

# 浙江德清淡水珍珠复合养殖系统 (二)

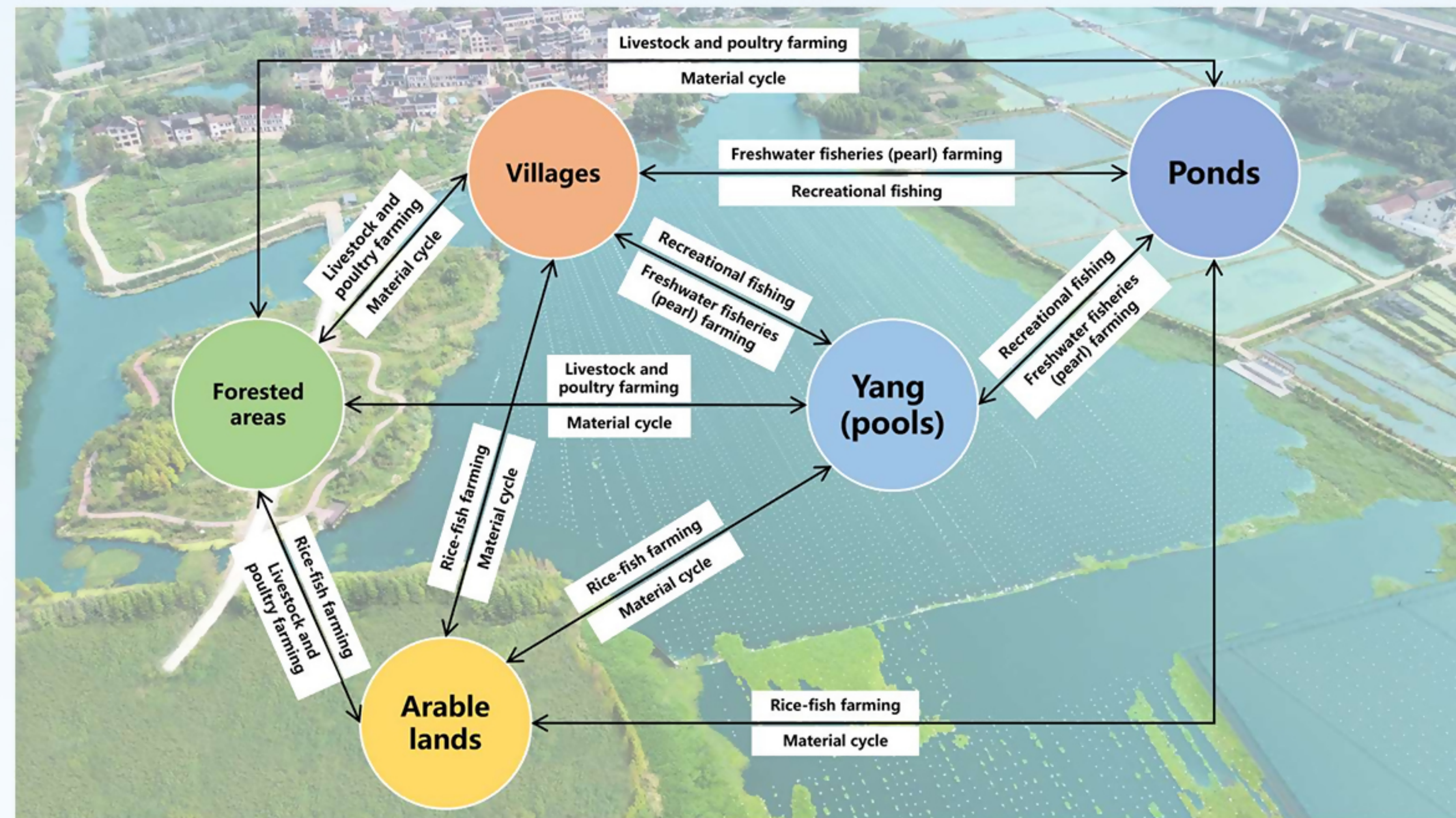
## Deqing Freshwater Pearl Mussels Composite Fishery System

