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# 2022 International Technology Cooperation Demands from Priority Industries of the Yangtze River Delta(YRD) Region

## Contents

<b>I. Medicine and Health.....</b>	<b>3</b>
1. Innovative Drugs.....	3
2. Medical Devices.....	3
3. Treatment Technologies.....	4
<b>II. New Generation Information Technology.....</b>	<b>6</b>
1. Integrated Circuits and High-end Chips.....	6
2. Quantum Technologies.....	7
3. Blockchain.....	8
4. Artificial Intelligence.....	9
5. Future Networks and Communication.....	10
6. Big data and cloud computing.....	10
7. Intelligent Connected Vehicles (ICV).....	11
<b>III. New Materials.....</b>	<b>12</b>
1. Third-generation Semiconductors.....	12
2. Special Steel Materials.....	12
3. Advanced Functional Materials.....	12
<b>IV. Equipment Manufacturing.....</b>	<b>13</b>
1. Intelligent Manufacturing.....	13
2. High-end Equipment and Precision Instruments.....	13
3. High-tech Ships and Marine Equipment.....	14

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**V. Advanced Energy and Environmental Protection..... 15**

- 1. New Energy Technologies..... 15
- 2. Zero-carbon/low-carbon Industrial Process Reengineering Technologies..... 17
- 3. Other Double-carbon Technologies..... 19

**VI. High-tech Agriculture..... 19**

- 1. Core and Key Technologies of Seed Source..... 19
- 2. Construction of Agricultural High Technology Zones..... 20
- 3. Innovation of Digital Agricultural Technologies and Manufacturing of Intelligent Agricultural Equipment..... 21
- 4. Forward-looking Agricultural Technologies..... 23
- 5. Green Development of Agriculture..... 23
- 6. Intensive Processing of Agricultural Products and Their Nutrition and Health 27
- 7. “Non-grain” Soil Treatment..... 28

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## I. Medicine and Health

### 1. Innovative Drugs

#### (1) Vaccines

Vaccines for rapidly-spreading serious infectious diseases, novel antibody drugs for serious conditions that are frequently encountered, novel biotechnology drugs (such as recombinant proteins), domestic high-end cell culture media, essential core enzyme preparations, engineering cell lines, etc;

#### (2) New drugs for major diseases

New chemical medications and supporting agents for serious illnesses such as cancers and infections caused by pathogens that are resistant to treatment;

#### (3) Traditional Chinese Medicine (TCM)

TCM uses cutting-edge medications, equipment for quality control, and techniques for evaluating and screening novel drugs, among other things.

### 2. Medical Devices

Diagnostic equipment for major diseases (e.g., tumors) and their key and core components, precision intelligent surgical systems and auxiliary robots, digital diagnosis and treatment equipment, in vitro diagnostic (IVD) equipment and reagents, high-accuracy testing reagents and kits for novel coronavirus and other diseases, medical biomaterials and implant

(interventional) products.

### 3. Treatment Technologies

#### (1) Comprehensive treatment of critical diseases

Key pathogenic mechanism of multiple organ dysfunction in critical patients, comprehensive treatment technologies (e.g., original extracorporeal blood purification treatment), and vital technology systems that provide multi-organ life support and use targeted therapy to eliminate pathogenic cells and damage factors;

#### (2) Early and accurate diagnosis of malignant tumors

Early and accurate diagnosis techniques based on molecular biology, molecular subtyping, pathology and imaging for common and frequently occurring malignant cancers;

#### (3) Biological (molecular targeted) cellular immunotherapy

Study into biological (molecular targeted) cell therapies with precise therapeutic effects for serious illnesses such as malignant tumors and hematological diseases based on the identification of precise and target biomarkers;

#### (4) Research on stem cells and transformation

Technologies for using stem cells in clinical research to cure serious illnesses of nervous, blood, cardiovascular, reproductive, immune and organ systems such as the liver, kidney and pancreas;

#### (5) Clinical research of brain science

Clinical study on the use of cutting-edge molecular biology, modern

imaging, informatics, speech science and technology in the diagnosis and treatment of severe and challenging diseases as Parkinson's, Alzheimer's, nerve damage repair, epilepsy and cerebral apoplexy;

