

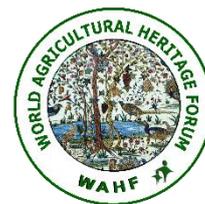
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# **Green Sustainable Agriculture Standard**

**Voluntary Sustainability Standards**

**Initiated by the World Agricultural Heritage Forum**



[www.worldagriculturalheritage.org](http://www.worldagriculturalheritage.org)

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## **Green Sustainable Agriculture**

### **Standard for Rice**

**(No-Chemical Synthetic Pesticides and Fertilizers)**

**GSAS 00002-2020**

**Adopted in 2021.**

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# Introduction

## 0.1 General Provisions

The scope of setting this Standard is to contribute to the implementation of long term plan set up by the Shanghai Municipal Government in the “13th five-year plan for the development of Chongming world-class ecological island” and to develop strategies of building a modern and comprehensive green-agricultural development framework , and closely follow the theme of Chongming “World-class Ecological Island” construction and to implement the “Policy and technical recommendations on Accelerating the Development of Chongming Green Agriculture”. Through a technical cooperation project (TCP/CPR/3702), the Food and Agricultural Organization of the United Nations (FAO) introduced several innovative rice production technologies and relevant agricultural best practices, so as to support the Chongming District in Shanghai to explore a sustainable development model in the agricultural sector that is called “No-Chemical synthetic Pesticides and Fertilizers” agriculture, and the “Green sustainable Rice System of No-Chemical synthetic Pesticides and Fertilizers” (hereby referred to as “Green sustainable Rice System”) and related standard setting of this initiative.

The North Subtropical Climate, diversified landscapes and abundant high-quality natural resources such as water, soil, forest and air make it possible in Chongming Island to produce agricultural products without using Chemical synthetic pesticides and fertilizers. It follows principles, requirements and key components of FAO’s Agroecological principles<sup>1</sup> and Sustainable Agricultural and Food Systems Development, as well as agricultural heritage criteria, while ensuring the quality attributes such as sensory and nutritional values, taking into account the resource, energy, environment and ecological indicators, so as to promote the optimization and improvement of the regional natural environment by the green sustainable rice production and processing.

Chemical synthetic Standardization and quality certifications are internationally recognized methods and important technical support for product quality improvement. The establishment of the international green sustainable standard for rice and certification system will effectively promote better and faster development of public agricultural product brands in the Chongming District. It will play an important role in building the “World-class Ecological Island” in the Chongming District; guiding the sustainable development of regional economy, society and ecology; highlighting the demonstration role of Shanghai as the core area of the Yangtze River Delta Economic Belt and the significant driving role of expanding to the surrounding areas. It can also set a benchmark for FAO’s agroecology and Sustainable Urban Food Production

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<sup>1</sup> FAO’s 10 Elements of Agroecology: Diversity; synergies; efficiency; resilience; recycling; co-creation and sharing of knowledge; human and social values; culture and food traditions; responsible governance; circular and solidarity economy.

Agenda in transferring and expanding to the world, in order to promote sustainable agriculture and food systems development.

## 0.2 Principles

Referring to the rules, principles and standards of international sustainable agriculture, international organic agriculture, agricultural heritage, and Chinese organic products and green food, the green sustainable agriculture, based on the principles and requirements of sustainable agriculture and agricultural heritage development, advocates not to use chemical synthesized pesticides and fertilizers in the whole process of production and processing.

Specifically, the Green Sustainable Agriculture follows the four major principles: 1) principle of sustainable development oriented; 2) principle of not using chemical synthetic pesticides and fertilizers (through positive list management); 3) principle of all production process coverage; 4) principle of highlighting the five criteria of agricultural heritage.

## 0.3 Structure of Standard

In line with the whole process of production and processing of Green Sustainable Rice products, Figure 1 shows the structural relationships of Chapters 5 to 9 of this standard.

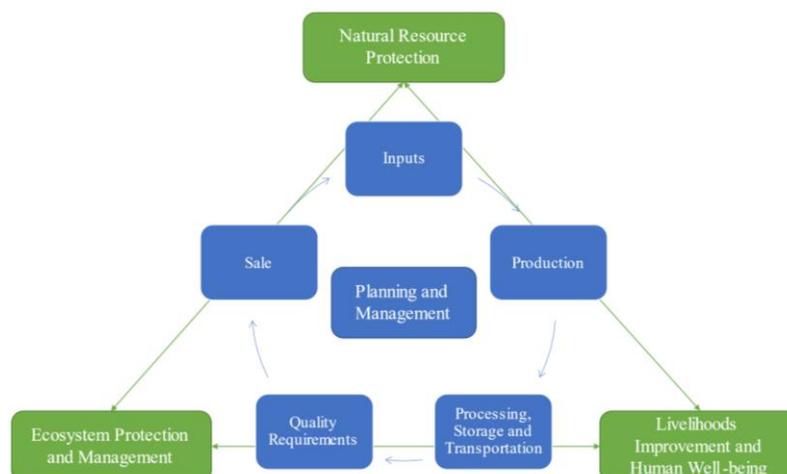


Figure 1: Structure of the Standard and relationship of each chapter, among which:

- Planning and management: on the basis of the ISO management system, establish a management and process control system for green sustainable agriculture to meet the requirements of production and processing.
- Control of the entire production process stages: focusing on the links of rice production and processing, covering process requirements such as inputs management, production, processing, storage and transportation, quality and safety, and sales.
- Sustainable elements: it is composed of three parts: natural resource protection, ecosystem protection and management, and improvement of livelihoods and human well-being, highlighting the sustainable agriculture principles.

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# Green Sustainable Agriculture

## Standard for Rice

### (No-Chemical synthetic Pesticides and Fertilizers)

#### 1. Scope

This standard specifies the requirements of production and processing of rice applying the green sustainable agriculture method of “no-Chemical synthetic pesticides and fertilizers”; it includes planning and management, entire value chain control, ecosystem protection and management, natural resource protection, livelihood improvement and human welfare.

This standard applies to control and management of the whole process of green sustainable rice production and processing, as well as evaluation and certification conducted by relevant parties.

#### 2. Normative References

The following documents are the essential normative reference to this standard. For dated references, shall apply to the dated versions only; for undated references, only the latest version (including all amendments) shall be applied to.

GB/T 19630-2019	Organic Products - Requirements for Production, Processing, Labeling and Management System
GB/T 20014	Good Agricultural Practice
GB/T 22000/ISO 22000	Food safety Management Systems
SAN	Sustainable Agriculture Standard
JAS	JAS Standards for organic plants and organic processed foods of plant origin
NOP	National Organic Program (NOP) of the United States
EU	European Union Organic Farming Rules

#### 3. Terms and Definitions

The following terms and definitions apply to this document.

