclosure. Villagers, residents and businesses will be informed in advance through media and information boards at construction sites of the construction activities, given the dates and duration of expected disruption.
信息披露。村民、居民和企业将通过媒体和施工现场的信息板提前了解施工活动，以及预计中断的日期和持续时间。

Construction site protection. Clear signs will be placed at construction sites in view of the public, informing people about the project GRM, and warning people against potential dangers such as moving vehicles, hazardous materials, and excavations, and raising awareness on safety issues. Heavy machinery will not be used at night. For works sites close to sensitive receptors (including schools and clinics), additional effort will be made to inform these facilities of the presence of the nearby works, the hazards posed (e.g., the risk of children accessing works sites and falling in trenches), and the need for improved supervision during works.
施工现场保护。将在施工现场设置清晰的标志，向公众告知项目 GRM，并警告人们注意潜在的危险，如移动车辆、危险材料和挖掘，并提高对安全问题的认识。夜间不使用重型机械。对于靠近敏感受体（包括学校和诊所）的工程现场，将额外努力告知这些设施附近工程的存在、造成的危险（例如，儿童进入工程现场和掉入沟渠的风险），以及在工程期间需要加强监督。

8. Occupational Health and Safety 职业健康与安全

Construction may cause physical hazards to workers from noise and vibration, dust, handling heavy materials and equipment, falling objects, work on water, fire hazards, chemical hazards such as toxic fumes and vapors, and others. Contractors will implement the following precautions to protect the health and safety of their workers:
施工可能对工人造成身体危害，包括噪音和振动、灰尘、搬运重型材料和设备、坠落物、水上作业、火灾、化学危害（如有毒气体和蒸汽等）等。承包商将采取以下预防措施，以保护其工人的健康和安全:

- Each contractor will undertake a health and safety risk assessment of construction works and implement relevant construction phase EHS plan in line with construction good practice as set out in EHS guidelines for health and safety.
- Each contractor will appoint an environmental health and safety manager to implement the construction phase EHS plan.
  - Identify and minimize the causes of potential hazards to workers. Implement appropriate safety measures, and make available emergency response facilities such as firefighting, first aid and rescue equipment to address risks associated with fire, drowning and accidents.
  - Provide training to workers on occupational health and safety, emergency response, especially with respect to using potentially dangerous equipment and storage, handling and disposal of hazardous waste. The induction will be conducted before construction, and no

worker is allowed on site without induction.
- Ensure that all equipment is maintained in a safe operating condition.
- Provide appropriate personal protective equipment (PPE) to workers.
- Provide procedures for limiting exposure to high noise or high temperature working environments in compliance with PRC occupational exposure limits for hazardous agents in workplace Part 2: physical agents (GBZ 2.2-2007 and EHS Occupational Health and Safety Guidelines).
- Ensure regular safety meetings with staff and carry monthly safety audits.
- Core labor standards will be implemented. Civil works contracts will stipulate priorities to: (i) employ local people for works; (ii) ensure equal opportunities for women and men; (iii) pay equal wages for work of equal value and pay women's wages directly to them; and (iv) not employ child or forced labor. Specific targets for employment have been included in the project gender action plan.

- 每个承包商都将对施工工程进行健康和安全风险评估，并根据 EHS 健康和安全指南中规定的施工良好实践实施相关施工阶段 EHS 计划。
- 各承包商将任命一名环境健康与安全经理，负责实施施工阶段的 EHS 计划。
  - 识别并尽量减少对工人造成潜在危害的原因。实施适当的安全措施，并提供消防、急救和救援设备等应急响应设施，以应对与火灾、溺水和事故相关的风险。
  - 向工人提供职业健康和安全、应急反应方面的培训，特别是关于使用有潜在危险的设备以及储存、处理和处置危险废物的培训。施工前进行上岗，未经上岗的人员不得进入现场。
  - 确保所有设备处于安全运行状态。
  - 为工人提供适当的个人防护装备（PPE）。
  - 根据中华人民共和国《工作场所有害因素职业接触限值第 2 部分：物理因素》（GBZ 2.2-2007）和《EHS 职业健康安全指南》，提供限制接触高噪声或高温工作环境的程序。
  - 确保与员工定期召开安全会议，并每月进行安全审核。
  - 将实施核心劳工标准。土建工程合同将规定以下优先事项：（i）雇用当地人进行工程；（ii）确保男女机会平等；（iii）同工同酬，并直接向她们支付妇女工资；（iv）不雇用童工或强迫劳工。项目性别行动计划中包括了就业的具体目标。

9. Physical Cultural Resources 物质文化资源

No cultural heritage or archaeological sites are known adjacent to the subproject areas. However, construction activities have the potential to disturb unknown underground cultural relics. The EMP mitigation measures include immediate suspension of construction activities if any archaeological or other cultural relics are encountered. The local Cultural Heritage Bureau, CPMO, and implementing agency will be promptly notified. Construction will resume only after investigation and with the permission of the appropriate authority. The clause for protection of unknown underground cultural relics will be included in construction contracts.
子项目区域附近没有已知的文化遗产或考古遗址。然而，施工活动有可能扰乱未知的地下文物。环境管理计划缓解措施包括在遇到任何考古或其他文物时立即暂停施工活动。将及时通知当地文物局、县项目办和执行机构。只有经过调查并获得有关当局的许可，才能恢复施工。将保护地下无名文物的条款写入施工合同。

10. Unintended damage to crops or disruption to harvests 对作物的意外损害或对收成的干扰

These risks are assessed to be low: (i) the existing farmland is flat, which reduces erosion potential, (ii) the land levelling will reduce ridges and facilitate machinery access and operation, (iii) all excavated earth will be reused on site – no spoil will be generated, and there will be no

transport of soil offsite (which might create risks associated with spillage or dust from vehicles), (iv) the construction duration is short (six months), reducing the likelihood of damage to crops, (v) works for land levelling and the irrigation canals will be scheduled during October to March to avoid the growing season, (vi) compensation procedures in the event of unintended damage to crops will be assessed and compensation amounts developed in accordance with the overall project assessment for involuntary resettlement, and (vii) works on irrigation canals will include temporary water diversions as needed to ensure uninterrupted water supply to existing crops.
这些风险被评估为较低：（i）现有农田平坦，这降低了侵蚀的可能性，（ii）土地平整将减少山脊，便于机械进入和操作，（iii）所有挖掘的土壤将在现场重复使用——不会产生弃土，也不会将土壤运出现场（这可能会产生与车辆溢出或灰尘相关的风险），（iv）施工期较短（六个月），减少了对农作物造成损害的可能性，（v）土地平整和灌溉渠工程将安排在 10 月至 3 月期间进行，以避开生长季节，（vi）对农作物造成意外损害的赔偿程序将根据非自愿移民安置的整体项目评估进行评估，并确定赔偿金额，（vii）灌溉渠工程将包括必要的临时引水，以确保不间断地向现有作物供水。

E. Operation Phase 运行阶段

1. Unsustainable use of water resources 水资源的不可持续利用

In the baseline year (2020), Yanshi District has a total of cultivated area of 23,000 mu, with irrigation quotas for wheat, corn, vegetables, grapes, and seedlings being 140 m^3/mu, 110 m^3/mu, 190 m^3/mu, 165 m^3/mu, and 140 m^3/mu, respectively, all with an irrigation efficiency coefficient of 0.6. The total water demand is 530.00 million m^3. In the planning year (2027), the cultivated area increases to 26,400 mu, with irrigation quotas for the same crops reduced to 123.2 m^3/mu, 96.8 m^3/mu, 119.7 m^3/mu, 103.95 m^3/mu, and 88.2m^3/mu, respectively. The irrigation efficiency coefficients will improve to 0.95 or 0.9. Consequently, the total water demand will decrease significantly to 297.01 million m^3. This reflects an increase in the cultivated area, a reduction in irrigation quotas, and improved irrigation efficiency, resulting in a substantial reduction in water demand.
基准年（2020 年），偃师区总耕地面积 2.3 万亩，小麦、玉米、蔬菜、葡萄、苗木灌溉定额分别为 140 m^3/亩、110 m^3/亩、190 m^3/亩、165 m^3/亩、140 m^3/亩。灌溉效率系数均为 0.6。总需水量为 530000m^3。规划年（2027 年），耕地面积增加到 2.64 万亩，相同作物灌溉定额分别减少到 123.2 m^3/亩、96.8 m^3/亩、119.7 m^3/亩、103.95 m^3/亩、88.2 m^3/亩。灌溉效率系数将提高到 0.95 或 0.9。因此，总需水量将大幅减少至 29701 万立方米。这反映了耕地面积的增加、灌溉定额的减少和灌溉效率的提高，从而导致水需求的大幅减少。

Xiangfu District has a total cultivated area of 36,000 mu, with irrigation quotas for wheat, corn, and rice being 120 m^3/mu, 95 m^3/mu, and 270 m^3/mu respectively, all with an irrigation efficiency coefficient of 0.6. The total watere demand is 1,074.17 million m^3. In the planning year, the cultivated area will increase slightly to 37,000 mu, with irrigation quotas for wheat, corn, and rice reduced to 105.6 m^3/mu, 83.6 m^3/mu, and 396 m^3/mu, respectively. The irrigation efficiency coefficients will improve to 0.9. As a result, the total water demand will decrease to940.62 million m^3.
祥符区总耕地面积 3.6 万亩，小麦、玉米、水稻灌溉定额分别为 120m^3/亩、95m^3/亩、270m^3/亩，灌溉效率系数均为 0.6。总需水量为 10.7417 亿立方米。规划水平年，耕地面积略有增加，达到 3.7 万亩，小麦灌溉定额降至 105.6 m^3/亩，玉米灌溉定额降至 83.6 m^3/亩，水稻灌溉定额降至 396 m^3/亩。灌溉效率系数将提高到 0.9。因此，总需水量将减少到 9.4062 亿立方米。

In the current year, Wuzhi County has a total cultivated area of 38,310 mu, with irrigation quotas for wheat, corn, rice, and soybeans being 155 m^3/mu, 127 m^3/mu, 397.6m^3/mu, and 108 m^3/mu, respectively, all with an irrigation efficiency coefficient of 0.6. The total water

demand is 1,206.19 million m^3. In the planning year, the cultivated area decreases to 33,100 mu, with irrigation quotas for the same crops remaining the same for wheat and corn but increasing for rice to 497 m^3/mu, while remaining the same for soybeans. The irrigation efficiency coefficients improve to 0.9. Consequently, the total water demand decreases to 941.19 million m^3.
武陟县当年总耕地面积为 38310 亩，小麦灌溉定额为 155 m^3/亩，玉米灌溉定额为 127 m^3/亩，水稻灌溉定额为 397.6 m^3/亩，大豆灌溉定额 108 m^3/亩，灌溉效率系数均为 0.6。总需水量为 120619 万 m^3。规划水平年，耕地面积减少至 3.31 万亩，同类作物灌溉定额小麦、玉米不变，水稻增加至 497 m^3/亩，大豆不变。灌溉效率系数提高到 0.9。因此，总需水量减少至 9.4119 亿立方米。

Currently, the irrigation in Yanshi District, Xiangfu District, and Wuzhi County relies on traditional methods such as surface irrigation and mechanical well pumping, with irrigation channels serving as the primary distribution system. In the planned future (2027), there is a transition towards more efficient irrigation techniques such as sprinkler, drip, and pipe irrigation systems. In Yanshi District, Xiangfu District, and Wuzhi County, water demand will decrease by 232.99 million m^3, 133.55 million m^3, and 265 million m^3, respectively. This transition reflects a strategic approach towards sustainable water management practices and adaptation to changing agricultural needs.
目前，偃师区、祥符区和武陟县的灌溉主要依靠地面灌溉和机井抽水等传统方法，渠道灌溉是主要的分配系统。在计划的未来（2027 年），将向更高效的灌溉技术过渡，如喷灌、滴灌和管道灌溉系统。偃师区、祥符区、武陟县需水量分别减少 23299 万 m^3、13355 万 m^3、26500 万 m^3。这一转变反映了实现可持续水管理做法和适应不断变化的农业需求的战略方针。

The Yellow River basin implements water allocation plan and water quota system. The irrigation water quota will be allocated to the farmers based on the farmland area and crop types. The farmers will take water using an integrated circuit card system to record quantities consumed to ensure consumption is within the specified allocated quota. For all subproject activities involving water extraction: (i) the volume of water used for operation of the subproject facilities will be monitored against the corresponding water entitlements, and (ii) the results will be included in the environment monitoring reports to ADB. The implementation of subprojects of Yanshi, Xiangfu and Wuzhi will not cause unsustainable water use in the subproject areas.
黄河流域实行水量分配方案和用水定额制度。灌溉用水定额将根据农田面积和作物种类分配给农民。农民将使用集成电路卡系统记录用水量，以确保用水量在规定的配额范围内。对于所有涉及水提取的子项目活动：（i）将根据相应的水权利对子项目设施运行所用的水量进行监测，以及（ii）监测结果将包含在提交给亚洲开发银行的环境监测报告中。偃师、祥符、武陟子项目的实施不会造成子项目区不可持续用水。

Table IV-4: Water balance analysis.

Table IV-4: 水平衡分析

Subproject 子项目	Year 年	Crop 作物	Area 面积 (mu)	Irrigation method 灌溉方法	Irrigation quota 灌溉定额 (m^3/mu)	Irrigation efficiency coefficient 灌溉效率系数	Irrigation demand 灌溉需水量 (10,000 m^3)
Yanshi 偃师	2020	Wheat 小麦	10000	Surface Irrigation 漫灌	140	0.6	233.33
		Corn 玉米	3000		110	0.6	55.00
		Vegetables 蔬菜	200		190	0.6	6.33
		Grape 葡萄	1600		165	0.6	44.00
		Seedlings 苗木	8200		140	0.6	191.33
		Subtotal 小计	**23000**		**---**	**---**	**530.00**

Subproject 子项目	Year 年	Crop 作物	Area 面积 (mu)	Irrigation method 灌溉方法	Irrigation quota 灌溉定额 (m^3/mu)	Irrigation efficiency coefficient 灌溉效率系数	Irrigation demand 灌溉需水量 (10,000 m^3)
	2027	Wheat 小麦	10000	Drip irrigation 滴灌	123.2	0.95	129.68
		Corn 玉米	6000		96.8	0.95	61.14
		Vegetables 蔬菜	400		119.7	0.95	5.04
		Grape 葡萄	1800		103.95	0.9	20.79
		Seedlings 苗木	8200		88.2	0.9	80.36
		Subtotal 小计	**26400**		**---**	**---**	**297.01**
Xiangfu 祥符	2020	Wheat 小麦	16000	Surface Irrigation 漫灌	120	0.6	320.00
		Corn 玉米	5000		95	0.6	79.17
		Rice 水稻	15000		270	0.6	675.00
		Subtotal 小计	**36000**		**---**	**---**	**1074.17**
	2027	Wheat 小麦	17000	Pipe irrigation 管灌	105.6	0.9	199.47
		Corn 玉米	4000		83.6	0.9	37.16
		Rice 水稻	16000		396	0.9	704.00
		Subtotal 水稻	**37000**		**---**	**---**	**940.62**
Wuzhi	2020	Wheat 小麦	19200	Surface Irrigation 漫灌	155	0.6	496.00
		Corn 玉米	12000		127	0.6	254.00
		Rice 水稻	6800		397.6	0.6	450.61
		Soybean 大豆	310		108	0.6	5.58
		Subtotal 小计	**38310**		**---**	**---**	**1206.19**
	2027	Wheat 小麦	19200	Channel lining 渠道衬砌	155	0.9	330.67
		Corn 玉米	3400		127	0.9	47.98
		Rice 水稻	10100		497	0.9	557.74
		Soybean 大豆	400		108	0.9	4.80
		Subtotal 小计	**33100**		**---**	**---**	**941.19**

Source: Feasibility Study Report, October 2022. 来源：可研，2022 年 10 月。

2. Soil and water pollution from use of agricultural chemicals 使用农业化学品造成的土壤和水污染

The environmental risks associated with the use of pesticide include potential contamination of soils, groundwater, or surface water resources by accidental spills. A principal objective of the overall project, which is rated under PRC standards as a “high-quality green agriculture project”, is to reduce the excessive use of chemicals and non-point source pollution of soil and water. The following design and mitigation measures will be implemented to reduce the risk of soil and water pollution from the use of agricultural chemicals.

与农药使用相关的环境风险包括意外泄漏对土壤、地下水或地表水资源的潜在污染。根据中国标准，整个项目被评为“高质量发展绿色农业项目”，其主要目标是减少化学品的过度使用以及土壤和水的非点源污染。将实施以下设计和缓解措施，以降低使用农业化学品造成土壤和水污染的风险。

- The subproject will promote the use of organic fertilizers and integrated pest management to reduce the use of chemical fertilizer and pesticides.
- No pesticides listed as hazardous under Classes I or II by the WHO, or Annexes A and B of the Stockholm Convention[9], or listed as prohibited or strictly controlled use under the PRC's national regulations[10] for pesticide management will be used for the subproject activities. For hazardous pesticides which are currently in use by farmers in the subproject area, these will be gradually phased out under the subproject, as part of the integrated pest management approach adopted.
- Formula fertilizer and integrated water and fertilizer irrigation will be adopted to achieve precise fertilizer application.
- Pesticide application technologies will be selected to minimize off-site movement or runoff (e.g., low-drift nozzles, using the largest droplet size and lowest pressure that are suitable for the product).
- Use plant protection drones and development of intelligent insect forecasting systems.
- The CPMO will record all the pesticides sold in the subproject areas.
  - 本子项目将推广使用有机肥料和综合虫害管理，以减少化肥和农药的使用。
  - 世界卫生组织（WHO）或《斯德哥尔摩公约》（Stockholm Convention）附件 A 和附件 B 未将任何农药列为第一类或第二类危险农药或被中国国家法规列为禁止或严格控制使用。 农药管理将用于子项目活动。对于子项目区农民目前使用的有害农药，将在子项目下逐步淘汰，作为所采用的综合虫害管理方法的一部分。
  - 采用配方肥、水肥一体化灌溉，实现精准施肥。
  - 将选择农药施用技术，以尽量减少场外移动或流失（例如，低漂移喷嘴，使用适合产品的最大液滴尺寸和最低压力）。
  - 使用植保无人机和开发智能昆虫预测系统。
  - 县项目办将记录在子项目区域销售的所有农药。

3. Risks to ecological values 生态价值风险

All project activities of subprojects of Yanshi, Xiangfu and Wuzhi are within the existing cultivation area or farms, which will not expand the farming area and the risk to the ecological values is low.

偃师子项目、祥符子项目和武陟子项目的所有项目活动均在现有养殖区域或养殖场内，不会扩大养殖面积，对生态价值的风险较低。

4. Risks to operational health and safety 运营健康和安全风险

Inadequate storage, handling, application, and disposal of pesticides may contribute to adverse environmental and risks for operational health and safety (OHS). These risks include potential exposure to pesticides through dermal contact and inhalation during preparation, mixing and application. The following measures will be implemented to mitigate these risks.

农药的储存、处理、施用和处置不当可能会对环境造成不利影响，并对操作健康和安全（OHS）造成风险。这些风险包括在制备、混合和施用过程中通过皮肤接触和吸入接触农药的可能性。将采取以下措施来降低这些风险。

- Ensure that any pesticides used are manufactured, formulated, packaged, labeled, handled, stored, disposed of, and applied according (i) to the FAO's International Code of Conduct on

[9] The Stockholm Convention on Persistent Organic Pollutants 2011. 2011 年《关于持久性有机污染物的斯德哥尔摩公约》。

[10] http://www.moa.gov.cn/xw/bmdt/201911/t20191129_6332604.htm

Pesticide Management,[11] and (ii) in a manner consistent with the recommendations given in the World Bank Group EHS Guidelines.[12]

- The CPMO will train the farmers on the safe storage, handling, application and disposal of pesticides.
- Pesticide application methods with lower OHS risk profile will be selected (such as using lower toxicity-rated products listed in the Table 4 and 5 of the WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification, or using safer application methods, such as shielded sprayers, incorporation, or low-volume equipment).
  - 确保所使用的任何农药的制造、配制、包装、标签、处理、储存、处置和施用符合（i）粮农组织《国际农药管理行为守则》； 以及（ii）以符合世界银行 EHS 指南中给出的建议的方式。
  - 农药管理办公室将对农民进行安全储存、处理、施用和处置农药的培训。
  - 将选择职业健康安全风险较低的农药施用方法（如使用《世界卫生组织推荐的农药危险性分类和分类准则》表 4 和表 5 中所列的毒性等级较低的产品，或使用更安全的施用方法，如屏蔽喷雾器、掺入法或低容量设备）。

5. Soil pollution from plastic mulch 地膜覆盖对土壤的污染

Residues of plastic mulch in soil will break down into plastic fragments and eventually microplastics. In accordance with the requirements of "Agricultural Plastic Film Management Measures" (Order No. 4, 2020 of the Agriculture and Rural Affairs, Ministry of Industry and Information Technology, Ministry of Ecology and Environment, and State Administration for Market Regulation) and the "Opinions on Strengthening Agricultural Film Recycling and Disposal Work" (Yu Nong Wen [2021] No. 269) issued by the Henan Provincial Department of Agriculture and Rural AffairsATo minitor and supervise plastic film recycling, the following measures will be implemented: **i)** Only plastic mulch that meets the requirement of Polyethylene Agricultural Ground Cover Films" (GB 13735-2017) will be used in the subproject area to minimize residues of mulch in the soil; **ii)** the local agriculture and rural affairs bureau will provide technical guidance to farmers on film removal timing and methods, promoting the use of thicker, high-strength, and biodegradable films; **iii)** the agricultural enterprises and cooperatives will be required to develop detailed record of film usage, date, supplier, etc; **iv)** establishing a recycling network with model of collection at village collection-township transportation-county processing; **v)** monitoring and tracking film residues annually; and **vi)** conducting regular inspection by the local agriculture and rural affairs bureau. These steps aim to achieve a 85% recovery rate by the end of 2025. In the subproject area, plastic film is usually only used for economic crops, such as vegetables. This subproject will focus on the planting of maize and wheat, for which film is not used. Film will be used within the greenhouses. Overall, the risk of environmental pollution from the use of plastic mulch is assessed to be low for this subproject.

塑料覆盖物在土壤中的残留物会分解成塑料碎片，最终形成微塑料。根据《农用地膜管理办法》（国发〔2000〕22 号）的要求，农业农村部、工业和信息化部、生态环境部、国家市场监管总局 2020 年第 4 号）和《关于加强农膜回收处理工作的意见》（渝农文〔2021〕4 号）。为了监督和管理地膜回收，将采取以下措施：**i**）在子项目区只使用符合《聚乙烯农用地膜》（GB 13735-2017）要求的地膜，以减少地膜在土壤中的残留；**ii**）当地农业和农村事务局将向农民提供有关薄膜拆除时间和方法的技术指导，推广使用较厚、高强度和可生物降解的薄膜；**iii**）要求农业企业和合作社详细记录薄膜的使用情况、日期、供应商等；**iv**）建立“村收—乡运—县处理”的回收网络；每年进行 **v**）监测和跟踪薄膜残留物；以及 **vi**）由当地农业和农村事务局进行定期检

[11] FAO, International Code of Conduct on Pesticides Management (revised 2014), (Rome: FAO, 2014) http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/Code/CODE_2014Sep_ENG.pdf.
粮农组织，《国际农药管理行为守则》（2014 年修订），（罗马：粮农组织，2014 年）

[12] World Bank Group. 2016. EHS Guidelines for Annual Crop Production. https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_policy_ehs_annual_crop_production

查。这些步骤旨在到 2025 年底实现 85%的治愈率。在子项目区域，塑料薄膜通常仅用于经济作物，如蔬菜。这一分项目将侧重于种植玉米和小麦，不使用薄膜。薄膜将在温室内使用。总体而言，该子项目因使用塑料薄膜而造成环境污染的风险较低。

6. Increased pressure on existing waste treatment and disposal facilities 对现有废弃物处理和处置设施的压力增加

Empty containers and packaging waste for pesticides and fertilizers will be collected by the pesticide's distributors with subsidies. The plastic film will be collected for recycle and reuse. All biomass waste from cultivation, pruning and weeding will be reused on site wither for composting or mulch. No waste will be burnt. The subprojects of Xiangfu, Yanshi and Wuzhi will not increase pressure on the existing waste disposal facility.

农药和化肥的空容器和包装废物将由有补贴的农药经销商收集。塑料薄膜将被回收再利用。种植、修剪和除草产生的所有生物质废物将在现场进行再利用，用于堆肥或覆盖。不会焚烧任何废物。祥符、偃师、武陟子项目不会增加现有垃圾处理设施的压力。

7. Impacts from straw returning 秸秆回收利用的影响

The straw returning activities in Wuzhi will be done in two ways: using straw broken into 1-3 cm pieces, mixing it with mitrogen sources and microbial agents, moistening to 70% water content, fermenting for about 15 days, and then applying it as organic fertilizer; or directly incorporating easily decomposable straw, while crushing wheat straw before incorporation and spraying a nutrient mixture with a decomposing agent afterward. Both methods can ensure thorough decomposition of the straw by maintaining proper moisture levels and prevent plant diseases.

武陟的秸秆循环利用活动将通过两种方式进行：使用碎成 1-3 厘米的秸秆，与氮源和微生物菌剂混合，湿润至 70%的含水量，发酵 15 天左右，然后作为有机肥施用；或直接掺入易分解的秸秆，掺入前将麦秸粉碎，掺入后喷洒加有分解剂的营养混合物。这两种方法都可以通过保持适当的湿度水平来确保秸秆的彻底分解，并防止植物病害。

8. Impacts from organic fertilizer plant 有机肥厂的影响

The major impacts of the organic fertilizer workshop are odor and noise during operation. The nearest residential areas is Maxuanzhai village about 585 m to the fertilizer plant.

有机肥车间的主要影响是运行过程中的气味和噪声。距离化肥厂最近的居民区为马宣寨村，距离化肥厂约 585m。

Odor. The foul odor gas produced by organic fertilizer plants mainly comes from the fermentation and maturation workshops' composting processes. Its main components are NH3 and H2S. Organic fertilizer plants will set up enclosed fermentation and maturation workshops, strengthen workshop sealing, avoid open ventilation windows, and adopt negative pressure exhaust for collection. The collected foul odor gas is purified, and the treated exhaust is discharged through a 15-meter-high chimney. At the same time, regular spraying of deodorant is done to reduce the emission of foul odor gas. For the processes of feeding, crushing, screening, mixing, and cooling, which collectively produce particulate matter, a single set of bag-type dust collectors is used. After treatment, the emissions are discharged through a 15-meter-high exhaust stack. The emissions from the drying process, including particulate matter, ammonia, and hydrogen sulfide, undergo treatment through a combination of bag-type dust collectors and biological filters before being discharged through a separate 15-meter-high exhaust stack.

