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## **Some Theoretical Thinking about Developing the Science of Sustainable Economics Science in China**

**[CN] Sihua Liu**

As early as at the beginning of 19th century, renowned economists Shan Shi, Guo Guang Liu and I all agreed that modern human civilization was entering into a new “Era of Ecology”. “What I am talking about when I use the term “Era of Ecology” is that interrelationships between humans and nature, social economy and natural ecology are evolving into a new stage”.<sup>1</sup> The result is the concept of Sustainable Development (SD), an ideology describing the movement from industrial civilization towards ecological civilization. In general, the principles of SD attempt to resolve the apparent contradiction between the continued economic growth of modernizing countries, and the environmental and ecological consequences of growth if development practices are not altered. As such, SD has a strategic guiding principle of development for modern civilization in the 21st century. In April 2002, 23 scholars published an article in the American scientific journal *Science* called “Sustainability Science.”, In this article, Sustainable Development ideology was “upgraded” into a scientific discipline. By integrating the research achievements from different disciplines and scientific fields, it was hoped that the foundation for the construction and development of a new scientific discipline could be achieved; i.e., Sustainability Science.

The economic concepts of SD, namely the development concept of sustainable economics, is a science of Sustainable Economics (SE). In another words, the theoretical foundation of a sustainable economy is the science of sustainable economics. It is the

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<sup>1</sup> Liu Sihua, *Collective Works of Liu Sihua* □ pp 310, 2003, Hubei People’s Publish House.

theoretical demonstration of an ecological era where the interrelationships of human society and environment will be harmonized; when economic development is environmentally sustainable

Since 2007, the building of an ecologically viable civilization has become a new guiding principle for governing the state for the Communist Party; the science of sustainable economics<sup>1</sup> is now entering the mainstream science. This article will discuss some of the ideas about how to build the science of sustainable economics within the Chinese framework.

## **1. The major traits of a science of sustainable economics with Chinese characteristics**

In 2001, I pointed out in my article, “The Formation and Future of Sustainable Development Economics,” that, if looking at the history of world economics, there are two basic traits to be found in the theoretical crisis of traditional economics at the end of 20th century. One of them is that with the emergence and advancement of so many new scientific subjects a breakthrough towards the development of a new economic science ideology has been made. A new road towards 21st century economics science is founded in this economics theoretical crisis.<sup>2</sup> For example, various transdisciplinary economics subjects emerged: service economics; sustainable development economics; property economics, and; internet economics, to name a few. And SD economics is the theoretical pattern of SE science. In the international society, in the mid and late 20<sup>th</sup> century some

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1 Science of Sustainable Economics mainly refers to sustainable development economics, includes as well Ecological Economics, Ecological Marxism Economics and so on.

2 Sihua Liu, “Sustainable Economic Development” □ pp7, 2001 China’s Environmental Science Publishing House

Japanese and American scholars published some books about SD economics. Among those, the book “Beyond Growth” written by Hermann E. Daly, an American ecological economist and published in 1996 is the most influential one. In 1997, the first textbook of this kind in China, “Sustainable Development Economics” was published and I was the chef-editor. Until the end of 2007, there were many more books of this kind published. Therefore, we have the reason to believe that the academic system of SD economics in China has already established. And SD economics with Chinese Characteristic has become a sub-subject in the world sustainable economics science and sustainability science. Nowadays, according to 17<sup>th</sup> Party Congress’s essence<sup>1</sup>, the science of SE that we need to build up and develop should have Chinese character, Chinese style, and to be adding continuously more Chinese national color, practical characters and marks of this era. It should be a science of economical development theory with Chinese character. In order to achieve the goal, I would like to emphasize the following three points:

First of all, during his research, one should be under the guidance of Marxism in order to develop the theoretical system of sustainability science with Chinese characteristic, and form a new, cross disciplinary economical science that has a foundation of Marxism ideology. Base on my previous researches, I have three experiences: first, economic research of sustainability science needs to apply Marxism’s standpoint, view and methodology; second, the research needs to apply also those basic theories of Marxism economics; third, the research needs to make use of Marxism Ecological ideology and ecological economics. Here what I need to point out specifically is that Marx and Engels’

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1 17th Communist Party of China (CPC) National Congress was held in October, 2007. The theme of the congress, explaining the great historical cause and the invaluable experience of reform and opening up, the Scientific Outlook on Development, the new requirements for building a moderately prosperous society in all respects, and the overall arrangements for the four-in-one economic, political, cultural and social development.

ecological economics ideology represents not only their ecological meaning of social and economical development, but also reflects their sustainable development concept of harmonizing natural ecological development and social economical development. Therefore, we have reason to believe that Marx and Engles are the pioneers who initiated this concept and their ideology is one of the sources of sustainability economics with Chinese characteristics.