### 系统特征

#### Summary

浙江德清淡水珍珠复合养殖系统是德清县从历史时期所开展的可持续发展的生态农业(渔业)的缩影,该系统充分体现了复合、高效、低碳、可持续发展的生态理念,对德清当地独特的土地、水域、森林和生物多样性资源进行了高效利用,系统的各个组分之间相互依存、和谐共生,充分体现了人与自然和谐共生的生态农业(渔业)理念。

Deqing Freshwater Pearl Mussels Composite Fishery System is the microcosm of sustainable ecological agriculture (fishery) carried out in Deqing County from a historical period, which fully manifests the ecological concept of composite, efficient, low-carbon and sustainable, and efficiently utilizes the unique land, water, forests, and biodiversity resources in Deqing. The interdependence and harmonious coexistence among various components of the system fully reflect the ecological agriculture (fishery) concept of harmonious coexistence between humans and nature.



Coupling of landscape resources in Deqing Freshwater Pearl Mussels Composite Fishery System

## 1 全球生态农业(渔业)发展的典范

### Model for the development of global ecological agriculture (fishery)

在漫长的历史时期,德清县是杭嘉湖地区粮、桑、鱼的主要生产基地之一,千百年来的农业发展积累并传承了丰富多样的农业智慧与技术体系。尤其是以起源于南宋时期(约公元1200~1300年)叶金扬发明的附壳珍珠养殖技术为依托形成的“浙江德清淡水珍珠传统养殖与利用系统”,于2017年被原农业部列为第四批中国重要农业文化遗产。20世纪80年代开始,在国家科委、农业部、浙江省科委、德清县农业农村局等单位的支持下,德清县率先开展了一系列生态农业实践探索项目,这些实践探索既有生态农业的技术开发,也有生态农业的模式总结(下表)。通过这些生态农业项目的不断发展、深化,德清县在我国现代生态农业的实践探索中走在了前列。

Throughout the long history, Deqing is one of the major production bases of crops, mulberries and fish in Hangzhou-Jiaxing-Huzhou region, and the agricultural development over the centuries has accumulated and inherited a rich and diverse system of agricultural wisdom and technology. Especially the Deqing traditional culture and utilization system of freshwater pearls formed depending on the shelled pearl culture technique invented by Ye Jinyang in the Southern Song Dynasty (1200-1300 AD) was listed into the Fourth Batch of Important Agricultural Cultural Heritage in China in 2017 by the former Ministry of Agriculture. Since the 1980s, supported by National Science and Technology Commission, Ministry of Agriculture, Zhejiang Provincial Science and Technology Commission, Deqing Agricultural Bureau and other organizations, Deqing has taken the lead in carrying out a series of ecological agriculture practice and exploration projects, including both the technological development of ecological agriculture and the summary of ecological agriculture models (see the table below). Through the continuous development and deepening of such ecological agricultural projects, Deqing now takes the lead in the practice and exploration of modern ecological agriculture in China.

Representative projects of Deqing County's eco-agriculture (fishery) practice

Year	Project Name
1983~1985	"Comprehensive Technological Research on Ecological Agriculture in the Central Plains of Hangzhou-Jiaxing-Huzhou"
1985	Establishment of "Jiehou Ecological Test Field"
1985~1988	"Ecological Agriculture Research in Ganshan Township of Deqing County"
1987	Establishment of "Sanqiao Township Ecological Agriculture Experimental Field"
1993	Recognized as one of the "Initial 51 National Ecological Agriculture Pilot Counties"
2017	"Deqing Freshwater Pearl Traditional Breeding and Utilization System" designated as an Important Agricultural heritage system of China
2018	Launch of Smart Agriculture Construction, Release of "Three-Year Action Plan for Intelligent Agriculture"
2019	Hosted the "First Beautiful China Rural Expo"
2019	Organized the "Aquaculture Green Development Summit"
2019	Recognized as one of the "Initial National Pilot Counties for Water System Connectivity and Beautiful Village Construction"
2019	Designated as a "National Fishery Healthy Breeding Model County"
2019	"Leveraging Rural Living Environmental Governance Results to Boost Economic and Social Development Outcomes: Deqing's Experience in Practicing the 2030 Sustainable Development" recognized as an exemplary case in the "Best Practices, Success Stories, and Experiences in Practicing the UN 2030 Sustainable Development"
2020	Completed the "Zhejiang Province Rice-Fish Comprehensive Breeding Key Demonstration Base"
2021	Designated as the "Key Rice-Fish Comprehensive Breeding Demonstration County of Zhejiang Province"
2021	Awarded the "Zhejiang Province Fishery Transformation Development Vanguard Zone"
2022	Its Digital Fishery case included in the "2022 National Smart Agriculture Typical Cases"

