Resources Accounting and Pricing Policy by Expert Working Group on Resources Accounting and Pricing Policy

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I. Working Program of the Working Group on Resources Accounting and Pricing Policy

The Working Group on Resources Accounting and Pricing Policy is one of the first five established by the China Council for International Cooperation on Environment and Development. The group will conduct research on the current situation of natural resources in China. In particular, it will do some research on the rationality of resource prices so as to formulate a pragmatic system of resource prices for the reference of Chinese government to guide society on the rational use of resources, on protecting the environment, on saving resources as well as prohibiting the exploitation and destruction of resources by market-based instrument.

Taking into account different features of resources in different regions of China, this group will select and study those which have an important bearing on the national economy. The resources to be selected are as follows:

a. Mineral Resources

When studying the prices of mineral resources, the group selected the following three items; coal, petroleum, and iron ore, with special emphasis on coal.

b. Forestry Resources

When studying forestry resources, the group plans to set up some forest regions with different types of trees in both North and South China for the survey. The analysis will be made on the basis of macrobalance of forestry resources with a hope to rationalize the price of forest products.

c. Water Resources

When studying water resources, this group will study surface und ground water resources and carry out an analysis on the macrobalance of water resources in China. When setting prices for water, the group will classify areas into those with abundant and those with scarce water resources so that a certain number of representative areas will be selected.

d. Land Resources

When studying land resources, the group will distinguish between the land resources of urban und rural areas. For urban land resources, a certain number of large and medium-sized cities with varying pollution density will be selected for study. For rural land resources, certain counties and townships in three regions (South, North and Northwest China) will be chosen for the examination, the main purpose of being to the study rationality of land prices.

e. Prairie Resources

This group, when studying prairie resources, will select certain pastoral areas in Inner Mongolia for case study, which primarily focuses on different prices in different areas and varying prairie qualities so as to rationally utilize and protect prairie resources.
On the basis of extensive research on the above-mentioned resources, the group will concentrate upon analysing the following six subjects;

(1) The development of theoretical studies of resource accounting at home and abroad

By now, scores of note-worthy achievements have been made by academics at home and abroad on theoretical studies of natural resource valuation, pricing, and accounting. In the West, there exist many ways of studying resource accounting theories. It is imperative for Chinese experts to introduce into China the experiences of how to apply western theory. Recent years have witnessed Chinese experts make explorations in resources accounting and voice some valuable viewpoints.

(2) Methods of resource valuation and pricing

The group maintain that there is a need to finalize feasible and effective methods by absorbing the existing achievements of domestic and overseas experts on the theoretical studies. The basic principles that the theoretical price of resources and their products should be equated to their marginal opportunity cost (MOC), which is the sum of marginal production cost (MPC), marginal depletion or use cost (MUC) and marginal environmental cost (MEC) or the international price of the resources whichever is greater. Observation of actual markets approach should be adopted to calculate MEC so as to guarantee the objectivity of the results. As to those which cannot be measured by observation of actual markets approach, a surrogate markets approach or contingent valuation approach can be adopted.

(3) International comparable prices of resources

The prices of those resources which can be traded as commodities should be comparable to international market prices.

The group plans to make an international comparison on resource prices, including the prices of forestry, coal, petroleum and iron ore, so as to find out an international parameters for China to formulate rational resource rice.

(4) Domestic relative resource prices

Domestic relative resource prices refer to the result of comparing resource prices with others in the same country. resource products which are put into the process of production are referred to as upstream products, while those which are made from resource products are called downstream products. Rationality should exist in the comparison between the prices of different upstream products, between those of upstream and those of downstream products as well ad among prices of different downstream products made from the same kind of resources. At present, there is no rational proportion among all these prices in China. In order to formulate a rational policy for resource prices, to save resources, to formulate a rational policy for resource prices, to save resources, to protect environment and to promote coordinated economic and environmental development the group will make a study of the domestic relative prices, including the prices of fresh water, forestry, coal, petroleum and iron ore. The outcome of the study on domestic relative prices for resources will primarily illustrate the degree of irrationality of current resource prices as well as the loss to economic trend, the objective ,and the procedures of readjusting resource prices in China.

(5) How to incorporate resources accounting into SNA

As we all know, resources accounting is supposed to be incorporated into SNA. But how? First of all, the following three questions need to be answered. First, what theories to rely on? Second, by what means to use? Third, how to evaluate natural resources?