恶臭。有机肥厂产生的恶臭气体主要来源于发酵车间和陈化车间发酵堆肥，其主要成分是 NH_3、

H_2S。有机肥厂将设置密闭的发酵车间和陈化车间，加强车间封闭，不舍通风窗，并采取负压抽气的方式进行收集，收集的恶臭气体进行净化处理，处理后的废气经 15m 高排气筒排放。同时通过定期喷洒除臭剂，减少恶臭气体排放。对于共同产生可吸入颗粒物的进料、破碎、筛分、混合和冷却过程，使用一套袋式除尘器。经处理后，排放物通过 15 米高的排气管排出。干燥过程中产生的排放物，包括可吸入颗粒物、氨和硫化氢，通过袋式除尘器和生物过滤器的组合进行处理，然后通过一个单独的 15 米高的排气筒排放。

Noise. The main noise sources are the noise of mechanical equipment such as the rotary turner, vertical crusher, drum screening machine, and twin-shaft mixer. The noise level is about 80 to 90 dB(A). For mechanical equipment with a fixed position in the production workshop, shock absorption will be installed at the bottom, and soft connections will be set to avoid the increase of noise value caused by equipment vibration. After taking these noise reduction measures, the noise level will be reduced to 60-50 dB(A) at the plant boundary that satisfy with the Class II of Emission Standard for Industrial Enterprises Noise at Boundary (GB 12348-2008) (60 dB daytime). Under the working conditions of strong noise for a long time, the staff are prone to occupational deafness. Workers will be required to wear personal soundproofing facilities, such as earplugs and earmuffs.
噪声。主要噪声源为轮盘式翻抛机、立式粉碎机、滚筒筛分机、双轴混合机等机械设备噪声。噪音水平约为 80-90dB（A）之间。对于生产车间内位置固定的机械设备，将在底部安装减震装置，并设置软连接，避免设备振动引起的噪声值增大。采取这些降噪措施后，厂界噪声值将降至 60-50 dB（A），满足《工业企业厂界环境噪声排放标准》（GB 12348-2008）2 类标准（昼间 60 dB）。工作人员长时间处于强噪声的工作条件下，容易发生职业性耳聋。工人将被要求佩戴个人隔音设施，如耳塞和耳罩。

Wastewater. The fermentation and maturation of organic fertilizer factory requires a biological deodorization device to treat odorous gases, including filtration and water spraying. The daily circulating water volume of the biological deodorization device is 19.2 m^3. Due to evaporation loss and other factors, 0.192 m^3 of fresh water needs to be added daily. The water used in this biological deodorization device is recycled and not discharged. The factory has a workforce of 12 workers. The estimated daily wastewater generation is about 0.48 m^3. Domestic sewage is treated using an existing 10 m^3 septic tank within the plant area and is regularly removed by tank trucks for use as fertilizer on cooperative farms. In order to evaluate the impact of the plant on groundwater, we will collect or supplement groundwater monitoring data before the start of the organic fertilizer plant, and continue to carry out monitoring work during the operation period of the project.
废水。有机肥厂发酵和陈化共需处理恶臭气体的生物除臭装置包括过滤装置和水喷淋，生物除臭装置每天的循环水量为 19.2m^3，由于蒸发损耗等因素，需每天新鲜水补充 0.192m^3，此生物除臭装置的用水是循环使用不外排。该工厂劳动定员 12 名工人，预计废水产生量约 0.48m^3/d，生活污水利用厂区现有 10m^3 化粪池处理后定期由罐车清运用于合作社农田施肥。有机肥厂项目建设设计对地面制定了相应防渗指标要求，废水、废气均设计相应处理要求，且废水主要为厂区一定量的生活污水和除臭循环用水，为评估厂区对地下水的影响，我们将在有机肥厂开工前收集或补充地下水监测数据，并在项目运营期持续开展监测工作。

Solid waste. The solid waste generated by organic fertilizer plants mainly consists of general solid waste, hazardous waste, and domestic garbage. General solid waste includes waste packaging materials, dust collected from dust removal facilities, waste filler, and non-conforming products. Waste packaging materials are periodically sold to recycling stations for comprehensive utilization. The dust collected from dust removal facilities is bagged and reused in production. Waste filler is recovered by the equipment supplier, and non-conforming products are collected and reused in production. Hazardous waste mainly includes waste air compressor oil, waste lubricating oil, and waste oil drums.Regarding the hazardous waste that

may be generated by the organic fertilizer plant, Qiaomiao Town will sign a recycling agreement with relevant qualified recycling institutions after the completion of the factory, and the hazardous waste during the operation of the plant will be recycled and treated by a qualified third-party organization; The general waste generated by the factory will be collected by the third-party garbage recycling agency entrusted by Qiaomiao Town and transported to the Xiuwu County Waste Incineration Plant for incineration treatment;
固体废弃物。有机肥厂产生的固体废弃物主要是一般固体废弃物、危险废弃物和生活垃圾。一般固体废弃物包括废包装材料、除尘设施收集的粉尘、废填料和不合格产品。废包装材料收集后定期外售废品回收站综合利用，除尘设施收集的粉尘袋装收集后回用于生产，废填料由设备供应厂家回收，不合格产品收集后重新用于生产。危险废弃物主要包括废空压机油、废润滑油和废油桶。关于有机肥厂可能产生的危险废弃物，乔庙镇将在工厂建成后与有相关资质的回收机构签订回收协议，工厂运行期间的危险废弃物将有具备资质的第三方机构进行回收；工厂所产生的一般垃圾将由乔庙镇统一委托的第三方垃圾回收机构进行收集，运送至修武县垃圾焚烧厂进行焚烧处理。

9. Impacts from the field power transmission lines 现场输电线路的影响

The presence of 10kV high voltage transmission lines in agricultural areas primarily poses risks of electrical hazards and fire. These power lines can lead to dangerous conditions if they malfunction or are damaged, such as electrocution risks during farming operations or sparking that could ignite fires in dry vegetation. Additionally, while the electromagnetic radiation levels from 10kV lines are relatively low, the physical presence of these structures can hinder farming activities by imposing height restrictions on machinery use and reducing the available land for cultivation.
农业地区的 10kV 高压输电线路主要存在电气危险和火灾风险。如果这些电线发生故障或损坏，可能会导致危险情况，例如在农业操作过程中的触电风险或可能在干燥植被中引发火灾的火花。此外，虽然 10kV 线路的电磁辐射水平相对较低，但这些结构的物理存在可能会对机械使用施加高度限制，并减少可用于耕种的土地，从而阻碍农业活动。

Given the configuration of power lines in agricultural areas, where utility poles stand 15 meters high and are spaced 50 meters apart with overhead insulated steel-core aluminum stranded conductors, the impact on community safety will be notably minimized. This setup ensures that high-voltage lines are well out of reach of large farming machinery, significantly reducing the risk of electrical hazards and potential contact incidents. To further enhance safety, it is essential to implement regular inspections and maintenance of the power lines to prevent malfunctions or wear that could lead to fires, especially in dry conditions by the local power companies. Additionally, community awareness programs about the safe operation of equipment near power lines and emergency response procedures implemented by the local power supply companies can help mitigate any residual risks, ensuring that both the productivity and safety of the community are maintained.
考虑到农业地区的电力线路配置，电线杆高 15 米，间隔 50 米，架空绝缘钢芯铝绞线，对社区安全的影响将显著降低。这种设置可确保高压线远离大型农业机械，从而显著降低电气危险和潜在接触事故的风险。为进一步加强安全，当地电力公司必须定期检查和维护输电线，以防止可能导致火灾的故障或磨损，特别是在干燥条件下。此外，当地供电公司实施的关于电力线附近设备安全运行的社区意识计划和应急响应程序可以帮助减轻任何残余风险，确保社区的生产力和安全得到维护。

10. Climate change risk assessment 气候变化风险评估

The climate risk and vulnerability assessment (CRVA) was conducted for the overall project (considering all 24 subprojects) rather than on a subproject basis: this was considered appropriated in order to ensure that cumulative effects of the project are considered; and, considering the similar scope of most subprojects. Levelling the cultivation land, water saving irrigation, rural road rehabilitation and greenhouse construction will enhance project adaptation to the future drought and flood event. The CRVA[13] report highlights various adaptation measures to address the increased risks posed by climate change across different project activities. These measures include enhancing storm and flood design standards, developing water-saving facilities, and improving infrastructure resilience against drought and flood impacts. For detailed information on specific adaptation strategies and recommendations, please refer to the CRVA report. It is crucial that all future project designs consider the adaptation measures outlined in Table 7 of the report to ensure sustainability and resilience in the face of evolving climate conditions.
气候风险和脆弱性评估（CRVA）是针对整个项目（考虑所有 24 个子项目）而不是以子项目为基础进行的：这被认为是适当的，以确保项目的累积效应得到考虑；并且，考虑到大多数子项目的相似范围。平整耕地、节水灌溉、农村道路修复和温室建设将增强项目对未来干旱和洪水事件的适应性。气候风险和脆弱性评估报告着重介绍了不同项目活动为应对气候变化带来的更大风险而采取的各种适应措施。这些措施包括提高暴雨和洪水设计标准，发展节水设施，提高基础设施抵御干旱和洪水影响的能力。关于具体适应战略和建议的详细信息，请参阅气候风险和脆弱性评估报告。至关重要的是，今后所有的项目设计都要考虑报告 Table 7 所列的适应措施，以确保在不断变化的气候条件下的可持续性和抗御力。

The project activities, including integrated utilization of crop residuals, fertilizer reduction, agricultural film recycling, and soil erosion prevention forest are deemed as climate risk mitigation activities. According to the CRVA, the practice of returning full amounts of straw to the fields combined with chemical fertilizers leads to an annual increase in soil organic carbon (SOC) by 230 kg per hectare. This change in the carbon stock is converted into CO_2 emissions reduction by multiplying it by a conversion factor of 3.67. Additionally, the report emphasizes encouraging farmers to use organic fertilizers and increase the proportion of animal organic manure returned to the fields as a replacement for chemical nitrogen fertilizers. This practice not only enhances soil carbon sequestration but also shows an annual increase in SOC by 180 kg per hectare. This increase, when converted using the same factor of 3.67, results in annual CO_2 reductions of 18,200 tons. Furthermore, artificial forests in the subproject area are noted for their CO_2 reduction capacity of 8.55 tons per hectare per year. Therefore, it is estimated that after the project implementation, carbon sequestration will reach 58,700 CO2e/yr, of which Yanshi, Xiangfu and Wuzhi will achieve a carbon reduction of 900t CO_2e/yr, 2,000 t CO_2e/yr and 680 t CO_2e/yr respectively.
本项目活动包括农作物秸秆综合利用、化肥减量、农膜回收、水土流失防护林等，属于气候风险减缓活动。根据气候风险和脆弱性评估的数据，秸秆全量还田与化肥相结合的做法导致土壤有机碳（SOC）每年每公顷增加 230 公斤。碳储存量的这一变化乘以转换系数 3.67，即转换为二氧化碳排放量的减少。此外，报告强调鼓励农民使用有机肥，并增加动物有机肥还田的比例，以替代化学氮肥。这种做法不仅增强了土壤碳固存，而且每公顷土壤有机碳每年增加 180 公斤。当使用相同的系数 3.67 转换时，这一增加导致每年减少 18,200 吨 CO_2。此外，子项目区人工林的 CO_2 减排能力为每年每公顷 8.55 吨。因此，预计本项目实施后，固碳量将达到 5.87 万 CO_2e/yr，其中偃师、祥符、武陟分别实现减碳量 900t CO_2e/yr、2000t CO_2e/yr、680t CO_2e/yr。

F. Indirect, Induced and Cumulative Impacts 间接、诱发和累积影响

[13] https://www.adb.org/sites/default/files/linked-documents/54027-002-ld-07.pdf

Indirect impacts are adverse and/or beneficial environmental impacts that cannot be immediately traced to a project activity but can be causally linked. Induced impacts are adverse and/or beneficial impacts on areas and communities from unintended but predictable developments caused by a project which may occur later or at a different location. Cumulative impacts are the combination of multiple impacts from existing projects, the proposed project, and anticipated future projects that may result in significant adverse and/or beneficial impacts that would not be expected in case of a stand-alone project.[14]
间接影响是指无法立即追溯到项目活动，但可以有因果联系的不利和/或有利的环境影响。诱发影响是指项目造成的非预期但可预测的发展对区域和社区造成的不利和/或有利影响，这些影响可能发生在以后或不同的地点。累积影响是现有项目、拟议项目和预期未来项目的多重影响的组合，可能会产生重大的不利和/或有利影响，而这些影响在独立项目中是无法预料的。

Indirect impacts. Through promotion of drip irrigation and other water-saving irrigation methods, the utilization efficiency of water resources will be improved. While ensuring crop irrigation needs and increasing crop yields, water resources are saved as much as possible to promote sustainable and efficient development of agricultural production. The application of integration of water and fertilizer irrigation will reduce fertilization labor and fertilizer usage.
间接影响。通过推广滴灌等节水灌溉方式，提高水资源利用效率。在保证作物灌溉需求、提高作物产量的同时，尽可能节约水资源，促进农业生产持续高效发展。水肥一体化灌溉的应用，将减少施肥用工和化肥用量。

Induced impacts. Long-term excessive use of organic fertilizer will cause environmental issues such as nutrients ruoff leading to water pollution, not in the subproject sites but also in the neighboring area. To mitigate this risk, the subprojects will impelemt soil testing and monitoring. Overuse of fertilizers will be avoided through soil testing to determine the specific nutrient needs of soil. Training sessions are also included in the subprojects to educate farmers on the appropriate use of orgnic fertilizers on correct dosages and timing to minimize environmental risks. Through education program, soil testing and monitoring, the subprojects can ensure that the benefits of organic fertilizers are maximized without compromising environment. With better agricultural infrastructures and increased crop production, the reduction of outflow of people from the rural areas is expected.
诱发的影响。长期过量使用有机肥会造成环境问题，如养分流失导致水污染，不仅在子项目现场，而且在邻近地区也是如此。为了降低这一风险，子项目将推动土壤测试和监测。将通过土壤测试确定土壤的具体养分需求，避免过度使用化肥。培训课程也包括在子项目中，以教育农民正确使用有机肥料的正确剂量和时间，以最大限度地减少环境风险。通过教育计划、土壤测试和监测，这些子项目可以确保在不损害环境的情况下最大限度地发挥有机肥料的效益。随着农业基础设施的改善和农作物产量的增加，预计农村地区的人口外流将会减少。

Cumulative impacts and benefits. The rural roads typically measure between 3m to 6 m in width. The construction activities will be conducted across the villages are anticipated to increase traffic flow, adding a cumulative impact on the existing traffic conditions. The overall impact on traffic is expected to be minimal, given the limited number of contructio vehicles involved, approximately 6-8 per civil contract section and also the construction activities will be across different locations and times. However, to mitigate potential disruptions, particularly in areas with narrower roads, comprehensive traffic management trategies will be employed. These trateggies will include installing clear and visible traffic signage and meticulously timing construction activities to coincide with non-peak periods, such as outside school hours, market days, and critical agricultural seasons like planting and harvesting. Proactive and ongoing

[14] ADB. 2011. Sourcebook for Safeguard Requirement 1: Environment. Manila.
亚行。保障要求1的2011.原始资料：环境。马尼拉。

communication with the affected villages shall be conducted.
累积影响和效益。乡村道路的宽度通常在 3 米至 6 米之间。施工活动将在整个村庄进行，预计将增加交通流量，增加对现有交通状况的累积影响。考虑到所涉及的施工车辆数量有限，每个土建合同段大约 6-8 辆，并且施工活动将跨越不同的地点和时间，预计对交通的总体影响最小。然而，为了减轻潜在的干扰，特别是在道路较窄的地区，将采用综合交通管理策略。这些策略将包括安装清晰可见的交通标志，并精心安排施工活动的时间，以配合非高峰期，如课外时间、集市日和关键的农业季节，如种植和收获。应与受影响的村庄进行积极和持续的沟通。

The cumulative impacts of the subproject in combination with existing and future projects in similar sectors will help to address the non-point source pollution and water stress, and contribute to green development of the Yellow River Basin. By 2027, Yanshi District, Xiangfu District and Wuzhi County will establish a modern agricultural system for green ecological orientation. Under the High Standard Farmland Development Plan (2021-2030), the following targets are expected to be achieved by 2027: the irrigation efficiency will increase from 0.6 to 0.9.
子项目的累积影响与相关部门的现有和未来项目相结合，将有助于解决非点源污染和水资源压力，并有助于黄河流域的绿色发展。到 2027 年，偃师区、祥符区、武陟县建立绿色生态导向的现代农业体系。根据《高标准农田发展规划（2021-2030）》，预计到 2027 年将实现以下目标：灌溉效率从 0.6 提高到 0.9。

V. ANALYSIS OF ALTERNATIVES 备选方案分析

Without the Yanshi, Xiangfu and Wuzhi subprojects, the benefits of improved water use efficiency and reduction of non-point source pollution cannot achieved. Therefore, the no project alternative is not considered.
如果没有偃师、祥符和武陟的子项目，就无法实现提高用水效率和减少面源污染的效益。因此，不考虑无项目备选方案。

VI. INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION 信息披露、咨询和公众参与

This section has added information and photos regarding the public announcement of the new address of the organic fertilizer plant, and updated the public consultation situation and interview photos for non-core sub-projects during the preliminary design phase.
本章节增加了有机肥厂厂址变更公示情况和公示照片，更新了非核心子项目在初设期间的公众咨询情况和访谈照片。

A. Legislative Framework for Public Consultation and Information Disclosure 公众咨询及资料披露的立法架构

Meaningful public participation and consultation during project feasibility study, design and implementation are important safeguard requirements. The PRC Environmental Protection Law and Regulations on the Administration of Construction Project Environmental Protection (Order No. 253 of the State Council), and Measures on Public Participation in Environmental Impact Assessment (Order No.4 of the Ministry of Ecology and Environment, April 2018), require that a DEIA solicits the opinions of organizations concerned, and villagers and residents within and near the project sites. In August 2012, the PRC National Development and Reform Commission (NDRC) issued a requirement for “Social Risk Assessment of Large Investment Projects”, which emphasizes the importance of public consultation in an effective manner and requires that the results of public consultation are clearly summarized in the DEIA report, including the dates of consultations, number of stakeholders, who the affected people are, and the comments received.
在项目可行性研究、设计和实施过程中，有意义的公众参与和协商是重要的保障要求。《中华人民共和国环境保护法》、《建设项目环境保护管理条例》（国务院令第 253 号）、《环境影响评价公众参与办法》（生态环境部令第 4 号，2018 年 4 月）要求环境影响评价办公室征求有关组织和项目所在地及附近村民、居民的意见。2012 年 8 月，中国国家发展和改革委员会（NDRC）发布了“大型投资项目社会风险评估”的要求，强调了以有效方式进行公众咨询的重要性，并要求在国内环评中明确总结公众咨询的结果，包括咨询日期、利益相关者数量、受影响人群以及收到的意见。

ADB’s SPS (2009) also requires meaningful public participation, consultation and information disclosure. The consultation process for this project followed both the PRC law/regulation and the ADB’s SPS.
亚洲开发银行的 SPS（2009）也要求有意义的公众参与、咨询和信息披露。该项目的咨询过程遵循中国法律/法规和亚洲开发银行的 SPS。

This section describes the public consultations for the environmental assessment, undertaken by the DEIA institute and implementing agencies, with guidance and participation of the TA consulting firm. Consultations comprised: (i) information disclosure; (ii) questionnaire surveys; (iii) informal visits to villages and households in the subproject areas; and (iv) public meetings attended by representatives of the affected public and other concerned stakeholders, including a questionnaire survey after the meeting. At the start of each meeting, the design institute and TA team explained the purpose of consultation, the proposed project objectives, components, and designs, the anticipated social and environmental benefits and risks, and the proposed design and mitigation measures to address these risks. Community feedback was sought, including concerns about potential impacts and measures to address these. A social and poverty analysis was also conducted by the TA social and resettlement experts based on group discussions with key agencies, beneficiaries, and adversely affected communities, with emphasis on poverty villages and potential gender issues.
本节描述了由国内环评机构和执行机构在技术援助咨询公司的指导和参与下进行的环境评估公众咨询。协商内容包括：（i）信息披露；（ii）问卷调查；（iii）对子项目区域内的村庄和家庭进行非正式访问；（iv）由受影响公众和其他利益攸关方代表参加的公开会议，包括会后的问卷调查。在每次会议开始时，设计院和技术援助团队都会解释咨询的目的、拟定的项目目标、组成部分和设计、预期的社会和环境效益和风险，以及应对这些风险的拟定设计和缓解措施。征求了机构群体的反馈意见，包括对潜在影响的关注以及解决这些问题的措施。技术援助社会和移民安置专家还根据与主要机构、受益人和受不利影响社区的小组讨论进行了社会和贫困分析，重点是贫困村庄和潜在的性别问题。

B. Information Disclosure 信息披露

The first round of information disclosure for the proposed subproject was conducted by the CPMOs and domestic EIA institute through the websites of governments of Xiangfu District, Yanshi District and Wuzhi County during May 2022 (Figure VI-1). The information disclosed included (i) the name and major content of the subproject, (ii) contact of the implementing agency, (iii) name and contact of the EIA institute, (iv) internet link of the public comment form, and (v) ways of submitting the public comment form. The second round of information disclosure was undertaken from Jun2, 2022 through the same official account as the first-round information disclosure after preparation of the draft IEE, FSR and domestic EIA, to seek public feedback on the findings, including potential impacts and updated mitigation measures, and included consultations with communities and villages in and near subproject sites.
拟建子项目的第一轮信息公开由县（区）项目办和国内环评机构于 2022 年 5 月在祥符区、偃师区和武陟县政府网站上进行（图 VI-1）。披露的信息包括：（i）子项目的名称和主要内容；（ii）执行机构的联系方式；（iii）环境影响评价机构的名称和联系方式；（iv）公众意见表的互联网链接；（v）提交公众意见表的方式。第二轮信息披露从 2022 年 6 月 2 日开始，在编制初始环境评估、可行性研究报告和国内环境影响评估草案后，通过与第一轮信息披露相同的官方账户进行，以寻求公众对调查结果的反馈，包括潜在影响和更新的缓解措施，并与子项目现场及其附近的社区和村庄进行协商。

The documents and information disclosed in the second round of information disclosure comprised: (i) description of the project and subprojects, including the subproject locations, scope and construction methods; (ii) the potential impacts and risks during construction and operation; (iii) the mitigation measures proposed in the IEE and DEIA; (iv) methods and contact channels for public feedback (to the DEIA Institute and the CPMO), and duration of public access to DEIA report; (v) forms and methods for the public consultation; and (vi) the date, time, location and organizer’s contact information for the public consultation meetings. Hard

copies of the translated version of the executive summary of the IEE were also made available at the village communities' offices for public access, to ensure that residents without access to the internet also had the opportunity to review and comments on the subproject. In addition, all information was provided in Chinese language, to ensure accessibility for residents
第二轮信息披露的文件和信息包括：（i）项目和子项目的说明，包括子项目的位置、范围和施工方法；（ii）施工和运营期间的潜在影响和风险；（iii）初始环境评估和国内环评中提出的缓解措施；（iv）公众反馈的方法和联系渠道（向国内环评机构和县区项目办），以及公众获取国内环评报告的持续时间；（v）公众咨询的形式和方法；（vi）公众咨询会议的日期、时间、地点和组织者的联系信息。村庄社区办公室还提供了初步环境评估执行摘要翻译版本的硬拷贝，供公众查阅，以确保无法访问互联网的居民也有机会对子项目进行审查和评论。此外，所有信息均以中文提供，以确保居民无障碍。

Figure VI-1: Information disclosure conducted for Wuzhi Subproject
Figure VI-1: 武陟子项目进行信息披露

<table>
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<tr>
<td>Wuzhi County Government website, 16 May, 2022
武陟县政府网站 2022 年 5 月 16 日</td>
<td>Wuzhi County Government website, 20 June, 2022
武陟县政府网站 2022 年 6 月 20 日</td>
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</table>

Figure VI-2: Information disclosure conducted for Yanshi Subproject

Figure VI-2:偃师子项目信息公开

Yanshi District Government website, 13 May, 2022

偃师区政府网 2022 年 5 月 13 日

Yanshi District Government website, 20 June, 2022

偃师区政府网 2022 年 6 月 20 日




Figure VI-3: Information disclosure conducted for Xiangfu Subproject

Figure VI-3: 祥符子项目进行信息披露

Xiangfu District Government website, 1 May, 2022

祥符区政府网站 2022 年 5 月 1 日

Yuncheng County Government website, 20 June, 2022

祥符区政府网站 2022 年 6 月 20 日

The Organic Fertilizer Factory in Qiaomiao Town, Wuzhi County conducted a domestic environmental impact assessment for the construction project of the new factory site in September 2024, and it was publicly announced on the website of the Jiaozuo City Ecology and Environment Bureau on September 29, 2025 (Figure VI-4). The content of the announcement mainly includes: (i) the location of the organic fertilizer factory; (ii) the environmental impact report form; (iii) contact information for public feedback.

武陟县乔庙镇有机肥厂于 2024 年 9 月对新厂址的有机肥厂建设项目进行了国内环境影响评估，并于 2025 年 9 月 29 日在焦作市生态环境局网站上进行了公示（图 VI-4）。公示的内容主要包括：（i）有机肥厂建设地点；（ii）环境影响报告表；（iii）公众反馈意见的联系方式。

Figure VI-4: Environmental Assessment and Information Disclosure of Organic Fertilizer Plants in Wuzhi Subproject

Figure VI-4: 有机肥厂环境评估信息披露

On July 15, 2025, the subsidiary project in Wuzhi County disclosed information regarding the change of site for the organic fertilizer factory. The disclosure mainly included: (i) the information of the cooperative after the change; (ii) the new site of the factory; (iii) the time and location of public consultation; (iv) the contract term after the land use contract change.It was publicly announced in Qiaomiaozhen, where the organic fertilizer factory is located.
2025 年 7 月 15 日，武陟县子项目针对有机肥厂厂址变更进行了信息披露，披露内容主要包括：（i）更改后的合作社信息；（ii）更改后的厂址；（iii）公众咨询时间及地点；（iv）用地合同更改后的合同期限。在有机肥厂所在的乔庙镇进行了公示。

Figure VI-5: Information disclosure conducted for Wuzhi Subproject
Figure VI-5: 武陟子项目进行信息披露

Notice of site change for the organic fertilizer plant in Wuzhi, July 15, 2025.

