
Financed by ADB Loan

Terms of Reference

Huangshan Xin’an River Basin Ecological Construction and Protection Center

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1. Project Background

In order to implement the overall plan of the CPC Central Committee and the State Council on the development of ecological civilization and the institutional reform of ecological civilization, the governments of Anhui and Zhejiang provinces officially implemented the pilot program of water environment compensation in Xin’an river basin in 2012, under the guidance of the Ministry of Finance and the former Ministry of Environmental Protection. The ecological compensation in Xin’an river basin has been implemented to the third round so far. The positive effects of the pilot program is expanding.

At present, a total of 11 river basins in China have established inter-provincial ecological compensation mechanisms with their own characteristics. A full coverage of ecological compensation in river basins has been achieved in several provinces, such as Anhui, Jiangsu, Sichuan, Guizhou, Yunnan, Jiangxi. As an effect way of water environment management, ecological compensation in river basin has been expanded from point to area, from a few cases to dozens and is being rapidly established and implemented nationwide. Although the pilot program of ecological compensation in river basins has made positive progress, there are still some problems in practice, like a narrow scope of compensation, a monolithic method, and insufficient basis of compensation standard, due to the late start and difficulty in operation. Compensation standard is the foundation of compensation mechanism, which is directly related to the effect of compensation implementation and the bearing capacity of the compensator. It has always been the core and difficulty of relevant researches. Whether the compensation standard could be scientifically and reasonably quantified is the basis for the smooth implementation of ecological compensation, and is also a powerful guarantee for the long-term effect of the compensation mechanism. The quantitative researches on the compensation standards for water environment in river basins are still in the initial stage in China. There is no unified and authoritative system of measurements and indicators. Particularly, the departments established the inter-provincial compensation standards in river basins have a strong administrative color, and the amount of compensation fund is determined at random.

Overall, the research and formulation of scientific and reasonable compensation standard for Xin’an river basin will facilitate the promotion and implementation of ecological compensation in Xin’an river basin, improve the key technology of ecological compensation in river basins in China, and promote the establishments of ecological compensation mechanisms
among different regions. Meanwhile, in consideration of the ecological compensation that has been widely carried out in the country, it has great practical significance to research and establish a general performance evaluation method and system for ecological compensation in river basins, carry out vertical and horizontal comparable performance evaluation on the existing compensation practices in China, measure the inputs, outputs, benefits and effects of this policy, find out the current situation and results of the implementation of this policy, based on which to manage, maintain and amend the policy.

II. Project Contents

The estimated total budget of the project is 3,406,700 yuan\(^1\), with a execution period of 18 months. The contents include four major categories as follow:

(1) Start ecosystem valuation

First, set a baseline for ecosystem valuation. The baseline for ecosystem service refers to the precondition for the occurrence of ecosystem service, or the threshold for reference when counting physical products of ecosystem service. When valuating ecosystem, the baseline shall be set according to the principle of actual occurrence, meanwhile the national or industrial standards shall be adopted as a priority, and take relevant management experience into consideration.

Second, put forward the principles of ecosystem valuation. In order to achieve the goal that the result of ecosystem valuation in Xin’an river basin could be “repeatable, comparable and wide application”, principles of ecosystem valuation in Xin’an river basin shall be raised. The principles should include human welfare, biological production, benefit protection, actual occurrence, measurement of physical products, data availability, continuous updating and non harmlessness.

Third, establish the index system of ecological value. At present, the index systems of ecosystem value in different countries and regions are quite different because of various types of ecosystem services, large differences in nature characteristics, and different understanding of related concepts. Therefore, it is necessary to establish an index system suitable for Xin’an river basin according to the determined principles of ecological valuation. To establish the index system of ecological value for Xin’an river basin, the framework of ecosystem valuation

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\(^1\) The exchange rate is 1: 6.8328 when the feasibility study of the project was carried out. The total budget of the project was 3.4164 million yuan after conversion, which should not be exceeded when the project gets published. According to the estimated input, the total budget is 3.4067 million yuan.
shall be clarified. The technical system of ecosystem valuation shall be based on data collection. The ecosystem valuation should be based on objective and accurate valuation, based on a thorough international literature review. It needs to value the marginal improvement in ecosystem services before and after project implementation. The establishment of the index system should refer to the commonly used valuation methods at home and abroad. Based on relevant studies at home and abroad, such as the Millennium Ecosystem Assessment (MA), the Economics of Ecosystems and Biodiversity (TEEB), and the System of Environmental Economic Accounting - Experimental Ecosystem Accounting (SEEA-EEA), valuation parameters and weights should be set up for each subdivision index to establish a complete system.

