



# 农业生态化发展路径研究

## ——基于超循环经济的视角

伍国勇◎著

NONGYE SHENGTAIHUA FAZHAN LUJING YANJIU

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## 摘 要

生态经济、循环经济是 20 世纪 90 年代后期,美国、德国、欧盟等西方主要发达国家和地区针对因工业化快速发展而出现的资源环境问题,建立起来的新型经济发展模式。当前,我国农业发展面临严峻的生态困境、资源和环境双重压力。借鉴西方发达国家的农业循环经济发展的理论,深入研究和科学运用农业循环经济基本理念,结合我国的农业发展实际,创新性运用农业循环经济的基本理论,指导农业生产,转变农业发展方式,实现人类社会与自然的和谐健康协调发展,促进解决农业发展面临的生态困境是我国农业发展的必然选择。本文旨在系统阐述农业生态化发展的理论基础,明确农业生态化发展系统的基本原理和系统特征以及基本类型,重点从超循环经济的概念出发,对农业生态化发展的路径进行系统分析,对其特征、行为和路径进行研究,并以贵州为样本进行案例实证研究,提出促进农业生态化发展的思路 and 对策。主要的研究内容和结论如下:

第一,基于农业生态理论、演化经济理论和超循环理论,提出了超循环经济的概念模型,认为超循环经济是以超循环理论为依据,以高效、和谐为价值原则,合理调控人与自然的复合矛盾运动,科学规划、组织和管理生产、流通、消费和排放的循环生产活动,持续满足人与自然健康发展需要的经济发展

模式；分析了超循环经济系统运行的“共生（依存）原理、制衡（约束）原理和转化（循环）原理”，“减量化、再循环、再利用、再创新”的“4R”原则，“开放性、高效性、互动性、包容性”等四大性质。研究了超循环经济与农业生态化发展的内在关系和科学依据，提出了基于超循环经济的农业生态化发展路径分析框架：即三个循环的路径演化分析、路径形成的影响行为分析、三个循环的路径设计。

第二，依据超循环经济的基本内容，在演化经济理论、制度变迁理论的指导下，分析了农业生态化发展路径演化的基本规律和特征，提出了路径突破的模型与突破方向。认为农业生态化发展路径演化会经过“给定条件、推动实施、形成状态、进入锁定、路径突破”五个过程；通过模型分析认为政府在实施产业生态化发展过程中发挥主导作用，启动时间越早，投入治理生态的成本越低，对经济社会发展的影响越小。反之启动越晚，投入越大，对经济社会发展的影响越大；通过模型分析了超循环经济三个循环的内在演化规律，研究了超循环经济系统的形成机制和三个循环演化的条件，为后续研究打下坚实基础。

第三，运用博弈论分析方法，就农业生态化发展过程中的利益主体：生产者、管理者、消费者在农业生态化过程中的具体行为、“产业生态链”形成以及农业“生态化发展体系”形成过程中的选择行为进行博弈分析。发现：（1）在三方博弈过程中，出于经济人角度的假设，三者都会选择最佳的时机来决定是否参与生态化发展活动。生产者存在“侥幸心理”，在压力不很大的时候，能逃则逃；管理者也存在“投机心理”，生态化发展成本如果不高，压力不大，就先不管；消费者存在“观望态度”，给自己带来损失很大，分配利益多，就监督，否则不管。（2）在“产业生态链”形成博弈中，生产者之间的利益博弈是

重要影响因素,要使得上下游生产者在长期采取合作态度,双方的策略都满足“激励相容”条件;这需要大众、政府及企业共同努力才能完成。(3)在“农业生态化发展体系”形成的进化博弈分析中,认为在有限理性假设条件下,企业通过市场自主选择会促进园区的形成,但园区是否稳定发展关键在于企业加入之后收益大小,政府通过提供激励因子,增加生态化外部压力等措施可促进园区稳定发展。(4)分析了博弈模型假设条件的实现措施和博弈分析最优结果满足条件的实现办法,提出了强化法律规定、增加外部压力、构建合作平台、建设共享机制、提供生态补贴激励办法和有效措施。