##### 3.1 Sustainable Agriculture

The management and conservation of the natural resource base, and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations. Sustainable agriculture conserves land, water, and plant and animal genetic resources, and is environmentally non-degrading, technically appropriate, economically viable and socially acceptable.<sup>2</sup>

##### 3.2 Green Sustainable Agriculture (No-Chemical synthetic Pesticides and Fertilizers)

The rice is produced for human consumption without using Chemical synthetic pesticides and fertilizers in the whole process of production and process and follows the concept and method of sustainable development.

*Examples: chemical synthetic pesticides and fertilizers include but are not limited to: pretilachlor, carbofuran, urea, etc.*

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<sup>2</sup> FAO, 1998 (<http://www.fao.org/3/u8480e/u8480e01.htm>).

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**3.3 Parallel Production**

The same crop is planted on green sustainable and conventional (or transitional) fields at the same period.

**3.4 Conversion Period**

The period from the beginning of management per this standard to production and product certification following this standard.

**3.5 Input**

All substances and materials used in the production process.

**3.6 Buffer Zone**

The transition area between the production area conforming to this standard and the conventional production area, which can be clearly defined to limit or block the prohibited material drift in the adjacent conventional area.

**3.7 Biodiversity**

The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

**3.8 Natural Ecosystem**

An ecosystem with similar species composition, structure and function, found or to be found in a specific area without significant human management impact.

**3.9 Natural Reserves**

Areas declared or designated by international and local authorities are protected due to their recognized natural, ecological and/or cultural values, so as to realize long-term protection of natural and related ecological assets and cultural values.

**3.10 High Protection Value Area**

Regions that are considered to have extremely important or very important values in terms of biology, ecology, society or culture in terms of countries, regions and the world.

**3.11 Non-Native Species**

Plants or animals that are not naturally found in an area, the accidental or deliberate introduction of which has or is likely to cause economic or environmental harm.

**3.12 Agricultural Production Waste**

Waste produced as a result of various agricultural operations. It includes manure and other wastes from farms, poultry houses and slaughterhouses; harvest waste; fertilizer run-off from fields; pesticides that enter into the water, air or soils; and salt and silt drained from fields.

**4. Principles**

The Green Sustainable Agriculture follows the four major principles:

- 1) principle of sustainable development oriented;
- 2) principle of not using chemical synthetic pesticides and fertilizers (through positive list management);
- 3) principle of all production process coverage; and
- 4) principle of highlighting the five criteria of agricultural heritage, namely: Food and livelihood security; Agrobiodiversity; Local and traditional knowledge systems; Cultures, value systems and social organizations; and Landscape and seascape features

## **5. Planning and Management**

### **5.1 Boundary Scope**

The green sustainable rice producers and processors shall reasonably demarcate the physical boundaries of green sustainable rice production and process, draw the location maps, divide the production, processing and other areas with respective marks, and conduct a regular review, including but not limited to the followings:

- a) boundary delineations of production and processing;
- b) list of total area, including production areas and natural ecosystem areas;
- c) location of planting plots, distribution of processing and management areas;
- d) information on each production plot/unit other main markers that can indicate the characteristics of the plot/unit;
- e) distribution of processing, packaging workshop, warehouse and related equipment;

### **5.2 Management Policy**

It shall formulate policies of green sustainable rice production, processing and operation management, set up management objectives, principles and requirements, and form corresponding systemic documents.

### **5.3 Responsibilities and Duties**

**5.3.1** According to the management policy, it shall establish and improve the internal responsibilities and authorities to ensure the implementation of management policy.

**5.3.2** The green sustainable rice producers, processors and operator shall meet the following requirements:

- a) one of the main managers in charge of the unit;
- b) understands relevant national laws, regulations and requirements;
- c) understands the requirements of this Standard and sustainable development;
- d) is familiar with the production, processing and operation management system and process of the unit.

**5.3.3** Internal inspectors shall be appointed by the green sustainable rice production, processing and operation enterprises, and meet the following requirements:

- a) understands relevant national laws, regulations and requirements;
- b) is relatively independent from the object to be inspected;
- c) is familiar with and understands requirements of this Standard and related natural resources (soil, water and air); and
- d) is familiar with the production, processing and operation management systems and process of the products.

## **5.4 Target Planning**

- 5.4.1** According to management policy, production and processing cycle, the corresponding specific management targets shall be formulated by the green sustainable rice production, processing and operation enterprises.
- 5.4.2** The planning and formulation of specific management targets shall cover the whole process of production and processing, as well as regional ecological environment protection. The targets shall be quantifiable, operable and inspectable.
- 5.4.3** According to the realization of management targets and changes in the regional environment, timely assessment for the targets shall be carried out, and corresponding targets change plan shall be formulated and implemented.
- 5.4.4** The management systems of target planning and change assessment shall be developed and implemented.

## **5.5 Resource Management**

- 5.5.1** The rice production, processing and operation shall have resources to be suitable for the area, scale and technologies.
- 5.5.2** All natural resource management within the area shall meet the corresponding requirements of this Standard.
- 5.5.3** The resources shall be reviewed regularly according to the needs, to ensure that resources meet the requirements of production, processing and other processes.
- 5.5.4** The corresponding system documents for resource management shall be formulated and implemented.

## **5.6 Personnel Training**

Managers of production, processing, operation and ecological environmental protection shall formulate, establish and implement training plans, and train employees in accordance with the plan to equip them with the qualifications and abilities to carry out corresponding work and meet the requirements of this Standard.

## **5.7 Document Management**

### **5.7.1 Document Content**

The management documents of green sustainable rice production, processing and operation systems and regional ecological environment shall include:

- a) location maps of production, processing, operation and other places;
- b) schematic diagram of the ecological environment within the boundaries, such as natural reserves, local vegetations, and wildlife reserves, etc.;
- c) processes and flow charts of production, processing and operation, as well as relevant measures for regional ecological environment protection; and
- d) operation procedures and corresponding records of production, processing, operation and regional ecological environment protection.

### **5.7.2 Document Management**

The documents required by the production, processing and operation management systems and regional ecological environment protection management shall be up-to-date and effective, and the valid versions of applicable documents shall be available during use.

Relevant regulations, requirements, methods and records in the documents of production, processing and operation management system shall be recorded.