(6) Minimally invasive treatment

The use of cutting-edge tools and equipment such as endoscopy (including surgical robots), in vivo real-time navigation imaging, endoscopy and micro robots for the non-invasive or minimally invasive diagnosis and treatment of associated disorders;

(7) Interventional diagnosis and treatment

On the basis of recent advancements in tools, materials, imaging, and other sectors, the use of new technology and methods in applicable fields of interventional diagnosis and treatment, such as cardiovascular and cerebrovascular diseases and malignant cancers;

(8) Precision medicine

Precise prevention and treatment schemes and clinical diagnosis and treatment decision-making for key diseases, standardized clinical diagnostic and treatment plans, application and promotion systems;

(9) 3D bioprinting and biomedical materials

The development of a single type (nerve, tendon, etc.) or multiple types of composite tissues or organs (skin, blood vessels, etc.) with bio substitutes to repair, maintain or enhance the function and morphology of various tissues or organs in the human body after injury using 3D bioprinting technologies and new biomedical materials;

(10) Medical big data and artificial intelligence

Artificial intelligence-based deep learning-based supplemental diagnosis, treatment, and decision-making.

(11) Reproductive health and birth defects

Clinical research on new methods and technologies for diagnosis and treatment of infertility, birth defects and other diseases related to maternal and infant health, and key technologies for assisted reproduction, prevention and treatment of genetic diseases and birth defects, prevention and treatment of pregnancy complications, and health risk assessment of descendants.

## II. New Generation Information Technology

### 1. Integrated Circuits and High-end Chips

(1) Design and manufacturing technologies of open-source CPU based on RISC-V architecture, third-party IP R&D integration, strong-computing-power chips, new memory chips, ultra-low power SOC chips, optoelectronic chips, high-performance analog chips, etc.

(2) Advanced production technologies and equipment manufacturing technologies of high-voltage integrated circuits (HVIC), insulated-gate bipolar transistors (IGBT), metal-oxide semiconductor field-effect

transistors (MOSFET), micro-electromechanical systems (MEMS), chiplets, etc.

(3) Advanced techniques for packaging and testing integrated circuits include multichip panel-level fan-out packaging, multichip system integration packaging (SiP), and reliability testing, 3D stacked packaging, photoelectric hybrid packaging, photon chip hybrid packaging.

(4) Production technologies of key materials like large-scale, low-defect monocrystalline silicon wafers, polycrystalline silicon suitable for electronics, high-power density packaging and heat dissipation materials, high-purity chemical reagents, high-precision photomasks, high-end photoresist, polishing liquid and high-purity target materials, etc.

## 2. Quantum Technologies

(1) Research and development of fundamental technologies and essential tools for quantum private communication, including quantum key distribution, quantum relay, quantum gateway, quantum storage and quantum teleportation;

(2) Research and development of fundamental technologies and components of practical quantum computers, including large scale integration of qubits, superconducting quantum computing, quantum chips and ultra-low-temperature microwave connections;

(3) Research and development of important technologies and

apparatus for quantum precision measurement, such as accurate artificial control of quantum systems, state monitoring and quantum sensing;

(4) Important quantum information transmission methods, including quantum light sources, single photon detectors, ultra-low-loss optical fibers, and co-fiber transmission and multiplexing of quantum channels.

### 3. Blockchain

(1) Core blockchain algorithms such as consensus algorithms, asymmetric encryption, distributed storage and smart contracts, as well as open-source software and hardware that make up the platform;

(2) Underlying blockchain technology including cross-chain communication and data collaboration, block data, timestamp, Non-Fungible token (NFT) and grouping;

(3) Blockchain-based identity authentication and privacy protection core technologies, including secure multi-party computation, trusted data networks, zero-knowledge proof, physical fingerprint features, and cross-regional CA interworking mechanism;

(4) Blockchain traceability, sharing and application technologies including transaction regulation traceability, blockchain finance, blockchain government operations, blockchain healthcare, and blockchain transportation and logistics.

