2.1 The General Goal

In the next 50 years, the overall goal for agricultural science and technology in China is to ensure the sustainable development of resources, environment and socio-economy, and on this basis to provide feasible and innovative agricultural science and technology support and security system for the development of agricultural products to meet the continual increase and change in demand (traditional or non-traditional) for agricultural products from human society.

In the field of plant germplasm resources and modern plant breeding, using the methods of system biology mainly and the products-oriented strategy, exploring the key and functional genes in germplasm and utilizing the superiority of gene resources-rich in China, making breakthroughs in plant photosynthesis research and developing genomic-knowledge based key biotechnology, constructing the new innovation system of functional plant products development, improving the yield potential, quality, and exploring multifunctional and smart cultivars, providing the scientific supporting to agricultural sustainable development.

In the field of animal germplasm resource and modern breeding science and technology, we mainly use integration of multidisciplinary research methods in the fields of life science and biotechnology such as systems biology, bioinformatics, genomics and proteomics, genetic engineering, etc., with major product-oriented research & develop strategy, develop healthy and sustainable development of animal aquaculture, including marine fisheries, cultivate livestock and poultry seafood with safety, growth, high protein content, high meatyield, high feed transformation or resistance to diseases, Fully explore and use our abundant resource of aquatic animals.

In the field of resource saving agricultural science and technology, it is to perfect the monitoring and disaster-forecasting platform of national arable land and water resources, to perfect management the technology research platform of water and nutrients, and to perfect the new fertilizer research and development platform. It is to establish three agricultural production technology systems including land-saving agriculture, water-saving agriculture and fertilizer- and energy-saving agriculture.
It is to enhance a new fertilizer industry and the modern agricultural equipment industry. It is to realize intensified utilization and management of regional water and soil. It is to implement agricultural mechanization by way of water-saving irrigation and highly-efficient fertilization. It is to standardize precision water and fertilizer management and energy-saving minimal and zero tillage. It is to secure that arable land area with medium and low yield should be reduced by 50% to 60%. The comprehensive utilization rate of soil, fertilizer and water in agriculture ecosystem should be improved by 30%. The nutrient and energy input should be reduced by 25% to 30%. It is to apply intelligent fertilizer widely, to realize the dynamic balance between arable land and water resources which food security production depends on. It is to set up modern agricultural production system with a high and stable yield, high efficiency and high quality in order to realize sustainable agriculture.

In the field of agricultural production and food safety science and technology, it is going to enhance the basic theoretical researches on agricultural production safety, prevention and control of major pests and diseases; maintain the nutrition of agricultural products, clean control, storage and processing and so on, the key technological breakthroughs and integrated technologies integrative innovation, the establishment of the prevention and control warning system of agricultural pests and diseases, intelligent expert management system, and form the food safety digital tracing system from farm to fork, implementation of accurate monitoring and prevention and control of “active safety strategy”. It is planning to establish a standardized system of safe production of agricultural products and green environment, and to ensure the quality and safety of agricultural products in the cultivation, breeding, storage and processing. It is to achieve precise design and quality regulation of food, and proceed the various nutrition food R&D to improve the diet combination, and to create “intelligent personalized nutritional food” to meet the personalized nutritional and healthy needs.

In the field of agricultural modernization and intelligent agricultural science and technology, it is to establish a modernization platform for promote innovations on Chinese agricultural researches and realize the following goals through the breakthrough of the key technologies and equipped by high-tech. These goals are: agricultural information service network, digital management of agricultural resources, precision management of the agricultural production process, intelligent of agricultural equipment and agricultural machine, network platform for virtual research in agriculture, rapidly increasing agricultural productivity, resources efficiency and agricultural continuous innovation ability.

### 2.2 Target Phases

The development of agricultural science and technology is including three phases that are short-term (2020), mid-term (2030) and long-term. The target for each phase of agricultural science and technology development is showing in the followings (Table 2-1).