Second, base upon China's situation, which is in particular its primary stage socialism, science of sustainability economics should be given a vividly national character. I had made a simplified comment on China's actual situation of primary socialism stage as "a big country due to its mass population; a small country due to its lack of resources and a puny country due to its deteriorated environment." Furthermore, in some of my articles in early 80's of twenty century, I emphasized the following two points: first, China's current situation have made a very weak ecological foundation of material exchange between China's society and natural environment, as a result, this is one of the main restriction factors for harmonizing and SD of China's social productivity development and ecological economics. Second, at primary socialism stage, the major conflicts in the society is that people's steadily growing material, cultural and ecological needs are in conflict with a backwards social productivity. Also this major conflicts dominant and decide that primary social stage is a historical period of time in which those main conflicts of ecological economical development are becoming severe and salience. Now, I would like to add a real problem: After 30 years of open-door policy, China's economy has been developed and grew very rapidly, even in recent years, the speed has been kept over 10%, as a result, China is becoming the fourth biggest economical system in the world in a short time, but the problem was, as pointed out by China's president Hu Jintao in his report during the 17<sup>th</sup> CPC National Congress, "rapidly economical growth is at the expense of environmental deterioration, and the price we paid is too high" China's economical development has a lot of unbalance, unharmonizing, unaccordance and unsustainable problems and difficulties. Therefore we must insist to take the reality as a starting point, combine Marxism ecological thought and ecological economy development theory with China's situation, and have in mind to solve varies unsustainable economical and social problems that are facing our developing of socialist with China's character. Through summarizing conscientiously those creative experiences from people's economical and social practices and how they harmonies natural ecology and development, we can provide some theoretical guiding for synchronous carry on and sustainable development of socialist economical construction, cultural construction, social construction and ecological construction.

Third, comply with the actual requirement of this era for "triple change" of human social economy, and vest a historical character in sustainability economics science. Every doctrine and study are the product and symbol of a epoch's transition and serve for its development. During last several years of last century and the beginning of this century, I

repeatedly stated in some of my books and articles that the world nowadays was in a historical moment facing a big change. “It has three main indicators: modern civilization is transforming from industrial civilization to ecological civilization; modern economical pattern is transforming from material economics to knowledge economics; and modern economical development road is transforming from unsustainable development to SD. Those are the so call “triple change” and this is the evitable trend of our new contrary modern economical development.<sup>1</sup> Every epoch has its question to study in order to have the answer. 21st century must be a new era of “Three-in-one”, that is ecological civilization, knowledge economics and SD. We should stand on this new high of era, push development of sustainability science, which can be reflected as a response to this new subject and understanding of this new ear’s spirit and push “triple change” of modern economical development. Therefore, we need to keep advancing with the times, combine developing sustainability science with Chinese characters with three-in-one new developing trend of this century, keep endowing it with a vividly historical characters base on an accurate understanding of historical advancement of modern economics’ “triple change”.

## **2. Economical theory root of modern world’s and China’s unsustainable development neglect**

### **3. Developing an Theoretical Innovation of Sustainable Economics Science**

In 21st century, the modern economical function and growth in which input and output of economical system has no ecological constraint is transforming into one with ecological constraint. As a result, economical function and growth has entered into an era in which

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1 Liu Sihua, Collective Works of Liu Sihua□pp 457, 2003 Hubei People’s Publish House.

ecological capital limits the economical development from an era in which material capital limits economical development. Therefore there are some important theoretical changes and innovations which caused traditional economics turned into sustainable economics science.

