



# Technical Assistance Report

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Project Number: 48469-001  
Policy and Advisory Technical Assistance (PATA)  
December 2015

## People's Republic of China: Developing Gross Ecosystem Product Accounting for Eco- Compensation

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**Asian Development Bank**

## CURRENCY EQUIVALENTS

(as of 14 December 2015)

Currency unit	–	yuan (CNY)
CNY1.00	=	\$0.1549
\$1.00	=	CNY6.4558

## ABBREVIATIONS

ADB	–	Asian Development Bank
CPS	–	country partnership strategy
GEP	–	gross ecosystem product
NDRC	–	National Development and Reform Commission
PRC	–	People's Republic of China
TA	–	technical assistance

## NOTE

In this report, "\$" refers to US dollars.

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## POLICY AND ADVISORY TECHNICAL ASSISTANCE AT A GLANCE

<b>1. Basic Data</b>		<b>Project Number: 48469-001</b>	
<b>Project Name</b>	Developing Gross Ecosystem Product Accounting for Eco-Compensation	<b>Department /Division</b>	EARD/EAER
<b>Country</b>	China, People's Republic of	<b>Executing Agency</b>	National Development and Reform Commission
<b>2. Sector</b>	<b>Subsector(s)</b>	<b>ADB Financing (\$ million)</b>	
✓ Agriculture, natural resources and rural development	Agricultural policy, institutional and capacity development		0.12
	Forestry		0.12
	Irrigation		0.12
	Land-based natural resources management		0.12
	Water-based natural resources management		0.12
	<b>Total</b>		<b>0.60</b>
<b>3. Strategic Agenda</b>	<b>Subcomponents</b>	<b>Climate Change Information</b>	
Inclusive economic growth (IEG)	Pillar 2: Access to economic opportunities, including jobs, made more inclusive	Climate Change impact on the Project	Low
Environmentally sustainable growth (ESG)	Environmental policy and legislation Natural resources conservation		
<b>4. Drivers of Change</b>	<b>Components</b>	<b>Gender Equity and Mainstreaming</b>	
Governance and capacity development (GCD)	Institutional development	No gender elements (NGE)	✓
Knowledge solutions (KNS)	Knowledge sharing activities		
<b>5. Poverty Targeting</b>		<b>Location Impact</b>	
Project directly targets poverty	No	Rural	Medium
		Urban	Medium
<b>6. TA Category:</b>	B		
<b>7. Safeguard Categorization</b>	Not Applicable		
<b>8. Financing</b>			
<b>Modality and Sources</b>		<b>Amount (\$ million)</b>	
<b>ADB</b>		<b>0.60</b>	
Policy and advisory technical assistance: Technical Assistance Special Fund		0.60	
<b>Cofinancing</b>		<b>0.00</b>	
None		0.00	
<b>Counterpart</b>		<b>0.00</b>	
None		0.00	
<b>Total</b>		<b>0.60</b>	
<b>9. Effective Development Cooperation</b>			
Use of country procurement systems			No
Use of country public financial management systems			Yes



## I. INTRODUCTION

1. The Government of the People's Republic of China (PRC) requested policy and advisory technical assistance (TA) from the Asian Development Bank (ADB) during ADB's 2014 country programming mission to enhance the ability of the National Development and Reform Commission (NDRC) to evaluate the impact of eco-compensation programs and the performance of local administrations involved in them.<sup>1</sup> The TA was included in ADB's country operations business plan for the PRC for 2015–2017.<sup>2</sup> ADB missions to the PRC reached an understanding with the NDRC and other stakeholders on the TA project's impact, outcome, outputs, implementation arrangements, cost, and financing arrangements, as well as the terms of reference for TA consultants. The design and monitoring framework is in Appendix 1.

## II. ISSUES

2. Improving the effectiveness of eco-compensation schemes in key designated ecological function zones became a government priority in 2013.<sup>3</sup> The PRC has made substantial investments in these zones to improve ecosystem services using eco-compensation mechanisms.<sup>4</sup> Overall government funding for eco-compensation in the PRC increased from CNY6.0 billion in 2008 to CNY48.3 billion in 2013.

3. The first issue is that despite its large investments, made through transfer payments to local governments, the government has not put a monitoring system in place to assess the extent to which degraded ecosystems have been restored. The main reason is a lack of tools and approaches to conduct systematic monitoring and assessment.