The group plans to rely on the new SNA of China. However, considering the fact that resources accounting not only includes flow but also stock accounting, therefore, the group is to adopt methods of combining them together. In the meantime, estimation by both magnitude in kind and magnitude of value should also be used. It plans to adopt an indirect measurement of converting into monetary terms the stock and flow of natural resources that can hardly be valued directly. The aim of this group is, first, to elaborate a balance table for relevant resources; and second, to incorporate them into SNA.

The basic consideration about incorporating resources accounting into SNA is to examine the variations in both income flow and resources stock in the course of economic operation. Variations in income flow induces that of resources stock and vice versa. Therefore, it is necessary to understand the amount, trend, causes, and tackling tactics of re-source stock deficit (its decreased value exceeds its increased value) through incorporating resources accounting into SNA so as to obtain the surplus of resource stock (its increased value exceeds its decreased value).

(6) Resource pricing policy
During the course of economic development, the consumption of certain resources, their amount of import and export, and their prices, should be based upon the amount of stock surplus or stock deficit of the resources and their substitutes. Therefore, the government should gradually readjust resource prices by market-by-market-based instruments like royalties and the pollution level. By 2000, resource prices should be equal to international market prices. As soon as practicable thereafter, resource prices should be equal to theoretically optimal prices based on marginals opportunity cost, and therefore equal to the sum of MPC, MUC and MEC, in cases where the sum of MPC, MUC and MEC exceeds international prices.

The study can be roughly divided into the following five stages, with one year for each stage. In the previous three stages, four main tasks will be carried out:

1. Extensively collecting the relevant data from home and abroad concerning the theory and practices of resource valuation and pricing;
2. Making studies of various kinds of natural resources and on their existing prices in turn and by stages;
3. Summarizing the achievements of resource accounting both at home and abroad at a theoretical level;
4. Formulating principles for valuing various natural resources on the basis of research, and making tentative measurement of rational prices for various natural resources in China.

In the latter two stages, five tasks will be carried out:

1. Comparing resource prices with those of other commodities so as to find out rational relative resource prices: estimating the loss which is inflicted upon coordinated economic and environmental development as a result of existing irrational resource prices, and therefore indicating the impact of readjusting Chinese resource prices;
2. Making an international comparison among resource prices so as to find out international reference data which can be used to lay down rational resource prices in China:
3. Making tentative measurements of each resource price on the basis of the above-mentioned comparisons and of the tentative measurements of all resource prices;
4. On the basis of the measurement of resource prices, elaborating a balance table of supply and demand for relevant resources, then incorporating them into SNA;
5. Putting forward the objective, the model, and the procedures for readjusting resource prices.

The group will deliver a report on its research at the end of each stage, i.e. annually. At the end of the project, the group will deliver a final report including a main report and four subordinate reports.

II. A Reflection over What This Group Has Done in 1992

This working group was established in April, 1992. By February, 1993, it carried out its tasks in the following three aspects on the basis of funds and manpower:

1. Primary data collection on resources accounting from home and abroad

The collected data includes: theoretical books about natural resources accounting in the field of environmental economics from abroad; research by overseas governmental institutions and international organizations on natural resources accounting and pricing policy, and individual case studies done by them about specific areas and resources; theoretical books by domestic scholars on natural resources accounting and pricing policy; information about theoretical studies and practices on price reform at home.

2. A tentative investigation on some natural resources and their existing prices in China

The group interviewed those departments concerned such as the National Environmental Protection Agency (NEPA), The State Bureau of Commodity Prices, the Ministry of Forestry, China Petro Chemical Corporation, etc., which provided an introduction to current situations and trends in natural resources, and their plan and practices of pricing resources.
The group also selected resources to make case study investigations, which included:

**Forests:** Forest areas in Mudanjiang Forestry Administration, Heilongjiang Province of Northeast China and in Longyan County Forestry Zone, Fujian Province of South China. The former is owned by the State, some of which includes experimental zones of pricing forest resources carried out by the Ministry of Forestry. The latter is collectively owned. As to prices, the State allocates the production of the former according to planned prices fixed by the State; while that of the latter is monopolized by the County's Forestry Administration, is purchased according to the prices fixed by the County, and is sold at the market prices. The two areas are representative of the two price systems existing in the Chinese forestry zones.

**Prairie:** The group made investigations in Hulunbei'er League, which is a famous prairie zone in China. The prairie used to be made use of freely. However, a new regulation concerning how to use the prairie with payments is being carried out.