(5) Metaverse technologies of new perceptual interaction terminals, breakthroughs of technical bottlenecks in display resolution, network transmission rate, delay, etc., and provision of technical support for deep



immersion interaction between the future virtual world and the real society;

#### 4. Artificial Intelligence

(1) Core algorithms like deep learning and reinforcement learning, as well as key technologies like AI scientific computing, brain-inspired computing, domain base models and general artificial intelligence;

(2) Key technologies used in industry, including computer vision, intelligent speech, natural language processing and autonomous unmanned systems, and full stack AI computing solutions based on domestic software and hardware platforms such as Ascend;

(3) Manufacturing techniques for specialized hardware and modules such as embedded artificial intelligence chips, neural-network processing units (NPU) chips and graphics processor unit (GPU) chips;

(4) Key technologies of mobile use of intelligent wearables, man-machine interaction, human function augmentation as key components of mobile intelligent mobiles;

(5) Significant technologies and software such as multimodal human-machine natural interaction, intelligent operation systems of universal robots, robot federated learning and multi-sensor information fusion;

(6) A number of key technologies including flexible tactile sensors, high-precision drive-control integrated joints, high-precision magnetic encoders and servo controllers used in the manufacture, measurement,

and control of the basic components of robots;

(7) Key technologies for the development and production of service robots, including high-precision surgical robots, intelligent rehabilitation robots, exoskeleton robots and foot walking robots;

(8) A number of key technologies for machine design and manufacturing of advanced industrial robots (such as high-precision heavy-duty manipulators) and specialized robots for deep-water autonomous navigation, severe environment operation, etc.

## 5. Future Networks and Communication

(1) Key multimodal network technologies including deterministic networks, programmable networks, computing networks, software-defined networks and IPv6+.

(2) Future network communication essentials including 6G mobile communication, terahertz wireless communication, satellite Internet and air-space-land-sea integration;

(3) Equipment and technologies such as all-optical switching, photonic integrated circuits, high-speed all-optical networks, visible light communication, large-capacity optical communication and others;

(4) Research and development of essential tools and technologies for active defense, endogenous security, network security monitoring and early warning, 5G network security, and security protection and confidentiality of industrial Internet.

## 6. Big data and cloud computing

(1) Key technologies for huge data collection and storage, including large-scale data collection, distributed storage, software-definition storage and hyper-converged infrastructure;

(2) Research and development of high-performance computing technologies and systems such as new generation E-level supercomputing, computing in memory, virtualization computing, edge computing, and cloud computing systems and software;

(3) Key data analysis technologies including network data mining, data visualization, cross-network data exchange, and big data analysis and governance;

(4) Major technologies of data security including privacy computing, data desensitization, symmetric cryptography, public key cryptography and digital signature.

## 7. Intelligent Connected Vehicles (ICV)

(1) Key technologies of vehicle intelligence, such as automotive operating systems, smart cockpits, domain controllers, automotive-grade chips and automatic driving;

(2) Key environmental perception and information-interaction technologies, such as laser radar, millimeter-wave radar, radar and video fusion, high-precision integrated navigation, bottom communication of Vehicle to Everything (V2X) and coordination between vehicles and roads;

(3) Key technologies of vehicle execution and control for

brake-by-wire, steer-by-wire and drive-by-wire chassis systems;

(4) Other important technologies, including those that integrate and make lightweight vehicles, new electronic and electrical architecture, automobile network security, and platforms and tools for intelligent network testing.

### III. New Materials

#### 1. Third-generation Semiconductors

Core technology includes high-quality raw silicon, high-quality substrates, large-size substrates and epitaxial materials. It also includes third-generation semiconductor optoelectronics, power electronics, infrared detection and other electronic devices, as well as high-end microelectronic chemicals and monocrystalline silicon furnaces.

#### 2. Special Steel Materials

Key basic special steels such as high-end bearing steels, rail transit steels, advanced tooling steel, high-strength marine engineering steels, and high-strength and high-toughness structural alloy steels; key components such as precision tools and high-temperature alloy blades; key components and materials for aerospace; high-efficiency continuous casting machines, high-speed finishing mills, etc.