### **5.7.3 Operation Procedures**

The procedures for production, processing, operation and regional ecological environment protection shall be formulated and implemented, which shall at least include:

- a) crop calendar and technical regulations for green sustainable rice production; it shall show the expected dates of field activities, at least including: timing of major operations (e.g., land preparation, planting, harvest), and timing of major fertilization and water management activities (e.g., irrigation).
- b) preventive measures to prevent pollution by prohibited substances in the process of production, processing and operation;
- c) measures are taken to prevent products from mixing with non-green sustainable rice products;
- d) harvesting procedures and operating procedures for post-harvest processing, transportation, storage and other aspects;
- e) health management and pest control regulations in processing areas;
- f) maintenance and cleaning procedures for transportation, mechanical equipment and storage facilities;
- g) management procedures for label and batch number.

### **5.7.4 Records**

Records shall be established and maintained according to the management system and operating procedures. The records shall be clear and accurate to provide effective evidence for production, processing, operation and ecological protection activities. The records shall be kept for at least 5 years and shall include but not limited to the following contents:

- a) historical records of production units, time of using prohibited substances, usages;
- b) information on the varieties and sources;
- c) information on the type, quantity, use date, application area and operator of fertilizers applied for soil fertility;
- d) information on name, effective composition, use reason, use amount, use date, application area and operator of diseases, insects and weed control substances;
- e) account records (source, purchase quantity, supplier, usage direction and quantity, inventory quantity, etc.) and purchase documents of all production inputs;
- f) harvest record, including variety, quantity, harvest date, harvest method, production batch number, etc.;
- g) processing records, including raw material source, warehousing, processing process, grade, packaging, identification, storage, inspection, warehousing, transportation records, etc.;
- h) records of pest control and cleaning of processing, transportation and storage facilities in the processing area;
- i) management records of marks use and sales records;
- j) internal training records;
- k) internal inspection records.

## **5.8 Traceability Management**

### **5.8.1 Traceability, Product Recall and Complaints**

- 5.8.1.1 An effective product recall system shall be established and maintained, including conditions of a product recall, handling of recalled products, corrective measures, follow-up tracking of customers, etc., and all records in the process of product recall shall be kept, including recall, notice, remedy, cause and handling, etc.
- 5.8.1.2 Traceable mark means shall be established, including the use of labels, marks, labels and records.
- 5.8.1.3 It should be identified and recognized the inputs that need for traceability, set up the requirements of material characteristics, and make clear requirements for traceability management of the suppliers.

## **5.8.2 Signage Management**

- 5.8.2.1 It shall strengthen the mark management on products and processes. The text, figures, or symbols in the logo shall be clear.
- 5.8.2.2 The process mark shall be classified and managed according to the production and processing, and corresponding management specifications shall be formulated, which shall at least meet the following requirements:
- a) purpose, application scope, use specifications and examples of various marks shall be specified;
  - b) all kinds of marks shall be distinguished to avoid misuse;
  - c) mark content used for raw materials shall reflect the name, production unit or number, harvest date, acceptance results of raw materials, etc.;
  - d) the mark content used for products shall include the batch number and product information, etc.

## **5.9 Internal Inspection**

- 5.9.1 An internal inspection system shall be established to ensure that the production, processing, operation and management processes of products meet the requirements of this Standard.
- 5.9.2 The internal inspection shall be undertaken by the internal inspector and the corresponding records shall be kept.
- 5.9.3 The responsibilities of internal inspectors shall include:
- a) according to the requirements of this Standard, check the operation and management system of the enterprise, and put forward rectification opinions for the contents violating the requirements of this standard;
  - b) according to the requirements of this Standard, inspect the production, processing, operation and other process implementation links of the enterprise, and put forward rectification suggestions; and
  - c) cooperate with the inspection and certification of a third-party certification authority.

## **5.10 Continuous Improvement**

It shall continuously improve the production, processing and operation management system to ensure the effectiveness of the management system and process. The specific requirements include but are not limited to the following:

- a) regularly analyze the use, production and processing records of inputs;
- b) regularly monitor the regional ecological environment;
- c) identify the causes of nonconformity or potential nonconformity;
- d) evaluate the resources to be implemented or coordinated to ensure no replication of nonconformity;

- e) clear implementation measures and requirements;
- f) result records of measures taken and requirements; and
- g) effectiveness review of measures and requirements.

## **6. Control of Entire Value Chain**

### **6.1 Input Management**

#### **6.1.1 Procurement Management**

- 6.1.1.1 Priority should be given to purchasing seed varieties that are suitable for local soil and climate environment, and have good resistance to disease and insects, taste and nutrition value. The genetic diversity should be protected in the process of variety selection and breeding.
- 6.1.1.2 It should ensure that seeds purchased cannot be obtained by genetic modification technologies.
- 6.1.1.3 Seeds and seedlings should be cultivated according to the production methods adopted by this Standard.
- 6.1.1.4 Plant protection products, fertilizers, growth regulators, additives and other inputs that meet the requirements of green sustainable agriculture should be selected to maintain and improve air quality, water quality, soil environment and soil fertility. maintain product properties and biodiversity, reduce soil erosion and eutrophication, reduce water damage and air pollution, and protect the field health.
- 6.1.1.5 It should ensure that seeds cannot be obtained by genetic modification technologies.
- 6.1.1.6 Seeds and seedlings should be cultivated according to the production methods adopted by this Standard. It should not use prohibited substances and methods to treat seeds and other materials.
- 6.1.1.7 The purchased seeds should be accompanied by the following records: variety name, batch number, supplier, seed quality certificate and quarantine certificate, and/or information on seed processing; etc. The self-retained seeds from farms shall retain records of seed characteristics, source and processing.

#### **6.1.2 Use Management**

- 6.1.2.1 It should not use prohibited substances and methods to treat seeds and other materials.
- 6.1.2.2 It should take measures to protect and maintain the bred good varieties.
- 6.1.2.3 It should use the plant protection products, fertilizers, growth regulators, additives and other inputs that meet the requirements of green sustainable agriculture, to maintain product properties and biodiversity, reduce soil erosion and eutrophication, reduce water damage and air pollution, and protect the field health.
- 6.1.2.4 Chemical synthetic fertilizers, untreated production and domestic sludge shall not be used.
- 6.1.2.5 Chemical synthetic plant protection products shall not be used. When the sustainable planting management measures are not enough to maintain the soil fertility and rice field health, the external inputs shall be selected from the inputs list provided in Appendix A and be used according to the specified conditions. Prohibited substances shall not be detected in the inputs.
- 6.1.2.6 Producers and operators shall promise not to use chemical synthetic pesticides and fertilizers in the whole production process of green sustainable rice production.