4. The second issue is lack of incentives for local governments to make the effective implementation of these eco-compensation programs a high priority. Despite the government's decision in 2013 to no longer use economic development indicators in its evaluation of the performance of local administrations in the key ecological function zones, both the national and local governments have found it difficult to switch to an evaluation model that also includes environmental health indicators. One reason for this is lack of pre-existing guidelines or policies in the PRC.

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<sup>1</sup> The TA first appeared in the business opportunities section of ADB's website on 5 November 2015.

<sup>2</sup> ADB. 2015. *Country Operations Business Plan: People's Republic of China, 2015–2017*. Manila.

<sup>3</sup> Eco-compensation is a package of different mechanisms—including monetary subsidies, project support, favorable policies, and other measures—that governments at all levels of the PRC's administration use to compensate those who invest money or suffer economic losses to protect ecosystems by transferring resources from those who benefit from or damage them. Ecological functional zones are zones specifically designated for ecological protection. One of the spatial planning approaches taken by the national government under its twelfth five-year plan for 2011–2015 was the designation of major zones that divide the nation into four categories: (i) prohibited development zones (e.g., natural and cultural heritage protection zones); (ii) restricted development zones (including ecological functional zones and agricultural zones); (iii) optimized development zones (highly industrialized areas); and (iv) key development zones (developing areas with large resources and environmental capacity for development).

<sup>4</sup> Natural systems such as forests, wetlands, and watersheds provide a wide variety of "ecosystem services" and contribute to human well-being and poverty reduction. These ecosystem services may include water supply and purification, flood regulation, fisheries, shoreline stabilization and more. Many of these ecosystem services are provided indirectly, i.e., with no direct link between the service provider and the consumer of the service. For example, this occurs due to the spatial separation between the location of services providers (often landowners or resource managers in the upper watershed) and the location of the users of these services (such as consumers of potable water and industries or agriculture using water downstream).

5. The TA will address these two issues by helping the NDRC pilot test an innovative approach using the ecosystem production function that makes it possible to link the characteristics of an ecosystem to the ecosystem services it ultimately delivers.<sup>5</sup> The TA will prepare tools and recommendations that will (i) further refine the concept of gross ecosystem product (GEP) and develop technical guidelines for calculating and using GEP, (ii) recommend an approach for evaluating the effectiveness of eco-compensation schemes and the performance of the local administrations involved in them, (iii) provide training to important stakeholders on GEP accounting and alternative approaches to monitoring the delivery of ecosystem services, and (iv) organize national and international knowledge-sharing seminars and workshops to disseminate the key lessons learned under the TA.

6. The TA is consistent with ADB's country partnership strategy (CPS) for the PRC for 2011–2015 and will help support the strategic priorities of ADB's draft PRC CPS for 2016–2020.<sup>6</sup> The new CPS will support more innovation in the use of eco-compensation for better environmental management. The TA builds on ADB's long-term cooperation with the PRC on the eco-compensation agenda. In addition to supporting related publications and regional knowledge-sharing events, ADB has provided TA to help develop the national and provincial policy and legislative framework for eco-compensation and was instrumental in facilitating the necessary policy and legal reforms.<sup>7</sup>

7. ADB has invested in the pilot operationalization of some eco-compensation concepts through such projects as the Guiyang Integrated Water Resources Management (Sector) Project, the Jiangsu Yancheng Wetlands Protection Project, and the Anhui Chao Lake Environmental Rehabilitation Project.<sup>8</sup> In July 2014, the ADB–NDRC joint knowledge hub on green growth and eco-compensation was launched in Beijing. The TA will build on these ADB activities and explore new innovations and the practical aspects of eco-compensation.

### III. THE POLICY AND ADVISORY TECHNICAL ASSISTANCE

#### A. Impacts and Outcome

8. The impacts will be (i) the establishment of a monitoring and evaluation system to assess the improvement of the targeted ecosystem services, and (ii) improvement in the environment in the key ecological function zones.<sup>9</sup> The outcome will be an enhancement of the NDRC's capacity for evaluating the impact of eco-compensation programs in the PRC's key ecological function zones and assessing the overall performance of the local administrations.

<sup>5</sup> The current limited literature defines gross ecosystem product (GEP) as total values of ecosystem services for human welfare and sustainable development. GEP mainly refers to the total value of direct and indirect use values of ecosystem services.