#### 3. Advanced Functional Materials

High-performance non-ferrous metal materials (such as high-strength and high-toughness light alloys), inorganic non-metallic materials and products (such as high purity quartz), well-functioning fibers and their composites, special organic polymer materials, high-end electronic components and materials, power batteries, new luminescent and display materials, new biological materials, high-efficiency catalysts, effective energy storage, separation membranes and other significant materials.

## IV. Equipment Manufacturing

### 1. Intelligent Manufacturing

Advanced industrial robots and special environmental robots, high-performance UAVs and their key components, integrated drive and control systems, super-torque heavy-duty reducers, high-performance and high-power servo systems, intelligent sensors, and high-speed multi-axis drilling centers, high-end CNC machine tools (such as large/heavy/special CNC machine tools) and their key components, high-efficiency laser processing, high-power optical fibers, high-precision array nozzles (heads).

### 2. High-end Equipment and Precision Instruments

High-performance hydraulic components and devices, precision

intelligent core castings, gears and transmission devices, precision heavy-duty bearings, lead screws and other key functional components, high-pressure precision molding equipment, aerodynamic systems, airborne equipment and core components, new energy key equipment, high-efficiency power and fuel cells, ultra-high voltage power transmission and transformation equipment, high-end optical systems and core components, high-end civil ray equipment, spectral imaging and other high-performance scientific instruments, high-speed precision detection systems and equipment, efficient human-machine collaboration machinery, high-end textile equipment, and advanced cold-chain logistics equipment.

### 3. High-tech Ships and Marine Equipment

Control systems for deep-sea anchoring and dynamic positioning, deep-sea oil and gas drilling systems and equipment, and super-large essential marine support equipment; high-end marine high-power low/medium-speed environmental protection engines, systems for sizeable liquefied petroleum gas/natural gas carriers and propulsion systems, sizeable liners and their supporting equipment, intelligent ship information system technology and key equipment, key shipboard equipment and systems for investigating and observing the marine environment.

## V. Advanced Energy and Environmental Protection

### 1. New Energy Technologies

Renewable energy technologies: (1) Advanced techniques and equipment for manufacturing crystalline silicon cells with high efficiency and cheap cost, as well as novel techniques for manufacturing solar cells such as thin-film and laminated cells;

(2) Comprehensive utilization technologies of solar energy such as solar energy carbon conversion, solar thermal power generation and photovoltaic building integration (BIPV);

(3) Key technologies comprising high-capacity and high-voltage wind turbines, low and medium-wind speed machines and components, deep-sea wind energy utilization, offshore wind power networking, and cooperative scheduling amongst different wind fields;

(4) Advanced nuclear energy, mid-depth geothermal energy, ocean energy, and biomass energy, among others.

Hydrogen energy technologies: (1) Technologies for producing hydrogen, including those that produce hydrogen on a massive scale using renewable energy, hydrogen from solid oxide electrolytic water, and hydrogen from compounds containing hydrogen;

(2) Key technologies for long-distance and large-scale hydrogen

energy transportation, such as high-pressure hydrogen transportation, low-temperature liquid hydrogen transportation and hydrogen-enriched compressed natural gas (HCNG) transportation;

(3) Technologies for safe and portable hydrogen storage, such as those that store hydrogen in solid materials and organic carriers;

(4) Hydrogen smelting, hydrogen heat engines and hydrogen fuel cells are examples of technologies for the effective use of hydrogen energy.

New power system technologies to absorb renewable energy: (1) Key smart grid technologies include large-scale renewable energy grid connections, flexible AC/DC transmission, long-distance UHV power transmission, and the secure and reliable operation of huge, complex power grids;

(2) Key technologies of power grid informatization, such as source-grid-load-storage integration, multi-energy complement, intelligent energy management and virtual power plants;

(3) New power system protection and control equipment and technologies.