C. Public Consultation Conducted to Date 已完成的公众咨询

During the project preparation period from 2021-2022, holding face-to-face consultation workshop was not feasible due to travel restrictions and government-imposed limits on the number of people gathering because of the COVID-19 pandemic. As a result, the public consultation was conducted through individual face-to-face visits and questionnaire completion by local Agriculture and Rural Affairs Bureaus personnel, under the guidance and supervision of the environmental assessment unit and TrTA consultant.
在 2021-2022 年的项目准备期间，由于旅行限制和政府因新冠肺炎大流行而对集会人数的限制，举行面对面的咨询研讨会是不可行的。因此，公众咨询是在环境评估单位和技术援助顾问的指导和监督下，由当地农业和农村部门人员通过个人面对面访问和填写问卷的方式进行的。

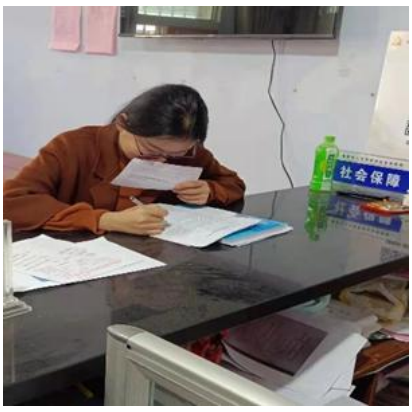
Household questionnaire were distributed to the potential affected villagers by the Agriculture and Rural Affairs Bureaus of Yanshi District, Xiangfu District and Wuzhi County under the guidance of TrTA consultant and domestic EIA institute (see Figure VI-3). A total of 86 questionnaires were sent out in Yanshi District and 86 copies were returned, giving a 100% response rate. Female respondents accounts for 29% of total respondents. Total of 62 questionnaires were sent out in Xiangfu District, with a return rate of 100%. The female respondents accounted for 31%. Total of 90 questionnaires were sent out in Wuzhi County, with a return rate of 100%. The female respondents accounted for 44%. The public who took

part in the survey included different age groups, occupations and levels of education, but most residents were elderly, rural and with low levels of education.
在技术援助顾问和国内环评机构的指导下，偃师区、祥符区、武陟县农业农村局向潜在受影响村民发放了入户调查表（见图 VI-3）。偃师区共发放问卷 86 份，收回 86 份，回复率 100%；女性受访者占总受访者的 29%。祥符区共发放问卷 62 份，回复率 100%；女性受访者占 31%。武陟县共发放问卷 90 份，回复率 100%；女性受访者占 44%。参与调查的公众包括不同的年龄段、职业和受教育程度，但大多数居民是老年人、农村居民和受教育程度较低的人。

Table VI-1: Participants of 1st Round of Public Consultation
Table VI-1: 第一轮公众咨询参与者

Item 项目		Yanshi 偃师		Xiangfu 祥符		Wuzhi 武陟	
		Population 人口	Percentage 百分比 (%)	Population 人口	Percentage 百分比 (%)	Population 人口	Percentage 百分比 (%)
Gender 性别	Male 男	61	71	43	69	50	56
	Woman 女	25	29	19	31	40	44
Age 年龄	Below 20 20 以下	0	0	0	0	0	0
	20-40	17	20	12	19	12	13
	41-60	43	50	35	56	60	67
	Above 60 60 以上	26	30	15	25	18	20
Occupation 职业	Government official 政府官员	1	1	10	16	7	8
	Staff of enterprises 企业工作人员	2	2	0	0	0	0
	Teacher 教师	1	1	0	0	1	1
	Farmer 农户	78	91	50	81	82	91
	Other 其他	4	5	2	3	0	0
Education 教育	College 大学	3	3	4	6	6	6
	High school 高中	29	34	1	2	43	48
	Middle school and below 中学及以下	54	63	57	92	41	46

Figure VI-4: Household Questionnaire Survey and Interview
Figure VI-4: 入户问卷调查及访谈



Yanshi District 偃师区

Yanshi District 偃师区

Xiangfu District 祥符区

Xiangfu District 祥符区

Wuzhi County 武陟县

Wuzhi County 武陟县

For Yanshi Subproject, the majority respondents have known this project through this survey (56%). 88% of respondents are satisfied with the current environmental conditions. There are still 23% respondents did not aware of the negative impacts of excessive use of chemical fertilizers. The majority of respondents, accounting for 80%, prioritize purchasing low-toxicity pesticides, even if they come at a slightly higher price. However, there is still a notable portion, comprising 9% of the respondents, who prioritize price over toxicity when selecting pesticides. The waste container and package are disposed in the domestic waste bins (28%), dedicated trash bin (37%), pesticide distributor (8%) and collected by designated staff (12%). 30% respondents indicated that they sent the waste plastic film to the recycling point, 24% respondents said they treated the waste plastic film together with the domestic waste and the rest 46% respondents didn't use plastic film. All respondents take certain protective measures during application of pesticides. During construction and operation, the most concern of the respondents is impacts of air pollution (17%) and ecological environment (82%). All respondents expressed strong support for the Yanshi subproject.

对于偃师子项目，大多数受访者通过本次调查了解该项目（56%）。88%的受访者对目前的环境状况表示满意。仍有 23%的受访者没有意识到过量使用化肥的负面影响。大多数受访者（占 80%）优先购买低毒农药，即使价格略高。然而，仍有 9%的受访者在选择农药时优先考虑价格而不是毒性。废物容器和包装被丢弃在家庭垃圾箱（28%）、专用垃圾桶（37%）、农药分配器（8%）和指定工作人员收集（12%）。30%的受访者表示会将废地膜送到回收点，24%的受访者表示会将废地膜与生活垃圾一起处理，其余 46%的受访者表示不会使用地膜。所有答复者在施用农药时都采取了一定的保护措施。在建设和运营期间，受访者最关心的是空气污染（17%）和生态环境（82%）的影响。所有受访者均表示大力支持偃师子项目。

For the Xiangfu Subproject, all respondents knew this project through this consultation. All

respondents are aware of the negative impacts of excessive use of chemical fertilizers. It is confirmed through the questionnaire that Xiangfu District has established a relatively complete agricultural waste collection system. The waste container and package disposal are disposed in the domestic waste bins (8%), dedicated trash bin (90%). All respondents indicated that they didn't use plastic film. All respondents take certain protective measures during application of pesticides. All respondents agreed to have this subproject.
对于祥符子项目，所有受访者都是通过此次咨询了解该项目的。所有受访者都意识到过度使用化肥的负面影响。通过调查问卷证实，祥符区已建立了较为完善的农业废弃物收集体系。废物容器和包装处理在生活垃圾箱（8%）和专用垃圾桶（90%）中处理。所有受访者都表示他们不使用塑料薄膜。所有答复者在施用农药时都采取了一定的保护措施。所有答复者都同意有这个子项目。

For the Wuzhi Subproject, most of respondents knew this project through this consultation (98%). All respondents are satisified with the current environment and are aware of the negative impacts of excessive use of chemical fertilizers. It is confirmed through the questionnaire that Wuzhi County has established a relatively complete agricultural waste collection system. All respondents indicated that they discard the waste container and packagein the dedicated trash bins and sent the waste plastic film to the recycling point. All respondents take certain protective measures during application of pesticides. All respondents agreed to have this subproject.
对于武陟子项目，大部分被访者是通过本次咨询了解该项目的（98%）。所有受访者都对当前环境感到满意，并意识到过度使用化肥的负面影响。通过调查问卷证实，武陟县已建立了较为完善的农业废弃物收集体系。所有受访者都表示，他们将废弃容器和包装丢弃在专用垃圾桶中，并将废弃塑料薄膜送到回收点。所有答复者在施用农药时都采取了一定的保护措施。所有答复者都同意有这个子项目。

Table VI-2: Results of Questionnaire Survey

Table VI-2: 问卷调查结果

Question 问题	Options 选项		Yanshi 偃师		Xiangfu 祥符		Wuzhi 武陟	
			Respondents 调查对象	% 百分比	Respondents 调查对象	% 百分比	Respondents 调查对象	% 百分比
1. How did you know this subproject? 1.你是怎么知道这个子项目的？	Internet 互联网		22	26	0	0	1	1
	Newspaper 报纸		1	1	0	0	1	1
	TV 电视		15	17	0	0	0	0
	This public consultation 这次公众咨询		48	56	62	100	88	98
2. What do you think is the current environmental status of the village? 2.您认为目前村庄的环境状况如何？	Air 空气	Good 好	74	86	62	100	75	84
		Average 平均值	12	14	0	0	4	4
		Poor 差	0	0	0	0	11	12
	surface water 地表水	Good 好	74	86	62	100	84	94
		Average 平均值	12	14	0	0	2	2
		Poor 差	0	0	0	0	4	4

Question 问题	Options 选项		Yanshi 偃师		Xiangfu 祥符		Wuzhi 武陟	
			Respondents 调查对象	% 百分比	Respondents 调查对象	% 百分比	Respondents 调查对象	% 百分比
	groundwater 地下水	Good 好	74	86	62	100	84	94
		Average 平均值	12	14	0	0	4	2
		Poor 差	0	0	0	0	2	4
	noise 噪声	Good 好	74	86	62	100	84	94
		Average 平均值	12	14	0	0	4	2
		Poor 差	0	0	0	0	2	4
	Ecological environment 生态环境	Good 好	59	67	62	100	84	94
		Average 平均值	27	33	0	0	4	2
		Poor 差	0	0	0	0	2	4
3. Are you satisfied with the current environment of the village? 3.你对村里目前的环境满意吗？	Satisfied 满意		76	88	62	100	90	100
	Average 平均值		10	22	0	0	0	0
	Dissatisfied (please specify the reason): 不满意（请说明原因）:		0	0	0	0	0	0
4. Do you understand the negative impact of excessive application of pesticides and fertilizers on the environment? 4.你了解过量使用农药和化肥对环境的负面影响吗？	Understand 理解		66	77	62	100	90	100
	Don't know 不知道		20	23	0	0	0	0
	Don't care 我不在乎		0	0	0	0	0	0
5. What is your primary consideration when purchasing pesticides? 5.在购买农药时，您的首要	Cheap, and it doesn't matter if the toxicity is strong 便宜，毒性大也没关系		8	9	0	0	0	0
	Low toxicity, less residue, and a little more expensive		69	80	62	100	90	100

Question 问题	Options 选项	Yanshi 偃师		Xiangfu 祥符		Wuzhi 武陟	
		Respondents 调查对象	% 百分比	Respondents 调查对象	% 百分比	Respondents 调查对象	% 百分比
考虑因素是什么？	毒性低，残留少，价格稍贵						
	Whether it is a biological pesticide 是否为生物农药	9	11	0	0	0	0
6. How do you deal with the pesticide packaging that you usually use? 6.你们平时用的农药包装是怎么处理的？	Discard directly in the field 在现场直接丢弃	13	15	0	0	0	0
	Dispose in household waste 在生活垃圾中处理	24	28	5	8	0	0
	Dispose of in the trash bin specially set up in the village 在村里专门设置的垃圾桶里处理。	32	37	56	90	90	100
	Send it back to the pesticide distributor 把它送回给农药经销商。	7	8	0	0	0	0
	There are especially responsible personnel for door-to-door recycling 特别有专人负责上门回收。	10	12	1	2	0	0
	Other: 其他:	0	0	0	0	0	0
7. Do you take protective measures when spraying pesticides? 7.你在喷洒农药时采取保护措施了吗？	Do not use 不使用	0	0	0	0	0	0
	Take some measures (such as long clothes and trousers, masks) 采取一些措施（如长衣长裤、口罩）	86	100	62	100	90	100
8. How do you deal with the waste plastic film? 8.你们是怎么处理这些废地膜的？	Incinerate on site 现场焚烧	0	0	0	0	0	0
	Send to recycling point 送至回收点	26	30	0	0	90	100
	Discard at will 随意丢弃	0	0	0	0	0	0
	Dispose in household waste	20	24	0	0	0	0

Question 问题	Options 选项	Yanshi 偃师		Xiangfu 祥符		Wuzhi 武陟	
		Respondents 调查对象	% 百分比	Respondents 调查对象	% 百分比	Respondents 调查对象	% 百分比
	在生活垃圾中处理						
	Do not use mulch 不要使用覆盖物	40	46	62	100	0	0
9. What factors have the greatest impact on you during the subproject implementation process? 9.在子项目实施过程中对您影响最大的因素是什么？	Air pollution 空气污染	15	17	0	0	0	0
	Water pollution 水污染	0	0	0	0	0	0
	Solid waste 固体废弃物	1	1	0	0	0	0
	Noise 噪声	0	0	0	0	0	0
	Ecological environment 生态环境	70	82	62	100	90	100
10. In which areas do you think the pollution prevention and control measures should be strengthened in the subproject implementation? 10.您认为在子项目实施过程中，应加强哪些领域的污染防治措施？	Exhaust gas 废气	0	0	0	0	0	0
	Wastewater 废水	9	10	0	0	0	0
	Solid waste 固体废弃物	1	1	0	0	0	0
	Noise 噪声	0	0	1	1	0	0
	Ecological environment 生态环境	76	89	61	99	90	100
11. Do you agree with the site selection of the subproject? 11.您是否同意子项目的选址？	Agree 同意	86	100	62	100	90	100
	Disagree 不同意	0	0	0	0	0	0
12. From the perspective of environmental protection, what is your basic attitude towards the construction of this subproject? (If you object to	Support 支持	86	100	62	100	90	100
	It doesn't matter 这不重要	0	0	0	0	0	0
	Not supported (please specify the reason): 不支持（请说明原因）：	0	0	0	0	0	0

Question 问题	Options 选项	Yanshi 偃师		Xiangfu 祥符		Wuzhi 武陟	
		Respondents 调查对象	% 百分比	Respondents 调查对象	% 百分比	Respondents 调查对象	% 百分比
this subproject without filling in the reason for objection, it will be regarded as an invalid survey sample. 12.从环保的角度来看，您对这个子项目建设的基本态度是什么？（如对该子项目有异议而未填写异议理由，将视为无效调查样本。							

During the preliminary design phase of the non-core subprojects in 2025, a second round of public consultations was carried out under the supervision and guidance of the project implementation consulting service agency. Public consultation surveys were conducted for the three non-core subprojects, and a questionnaire survey was conducted for the new site of the organic fertilizer plant in Wuzhi County.

2025 年非核心子项目初步设计期间，在项目执行咨询服务机构的监督指导下开展了第二轮公众咨询，分别对三个非核心子项目进行公众咨询问卷调查，并对武陟县有机肥厂新址进行问卷调查。

The public consultation questionnaire for the project area is conducted by local agricultural and rural department personnel using electronic questionnaires. A total of 93 questionnaires were distributed in Xiangfu District, all 93 were returned, with a response rate of 100%; among them, 43 were women, accounting for 46%; there were 61 valid questionnaires, with a validity rate of 66%. A total of 92 questionnaires were distributed in Yanshi District, all 92 were collected, with a response rate of 100%; among them, 38 were women, accounting for 41%; 67 questionnaires were valid, with a validity rate of 73%. A total of 134 questionnaires were distributed in Wuzhi County, all 134 were collected, with a response rate of 100%; among them, 73 were women, accounting for 54%; 68 questionnaires were valid, with a validity rate of 51%.

项目区公众咨询问卷由当地农业农村部门人员使用电子问卷的形式，通过项目村田间地头随机访谈的形式进行。祥符区共发放 93 份问卷，收回 93 份，回复率 100%；其中女性 43 人，占比 46%；有效问卷 61 份，问卷有效率 66%。偃师区共发放问卷 92 份，收回 92 份，回复率 100%；其中女性 38 人，占比 41%；有效问卷 67 份，问卷有效率 73%。武陟县共发放问卷 134 份，收回 134 份，回复率 100%；其中女性 73 人，占比 54%；有效问卷 68 份，问卷有效率 51%。

Table VI-3: Questionnaire Status of 2nd Round of Public Consultation

Table VI-3:第二轮公众咨询问卷情况

County/District 项目区	Total No. 发放问卷总量	Female 其中女性		No. of valid questionnaires 有效问卷数量	Questionnaire Response % 问卷有效率
		No. of people 人数	% 占比		
XiangFu 祥符	93	43	46%	61	66%
YanShi 偃师	92	38	41%	67	73%

County/District 项目区	Total No. 发放问卷总量	Female 其中女性		No. of valid questionnaires 有效问卷数量	Questionnaire Response % 问卷有效率
		No. of people 人数	% 占比		
WuZhi 武陟	134	73	54%	68	51%
SUM 合计	**319**	**154**	**48%**	**196**	**61%**

A total of 196 valid respondents participated in the second round of public consultation for non-core subprojects in Henan Province, including 93 women, accounting for 53%. Among them, 61 were from Xiangfu District, with women making up 49%; 67 were from Yanshi District, with women accounting for 45%; and 68 were from Wuzhi County, with women accounting for 63%. The public participating in the survey included people of different ages, occupations, and educational backgrounds, with the majority being middle-aged and having mostly moderate education levels.

河南省非核心子项目第二轮公众咨询有效受访者共 196 人，其中女性 93 人，占 53%。其中祥符区共 61 人，女性占 49%；偃师区共 67 人，女性占 45%；武陟县共 68 人，女性占 63%。参与调查的公众包括不同的年龄段、职业和受教育程度，受访人群以中年人居多，受教育程度多集中在中等教育。

Table VI-3: Participants of 2nd Round of Public Consultation

Table VI-3: 第二轮公众咨询参与者

Item 项目		Xiangfu 祥符		Yanshi 偃师		Wuzhi 武陟	
		Valid respondents 有效受访人数	% 占比	Valid respondents 有效受访人数	% 占比	Valid respondents 有效受访人数	% 占比
Gender 性别	Male 男	31	51%	37	55%	25	37%
	Female 女	30	49%	30	45%	43	63%
Age 年龄	Below 20 20 岁以下	1	2%				
	20-40age group 20-40 岁	26	43%	17	25%	25	37%
	41-60age group 41-60 岁	30	49%	42	63%	38	56%
	Above 60 60 岁以上	4	7%	8	12%	5	7%
Education 受教育程度	Middle school and below 初中及以下	8	13%	20	30%	31	46%
	High School/Vocational High School/Secondary Specialized School 高中/职业高中/中专	24	39%	30	45%	25	37%
	Junior college 大专	15	25%	14	21%	5	7%
	Bachelor's degree or	14	23%	3	4%	7	10%

Item 项目		Xiangfu 祥符		Yanshi 偃师		Wuzhi 武陟	
		Valid respondents 有效受访人数	% 占比	Valid respondents 有效受访人数	% 占比	Valid respondents 有效受访人数	% 占比
	above 本科及以上						
Occupation 职业	Small-scale Farmer 农业种植户（小型）	20	33%	22	33%	18	26%
	Large-scale farming households(Planting) 规模化种植农户	1	2%	5	7%	2	3%
	Large-scale farming households(Breeding) 规模化养殖农户	1	2%			1	1%
	Agricultural enterprise/cooperative staff 农业企业/合作社工作人员	2	3%			2	3%
	Agricultural Enterprise/Cooperative Manager 农业企业/合作社管理者			4	6%	1	1%
	village official 村干部	16	26%	12	18%	14	21%
	Government staff 政府工作人员	8	13%	1	1%		
	Teacher 教师					1	1%
	Other 其他	13	21%	23	34%	29	43%

Figure VI-5: Field Interview
Figure VI-5:田间随机访谈


Xiangfu District 祥符区


Yanshi District 偃师区


Wuzhi County 武陟县

For Xiangfu Subproject, the majority respondents have known this project through village assembly (29%). 97% of respondents are satisfied with the current environmental conditions. There are still 5% respondents did not aware of the negative impacts of excessive use of chemical fertilizers. Most of the surveyed crop-growing farmers (26%) would prioritize buying low-toxicity pesticides even if the price is slightly higher; still 3% of farmers would prioritize cheaper pesticides regardless of their toxicity. Used pesticide containers are mostly taken to designated collection points in the village for disposal (18%), thrown away with household garbage (8%), or collected directly by pesticide dealers (7%). Among the surveyed farmers, only one did not take protective measures when spraying pesticides. Among the respondents, 74% do not use agricultural film. Among the farmers who do use agricultural film, most send

the waste film to recycling points for collection (18%), while another 8% dispose of it together with household garbage. During the construction and operation periods, respondents were most concerned about air pollution (26%), noise (21%), and the ecological environment (20%). All respondents expressed strong support for the Xiangfu subproject.
祥符子项目，大多数受访者通过村民大会了解到本项目（29%）。97%的受访者对目前的环境状况表示满意。仅有 5%的受访者没有意识到过量使用化肥的负面影响。种植作物的受访农户大多数（26%）即使价格略高，也会优先购买毒性低的农药；仍有 3%的农户会优先选择价格便宜的农药，而不考虑其毒性；用过的农药包装多拿去村里专门设置的收集点处理（18%）、与生活垃圾一起扔掉（8%）、农药经销商直接来回收（7%）。受访的种植农户中仅有 1 人在喷洒农药时不采取防护措施。受访者中有 74%不使用农膜，使用农膜的农户将废弃的农膜多送至回收点回收（18%），另有 8%的农户会与生活垃圾一起处理。在建设和运营期间，受访者最关心的是空气污染（26%）、噪声（21%）和生态环境（20%）。所有受访者均表示大力支持祥符子项目。

For Yanshi Subproject, the majority respondents have known this project through village assembly (32%). 93% of respondents are satisfied with the current environmental conditions. There are still 9% of respondents who are unaware of the negative effects of excessive fertilizer use, and 4% of respondents said they do not care. Most of the surveyed crop-growing farmers (24%) would prioritize buying low-toxicity pesticides even if the price is slightly higher; still 9% of farmers would prioritize cheaper pesticides regardless of their toxicity. Used pesticide containers are mostly taken to designated collection points in the village for disposal (28%), thrown away with household garbage (12%), or collected directly by pesticide dealers (4%). Among the farmers interviewed, three did not take any protective measures while spraying pesticides. Among the respondents, 79% do not use agricultural film. Among the farmers who do use agricultural film, most send the waste film to recycling points for collection (15%), while another 6% dispose of it together with household garbage. During the construction and operation periods, respondents were most concerned about solid waste(22%), air pollution (22%) and the noise (40%). All respondents expressed strong support for the Yanshi subproject.
偃师子项目，大多数受访者通过村民大会了解到本项目（32%）。93%的受访者对目前的环境状况表示满意。仍有 9%的受访者没有意识到过量使用化肥的负面影响,4%的受访者表示无所谓。种植作物的受访农户大多数（24%）即使价格略高，也会优先购买毒性低的农药；仍有 9%的农户会优先选择价格便宜的农药，而不考虑其毒性；用过的农药包装多拿去村里专门设置的收集点处理（28%）、与生活垃圾一起扔掉（12%）、农药经销商直接来回收（4%）。受访的种植农户中有 3 人在喷洒农药时不采取防护措施。受访者中有 79%不使用农膜，使用农膜的农户将废弃的农膜多送至回收点回收（15%），另有 6%的农户会与生活垃圾一起处理。在建设和运营期间，受访者最关心的是固体废弃物（22%）、空气污染（22%）和噪声（40%）。所有受访者均表示大力支持偃师子项目。

For Wuzhi Subproject, the majority respondents have known this project through village assembly (33%). 91% of respondents are satisfied with the current environmental conditions. There are still 12% of respondents who are unaware of the negative effects of excessive fertilizer use, and 1% of respondents said they do not care. Most of the surveyed crop-growing farmers (21%) would prioritize buying low-toxicity pesticides even if the price is slightly higher; still 3% of farmers would prioritize cheaper pesticides regardless of their toxicity. Used pesticide containers are mostly taken to designated collection points in the village for disposal (19%), thrown away with household garbage (6%), or especially responsible personnel for door-to-door recycling (7%). Among the farmers interviewed, four did not take any protective measures while spraying pesticides. Among the respondents, 88% do not use agricultural film. Among the farmers who do use agricultural film, most send the waste film to recycling points for collection (9%), while another 3% dispose of it together with household garbage. During the construction and operation periods, respondents were most concerned about wastewater (21%), solid waste(26%), noise (34%), and the ecological environment (28%). All respondents

expressed strong support for the Wuzhi subproject.
武陟子项目，大多数受访者通过村民大会了解到本项目（33%）。91%的受访者对目前的环境状况表示满意。仍有 12%的受访者没有意识到过量使用化肥的负面影响,1%的受访者表示无所谓。种植作物的受访农户大多数（21%）即使价格略高，也会优先购买毒性低的农药；仍有 3%的农户会优先选择价格便宜的农药，而不考虑其毒性；用过的农药包装多拿去村里专门设置的收集点处理（19%）、与生活垃圾一起扔掉（6%）、专人负责上门回收（7%）。受访的种植农户中有 4 人在喷洒农药时不采取防护措施。受访者中有 88%不使用农膜，使用农膜的农户将废弃的农膜多送至回收点回收（9%），另有 3%的农户会与生活垃圾一起处理。在建设和运营期间，受访者最关心的是水污染（21%）、固体废弃物（26%）、噪声（34%）和生态环境（28%）。所有受访者均表示大力支持武陟子项目。

Table VI-4: Results of 2nd Round of Questionnaire Survey

Table VI-4: 第二轮问卷调查结果

Question 问题	Options 选项		Xiangfu 祥符		Yanshi 偃师		Wuzhi 武陟	
			Respondents 受访者	% 占比	Respondents 受访者	% 占比	Respondents 受访者	% 占比
1. How did you know this subproject? 1.你是怎么知道这个子项目的？	Village Assembly 村民大会		33	29%	43	32%	36	33%
	This public consultation 本次问卷		25	22%	22	16%	25	23%
	WeChat group of the project village 所在项目村微信群通知		15	13%	29	21%	16	15%
	Consultation on the project design and survey stage 项目设计勘察阶段的意见征询		7	6%	19	14%	17	16%
	WeChat Official Account 公众号宣传		19	17%	9	7%	4	4%
	Internet 相关网站对项目的报道		10	9%	2	1%	3	3%
	Public notice posted at the project village 项目现场张贴的公示信息		3	3%	6	4%	3	3%
	Newspaper 报纸		0	0%	4	3%	2	2%
	TV 电视报道		0	0%	1	1%	2	2%
2.How many channels for understanding the project? 2.了解项目的渠道途径。	One 通过一个渠道了解到本项目		39	64%	29	43%	52	76%
	Two 通过两个渠道了解到本项目		16	26%	22	33%	12	18%
	Three 通过三个渠道了解到本项目		5	8%	12	18%	3	4%
	Above four 通过四个渠道及以上了解到本项目		1	2%	4	6%	1	1%
3.What do you think is the current environmental status of the village? 3. 您认为所在项目村目前的环境状况如何？	Air 空气	Good 好	58	95%	60	90%	62	91%
		Average 一般	3	5%	6	9%	6	9%
		Poor 差	0	0%	1	1%	0	0%
	Surfacewater 地表水	Good 好	57	93%	57	85%	58	85%
		Average 一般	4	7%	8	12%	9	13%
		Poor 差	0	0%	2	3%	1	1%
	Groundwater 地下水	Good 好	60	98%	58	87%	55	81%
		Average 一般	1	2%	7	10%	11	16%
		Poor 差	0	0%	2	3%	2	3%

	Noise 噪声	Good 好	56	92%	56	84%	50	74%
		Average 一般	5	8%	10	15%	18	26%
		Poor 差	0	0%	1	1%	0	0%
	Ecological environment 生态环境	Good 好	58	95%	58	87%	62	91%
		Average 一般	3	5%	8	12%	6	9%
		Poor 差	0	0%	1	1%	0	0%
	Soil 土壤	Good 好	57	93%	58	87%	62	91%
		Average 一般	4	7%	9	13%	6	9%
		Poor 差	0	0%	0	0%	0	0%
4.Are you satisfied with the current environment of the village? 4. 您对所在村里目前的环境满意吗？	Satisfied 满意		59	97%	62	93%	62	91%
	Average 一般		2	3%	5	7%	6	9%
	Dissatisfied (Please specify the reason) 不满意（请说明原因）		0	0%	0	0%	0	0%
5.Do you understand the negative impact of excessive application of pesticides and fertilizers on the environment? 5. 您了解过量使用农药和化肥对环境的负面影响吗？	Understand 了解		58	95%	58	87%	59	87%
	Don't know 不了解		3	5%	6	9%	8	12%
	Don't care 无所谓		0	0%	3	4%	1	1%
6.What is your primary consideration when purchasing pesticides? 6. 在购买农药时，您的首要考虑因素是什么？	Cheap, and it doesn't matter if the toxicity is strong 便宜，毒性大也没关系		2	3%	6	9%	2	3%
	Low toxicity, less residue, and a little more expensive 毒性低、不易残留，价格贵也可以接受		16	26%	16	24%	14	21%
	Whether it is a biological pesticide 是否为生物农药		5	8%	9	13%	7	10%
	Non-Planting farmer 非种植户		38	62%	36	54%	45	66%
7. How do you deal with the pesticide packaging that you usually use? 7. 使用过的农药包装，您是如何处理的？	Discard directly in the field 直接丢弃在农田里		2	3%	0	0%	0	0%
	Dispose in household waste 拿回家与生活垃圾一起扔掉		5	8%	8	12%	4	6%
	Dispose of in the trash bin specially set up in the village 拿去村里专门设置的农药包装收集点处理		11	18%	19	28%	13	19%
	Send it back to the pesticide distributor 农药经销商直接来回收		4	7%	1	1%	1	1%
	There are especially responsible personnel for		1	2%	3	4%	5	7%

	door-to-door recycling 有其他专人负责上门回收						
	Non-Planting farmer 非种植户	38	62%	36	54%	45	66%
8.Do you take protective measures when spraying pesticides?(such as long clothes and trousers, masks) 8. 您在喷洒农药时采取防护措施（如戴口罩、戴手套、着长衣长裤）了吗？	Do not use 不使用	1	2%	3	4%	4	6%
	Take some measures 采取一定的防护措施	22	36%	28	42%	19	28%
	Non-Planting farmer 非种植户	38	62%	36	54%	45	66%
9.How do you deal with the waste plastic film? 9. 您是如何处理废弃农膜的？	Incinerate on site 现场焚烧	0	0%	0	0%	0	0%
	Discard at will 随处丢弃	0	0%	0	0%	0	0%
	Send to recycling point 送至回收点	11	18%	10	15%	6	9%
	Dispose in household waste 与生活垃圾一起处理	5	8%	4	6%	2	3%
	Do not use mulch 不使用农膜	45	74%	53	79%	60	88%
10.Do you agree with the site selection of the subproject? 10. 您是否赞成本项目的选址？	Agree 赞成	61	100 %	67	100 %	68	100 %
	Disagree 不赞成	0	0%	0	0%	0	0%
11.What factors have the greatest impact on you during the subproject implementation process? 11. 在项目施工过程中，您认为对您影响最大的因素是什么？	Air pollution 空气污染	16	26%	15	22%	12	18%
	Water pollution 水污染	10	16%	3	4%	14	21%
	Solid waste 固体废弃物	10	16%	21	31%	13	19%
	Noise 噪声污染	13	21%	14	21%	10	15%
	Ecological environment 破坏生态环境	12	20%	14	21%	19	28%
12.In which areas do you think the pollution prevention and control measures should be strengthened in the subproject implementation ? 12. 您认为在项目实施过程中，应加强哪些领域	Exhaust gas 废气	12	20%	6	9%	5	7%
	Wastewater 废水	11	18%	4	6%	14	21%
	Solid waste 固体废弃物	8	13%	22	33%	18	26%
	Noise 噪声污染	18	30%	27	40%	23	34%
	Ecological environment 生态环境保护	12	20%	8	12%	8	12%

