



The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

Value Circulation Theory——Based on Practices of Agricultural Circular Economy

Lizhi ZHU*

Institute of Agricultural Economics and Development, Chinese Academy of Agricultural Sciences (CAAS), Beijing 100081, China

Abstract If all material units in the economic entities (including inorganic substances and organisms) can fully realize value circulation, the entities will be able to produce the largest total value. Total value refers to the "net value" by subtracting "negative value" from "positive value". The "positive value" is the direct value of products provided by the economic entities, and the "negative value" refers to the value loss caused by the negative influence of economic entities on resource environment and social economy. This paper makes exposition of circular economy from three aspects; circulation of material units in the production process within economic entities is the core of circular economy; circular economy aims at bringing material units out the economic entities by being affiliated to products; branding material units with value for recycling in economic entities is the guarantee of circular economy.

Key words Value circulation, Material units, Positive value, Negative value

1 Background

Long engaged in researches on agricultural circular economy, I have participated in many practices of agricultural circular economy. To make essence of circular economy clear to all members of the teams, Value Circulation Theory was concluded, and the theory was found helpful in grasping key points of the work and direction of thinking during the author's cooperation with experts and grass-roots staff. In view of this, Value Circulation Theory was regarded as one of the direct theories to promote circular economy and sustainable development.

2 Outline of the theory

Modern economic entities should not only be able to create and realize value, but also focus on value circulation. Essentially, value circulation guarantees the creation and realization of higher value with limited resources. If all material units in the economic entities (including inorganic substances and organisms) can fully realize value circulation, the entities will be able to produce the largest total value. Total value refers to the "net value" by subtracting "negative value" from "positive value". The "positive value" is the direct value of products provided by the economic entities, and the "negative value" refers to the value loss caused by the negative influence of economic entities on resource environment and social economy. Such value loss sometimes is not obvious in a short term, but will be gradually revealed in the near future. "Positive value" should not be the only yardstick for measuring the quality of economic entities, and the corresponding "negative value" should be subtracted from the fruits of economic entities.

If material units of the economic entities are transferred out

along with products, "positive value" will be formed, and if with non-renewable wastes, "negative value" will be formed. And only when material units are recycled as many times as possible in the production process within the economic entities, they will be more affiliated to the products and taken out of the economic entities, and the entities will have higher "positive value" and lower "negative value" with the same resource input.

How to make the full recycling of material units in the economic entities? To achieve it smoothly, these units should be carried with "value ship", because each component in the economic entities is complete or incomplete rational economic unit, they will be transacted via value chain, that is, "value" is what really matters.

3 Expositions of the theory

3.1 Circulation of material units in the production process within economic entities is the core of circular economy

In the 1970s – 1980s, the ways of many nations processing pollutants were transferred from reducing potential dangers to using them as resources. From "purifying pollutants" to "using pollutants", ecological consequences of the economic activities have always been the focus of attention, while economic operation mechanism has seldom been considered. For the fundamental issues such as "whether the production of pollutants is reasonable", and "if it is necessary to prevent pollution from the source of production", most countries have not given effective answers yet. By the 1990s, especially since sustainable development strategies became the trend of the world, prevention from the sources and the whole – process treatment have replaced terminal treatment as the real mainstream of national environment and development policy. Based on unceasing exploration, development strategies of circular economy were proposed as "with improving resource utilization efficiency and reducing pollution emission as the principal line, gradually integrating clean production, comprehensive resource utiliza-

tion, ecological design and sustainable consumption".

In terms of the flow direction of material units, conventional economy is a kind of one-way flowing linear economy, that is, "resource → product → waste". The growth of linear economy is characterized by high-intensity resource exploration and consumption, and high-intensity destruction of ecological environment. Circular economy is an economic development pattern "promoting the coordination and harmony between human and nature", it takes "reduce", "reuse" and "recycle" as the criteria of social economic activities, uses ecological laws to organize economic activities into the circulation of "resource → product → renewable resources". In this way, "low level of exploration, high-efficiency utilization, and low emission" will be realized, and the material units in the system best used, resource utilization efficiency improved, pollution emission reduced, economic operation efficiency increased, quality of ecological environment and social life improved. Comparison of conventional economy and circular economy is clearly shown in the following Figure, in which the weak circular chain and the strong circular chain reflect whether the material units go through the production process many times or not.