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### **6.1.3 Storage and Transport**

- 6.1.3.1 It shall formulate and implement the supplier management evaluation and assessment mechanism, and form a corresponding documented procedure to ensure that suppliers meet the requirements of this Standard for product compliance control, and guide the relevant stakeholders of the supply chain for green and sustainable development.
- 6.1.3.2 Suppliers responsible for providing inputs and services, and participating in product processing, transportation and other processes shall provide effective evidence to prove that their qualifications and capabilities that meet the requirements.
- 6.1.3.3 It shall implement dynamic management of suppliers, timely eliminate unqualified suppliers or operators, add new qualified suppliers or operators, and introduce qualified third-party organizations to participate in management if necessary.
- 6.1.3.4 It should establish a green supply chain management system according to the requirements of ecological environment protection, so as to minimize the negative impact of products on the environment and maximize the efficiency of resource utilization in the whole process of production, processing, transportation and waste treatment, etc.

## **6.2 Production Process**

### **6.2.1 Origin Environment**

- 6.2.1.1 The boundary of the production area or unit shall be clear and obviously marked, which shall meet the relevant requirements in “5. Planning and Management” of this Standard.
- 6.2.1.2 The production needs to be carried out under suitable environmental conditions, and the production base needs to meet the requirements of “7. Natural Resource Protection” in this Standard, and be far away from the urban areas, industrial zones, traffic trunk lines, industrial pollution sources and domestic waste yards, etc. The production area could have a natural isolation zone.
- 6.2.1.3 The environmental quality (air, irrigation water and soil environmental quality) of the place of production should comply with the relevant laws and regulations of the country where it is located, and the requirements of agricultural production.
- 6.2.1.4 The risks of contamination of production areas by adjacent areas should be analyzed. If risks are identified, an effective buffer belt or physical barrier shall be set between the production areas and other areas to prevent the production of land from pollution.

### **6.2.2 Conversion Period**

- 6.2.2.1 It requires a conversion period from conventional production to the production meeting the requirements of this Standard, and the paddy produced only after the conversion period can be used as the processing raw material of green sustainable rice. Production activities during the conversion period shall fully meet the requirements of this Standard.
- 6.2.2.2 The conversion period shall be at least 24 months before sowing. For newly reclaimed land, abandoned land for more than 36 months or land with sufficient evidence proving that no prohibited substances in this Standard have been used for more than 36 months; the conversion period may be shortened appropriately, but at least be 12 months.

6.2.2.3 If the prohibited substances in this standard are used for the plot in the conversion period, the conversion shall be restarted.

6.2.2.4 The setting of the conversion period can be extended according to local environmental monitoring and soil pollution.

### **6.2.3 Parallel Production**

It should meet the general principles and requirements of relevant national standards or international general methods.

### **6.2.4 Cultivation**

6.2.4.1 It should restore and improve soil fertility through winter fallow, ploughing and planting green manure, and control the breeding of diseases, pests and weeds. In the process of cultivation and planting, it shall pay attention to the maintenance of biodiversity.

### **6.2.5 Soil and Fertilizer Management**

**6.2.5.1** The cultivation measures shall be reasonably arranged to maintain and improve soil fertility, including:

- a) encouraging the implementation of green sustainable rice-legume crops rotation;
- b) applying sustainable production methods, such as returning straw to the field etc., to supplement the organic matter and soil nutrients taken from the soil after harvest; and
- c) by planting green manure in winter, following land and other ways to restore soil fertility.

**6.2.5.2** If the measures in 6.2.5.1 cannot meet the needs of rice growth, soil fertility can be maintained by applying organic fertilizer. However, strict application rates and methods shall be formulated.

**6.2.5.3** The source of organic fertilizers should be provided in this local area, or the areas certified by this Standard.

**6.2.5.4** The applicable soil fertilities and improvement materials are shown in table A.1 of Appendix A.

### **6.2.6 Integrated Pest Management (IPM)**

6.2.6.1 The pest management and control should be based on the principles of IPM, sustainable and ecological agriculture and circular ecosystem, comprehensive use of a variety of control measures, to create the natural environment conditions that discourage the development of pest populations, in order to maintain the balance of the ecosystem, and to naturally reduce the yield loss caused by pests and weeds.

6.2.6.2 If none of the above operations can effectively control pests and weeds, the plant protection products listed in table A.2 of Appendix A can be used.

### **6.2.7 Harvest**

6.2.7.1 It shall establish the corresponding harvest time according to the different maturity of rice varieties to ensure the normal harvest and quality assurance of rice.

6.2.7.2 The harvesting equipment shall be cleaned to avoid product pollution. Harvest shall be made in batches according to the production area or field, and manage the marks.

6.2.7.3 The harvested paddy shall be dried in the designated special site, and the drying site shall be subject to basic cleaning management and isolation protection to prevent the paddy from being polluted.

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## **6.2.8 Pollution Prevention and Control**

- 6.2.8.1 It shall monitor and analyze whether the production area conforming to this Standard will be polluted by the adjacent conventional production areas and the pollution level. If there is a possibility of pollution, a buffer zone or isolation zone of the corresponding area shall be set between the two areas according to the severity of the impact to prevent the area from conforming to this Standard from potential pollution.
- 6.2.8.2 Appropriate measures shall be taken to prevent water penetration or immersion from the conventional production to the area conforming to this Standard.
- 6.2.8.3 Wastewater and sewage generated during the production process shall be collected and discharged to the designated place after the treatment reaches the standards, and shall not be dumped that to cause water pollution.
- 6.2.8.4 No-spraying area or physical isolation measures shall be set up to prevent the prohibited substances spraying or air pollution in the conventional area from affecting the area conforming to this Standard.
- 6.2.8.5 If the equipment in the conventional production area needs to be used in the area conforming to this Standard, clean measures to the equipment shall be taken before use to avoid the pollution of the area caused by prohibited substances or other mixed substances from the conventional area.
- 6.2.8.6 Prohibited substances shall not be used when cleaning the equipment, residues of cleaning substances shall be avoided, and product pollution shall be avoided.
- 6.2.8.7 The paddy shall be stored separately from the product. It shall ensure the space around the stacking and between the wall, in order to keep the ventilation and avoid the breeding of diseases and pests.
- 6.2.8.8 The internal transportation pipeline shall be cleaned regularly and timely to avoid product pollution caused by material retention in the pipeline.

## **6.3 Processing, Storage and Transportation**

### **6.3.1 Processing**

- 6.3.1.1 The processing should meet the requirements of product inspection indicators, and should not damage the main nutrients of the product.
- 6.3.1.2 Necessary measures shall be taken to prevent contamination of green sustainable rice products by mixing conventional products and other substances out of the approved list.
- 6.3.1.3 The processing should comply with the mandator's national standards. The processing water shall meet the corresponding requirements of the national standard, and no substances can be added to during the production process.
- 6.3.1.4 Screening materials containing prohibited or harmful substances shall not be used.
- 6.3.1.5 The processing area shall be reasonably divided. Rules and regulations, process flow chart, equipment operation requirements, etc. shall be indicated in the processing area; For areas restricted by site conditions, when the same processing area needs to be used for different functions at different times, the schedule for the processing area should be reasonably determined.