的污染防治措施？							
13.From the perspective of environmental protection, what is your basic attitude towards the construction of this subproject? 13. 您是否支持本项目的建设	Support 支持	61	100 %	67	100 %	67	99%
	It doesn't matter 不关心	0	0%	0	0%	1	1%
	Not supported (please specify the reason) 不支持（请说明原因）	0	0%	0	0%	0	0%

A public consultation questionnaire survey was conducted in Maxuanzhai Village regarding the new site for the organic fertilizer plant. A total of 109 electronic questionnaires were distributed, and all 109 were returned, giving a response rate of 100%. Among the respondents, 44 were women, accounting for 40%. There were 55 valid questionnaires, resulting in a valid response rate of 50%. There were a total of 55 valid respondents, including 28 women, accounting for 51%. The surveyed public included people of different ages, occupations, and educational levels, with the majority being middle-aged and elderly, and most having only basic education. 针对有机肥厂新址马宣寨村开展的公众咨询问卷调查，共发放了 109 份电子问卷，回收 109 份问卷，回收率 100%；其中 44 名女性，占比 40%。有效问卷共 55 份，有效回复率 50%。有效受访者共 55 人，其中女性 28 人，占 51%。参与调查的公众包括不同的年龄段、职业和受教育程度，受访人群以中老年人居多，受教育程度多集中在初等教育。

Table VI-5: Participants of Organic Fertilizer Factory Survey

Table VI-5: 有机肥厂问卷调查参与者

Item 项目		**Maxuanzhai Village, Qiaomiao Town 乔庙镇马宣寨村**	
		Valid respondents 有效受访人数	**% 占比**
Gender 性别	Male 男	27	49%
	Female 女	28	51%
Age 年龄	Below 20 20 岁以下	3	5%
	20-40age group 20-40 岁	13	24%
	41-60age group 41-60 岁	30	55%
	Above 60 60 岁以上	9	16%
Education 受教育程度	Middle school and below 初中及以下	29	53%
	High School/Vocational High School/Secondary Specialized School 高中/职业高中/中专	21	38%
	Junior college 大专	3	5%
	Bachelor's degree or above 本科及以上	2	4%
Occupation 职业	Small-scale Farmer 农业种植户（小型）	15	27%
	Large-scale farming households(Planting) 规模化种植农户	1	2%

Item 项目		Maxuanzhai Village, Qiaomiao Town 乔庙镇马宣寨村	
		Valid respondents 有效受访人数	% 占比
	Large-scale farming households(Breeding) 规模化养殖农户	0	0%
	Agricultural enterprise/cooperative staff 农业企业/合作社工作人员	0	0%
	Agricultural Enterprise/Cooperative Manager 农业企业/合作社管理者	0	0%
	village official 村干部	2	4%
	Government staff 政府工作人员	0	0%
	Teacher 教师	2	4%
	Other 其他	35	64%

Most respondents learned about the organic fertilizer plant project through this questionnaire (38%), while 35% learned about it through the village WeChat group, and 22% learned about it through the village assembly. During the operation of the organic fertilizer plant, respondents were most concerned about solid waste (29%), air pollution (27%), and odor pollution (24%). The majority of respondents (87%) expressed strong support for the construction of the organic fertilizer plant, while 13% were indifferent.

大多数受访者通过本次问卷了解到有机肥厂工程（38%），另有 35%的受访者通过村微信群得知，22%的受访者通过村民大会得知。在有机肥厂运营期间，受访者最关心的是固体废弃物（29%）、空气污染（27%）和臭气污染（24%）。大部分受访者（87%）表示大力支持有机肥厂的建设，13%的受访者并不关心。

Table VI-6: Results of Organic Fertilizer Factory Survey

Table VI-6: 有机肥厂问卷调查结果

Question 问题	Options 选项	Respondents 受访者	% 占比
1.How did you know the organic fertilizer factory project? 1.您通过什么途径得知本村将要建设有机肥厂？	This public consultation 本次问卷	21	38%
	WeChat group of the project village 所在项目村微信群通知	19	35%
	Public notice posted at the project village 项目现场张贴的公示信息	7	13%
	Village Assembly 村民大会	12	22%
	Consultation on the project design and survey stage 项目设计勘察阶段的意见征询	1	2%
	WeChat Official Account 公众号宣传	3	5%
	TV 电视报道	1	2%
	Internet 相关网站对项目的报道	0	0%
	Newspaper 报纸	0	0%

Question 问题	Options 选项	Respondents 受访者	% 占比
2.Do you agree with building an organic fertilizer factory in the village? 2.您是否赞成在本村建设有机肥厂？	Agree 赞成	53	96%
	It doesn't matter 不关心	2	4%
	Disagree 不赞成	0	0%
3.What factors have the greatest impact on you during the organic fertilizer plant production process ? 3. 您认为有机肥厂生产过程中对您影响最大的因素是什么？	Odor pollution 臭气污染	13	24%
	Air pollution 空气污染	15	27%
	Noise 噪声污染	1	2%
	Groundwater pollution 地下水污染	10	18%
	Solid waste 固体废弃物	16	29%
4.In which areas do you think the pollution prevention and control measures should be strengthened in the organic fertilizer plant production process? 4. 您认为有机肥厂生产过程中应加强哪方面的污染防治措施？	Stench 臭气	15	27%
	Exhaust gas 废气	7	13%
	Noise 噪声污染	3	5%
	Wastewater 废水	12	22%
	Solid waste 固体废弃物	18	33%
5.From the perspective of environmental protection, what is your basic attitude towards the construction of the organic fertilizer plant? 5. 从环保角度看，您对有机肥厂的建设持什么态度？	Support 支持	48	87%
	It doesn't matter 无所谓	7	13%
	Not supported (please specify the reason) 不支持（请说明原因）	0	0%

D. Future Information Disclosure and Public Consultation Program

未来信息披露和公众咨询计划

Public consultations will be maintained with subproject communities throughout subproject implementation (see Table EMP-7), including: (i) before and after key works, to ensure residents are informed of, and have the opportunity to respond to, pending works and procedures, (ii) during period broader consultations about subproject progress. The following subproject documents will be disclosed on the websites of ADB and local government: (i) this IEE and EMP and its revision if any during subproject implementation; and (ii) environmental monitoring reports. Future consultation will be undertaken by the CPMO and its Environment and Social Officers, via questionnaire surveys, household visits, workshops, and public hearings (see attached EMP).

在整个子项目实施过程中，将与子项目社区保持公众协商（见 Table EMP-7），包括：（i）在关键工程之前和之后，确保居民了解并有机会回应未完成的工程和程序，（ii）在此期间，就子项目进度进行更广泛的协商。以下子项目文件将在亚洲开发银行和当地政府的网站上披露：（i）本初始环境评估和环境管理计划及其修订（如有）；（ii)）环境监测报告。未来的咨询将由县（区）项目办及其环境和社会官员通过问卷调查、家庭访问、研讨会和公开听证会进行（见所附的 EMP）。

VII. GRIEVANCE REDRESS MECHANISM 申诉补偿机制

A project GRM was prepared and complies with ADB's SPS (2009) and PRC requirements. The GRM will be accessible to diverse members of the villages and community, including more

vulnerable groups such as women, minority and poor. Multiple points of entry, including face-to-face meetings, written complaints, telephone conversations, or e-mail, will be available. The GRM is described in the subproject EMP.
编制了项目申诉机制，并符合亚行的 SPS（2009）和国内要求。乡村和社区的不同成员，包括妇女、少数民族和低收入者等弱势群体，都可以使用申诉机制。将提供多个切入点，包括面对面会议、书面投诉、电话交谈或电子邮件。申诉机制在子项目环境管理计划中进行了描述。

VIII. ENVIRONMENTAL MANAGEMENT PLAN 环境管理计划

A subproject EMP has been prepared (Attachment 1), based on the findings of the IEE, domestic assessments, fieldwork, and stakeholder consultations. The EMP defines: (i) responsibilities and authorities for the EMP implementation, (ii) summary of impacts and mitigation measures, (iii) environmental monitoring and inspection, (iv) institutional strengthening and training, (v) reporting requirements, (vi) public consultation, (vii) cost estimates, and (viii) mechanism for feedback and adjustment. The EMP will be included as an annex in bidding and contract documents. Contractors will be required to develop site-EMPs that comply with the EMP.
根据初步环境评估、国内评估、实地工作和利益相关者协商的结果，编制了子项目环境管理计划（附件 1）。环境管理计划规定了：（i）环境管理计划实施的责任和权限，（ii）影响和缓解措施总结，（iii）环境监测和检查，（iv）制度强化和培训，（v）报告要求，（vi）公众咨询，（vii）成本估算，以及（viii）反馈和调整机制。环境管理计划将作为附件包含在投标和合同文件中。要求承包商制定符合环境管理计划的现场环境管理计划。

IX. CONCLUSIONS 结论

The subprojects of Yanshi, Xiangfu and Wuzhi aim to develop green and climate resilient agricultural production bases through invest in development of farmland infrastructures and promotion of green farming techniques in the project area. Environmental risks in the construction phase include noise, dust, soil erosion and occupational and community health and safety issues. These will be short term and localized and are expected to be mitigated through the prescribed project mitigation measures. Environmental risks during operation include agricultural- related pollution including overuse of chemical fertilizer and pesticides, unsustainable use of water resources, pollution of plastic films and pesticides package. These will be addressed through the project design and procedures for O&M, which focus on modern farming techniques and management measures, such as integrated water and fertilizer irrigation, formulated fertilizer, promotion of organic fertilizer, drip and spray irrigation, promotion of plastic film recycling and pesticides package collection and proper disposal. Overall, the Yanshi, Xiangfu and Wuzhi subprojects are expected to generate multiple significant environmental benefits (i) reduction of the chemical fertilizer and pesticide application rate and total quantity, and contribution to the control of NPS pollution in the subproject region; (ii) reduced soil erosion and improved soil quality; (iii) recycling of agricultural waste and its reuse as fertilizer resources, and promotion of green agricultural development; (iv) improvement of water use efficiency; and (v) enhanced climate resilience and contribute to green development of Yellow River Basin. It is concluded that the Yanshi, Xiangfu and Wuzhi subprojects are feasible from environmental perspective.
偃师、祥符和武陟的子项目旨在通过在项目区投资发展农田基础设施和推广绿色农业技术，发展绿色和气候适应型农业生产基地。施工阶段的环境风险包括噪音、灰尘、水土流失以及职业和社区健康和安全问题。这些将是短期和局部的，预计将通过规定的项目缓解措施得到缓解。运营期间的环境风险包括农业相关污染，包括化肥和农药的过度使用、水资源的不可持续使用、塑料薄膜和农药包装的污染。这些将通过项目设计和 O&M 程序来解决，重点是现代农业技术

和管理措施，如水肥一体化灌溉、配方施肥、推广有机肥、滴灌和喷灌、推广地膜回收和农药包装收集和妥善处置。总体而言，偃师子项目、祥符子项目和武陟子项目预计将产生多项显著的环境效益：（i）减少化肥和农药的施用量和总量，有助于控制子项目区域的非点源污染；（ii）减少土壤流失，改善土壤质量；（iii）农业废弃物资源化利用，促进农业绿色发展；（iv）提高用水效率；（v）增强气候适应能力，促进黄河流域绿色发展。从环境角度看，偃师、祥符、武陟 3 个子项目是可行的。

ATTACHMENT 1: ENVIRONMENTAL MANAGEMENT PLAN 环境管理计划

ENVIRONMENTAL MANAGEMENT PLAN FOR THE SUBPROJECTS OF YANSHI, XIANGFU AND WUZHI

偃师、祥符、武陟子项目环境管理计划

People's Republic of China

中华人民共和国

The EMP has been updated regarding the recruitment and payment of external environmental monitoring agencies. Since the recruit environmental monitoring agency in Henan Province are uniformly tendered by the PPMO, and the CPMOs separately sign contracts with the monitoring agencies, with monitoring fees also paid by the CPMOs, the relevant descriptions in this EMP have been updated. In addition, the total amount of cost estimates for the EMP implementation has been corrected.
本环境管理计划对外部环境监测机构的招聘与支付进行了更新，因河南省外部环境监测机构是由省项目办进行统一招标、县（区）项目办分别与监测机构签订合同的，监测费用也由县（区）项目办支付，所以对本环境管理计划中的相关表述进行了更新。另，对环境管理计划实施成本估算的汇总金额进行了纠正。

A. Objectives 目标

1 This environmental management plan (EMP) is developed for the subprojects of Yanshi, Xiangfu and Wuzhi of Yellow River Basin Green Farmland and High-Quality Agricultural Development Project, People's Republic of China (PRC). The EMP is prepared in accordance with the requirements of the Asian Development Bank's (ADB's) Safeguard Policy Statement (SPS 2009) on the basis of the domestic environmental impact assessment and the initial environment examination (IEE) conducted for the subproject.
本环境管理计划（EMP）是为中华人民共和国（PRC）黄河流域绿色农田和农业高质量发展项目偃师区、祥符区和武陟县的子项目制定的。环境管理计划是根据亚洲开发银行（ADB）保障政策声明（SPS 2009）的要求，在国内环境影响评估和对子项目进行的初始环境评估（IEE）的基础上编制的。

2 The EMP defines appropriate mitigation measures for the anticipated environmental impacts and defines the institutional responsibilities and mechanisms to monitor and ensure compliance with PRC's environmental laws, standards and regulations, and ADB's SPS. The EMP specifies (i) objectives; (ii) mitigation measures; (iii) implementing organization and responsibilities; (iv) inspection, monitoring, and reporting arrangements; (v) training and institutional strengthening; (v) a feedback and adjustment mechanism; and (vi) the grievance redress mechanism (GRM).
环境管理计划规定了预期环境影响的适当缓解措施，并规定了机构责任和机制，以监督并确保遵守中华人民共和国的环境法律、标准和法规以及亚洲开发银行的 SPS。环境管理计划规定了（i）目标；（ii）缓解措施；（iii）实施机构及职责；（iv）检查、监测和报告安排；（v）培训和加强体制；（v）反馈和调整机制；（vi）申诉补偿机制。

3 The EMP will be reviewed and updated at the end of the detailed designs, as needed, in order to be consistent with the final design; and in such instance, the IEE with updated EMP will be re-disclosed on ADB's website. The EMP (or its updated version) will be included as a separate annex in all bidding and contract documents. The contractors will be made aware of their obligations to implement the EMP and to budget the EMP implementation costs in their proposals. The EMP supervision and monitoring results will be used to evaluate (i) the extent and severity of actual environmental impacts against the predicted impacts, (ii) the performance of the environmental protection measures or compliance with related rules and regulations, (iii) trends of impacts; and (iv) overall effectiveness of the mitigation measures.
在详细设计结束时，将根据需要对环境管理计划进行审查和更新，以便与最终设计保持一致；在这种情况下，将在亚洲开发银行的网站上重新披露具有更新环境管理计划的初始环境评估。环境管理计划（或其更新版本）将作为单独的附件包含在所有投标和合同文件中。承包商应了解其实施环境管理计划的义务，并在其建议书中对环境管理计划的实施成本进行预算。环境管理计划监督和监测结果将用于评估（i）实际环境影响的范围和严重性与预测的影响；（ii）环境

保护措施的执行情况或对相关规章制度的遵守情况；（iii）影响的趋势；（iv）缓解措施的总体有效性。

B. Institutional Responsibilities 机构责任

4 The Ministry of Agriculture and Rural Affairs (MARA) is the executing agency. A national project management office (NPMO) is set under the MARA. The implementation agencies of the subprojects of Yanshi, Xiangfu and Wuzhi are the Department of Agriculture and Rural Affairs of Henan Province. A provincial PMO (PPMO) is set under the implementing agency. The Yanshi/Xiangfu/Wuzhi Bureau of Agriculture and Rural Affairs is the project implementation unit (PIU) and a county PMO (CPMO) is set under the PIU.
农业和农村事务部是执行机构。农业农村部下设国家项目管理办公室（NPMO）。偃师、祥符、武陟子项目实施机构为河南省农业农村厅。在执行机构下设立省级项目管理办公室（省项目办）。偃师区/祥符区/武陟县农业农村局为项目实施单位，下设县级项目办。

5 The subproject EMP implementation arrangements and responsibilities of governmental organizations are summarized in Table EMP-1.
表 EMP-1 总结了子项目环境管理计划的实施安排和政府组织的责任。

Table EMP-1: Institutional Responsibilities for EMP Implementation
Table EMP-1:环境管理计划实施的机构责任

Agency **机构**	**Environmental Management Roles and Responsibilities** **环境管理角色和职责**
NPMO 国家项目办	• Overall implementation coordination • Guidance on strategic issues and interagency coordination • Recruit project implementation consultant at national level, including an LIEC • Assign 1 NPMO Environment Officer and 1 NPMO Social Officer • Consolidate and submit annual environmental monitoring report • 总体执行协调 • 战略问题和机构间协调指导 • 招聘国家级项目实施顾问，包括贷款实施环境顾问(LIEC) • 指派一名国家项目办环境官员和一名国家项目办社会官员 • 汇总并提交年度环境监测报告
Henan PPMO 河南省项目办	• Recruit project implementation consultant at provincial level, including an LIEC • Recruit environmental monitoring agency for CPMOs • Consolidate semi-annual environmental monitoring report at provincial level • Assign 1 PPMO Environment Officer and 1 PPMO Social Officer • Respond to any unanticipated safeguard issues and take corrective actions as needed • Ensure project compliance with the loan and project agreements (including all safeguard provisions) and EMP • Prepare semiannual environment monitoring reports to ADB with the support of the LIEC • Update IEE and/or EMP as needed, especially during the stage of detailed engineering designs • Ensure that the EMP, especially all relevant mitigation measures, are included in the detailed engineering designs • Establish the EMP grievance redress mechanism • 招聘省级项目实施顾问，包括贷款实施环境顾问 • 招聘环境监测机构 • 汇总省级半年度环境监测报告

Agency 机构	Environmental Management Roles and Responsibilities 环境管理角色和职责
	• 指派一名省项目办环境官员和一名省项目办社会官员 • 对任何未预料到的安全问题做出响应，并根据需要采取纠正措施 • 确保项目符合贷款和项目协议（包括所有保障条款）和环境管理计划 • 在贷款实施环境顾问的支持下，每半年向亚洲开发银行提交一份环境监测报告 • 根据需要更新初始环境评估和/或环境管理计划，特别是在详细工程设计阶段 • 确保环境管理计划，尤其是所有相关环节措施，包含在详细的工程设计中 • 建立环境管理计划申诉补偿机制
Yanshi/Xiangfu/Wuzhi CPMO 偃师/祥符/武陟县（区）项目办	• Assign one CPMO environment and social officer as focal point • Assist prepare and update of subproject IEE and EMP, as needed • Supervise the implementation of contractors' site-EMPs • Act as local entry point for the project GRM • Assess contractors' compliance with EMP and PRC environmental quality standards for ambient air, water, and noise quality • Submit quarterly inspection results to the contractors for information • Commission the constructed facilities • Operate and maintain the completed facilities, including environmental management, monitoring and reporting responsibilities • 指派一名县项目办环境和社会官员担任协调人 • 根据需要，协助准备和更新子项目初始环境评估和环境管理计划 • 监督承包商现场环境管理计划的实施 • 作为项目申诉补偿机制的本地入口点 • 评估承包商对环境管理计划和中华人民共和国环境空气、水和噪音质量标准的遵守情况 • 向承包商提交季度检查结果以供参考 • 调试已建设施 • 运营和维护已建设施，包括环境管理、监测和报告责任
Contractor 承包商	• Ensure sufficient funding and human resources for full implementation of mitigation and monitoring measures in the subproject EMP • Develop site-specific EMPs based on the subproject EMP • Timely and effective implementation of EMP measures for works • 确保有足够的资金和人力资源，以全面实施子项目环境管理计划中的缓解和监测措施 • 根据子项目环境管理计划制定现场特定环境管理计划 • 及时有效地实施工程的环境管理计划措施
Construction supervision company(CSC) 施工监理机构	• Ensure sufficient funding and human resources for supervising and instructing contractors for proper and timely implementation of required mitigation and monitoring measures in the EMP • Supervise construction progress and quality • Appoint qualified EHS officer for regular onsite supervision of contractors • Supervise the contractor's EMP implementation performance • Undertake simple and cost-effective on-site quantitative measurements to regularly check that construction complies with the project environmental monitoring standards and targets, especially for noise and air quality, using a basic hand-held meter • Submit monthly EMP monitoring reports to CPMO •确保有足够的资金和人力资源来监督和指导承包商正确及时实施环境管理计划中要求的缓解和监测措施 •监督施工进度和质量 •任命合格的环境、健康和安全专员定期对承包商进行现场监督 •监督承包商的环境管理计划执行情况

Agency 机构	Environmental Management Roles and Responsibilities 环境管理角色和职责
	•使用基本的手持仪器，进行简单且具有成本效益的现场定量测量，以定期检查施工是否符合项目环境监测标准和目标，特别是噪音和空气质量 •每月向县项目办提交环境管理计划监控报告
Loan Implementation Environmental Consultant (LIEC) – at NPMO level (1 position) 贷款实施环境顾问-国家项目办（1 个职位）	• To be recruited under the loan implementation consulting services; • Review the updated subproject IEE and EMP prepared by the PPMO if there is significant change or unanticipated environment impacts; • Prepare the consolidated EMP monitoring report of the seven participating provinces; • Assist NPMO in overseeing the environmental performance of the seven participating provinces on EMP implementation. • 在贷款实施咨询服务项下招聘 • 如果有重大变化或未预料到的环境影响，则审查省项目办编制的更新的子项目初始环境评估和环境管理计划 • 编制七个参与省份的综合环境管理计划监测报告 • 协助国家项目办监督七个参与省在环境管理计划实施方面的环境绩效
Loan Implementation Environmental Consultant (LIEC) Henan PPMO level (1 position) 贷款实施环境顾问河南省项目办级别（1 个职位）	• One LIEC at PPMO level will be recruited by Henan PPMO for subprojects of Shanzhou, Yanshi, Xiangfu and Wuzhi. • Assist in prepare or update the subproject IEE and EMP if there is significant change or unanticipated environment impacts • Assist in updating the EMP and environmental monitoring program • Supervise the implementation of the mitigation measures specified in the EMP on behalf of the CPMOs and PPMO, prepare the semi-annual EMP monitoring and progress reports in English and submit it to ADB • Provide training to the CPMOs, PPMO, CSCs, on the PRC's environmental laws, regulations and policies, ADB SPS (2009), EMP implementation, and GRM in accordance with the training plan defined in the subproject EMP • Identify any environment-related implementation issues and propose necessary corrective actions to undertake site visits for EMP inspection as required. •河南省项目办将为陕州、偃师、祥符和武陟的子项目招聘一名省项目办级别的贷款实施环境顾问 •如果有重大变化或未预料到的环境影响，协助准备或更新子项目初始环境评估和环境管理计划 •协助更新环境管理计划和环境监测计划 •代表县项目办和省项目办监督环境管理计划中规定的缓解措施的实施，编制英文版的半年度环境管理计划监测和进度报告，并将其提交给亚洲开发银行 •根据子项目环境管理计划中规定的培训计划，向县项目办、省项目办、承包商和施工监理公司提供关于中华人民共和国环境法律、法规和政策、亚洲开发银行 SPS（2009）、环境管理计划实施和申诉补偿机制的培训 •确定任何与环境相关的实施问题，并提出必要的纠正措施，以便根据需要进行现场访问，以进行环境管理计划检查
ADB	• Advise the NPMO on the type and extent of environmental assessment report to be prepared, based on the SPS requirements • Review and approve subproject IEEs and disclose on ADB 's project website in accordance with ADB 's disclosure policies • Review semiannual environmental monitoring reports submitted by the NPMO, and conducting review missions during implementation to determine compliance with SPS requirements • Disclose environmental monitoring reports on ADB's project website in accordance with ADB 's disclosure policies • 根据 SPS 要求，就环境评估报告的类型和范围向国家项目办提出建议 • 根据亚行的披露政策，审查和批准子项目初始环境评估，并在亚行的项目网站上披露

Agency 机构	Environmental Management Roles and Responsibilities 环境管理角色和职责
	• 审查国家项目办提交的半年度环境监测报告，并在实施期间执行审查任务，以确定是否符合 SPS 要求 • 根据亚行的披露政策，在亚行的项目网站上披露环境监测报告

ADB = Asian Development Bank, CSC = construction supervision company, CPMO = county project management office, EMP = environmental management plan, GRM = grievance redress mechanism, IEE = initial environmental examination, LIEC = loan implementation environmental consultant, NPMO = national project management office, PPMO = provincial project management office, PRC = People's Republic of China.
ADB=亚洲开发银行，CSC=建设监理公司，CPMO=县项目管理办公室，EMP=环境管理计划，GRM=申诉补偿机制，IEE=初始环境评估，LIEC=贷款实施环境顾问，NPMO=国家项目管理办公室，PPMO=省项目管理办公室，PRC=中华人民共和国。

6 **Environment staff within Henan PPMO and Yanshi/Xiangfu/Wuzhi CPMO.** The PPMO will designate a qualified environment officer, who will take overall responsibility for supervising the implementation of the EMP. The officer will work full-time for the project and will take charge of: (i) supervising the implementation of mitigation measures during project design, construction and operation; (ii) ensuring that environmental management, monitoring, and mitigation measures are incorporated into bidding documents, construction contracts and operation management manuals; (iii) submitting semi-annual EMP monitoring and progress reports to ADB; (iv) coordinating the GRM; and (v) responding to any unforeseen adverse impacts. The PPMO Environment Officer will be technically supported by the loan implementation environment consultant. The CPMO will nominate one qualified environment and social office as focal point to check the overall implementation of environmental management provisions of the EMP and to work in close coordination with the PPMO Environmental Officer.
河南省项目办和偃师/祥符/武陟县（区）项目办的环境工作人员。省项目办将指定一名合格的环境官员，全面负责监督环境管理计划的实施。该官员将全职为项目工作，并将负责：（i）在项目设计、施工和运营期间监督缓解措施的实施；（ii）确保将环境管理、监测和缓解措施纳入招标文件、施工合同和运营管理手册；（iii）每半年向亚洲开发银行提交环境管理计划监测和进度报告；（iv）协调申诉补偿机制；以及（v）应对任何不可预见的不利影响。贷款实施环境顾问将为省项目办环境官员提供技术支持。项目管理办公室将指定一名合格的环境和社会办公室作为联络点，以检查环境管理计划中环境管理规定的总体实施情况，并与项目管理办公室环境官员密切合作。

7 **Loan implementation consultants.** The PPMO will engage one loan implementation environmental consultant (LIEC) and loan implementation social consultant (LISC), as part of the loan consultancy implementation services to be recruited at the provincial level. The consultants will support the PPMO to provide capacity building for, and coordination of, the EMP implementation. The LIEC will also support contractors in developing construction site-specific environmental management plans (CEMPs) prior to construction and operation.
贷款实施顾问。省项目办将聘请一名贷款实施环境顾问（LIEC）和一名贷款实施社会顾问（LISC），作为省级贷款咨询实施服务的一部分。顾问将支持省项目办为环境管理计划实施提供能力建设和协调。贷款实施环境顾问还将支持承包商在施工和运营前制定施工现场特定的环境管理计划（CEMPs）。

C. Summary of Potential Impact and Mitigation Measures 潜在影响和缓解措施摘要

8 Table EMP-2 and EMP-3 summarizes the potential impacts and environment safeguard

issues of the subprojects during pre-construction, construction, and operation as identified by the environmental impact assessments and set out in the subproject IEE, as well as corresponding mitigation measures designated to minimize those impacts and address these issues. The mitigation measures will be incorporated into detailed design, bidding documents, construction contracts and operational management manuals, by the design institutes (during detailed design) and contractors (during construction), under the supervision of the PPMO and CPMO Environment Officers and CSCs, with technical support from the LIECs. The effectiveness of these measures will be evaluated based on environmental inspections and monitoring to determine whether they should be continued, improved, or adjusted.