第四,在农业生态化发展路径设计研究中,基于超循环经济的理论框架,结合路径演化与突破机制的研究结果,以及路径影响行为的博弈分析结论,从“内循环、中循环和超循环”三个角度,设计了基于“农业超循环经济”的农业生态化发展路径。(1)农业发展机制生态化路径。发展模式上认为有机农业是农业生态化发展的愿景,当前食物保障为主的中国,发展超循环农业是可行办法;生产机制方面注重清洁化生产模式的建立;经营机制方面更注重耕作技术生态化、化学投入合理化、生产结构复合化。(2)超循环农业园区建设中,要求按照W模式、G模式或H模式,构建超循环农业园区;(3)超循环农业园区网的建设,从区域类型看,可构建区域性、广域性农业产业园区网兼顾经济系统、社会系统与生态系统的良性循环;从功能类型看,可构建生产型、流通型、还原型和服务型超循环农业园区。

第五,从制度、经济与技术三个层面提出了农业生态化发展的保障措施。认为:制度方面要制定导向性宏观法律体系、构建系统性中观产业政策、完善应用性微观技术规范的高度重视人

性化的非正式制度设计；经济方面要改革农业资源价格策略、强化庇古手段应用、启动农产品市场调节、加强农业金融支持；技术方面要实施生态化技术战略，有针对性实施生态化相关技术创新，加强技术创新建设。

第六，以贵州为例，分析了基于超循环经济的农业生态化发展路径问题，剖析了贵州农业生态化发展的历史、现状与问题，总结了贵州水稻、茶叶、草业、畜牧业的传统循环经济实践探索与经验；分别从超循环农业发展、超循环农业园区和超循环农业园区网建设三个层次，构建了贵州农业超循环经济发展体系，形成有利经济系统、社会系统和生态系统良性、和谐健康发展的农业超循环经济系统。

总之，从以上几个方面，围绕“超循环经济的‘三个循环’的分析框架”，本文就构建农业生态化发展路径展开研究，认为构建“农业超循环经济体系”是促进农业生态化发展的有效路径，其内涵宽广、外延表现丰富，是促进解决现代农业生态困境的有效路径。

**关键词：**农业；生态化；路径；超循环经济；系统

## **Abstract**

Ecological economy, circular economy is a new economic development model the late 1990s, the United States, Germany, the European Union and other major western industrialized countries and regions for the rapid development due to the emergence of resource and environmental problems. At present, agricultural development in China is facing severe ecological difficulties, under the dual pressures of resources and the environment. Here is a inevitable choice, that is, drawing on the Agricultural Circular Economy Theory of developed Western countries, having an in-depth research on and applying the basic concepts of Agricultural Circular Economy Theory scientifically. In order to get harmonious development between human being and nature, overcome the ecological difficulties of agricultural development and transform the way of agricultural development, the actual condition of our country's agricultural development needs to be concerned, Agricultural Circular Economy Theory also needs to be applied creatively. This paper describes the theoretical basis of agro-ecological systems development, a clear rationale and system characteristics and the basic types of agricultural ecological development system, focus on the concept of super-cycle economy



on the path of development of the agro-ecological system analysis, its characteristics, behavior and path studies. we take Guizhou as an sample to do the case studies to find out the measures that can promote the development of ecological agriculture. The main contents and conclusions are listed as follows :

First, based on agro-ecological theory, economic theory and the evolution of super- cycle theory, we put forward the concept model of super- cycle economy, we hold the view that circular economy is based on super cycle theory in the principal of efficiency and harmony. The theory holds the idea that circular economy reasonably regulates man and nature's composite contradictory movement, scientific planning, organization and management of production, distribution, consumption and emissions, thus, continuing to meet man and nature's needs; we also have an analysis of the economic system, that is running super- cycle “symbiotic ( interdependent) principle checks, balances (constraints) principles and transformation (loop) principles”, “reduce, recycle, reuse, and innovation”, the “4R” principle, the “open, efficient, interactive, inclusive” principal. Research and scientific basis of the intrinsic relationship Hypercycle economic development and ecological agriculture, ecological agriculture is proposed based on the analytical framework developed over the path of circular economy: the path to three cycles of evolution analysis, impact analysis of the behavior of the path formed by the three cycle path design.

Second, we analyze the basic rules and agro-ecological

characteristics of the evolution of the development path based on the basic content of super- cycle economy, in the guidance of evolution of economic theory and the theory of institutional change. We proposed the breakthrough model and direction . We consider that the evolution of agricultural ecological development path will experienced following five process: given conditions, implementation promotion, the state of formation, breakthrough path. We think the government play a leading role in the development process in the implementation of industrial ecology, the earlier to start, the lower the investment management and ecological costs, the smaller the impact on economic and social development. On the contrary, the later to start, the greater the investment, the greater the impact on the economic and social development;Our research lay a solid foundation for future study and through the model we found the mechanism of the economic system and the super- cycle three cycles of evolution conditions.