(4) New photovoltaic grid-connected inverter systems

(5) Technologies for coordinated planning and operation of large-scale distributed photovoltaic clusters, optical storage microgrids and active distribution networks

(6) Technologies for group control of multi-unit grid connection and



power generation of large photovoltaic power stations, as well as coordinated operation and active support of power systems

New energy storage technologies: (1) Technologies for medium- and long-term energy storage such as semi-solid batteries, all-solid-state batteries, sodium-ion batteries and solid oxide fuel cells;

(2) Ultra-long-term energy storage technologies including compressed air, solid heat storage and molten salt storage;

(3) Technologies for energy storage that are very effective, durable, inexpensive, and powerful such as hybrid battery capacitors, super capacitors, flow batteries and flywheel batteries;

(4) System integration technologies such as high-performance fast-charging systems, ultra-large-scale energy storage and distributed energy storage.

(5) Research and development of defect detection devices for lithium-ion batteries

## 2. Zero-carbon/low-carbon Industrial Process Reengineering Technologies

Technologies for reengineering industrial processes to be zero- or low-carbon in the iron and steel and chemical industries: (1) Important technologies for reducing pollution and carbon reduction include deep decarbonization of production processes, short-flow manufacturing, novel gel materials, one-step alkene manufacturing, new wet processes, biodegradable plastics and additives;

(2) Technologies for a broad improvement in energy efficiency, such as high-efficiency motor and driving equipment, high-efficiency refrigeration, high-efficiency heat pump, enhanced ventilation, and intelligent process control;

(3) Integration and optimization of low-carbon technologies such as clean and efficient utilization of fossil energy, green and low-carbon transportation, energy conservation, and carbon reduction of new infrastructure;

(4) Cross-integration innovation of new generation of information technologies (for instance, artificial intelligence, big data, 5G) and green low-carbon technologies.

Waste resource recovery carbon reduction and low-carbon utilization technology:

(1) Technology for the clean, high-efficiency treatment of waste gas, waste liquid and residues;

(2) Technologies for deep recovery and resource use of residual energy such as industrial residual pressure and waste heat;

(3) Key technology for recycling of retired power cells, photovoltaic modules and wind power blades.

(4) Research, development and demonstration of key technologies and equipment for intelligent classification and resource utilization of domestic waste

(5) Research, development, equipment and demonstration of

degradable plastics and plastic pollution control technologies

### 3. Other Double-carbon Technologies

(1) Technical framework for effective carbon capture, use and storage;

(2) Technical infrastructure of revolutionary zero-carbon energy;

(3) Technical framework for collaborative climate and environment control;

(4) Technical infrastructure of the restoration of degraded ecosystems and carbon sink collaboration.

(5) Key technologies, equipment and demonstration of clean and efficient coal utilization

(6) Research and development of key technologies and equipment for carbon emission reduction in high-carbon industries

## VI. High-tech Agriculture

### 1. Core and Key Technologies of Seed Source

(1) Technology research and platform construction for high-throughput, precise identification of superior rice gene resources;

(2) Technology research and platform construction for high-throughput, precise identification of superior wheat gene resources;

(3) Discovery of novel high-quality, high-yield and stress-inducible rice genes and their germplasm innovation;

(4) Discovery of novel high-quality, green and high-yield wheat genes and their germplasm innovation;

(5) Gene mapping of essential traits of soybean, cotton and oil crops and creation of excellent germplasm resources;

(6) Gene pyramiding breeding technology of fruit trees (peach, pear, grape and strawberry) based on whole genome analysis;

(7) Discovery of high-quality, high-yield and stress-inducible fruit and vegetable genes and new variety breeding based on whole genome analysis;

(8) Discovery of superior poultry genes and creation of new breeds for high-quality and quick reproduction;

(9) Identification of superior genes in aquatic shrimp and crab products and the breeding of novel, high-quality and high-efficient varieties (lines).

## 2. Construction of Agricultural High Technology Zones

(1) R&D in industrial technology and scene construction for aerosol culture of horticultural crops, vegetables and flowers;

(2) Significant technological advancements and scene construction of the sowing of green fruits and vegetables using digital twins;

(3) R&D and demonstration of key technical equipment for unmanned harvesting in modern orchards;

(4) New variety selection and intelligent manufacture of high-quality, high-yield, factory-produced and edible fungi varieties, and research and demonstration of comprehensive waste utilization technologies.