Table EMP-2 和 Table EMP-3 总结了子项目在施工前、施工和运营期间的潜在影响和环境保护问题，这些问题由环境影响评估确定，并在子项目初始环境评估报告中列出，以及为最大限度地减少这些影响和解决这些问题而指定的相应缓解措施。缓解措施将由设计院（在详细设计期间）和承包商（在施工期间）在省项目办和县（区）项目办环境官员和施工监理机构的监督下，在贷款实施环境顾问的技术支持下，纳入详细设计、招标文件、施工合同和运营管理手册中。这些措施的有效性将根据环境检查和监测进行评估，以确定是否应继续、改进或调整这些措施。

Table EMP-2: Potential Environmental Impacts and Mitigation Measures

Table EMP-2: 潜在环境影响及缓解措施

Item 项目	Potential impacts/ issues 潜在影响/问题	Mitigation measures 缓解措施	Who implements 实施者	Who supervises 监督者
A. DESIGN AND CONSTRUCTION PHASES 设计和施工阶段				
Detailed design stage 详细设计阶段	Institutional strengthening for EMP Implementation and supervision 加强环境管理计划实施和监督的制度建设	• At least 1 month before construction: (i) reconfirm the full-time status of the CPMO and PPMO Environmental Officers; (ii) appoint at least one Environment Focal Staff at CPMO and PPMO. • At least 2 months before any construction, PPMO engages LIEC. • At least 2 months before any construction, provide training to all environmental staff for EMP implementation and supervision. • Engage one certified EMA has been recruited for the subproject at least 2 months before any construction. • Establish early screening measures and procedures to ensure that all new project personnel are tested negative before commencing on-site work. • Organize and conduct training on the subproject EMP for appropriate staffs of the PMO, IAs, PIUs, contractors, and CSCs. • 施工前至少一月：（i）重新确认县项目办和省项目办环境官员的在职状态；（ii）在县项目办和省项目办任命至少一名环境联络人员。 • 在任何施工前至少两个月，省项目办与贷款实施环境顾问接洽。 • 在任何施工前至少两个月，为子项目招聘一个经认证的环境检测机构。 • 建立早期筛查措施和程序，以确保所有新的项目人员在开始现场工作前均检测为阴性。 • 为项目管理办公室、执行机构、项目执行单位、承包商和施工监理机构的相关人员组织和开展子项目环境管理计划培训。	CPMO,PPMO 县项目办、省项目办	NPMO 国家项目办
	Climate change risk 气候变化风险	• Incorporate the recommendations in the Table 7 of the CRVA into the design •将 CRVA 表 7 中的建议纳入设计中	DIs, CPMO, LIEC 设计机构、县	PPMO, ADB 省项目办、亚行

Item 项目	Potential impacts/ issues 潜在影响/问题	Mitigation measures 缓解措施	Who implements 实施者	Who supervises 监督者
			项目办、贷款实施环境顾问	
	Associated and/or existing facilities 相关和/或现有设施	• Conduct due diligence for the identified associated and/or existing facilities, including but not limited to i) source of the gravels and concrete; ii) earth borrow pits and spoil disposal pits (if any) based on the final design; and iiii) final diposal facilities for the agricultural waste films and irrigation pipes. •对已确定的相关和/或现有设施进行尽职调查，包括但不限于 i）砾石和混凝土的来源；ii）基于最终设计的取土坑和弃土坑（如有）；以及 iiii）用于农业废膜和灌溉管道的最终处理设施。	CPMO, LIEC 县项目办、贷款实施环境顾问	PPMO 省项目办
	Updating EMP 更新环境管理计划	**Update the mitigation measures defined in this EMP,** • Update as needed, based on final detailed design. • Ensure that the final designs do not involve any expansion of agricultural land or change in land zoning from other land types to agricultural land use. • Submit the updated EMP to ADB for review. The updated IEE, including the EMP will be disclosed on the websites of ADB and governments'websites of Yanshi, Xiangfu and Wuzhi. **Changes in subproject locations or scope** • In case of major changes of subproject location and/or additional physical components, form a DEIA team to conduct a supplemental DEIA and undertake the required public consultation. • PPMO to consult with ADB to determine if the change is minor or major in scope. **更新本环境管理计划中规定的缓解措施，** • 根据最终详细设计，按需更新。 • 确保最终设计不涉及农业用地的任何扩张，或将土地分区从其他土地类型改为农业用地。	PPMO, LIEC 省项目办，贷款实施环境顾问	NPMO, ADB 国家项目办，亚行

Item 项目	Potential impacts/ issues 潜在影响/问题	Mitigation measures 缓解措施	Who implements 实施者	Who supervises 监督者
		• 将更新后的环境管理计划提交给亚洲开发银行审查。更新后的初始环境评估（包括环境管理计划）将在亚洲开发银行网站和偃师区、祥符区、和武陟县政府网站上公布。 **子项目位置或范围的变更** • 如果子项目位置和/或额外的物理组件发生重大变化，则组建国内环评团队进行补充国内环评，并进行所需的公众咨询。 • 省项目办应与亚洲开发银行协商，以确定变更的范围是小还是大。		
Construction Preparation 施工准备	Environmental monitoring plan 环境监测计划	• Prior to construction, the PPMO will hire an EMA for environmental monitoring. • Prepare a detailed monitoring plan in accordance with the monitoring plan in this EMP. • 在施工之前，省项目办将聘用一家环境监测机构进行环境监测。 • 根据本环境管理计划中的监测计划编制详细的监测计划	PPMO, EMA 省项目办、环境监测机构	NPMO 国家项目办
	Bidding and contract documents 投标和合同文件	• Mitigation measures in the EMP are incorporated in all bidding documents. • Bidding documents are sent to ADB for review. • Prepare environmental contract clauses for contractors. • 环境管理计划中的缓解措施包含在所有招标文件中。 • 招标文件送交亚行审查。 • 为承包商准备环境合同条款。	DIs, CPMO, LIEC 设计机构、县项目办、贷款实施环境顾问	PPMO, ADB 国家项目办、亚行
	EMP training 环境管理计划培训	• LIEC, or invited environment specialists and/or officials from EEB provide training on construction environmental management, implementation, supervision, to contractors and CSCs, in accordance with the training plan in this EMP. • 根据本环境管理计划中的培训计划，贷款实施环境顾问或生态环境局邀请的环境专家和/或官员，向承包商和监理提供施工环境管理、实施、监督方面的培训。	LIEC, CPMO 贷款实施环境顾问、县项目办	PPMO, EEB 省项目办、生态环境局
	Establish GRM 建立申诉补偿机制	• Responsibility for GRM implementation is assigned to the PMO and PIU Environmental Officers and Social Officers and is included in their terms of reference.		

Item 项目	Potential impacts/ issues 潜在影响/问题	Mitigation measures 缓解措施	Who implements 实施者	Who supervises 监督者
		• CPMO and PPMO personnel will be aware of, and trained in, the GRM, and will help support the environmental and social officers when necessary. • Key contact details for the GRM (phone number, WeChat, address, email) will be provided on the CPMO, PPMO and/or EEB public websites and information boards at construction sites. • 申诉补偿机制实施的责任分配给项目管理办公室和项目执行单位的环境官员和社会官员，并包括在他们的职权范围内。 • 县项目办和省项目办人员将了解并接受申诉补偿机制培训，并在必要时帮助支持环境和社会官员。 • 申诉补偿机制的主要联系方式（电话、微信、地址、电子邮件）将在县项目办、省项目办和/或生态环境局公共网站和施工现场的信息板上提供。	CPMO, PPMO 县项目办、省项目办	LIEC 贷款实施环境顾问
	Site EMPs 施工现场环境管理计划	• Prior to any works, prepare site-specific EMP for individual construction sites 在任何工程之前，为各个施工现场编制现场特定的环境管理计划	Contractor 承包商	CSC 监理
		• Review and ensure site EMP comply with the measures in this EMP 审查并确保现场环境管理计划符合本环境管理计划中的措施	CPMO 县项目办	LIEC, PPMO 贷款实施环境顾问、省项目办
B. CONSTRUCTION PHASE 建设阶段				
Topography and Soils 地形和土壤	Earthwork, soil erosion, soil contamination 土方工程、水土流失、土壤污染	• The construction method of terrace leveling shall meet the provisions of "Technical Specification for Comprehensive Management of Soil and Water Conservation and Slope Farmland Management Technology" (GB/T16453.1-2008). • At the construction site, the potential for the stormwater runoff will be assessed and appropriate stormwater drainage systems to minimize soil erosion will be implemented, including perimeter bunds and establishment of temporary detention and settling ponds to control topsoil runoff.	Contractor 承包商	CSC, CPMO, PPMO, EEB, WRB,LIEC 监理、县项目办、省项目办、生态

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		• Land excavation and filling will be balanced so as minimize the requirement for fill material transportation. • During earthworks, the area of soil exposed to potential erosion at any time will be minimized through good project and construction management practices. • Waste construction material such as residual concrete and asphalt will be properly handled for reuse or disposal. • Construction and material handling activities will be limited or halted during periods of rains and high winds. • Any planned paving or vegetating of areas will be done as soon as practical after the materials are removed to protect and stabilize the soil. • During construction and excavation, the topsoil layer shall be separately collected and stacked, and soil erosion prevention and control measures shall be taken. Land temporarily compacted during construction shall be ploughed immediately after completion of construction. • All quarry and sands used for civil works will be sourced only from officially approved quarry sites and companies. Prior to purchase of quarry and sands, the contractor will inform the CPMO, CSC and LIEC of the specific supplier and the supplier will provide documents confirming (a) they are a certified and legal supplier, and (b) that all materials are sourced from legal sites and are not illegal extraction sites, protected areas or other sensitive locations. Measures for soil contamination: • Store petroleum products, hazardous materials and wastes on impermeable surfaces in secured in line with the Regulations on Management of Hazardous Chemicals (2011) and covered areas at a minimum of 200 meters from the nearest canal or drainage ditch.		环境局、水务局、贷款实施环境顾问

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		• Remove all construction wastes from the site to approved waste disposal sites. • Establish emergency preparedness and response actions. • Provide spill cleanup measures and equipment at each construction site. • Train contractors and crews in emergency spill response procedures. • 梯田平整的施工方法应符合《水土保持综合治理与坡耕地治理技术规范》（GB/T 16453.1-2008）的规定。 • 在施工现场，将评估雨水径流的可能性，并实施适当的雨水排水系统，以最大限度地减少土壤侵蚀，包括周边堤岸和建立临时滞留池和沉淀池，以控制表土径流。 • 土地开挖和填埋将保持平衡，以尽量减少对填料运输的需求。 • 土方工程期间，通过良好的项目和施工管理实践，将随时暴露于潜在侵蚀的土壤面积降至最低。 • 废弃的建筑材料，如剩余的混凝土和沥青，将被妥善处理，以供再用或处置。 • 在下雨和大风期间，施工和材料处理活动将收到限制或停止。 • 在移除材料以保护和稳定土壤后，将尽快进行任何计划的铺路或植被区域。 • 施工开挖时，应将表土层单独收集堆放，并采取水土流失防治措施。施工中临时压实的土地，应在施工结束后立即翻耕。 • 所有用于土建工程的采石场和沙子只能从官方批准的采石场和公司采购。在购买采石场和沙子之前，承包商将通知县项目办、监理和贷款实施环境顾问具体供应商，供应商将提供文件，确认（a）他们是经过认证的合法供应商，以及（b）所有材料均来自合法地点，而不是非法开采地点、保护区或其他敏感地点。 **土壤污染措施：** • 根据《危险化学品管理条例》（2011），将石油产品、危险材料和废物储存在安全的不透水表面上，并将覆盖区域距离最近的运河或排水沟至少 200 米。 将所有建筑垃圾从现场运至经批准的垃圾处理场。		

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		• 建立应急准备和响应行动。 • 在每个施工现场提供泄漏清理措施和设备。 • 对承包商和员工进行紧急泄漏响应程序的培训。		
Ambient Air 环境空气	Dust generated by construction activities, gaseous air pollution (SO2, CO, NOx) from construction machinery and asphalt pavement after pipeline laying 施工活动产生的扬尘、施工机械和管道铺设后沥青路面产生的气态空气污染（SO2、Co、NOx）	• Equip material stockpiles and concrete mixing equipment with dust shrouds. • Spray water on construction sites and earth/material handling routes. • Cover materials during truck transport. • Store petroleum or other harmful materials at appropriate places. • Ensure emissions from vehicle and machinery comply with PRC standards of GB18352-2005, GB17691-2005, GB11340-2005, GB2847-2005, and GB18285-2005. • Provide high-horsepower equipment with tail gas purifiers. • Turn off equipment/vehicles when not in use and limit engine idling to 5 minutes to reduce air pollution onsite. • The straw crushing equipment must be equipped with dust suppression systems such as water spray systems, baghouse dust collectors, or electrostatic precipitators. • 为材料堆和混凝土搅拌设备配备防尘罩。 • 在施工现场和泥土/材料搬运路线上洒水。 • 卡车运输期间覆盖材料。 • 在适当的地方储存石油或其他有害物质。 • 确保车辆和机械的排放符合中华人民共和国 GB18352-2005、GB17691-2005、GB11340-2005、GB2847-2005 和 GB18285-2005 标准。 • 提供带尾气净化器的大马力设备。 • 不使用时关闭设备/车辆，并将发动机怠速时间限制为 5 分钟，以减少现场空气污染。 • 秸秆粉碎设备必须配备抑尘系统，如喷水系统、袋式除尘器或静电除尘器。	Contractor 承包商	CSC, CPMO, PPMO, LIEC 监理、县项目办、省项目办、贷款实施环境顾问
	Noise and vibration generated from	• Ensure construction machinery conforms to PRC standard of GB12523-2011. • Properly maintain vehicles and machineries to minimize noise.	Contractor 承包商	CSC, CPMO,

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Noise and vibration 噪音和振动	construction activities 施工活动产生的噪声和振动	• Apply noise reduction devices or methods where noisy machinery is operating. • Night construction is prohibited. • Place temporary hoardings or noise barriers around noise sources during construction. • Conduct checks for cracks at sites before and after vibration-inducing works. • Monitor noise at sensitive areas and consult villagers/residents at regular intervals (see Table EMP-4). If noise standards are exceeded, equipment and construction conditions shall be checked, and mitigation measures shall be implemented to rectify the situation. • Conduct interviews with residents adjacent to construction sites to identify and resolve issues, including adjustment of work hours of noise-generating machinery. • For households that will be within 50 m of construction works particular attention will be provided. This will include: (a) follow-up consultations with these households prior to the start of any works, to specify the exact planned dates and schedule of works, nature of works, equipment to be used, safety measures, and public access during construction; (b) installation of noise barriers to reduce as much of the emissions as possible, and/or installation of additional layers on the windows of the affected homes as necessary, based on the assessment of the most technically effective method and feedback from the community consultations; (c) agreement on the duration of daily works. • Restrict the routes of road rollers to designated areas to avoid uncessary soil compaction on cultivable land. • 确保施工机械符合中华人民共和国 GB12523-2011 标准。 • 妥善保养车辆和机械，尽量减少噪音。 • 在有噪音的机器运行时，使用降噪装置或方法。 • 禁止夜间施工。 • 施工期间，在噪声源周围设置临时围板或隔音屏障。		PPMO, LIEC 监理、县项目办、省项目办、贷款实施环境顾问

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		• 在进行振动诱导工程之前和之后，检查现场是否有裂缝。 • 监测敏感区域的噪音，并定期咨询村民/居民（见表 EMP-4）。如果超过噪音标准，应检查设备和施工条件，并采取缓解措施进行整改。 • 与建筑工地附近的居民进行访谈，以确定和解决问题，包括调整产生噪音的机器的工作时间。 • 对于建筑工程 50 米范围内的住户，将给予特别关注。这将包括：（a）在任何工程开始之前与这些住户进行后续协商，以具体说明工程的确切计划日期和时间表、工程性质、使用的设备、安全措施和施工期间的公共通道；（b）根据对技术上最有效的方法的评估和社区协商的反馈，安装隔音屏障以尽可能减少排放，，和/或必要时在受影响房屋的窗户上安装附加层；（c）关于日常工作期限的协议。 • 将压路机的路线限制在指定区域，以避免对耕地进行不必要的土壤压实。		
Water pollution 水污染	Impact from wastewater pollution 废水污染影响	• Most of the workers will live in rented apartments in the towns and villages; therefore, the majority of domestic sewage will be discharged and disposed to the septic tank and reused as fertilizer after composting. Procedures for safe treatment and handling will follow existing established procedures in the subproject area and nationally and will comply with the PRC's *Guide to Harmless Treatment and Resource Utilization of Rural Toilet Feces* and *Typical Model of Rural Toilet Feces Treatment and Resource Utilization*; • Fuel storage and vehicle cleaning areas must be stationed at least 500 m away from river or canal. • Equip machine wash-down sites with water collection basins and sediment traps. • Install oil-water separators before the sedimentation tank for oily wastewater treatment. • Equip all sites for washing of construction equipment with water collection basins and sediment traps.	Contractor;and, for the treated compost: (i) household owners renting the apartments to workers, (ii) farmers applying the compost on fields	CSC, CPMO, PPMO, LIEC 监理、县项目办、省项目办、贷款实施环境顾问

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		• Install portable toilets at work sites. After pre-treated in the septic tank and composting, the manure will be used as fertilizer. Discharge into the canals and drainage ditches are prohibited. • All necessary measures will be undertaken to prevent construction materials and waste from entering the irrigation canals nearby. • Maintenance of construction equipment and vehicles will not be allowed on sites to reduce wastewater generation. • All construction machinery is repaired and washed at special repairing shops. No on-site machine repair, maintenance, and washing shall be allowed so as to reduce wastewater generation; • Storage facilities for fuels, oil, and other hazardous materials are within secured areas on impermeable surfaces with 110% volume of the materials stored, and provided with bunds and cleanup kits; • The contractors' fuel suppliers are properly licensed, follow proper protocol for transferring fuel, and are in compliance with Transportation, Loading and Unloading of Dangerous or Harmful Goods (JT 3145-88). • 大多数工人将住在城镇和乡村的出租公寓内。因此，大部分生活污水将排入化粪池处理，堆肥后作为肥料再利用。安全处理和处置程序将遵循子项目区域和国家现有的既定程序，并符合中华人民共和国*《农村厕所粪便无害化处理和资源化利用指南》*和*《农村厕所粪便处理和资源化利用典型模式》*； • 燃料储存区和车辆清洗区必须距离河流或渠道至少 500 米。 • 为机器冲洗场配备集水池和沉积物收集器。 • 含油废水处理沉淀池前设置油水分离器。 • 为所有清洗施工设备的场地配备集水池和沉积物收集器。	承包商；以及，对于处理过的堆肥：（i）公寓出租给工人房屋的房主，（ii）在田地上施用堆肥的农民	

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		• 在工地安装移动厕所。粪便经化粪池预处理、堆肥后，作为肥料使用。严禁排入水渠、排水沟。 • 将采取一切必要措施，防止建筑材料和废物进入附近的灌溉渠。 • 现场不允许维护施工设备和车辆，以减少废水的产生。 • 所有施工机械均在专门的维修车间进行维修和清洗。不得在现场维修、保养、清洗机器，以减少废水的产生； • 燃料、石油和其他危险材料的储存设施位于不透水表面上的安全区域内，储存材料的体积为 110%，并配有堤岸和清理工具； • 承包商的燃料供应商持有适当的许可证，遵守适当的燃料运输协议，并遵守《危险或有害货物的运输、装卸》（JT 3145-88）。		
Solid Waste 固体废弃物	Solid waste generated by construction activities and from workers 施工活动和工人产生的固体废物	• Provide appropriate waste collection and storage containers at locations away from surface water or sensitive spots. • Arrange with municipal waste collection services for regular collection of waste. • Properly remove and dispose of residual materials, wastes and contaminated soils. Paving or vegetating shall be done as soon as the materials are removed to stabilize the soil. • Burning waste is strictly prohibited. • Provide sufficient garbage bins at strategic locations and ensure that they are protected from birds and vermin, and emptied regularly by the municipal waste collection systems. CONTRACTOR PERFORMANCE TARGET: No uncollected waste at the close of construction activities each day. • 在远离地表水或敏感点的位置提供适当的废物收集和储存容器。 • 与市政废物收集服务部门安排定期收集废物。	Contractor 承包商	CSC, CPMO, PPMO, LIEC 监理、县项目办、省项目办、贷款实施环境顾问

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		• 妥善清除和处置残余材料、废物和受污染的土壤。应在移除材料后立即进行铺砌或植被，以稳定土壤。 • 严禁焚烧废弃物。 • 在关键位置提供足够的垃圾箱，确保其免受鸟类和害虫的侵害，并由市政垃圾收集系统定期清空。 **承包商绩效目标：**没天施工活动结束时无未收集的废物。		
Biological resources 生物资源	Protection of flora and fauna around construction sites 保护施工现场周围的动植物	• Construction workers are prohibited from capturing any wildlife in the subproject areas; • Prior to construction, demarcate vegetation, e.g., vegetated roadsides, trees, riverbanks. • As far as possible, avoid the clearance of any vegetation. • In the event that non-native seedlings are required for rapid stabilization of exposed soils and sites, only sterile seedlings will be used to prevent the spread of weeds. • No plant species will be used that are classified in the PRC as weeds, as defined by the China National Invasive Plant Database (www.iplant.cn/ias); 229 species) and by the MEE and Chinese Academy of Sciences (19 species). • To avoid pollution of the rivers, no top-dressing fertilizers will be used for any of the re-vegetation, planting, afforestation. For all planting activities, fertilizer will be applied at the root mass of each plant. • No pesticides or agricultural chemicals listed as hazardous under Classes I or II by the WHO or listed as prohibited or strictly controlled use under the PRC's national regulations for pesticide management will be used for the subproject activities. •禁止施工人员在子项目区域内捕捉任何野生动物； •施工前，划定植被界线，如植被覆盖的路边、树木、河岸。 •尽可能避免清除任何植被。	Contractor 承包商	CPMO, PPMO, LIEC, Forestry Bureau 县项目办、省项目办、贷款实施环境顾问、林业局

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		•如果需要非本地幼苗来快速稳定暴露的土壤和场地，则只能使用无菌幼苗来防止杂草蔓延。 •不会使用被中国列为杂草的任何植物种类，如被中国国家入侵植物数据库（www.iplant.cn/IAS）；229 种）定义的，和生态环境部和中国科学院定义的（19 种）。 •为避免污染河流，任何植被恢复、种植、造林都不会使用追肥。对于所有种植活动，将在每株植物的根块上施肥。 •在子项目活动中，不得使用世界卫生组织列为第一类或第二类有害物质，或中华人民共和国国家农药管理条例列为禁止或严格控制使用的农药或农用化学品。		
Physical cultural resources 物质文化资源	Damage to known or unknown above or below-ground cultural relics 损坏已知或未知的地上或地下文物	• Establish chance-find procedures for physical cultural resources; • If a new site is unearthed, work shall be stopped immediately and the CPMO and cultural relics bureau promptly notified. The construction will resume only after a thorough investigation and with the permission of appropriate authority. • 建立物质文化资源的机会发现程序； • 如有新的遗址出土，应立即停工，并及时通知县项目办和文物局。只有经过彻底调查并获得有关当局的许可后，才能恢复施工。	Contractor 承包商	CPMO LIEC, cultural relic bureau 县项目办、贷款实施环境顾问、文物局
Socio-economic resources 社会经济资源	Temporary interruption to water supply from pipeline or embankment construction 因管道或路堤施工导致供水临时中断	• Use coffer dams and temporary diversion channels to maintain continued water flow while works are conducted. • Prior to works, re-confirm the planned construction schedule and site EMP actions. • Inform residents at least two days before any planned water interruptions. • Assist residents if requested with community water storage during the interruption period. • Interruptions to water supply should not be longer than one (1) day. • Land use will be planned through voluntary agreements with respective collective landowners/land users. Agreements must secured before any works.	Contractor 承包商	CSC, PIU, PMO, LIEC 监理、项目实施单位、项目办、贷款实施环境专家

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		• Any crop losses (e.g., due to accidental damage by a contractor) will be compensated according to the project framework on land use right transfer. • In case of accidental interruption, immediately inform affected communities and assist with water supply until the issue is resolved. • Works for land levelling and irrigation canals will be scheduled during October to March to avoid the growing season and minimize the risk of impacts to crops. • 在施工期间，使用围堰和临时导流渠保持持续的水流。 • 开工前，重新确认计划的施工进度和现场环境管理计划措施。 • 在计划停水前至少两天通知居民。 • 如有要求，在中断期间协助居民进行社区储水。 • 供水中断不得超过一（1）天。 • 土地使用将通过与各集体土地所有者/土地使用者的资源协议进行规划。协议必须在任何工程之前获得。 • 任何农作物损失（例如由于承包商的以外损坏）将根据土地使用权转让的项目框架进行赔偿。 • 如果发生意外中断，立即通知受影响的社区，并协助供水，直到问题得到解决。 • 土地平整和灌溉渠工程将安排在 10 月至 3 月期间进行，以避开生长季节，并将农作物的影响风险降至最低。		
Community and occupational health and safety 社区和职业健康与安全	Community consultation, health, and safety 社区咨询、健康和安全	**Community consultations** • Prior to works, inform residents and businesses through media, information boards, and direct consultations of the construction activities, dates and duration of expected disruption. • Especially for the communities within 50 m of works and who will be subjected to higher noise/dust levels, conduct meetings with residents prior to any works. • Record all community feedback and solutions discussed and agreed.	Contractor 承包商	CSC, CPMO, PPMO, LIEC 监理、县项目办、省项目办、贷款