First of all sustainable economics is based on the concept of limited planet. In the past, all the east and west economics' theoretical premise is that natural resource is unlimited so that we can use them unlimited and unpaid for economical growth and material wealth growth. Natural carrying capacity is also unlimited so that we can generate and discharge all the pollution from our economical and human activities without restrict and with no consideration. Basing on this theory, industrial development believes that material wealth can be growth unlimited, economy can be developed unlimited and consumption and population can be increased unlimited. Traditional economics theory is to point out the direction for unlimited economical growth and to provide methods. The whole industrial civilization was developed on the foundation that there was no ecological constrict in the world system. Therefore, the theoretical pattern of traditional economics is both a product of industrial civilization and a theoretical manifestation of industrial civilization development.

On the contrary, theoretical premise of SE is that both natural resource and its inventory is limited, the usage of natural resource should be restricted and should be compensated. The carrying capacity of natural environment is limited, and both its flux and its total. Its utilization should be restricted and should be compensated either. Base on this concept, ecological civilization believes that the material wealth growth is limited, economical growth is limited and consumption and population increase is limited, they are all restricted by ecological environment. Hence we could say, the core value of development concept of sustainable economics science is that economical development in an ecological civilization era can not exceed the carrying capacity of ecological system of this planet, their respected country and their regions. Therefore, the science of SE, as a theoretical pattern of 21st century economics, is both a product of a transformation process from industrial civilization into ecological civilization, and a theoretical manifestation of economical development of ecological civilization.

Second, the fundamental question that we face when we develop from traditional economics into SE is that economical development has to internalize ecological environment which was an external factor. Before the funding of sustainable development economics, theoretical structure of mainstream economics in China and abroad has a character that is very difficult to change, which is not to internalize environment and not to do innovating analyses. Ecological environment has been treated as an external factor during the course of economical growth and development. Although environmental economics and ecological economics etc, have emphasized the importance and fundamental affect of ecological environment to economical development from different angles; and point out environment is a fundamental restrict factor of economical development mainly

from the point of view that interrelationship of environment and economical society is discussed. All above arguments have provided some new theories and methodologies to internalize environment, but it has not yet been treated as an internal force for deciding economical development and its sustainability. Only if it is within a theoretical framework of sustainable economics, internalizing environment and innovating analyses can be done; thereby it is assumed to be an internal variable of economical system function and develop and is included into an economical analysis process, so that it could become a core factor of theoretical study of sustainable economics development. If we simply review world economics development history, we can see that during the course of developing world economics theory, there have been many times of internalization. No we need to establish development theory of sustainable economics who internalize environment in order to get rid of classical economics dilemma. Those theories from economical growth theory of material capital internalized, economical growth theory of technology innovation internalized, to institutional innovation internalized economical theory, are all economical growth theory that ecology is separate from economy. Ecological innovation internalized economical growth theory is the fundamental change of preview all development theories of economical growth and development. For a long time, anti-ecology environmental theory breaks ecological environment from real world system, and study human economical society insolated. It only sees environment as an external force of world society and external factor of human civilization development. Thus the development of “natural world” and “social world” has no concerned whatsoever. From an economics point of view, in the 2 or 3 hundred years of industrial economy, no matter western economics or eastern economics, it was first economical growth theory and then economical development theory, both of them have seen environment as an external variable of economical growth and development and productivity development. This is traditional economical development view: “Environment Externalize”.

SD economics has overcome the fundamental defect of previews all economical growth and development theories that assume environment as external factor, and turned into the source and decisive factor of modern economical development and its sustainability under the assumption of internalized environment. It considers ecological change and innovation that is a fundamental decisive factor of economical sustainable development for long time as a internal force of sustainable economical development system, breaks through current research framework of mainstream economics theory in China and aboard and forms a sustainable economical development theory that internalize ecological innovation. Its core content are that ecological change is an internal decisive function, and internalized ecological innovation, technological innovation and institutional innovation have formed the three pillars of SD economics theory. Ecological Crisis in the 20 century, in particularly after the 80's, many practices from world system's productivity function and development shows that ecological system is not only an external environment of modern productivity

function, but also an internal factor of modern productivity function; and that is also a fundamental element for modern productivity move smoothly and develop healthily. Ecological environment and economical society is forming a new type of relationship. Environmental change and ecological development are gradually playing decisive role in modern economical development model, direction and tendency. Ecological environment is becoming an internal force of modern economical and social development with each passing day.<sup>1</sup> This is “Ecological Internalized Theory”. The funding of SD economics theory provides an objective economical framework to turn ecological internalized theory into an independent modern economical development element. The development of 21<sup>st</sup> century economics theory will be evolved around this main subject.