### **6.3.2 Package**

- 6.3.2.1 It is encouraged to use the packaging materials in wood, bamboo, plant stem and leaf and environmental protection paper, and the biodegradability and recyclability of the packaging materials should be considered.
- 6.3.2.2 Bags or containers which have been treated or contacted with prohibited substances cannot be allowed to use to contain the products of this Standard.
- 6.3.2.3 The packaging should be simple and practical to avoid over-packaging.
- 6.3.2.4 The product mark, name, list of ingredients, net content, specification, grade, place of origin, packaging date, shelf life, product standard code, food production license number, nutrition label, storage precautions, etc. shall be printed on the packaging surface, and the pattern and text content shall be clear, correct and firm.

### **6.3.3 Storage**

- 6.3.3.1 Paddy shall be stored by classification according to specifications and grades, and shall not be polluted by other substances during storage.
- 6.3.3.2 The storehouse and paddy shall be clean, free harmful substances.
- 6.3.3.3 In addition to normal temperature storage, the following methods can be used for storage:
  - a) air conditioning of storage room;
  - b) temperature control;
  - c) drying; and
  - d) humidity control.

### **6.3.4 Transportation**

- 6.3.4.1 During the transportation of paddy in pipelines of the processing steps, it shall pay attention to the quantity of rice to avoid product contamination due to clogging or stalling.
- 6.3.4.2 Before loading the standard products, the means of transport shall be cleaned to avoid product pollution.
- 6.3.4.3 In the process of transportation, the products shall not be mixed with other conventional products or subject to other pollution, the transportation environment shall be controlled reasonably, and the products shall not be polluted or deteriorated due to excessive stacking or poor transportation conditions.
- 6.3.4.4 During the transportation, loading and unloading of products, the integrity and cleanness of the outer package shall be ensured, and there shall be no-damage and stain, and the product mark and text information on the outer package shall not be stained.

### **6.3.5 Pest Control**

- 6.3.5.1 Priorities should be given to the following methods for pest control:
  - a) eliminate the environmental conditions for breeding harmful pests;
  - b) adopt physical isolation and other methods to prevent harmful pests from contacting process equipment and corresponding areas; and
  - c) set and control the temperature, humidity, light, air and other conditions to prevent the reproduction of harmful pests.

6.3.5.2 It can use catching tools, physical isolation, acousto-optic appliances in mechanical, odor, color, pheromone, adhesive facilities and materials for pest control.

6.3.5.3 The disinfectant approved by the national competent department may be used appropriately to disinfect the processing, storage, transportation process and environment, but the residual disinfectant of toxic and harmful substances shall be forbidden.

## **6.4 Quality Requirements<sup>3</sup>**

### **6.4.1 Hygiene Requirements**

6.4.3.1 Rice products shall meet the requirements of national laws and regulations. The producers and processors of green sustainable rice promise no-use of chemically synthesized pesticides and fertilizers.

6.4.3.2 Products should be implemented in line with national food safety standards and relevant national regulations.

### **6.4.2 Paddy Quality Indicators**

Green sustainable rice paddy quality indicators. Inspection methods and rules are implemented in line with relevant national standards and regulations.

#### **6.4.3.1 Quality indicators**

Green sustainable rice quality indicators please see Table 2. Inspection methods and rules are implemented in line with relevant national standards and regulations.

#### **6.4.3.2 Sensory test indicators**

- a) the size of kernels is consistent, and it has the inherent aroma of rice;
- b) kernels are translucent or has a light milky color;
- c) the cooked rice should have a unique rice flavor. During the cooking process, the surface of rice should have a clear water-retention membrane (i.e., a layer of transparent viscous liquid). The surface of the rice should be glossy, soft and elastic. After cooling, the viscosity of the rice should be significantly increased and still maintain a good taste; and
- d) inspection methods shall be carried out according to relevant national standards or international general methods.

## **7. Natural Resource Conservation**

### **7.1 Germplasm Resources and Species Diversity Conservation**

**7.1.1** Green sustainable rice seeds shall not contain genetically modified ingredients and shall not be treated with genetically modified and similar substances.

**7.1.2** It can select the seeds suitable for the regional ecological environment for planting but shall not limit the varieties.

**7.1.3** It shall maintain the natural genetic characteristics of germplasm resources, and no human intervention shall be allowed to maintain the germplasm resources and species diversity.

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<sup>3</sup> These quality requirements are only for Japonica Rice – Keng varieties in this version of the Standard, as per actual rice production in the FAO TCP/CPR/3702.

## **7.2 Soil Management and Conservation**

- 7.2.1** Soil erosion by water and wind should be reduced by the use of vegetation such as ground cover and mulch vegetation restoration in steep slope areas, platforms and filter belts.
- 7.2.2** It shall adopt fallow, rotation and other methods to plant nitrogen-fixing ground cover plants, compost or mulch and other methods to maintain and promote soil health.
- 7.2.3** According to the needs of crops, it can establish the corresponding soil fertility and crop nutrition monitoring indicators for the soil in the production area, and the monitoring can be carried out at fixed points regularly.
- 7.2.4** According to the condition of soil health, soil fertility and crop demand, it is encouraged to make a precise fertilization scheme to minimize the amount of fertilizer and human environmental intervention.
- 7.2.5** In addition to the highway facilities within the boundary, another land should control the vehicle access time and vehicle size to reduce the hardening of soil.

## **7.3 Water Resources Conservation**

- 7.3.1** The production and domestic sewage within the boundary shall be treated accordingly and discharged normally only after meeting the water quality parameters required by laws and regulations. The untreated sewage shall not be discharged directly. The treatment and discharge points of production and domestic sewage shall be marked on the map within the boundary.
- 7.3.2** The extraction of surface or underground water sources for production, processing and other activities shall comply with the relevant national laws and regulations.
- 7.3.3** It can record the water consumption for production, processing and other activities, and a water consumption plan can be reasonably formulated to achieve the purpose of water conservation.

## **7.4 Energy Management**

- 7.4.1** If use biomass energy, the following measures should be taken to reduce the impact of the use of biomass energy on the natural ecosystem:
  - a) planting trees to increase the availability of biomass energy from artificial planting;
  - b) it mainly uses biomass energy within the boundary, and establishes a recyclable system;
  - c) install energy-saving devices on machines used in production, processing and other activities.