Item 项目	Potential impacts/ issues 潜在影响/问题	Mitigation measures 缓解措施	Who implements 实施者	Who supervises 监督者
		• Based on feedback from community consultations: (i) update contractor site plans as needed to incorporate solutions e.g., revisions in work schedules, daily working hours, construction methods, and/or mitigation methods; (ii) revise CSC monitoring schedules and monitoring criteria as needed to reflect the updated contractor site management plans. **Community health, safety, and minimizing disruption to daily life** • Traffic management. Negotiating haulage truck and machinery movements with village committees to ensure that village activities (market days etc.) and residential roads are minimally impacted by construction traffic; • For all works involving excavation along roads and easements with existing subsurface utilities (power cables, sewage pipes, water pipes, telecommunication cables): (i) plan and coordinate the project pipeline construction with utility managers, (ii) check if there are other pending projects to upgrade these utilities. Coordinate works to avoid repeated excavation at sites; and work with utility managers to minimize damage or disruption to existing utilities. • Install signs at construction sites to inform people of the subproject GRM, potential dangers (e.g., moving vehicles, hazardous materials, excavations) and safety issues. • Install safety barricades around all excavations and trenches. • Assign personnel to direct pedestrians around dangerous work areas. • Ensure that all sites are secure, discouraging access through appropriate fencing. • Lock and secure all work sites to prevent unauthorized access. • Night-time (8:00 pm – 6:00 am) use of heavy machinery is strictly prohibited. **社区协商** • 在施工前，通过媒体、信息板和直接咨询告知居民和企业施工活动、日期和预期中断的持续时间。		实施环境顾问

Item 项目	Potential impacts/ issues 潜在影响/问题	Mitigation measures 缓解措施	Who implements 实施者	Who supervises 监督者
		• 特别是对于工程 50 米范围内的社区，以及将受到较高噪音/灰尘水平影响的社区，在任何工程之前与居民举行会议。 • 记录所有机构群体反馈和讨论并达成一致的解决方案。 • 根据社区协商的反馈：（i）根据需要更新承包商现场计划，以纳入解决方案，例如修订工作计划、每日工作时间、施工方法和/或缓解方法；（ii）根据需要修改监理监控时间表和监控标准，以反映最新的承包商现场管理计划。 **社区健康、安全和尽量减少对日常生活的干扰** •交通管理。与村委会协商运输卡车和机械移动，以确保村庄活动（集市日等）和住宅区道路受施工交通的影响最小； •对于涉及道路沿线开挖和现有地下公共设施（电力电缆、污水管道、水管、电信电缆）地役权的所有工程：（i）与公用设施经理一起计划和协调项目管道施工，（ii）检查是否有其他未完成的项目来升级这些公用设施。协调工程，避免现场重复开挖；并与公用事业经理合作，尽量减少对现有公用事业的损害或中断。 •在施工现场安装标志，告知子项目申诉补偿机制、潜在危险（如移动车辆、危险材料、挖掘）和安全问题。 •在所有挖掘和沟渠周围安装安全路障。 •指派人员引导危险工作区域周围的行人。 •确保所有场地的安全，通过适当的围栏阻止进入。 •锁定并保护所有工作场所，以防止未经授权的访问。 •夜间（晚上 8:00-早上 6:00）严禁使用重型机械。		
	Occupational health and safety 职业健康与安全	• Prepare environmental, health and safety plan, to include: (i) clean and sufficient supply of fresh water for construction sites, camps, offices; (ii) sufficient latrines and other sanitary arrangements at construction sites and work camps; (iii) garbage receptacles and regular emptying; and (iv) provision of safety clothing and equipment as needed, in accordance with health and safety regulations.	Contractor 承包商	CSC, CPMO, PPMO, LIEC 监理、县项目办、省项

Item 项目	Potential impacts/ issues 潜在影响/问题	Mitigation measures 缓解措施	Who implements 实施者	Who supervises 监督者
		• Prepare emergency response plan and submit to PMO and EEB for approval. Establish emergency phone links with township hospitals. Maintain a first-aid base in each construction camp. • Establish a records management system for occupational accidents, diseases, incidents that: (a) includes a tracking system to ensure that incidents are followed-up; (b) can easily retrieve records; and (c) can be used during compliance monitoring and audits. The system will be backed up on at least one external hard drive to protect records against loss or damage. The records will be reviewed during compliance monitoring and audits. • Establish worker camps in conformance with relevant domestic guidelines. • Safety communication. Publicize occupational health and safety matters to all project personnel. Install on-site signs and give regular training. • Comply with the Code of safe work in electrical industry (DL/T409) during power transmission line installation and testing. • Train workers in sanitation, health, safety, and work hazards. Implement awareness and prevention program for HIV/AIDS and other diseases for communities and workers. • Provide personal protection equipment to workers as needed, e.g., safety boots, helmets, gloves, protective clothing, goggles, ear protection. • Asbestos. In the event that materials containing asbestos are suspected: (i) the contractor will immediately inform the PIU, who will inform the PMO; (ii) the contractor will subcontract the municipal center for hazardous waste, who will be responsible for the safe handling, transport, and disposal of the materials; (iii) such materials will only be disposed in a landfill site certified and designed to receive hazardous materials. **CONTRACTOR PERFORMANCE TARGET:** Camps clean, emergency response plans in place, and 100% of workers aware of emergency response procedures.		目办、贷款实施环境顾问

Item 项目	Potential impacts/ issues 潜在影响/问题	Mitigation measures 缓解措施	Who implements 实施者	Who supervises 监督者
		• 制定环境、健康和安全计划，包括：（i）为施工现场、营地、办公室提供清洁和充足的淡水；（ii）在建筑工地和工地营地提供足够的厕所和其他卫生设施；（iii）垃圾容器和定期清空；（iv）根据健康和安全条例，提供所需的安全服装和设备。 • 编制应急预案，报项目管理办公室和生态环境局审批。与乡镇卫生院建立急救电话联系。在每个施工营地维持一个急救基地。 • 建立一个记录管理系统，用于处理职业事故、疾病和事件，如下：(a) 包括一个追踪系统，以确保事件得到跟进；(b) 可以轻松检索记录；并且 (c) 可用于合规监测和审计。系统将至少在一个外部硬盘上备份，以保护记录免受丢失或损坏。在合规监测和审计期间将对记录进行审核。 • 根据相关国内准则建立工人营地。 • 安全通信。向所有项目人员宣传职业健康和安全事项。安装现场标志并定期培训。 • 在输电线路安装和试验过程中，应遵守《电业安全工作规程》（DL/T409）。 • 对工人进行卫生、健康、安全和工作危险方面的培训。为社区和工作实施艾滋病毒/艾滋病和其他疾病的宣传和预防方案。 • 根据需要为工人提供个人防护设备，如安全靴、头盔、手套、防护服、护目镜、护耳器。 • 石棉。如果怀疑材料含有石棉：（i）承包商应立即通知项目执行机构，项目执行机构将通知项目办；（ii）承包商将分包给市政危险废物中心，该中心将负责材料的安全处理、运输和处置；（iii）此类材料只能在经认证和设计用于接受危险材料的填埋场进行处理。 **承包商绩效目标：**营地清洁，应急响应计划到位，100%的工人了解应急响应程序。		

Table EMP-3: Potential Impacts and Mitigation Measures during Operation

Table EMP-3: 运营期间的潜在影响和缓解措施

Issue 问题	Mitigation Measure 缓解措施	Implement 实施	Supervise 监督
Pollution from cultivation activities 种植活动污染	**Soil and water pollution risks:** • The subproject will promote the use of organic fertilizers and integrated pest management to reduce the use of chemical fertilizer and pesticides. • Formular fertilizer and integrated water and fertilizer irrigation will be adopted to achieve precise fertilizer application. • No pesticides listed as hazardous under Classes I or II by the WHO[15],, or Annexes A and B of the Stockholm Convention[16], or listed as prohibited or strictly controlled use under the PRC's national regulations[17] for pesticide management will be used for the project activities. • Use plant protection drones and development of intelligent insect forecasting systems. • Pesticide application technologies will be selected to minimize off-site movement or runoff (e.g., low-drift nozzles, using the largest droplet size and lowest pressure that are suitable for the product). • The CPMO will record all the pesticides sold in the subproject areas. • Implement subproject integrated pest management plan and awareness raising training to phase out existing use of hazardous pesticides. **土壤和水污染风险：** •该子项目将促进使用有机肥和综合病虫害管理，以减少化肥和农药的使用。 •采用配方施肥、水肥一体化灌溉，实现精准施肥。 •没有被 WHO 列为一级或二级危险的农药或《斯德哥尔摩公约》附件 A 和 B 或被中国国家法规列为禁止使用或严格控制使用。农药管理将用于项目活动。 •使用植保无人机和开发智能昆虫预测系统。 •将选择农药施用技术，尽量减少场外移动或流失（例如，低漂移喷嘴，使用适合产品的最大液滴尺寸和最低压力）。 •县项目办将记录在子项目区域销售的所有农药。 •实施子项目综合病虫害防治计划和提高认知培训，以逐步淘汰现有有害农药的使用。	PIU- Bureau of Agriculture and Rural Affairs; Forestry Bureau 项目执行机构-农业农村局；林业局	PPMO, EEB 省项目办、生态环境局

[15] World Health Organization (WHO), Recommended Classification of Pesticides by Hazard and Guidelines to Classification, (Geneva, 2019)https://www.who.int/publications/i/item/9789240005662 .
世界卫生组织（卫生组织），《建议按危害性对农药进行的分类和分类准则》，（日内瓦，2019）。

[16] The Stockholm Convention on Persistent Organic Pollutants 2011.
2011 年《关于持久性有机污染物的斯德哥尔摩公约》。

[17] http://www.moa.gov.cn/xw/bmdt/201911/t20191129_6332604.htm

Issue 问题	Mitigation Measure 缓解措施	Implement 实施	Supervise 监督
	Risk to occupational health and safety: • Ensure that any pesticides used are manufactured, formulated, packaged, labeled, handled, stored, disposed of, and applied according (i) to the FAO's International Code of Conduct on Pesticide Management[18], and (ii) in a manner consistent with the recommendations given in the World Bank Group EHS Guidelines. [19] • The CPMO will train the farmers on the safe storage, handling, application and disposal of pesticides. • Pesticide application methods with lower OHS risk profile will be selected (such as using lower toxicity-rated products listed in the Table 4 and 5 of the WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification, or using safer application methods, such as shielded sprayers, incorporation, or low-volume equipment). **职业健康与安全风险：** • 确保所使用的任何农药的制造、配制、包装、标签、处理、储存、处置和施用符合（i）粮农组织《国际农药管理行为守则》；以及（ii）以符合世界银行集团 EHS 指南中给出的建议的方式。 • 农药管理办公室将对农民进行安全储存、处理、施用和处置农药的培训。 • 将选择职业健康安全风险较低的农药施用方法（如使用《世界卫生组织推荐的农药危险性分类和分类准则》表 4 和表 5 中所列的毒性等级较低的产品，或使用更安全的施用方法，如屏蔽喷雾器、掺入法或低容量设备）。 **Disposal of agricultural wastes:** • All biomass waste from cultivation, pruning and weeding will be reused on site wither for composting or mulch. No waste will be burnt. • Only plastic much meet with the requirement of Polyethylene Agricultural Ground Cover Films" (GB 13735-2017) will be used in the subproject area. The standard plastic film will be collected and recycled. • The pesticides containers and packaging will be collected by the pesticide distributor with subsidies to the farmers and distributors and final disposed by the manufacturer. **农业废弃物处理：**		

[18] FAO, International Code of Conduct on Pesticides Management (revised 2014), (Rome: FAO, 2014) http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/Code/CODE_2014Sep_ENG.pdf.
粮农组织，《国际农药管理行为守则》（2014 年修订），（罗马：粮农组织，2014 年）。

[19] World Bank Group. 2016. EHS Guidelines for Annual Crop Production. https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_policy_ehs_annual_crop_production
世界银行年度作物生产的 2016.EHS 指南。

Issue 问题	Mitigation Measure 缓解措施	Implement 实施	Supervise 监督
	•种植、修剪和除草产生的所有生物质废物将现场重新利用，用于堆肥或覆盖。不会焚烧任何废物。 •子项目区仅使用符合《聚乙烯农用地膜》（GB 13735-2017）要求的塑料。标准塑料薄膜将被收集并回收。 •农药容器和包装将由农药经销商收集，并向农民和经销商提供补贴，最终由制造商处理。		
Impacts of the organic fertilizer workshop 有机肥厂的影响	**Occupational health and safety:** • Provide adequate safety training regularly and proper personnel protective equipment (such as earplugs and mask) to the workers. **Noise:** • Maintain all mechanical equipment in good conditions; • shock absorption will be installed at the bottom, and soft connections will be set to avoid the increase of noise value caused by equipment vibration. **Odor:** • The emission concentrations should satisfy with the H_2S, NH_3 and odor will satisfy with the Malodorous Pollutant Emission Standard (GB 14554-93). **职业健康与安全：** • 定期为工人提供足够的安全培训和适当的个人防护装备（如耳塞和面罩）。 **噪音：** • 保持所有机械设备处于良好状态； • 底部将安装减震装置，并设置软连接，避免设备振动引起的噪声值增大。 **气味：** • 排放浓度应满足 H_2S、NH_3，臭气应满足恶臭污染物排放标准（GB 14554-93）。	organic fertilizer plant 有机肥厂	CPMO 县项目办
Impacts from field power transmission lines 现场输电线路的影响	• implement regular inspections and maintenance of the power lines to prevent malfunctions or wear that could lead to fires, especially in dry conditions. • Organize community awareness programs about the safe operation of equipment near power lines and emergency response. • 对电源线进行定期检查和维护，以防止可能导致火灾的故障或磨损，尤其是在干燥条件下。 • 组织关于电力线附近设备安全操作和应急响应的社区意识计划。	Local power supply companies 地方供电公司	CPMO 县项目办

CPMO = County Project Management Office, EEB = Ecology and Environment Bureau, OHS = occupational health safety, O&M = operation and maintenance, PPE = personal protective equipment, PRC = People's Republic of China, WHO = World Health Organization.

CPMO=县项目管理办公室，EEB=生态环境局，OHS=职业健康与安全，O&M=运营与维护，PPE=个人防护装备，PRC=中华人民共和国，WHO=世界卫生组织。

D. Environmental Monitoring, Inspection and Reporting 环境监测、检查和报告

9 **Environment safeguards monitoring** will include: (i) internal monitoring-to be conducted by the CPMOs, contractors and construction supervision companies (CSCs); (ii) external monitoring of air, water, noise and soil standard, to be conducted by a licensed environment monitoring agency (EMA); and (iii) compliance monitoring-to be conducted by the LIEC, to ensure the EMP is being implemented.
环境保障监测将包括：（i）内部监督-由县项目办、承包商和施工监理公司进行；（ii）由经许可的环境监测机构对空气、水、噪音和土壤标准进行外部监测；（iii）合规监测-由贷款实施环境顾问进行，以确保环境管理计划得到实施。

10 **Internal monitoring.** During the construction phase, the CSCs and the CPMOs will be responsible for conducting the internal environmental monitoring in accordance with the monitoring plan. Results will be reported through the CSCs monthly reports to the CPMOs.
内部监测。在施工阶段，监理和县项目办将负责按照监测计划进行内部环境监测。结果将通过监理月度报告向县项目办报告。

11 **External monitoring.** The PPMO will recruit an EMA, and the CPMOs contract and fund the EMA to conduct the environmental impact monitoring described in the monitoring program of EMP. This monitoring will be conducted during the entire construction phase and the first full year of operation of the relevant facility. The EMA will submit the monitoring results to the PPMO and CPMOs quarterly.
外部监测。河南省项目办将招聘一家环境监测机构，县项目办将与环境监测机构签订合同并为其提供资金，以进行环境管理计划监测计划中所述的环境影响监测。监测将在整个施工阶段和相关设施运营的第一个整年进行。环境监测机构将每季度向省项目办和县项目办提交监测结果。

12 **Compliance monitoring for EMP.** The provincial LIEC will review subproject progress and compliance with the EMP based on field visits, consultations with the CPMOs and PPMO environment officers, contractors, and CSCs, and review of the monitoring reports by the CSCs and EMA under the guidance and supervision of the national LIEC. The site visits will include a comparison of the works and conditions observed with the EMP mitigation and monitoring measures. The site visits will include, but not be limited to: visual inspection of worker and construction solid waste at work sites; evidence of soil erosion, water pollution, and sewage; community and occupational health and safety (hygiene, availability of clean water); and, evidence that emergency response plans are in place and that workers are familiar with them. There is no set frequency for these inspections: the provincial LIEC will make site visits as often as possible within the available budget, focused especially on periods of peak construction. The findings of the provincial LIEC will be reported to PPMO and NPMO through the environment monitoring reports of each province.
环境管理计划合规性监测。省贷款实施环境顾问将根据实地考察、与县项目办和省项目办环境官员、承包商和监理的协商，以及在国家贷款实施环境顾问的指导和监督下对监理和环境监测机构的监测报告的审查，审查子项目进度和对环境管理计划的遵守情况。现场考察将包括对所观察到的工程和条件与环境管理计划缓解和监测措施进行比较。现场视察将包括但不限于：对工作现场的工人和建筑固体废物进行目视检查；土壤侵蚀、水污染和污水的证据；社区和职业健康与安全（卫生、清洁水的供应）；以及应急响应计划到位且工人熟悉这些计划的证据。这些检查没有固定的频率：省贷款实施环境顾问将在可用预算范围内尽可能频繁地进行现场访问，特别关注施工高峰期。省级贷款实施环境顾问的调查结果将通过各省的环境监测报告报告给省

项目办和国家项目办。

13 **Quality assurance (QA) /quality control (QC) for compliance monitoring.** To ensure accuracy of the monitoring, QA/QC procedures will be conducted in accordance with the following regulations: (i) regulations of QA/AC Management for Environmental Monitoring issued by the State Environmental Protection Administration in July 2006; (ii) QA/QC Manual for Environmental Water Monitoring (Second edition), published by the State Environmental Monitoring Centre in 2001; and (iii) QA/QC Manual for Environmental Air Monitoring published by the State Environmental Monitoring Centre in 2001.

合规监测的质量保证（QA）/质量控制（QC）。为确保监测的准确性，将按照以下规定执行质量保证/质量控制程序：（i）国家环保总局于 2006 年 7 月发布的《环境监测质量保证/质量控制管理规定》；（ii）《环境水监测质量保证/质量控制手册》（第二版），国家环境监测总站 2001 年出版；（iii）国家环境监测中心于 2001 年出版的《环境空气监测质量保证/质量控制手册》。

Table EMP-4: Environmental Monitoring Program for "Internal" and "External" Monitoring

Table EMP-4:"内部"和"外部"监测的环境监测计划

Subproject 项目	Parameter 参数	Location 位置	Frequency 频率	Implement 实施	Supervise 监督
CONSTRUCTION PHASE 施工阶段					
Internal monitoring-by contractors, CSCs, PMO and PIU-ES **内部监测-由承包商、监理、项目办和项目实施单位-ES 进行**					
Ambient air quality 环境空气质量	Compliance with air pollution mitigation measures (Tables EMP-2 and 3) 空气污染缓解措施的遵守情况（Tables EMP-2 和 3）	Visual inspection at all construction sites 所有施工现场的目视检查	Once/week 一周一次	Contractor, CSC,CPMO 承包商、监理、县项目办	PPMO, LIEC 省项目办、贷款实施环境顾问
Noise 噪声	LAeq: measured with hand-held meter Contractor performance targets: (i) noise level meets standard at site boundary; (ii) for nearby households most at risk from the construction noise, the installed noise barriers reduce noise levels by at least 80% LAeq：用手持式仪表测量 承包商绩效目标：（i）噪音水平在地盘范围内符合标准；（ii）对于附近受建筑噪音影响最大的住户，已安装的隔音屏障可将噪音水平减低最少 80%。	Construction site boundary 施工现场边界	Once/week minimum during peak construction levels at work sites 工地施工高峰期每周至少一次	Contractor, CSC, CPMO 承包商、监理、县项目办	PPMO, LIEC 省项目办、贷款实施环境顾问
Soil erosion and re-vegetation 水土流失与植被重建	Soil erosion intensity 土壤侵蚀程度	Visual inspection at spoil sites and all construction sites 废料场和所有施工现场的外观检查	Once/week; and immediately after heavy rainfall 每周一次；强降雨后立即	Contractor, CSC, CPMO 承包商、监理、县项目办	PPMO, LIEC 省项目办、贷款实施环境顾问
Soil run-off and contamination	(i) adequacy of soil runoff prevention measures; (ii)adequacy of soil	Visual inspection of the construction sites.	Weekly during peak construction	Contractor, CSC, CPMO	PPMO, LIEC

Subproject 项目	Parameter 参数	Location 位置	Frequency 频率	Implement 实施	Supervise 监督
土壤流失和污染	contamination prevention techniques. （i）土壤径流预防措施的充分性；（ii）土壤污染预防技术的充分性。	对施工现场进行目视检查。	period, and monthly after 施工高峰期每周一次，之后每月一次	承包商、监理、县项目办	省项目办、贷款实施环境顾问
Wastewater management 废水管理	Quality of treated construction wastewater after filtration and sedimentation 施工废水经过滤沉淀处理后的水质	Visual inspection of the construction sites. 对施工现场进行目视检查。	Weekly during peak construction period, and monthly after 施工高峰期每周一次，之后每月一次	Contractor, CSC, CPMO 承包商、监理、县项目办	PPMO, LIEC 省项目办、贷款实施环境顾问
Solid and liquid waste management 固体和液体废物管理	(i) adequacy of solid and liquid waste management, storage and containment system; (ii)presence of solid waste dumps, waste fires.Contractor performance target: no uncollected waste at end of works each day （i）固体和液体废物管理、储存和封存系统的充分性；（ii）固体废物倾倒场和废物火灾的存在。 承包商绩效目标：每天工程结束时没有未收集的废物	Visual inspection of the construction sites. 对施工现场进行目视检查。	Weekly during peak construction period, and monthly after. 施工高峰期每周一次，之后每月一次。	Contractor, CSC, CPMO 承包商、监理、县项目办	PPMO, LIEC 省项目办、贷款实施环境顾问
Occupational health and safety 职业健康与安全	Hygiene, safety, availability of clean water, EMRs Contractor performance target: EMRs in place; 100% of workers aware of EMR procedures 卫生、安全、清洁水的可用性、应急响应计划。承包商绩效目标：应急响应计划到位；100%的员工了解应急响应计划。	Visual inspection and interviews with construction workers and contractors at construction sites 在建筑工地进行目视检查，并与建筑工人和承包商进行面谈。	Weekly during peak construction period, and monthly after. 施工高峰期每周一次，之后每月一次。	Contractor, CSC, CPMO 承包商、监理、县项目办	PPMO, LIEC 省项目办、贷款实施环境顾问
Community health and safety 社区健康与安全	(i) adequacy of construction site signage, fencing, and noise mitigation measures; (ii) type and extent of any accidents; (iii) emergencies and responses; (iv) public complaints (e.g., about noise, pollution, safety) （i）施工现场标志、围栏和降噪工程的充分性；（ii）任何事故的类型和程度；（iii）紧急情况和应对措施；（iv）公众投诉（例如有关噪音、污染、安全等）	Visual inspection of the construction sites informal interviews with nearby residents 对建筑工地进行目视检查与附近居民进行非正式访谈	Weekly during peak construction period, and monthly after. 施工高峰期每周一次，之后每月一次。	Contractor, CSC, CPMO 承包商、监理、县项目办	PPMO, LIEC 省项目办、贷款实施环境顾问
External monitoring-by certified environment monitoring agency 外部监测-经认证的环境监测机构					
Air quality	TSP, PM_{10}	The nearest sensitive	Once during construction at	EMA	EEB, PPMO, LIEC

Subproject 项目	Parameter 参数	Location 位置	Frequency 频率	Implement 实施	Supervise 监督
空气质量		receivers (Section IV of the IEE) 最近的敏感受体（初始环境评估报告第 IV 章）	peak season;if any of the parameters are exceeded, a second sample after corrective measures are taken is required. 施工高峰期一次；如果超过任何参数，则需要在采取纠正措施后进行第二次取样。	环境监测机构	生态环境局、省项目办、贷款实施环境顾问
Noise 噪声	LAeq	The nearest sensitive receivers (Section IV of the IEE) 最近的敏感受体（初始环境评估报告第 IV 章）	Once during construction at peak season;if any of the parameters are exceeded, a second sample after corrective measures are taken is required. 施工高峰期一次；如果超过任何参数，则需要在采取纠正措施后进行第二次取样。	EMA 环境监测机构	EEB, PPMO, LIEC 生态环境局、省项目办、贷款实施环境顾问
Construction wastewater quality 施工废水水质	Quality of treated wastewater at construction sites reused for dust control and/or disposed onsite;Petroleum, pH and SS 施工现场经处理的废水的质量，用于粉尘控制和/或现场处理；石油、PH 和 SS	outlet of the onsite wastewater treatment facility 现场废水处理设施出水口	Once during construction at peak season;if any of the parameters are exceeded, a second sample after corrective measures are taken is required. 施工高峰期一次；如果超过任何参数，则需要在采取纠正措施后进行第二次取样。	EMA 环境监测机构	EEB, PPMO, LIEC 生态环境局、省项目办、贷款实施环境顾问
OPERATIONAL PHASE-by PIU and EMA 运营阶段-由项目实施单位和环境监测机构进行					
Pesticide use	(i) Inventory of all agro-chemicals and pesticide use, including disease/pest occurs, application rate and time, amount used; amount and disposal of the pesticide	The green farmland developed under the Yanshi, Xiangfu and	At least two years of operarion	CPMO	PPMO

Subproject 项目	Parameter 参数	Location 位置	Frequency 频率	Implement 实施	Supervise 监督
农药使用	packaging to achieve a reduction in the volume of chemical pesticides applied per hectare (as compared to the existing baseline application rate in the same or adjoining farmland sites) – see IEE Table IV-1; (ii) proper handling of pesticide (storage and application). （i）所有农用化学品和农药使用情况的清单，包括发生的疾病/虫害、施用率和时间、使用量；农药包装的数量和处置，以实现每公顷化学农药施用量的减少（与相同或相邻农田的现有基准施用量相比）-见初始环境评估报告 Table IV-1；（ii）正确处理农药（储存和施用）。	Wuzhi subprojects 偃师、祥符、武陟子项目开发的绿色农田	运营期至少两年	县项目办	省项目办
Water extraction 抽水	(i) Install gauges and measure the volume of water used for operation of the subroject facilities, (ii) ensure compliance with the subproject water allocation entitlements,(iii) include the results in the environment monitoring reports to ADB （i）安装计量器并测量子项目设施运行所用的水量，（ii）确保符合子项目水分配权利，（iii）将结果纳入提交给亚行的环境监测报告中。	All subproject activities involving water extraction 涉及抽水的所有子项目活动	Continuous 连续的	CPMO 县项目办	PPMO 省项目办
Water quality 水质	Indicators required in the GB3838-2002 Surface Water Quality Standard GB 3838-2002《地表水环境质量标准》要求的指标	State-controlled monitoring point of Yuni River 由国家控制的淤泥河监测点	Monthly 每月	EEB 生态环境局	/ /
Odor from the organic fertilizer plant 有机肥厂臭气	Odor, H_2S, NH_3 气味、H_2S、NH_3	Boundary of Wuzhi organic ferlizer plant 武陟有机肥厂厂界	Quarterly 按季	EMA 环境监测机构	EEB, PPMO, LIEC 生态环境局、省项目办、贷款实施环境顾问
Noise from the organic fertilizer plant 有机肥厂噪音	LAeq	Four boundaries of the Wuzhi organic fertilizer plant 武陟有机肥厂四个边界	Quarterly 按季	EMA 环境监测机构	EEB, PPMO, LIEC 生态环境局、省项目办、贷款实施环境顾问