<sup>6</sup> ADB. 2012. *Country Partnership Strategy: People's Republic of China, 2011–2015*. Manila

<sup>7</sup> ADB. 2010. *Technical Assistance to the People's Republic of China for Study on Eco-Compensation Regulations*. Manila; and ADB 2012. *Technical Assistance to the People's Republic of China for Building a Framework for Regulation and Policy Support System for Eco-Compensation in Gansu*. Manila.

<sup>8</sup> ADB. 2009. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the People's Republic of China for the Guiyang Integrated Water Resources Management (Sector) Project*. Manila (Loan 2573-PRC); ADB. 2011. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the People's Republic of China for the Jiangsu Yancheng Wetlands Protection Project*. Manila (Loan 2838-PRC); and ADB. 2012. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the People's Republic of China for the Anhui Chao Lake Environmental Rehabilitation Project*. Manila (Loan 2941-PRC).

<sup>9</sup> The impacts align with government decisions taken at the third plenary of the 18th Central Committee of the Communist Party of China.



## B. Methodology and Key Activities

9. The TA will deliver three outputs: (i) the development of an accounting methodology and approach for GEP; (ii) preparation of recommendations for evaluating the effectiveness of targeted eco-compensation schemes and the performance of the local level administrations involved; and (iii) national and provincial staff involved in GEP accounting trained and lessons learned shared.

10. **Output 1: Gross ecosystem product accounting methodology and approach developed.** Through a literature review, detailed discussions between technical experts and policy makers, and the implementation of pilot projects in three provinces, the TA will develop technical guidelines for GEP accounting. The proposed pilot study provinces are Guizhou, Qinghai, and Yunnan. The TA activities will include the following:

- (i) TA consultants will prepare a methodology and approach paper for GEP accounting.
- (ii) NDRC and TA consultants will organize workshops and seminars for experts and key sector agencies to discuss the draft GEP methodology and approach paper.
- (iii) TA consultants will implement pilot studies for GEP accounting in the targeted provinces.<sup>10</sup> The studies will involve several aspects:
  - (a) TA consultants will conduct detailed stakeholder consultation and select final targeted ecosystem services that possess explicit social value, and are derived from a measurable ecological function unit (e.g., a river basin).
  - (b) TA consultants will quantify targeted ecosystem services and the management options for reducing service shortfalls. This could be done using biophysical models and ecological production functions.
  - (c) TA consultant will prepare detailed technical reports on the case studies that demonstrate the calculation of GEP in the target study areas over a 6-month period.
- (iv) NDRC and TA consultants will organize national and local level seminars and workshops to discuss the findings of the pilot studies.
- (v) TA consultants will develop draft technical guidelines for GEP accounting based on the results of the pilot studies and stakeholder consultation.

11. **Output 2: Recommendations for evaluating effectiveness of targeted eco-compensation schemes and performance of local level administration prepared.** The TA activities to deliver output 2 will include the following:

- (i) TA consultants will prepare a preliminary draft report with recommendations to the government for evaluating the effectiveness of eco-compensation schemes based on GEP accounting, results of the output 1 pilot studies, and other criteria.
- (ii) TA consultants will organize national and local seminars to discuss the draft technical guidelines for the evaluation of eco-compensation effectiveness and the performance of those local administrations involved.
- (iii) Based on lessons learned abroad and from TA development of the GEP accounting approaches, TA consultants will revise the report and recommendations for the NDRC on the approach and criteria to be used for evaluating local administration performance.

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<sup>10</sup> ADB expects that the TA will support case studies at the provincial, prefecture, and county levels in these provinces.

12. **Output 3: Key stakeholders related to gross ecosystem product accounting trained and lessons learned from national pilot projects and international experience shared.** The training for key stakeholders and the sharing of lessons learned under the TA will include the following activities:

- (i) The NDRC and other relevant agencies will undertake foreign study tours to give them an understanding of how ecological improvement indicators similar to GEP can be used to assess the performance of participating local administrations. Along with other information, the study tours will provide (a) practical examples of the monitoring of returns from investments in the restoration of ecosystem functions and services; and (b) options for evaluating the performance of local administration in schemes other than the simple use of economic development indicators.<sup>11</sup>
- (ii) TA consultants will prepare a knowledge product on the key TA project findings that will focus on how to use GEP as a tool to assess the effectiveness of eco-compensation programs.
- (iii) NDRC and TA consultants will organize an international knowledge-sharing seminar on evaluating the impacts of payments for ecosystem services and eco-compensation programs to share lessons learned from the GEP pilot projects and findings of the TA.