Third, the core thought that traditional economics move forward to sustainable economics is to achieve an internal integration of economical development and sustainability. Industrial civilization has developed until today; no matter it was economical growth theory from Western economics, or it was economical development theory from new classical development economics, they all provide theoretical principle and implementation path for people’s economical activities and development behavior towards no restriction to pursue economical growth and no limitation to pursue economical development. Therefore the core problem here with prevailing mainstream economics in China and abroad that are facing unsustainable development is still not to admit that carrying capacity of planet is limited in its own theoretical system, thus it denies that economical growth and development should protect ecological sustainability. Sustainable theory of economical development, especially ecological sustainability principle, does not exist in the theoretical framework of economical development in mainstream economics. Nowadays, Planet is limited which is funded by sustainable economics has illustrated

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1 Liu Sihua, Green Economy-Economic Development Theory of China’s Economic Reform and Reconstruction, Second Chapter, 2001 China’s Finance and Economy Publishing House

scientifically that modern economical development can neither scarify natural environment, nor exceed the carrying capacity of the earth's resource and environment. It requires that human economical activities and development should be limited to a certain extent that this planet's resource and environment system can be permitted. Only like this, sustainability of natural ecology can be maintained and sustainability of economical development can be assured. In another words, the intensity of exploit and utilize natural resource from human economical activities and development behavior can not exceed the reproduction ability of eco-system; quantity of waste disposal should be within the scale of its self-cleaning ability. This model of economical development will be sustainable, and can reach unification of economical development and sustainability. This is the core concept that conventional economics move towards sustainable economics.

Fourth, the key that conventional economics move towards sustainable economics is that market principle; technology principle and ecology principle are tied closely and harmonize successfully. For economical development in the 21<sup>st</sup> century, we should accurately combine closely, united, successfully integrate and elaborate sufficiently these three principles which is market system function, technological advance and ecological sustain, this is a fundamental principle for modern economical sustainable development in the 21 century. The defect of prevailing mainstream economics is not to fit into this objective demand. So we can say until now, mainstream economics in China and abroad still only emphasize that market mechanism and technological advance can solve all the problems caused by economical growth and development, extremely believe in market principle and technological principle but denies ecological principle which play an important role in economical growth and development. This is a central principle of conventional economics.

Undoubtfully market mechanism and technological advance can be two basic tools for economical growth and development, however, because market and technology force consider economical efficiency as the only target to pursue unlimitedly and ignore ecological demand. This big defect will not only not implement integration of economical growth and development and sustainability, but also become the economical and technological root of ecological crisis. What we need to emphasis here is that market mechanism and technological advance may solve some concrete problems of resources and environment, but they will not and can not overcome unlimited of the earth resource. Therefore under this big trend of prevailing integration of economical globalization and environmental globalization, market and technology play only the minor role, they should depend on closely tie up and successfully integrate with ecological principle in order to stop the unsustainable practices. This is the fundamental problem of modern economical sustainable development, is also the fundamental principle of sustainable economics science. I have proposed that modern human practical activities should and must follow the rule of ecology first; all economical and social

activities should base on the principle of ecological safety first in order to build an ecological safety system for human survival and economical and social development.”<sup>1</sup> This is to say that ecological first is the most fundamental principle of all development such as ecological development and economical development. Thus we must respect the principle that natural environment is limited, in particular, we should correct ecological negative impact caused by market and technological principle through ecological principle, standardized the development of modern economy so that modern economy can move towards an ecology–sound sustainability economics.