BOD_5 = 5-day biochemical oxygen demand, COD_{cr} = chemical oxygen demand, CSC = construction supervision company, CPMO=county project management office, EMA = environmental monitoring agency, EMR = emergency

response plan, EEB = ecology and environment bureau, LAeq = equivalent continuous A-weighted sound pressure level, H_2S=hydrogen sulfide, NH_3=Ammonia, NH_3-N = ammonia nitrogen, NO_x = nitrogen oxide, PM_{10} = particles measuring ≤10μm, PPMO = provincial project management office, SO_2 = sulfur dioxide, SS = suspended solids, TSP = total suspended particle,
BOD_5=5 天生化需氧量，COD_{Cr}=化学需氧量，CSC=建设监理公司，CPMO=县项目管理办公室，EMA=环境监测机构，EMR=应急响应计划，EEB=生态环境局，LAeq=等效连续 A 计权声压级，H_2S=硫化氢，NH_3=氨，NH_3-N=氨氮，NO_x = 氮氧化物, PM_{10} = 直径小于或等于 10μm 的颗粒, PPMO = 省级项目管理办公室, SO_2 = 二氧化硫, SS = 悬浮固体, TSP = 总悬浮颗粒,

[1] Compared by measuring noise on each side of the noise barrier with a hand-held meter.
[1] 通过使用手持式仪表测量声屏障两侧的噪声进行比较。

14 **Reporting.** Reporting on progress for environmental safeguards monitoring is summarized in Table EMP-5.
报告。环境保护监测进展的报告总结如下 Table EMP-5。

Table EMP-5: Environmental Reporting Plan
Table EMP-5: 环境报告计划

Report 报告	From 提供者	To 接收者	Frequency of Reporting 报告的频率
Construction Phase 施工阶段			
Internal progress reports 内部进度报告	CSC 监理	CPMO 县项目办	Monthly 每月
Environment impact monitoring reports 环境影响监测报告	EMA 环境监测机构	CPMO, PPMO 县项目办、省项目办	Semi-annual 半年
Environmental monitoring report 环境监测报告	PPMO 省项目办	NPMO 国家项目办	Semi-annual 半年
Consolidated environmental monitoring report 综合环境监测报告	NPMO 国家项目办	ADB 亚行	Semi-annual in the first year, and annual after the first year 第一年每半年一次，第一年后每年一次
Operation Phase 运营阶段			
EMP progress reports 环境管理计划进度报告	NPMO 国家项目办	ADB 亚行	annual 每年

ADB = Asian Development Bank, CSC = construction supervision company, EEB = ecology and environment bureau, EMA = environmental monitoring agency, PIU =project implementation unit, PMO = project management office.
ADB = 亚洲开发银行, CSC = 施工监理公司, EEB = 生态环境局, EMA = 环境监测机构, PIU =项目实施单位, PMO = 项目管理办公室。

E. Institutional Strengthening and Training 机构强化和培训

15 The CPMO and PIU have no previous experience with ADB-funded projects or safeguard requirements in recent five years. The experience of individual staff within the county, townships and county EEB for environmental management varies considerably. Implementation of the current EMP represents a significant new task for the local agencies. Preliminary training on EMP implementation was provided by the TA Consultant during the project preparation phase, including roles and responsibilities of contractors and CSCs for EMP implementation, project impacts, and mitigation measures.
近五年来，县项目办和项目实施单位在亚洲开发银行资助的项目或保障要求方面没有经验。县、乡镇和县环境管理局的个别工作人员在环境管理方面的经验差异很大。当前环境管理计划的实施对地方机构来说是一项重要的新任务。在项目准备阶段，技术援助顾问提供了有关环境管理

计划实施的初步培训，包括承包商和监理在环境管理计划实施、项目影响和缓解措施方面的角色和责任。

16 During implementation, a capacity building program will be implemented for safeguards and technical capacity for the designed components, including: (i) implementation of the EMP, including the mitigation measures, monitoring, and reporting; (ii) green cultivation techniques; Training will be provided by the loan implementation consultants and EEBs of Yanshi District, Xiangfu District and Wuzhi County, facilitated by the CPMO. Trainees will include the CPMO, contractors, CSCs, farmers and relevant local bureaus (including water resources, agriculture, forestry). During the loan implementation period, the project implementation consultant (PIC) and the CPMO and PPMO will evaluate the training needs and further refine the training plan. The training will be participatory and will take place in various formats, including lectures, field training, group exercises, on-the-job training. The PIC will conduct before- and after- surveys to assess the training effectiveness.
在实施过程中，将针对所设计组件的保障和技术能力实施能力建设计划，包括：（i）环境管理计划的实施，包括缓解措施、监测和报告；（ii）绿色栽培技术；培训将由偃师区、祥符区和武陟县的贷款实施顾问和生态环境局提供，并由县项目办提供协助。学员将包括县项目办、承包商、监理、农民和相关地方部门（包括水利、农业、林业）。在贷款实施期间，项目实施顾问和县项目办和省项目办将评估培训需求并进一步细化培训计划。培训将是参与性的，并将以各种形式进行，包括讲座、实地培训、小组练习和在职培训。项目实施顾问将进行培训前和培训后调查，以评估培训效果。

Table EMP-6: Project Environment Training Program

Table EMP-6: 项目环境培训计划

Training program 培训计划	Scope of Training 培训范围	Trainer 培训者	Trainee 受训人	Time 时间	Days 天	Persons 人
Procurement and contract management (emphasize EMP implementation) 采购和合同管理（强调环境管理计划的实施）	ADB procurement guidelines Bidding document and contract preparation, including EMP clauses Risk of improper procurement and mitigation measures, and handling variation orders and contract management 亚行采购指南 招标文件和合同编制，包括环境管理计划条款 不当采购和缓解措施的风险，以及处理变更单和合同管理	PICs 项目实施顾问	CPMO, PPMO 县项目办、省项目办	1	1	15
Implementation of EMP 实施环境管理计划	ADB safeguard policy statement requirements for EMP implementation and progress reporting Roles, responsibilities, monitoring, inspection, reporting in EMP Environment monitoring program; Public consultation and participation; GRM implementation, coordination, reporting, working with the public; Environment, health and safety during project construction and operation for workers and the community; Occupational health and safety, including prevention and control of transmissible diseases and HIV/AIDS, Disposal of agricultural waste (pesticide container and packaging, plastic film); Safe application of pesticides. 亚洲开发银行环境管理计划实施和进度报告的保障政策声明要求	LIEC, EEB 贷款实施环境顾问、生态环境局	CPMO, PPMO contractors, CSCs 县项目办、省项目办、承包商、监理	1	1	20

Training program 培训计划	Scope of Training 培训范围	Trainer 培训者	Trainee 受训人	Time 时间	Days 天	Persons 人
	环境管理计划中的角色、职责、监控、检查、报告 环境监测计划； 公众咨询和参与； 申诉补偿机制实施、协调、报告、与公众合作； 项目施工和运营期间工人和社区的环境、健康和安全； 职业健康和安全，包括预防和控制传染病和艾滋病毒/艾滋病， 处理农业废物（农药容器和包装、塑料薄膜）； 安全施用农药。					
Green farmland and agricultural development 绿色农田与农业发展	Green farmland cultivation techniques (the details will be in the training plan of the subproject and the cost is part of the Output 1 so not count as EMP cost here) 绿色农田栽培技术（详情见子项目培训计划，成本为产出 1 的一部分，因此不计入 EMP 成本）	PICs 项目实施顾问	CPMO, farmers in the subproject area 县项目办、子项目区农户	/	/	/
Total 总数				10	10	710
Total Cost 总成本	USD 700 training for 35 person times in total, assuming USD 20 for each person time) 共计 35 人次，700 美元，按每人次 20 美元计算）					

ADB = Asian Development Bank, CAB = civil affairs bureau, CPMO = county project management office, CSC = construction supervision company, EEB = environment protection bureau, EMP = environment management plan, GRM = grievance redress mechanism, LIEC = loan implementation environmental consultant, PIC = project implementation consultant, PPMO = provincial project management office.

ADB=亚洲开发银行，CAB=民政事务局，CPMO=县项目管理办公室，CSC=建设监理公司，EEB=环境保护局，EMP=环境管理计划，GRM=申诉补偿机制，LIEC=贷款实施环境顾问，PIC=项目实施顾问，PPMO=省项目管理办公室。

F. Grievance Redress Mechanism 申诉补偿机制

17 This subproject GRM is a joint GRM for (i) the initial identification, documentation, and preliminary management of both environmental and social safeguard-related grievances; (ii) the resolving of environmental safeguard-related grievances; and (iii) the resolving of, and/or timely referral of, social safeguard-related grievances. The GRM complies with ADB's SPS (2009), and PRC requirements to protect the rights of citizens from construction-related environmental and/or social impacts. Decree No. 431 Regulation on Letters and Visits, issued by the State Council of PRC in 2005, codifies a complaint acceptance mechanism at all levels of government and protects the complainants from retaliation. Based on the regulation, the former MEP published updated Measures on Environmental Letters and Visits (Decree No. 15) in December 2010.

子项目申诉补偿机制是一个联合申诉补偿机制，用于（i）初步确定、记录和初步管理与环境和社会保障相关的申诉；（ii）解决与环境保障有关的申诉；（iii）解决和/或及时转介与社会保障有关的申诉。申诉补偿机制符合亚洲开发银行的 SPS（2009）和中华人民共和国的要求，以保护公民的权利免受施工相关的环境和/或社会影响。第号法令 431 中华人民共和国国务院于 2005 年颁布的《信访条例》规定了各级政府的投诉受理机制，并保护投诉者免受报复。根据该条例，原环境保护部于 2010 年 12 月发布了《环境信访办法》（第 15 号令）。

18 The GRM is designed to achieve the following objectives: (i) provide channels of communication for local villages and communities to raise concerns about environmental and social-related grievances which might result from the project; (ii) prevent and mitigate adverse

environmental and social impacts to villages and communities caused by project construction and operation, including those associated with resettlement; (iii) improve mutual trust and respect and promote productive relationships between the project agencies and local villages and communities; and (iv) build village and community acceptance of the project. The GRM is accessible to all members of the villages and communities, including women, youth, minorities and poverty-stricken villagers and residents. Multiple points of entry are available, including face-to-face meetings, written complaints, telephone conversations, e-mail, and social media
申诉补偿机制旨在实现以下目标：（i）为当地村庄和社区提供沟通渠道，以提高对项目可能导致的环境和社会相关不满的关注；（ii）预防和减轻项目施工和运营对村庄和社区造成的不利环境和社会影响，包括与移民安置有关的影响；（iii）增进相互信任和尊重，促进项目机构与当地村庄和社区之间富有成效的关系；（iv）建设村庄和社区对项目的认可。乡村和社区的所有成员，包括妇女、青年、少数民族和贫困村民和居民，都可以使用乡村资源管理系统。提供多个切入点，包括面对面会议、书面投诉、电话交谈、电子邮件和社交媒体

19 Environmental and social safeguard-related grievances may differ considerably in the nature of grievances and agencies, procedures, and timing required to address them. The GRM provides a simple, time-based mechanism to meet project needs as required. Social safeguard issues beyond the scope of the GRM procedures, including issues related to land acquisition or resettlement, will be referred to relevant agencies as needed.
与环境和社会保障相关的申诉在申诉的性质和机构、程序以及解决申诉所需的时间方面可能有很大不同。申诉补偿机制提供了一种简单的、基于时间的机制，以满足所需的项目需求。超出申诉补偿机制程序范围的社会保障问题，包括与土地征用或移民安置有关的问题，将根据需要提交给相关机构。

20 The PPMO Environment Officer and Social Officer will lead the coordination of the GRM. However, all project agencies and staff will be trained in the GRM and are expected to take an active role in implementing the GRM. At the PPMO level, the PPMO Environment Officer and Social Officer will establish a GRM tracking and documentation system, conduct daily coordination with the CPMO officers, arrange meetings and conduct site visits as necessary, maintain the overall project GRM database, and prepare the reporting inputs for progress reports to ADB. At the CPMO level, the environment and social officer will instruct contractors and CSCs on the GRM procedures, and coordinate with the local EEBs and other government divisions as necessary. PPMO and CPMO staff will be trained and supported by the LIEC and loan implementation social consultant.
省项目办环境官员和社会官员将领导申诉补偿机制的协调工作。然而，所有项目机构和工作人员都将接受申诉补偿机制的培训，并有望在实施申诉补偿机制中发挥积极作用。在省级项目管理办公室层面，省项目办的环境官员和社会官员将建立一个申诉补偿机制跟踪和文件系统，与县项目办官员进行日常协调，安排会议并进行必要的实地考察，维护整个项目申诉补偿机制数据库，并为向亚洲开发银行提交的进度报告准备报告中输入。在县项目办层面，环境和社会官员将就申诉补偿机制程序向承包商和监理提供指导，并在必要时与当地生态环境局和其他政府部门进行协调。省项目办和县项目办工作人员将接受贷款实施环境顾问和贷款实施社会顾问的培训和支持。

21 The contact persons for different GRM entry points, such as the PPMO and CPMO environmental and social officers, contractors, operators of project facilities, and EEBs, will be updated prior to construction. The contact details for the entry points (phone numbers, addresses, e-mail addresses) will be publicly disclosed on information boards at construction sites and on the websites of the local EEB.
不同申诉补偿机制入口点的联系人，如省项目办和县项目办环境和社会官员、承包商、项目设施运营商和生态环境局，将在施工前更新。入口点的联系方式（电话号码、地址、电子邮件地

址）将在施工现场的信息板和当地生态环境局的网站上公开披露。

22 Public grievances to be addressed by the GRM may include disturbance of agricultural activities, traffic, dust emissions, construction noise, inappropriate disposal of construction wastes, damage to private houses, safety measures for the protection of the public and construction workers, and/or water quality deterioration.
由申诉补偿机制处理的公众投诉可能包括农业活动干扰、交通、粉尘排放、施工噪音、施工废物不当处置、私人房屋损坏、保护公众和施工人员的安全措施和/或水质恶化。

23 The GRM will be accessible to diverse members of the villages and community, including more vulnerable groups such as women, minority and poor. Multiple points of entry, including face-to-face meetings, written complaints, telephone conversations, or e-mail, will be available.
乡村和社区的不同成员，包括妇女、少数民族和低收入等弱势群体，都可以使用申诉补偿机制。将提供多个切入点，包括面对面会议、书面投诉、电话交谈或电子邮件。

24 If a complaint is received, the PPMO and CPMO officers will identify if the complaint is eligible for management under the GRM. Eligible complaints under the GRM include those where: (i) the complaint pertains to the project; and (ii) the issues arising in the complaint fall within the scope of environmental and/or social issues that the GRM is authorized to address. Ineligible complaints include those where: (i) the complaint is not project-related; (ii) the nature of the issue is outside the mandate of the GRM (such as fraud or corruption); and/or (iii) other procedures would be more appropriate to address the issue. Ineligible complaints will be documented and provided to the relevant authorities and the complainant will be informed of these steps. The procedure and timeframe for the GRM are as follows and summarized in Figure EMP-1.
如果收到投诉，省项目办和县项目办官员将确定该投诉是否符合申诉补偿机制的管理条件。申诉补偿机制下的合格投诉包括：（i）投诉与项目有关；以及（ii）投诉中出现的问题属于申诉补偿机制有权解决的环境和/或社会问题的范围。不合格投诉包括：（i）投诉与项目无关；（ii）问题的性质超出了申诉补偿机制的授权范围（如欺诈或腐败）；和（或）（iii）其他程序更适合处理这一问题。不合格的投诉将被记录并提供给有关当局，投诉人将被告知这些步骤。申诉补偿机制的程序和时间表如下所示，并在 Figure EMP-1 中进行了总结。

25 GRM procedure and timeframe. Procedures and timeframes for the grievance redress process are as follows:
申诉补偿机制程序和时间表。申诉补偿流程的程序和时限如下：

26 Stage 1 (5 calendar days): If a concern arises during construction or operation, the affected person may submit a written or oral complaint to any of the project agencies and personnel involved and to whom the affected person feels most comfortable in raising the issue e.g., with the contractor, CPMO, PPMO, and/or village committees (construction phase) or operator of the project facility, CPMO, and/or village committees (operation phase). Upon being approached the affected person or being informed of the issue, the contractor will: (i) respectfully acknowledge the issue and immediately stop the causal activity (e.g., on-site construction causing high noise levels to a nearby household); (ii) not resume the activity until the complaint has been resolved; (iii) inform the CPMO of the incident on the same day of the incident occurring and how the contractor has responded or will respond; (iv) give a clear reply to the affected person within two calendar days; and (v) as far as possible, resolve the problem within five calendar days from receiving the complaint. The CPMO will: inform the PPMO, local village committee, and Ecology and Environment Bureau of the incident within one working day of being informed by the contractor; and, subsequently, keep these parties informed at all stages.

第 1 阶段（5 个日历日）：如果在施工或运营期间出现问题，受影响人员可向任何相关项目机构和人员提交书面或口头投诉，受影响人员可向承包商、县项目办、省项目办和/或村委会（施工阶段）或项目设施运营商、县项目办提出问题。和/或村委会（运营阶段）。在接触受影响人员或被告知该问题后，承包商将：（i）尊重地承认问题，并立即停止造成问题的活动（如，现场施工导致附近家庭产生高噪音）；（ii）在投诉解决之前不恢复该活动；（iii）在事件发生的当天通知县项目办事件发生情况以及承包商的回应或将采取的回应；（iv）在两个日历日内向受影响的人员作出明确回复；（v）尽可能在收到投诉后的五个日历日内解决问题。县项目办将：在承包商通知后的一个工作日内，通知省项目办、当地村委会和生态环境局事件的情况；并在所有阶段保持这些方的更新。

27 Stage 2 (5 calendar days): If the issue cannot be resolved in Stage 1, after five calendar days, the CPMO and/or PPMO will take over responsibility. Eligibility of the complaint will be assessed and a recommended solution given to the complainant and contractors within two calendar days. If the solution is agreed upon by the complainant, the contractors and/or facility operators (in operation) will implement the solution within five calendar days from the CPMO or PPMO, taking over the responsibility of the complaint. Written records will be made of all stages and outcomes. At the expiration of Stage 2, PPMO will inform ADB of the outcome.
第 2 阶段（5 个日历日）：如果问题在第 1 阶段无法解决，则在 5 个日历日后，县项目办和/或省项目办将接管责任。将评估投诉的资格，并在两个日历日内向投诉人和承包商提供建议的解决方案。如果投诉人同意解决方案，承包商和/或设施运营商（运营中）将在省项目办或县项目办的五个日历日内实施解决方案，接管投诉责任。将对所有阶段和结果进行书面记录。在第 2 阶段到期时，省项目办将向亚洲开发银行通报结果。

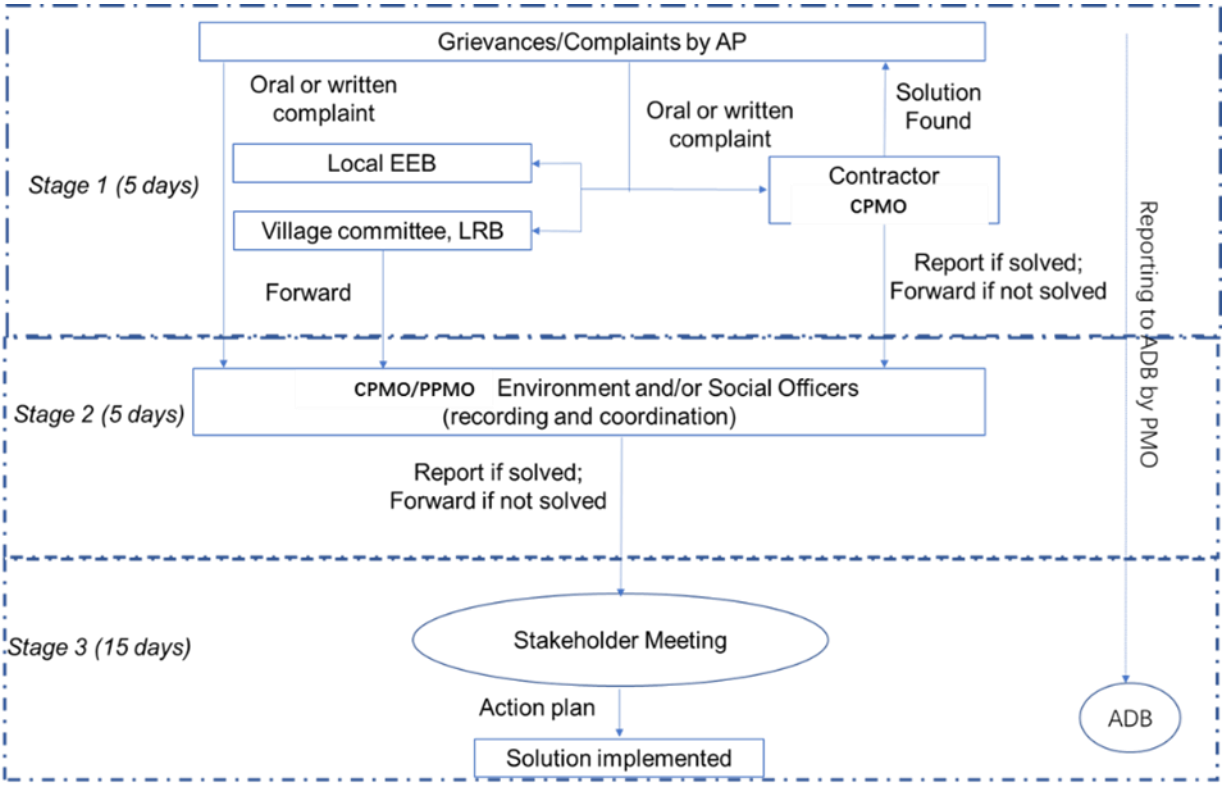
28 Stage 3 (15 calendar days): If no solution can be identified by the PPMO and/or CPMO, and/or the complainant is not satisfied with the proposed solution, the CPMO and/or PPMO will organize, within seven (7) calendar days, a stakeholder meeting (including the complainant, contractor and/or operator of the facility, EEB, CPMO, PPMO). A solution acceptable to all shall be identified, including clear steps. The contractors (during construction) and facility operators (during operation) will immediately implement the agreed solution. All attempts will be made to fully resolve the issue within 15 calendar days. Written records will be made of all stages and outcomes. At the expiration of Stage 3, PPMO will inform ADB of the outcome.
第 3 阶段（15 个日历日）：如果省项目办和/或县项目办无法确定解决方案，和/或投诉人对建议的解决方案不满意，则县项目办和/或省项目办将在七（7）个日历日内组织利益相关者会议（包括投诉人、承包商和/或设施运营商、生态环境局、县项目办、省项目办）。应确定所有人都能接受的解决方案，包括明确的步骤。承包商（施工期间）和设施运营商（运营期间）将立即实施商定的解决方案。将尽一切努力在 15 个日历日内完全解决问题。将对所有阶段和结果进行书面记录。在第 3 阶段到期时，省项目办将向亚洲开发银行通报结果。

29 The contractor and/or CPMO will ensure the affected person is updated at all times, in each stage, of the progress toward resolving the grievance. The GRM does not affect the right of an affected person to submit their complaints to any agency they wish to, for example, the local village committee, community leaders, courts, PPMO, CPMO, governments of Yanshi, Xiangfu and Wuzhi, and/or ADB.
承包商和/或县项目办将确保在每个阶段随时向受影响人员更新解决申诉的进度。申诉补偿机制不影响受影响人员向其希望的任何机构提交投诉的权利，例如当地村委会、社区领导、法院、省项目办、县项目办、偃师区、祥符市和武陟市政府和/或亚洲开发银行。

30 The PPMO and CPMO shall bear any and all costs of implementing the GRM, including meeting, travel, and/or accommodation costs of the project staff or affected person. The GRM

will be implemented throughout project construction and at least the first year of operation for each project facility.
省项目办和县项目办应承担实施申诉补偿机制的任何及所有费用，包括项目人员或受影响人员的会议、差旅和/或住宿费用。申诉补偿机制将在整个项目施工过程中实施，并至少在每个项目设施运营的第一年实施。

Figure EMP-1: Grievance Redress Mechanism
Figure EMP-1: 申诉补偿机制



ADB = Asian Development Bank, AP = affected persons, EEB = Ecology and Environment Bureau, CPMO = county project management office, PPMO=provincial project management office; GRM = grievance redress mechanism, LRB = Land Resources Bureau.
ADB=亚洲开发银行，AP=受影响人，EEB=生态环境局，CPMO=县级项目管理办公室，PPMO=省级项目管理办公室；GRM=申诉补偿机制，LRB=国土资源局。

G. Consultation, Participation, and Information Disclosure 公众咨询、参与和信息披露

31 Information disclosure and public consultation relating to environment safeguards will continue throughout project implementation. The subproject's environmental information will be disclosed by ADB as follows:
在整个项目实施过程中，将继续进行与环境保护措施相关的信息披露和公众咨询。亚行将披露子项目的环境信息如下:

- The subproject IEE will be disclosed on the ADB website at https://www.adb.org/. In the event of any revisions to the EMP, the IEE with revised EMP will be re-disclosed on the ADB website.
- All environmental monitoring reports during project implementation will be available at

https://www.adb.org/

- The domestic EIA of the project and summary of subproject IEE and EMP, and its revision if any, will be disclosed on the website of Yanshi/Xiangfu/Wuzhi government (in Chinese);
- The project information and GRM entry points will be disclosed on the information board of each construction site (in Chinese).
- 子项目初始环境评估将在亚行网站上公布：https://www.adb.org/。如果对环境管理计划进行任何修改，将在亚行网站上重新披露修改后的环境管理计划的环境初始评估。
- 项目实施期间的所有环境监测报告将在以下网站提供：https://www.adb.org/
- 本项目的国内环境影响评价和子项目初始环境评估和环境管理计划的总结及其修订（如有）将在偃师区/祥符区/武陟县政府网站上公布（中文）；
- 项目信息和申诉补偿机制入口点将在每个施工现场的信息板上公布（中文）。

32 Meaningful public consultation was conducted during project preparation (Section VI of the IEE). During construction, the subproject will continue to seek public consultation and raise awareness of project activities, especially those may impact the public, such as noise, dust or odor from dredged sediment. The public consultation plan is in Table EMP-7 and includes public participation in evaluating environmental benefits and impacts. CPMO shall announce the time, place, theme, and registration method of the meeting to the public through the website and post announcements in places where the public can easily be informed 2 weeks prior to the meeting. CPMO shall disclose the minutes and measures to address the public concerns truthfully to the public through the website, WeChat group, community posters, etc., within 5 working days after the consultation forum.