## **8. Ecological System Management and Conservation**

### **8.1 General Rules**

- 8.1.1** It shall take protection measures for all-natural ecosystems within the regional area, and corresponding management measures or requirements shall be formulated.
- 8.1.2** The production, processing, operation and other activities within the boundary should not directly or indirectly cause the degradation of the nature reserves in the regional area.
- 8.1.3** If there is a high protection value area within the boundary, targeted protection measures shall be formulated, and clear evidence shall be provided to prove that the high protection value area has not been damaged in the past ten (10) years.

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## **8.2 Local Vegetation Protection**

- 8.2.1** It shall maintain the existing local vegetation within and outside the natural ecosystem (no damaged forest or another natural ecosystem) within the boundary, including:
- a) shade trees near existing production areas;
  - b) existing vegetation area close to the aquatic ecosystem;
  - c) large local trees, except where they cause harm to people or infrastructure.
- 8.2.2** It shall prepare the map of production and processing area, on which shall be marked with the area information including the natural ecosystem and local vegetation coverage, such as coverage scope and proportion of the area.

## **8.3 Wildlife Protection**

- 8.3.1** It shall formulate measures for the protection of endangered wild plants. If it is necessary to collect them for medicinal or academic research purposes, the permission of the local competent authority shall be obtained.
- 8.3.2** It shall formulate the wild animal protection measures. Wild animals shall not be captive, nor endangered or protected animals shall be hunted or killed. If the animals are captive for treatment or humanitarian purposes, the permission of the local competent department shall be obtained.
- 8.3.3** It is not allowed to introduce or release invasive species. For species invasion caused by objective conditions, corresponding measures shall be formulated to protect local species and wild animals and plants.

## **8.4 Agricultural Waste Management**

- 8.4.1** The storage and treatment method of agricultural waste shall not affect the environment, animals, plants and human health and safety within the boundary, and the method with the least negative impact shall be selected for storage and treatment. Agricultural waste and straw shall not be incinerated.
- 8.4.2** The production, processing and other activities facilities and equipment within the boundary shall be kept clean, and the wastes shall be placed in an orderly manner in the designated storage and treatment place.
- 8.4.3** The organic waste shall be reused by composting or other organic treatment methods. Other wastes with still use-value shall be stored in the designated place for use.
- 8.4.4** The non-recyclable wastes shall be handed over to the designated waste treatment organization for unified treatment.
- 8.4.5** It is encouraged to intervene the agricultural waste management in the surrounding areas of production, processing and other activities to ensure that the waste management in the surrounding areas does not pollute the natural resources and ecological environment.

## **8.5 Emergency and Conflict Management**

The emergency management system shall be formulated and implemented for the entire process of production and processing, as well as the regional ecological environment management process. According to the principle of minimizing environmental impact, management procedures for emergency matter assessment, processing, and feedback system should be established to evaluate and improve the emergency preparedness and response speed. It shall formulate and implement the emergency management measures for ecosystem protection, including but not limited to the following:

- a) design and establish the infrastructure, on the premise of the minimizing of the impact, set up the plant fence isolation belt, with the height consistent with the crop height, physically isolate the production, processing area and the other areas, as well as to avoid conflicts between human and wild animals and plants;
- b) develop and implement emergency management measures for waste disposal.

## **9. Livelihoods Improvement and Human Wellbeing**

### **9.1 Occupational Health and Safety**

**9.1.1** The occupational health and safety management system shall describe and grade the risks according to the frequency and impact the degree of potential hazards, and establish the requirements for publicity, training, facilities and management procedures, including the establishment of regular medical examination, the establishment of first aid kits at corresponding positions in the area and the provision of labor protection equipment and facilities for employees, so as to prevent and reduce the health risk of those personnel working inside the area or other areas.

### **9.2 Employee Rights and Benefits**

**9.2.1** All forms of forced, compulsory or slave labor, child labor and discrimination in any form are prohibited, including any distinction, exclusion, or preference to invalidate or harm equality of opportunity or treatment in employment; and different pay to men and women for work of equal value.

**9.2.2** All workers receive no less than the legal minimum wage or wages negotiated collectively. Regular working hours do not exceed 48 hours per week, with at least one full day of rest for every six consecutive days worked. All overtime work is voluntary. Overtime does not result in a workweek exceeding 60 total hours, except under extraordinary circumstances.

### **9.3 Community Relationship**

**9.3.1** The production and living areas within the boundary shall be reasonably divided so as not to interfere with each other or infringe upon each other.

**9.3.2** It should establish an open communication mechanism to clarify the concerns and interests of relevant personnel in all aspects of production and life within the boundary.

**9.3.3** It shall establish and implement a grievance and handling mechanism to receive and respond to grievances from living areas and surrounding areas and record the handling results.

### **9.4 Public Benefit Activities**

**9.4.1** In order to promote local employment and improve the income level of local people, it should give priority to employing local personnel to participate in the work.

**9.4.2** It should take part in activities to improve the living standards and living conditions of the local people.

**9.4.3** It shall establish a sustainable development plan, publicize the development concept of sustainable and ecological agriculture to the surrounding areas and provide corresponding help.

## Appendix A

(Normative Appendix)

### Permitted Inputs in the Green Sustainable Rice Production

The allowed soil fertility and improvement substances in the green sustainable rice production are in Table A.1.

The allowed plant protection products in the green sustainable rice production are in Table A.2.

**Table A.1 soil fertility and improvement materials**

Category	Name and Composition	Conditions of Use
Plant and animal sources	Plant materials (straw, green manure, etc.)	—
	Manure and compost of livestock and poultry (including ring manure)	Composted and well-ripened
	Anaerobic fermentation products (biogas fertilizer) of animal manure and plant materials	—
	Seaweed or seaweed products	It can only be obtained directly through the following ways: physical process, including dehydration, freezing and grinding; extraction with water or acid and / or alkali; ferment
	Wood, bark, sawdust, shavings, ash, charcoal	From timber that has not been chemically treated after harvesting, covered or stacked
	Humic acids (natural humic acids such as lignite, weathered lignite, etc.)	Natural source, without chemical treatment and Chemical synthetic substance added
	By products from animal sources (blood powder, meat powder, bone powder, hoof powder, horn powder, etc.)	No prohibited substances are added, which are decomposed and harmless
	Fish meal, shrimp and crab shell meal, fur, feather, hair powder and its extract	It can only be obtained directly through the following ways: physical process; extraction with water or acid and / or alkali; ferment
	By products of food industry	After stacking or fermentation
	Plant ash	As a product of firewood combustion
	Canola meal	Cannot be chemically processed
Mineral sources	Phosphate rock	Natural source, cadmium content less than or equal to 90 mg/kg phosphorus pentoxide
	Potash powder	Natural sources are not concentrated by chemical methods. Less than 60% chlorine
	Borax	Natural source, without chemical treatment and Chemical synthetic substance added
	Trace element	
	Magnesium ore powder	