### 3. Innovation of Digital Agricultural Technologies and Manufacturing of Intelligent Agricultural Equipment

(1) Research and demonstration of key technologies for green and intelligent production of rice and wheat in Jiangsu;

(2) R&D and machine assembly of new high-efficiency transmission systems and intelligent hitch systems with double clutch structure for big tractors;

(3) R&D of key technologies and equipment for grain machine harvesting and post-harvesting quality guarantee and loss reduction;

(4) R&D of technologies and equipment for information monitoring and environmental intelligent control of livestock and aquiculture;

(5) R&D of technologies and equipment for intelligent irrigation and drainage of well-facilitated farmlands;

(6) R&D of monitoring and early warning technologies for agricultural and forestry diseases and pests;

(7) R&D of tools and systems for automatic detection of danger signs in recently harvested agricultural products.

(8) Research, development and industrialization of small and medium-sized intelligent and efficient caterpillar tractors in hilly and mountainous areas

(9) Research, development and application of new energy power chassis in hilly and mountainous areas

(10) Research, development and industrialization of dynamic intelligent shift transmission assembly for small and medium-sized tractors

(11) Research, development and application of riding rice transplanters in hilly and mountainous areas

(12) Research, development and application of complete harvesters for ratoon rice

(13) Research, development and industrialization of self-propelled tea pickers in hilly and mountainous areas

(14) Research, development and application of multi-functional afforestation equipment for characteristic economic forests

(15) Research, development and application of complete equipment for efficient crushing and utilization of trees infected with pine wood nematode

(16) Research and development of full-scene autonomous operation systems and equipment for orchards

(17) Research and development of unmanned technologies and equipment for intelligent fruit sorting

(18) Research and development of key technologies and equipment for treatment of heading vegetable fields

(19) Research, development and industrialization of equipment for

industrialized production of high-quality forage

(20) Research, development and application of energy-saving and water-saving equipment for modular aquaculture

(21) Research, development and application of whole-process mechanized equipment for mudflat shellfish aquaculture

(22) Research, development and application of automatic longline fishing equipment on fiberglass fishing boats

#### 4. Forward-looking Agricultural Technologies

(1) Molecular analysis of significant agricultural attributes and precision breeding technologies;

(2) Key technology research and component manufacturing of agricultural biosensors for complex environment;

(3) Research into immune systems and the creation of new vaccines for major livestock, poultry and aquatic product illness;

(4) Key technologies for the additive manufacturing of plant-based design and restructured foods.

(5) Research and industrialization of key technologies for extracting “lactoferrin” from transgenic rice

(6) Research and development of new veterinary herbal medicine and imported adjuvants to replace animal vaccines

(7) Research, development and application of nano bactericides

#### 5. Green Development of Agriculture

(1) Key technologies for green and low-carbon agricultural

production based on biodiversity goals;

(2) Research on the application of graphene electrothermal film and other energy-saving new materials in facility agriculture;

(3) Key technologies for reducing greenhouse gas emissions and utilizing low-carbon aquaculture in freshwater fish farming;

(4) Collaborative technologies for quality improvement, carbon sequestration and emission reduction of well-facilitated farmlands;

(5) Important technological advancements for precision, low-carbon and reduced application of chemical fertilizers and pesticides;

(6) Key processes for creating organic fertilizers from biomethanol based on biogas and green hydrogen.

(7) Research, development and demonstration of technologies for development and safe production of new rice seed sources with ultra-low cadmium accumulation

(8) Research and industrialization of key technologies for high-quality seed multiplication of superior and characteristic vegetables

(9) High-quality seed multiplication technologies and industrialization of superior and characteristic oil crops

(10) Research on key technologies for industrialization of genetically modified superior varieties of crops such as corn and soybean

(11) Research and industrial application of high-yield and high-efficiency cultivation models of the multiple cropping system of dry grain



(12) Research and industrialization of key technologies for improving the quality of grafted melons

(13) Research and application of key technologies for high-efficient cultivation of alpine vegetables

(14) Development and industrialization of new and efficient biological pesticides for vegetable diseases and pests

(15) Research and application of key technologies for carbon sequestration and sink enhancement of the mangrove ecosystem

(16) Research and application of key technologies for quality improvement and sink enhancement of main forest types in Zhejiang Province