Third, based on the result of a game analysis, we analyze the the development of ecological agriculture in the process of stakeholders: producers, regulators, consumer behavior in specific agro- ecological processes, “ecological chain” form, “Ecological Technology innovation” process and the super- cycle economy “system to form a” course of conduct selection game analysis.Found that: (1) In the process of tripartite game, for assuming that the angle of economic man, the three will choose the best time to decide whether to participate in eco- development activities. Producers exist “luck”, not a lot of pressure, I can escape the escape;managers are also “speculation”, eco-

development costs, if not high, the pressure is not on, then no matter; consumers exist “wait and see attitude” to bring their own great loss, the distribution of benefits and more on supervision, otherwise no matter what. (2) In the “industrial ecological chain” formation game, between the interests of the game producers is an important factor to make the upstream and downstream producers cooperative approach in the long term, both sides of the policy are met “incentive compatibility” condition; this needs of the public, government and enterprises to work together to complete. (3) Evolutionary Game Theory in the “development of agro-ecological system”, formed, that under the assumption of bounded rationality, companies choose through the market will promote the formation of the park, but the park after the key is whether the stable development of enterprises to join revenue size, Government by providing incentives factor, increasing external pressures ecological measures to promote the stable development of the park. (4) analyzed the game model assumptions and game analysis to achieve optimal results measures to meet the conditions of realization approaches proposed to strengthen the law, increasing external pressure to build cooperation platform, building a shared mechanism to provide incentives and subsidies for eco- effective measures.

Fourth, in the path of agricultural development in eco- design studies, based on the theoretical framework of economic super-cycle, combined with the findings and breakthrough mechanisms evolution path, and the path to influence the behavior of game analysis concluded, from the “inner loop, the loop and super-

cycle” three angles, is designed based on “agro-ecological agriculture development path Hypercycle economy” .(1)Agricultural Development Mechanism ecological path. One is that the mode of development of organic agriculture is the vision for the development of ecological agriculture, the current food security mainly China, the development of agriculture is a viable way to super cycle; Second, focus on aspects of the production mechanism for the establishment of cleaner production patterns, Third aspects of the operating mechanism pay more attention to ecological farming techniques, the rationalization of chemical inputs, production of structural composites. (2) the construction of super cycle agricultural park, requiring the W model, G mode or H mode, build ultra-cycle agricultural park;construction (3) super cycle of agricultural campus network, from a regional types, can build a regional, wide area agricultural industrial park network both virtuous cycle of economic systems, social systems and ecosystems;from the functional types, can be constructed production, circulation type, reduced and service-oriented Hypercycle agricultural park.

Fifth, from the institutional, economic and technical safeguards proposed three levels of agricultural ecological development. Considered: one regime to develop a macro-oriented legal system, in view of the systematic construction of industrial policy, and improve the application of technical specifications microscopic attention humane informal system design;Second, the economic aspects of pricing strategy to reform agricultural resources, strengthening Pigou means of the application, start the agricultural market regulation, financial support to strengthen agriculture;Third,

the technical aspects of the strategy to implement eco- technology, targeted implementation of eco -related technological innovation, strengthen the construction of technological innovation .

Sixth, Guizhou, analyzes the development path based on agro-ecological problems Hypercycle economy, analyzes the history, current situation and problems of ecological agriculture development in Guizhou, summed up, tea, grass cycling livestock industry in Guizhou rice, economic practice and Experience;respectively, from the super- cycle agricultural development, agricultural park and ultra- ultra- loop cycle three levels of agricultural campus building was constructed in Agriculture super cycle of economic development system, the formation of a favorable economic systems, social systems and ecosystems healthy, harmonious and healthy development of agriculture super- cycle economic system .

In short, in several aspects from the theme of “super- cycle economy ‘three cycles of ’ analytical framework” to build agro-ecological papers on the development path of a study that “agriculture super-cycle economy” is to promote the development of ecological agriculture valid path, its meaning broad, rich epitaxial performance is a valid path facilitate the resolution of modern agro-ecological dilemma.

**Keywords:** Agriculture;Ecology;Path;Super recycling economy;System

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