## 2 东亚地区淡水蚌类和鱼类品种资源库

### Freshwater mussels and fish species repository in east Asia

从历史上看,浙江德清淡水珍珠复合养殖系统所在的地区是中国淡水渔文化和全球附壳珍珠养殖技术的发源地。在漫长的历史进程中,当地积累起了丰富的淡水渔业品种资源,既包括用来培育珍珠的蚌类,如褶纹冠蚌、池螺蚌、背角无齿蚌、圆背角无齿蚌、三角帆蚌、背瘤丽蚌和猪耳丽蚌等,也包括用来作为淡水渔业捕捞和养殖的鱼类,如食植物性鱼类鲢鱼、食动物性鱼类鳊鱼、银鱼、青鱼等,也包括不少杂食性鱼类鲫鱼、鲤鱼、颌须鲷类等。这些丰富的品种资源作为东亚地区淡水渔业品种资源库,对淡水渔业的生物多样性保护与发展具有重要意义。

Historically, the Deqing Freshwater Pearl Mussels Composite Fishery System's locale is the cradle of China's freshwater fishery culture and global mussel pearl cultivation techniques. In the long history process, abundant freshwater fishery species resources have accumulated there, including the clams for pearl culture, such as *Cristaria plicata*, *Hyriopsis schlegeli*, *Anodonta woodiana*, *Anodonta woodiana pacifica*, *Hyriopsis cumingii*, *Lamprotula Lei* and *Lamprotula rochechouarti*, as well as the fish species for freshwater fishing and aquaculture, such as silver carp and other plant-eating fish, *Aristichthys nobilis*, *Hemibarbus prognathous*, *Mylopharyngodon piceus* and other animal-eating fish, as well as *Carassius auratus*, *Cyprinus carpio*, *Gnathopogon taeniellus* and other omnivore-fish. As the freshwater fishery species resource pool in East Asia, such abundant species resources are of vital importance to the protection and development of freshwater fishery diversity.



The scene of catching freshwater fish and the species of freshwater pearl mussels in Deqing County

## 3 全球最大的珍珠深加工基地

### The world's largest pearl deep processing base

中国是全球最大的淡水珍珠出产国,产量占全球珍珠产量的90%。浙江德清淡水珍珠复合养殖系统具有从河蚌养殖到加工成珍珠终端产品的完整产业链条。河蚌的蚌肉可以食用,味道鲜美;蚌壳可以加工成各种各样装饰品和首饰;珍珠饰品的加工制作,更是促进了整个珍珠产业的良性循环。当前,浙江德清淡水珍珠复合养殖系统的河蚌养殖面积约5000亩,从业人员近3000人,上下游带动就业3万余人,珍珠养殖与深加工年产值超过70亿元,珍珠深加工总量100吨,占全国淡水珍珠总产量的10%左右,是中国乃至全球最大的珍珠深加工基地。

China is the largest freshwater pearl export country in the world, whose yield accounts for 90% of the global pearl yield. Deqing Freshwater Pearl Mussels Composite Fishery System owns the complete industrial chain from clam culture to end pearl product processing. The clam meat is edible and delicious. The clam shells can be processed into various accessories and jewelries. The processing of pearl accessories further promotes the benign circulation of the whole pearl industry. At present, the clam culture areas using Deqing Freshwater Pearl Mussels Composite Fishery System are about 5,000 Mu with almost 3,000 practitioners, employment positions in the upstream and downstream industries over 30,000, annual output values of pearl culture and deep processing over 7 billion Yuan, and total amount of pearl deep processing over 100 tons, accounting for about 10% of the total yield of national freshwater pearls, making Deqing the largest pearl deep processing base in China, even in the world.



Freshwater pearl mussels' cultivation and processing