(17) Research on the mining and industrialization technologies of new high-quality forest food resources

(18) Research and application of digital technologies for high-efficient cultivation of characteristic fruit trees

(19) Research and industrialization of technologies for efficient and precise cultivation of orchid throughout the industrial chain

(20) Agricultural engineering technologies of non-cultivated land facilities and their large-scale application

(21) Key prevention and control technologies and product development of livestock and poultry pox viruses

(22) Research and application of key technologies for regional purification of important epidemic diseases of livestock and poultry

(23) Research and industrialization of key technologies for efficient and low-carbon livestock and poultry breeding based on feed grain reduction

(24) Development and application of key technologies for cage engineering in terrible deep sea and ocean environments

(25) Research, development and application of functional compound feed containing precise nutrition for parents and seedlings of freshwater fish and shrimp

(26) Research and application of green prevention and control technologies for iridovirus diseases affecting aquatic animals, based on big data analysis

(27) Ecological research on important zoonosis pathogens and development of source blocking technologies

(28) Research and application of key technologies for monitoring and controlling red fire ants

(29) Research, application and demonstration of key technologies for green prevention and control of diseases and pests for superior woody grain and oil plants in Zhejiang Province

(30) Research, development, demonstration and promotion of key technologies for ecological management of characteristic and genuine medicinal materials in the “Daxiajiang” region

(31) Research and demonstration of key technologies for virus-free seedling breeding and high-quality and efficient ecological cultivation of

## Citrus tangelo

(32) Breakthroughs, promotion and demonstration of technologies for new varieties, cultivation of functional drought-resistant rice and efficient ecological planting and breeding under the trend of non-grain transformation

(33) Research on technologies for the breeding of *Wikstroemia canescens* varieties and high-efficient cultivation of plantations

## 6. Intensive Processing of Agricultural Products and Their Nutrition and Health

(1) Efficient extraction of functional components of marine organisms and their product development;

(2) Key technological advancement for agricultural goods' post-harvesting preservation and processing quality enhancement.

(3) Research, development and industrialization of tea polyphenol nano-carrier technologies

(4) Research, development and industrialization of new products with high antibacterial efficiency of secondary metabolites from forest sources

(5) Higher value and cascade application of local berries in Zhejiang, as well as research and development of relevant health products

(6) Research, development and application of functional factors of camellia oleifera

(7) Research and application of key technologies for cold-chain

logistics intelligence of fresh agricultural products

(8) Research and development of key technologies and equipment for intelligent processing of famous tea

(9) Research, industrialization and demonstration of key technologies for comprehensive utilization of medicinal resources of *Citrus maxima* (Burm) Merr.

#### 7. “Non-grain” Soil Treatment

(1) Research, development and utilization of key technologies for the health remodeling of the microbial community in “non-grain” soil

(2) Research on key technologies for the rapid maturation of “non-grain” soil alongside rice productivity improvement

(3) Research on technologies for risk assessment of obstacle factors of “non-grain” soil

(4) Research and development of key technologies and products for “non-grain” soil acidification and salinization reduction

(5) Integration, application and demonstration of soil improvement and rapid restoration technologies for seedling and sod rehabilitation

(6) Research on key technologies for the ecological restoration of major pollutants in “non-grain” soil

(7) Research on technologies for reducing cadmium and enriching selenium in the agricultural products of high geological background areas

(8) Research, development and industrialization of highly effective soil microbial agents

(9) Research and development of bio-organic fertilizers from seafood wastes

(10) Research on technologies for the preparation and improvement of carbon-based fertilizers based on agricultural and forestry wastes

(11) Research and application of technologies for the rapid reconstruction of “non-grain” soil plough layers

(12) Technologies for risk assessment and green prevention alongside the control of diseases and pests in reclaimed farmlands and modified soil

(13) Research on models for high-efficient underwood cultivation with “non-grain” soil

(14) Research on models for planting and breeding of high-efficient compound rice in “non-grain” soil

(15) Research, development and integrated demonstration of technologies for high-efficient compound planting of grain and oil crops in “non-grain” and “non-agriculture” soil in the southwest of Zhejiang Province