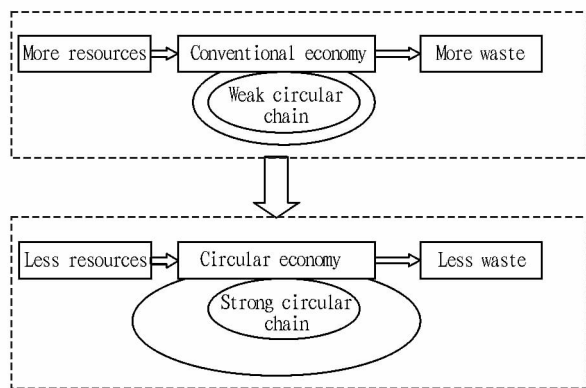


Fig. 1 Comparison of conventional economy and circular economy

For example, agricultural waste is mainly organic waste that can be collected and processed to supplementary energy or alternative energy through fermentation, or agricultural means of production such as organic fertilizer, forage or base materials for mushroom industry. It is an important content of circular economy. In addition, compound industrial system in agriculture provides opportunities to circular economy, crop farming, fish breeding and poultry raising, animal husbandry, mushroom industry, agricultural product processing, and the newly-emerging tourism industry and service industry can be integrated into a whole by circular economy. By combining arterial industry dominated by agricultural production and venous industry dominated by waste processing, circular economy seeks for the high-efficiency utilization of resources and "zero emission" of hazardous materials, so as to form the development pattern of "high growth of agricultural output, low growth of agricultural resource consumption, negative growth of agricultural environment pollution".

3.2 Circular economy aims at bringing material units out the economic entities by being affiliated to products This proposition is based on the former one, that is, only if material units of the economic entities go through the production process many times, the economic entities will provide more products to the others and produce higher total value.

Despite the constant effort for "zero pollution emission", economic entities produce waste as well as products. If material units go through the production process many times, they will be more affiliated to products and transferred out of the entities with products, but not waste. For example, straws in crop farming are organic remains, and in most cases, they are treated as waste. If these straws are returned to the field or reused by other means, material units of straws will be transferred to those of products, but not those of waste, so more products will be provided.

"Positive value" will be created when material units are transferred out of the production process by being affiliated to products, and "negative value" formed if they are affiliated to waste. Therefore, value of product, or "positive value", should not be the only yardstick of measuring quality of economic entities, "negative value" should be subtracted from the "positive value". However, the loss of social economy and ecological environment brought by such "negative value" perhaps are not demonstrated immediately, but will gradually appear in the future, so the "negative value" to be subtracted every year should be the shared present value.

3.3 Branding material units with value for recycling in economic entities is the guarantee of circular economy Only if material units go through the production process many times, they will be affiliated to products and taken out of the economic entities. However, it is not easy to realize the full recycling of material units in economic entities, and a reasonable operation mechanism is needed.

As we know, components of economic entities are complete or incomplete rational economic units, and profit is the main driving force, and there is actually value distribution behind the profit, so value is what really matters.

Therefore, such an operation mechanism should be established to guarantee the development of circular economy, it is to carry material units with "value ship" so that they can be recycled smoothly within the economic entities. It is the core of Value Circulation Theory, and also the fundamental guarantee for the effective operation of circular economy. For example, the material units of straws can be returned to the field after they were processed into forage and eaten by livestock, and the circular economy can only run well if crop farming and animal husbandry (or in some regions straw collection organizations, and straw professional cooperative organizations are also involved) trade reasonably on the value chain of straws, that is, material units of the straws can only be recycled smoothly between crop farming and animal husbandry if they are branded with value.