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ATLAS OF AGRICULTURAL RESOURCES AND REGIONALIZATION OF HENAN PROVINCE

Sponsored by

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**THE PUBLISHING HOUSE OF
SURVEYING AND MAPPING**

BEIJING • 1990

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序

农业生产当然是生物工程；但同时也是地学工程。人类通过劳动的参与，来加速无机的物质和能量转换为有机质和生物能。由于这一人类经济活动，规模如此宏大，基本上是在自然环境下进行，目前还没有可以完全替代的工程技术，因此，充分认识农业自然资源与环境的差异和环境变化，才能因势利导去发挥人的主观能动性。通俗地说，就是“天时、地利、人和”，才能有计划、有步骤地发展农业。农业是人类赖以生存与发展的首要任务，也是国家安定团结的物质基础。

河南省领导和科学家们，长期以来，坚持为农业服务，作了大量深入细致的工作，付出了辛勤的劳动。例如豫北灌溉渠系的调查，封丘盐碱土的治理，豫东防护林网的建设，淮北砂姜黑土、低产田的改良……等等优秀的科研成果早已在河南省推广运用，开花结果，造福桑梓。现在再把这些成果按照生态系统的观点进行综合分析和评价，经深化提高用地图的形式来表达，公开发表，奉献给全国和全世界的同行专家，交流农业资源调查与农业区划、规划的理论与实践，更值得我们称颂和赞扬。

不少省、市、自治区编制出版了农业资源与农业区划地图集，百家齐放，各具芬芳，但对于河南省这部地图集的问世，我们表示分外的关注与热烈的祝贺。因为就全国而言，它的关系错综复杂，意义特别重大。研究的难度自然也特别高一些。

秦岭迤东，我国南北地理分带并不明显，河南全省，界于亚热带与暖温带的过渡地带，古称淮南为桔，淮北为枳，并不尽然。据文献考证，犀牛与野象，曾经活动于豫北，蚕桑、竹类，曾经盛行于太行。而今由于灌溉水利、土壤改良，通过品种优化与驯化，水稻与小麦的复种指数，全省普遍提高。甚至东北的水貂也能繁殖于洪泽湖旁，热带的木薯已经引种到伏牛山的南麓。这些现象说明，河南的农业水热生物资源既丰富而又多变，农业资源与农业区划的时空规律与动态演化，并不是三言二语可以说得清楚，一二幅地图就可以交代明白的，需要有综合性的调查研究，更需要有系统的地图集来表达。

河南省地跨海河、黄河、淮河和长江四大流域。以黄河大冲积扇为主体，郑州以下的黄河河床高出平地6~12米，两岸400公里大堤，防范溃决，关系国家安危。豫北中原油田，煤运铁路必须确保；东南部林网固沙，果粮丰收，全国烤烟、粮、棉、油基地，又岂能掉以轻心？太行、秦岭、伏牛山区为我国主要暴雨中心，黄土、红黄壤丘陵，土壤侵蚀严重，水库调度，对于江河洪水的控制与旱涝灾害的减救，至关重要，直接影响本省以及黄淮海与江汉平原农业的丰歉。河南省农业资源与农业区域的战略意义，决不局限于本省，其影响实波及全国。

河南地居中原，农业开发，历史悠久。殷商以来，古都洛阳、开封，水利漕运，历久不衰。为古代东方文化、经济的繁荣昌盛，作出了巨大的奉献。而新中国建国40年来，西部山区水库建设，栉比皆是：三门峡、丹江口、小浪底、薄山、南湾等，均系国家重点工程，对农业旱涝保收，已经发挥了巨大的作用；而今后南水北调中线工程，受益范围更将扩大到全省工农业。国家南北、东西铁路干线，在河南省内构成井字格架，对农业产品的运输，农村乡镇企业的繁荣，方兴未艾，未可限量。国家的四化建设，也为河南的农业土地资源的合理开发与农业远景规划，创造了空前未有的有利条件。

这部地图集的重要优点和特点是：较成功的运用了系统论和辩证唯物论的观点，及综合分析 with 综合制图的理论方法，进行图集的设计和图集生产的整个过程，还吸取了生物学特别是农学、农业区划和地理学的理论方法与综合制图原理相结合融合成一体，丰富了农业制图学的理论宝库。图集的结构严谨，逻辑性强；选题内容有针对性、有新意，区域特色明显；图集信息丰富，内容互补性好，表示方法合理，尤其区划图型较传统区划图型有很大改进；地图色彩明快，制印精良，具有巨大的实用意义和科学价值。

随着农业科学的进步，农村劳动力的转移；随着农业工程化、商品化和区域专业化的加强，农业科学管理和信息流通就将愈见重要。农业资源与农业区划地图集的编制出版，并不是终点而是新的起点。它标志着河南省的农业科学管理达到了一个新的阶段，即由静态分析转变到动态监测，完成了此项最重要的科学储备，将为建立农业资源动态数据库和农业规划与管理信息系统，奠定坚实的基础。祝愿河南省科技界快马加鞭，继续前进，为农业建设不断作出新贡献。