(2) Ensure the ecological compensation standard

When fixing the ecological compensation standard, the output capacity of ecological products of Xin’an river basin should be the foundation; comprehensively considering the scientific and reliability of the result, and the acceptability of the subject and the object in compensation; and trying to use different valuation methods (like cost of ecological protection, value of ecosystem service and opportunity cost). Take the end of 2019 as starting point to calculate the compensation standard for Xin’an river basin. Quantitative analysis dominates while supplemented with qualitative analysis. According to different results of different valuation methods, it shall propose suggestions on reasonable selection of compensation standard in different stages of ecological compensation in Xin'an river basin. The final ecological compensation standard to be implemented is determined through negotiations between two parties in accordance with the actual situation, based on valuation and combined with the interest of concerned parties in ecological compensation.

At present, the commonly used methods to determine the ecological compensation standard are valuation of ecosystem service function, equivalence analysis of ecological benefits, marketing, survey of interest, opportunity costs and microeconomic model.

The valuation of ecosystem service function is a method based on the value of ecosystem service function itself or modified value to make sure the ecological compensation standard. The core is to estimate the value of ecosystem service function by means of market value, opportunity cost, basic cost, human capital, production cost and replacement cost, and use the estimated value to ensure the ecological compensation standard.
Equivalence analysis of ecological benefits is method to quantify the ecological function loss, which can estimate the compensation ratio needed to make up the ecological function damage, that is, the compensation standard is specified. This is a multi-parameter economic mathematical model which can quantify the intensity of ecological compensation. It obtains the ecological compensation standard from the restoration value of the damaged ecosystem service function.

The survey of interest integrates the incomes, direct costs, expectations as well as other factors of the concerned parties in ecological compensation into a simple interest. According to the data from the survey of interest, the costs of providing high-quality ecosystem services independently by ecosystem service providers and the maximum value that compensation providers willing to pay can be figured out.

The method of marketing regards the ecosystem service function as a kind of commodity and establishes a market around the commodity. The buyer and seller of the market are provider and receiver of ecological compensation. In this market, the equilibrium price coordinated with market rules defines the ecological compensation standard, also it is the intersection point of the supply and demand curve.

The application of opportunity costs in ecological compensation mechanism refers to the economic income and development opportunities that the ecosystem service providers give up, in order to protect the ecological environment.

Microeconomics modeling is a method to establish models combining mathematics and economics and studying the preferences of related individuals to find out ecological compensation standard, which is based on microeconomic principles.

(3) Establish a performance evaluation system for ecological compensation in river basins

Establish the principles, index system and evaluation methods through using the research experience in performance evaluation at home and abroad, deeply analyzing performance evaluation cases of ecological compensation in Xin’an river basin and taking the different types and characteristics of ecological compensation in China into consideration. And design a general performance evaluation system based on the principles of representativeness, universality and sustainability.

Start performance evaluation of compensation in river basins on the typical cases selected
from cases of inter-provincial and intra-provincial ecological compensation in river basins and relevant data, and make a comparison from evaluation indicators and evaluation results to verify whether the results are practicable and reasonable.

(4) Promote ecological compensation

The promotion of ecological compensation is based on the construction of index system of ecological value of Xin’an river basin and the ecosystem valuation, with the improvement of ecological environment quality as the core to establish ecological compensation standard suitable in Xin’an river basin, Huangshan and a general performance evaluation system for ecological compensation in river basins.

To put forward suggestions and proposals from improving compensation mechanism in river basins, establishing long-term and effective mechanism and etc, performance evaluation system and the result of relevant case study shall be considered comprehensively, incorporating the actual situations of river basin in China. In order to promote the implementation of ecological compensation standard, Huangshan City should establish a regular release system.