在项目准备期间进行了有意义的公众咨询（初始环境评估报告 VI 章）。在施工期间，子项目将继续征求公众意见，并提高对项目活动的认识，特别是那些可能影响公众的活动，如疏浚沉积物产生的噪音、灰尘或气味。公众咨询计划见 Table EMP-7，包括公众参与评估环境效益和影响。县项目办应通过网站向公众公布会议的时间、地点、主题和登记方式，并在会议前 2 周在公众容易获知的地方张贴公告。县项目办应在协商座谈会后 5 个工作日内，通过网站、微信群、社区海报等方式，向公众如实披露会议纪要和解决公众关切的措施。

Table EMP-7: Public Consultation and Participation Plan

Table EMP-7: 公众咨询和参与计划

Organizer 组织者	Approach 方法	Times/Frequency 次数/频率	Subjects 项目	Attendees 与会者
Construction phase 施工阶段				
CPMO and PPMO, LIEC 县项目办、省项目办、贷款实施环境顾问	Public consultation workshop and hearing 公众谘询座谈会及听证会	At least once during peak construction period 施工高峰期至少一次	Adjusting of mitigation measures if necessary; construction impact; and comment and suggestion 必要时调整缓解措施；施工影响；以及评论和建议	Residents adjacent to subproject sites 子项目现场附近的居民
Operation stage 操作阶段				
CPMO, PPMO 县项目办、省项目办	Consultation and site visits 咨询和实地考察	At least once in first year of operation 至少在运行的第一年进行一次	Effects of mitigation measures, impacts of operation, feedback 缓解措施的效果、运行的影响、反馈	Affected persons and/or agencies 受影响人员和/或机构

CPMO = county project management office, LIEC = loan implementation environmental consultant, PPMO = provincial project management office.

CPMO=县项目办；LIEC=贷款实施环境顾问；PPMO=省项目办

H. Cost Estimates 成本估算

33 This section provides an estimate of the cost of EMP implementation. The cost comprises expenses for three categories: the mitigation measures described in Tables EMP-2 and 3; monitoring in Table EMP-4; and training in Table EMP-6. The cost estimation is calculated for five years construction and the first-year operation. The costs do not include: (i) detailed design revisions and adjustments; (ii) internal monitoring and inspection of solid waste disposal, soil erosion and re-vegetation, and occupational health and safety during construction (these costs will be included in the design, construction and construction supervision contracts); and (iii) salaries of PPMO and CPMO staff. The LIEC will be engaged by the PPMO for all subproject in the province so the cost not count in the subproject EMP. Costs for mitigation measures and training are based on estimates in the domestic environmental assessments and the experience of the TA consultant from other similar projects. All costs were discussed with the DEIA Institute, CPMO and PPMO.
本节提供了环境管理计划实施成本的估算。成本包括三类费用：Table EMP-2 和 Table EMP-3 所述的缓解措施；Table EMP-4 中的监测；以及 Table EMP-6 中的培训。成本估算按五年施工和第一年运营计算。费用不包括：（i）详细设计的修改和调整；（ii）施工期间固体废物处理、土壤侵蚀和植被恢复以及职业健康和安全的内部监测和检查（这些费用将包括在设计、施工和施工监理合同中）；（iii）省项目办和县项目办员工的工资。贷款实施环境顾问将由省项目办参与该省的所有子项目，因此成本不计入子项目环境管理计划。缓解措施和培训的成本基于国内环境评估中的估计和技术援助顾问从其他类似项目中获得的经验。与国内环评机构、县项目办和省项目办讨论了所有费用。

34 The total estimated cost for EMP implementation (Table EMP-8) accounts for about 1.4% of the total project physical investment, spread over 6 years. These estimates cover the minimum required monitoring standards of the PRC and project scope. Construction-phase costs will be paid by the contractors (as part of their contracts). For the operations phase, the operational costs for the project facilities will be funded by the facility operators. For the external environmental monitoring in the operational phase: for the first year of operations, a monitoring agency will be contracted by the CPMO; for subsequent years, external monitoring (e.g., to comply with PRC monitoring requirements) will be paid by the CPMO of the project facilities.
环境管理计划实施的总估算成本（Table EMP-8）约占项目总物理投资的 1.4%，分布在 6 年内。该等估计涵盖中华人民共和国最低要求的监测标准及项目范围。施工阶段的费用将由承包商支付（作为其合同的一部分）。对于运营阶段，项目设施的运营成本将由设施运营商出资。对于运行阶段的外部环境监测：在运行的第一年，县项目办将与监测机构签订合同；随后几年，外部监测（例如，符合中华人民共和国监测要求）将由项目设施的县项目办支付。

Table EMP-8: Cost Estimates for EMP Implementation
Table EMP-8: 环境管理计划实施的成本估算

Item 项目	Xiangfu 祥符	Yanshi 偃师	Wuzhi 武陟
1. Project management and capacity building-paid by CPMO 项目管理和能力建设-由县项目办支付			
1.1 Environmental capacity building throughout the project implementation 项目实施过程中的环境能力建设	710	710	710
1.2 Public consultation throughout the project implementation 项目实施过程中的公众咨询	2,000	2,000	2,000
1.3 GRM 申诉补偿机制	3,000	3,000	3,000

Item 项目	Xiangfu 祥符	Yanshi 偃师	Wuzhi 武陟
Subtotal 小计	**5,710**	**5,710**	**5,710**
2. Environmental mitigation measures during construction-paid by contractors 施工期间的环境缓解措施-由承包商支付			
2.1 Soil erosion and contamination 土壤侵蚀和污染	8,000	10,000	10,000
2.2 Dust and air pollution control 粉尘及大气污染控制	24,000	30,000	30,000
2.3 Noise and vibration 噪声与振动	8,000	10,000	10,000
2.4 Surface water pollution 地表水污染	4,000	5,000	5,000
2.5 Solid waste 固体废弃物	4,000	5,000	5,000
2.6 Protection of flora and fauna 动植物保护	1,600	2,000	2,000
2.7 Community health & safety 社区健康与安全	4,000	5,000	5,000
2.8 Occupational health & safety 职业健康与安全	4,000	5,000	5,000
Subtotal 小计	**57,600**	**72,000**	**72,000**
3. Environmental monitoring during construction and first year of operation by EMA-paid by CPMO 由环境监测机构进行的施工期和运营第一年的环境监测-由县项目办支付	25,000	30,000	30,000
Grand total 总计	**88,310**	**107,710**	**107,710**

CPMO = county project management office, EMA = environmental monitoring agency, GRM = grievance redress mechanism, PPMO = provincial project management office.
CPMO=县级项目管理办公室，EMA=环境监测机构，GRM=申诉补偿机制，PPMO=省级项目管理办公室。

I. Mechanisms for Feedback and Adjustment 反馈和调整机制

35 Based on-site inspections and monitoring reports, including environmental monitoring reports, the PPMO with assistance from the LIEC will decide whether (i) EMP is adequate and effective and further mitigation measures are required as corrective actions, or (ii) some improvements are required for environmental management practices. The effectiveness of mitigation measures and monitoring will be evaluated in the environmental progress reports submitted to ADB. The need to update and adjust the EMP will be reviewed when there are design changes, changes in construction methods and program, negative environmental monitoring results or inappropriate monitoring locations, and ineffective or inadequate mitigation measures.
根据现场检查和监测报告，包括环境监测报告，省项目办将在贷款实施环境顾问的协助下决定（i）环境管理计划是否充分有效，是否需要进一步的缓解措施作为纠正措施，或（ii）是否需要对环境管理实践进行一些改进。缓解措施和监测的有效性将在提交给亚洲开发银行的环境进展报告中进行评估。当出现设计变更、施工方法和计划变更、负面环境监测结果或不适当的监测位置以及无效或不充分的缓解措施时，将对更新和调整环境管理计划的必要性进行审查。

36 The PPMO will play a critical role in the feedback and adjustment mechanism with the support from the LIEC. Where unanticipated environmental impacts become apparent during project implementation, the PPMO shall update the environmental assessment and EMP or prepare a new environmental assessment and EMP to assess the potential impacts, evaluate the alternatives, and outline mitigation measures and resources to address those impacts. In such cases, the PPMO will inform ADB promptly on any proposed changes to the project and

needed adjustments to the EMP. The updated EMP will be submitted to ADB for review and approval and will be disclosed on the the websites of ADB and Yanshi District, Xiangfu District and Wuzhi County Agricultural and Rural Affairs Bureaus. PPMO will assess whether further mitigation measures are required as corrective action, or improvement in environmental management practices are required with the support from the LIEC.

在贷款实施环境顾问的支持下，省项目办将在反馈和调整机制中发挥关键作用。如果在项目实施过程中，未预料到的环境影响变得明显，项目管理办公室应更新环境评估和环境管理计划，或编制新的环境评估和环境管理计划，以评估潜在影响，评估替代方案，并概述缓解措施和资源，以解决这些影响。在这种情况下，项目管理办公室将及时通知亚洲开发银行对项目的任何拟议变更以及对环境管理计划的必要调整。更新后的环境管理计划将提交给亚洲开发银行审查和批准，并将在亚洲开发银行和偃师区、祥符区和武陟县农业农村局的网站上公布。省项目办将评估是否需要采取进一步的缓解措施作为纠正措施，或者是否需要在贷款实施环境顾问的支持下改进环境管理实践。

ATTACHMENT 2: DRAFT TERMS OF REFERENCE FOR ENVIRONMENTAL POSITIONS 环境职位职责范围草案

Regarding the last subsection of this attachment, loan implementation environmental consultant-Provincial made corrections.
对本附件最后一节，省级贷款实施环境顾问进行了纠正。

1. NATIONAL PROJECT MANAGEMENT OFFICE (NPMO) – ENVIRONMENT OFFICER (one position) 国家项目管理办公室（国家项目办）-环境官员（1 个职位）

A. Scope and Duration of Work 工作范围和期限

1. The officer will work on behalf of the national project management office (NPMO) to coordinate the preparation of subproject IEEs and EMPs, and oversee the implementation of subproject EMPs. For this reason, the NPMO will assign at least one full-time officer for this role. These terms of reference describe the requirements for this officer. The officer will report directly to the NPMO. The position is for the entire project duration (5 years).
该官员将代表国家项目管理办公室（国家项目办）协调子项目初始环境评估和环境管理计划的编制，并监督子项目环境管理计划的实施。为此，国家项目办将至少指派一名全职官员担任这一角色。本职权范围规定了对该官员的要求。该官员将直接向国家项目办报告。该职位适用于整个项目期间（5 年）。

B. Qualifications 资质

2. The officer will have: (i) an undergraduate degree or higher in environmental management or related field; (ii) at least 5 years of experience in environmental management, monitoring, and/or impact assessment; (iii) ability to communicate and work effectively with ADB and government agencies; (iv) ability to analyze data and prepare technical reports; and (v) ideally, proficiency in spoken and written English.
该官员应具备：（i）环境管理或相关领域的本科或更高学位；（ii）至少 5 年的环境管理、监测和/或影响评估经验；（iii）能够与亚行和政府机构有效沟通和合作；（iv）具备分析数据和编写技术报告的能力；（v）理想情况下，熟练掌握英语口语和书面语。

C. Detailed Tasks 详细任务

3. The NPMO environment officer will have the following tasks:
国家项目办环境官员将承担以下任务：

(i) Assist the TrTA environmental consultant conduct environmental assessment and prepare subproject IEEs.
(ii) Oversee the compliance of EMP implementation of all subprojects.
(iii) Consolidate and submit the environmental monitoring report during project implementation on a semi-annual basis for the first year then annual thereafter.
(iv) Facilitate review missions by ADB.
(i) 协助技术援助环境顾问进行环境评估并准备子项目初始环境评估。
(ii) 监督所有子项目的环境管理计划实施的合规性。
(iii) 在项目实施期间，第一年每半年汇总并提交一次环境监测报告，之后每年提交一次。
(iv) 为亚行审查团提供便利。

D. Reporting Requirements 报告要求

4. Annual/semiannual environment monitoring reports using the template provided by ADB or a domestic format reviewed and approved by ADB.
年度/半年度环境监测报告，采用亚洲开发银行提供的模板或亚洲开发银行审查和批准的国内格式。

E. Logistical Support Provided by the NPMO to the Environment Officer 国家项目办向环境官员提供的后勤支持

(i) Provision of hard and soft copies of the EMPs of all subprojects, domestic and project environmental reports, feasibility study reports, loan and project agreements, maps, and other supporting materials as necessary to ensure the officer can implement the tasks.
(ii) Vehicle transport, office materials, and other logistical support, as necessary for the officer to visit the project construction sites and local communities, arrange and conduct meetings, and prepare and distribute consultation materials.
(iii) Overall coordination, including review of the draft semiannual monitoring reports, and final responsibility for submission of the monitoring reports to ADB.

(i) 提供所有子项目的环境管理计划、国内和项目环境报告、可行性研究报告、贷款和项目协议、地图和其他必要的辅助材料的硬拷贝和软拷贝，以确保官员能够执行任务。
(ii) 车辆运输、办公材料和其他后勤支持，必要时，官员访问项目施工现场和当地社区，安排和举行会议，并准备和分发咨询材料。
(iii) 总体协调，包括审查半年期监测报告草案，并最终负责向亚洲开发银行提交监测报告。

2.PROVINCIAL PROJECT MANAGEMENT OFFICE (PPMO) – ENVIRONMENT OFFICER (one position per province; seven provinces in total)省项目管理办公室（省项目办）-环境官员（每个省一个职位；共七个省）

A. Scope and Duration of Work 工作范围和期限

5. The officer will work on behalf of the provincial project management office (PPMO) to coordinate the preparation of subproject IEEs and EMPs within its jurisdiction, and implementation of the subproject environmental management plan (EMP). The EMP is the critical guiding document to manage, monitor, and report upon project environmental impacts. For this reason, the PPMO will assign at least one full-time officer for this role. These terms of reference describe the requirements for this officer. The officer will report directly to the PPMO. The position is for the entire project duration (5 years).
该官员将代表省项目管理办公室（省项目办）协调其管辖范围内的子项目初始环境评估和环境管理计划的编制，以及子项目环境管理计划（EMP）的实施。环境管理计划是管理、监测和报告项目环境影响的关键指导文件。因此，省项目办将至少指派一名全职官员担任这一角色。本职权范围规定了对该官员的要求。该官员将直接向省项目办报告。该职位适用于整个项目期间（5 年）。

B. Qualifications 资质

6. The officer will have: (i) a college degree or higher in environmental management, agriculture or related field; (ii) ability to communicate and work effectively with local communities, contractors, and government agencies; (iiii) ability to analyze data and prepare technical reports; (iv) willingness and health to regularly visit the project construction sites and in different seasons; and (v) ideally, proficiency in spoken and written English.
该官员应具备：（i）拥有环境管理、农业或相关领域的大学学位或更高的学历；（ii）能够与当地社区、承包商和政府机构有效沟通和合作；（iii）能够分析数据并准备技术报告；（iv）愿意且身体健康，能够定期在不同季节访问项目施工现场；（v）理想情况下，具备流利的英语口语和书写能力。

C. Detailed Tasks 详细的任务

7. The PPMO environment officer will have the following tasks:
省项目办环境官员将承担以下任务：

(i) Assist the TrTA environmental consultant conduct environmental assessment and prepare subproject IEEs.
(ii) Assess whether the IEE and EMP requires updating due to any changes in project design, which may have occurred after the EMP was prepared.

(iii) Distribute the Chinese language version of the EMP to all relevant agencies, including the PMOs at all levels, and provincial and municipal agencies for environment protection. This should occur at least 3 months before construction begins.
(iv) Conduct meetings with agencies as necessary to ensure they understand their specific responsibilities described in the EMP.
(v) Ensure that relevant mitigation, monitoring, and reporting measures in the EMP are included in the bidding documents, contracts, and relevant construction plans.
(vi) Confirm that the PIUs responsible for the internal environment monitoring described in the EMP understand their tasks and will implement the monitoring in a timely fashion.
(vii) At least 2 months before construction begins, establish and implement the project grievance redress mechanism (GRM) described in the EMP. This will include: (a) preparation of a simple table and budget identifying the type, number, and cost of materials needed to inform local communities about the GRM and starting dates and scope of construction; (b) design, prepare, and distribute these materials, and plan and conduct the community meetings; (c) prepare a form to record any public complaints; (d) preparation of a summary table to record all complaints, including dates, issues, and how they were resolved; and (e) ensure that all relevant agencies, including contractors, understand their role in the GRM.
(viii) Prior to construction, ensure that the implementation agencies and their contractors have informed their personnel, including all construction workers, of the EMP requirements. This will include all mitigation measures relating to impacts to air, water, noise, soil, sensitive sites, ecological values, cultural values, worker and community health and safety, respectful behavior when communicating with local communities, and responding to and reporting any complaints.
(ix) During project construction, make regular site visits with the loan implementation environment consultant (LIEC) to assess progress, meet with contractors and/or local communities, and assess compliance with the EMP.
(x) Ensure that all relevant agencies submit required progress reports and information, including environmental monitoring and reports of any issues or grievances.
(xi) Compile, review, and store environmental progress reports from the implementation agencies, records of any grievances, and any other relevant issues. Maintain digital copies of all information. When necessary, enter data into summary tables in digital format (e.g., to transfer records of grievances from hard copy forms). Ensure that all information is stored in the PPMO filing system, backed up, and can be easily retrieved.
(xii) Prepare environment progress reports.
(xiii) Work closely with the PMOs at each level, and other agencies as needed to conduct these tasks.

(i) 协助技术援助环境顾问进行环境评估并准备子项目初始环境评估。
(ii) 评估初始环境评估和环境管理计划是否因项目设计的任何变更而需要更新，这些变更可能发生在环境管理计划编制之后。
(iii) 将环境管理计划的中文版本分发给所有相关机构，包括各级项目管理办公室和省市环境保护机构。这应在施工开始前至少 3 个月进行。
(iv) 必要时与各机构召开会议，以确保他们了解环境管理计划中所述的具体职责。
(v) 确保环境管理计划中的相关缓解、监测和报告措施包含在招标文件、合同和相关施工计划中。
(vi) 确认负责环境管理计划中所述内部环境监测项目实施单位了解其任务，并将及时实施监测。
(vii) 在施工开始前至少 2 个月，建立并实施环境管理计划中所述的项目申诉补偿机制（GRM）。这将包括：（a）编制一份简单的表格和预算，确定所需材料的类型、数量和成本，以告知当地社区有关申诉补偿机制、开工日期和施工范围的信息；（b）设计、准备和分发这些材料，并计划和举行社区会议；（c）编制表格，记录任何公众投诉；（d）编制一份汇总表，记录所有投诉，包括日期、问题和解决方式；（e）确保包括承包商在内的所有相关机构了解其在申诉补偿机制中的作用。
(viii) 施工前，确保执行机构及其承包商已将环境管理计划要求告知其人员，包括所有施工工人。这将包括与空气、水、噪音、土壤、敏感地点、生态价值、文化价值、工人和社区健康和安全、与当地社区沟通时的尊重行为以及回应和报告任何投诉有关

的所有缓解措施。

(ix) 在项目施工期间，与贷款实施环境顾问（LIEC）一起进行定期现场访问，以评估进度，与承包商和/或当地社区会面，并评估是否符合环境管理计划。

(x) 确保所有相关机构提交所需的进度报告和信息，包括环境监测和任何问题或申诉的报告。

(xi) 编制、审查和保存执行机构的环境进展报告、任何申诉记录和任何其他相关问题。维护所有信息的数字副本。必要时，以数字格式将数据输入汇总表（例如，从硬拷贝表格转移申诉记录）。确保所有信息都存储在省项目办归档系统中，进行备份，并且可以轻松检索。

(xii) 准备环境进度报告。

(xiii) 与各级项目管理办公室密切合作，并根据需要与其他机构密切合作，以执行这些任务。

D. Reporting Requirements 报告要求

8. Semiannual environment monitoring reports using the template provided by ADB or a domestic format reviewed and approved by ADB.
使用亚洲开发银行提供的模板或亚洲开发银行审查和批准的国内格式的半年度环境监测报告。

E. Logistical Support Provided by the PMO to the Environment Officer 项目办为环境官员提供的后勤支持

(i) Provision of hard and soft copies of the project EMP, domestic and project environmental reports, feasibility study reports, loan and project agreements, maps, and other supporting materials as necessary to ensure the officer can implement the tasks.

(ii) Vehicle transport, office materials, and other logistical support, as necessary for the officer to visit the project construction sites and local communities, arrange and conduct meetings, and prepare and distribute consultation materials.

(iii) Overall coordination, including review of the draft semiannual monitoring reports, and final responsibility for submission of the monitoring reports to ADB.

(i) 提供项目环境管理计划、国内和项目环境报告、可行性研究报告、贷款和项目协议、地图和其他必要的辅助材料的硬拷贝和软拷贝，以确保官员能够执行任务。

(ii) 车辆运输、办公材料和其他后勤支持，必要时，官员访问项目施工现场和当地社区，安排和举行会议，并准备和分发咨询材料。

(iii) 总体协调，包括审查半年期监测报告草案，并最终负责向亚洲开发银行提交监测报告。

3. COUNTY PROJECT MANAGEMENT OFFICE – ENVIRONMENT-AND-SOCIAL FOCAL POINT (one position per subproject; 24 subprojects in total) 先项目管理办公室-环境和社会协调中心（每个子项目一个职位，共 24 个子项目）

A. Scope and Duration of Work 工作范围和期限

9. At the subproject level, coordination of the subproject EMP, social development action plan (SDAP), gender action plan (GAP) and land use rights transfer framework (LURTF) is the responsibility of the county project management office (CPMO) environment-and-social focal point. At the subproject level, daily coordination and implementation of the SDAP, GAP, LURTF and EMP will be undertaken by the CPMO responsible for each subproject. For this purpose, each CPMO requires an environment-and-social focal point. These officers will work on behalf of the CPMOs to implement the project SDAP, GAP, LURTF and EMP. The officers will report directly to each of CPMOs and work closely with the county social and environment protection bureaus (SEBs), social and environment monitoring agencies or experts (SEMAs), and PPMO social and environment officers. The positions are for the entire project duration (5 to 6 years).
在子项目层面，协调子项目环境管理计划、社会发展行动计划（SDAP）、性别行动计划（GAP）和土地使用权转让框架（LURTF）是县项目管理办公室（CPMO）环境和社会协调中心的责任。在子项目层面，社会发展行动计划、性别行动计划、土地使用权转让框架和环境管理计划的日常协调和实施将由负责每个子项目的县项目办负责。为此，每个县项目办需要一个环境和社会的联络点。这些官员将代表县项目办实施项目社会发展行动计划、性别行动计划、土地使用权

转让框架和环境管理计划。这些官员将直接向每个县项目办报告，并与县社会和环境保护局(SEBs)、社会和环境监测机构或专家(SEMAs)，以及省项目办的社会和环境官员密切合作。这些职位适用于整个项目期间（5 至 6 年）。

B. Qualifications 资质

10. The officer will have: (i) undergraduate degree or higher in social and/or environmental management or related field; (ii) at least 3 years of experience in social and/or and environmental management, monitoring, and/or impact assessment, including specific experience on the management and monitoring of agriculture projects; (iii) ability to communicate and work effectively with local communities, contractors, and government agencies; (iv) ability to analyze data and prepare technical reports; (v) willingness and health to regularly visit the project construction sites and in different seasons; and (vi) ideally, proficiency in English.
该官员将拥有：（i）社会和/或环境管理或相关领域的本科或更高学位；（ii）至少 3 年的社会和/或环境管理、监测和/或影响评估经验，包括农业项目管理和监测的具体经验；（iii）能够与当地社区、承包商和政府机构进行有效沟通和合作；（iv）具备分析数据和编写技术报告的能力；（v）愿意并健康地定期和在不同季节访问项目施工现场；（vi）理想情况下精通英语。

C. Detailed Tasks 详细的任务

11. The CPMO environment-and-social focal point will have a detailed understanding of the subproject SDAP, GAP, LURTF and EMP and supporting documents, including the domestic social and environmental reports, subproject IEE, and subproject social and environmental assurances. The officer will have the following tasks.
县项目办环境和社会联络人将详细了解子项目社会行动计划、性别行动计划、土地使用权转让框架和环境管理计划以及支持文件，包括国内社会和环境报告、子项目初始环境评估报告和子项目社会和环境保障措施。该官员将承担以下任务。

(i) Collect and provide necessary information for the preparation of environment and social safeguards documents to the TrTA consultants;
(ii) Work closely with the PPMO social and environment officers, SEB, social and environment monitoring agencies, contractors, construction supervision companies, and all other relevant agencies to implement the SDAP, GAP, LURTF and EMP.
(iii) Distribute the Chinese language version of the SDAP, GAP, LURTF and EMP to all relevant agencies, including the PIUs, provincial and municipal agencies for social and environment protection. This should occur at least 3 months before construction begins.
(iv) Conduct meetings with agencies as necessary to ensure they understand their specific responsibilities described in the SDAP, GAP, LURTF and EMP.
(v) Ensure that contractors implement the SDAP, GAP, LURTF and EMP.
(vi) Implement the monitoring and reporting requirements in the SDAP, GAP, LURTF and EMP, including timely submission of progress reports to the PPMO social and environment officers.
(vii) Implement the project grievance redress mechanism.
(viii) Make regular inspections of construction sites to assess progress, meet with contractors and/or local communities, and assess compliance with the SDAP, GAP, LURTF and EMP.
(ix) Maintain digital records of all progress and information.
(x) Support the PPMO social and environment officers in all of their tasks.

(i) 收集并向技术援助顾问提供编制环境和社会保障文件所需的必要信息；
(ii) 与省项目办社会和环境官员、社会和环境保护局、社会和环境监测机构、承包商、施工监理公司和所有其他相关机构密切合作，实施社会发展行动计划、性别行动计划、土地使用权转让框架和环境管理计划。
(iii) 将社会发展行动计划、性别行动计划、土地使用权转让框架和环境管理计划的中文版本分发给所有相关机构，包括项目实施单位、省级和市级社会和环境保护机构。这应在施工开始前至少 3 个月进行。
(iv) 必要时与各机构举行会议，以确保他们了解社会发展行动计划、性别行动计划、土地使用权转让框架和环境管理计划中所述的具体职责。

(v) 确保承包商执行社会发展行动计划、性别行动计划、土地使用权转让框架和环境管理计划。
(vi) 实施社会发展行动计划、性别行动计划、土地使用权转让框架和环境管理计划中的监测和报告要求，包括及时向省项目办社会和环境官员提交进度报告。
(vii) 实施项目申诉补偿机制。
(viii) 对施工现场进行定期检查，以评估进度，与承包商和/或当地社区会面，并评估是否符合社会发展行动计划、性别行动计划、土地使用权转让框架和环境管理计划。
(ix) 维护所有进度和信息的数字记录。
(x) 支持省项目办社会和环境官员的所有任务。

D. Reporting Requirements 报告要求

12. Quarterly reports to the PPMO social and environment officers.
向省项目办社会和环境官员提交季度报告。

4.LOAN IMPLEMENTATION ENVIRONMENTAL CONSULTANT – NPMO LEVEL (national; 1 position) 贷款实施环境顾问-国家项目办级别（国家；1 个职位）

13. See Appendix 7 of the Project Administration Manual for the National LIEC.
见项目管理手册附件 7 中国家贷款实施项目顾问。

5. LOAN IMPLEMENTATION ENVIRONMENTAL CONSULTANT – PROVINCIAL (Provincial-level; one per project province; seven positions in total) 贷款实施环境顾问-省级（省级；每个项目省一个，共 7 个职位）

14. See Appendix 8 of the Project Administration Manual for the Provincial LIEC.
见项目管理手册附件 8 省级贷款实施环境顾问。