中国科学院地学部委员

陈世彭

1990年2月7日

PREFACE

Agricultural production is doubtlessly to be biological engineering, but while it is also a geotechnology. Human activities accelerate the transform of inorganic substance and energy into organic substance and biological energy. Because human economic activities carry out so broad in scope under natural environment conditions, there is no other engineering technique to replace at present. Therefore, only by recognizing the regional differentials of agricultural natural resources and environmental changes, can human fully play subjective initiatives. To use a common expression, agriculture can not develop step by step in a planned way until there is a homogeneous geoeologic relationship.

The governors and scientists of Henan province have insisted on giving service to agriculture for a long time conducting a great deal of throughgoing and painstaking work with excellent scientific achievements implemented and extended in Henan province with yielding positive results. Now according to the view of ecological system, the achievements are comprehensively analyzed and evaluated, and then expressed in the form of an atlas. The publication of this atlas is praiseworthy devoted to the experts of the same occupation both in China and in the world to exchange theories and experiences on agricultural resource investigation and agricultural regionalization.

A number of provinces or autonomous region have compiled the atlas of agricultural resources and regionalization. We may say that flowers of every kind are in bloom, and each has its own special fragrance, but we express our special concerns and warm congratulations on the publication of Henan's atlas. Speak to the whole country, the geographical position of Henan has verily complex characteristics so it is of higher difficulties in the study. To the east of the Qinling mountains, there is no obvious differentiation between south and north geographical zonation in China. Henan province is located in the transition area from subtropic zone to temperate zone, with various and plentiful water, heat, and biological resources. The spatial and temporal law and dynamic evolution of agricultural resources and regionalization can not be explained clearly by several words and one or two sheets of maps, which need a systematic atlas in expression through comprehensive investigation and study.

Henan province, crossing four big river basins of the Huanghe, the Huaihe, the Haihe, and the Changjiang, takes the large alluvial fan of the Huanghe River as the main body. The river bed down Zhengzhou is 6–12 m higher than ground level. The break prevention of 400 km long dyke along two banks strongly influences the safety of the whole country. The safety of Zhongyuan oil field in northern Henan and coal transport railways must be ensured, and also we can never lower our guard on southeastern Henan with a harvest of fruit and grain, and forest network for sand stabilization, and the basis of flue-cured tobacco, grain and cotton. Main heavy storm center is in Taihang, Qinling and Funiu mountains. Soil erosion is severe in loess and red-yellow earth in the western Henan hills. Reservoir regulation is vital to the flood control of rivers and the reduction of drought and waterlogging disasters affecting agricultural harvests of Henan province, Huang Huai Hai plain and Jiangnan plain. Hence, the strategic importance of Henan province's agricultural and regionalization are not only for the scope of Henan province, but also for the whole country.

Henan is just situated in the central plain in China with a long history of agricultural development. Since Yin and Shang Dynasties, ancient capitals of Luoyang, Kaifeng, long lasting water transportation made enormous contributions to thriving and prosperous oriental culture and economy. Since the foundation of People's Republic of China, reservoir construction in western mountains has achieved great progress; reservoirs of Sanmenxia, Danjiangkou, Xiaolangdi, Boshan and Nanwan all belong to national key projects playing huge functions in agricultural harvest-ensurance despite drought and waterlogging. The future implementation of middle route of long distance water transfer work from south to north will bring more benefits to provincial industries and agriculture. National north-to-south and east-to-west railways are forming a grid pattern in Henan province with bright development prospects in transporting agricultural products and prospering rural industrial enterprises. National great cause of four modernizations provide unsurpassed unique favourable conditions for the rational exploitation of agricultural land resources and agricultural long-term planning of Henan province.

The main strongpoints and characteristics of this atlas are mainly shown in: successful use of the view of systematics and dialectical materialism, and the theories and methods of comprehensive analysis and complex mapping in the whole process of the design and production, absorption of the theories and methods of biology, agronomy, agricultural regionalization and geography combined with the principle of complex mapping to enrich the theoretical treasure house of agricultural mapping. This atlas is characterized by well-knit pattern, new and high logic special selection, obvious local features, plentiful information, high complementary in content, rational expression measures, especially the much improved form of regional map. The atlas is well printed with bright colour and fine quality providing realistic importance and high scientific value.

With the progress of agricultural science, shift of rural labor, and the strengthening of engineeringlization, commercialization and regional specialization, agricultural scientific management and information exchange become more and more important. The publication of Atlas of Agricultural Resources and Regionalization is not the end, but a new beginning indicating that Henan province's agricultural scientific management is coming to a new stage transferring from stable analysis to dynamic monitoring. This most important scientific store will build a solid foundation for setting up a dynamic data base of agricultural resources, and an information system of agricultural planning and management. I wish the scientists of Henan province to make further contributions to agricultural construction with whip and spur.

