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2. DEFINITION AND CHARACTERISTIC FEATURES OF INTEGRATED FARMING SYSTEMS IN CHINA

2.1. Concept and definition of integrated farming systems in China

Despite the fact that integrated farming system (ecological farming, ecological agricultural engineering, etc.) is widely recognized by both natural and social scientists in China, there is no commonly approved definition for this term. Some scientists suggest that the integrated farming or ecological farming system is an agro-ecosystem with a carefully designed ecosystem structure in space and time, in order to ensure sustainable development by means of regulating the relationship between its components, prolonging the food or trophic chain and multiplying the recycling of nutrients and other materials. Others define integrated farming as a kind of agricultural engineering with the aim of constructing a sustainable, high production agricultural system, using the principles of economy and ecology to obtain optimum ecological, economic and social effects.

At the 'All-China Conference of Ecological Agriculture' held in 1987, this term was defined as a new type of integrated farming system, in which multiple agricultural production and development are guided, organized and managed in the light of ecological-economic principles and by using the system engineering approach.

Attempts to arrive at an absolute definition usually produce a result too general to be used. What we intend to do in this paper is to clarify the most important features of the system rather than just create a brief definition. What then are some essential features of this important but broad concept?

2.2. Important features of the concept

1. IF (Integrated Farming) is system oriented multicomponent agriculture. It views the farming in a holistic manner emphasizing the interactions between components. Giving the multi-biological components as its central part, integrated farming is a complex biological-social-economic system. The final goal of management is to seek for the integrated effects of the whole system, not the effects of its individual compartment. (Fig. 3).
2. IF goes beyond narrow sectorial limitations. Whenever possible it tries to combine agriculture, forestry, horticulture, animal husbandry, aquaculture, as well as other biological production, into an interconnected system.

Some of the village cottage industries which have an immediate link with the system are also becoming a component of the system.

3. Increase in primary and corresponding secondary productivity is a key indicator in judging the successfulness of the system. This goal is to be reached mainly by multiplying the composition and structure of the system in space and time; by rising the converting effects, by increasing the recycling of nutrients within the system and, through the intensive management, using the surplus labour in the rural areas rather than relying on high input from outside the system.
4. The system is expected to meet the economic needs of the farming community by providing multiple products. It is expected to overcome or mitigate the risks of monoculture, particularly those of irregular rainfall, market fluctuations, pest outbreaks, insufficient weeding and high fertilizer costs. The IF system is expected to have more flexibility in distributing work loads over the course of a year, allowing farmers to earn additional income in their village's small processing industries. The IF system should combine short-term with mid-term and long-term goals, introducing better varieties and crops with higher economic value.

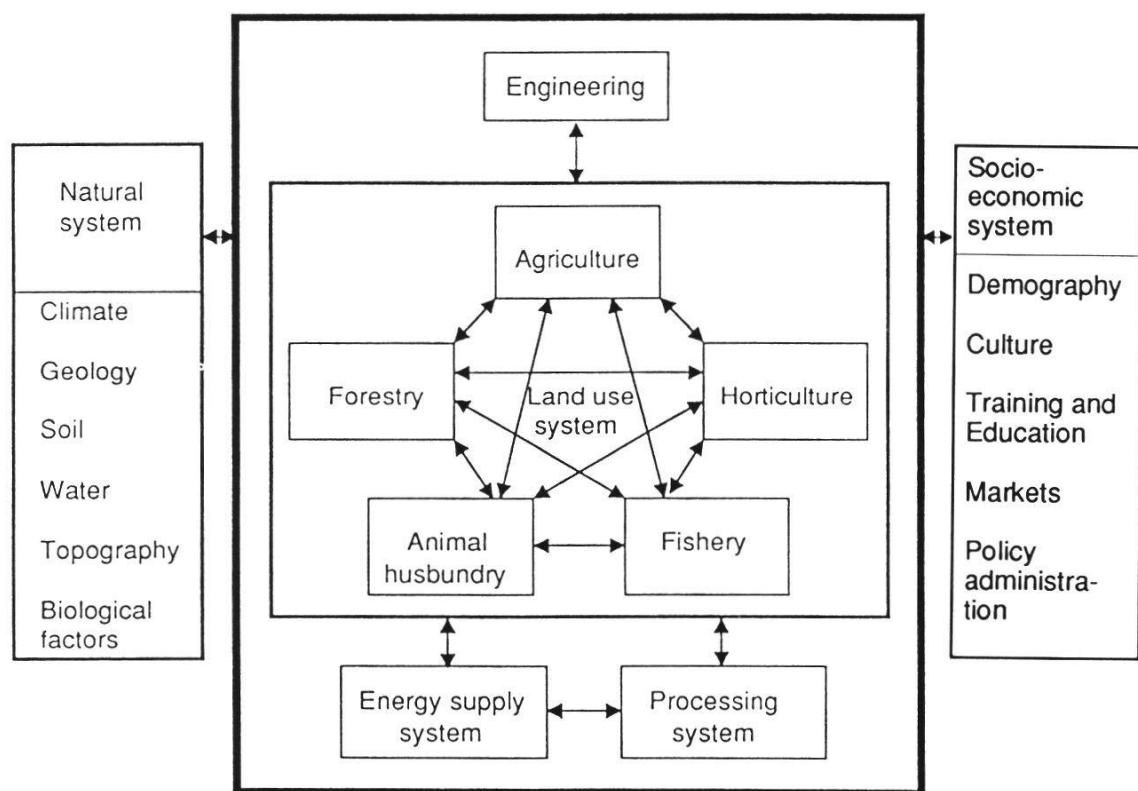


Fig. 3. Diagram of the structure of an integrated farming system.

5. IF's high ecological value, allowing multiple use, is achieved through recycling organic materials under the philosophy that by-products (waste) from the use of one resource must, whenever possible, become an input into another use of resources. IF is trying to use renewable energy and apply energy-saving techniques to complement the inadequate conventional energy. IF pays great attention to using organic fertilizers and biological pest control. Chemical input, while not excluded, is limited to a certain extent.
6. Although incentive is necessary, integrated farming tends to develop a mechanism, which can help the farmers to develop their economy on a self-reliant basis.
7. The IF concept can be used in different hierarchies, from the homegarden to farmland, watersheds of the regional and national levels if these areas are designated as integrated units for implementation.
8. The ultimate goal for the development of the integrated farming system is to achieve integrated ecological, economic and social effects, or in other words, to implement the concept of sustainable development in the rural area.
9. Research for integrated farming should be of a cross disciplinary character with interdisciplinary experts in participation.
10. For the implementation of IF, particularly in medium and macro-scale integrated farming, it is necessary to have the cooperation not only of the scientists and technicians but also of the farmers and related decision makers.

One can readily see that the integrated farming system bears similarities to many existing concepts, such as 'Agroforestry', 'Ecological Farming', 'Alternative Farming', 'Holistic Agriculture' etc. We do not intend to give a detailed review of the similarities and differences between these terms in this report. What we wish to emphasize is that integrated farming is generally understood in China in a wider sense. For example, woody species in most combinations are an important component of the integrated farming system. However, inclusion of woody species is not a prerequisite for the definition of an integrated farming system, if several non-woody species are deliberately managed in more than one component within one system.

Furthermore, integrated farming is treated as a physiological socio-economic system in which the off-farm production activities are also treated as elements of this system.