Fifth, Theoretical hypothesis of conventional economics moving towards SE is that economic man is turning into ecological economic man. This is a fundamental theoretical hypothesis, and is becoming whole logical starting point and main scale or theoretical cornerstone. The so-call economic man, as a main body of economical behavior, is continuing change their existing forms in several hundred years after the Industrial Revolution, but their character to pursuing maximized self interests during economical and social activities remains the same. Therefore, according to the hypothesis of economic man, all their purpose and the only goal is to pursuing maximum benefit and gain maximum self-interest during economical and social activities. In order to realize economical benefit of modern human being, they are not hesitate to scarify natural interest, scarify the others’ and other nation’s interests. In particular, when it concerns the question of resource allocation between generations, this hypothesis will only have negative effect, will scarify future generation’s interests, sequentially, it will cause inequality to the nature, to the others, to other nations and to the future generation. It is from this meaning that present unsustainable development crisis is caused by economic man; put it in another word, economical growth and development base on economic man hypnotizes is the economical root of unsustainable development crisis at the world scale. This economical root reflects a

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1 Liu Sihua, Liu Sihua, Colleted Works, pp494, 2003 Hubei People’s Publishing House

big defect that exists in the world market economical system and market competition system. During the course of western economics evolution and development, western scholars had been criticizing severely about rational economist and done some renewal and correction. Despite that, because western economics has its main character which separate ecology and economy, it has a fundamental and deadly defect, which is that it does not recognize ecology as a human natural inbeing, and ignore human's creature nature and environmental nature, thus it believes wrongly that nature environment is a external variable of economical growth and development, and is a object that human can conquer, rob and possess. In order to maximize its own economical benefit, economical behavior main body can not only consume natural environment of the planet without any restriction, but also not calculate the cost and price of natural environment. This will result in a "collective tragedy". Philosopher Yu Mo Chang has said: "to a certain extend, modern environmental problems are caused by economic man."<sup>1</sup> This is to show sufficiently that economic man, that has an unsustainable nature in the basic category of western mainstream economics, is a behavior rule which is against sustainable economical development and sustainable economical growth. It is because that, American ecological pro-modernism founder Charlene Spretnak believes that in the field of economy, in the eye's of ecological society, human is not considered as "Economic Man", and economy is not seen as the core focus and drive engine of the society."<sup>2</sup> Ten years ago, I have pointed out clearly that because economic man hypothesis was not only limited in studying the issues concerning inter-generation problem, but also has deadly defect in studying those concerning trans-generation problems. Therefore it can not be either considered as part of ecological economics and environmental economics category, or part of SD economics

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1 Yu Mou Chang, *Ecological Philosophy*, pp111, Shan Xi People's Education Publishing House 2000

2 "Marxism and Reality" pp62, *Journal*, No.2 2007

basic category.<sup>1</sup> As a result, we must introduce newly emerged economics theory into modern economics development theory, widening and correcting economic man's assumption and new economic man's assumption; to establish new concept of social and ecological economic man that consider modern economical behavior as main body. Its behavior rule has to be build base on social and ecological economic man theoretical hypothesis, and push the transformation of the basic category of economics from economic man to social and ecological economic man.

So called social and ecological economic man means that modern economical behavior which give priority to persuade more economical benefits will still be a basic truth of modern economical life, but it should protect human's benefit, at the same time, it should protect natural benefit equally, it must improve harmony and inter-generation fair of individual and society, benefit of micro-economy and macro-economy, social benefit and ecological economy; it must ensure trans-generation fairness that the increasing benefit of present generation will not decrease the benefit of future generation. In an ecological civilization society of 21<sup>st</sup> century, economic man, social man and ecological man are integrated in the real economical life. Economic man is social man, but primarily is ecological man. Everyone in the real world of ecology-economy- society complex has centered several relationships of ecology, economy and society into one body; they are both individual and main body of several ecology, economy and society relationships. In another word, human in the economical system is main body of economical relation, in social system is the main body of social relationship and in ecological system is the main body of ecological relationship. Therefore, in the real world of ecology-economy-society complex system, the main body of modern economical behavior is a united entity of ecological man, economic man and social man. It is only when this entity can function healthily and develop sustainability; this complex system can be function healthily and develop

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1 Liu Sihua et ect, Sustainable Economics, pp42, Hubei People's Publishing House 1997

sustainability. Therefore, this hypothesis which assume social and ecological economic man hypothesis is the united concept of economic man, social man and ecological man, will eventually become the basic theoretical hypothesis of a newly emerge economics, meaning sustainable economics science, in ecological civilization era.

#### **4. To strength the building of comprehensive theoretical platform of Sustainable Economics Science**