The consulting service of this project is an important part of the project capacity building. Due to the complexity, heavy workload and strong professionalism of the project, it is necessary to hire a consulting company with required ability and experience to provide project consulting services to ensure that the quality and progress of project implementation and the results of the project meet the standards and requirements of ADB, KfW and management regulations in accordance with international practices as well as relevant domestic requirements.

III. Scope and main tasks of consulting services

1. Scope of consulting services

The scope of consulting services includes but not limited to the following tasks: systematically review and summarize the implementations and effects of river basin ecological compensation at home and abroad; sort out evaluation index systems of performance evaluation system and calculation methods of compensation standards at home and abroad; research on establishment of compensation standard for Xin’an river basin; research on performance evaluation system of ecological compensation in river basins; case studies on performance evaluation of ecological compensation mechanisms in river basins; and put forward proposals and suggestions on policies of improving ecological compensation.
mechanisms in river basins.

2. Main tasks

(1) **Systematically summarize the implementations and effects of river basin ecological compensation at home and abroad:**

Systematically summarize the cases of river basin ecological compensation at home and abroad by means of literature research, comparative study, investigation and statistics, analyze the characteristics of compensation in different river basins, and summarize the implementations and effects of river basin ecological compensation to provide reference for the establishment and application of ecological compensation mechanism in river basins.

(2) **Sort out evaluation index systems of performance evaluation system and valuation methods of compensation standards at home and abroad:**

Analyze evaluation index systems of performance evaluation system and valuation methods at home and abroad by using methods of case study, literature research, investigation and statistics to summarize common theories and methods, and compare their advantages, disadvantages and applicable conditions.

(3) **Research on establishment of compensation standard for Xin’an river basin:**

In view of the current situations that the valuation methods and technologies of ecological compensation standard in China are not sound, a large amount of data to calculate, and the results are not applicable, carry out the valuation of compensation standard for Xin’an river basin, taking the scientific and reliability of the results and the degree of acceptance of the compensation subject into consideration, based on the actual situations of Xin’an river and relevant data. According to the results of different evaluation methods, put forward suggestions on policies of selecting reasonable compensation standards in different stages of the implementation of ecological compensation in Xin'an river basin.

(4) **Research on performance evaluation system of ecological compensation in river basins:**

Establish the principles, index system and evaluation methods through using the research experience in performance evaluation at home and abroad, deeply analyzing performance evaluation cases of ecological compensation in Xin’an river basin and taking the different types and characteristics of ecological compensation in China into consideration. And design a general performance evaluation system.
(5) Case studies on performance evaluation of ecological compensation mechanism in river basins:

Start performance evaluation of compensation in river basins on the typical cases selected from cases of inter-provincial and intra-provincial ecological compensation in river basins and relevant data, and make a comparison from evaluation indicators and evaluation results.

(6) Put forward proposals and suggestions on policies of improving ecological compensation mechanism in river basins:

To put forward suggestions and proposals from improving compensation mechanism in river basins, establishing long-term and effective mechanism and etc, performance evaluation system and its case study results shall be considered comprehensively, incorporating the actual situations of river basin in China.

IV、The main achievements, report documents and time requirements

<table>
<thead>
<tr>
<th>Stage</th>
<th>Content</th>
<th>Achievements</th>
<th>Submitted Date</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start of the project</td>
<td>According to the scope and main tasks of the project, complete the opening research.</td>
<td>Inception report</td>
<td>Within 1 month after signing the contract</td>
<td>electronic version in English and Chinese.</td>
</tr>
<tr>
<td>Mid-term research</td>
<td>Complete the first three of the six main tasks of the project consulting services.</td>
<td>Interim report</td>
<td>Within 9 month after signing the contract</td>
<td>electronic version in English and Chinese</td>
</tr>
<tr>
<td>Preparation for results</td>
<td>Complete all six main tasks of the project consulting service and submit results report.</td>
<td>Final report</td>
<td>Within 18 months after signing the contract</td>
<td>50 copies of paper version and electronic version in English and Chinese</td>
</tr>
</tbody>
</table>

Note:
1. The report submitted by the consultant in each stage will be evaluated by experts and relevant authorities organized by the Employer.
2. 50 copies of paper version of the final draft report shall be submitted.
3. The intellectual property rights of the research results and the right to use the research results belong to the Employer, and shall not be used without the written permission of the
4. Payments will be specified in the contract.