Category	Name and Composition	Conditions of Use
	Sulfur	
	Limestone, gypsum and chalk	
	clay (such as perlite, frog stone, etc.)	
	Sodium chloride	
	Kiln ash	Without chemical treatment or adding chemical synthetic substances
	Calcium magnesium carbonate	Natural source, without chemical treatment and chemical synthetic substance added
	Epsom salts	Without chemical treatment or adding chemical synthetic substances
Microbial sources	Biodegradable microbial processing by-products, such as those of the brewing and distilling industries	No chemical compounds added
	Microorganism and its extract preparation	Nontransgenic, no chemical compounds added

Table A.2 plant protection products

Category	Name and Composition	Conditions of Use
Plant and animal sources	Neem	Insecticide
	Natural pyrethroids (extract of pyrethroids)	
	Matrine and oxymatrine (extract of sophora flavescens, etc.)	
	Rotenone	
	Osthol (extract of osthol)	Insecticidal and fungicide
	Berberine (coptis, phellodendron and other extracts)	Bactericide
	Emodin methyl ether (extract of rhubarb, polygonum cuspidatum, etc.)	
	Vegetable oil (such as peppermint oil, pine oil, coriander oil)	Insecticide, acaricide, fungicide, germination inhibitor
	Oligosaccharide (chitin)	Fungicides, plant growth regulators
	Natural acids (such as vinegar, wood vinegar and bamboo vinegar)	Bactericide
	Propolis	Bactericide
	Gelatin	Insecticide
	Lecithin	Fungicide
	Plant extracts with repellent effect (extracts of garlic, peppermint, capsicum, zanthoxylum, lavender,	Repellent

Category	Name and Composition	Conditions of Use
	bupleurum and wormwood)	
	Insect natural enemies (e.g. trichogramma, ladybug, sand-fly, etc.)	Pest control
Mineral sources	Sulfur mixture	Fungicides, insecticides, acaricides
	Calcium hydroxide (lime water)	Fungicides, insecticides
	Potassium bicarbonate	Fungicide
	Paraffin oil	Insecticide, acaricide
	Calcium chloride	For the treatment of calcium deficiency
	Silicate (such as sodium silicate, potassium silicate, etc.)	Repellent
	Quartz sand	Fungicide, acaricide, repellent
	Diatomite	Insecticide
	Clay (such as bentonite, perlite, frog stone, zeolite, etc.)	
Microbial sources	Fungi and fungal extracts (e.g. acetabulum stiffness bacteria, verticillium, trichoderma, etc.)	Insecticidal, bactericidal, herbicide
	Bacteria and bacterial extracts (such as bacillus thuringiensis, bacillus subtilis, Bacillus cereus, bacillus licheniformis, pseudomonas fluorescens, etc.)	Insecticidal, fungicide, herbicide
	Virus and virus extract (such as nuclear polyhedrosis virus, granulosis virus, etc.)	Insecticide
Others	Carbon dioxide	Pesticides, for storage facilities
	Ethanol	Bactericide
	Sea salt and brine	Fungicides for seed treatment
	Alum	Bactericide
	Soft soap (potassium soap)	Insecticide
	Ethylene	—
	Insect sex pheromone	Only for use in traps and dispensers
	Diammonium hydrogen phosphate	Attractant, only for use in trap
Trap, barrier	Physical measures (such as: color trap, mechanical trap)	
	mulch (such as straw, weeds, mulch, insect control net, etc.)	

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# Appendix B

(Informative Appendix)

## Good Practice

(Key Points of Green sustainable Rice Technical Specifications in Chongming, Shanghai)

### B.1 Overview

This appendix is developed based on the FAO Technical Cooperation Project for Green Rice Technology Integration and Demonstration Project in the Chongming District of Shanghai, China, as an example of Best Practices (key points) for this Standard. This part is expected to achieve the “No-Chemical synthetic Pesticides and Fertilizers” agriculture. practices in production, processing, management and regional ecological environment protection.

In this appendix, the clause number and titles are indicated to link best practices with standard requirements.

### B.2 Good Practice

#### B.2.1 Resource Management (see 5.5)

It is encouraged to introduce smart agricultural technologies, establish a big data center through advanced ICT/Internet technologies for smart process farmland management, such as field inspection, seeding, fertilization and harvesting, establish digital collection stations, and collect traceable information, including rice field temperature, humidity, light, and soil pH, etc.

#### B.2.2 Traceability Management (see 5.8.1)

It is encouraged to use the Internet of Things and other technologies, to strengthen the paddy and rice quality traceability system.

#### B.2.3 Signage Management (see 4.8.2)

It is encouraged to use the Internet of Things technology, remote monitoring system, one code for one product and other technical means, to uniformly code and identify the processes of cultivation, processing and the product status information can be obtained at any time through one code scanning to achieve quality traceability.

#### B.2.4 Other Inputs (see 6.1.2)

Green sustainable rice producers can establish a closed management system for agricultural inputs, strictly implement the selection requirements of input suppliers, form a list of qualified input suppliers, and implement unified control over inputs by specialized departments.

#### B.2.5 Supply Chain Management (see 6.1.3)

Establish a green supply chain to promote the development of green sustainable rice production bases, and to meet the national requirements for green factories in the country, in order to realize the green and sustainable development of industrial and supply chain circles on green sustainable rice. It includes the requirements for infrastructure, management system, energy and resource inputs, products, and environmental emissions, etc.

### **B.2.6 Cultivation (see 6.2.3)**

By optimizing field crop rotations, planting green manure crops such as broad beans and milk vetch in winter to improve soil fertility, and achieving rice-legume rotation. During the rice-growing season, through practical research on local field irrigation and the unique “polder system” in Chongming District of Shanghai, in combination with the collection and analysis of local meteorological conditions and light and temperature information of the rice growth cycle, to achieve the accurate field irrigation.

It can build the field ecological balance system through the combination of planting and breeding, such as breeding rice shrimp, turtle, etc. Through the practice of combining local aquaculture and cultivation in Chongming, it can build the field ecological balance system through the combination of planting and aquaculture breeding, such as rice-shrimp, rice-turtle models, etc., to realize the real-time monitoring of harmful substances in the cultivation process of green sustainable rice.