Chen Shupeng

Member of the Division of Earth Science, Academia Sinica

Feb.1990

前 言

编制《河南省农业资源与农业区划地图集》，是全省农业发展到现阶段，生产领导部门对科研单位提出的客观要求，图集的科学研究成果是为生产服务的产物。

建国以来，河南省农业的发展走过一条曲折的道路。党的十一届三中全会作出了把工作重点转移到社会主义现代化建设上来的战略决策，并制订了“关于加速农业发展若干问题的决定”，为农业制图提出了新要求和新任务。

农业地图集国外已有出版，近年国内也有省区农业资源与农业区划地图集问世，但系统的经验和理论论述不多，我们在实践中对这类图集的理论技术等问题作了探讨。由于农业生产本身是一个巨系统，图集也是一项大的制图工程，所以图集的科学技术设计运用了系统论的原理和方法，来反映农业生产及其有关内容为主题的农业资源与农业区划地图集。其制图内容涉及到农业经济、农业技术和农业生态等农业生产的3个子系统，故要以农学、生物学、地理学和地图学及农业区划学的基本理论作为图集制图的理论基础，制订图集的设计和编制原则，以保证图集整体上的科学质量和水平。

本图集属于区域性综合农业地图集。较全面地总结概括了河南省40年来农业生产的基本经验，全面系统地再现全省10年来农业资源调查与农业区划各级各类的系列成果，从中吸取营养得到滋补，集我省农业资源、生态环境、生产技术条件、经济状况、生产部门、产业结构等各方面农业科学之大成，且从相关科学研究成果中吸收对编制本图集有用的内容，达到博采百家之精论，兼收各派之灼见，使图集的结构、选题、内容更趋完善，更切合本省的实践需要。因此，图集是一本独立的农业地图论著，是我省第一部用图集形式全面反映农业资源、农业生产和农业经济的全书，填补了省地图集的空白。

为使图集在整体上和各环节上都有规可循并有序施工，其图集的设计和选题原则是：①把现代系统论的科学思想、方法同地图学的理论技术相结合运用到图集设计和编绘的全过程；②贯彻发生学原则，即从自然资源的形成机制和原因阐明其成因规律和分布规律进行地图编制；③地图的选题内容要全面、完整，要切合农业发展需要，又要突出农业自然资源与自然条件的地域差异性，体现农业资源的分布、组成及其联系、相互制约的整体性及各学科的系统性；④突出区域特点，增强地图服务生产的紧密性和实用性；⑤体现农业资源与农业区划图集本身所具有的独立体系，尽可能反映有关新成果，图幅内容要有一定深度，并以动态观点反映认识自然的不断深化；⑥体现综合性和统一协调性。这是农业本身具有明显的综合性和地域性及农业生产是自然再生产同经济再生产过程相互交织的特性所决定的。

地图既是空间信息的载体，又是一种传输信息的手段，编制地图集更是一项科学的总结性工作。本图集把河南省域作为一个整体，着重反映农业生态环境、农业自然资源及其开发利用前景；展现农业生产的状况和特征及农业地域差异性；阐明农业生态环境的形成、演化、及其对区域农业进一步开发的影响；同时要反映农业生产的技术条件和农业经济特征，农业生产结构、农业商品粮、棉、油等基地，农业人口、肥料施用，农作物与农业配置的变化，以及不同的农业区域和发展方向等等。图集分为：一、序图；二、农业生态条件；三、农业自然资源；四、农业技术条件；五、农业经济特征；六、农业生产部门；七、农业区划。共7个图组。这些农业地图综合地反映了农业生产的自然基础与农业经济的面貌，揭示农作物配置的地理变化，及农业区域不同的特色，指明了社会主义农业配置的现代特征。

该图集特点：①图集运用系统论观点，及综合分析和综合制图的理论方法，图集内容内在联系紧密，整体上较完整；②明确的把农学、生物学、地理学和地图学以及农业区划理论结合融为一体，作为综合农业地图集的理论基础；③贯彻一个“全”字，突出一个“新”字。全，是从农业生产的特点及其需要着眼，尽量做到选题内容全，资料翔实而全面；新，表现在较过去的农业制图有许多新选题新内容和制图资料新，理论上运用系统论、信息论和地图图形符号学理论；④贯彻了以农业为主线，加强区域特征的反映；⑤资料分析和编图中用发展的、动态的观点认识地理环境及其和农业生产间的关系；⑥地图内容与指标的选择和农业生产实践结合，提高图集的实用性；⑦图型设计和表示方法上有新意。