V、Qualification requirements and implementation of consulting companies and consulting personnel

The estimated start date of this consulting service is October 2020 and the end date is March 2022 (calculated from the date when the two parties sign the contract). If the project account is closed for delay or other reasons, both parties can negotiate to extend the contract execution period. If the consulting company fails to meet the above requirements of main tasks, fails to complete all works in time, fails to respond to the requirements of the Employer, ADB and KfW in time, and fails to provide satisfactory services, the Employer may terminate the contract at any time.

The consultant will be responsible for and undertake all aspects of the tasks. The consulting company shall provide high-quality services and satisfactory deliverables, and shall be obliged to provide sufficient human resources to complete this task. The project manager shall approve all the personnel and have the right to reject the personnel who are not suitable. If the personnel need to be replaced, the Consultant shall submit a written application to the Employer, and the qualification of the replacement personnel shall not be lower than the personnel to be replaced.

1. General qualification requirements for consulting companies:

(1) Have the ability to bear civil liability independently (provide supporting documents such as business licenses of corporations or other organizations);

(2) Have good business reputation and sound financial accounting system (provide the financial report of 2018 or 2019, and consultants which are established less than one year shall provide a copy of credit certificate issued by the bank);

(3) Have good records of paying taxes and social security in accordance with laws (provide copies with official seal of supporting documents of paying tax and social security in any one month within 6 months before bid opening. If tax and social security are not required according to laws, supporting documents shall be provided as well) ;

(4) In the last three years (from 2017 to 2019) when participating in government procurement activities, no records of major illegal activities in business (provide written statement in self-made format);
(5) Different consultants with a same person who is in charge or have direct relationships such as shareholding or management shall not participate in the bidding at the same time (provide written statement in self-made format);

(6) Other conditions stipulated by laws and administrative regulations.

2. Staff positions and requirements:

<table>
<thead>
<tr>
<th>Position</th>
<th>Basic requirements</th>
<th>Minimum person-months</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project manager</strong></td>
<td>a) General qualifications:</td>
<td>18</td>
</tr>
<tr>
<td>(1 person)</td>
<td>i) Possess a senior and above technical certificate as senior engineer in environment engineering or environment protection .</td>
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<tr>
<td></td>
<td>ii) Have more than 5 years’ working experience in environment protection and related fields, and successfully completed projects as project manager (provide supporting documents).</td>
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<tr>
<td></td>
<td>b) Adaptability to work:</td>
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<tr>
<td></td>
<td>i) Have management experience in 2 and more consulting service projects for local government.</td>
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<tr>
<td></td>
<td>c) Experience and language in similar areas:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>i) Have working experience in similar areas.</td>
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<tr>
<td></td>
<td>ii) Good oral and written communication skills in both Chinese and English.</td>
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</tr>
<tr>
<td><strong>Ecological compensation</strong></td>
<td>a) General qualifications:</td>
<td>14</td>
</tr>
<tr>
<td><strong>specialist</strong></td>
<td>i) Possess a professional technical certificate as senior engineer with the rank of a professor in environmental science and engineering, and environmental or ecological economics.</td>
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<tr>
<td>(1 person)</td>
<td>ii) Have 15 years and more experience in researches on management polices of water environment in river basins.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Adaptability to work:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>i) Have working experience in ADB consulting services</td>
<td></td>
</tr>
</tbody>
</table>
| Energy conservation and environmental protection specialist (1 person) | a) General qualifications:  
i) Possess a professional technical certificate as senior engineer with the rank of a professor in energy conservation and environmental protection technology.  
ii) Have 15 years and more working experience in energy conservation and environmental protection.  
b) Adaptability to work:  
i) Have working experience in 1 and more pilot projects of ecological compensation mechanism in river basins.  
c) Experience and language in similar areas:  
i) Good oral and written communication skills in both Chinese and English. |
| --- | --- |
| Environmental Economic Specialist (1 person) | a) General qualifications:  
i) Possess a professional certificate as senior economist and above.  
ii) Have more than 10 years’ working experience in related fields of environmental protection.  
b) Adaptability to work:  
i) Have working experience in 1 and more technical consulting service projects of environmental protection.  
c) Experience and language in similar areas:  
i) Working experience in similar areas  
ii) Good oral and written communication skills in both Chinese and English. |
| Environmental Consultant | a) General qualifications:  
i) Possess a senior and above technical certificate as senior engineer in environment engineering or  
ii) Have working experience in similar areas  
iii) Good oral and written communication skills in both Chinese and English. |
| (3 persons) | environment protection.  
  ii) Have more than 8 years’ working experience in environment protection and related fields, and successfully participated in consulting service projects of environmental protection (provide supporting documents).  
  b) Adaptability to work:  
  i) Have working experience in 1 and more consulting service projects for local government.  
  c) Experience and language in similar areas:  
  i) Have working experience in similar areas.  
  ii) Good oral and written communication skills in both Chinese and English. |