By summarizing the local agricultural practices in Chongming, the following points of operation were summarized and refined:

- a) Before soaking, choose sunny days to dry the seeds for 1-2 days, to improve the seed vitality.
- b) Use 2% lime water for seed soaking, and the soaking time of a single-cropping late rice in the Chongming area is generally 48-60 hours.
- c) It is advisable to use mechanical transplanting seedlings. The seed rate in the field that using transplanter is 1:100, the net seed weight of common rice varieties is 4 kg/mu (0.067 ha).
- d) Mechanical transplanting shall be conducted when seedlings reach 3-4 leaf stage, and seedlings height is 12-8 cm. In normal circumstances, the early-maturing rice varieties (harvest before 1st October the Chinese National Day) shall be soaked around 20 April and be transplanted around 25 May in the year; the middle- or late-maturing rice varieties shall be soaked around early of May, and be mechanically transplanted around the end of May or early of June in the year.
- e) Health cultivation methods are encouraged. The plant density of common rice varieties is 1 million seed-holes/mu (0.067 ha), and the basic seedlings are around 1 million.

### **B.2.7 Soil and Fertilizer Management (see 6.2.4)**

It is advisable to establish comprehensive management and control of sources of organic fertilizers. Random quality sampling inspection shall be carried out for organic fertilizer products and their suppliers, to ensure that the organic fertilizer products have passed relevant evaluation procedures and meet the corresponding national standard requirements. The application amount and use method of organic fertilizer shall be recorded.

The following requirements of water and fertilizer were summarized and refined in line with practices of green sustainable rice production in the Chongming District:

- a) Chemical synthetic fertilizers will not be used in the whole process of green sustainable rice, meanwhile properly supplement organic nutrients according to the nutrient requirements of the whole rice growth period. Through measures such as planting green manure in winter, returning straw to the field, and applying high-quality organic fertilizer, it should pay attention to the balanced application and reasonable ratio of N, P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O nutrients to increase the content of

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organic matter in the soil, to improve the structure of soil granules, the soil quality and fertility, and the resistance of rice.

- b) After the mechanical transplanting, keep a shallow water level on a sunny day to protect seedlings, maintain moisture to promote rooting and root alive; keep shallow water and frequent irrigation to promote tillering, while drying the field properly to promote root aeration. It suggested to manage fertilizer and air through water management, improve the roots breath to shorten the stages of rooting and tillering, and improve the rate of panicle development.
- c) When the population of machinal transplanted seedlings is sufficient, it shall conduct the field storage, from light to heavy. For the early-maturing rice varieties, field storage usually starts from the end of June or early July, while for the middle- or late-maturing rice varieties it starts from early July.
- d) After the field storage and during panicle initiation to booting stage, it shall timely be flooding of water and apply the Alternate Wetting Drying (AWD) as well as intermittent irrigation, to maintain the coordination of water and air in the rice field. During the heading and flowering stages, maintain the shallow water level. For the middle- or late-maturing rice varieties, it should remain flooded before the end of September and transferred from wetting to drying in October. The field then shall stop irrigation a week before harvest, in order to protect roots and leaves and to increase the weight of rice. For early-maturing rice varieties, it shall stop irrigation a week before harvest, in order to improve the appearance and taste quality of rice.

#### **B.2.8 Integrated Pest Management (IPM) (see 6.2.5)**

The green sustainable rice shall not use chemical synthetic pesticides throughout the whole process. Green sustainable rice producers shall prevent and control the pests and weeds during the whole process of rice growth, and conduct necessary monitoring and analysis of the use of plant protection products to evaluate the effects of use; meanwhile, they can set up effective buffers or isolation areas, to achieve effective isolation of plant protection products used in other conventional farmland, and to avoid pollution to the green sustainable rice.

#### **B.2.9 Harvest (see 5.2.6)**

The ICT/Internet intelligent rice harvesting technology can be incorporated into the rice harvesting process, and the real-time monitoring system can be used to ensure that the harvesting time and scope meet the rice maturity period.

#### **B.2.10 Pollution Prevention and Control (see 6.2.7)**

It can use the natural water system and geographical barriers to create buffer zones and isolation zones. It can cultivate/breed selected plants or animals in the buffer zones and isolation zones, using their natural reproduction and growth characteristics to build a regional ecological cycle system, adjust and improve the environmental conditions of conventional areas, establish ecological barriers, and avoid pollution hazards from the origins.

**B.2.11 Processing, Package, Storage and Transportation (see 6.3.1-6.3.4)**

It is advisable to use intelligent technical means to achieve full control of the processes of processing, package, storage and transportation, and timely provide feedback to the central control end to collect and analyze the data.

**B.2.12 Sales (see 6.5)**

It is encouraged to combine with the Internet, e-commerce, new retail and other innovative marketing and publicity methods, adopt multi-channel promotion, online and offline brand marketing models, and use of short video, live broadcast and other means to enhance the branding influence.

**B.2.13 General Rule of Ecological System Management and Conservation (see 8.1)**

In the boundaries of production and processing of green sustainable rice producers, processors and operators, it can use intelligent monitoring means to establish a natural-ecological monitoring system. Set up continuous monitoring tasks and equipment, to prefect the ecological green land and nature reserves, as well as high-value nature reserves. According to the climate change situation in the past, provide feedback on the ecological environment within in real-time, analyze and warn the possible harm to the ecosystem within the boundary and implement preventive measures in advance.

Through the protection and cultivation of ecosystem and species diversity within the boundaries in the Chongming District, it can effectively improve and enhance the ecosystem and species diversity of river estuary around the geographical environment. For example, adjusting the overall water quality, improving the habitats of animals and plants, improving the aquatic ecosystem and biodiversity and ultimately achieving the ecosystem balance of the Yangtze River Estuary.

**B.2.14 Local Vegetation Protection (see 8.2)**

By protecting the local vegetation, improving the green vegetation coverage area within the boundary, and creating a multi-species ecological reproduction and growth environment, local air quality improvement function can be used to drive improvement of the urban air environment. For example, digestion and absorption of urban and agricultural carbon emissions through the “lung” cycle function of vegetation.

**B.2.15 Wildlife Protection (see 8.3)**

The natural water network and geographical barrier within the boundary can be used to create a buffer zone to protect the habitat environment of wild animals and plants, and can help to establish a regional ecological balance system to adjust and improve the regional ecological environment by reasonably planting and breeding corresponding animals and plants, such as improving the structure of Yangtze River water body, optimizing water quality and promoting the habitat of aquatic organisms in the Yangtze River.

**B.2.16 Water Resource Conservation (see 7.3)**

According to the unique polder system within the boundary, the traditional irrigation and water transportation system can be managed and maintained to optimize crop productivity while minimizing water waste and reducing soil erosion and salinization.