**Coal:** The group made investigations on coal mines and coal prices in Shaoyang City, Hunan Province of South China. There are many local state-owned coal mines. Since the exploitation cost is higher than the main coal mines located in the main production zones in China. They are profitable when there is shortage in coal. How ever, if demand is equal to or less than supply, the coal mines in this city have deficit. So they belong to the type called "marginal coal mines".

**Water:** The group made investigations in Beijing, Tianjin, and Hebei Province which belong to drainage area of the Haihe Rivers and in the drainage area of Taihu Lake in the downstream portion of the Yangtze River. The former areas are short of water resources, and need to transfer them from other drainage areas (from Yangtze River); the latter is at balance of the water resources, but confronted with water pollution problems.

3. On the basis of data collection and research, the group has formulated tentative thoughts of how to calculate some resource prices.

For example, as to calculating coal prices, the international recommended approach is reverse algorithm of net price approach, that is, subtract the cost of production, of geological prospecting, and of transportation which contains the average profit rate from the international market price, which results in a price of coal resource, Prof. Li Jinchang used this method to estimate Chinese coal prices. First, he used the average international market price of 1987 for estimation. Then, he used the average domestic "shadow price" of the main pits (theoretically speaking, the "shadow" price should be compatible to the international price) for estimation. However, the two results have a gap of more than one times. Since the domestic "shadow" price has increased a lot in 1990, the gap between international market price and domestic "shadow" price has narrowed greatly. So this group suggests using reserve algorithm of net price approach as basic approach and adopting domestic "shadow" price as basic referential data when calculating coal price.

Another example is related to water resources.

In the drainage area of the Haihe River, the water resources are insufficient. Therefore, it is imperative to transfer water resources from Yangtze River. According to the theory of differential rents of natural resources, the amount of differential rents depends on the "shadow" price of the worst type of resources. Therefore, water price of the drainage area of the Haihe River should be fixed in accordance with the unit cost of transferring water from another basin. Under this prerequisite, to decide how to share water fee by the state, the enterprises, and the individual consumers.

Through one-year-long work, this group has the following two thoughts;

(1) No single mode can be applied to various situation of natural resources. Some resources (e.g. coal) are abundant; some (e.g. forest) are insufficient; some vary from different areas, that is to say, some areas have enough resources while others do not (e.g. water). Some have international market prices (e.g. coal, wood); some have regional prices (e.g. water), International market prices have different impacts on domestic prices. Domestic coal price have much less impact from its international market price than that of forest products. The flow balance between demand and supply of water resources varies seasonally; while that of forestry and coal resources is related to long-time stocks (proved reserves or net volume of growing stock of forest). Some are easily affirmed and compensated (e.g. cultivated land has sunk because of coal exploitation) while others are not (e.g. environmental functions of forest resources): even after they are affirmed, they cannot be compensated. Due to various situations, no single mode, no single accounting method, no single policy can be applied to different natural resources.
Due to various situations of different natural resources, the working group should make preparations and data collections of each resource one by one. It is impossible to carry out investigations on all natural resources simultaneously, because the work load is too much. Therefore, the group has already amended its yearly programme and decided to complete investigations respectively in three stages so as to guarantee the quality of its work.

(2) It is known that resource accounting and pricing policy are an overlapping and complex research subject; therefore, a working process of further investigations is needed. In order to guarantee the quality of the investigations, supplementary investigation will be carried out for the more complex natural resources.

III. A Plan for What The Group Do in 1993

In 1993, the group plans to carry out three tasks:

1. Continue to collect information about theories and practices of resources accounting from home and abroad.

   The quality of data should be emphasized when they are collected. This group will concentrate on two aspects: (1) studies of individual cases, which refer to accounting and data-collecting approaches adopted by overseas counterparts when they are accounting certain kind of resources; (2) how to incorporate resources accounting into SNA. As to domestic data, this group will mainly collect those concerning individual case studies and relevant statistics.

2. To make investigations.

   As to those resources of which the group has already formulated ideas of how to estimate the price, it plans to carry out supplementary investigations in accordance with those trains. As to definite idea of how to estimate prices, it plans to develop a detailed investigation outline and to carry out investigations by adopting several possible accounting approaches. In 1993, the task will concentrate on case investigation of fresh water, forestry and coal.

3. The group will make tentative measurements on those resources of which the group has already formulated tentative thoughts.

   There will be made after supplementary investigations in the summer vacation of 1993.

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