本图集可为省级领导同志研究农业问题进行宏观决策、制订全省农业发展战略与规划提供科学依据；是省计划、农林牧副渔，乃至水利部门制订部门生产规划和计划的依据；是深入研究和农业对农业发展进程再认识的基础；是全面宣传党和国家发展农业的方针、政策，及提高农业战线人员素质的重要工具之一；是各类有关农学和地学专业研究农业问题不可缺少的科学资料；为社会各界提供系统的区域性农业信息，也是国家编制农业地图的重要科学资料。

本图集是协作攻关的产物，是千百人汗水和智慧的结晶。在调研、设计、搜集资料和地图编绘过程中，得到了省计委、省直有关厅局、河南大学、河南农大、省农科院和解放军测绘学院等单位的热情支持和帮助。特别是河南省农业区划办公室和中国科学院地理研究所的部分同志对图集总体设计稿提出了宝贵意见，有的同志把自己的研究资料也奉献给图集。河南省科学院和地理所的领导对图集更加关怀支持，上海中华印刷厂在图集制印中大力合作。在此对曾为图集设计编制工作提供帮助和支持的单位和个人，致以诚挚谢忱！参加图集作者原图编制的同志，在各图幅文字说明之后注出，不再一一列举。

由于图集内容涉及面广，编制出版工作量大，加上我们经验和水平所限，不妥之处难免，恳请读者批评指正。

编 者

一九八九年十月

FORWORD

The Atlas of Agricultural Resources and Regionalization of Henan Province is a comprehensive regional map collection of agriculture. It sums up the past 40 years' primary experiences of the agricultural production in Henan province, and gives a thorough display of the provincial investigation on agricultural resources and regionalization series in the past decade. It includes Henan's resources of agriculture, ecological conditions, technical conditions, economic features, production sectors, etc. Besides, it absorbs useful materials from the achievements of related scientific researches. Thus we can say that this atlas, drawing the correct and penetrating views of each school and seeking advice from all sides, has relatively perfect structure, sensible selection of subjects and rich contents, practicable for the reality of Henan. It is an unique treatise on agricultural resources as well as a first encyclopaedia of agricultural resources, agricultural production and agricultural economy by means of atlas, thus filling up the blank of agricultural atlases of Henan.

The principles of designing the atlas and selecting subjects are as follows: 1) Application of the scientific ideology and methodology of the modern systematology combining with the theory and technology of cartography to the whole process of the designing and compilation of the atlas. 2) Compilation according to the laws of formation of the natural resources and their distribution. 3) Comprehensive selection of subjects to meet the needs of the development in agriculture, to emphasize the difference between natural resources and natural conditions, to show the wholeness of the distribution and formation of the agricultural resources, and their interrelations and mutual restriction. 4) Emphasis of areal features as to serve the production better. 5) Incarnation of the unique system that the atlas itself has, — an atlas of agricultural resources and agricultural regionalization, to display the latest achievements as thoroughly as possible, to reflect the continuous deepening of the knowledge of nature from the point of view of development. 6) Incarnation of multipurpose, unity and harmony, to reflect the mutual relation between natural reproduction and economic reproduction.

As a carrier of spacial messages and a means of communication, the compilation of an atlas is therefore a scientific summarizing task. Taking Henan province as a whole, this atlas offers a beautiful perspective of the exploitation and utilization of the agricultural resources, shows the ecological conditions of agriculture, the distribution of agricultural resources, the conditions and features of agricultural production and the regional differences, and states the formation and evolution of the ecological conditions and their influence on further development of the regional agriculture. Meanwhile, it also reflects the technology of agricultural production, the characteristics of agricultural economy, the structure of agricultural production bases of grain, cotton, and edible oil, agricultural production, application of fertilizer, crops and changes of disposition of agriculture, different agricultural regions and their development, etc. The atlas consists of seven sets of maps: Preliminary Maps; Ecological Conditions of Agriculture; Natural Resources of Agriculture; Technology of Agriculture; Features of Agricultural Economy; Agricultural Production Sectors; and Agricultural Regionalization.

This atlas renders scientific data for the provincial leaders to discuss the agricultural problems so as to make an overall strategy and tactics in agricultural development of the province, data for sectors of planning, farming, forestry, grazing, fishery, even the sector of water conservancy, to make projects for their sectoral production. It is an essential tool for enhancing the quality of the personnel working in the agricultural front, for supplying systematic regions information on agriculture to various circles of the society, as well as an important material for compiling national maps of agriculture.

This atlas is a fruit of cooperation. The authors of the atlas are grateful to the personnel, and departments, universities, bureaus concerned, who have offered valuable suggestions and materials in the compiling process. The translation work of the atlas is mainly done by Assoc. Pr. Zhang Tianzhen, Ma Min, Assoc. Pr. Joseph Levy, and Assoc. Pr. Yang Guoyu.

Editor

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