Note: the consultant shall provide a list of all expert personnel, and other personnel required by the consultant may consider it on their own and ensure the quality of the consulting services. The consultant shall ensure that the personnel nominated in the technical proposal can participate in the completion of various tasks; only after the written approval of the project Employer can the relevant personnel be adjusted.

3. Major Consulting Personnel Duties: (including but not limited to the following)

a. Project manager

(1) Responsible for the overall coordination and management of the project, including project quality control, project progress and budget control, contract management, financial management, implementation of social safe guard policies. Responsible for the overall investment plan of the project management team and relevant arrangement.

(2) Responsible for coordinating the work reports and progress reports of the project, and other documents and reports that need to be submitted to the project Employer, ADB, and KfW.

(3) Responsible for transferring acceptable and satisfactory project results.

(4) Deal with problems in project management and contract management in a timely manner and report and communicate to the Employer.

(5) Responsible for completing other work related to the project explained by the Employer.

b. Ecological compensation specialist
(1) Responsible for establishing ecological compensation standards and performance evaluation system, and designing and providing suggestions for improving its feasibility and sustainability.

(2) Cooperate with energy conservation and environmental protection specialist to ensure the quality of ecological compensation standards and performance evaluation system designed under the project.

(3) Review the quality of the project research to ensure the results are reasonable and workable.

(4) Undertake other tasks assigned by the project Employer and project manager.

c. Energy conservation and environmental protection specialist

(1) Cooperate with ecological compensation to control the quality of research results of ecological compensation standards and performance evaluation system.

(2) Put forward opinions and suggestions on environmental management policies from aspects of improving the compensation mechanism in river basins, establishing long-term compensation mechanism, etc.

(3) Ensure the quality of deliverables such as written reports.

(4) Undertake other tasks assigned by the project Employer and project manager.

d. Environmental economic specialist

(1) Assist project manager in carrying out on-site researches, literature review and related researches.

(2) Cooperate with environmental consultants to start researches on ecological compensation standards and performance evaluation system.

(3) Responsible for preparation of written report and implementation of specific tasks.

(4) Undertake other tasks assigned by the project Employer and project manager.

e. Environmental consultant

(1) Assist project manager in carrying out on-site researches, literature review and related researches.

(2) Responsible for researches and analysis of ecological compensation cases abroad.

(3) Cooperate with environmental economic specialist to start researches on ecological compensation standards and performance evaluation system.

(4) Responsible for preparation of written report and implementation of specific tasks.
(5) Undertake other tasks assigned by the project Employer and project manager.

VI、Facilities and resources provided by consulting company and the Employer

1. Resources and facilities provided by consulting company

(1) The office space, office equipment and transportation of the consulting management company shall be arranged and solved by itself.

(2) Responsible for the research reports and deliverables in each stage during the contract execution period and answer the Employer’s questions about the project consulting services when needed.

2. Resources and facilities provided by the Employer

(1) Provide necessary information and conditions: including providing consulting company with project related documents, reports, materials, data and other necessary permits and corresponding working conditions in a timely manner.

(2) Coordinate with other government agencies such as finance, water conservancy, agriculture, forestry, culture and tourism, housing and construction, environmental protection, etc.

(3) Assign special personnel to cooperate with the consulting company.

VII、Opinions and suggestions from consulting company

The consulting company can comment on TOR and put forward opinions and suggestions on improving the TOR in the technical proposal. If it involves financial issues, it should be noted in the financial proposal.