13. The GEP is a new concept, and its use to monitor eco-compensation program effectiveness poses some risks. First, the technical details of the GEP approach will require further discussion between technical experts, academics, and key policy makers and fine-tuning during the early stages of the inception phase of the TA implementation before it can be applied for TA pilot project implementation. Published literature on GEP is limited.<sup>12</sup> In addition, the current literature also combines agricultural production and ecosystem services in the GEP accounting although these are not necessarily always compatible uses of land. The differences in spatial planning and approaches and practices between sectors and ministries in the PRC could also compromise the actual proper functioning of the designated ecological function zones. Even though this makes close interministerial coordination crucial, a risk exists that some sector agencies may be unable to reach the strategic consensus required for the concept to work.

### C. Cost and Financing

14. The TA is estimated to cost \$750,000, of which \$600,000 will be financed on a grant basis by ADB's Technical Assistance Special Fund (TASF-other sources). The government will provide counterpart support in the form of counterpart staff, necessary data, office space, local transportation to the project sites, pilot testing, workshop costs, and other in-kind contributions. The TA will be disbursed in accordance with ADB's *Technical Assistance Disbursement Handbook* (2010, as amended from time to time). The cost estimates and financing plan are in Appendix 2.

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<sup>11</sup> The two study tours currently planned include visits to Switzerland (the Organisation for Economic Co-operation and Development, the World Wide Fund for Nature, and the International Union for the Conservation of Nature); the United Kingdom (the United Nations Environment Programme-World Conservation Monitoring Centre); Kenya (the United Nations Environment Programme); Canada (the Convention on Biological Diversity) and the United States (the World Bank). Other planned activities will raise participants' understanding of the Water Quality Trading Program in New York and wetland banking initiatives in the United States.

<sup>12</sup> Z. Y. Ouyang *et al.* 2013. Gross Ecosystem Product: Concept, Accounting Framework and Case Study. *Acta Ecologica Sinica*. 33( 21). pp. 6747–6761.

#### **D. Implementation Arrangements**

15. The TA will be implemented from 1 February 2016 to 31 July 2017. The Department of Western Region Development of NDRC will be the executing agency. A TA management office will be established in NDRC and will be responsible for day-to-day operations, with ADB consultants reviewing their outputs and coordinating with the consultants and related government agencies for the preparation of the national and provincial workshops. A project management office will be set up within NDRC and be responsible for day-to-day TA operations, including overseeing the TA consultants' work plans. An advance payment facility will be established for TA implementation and an intersector coordination body will be set up by NDRC to provide guidance and input during the TA implementation.

16. The TA will require 3 person-months of international and 37 person-months of national consulting services. The project will require one international specialist (deputy team leader and ecosystem management specialist) and seven national specialists (team leader and ecosystem management specialist, eco-compensation policy specialist, environmental economist, environmental monitoring specialist, statistics specialist, social development specialist, and remote sensing and geographic information system specialist). The outline terms of reference for consultants are in Appendix 3. Consultants will be engaged on an individual basis in accordance with ADB's Guidelines on the Use of Consultants (2013, as amended from time to time).

17. The TA will follow the standard monitoring and supervision procedures for ADB-administered TA projects. ADB will carry out monitoring and review missions at the inception, interim, and final phases of the project. During these missions, ADB, the executing agency, the consultants, and stakeholders will review the technical progress of the project and provide feedback to improve the TA. Progress will be measured against the targets and indicators in the design and monitoring framework (Appendix 1) and the consultants' terms of reference, and reported in TA progress reports. TA progress reports will be reviewed by ADB and local experts to provide additional feedback and guidance. The best practices and lessons learned will be disseminated through project reports, a training program, TA workshops, and media releases.

#### **IV. THE PRESIDENT'S DECISION**

18. The President, acting under the authority delegated by the Board, has approved the provision of technical assistance not exceeding the equivalent of \$600,000 on a grant basis to the Government of the People's Republic of China for Developing Gross Ecosystem Product Accounting for Eco-Compensation, and hereby reports this action to the Board.

## DESIGN AND MONITORING FRAMEWORK

### Impacts the Technical Assistance Project is Aligned with

1. A monitoring and evaluation system to assess the improvement of the targeted ecosystem services established.
2. Environment in the key ecological function zones improved.

(Decisions taken at the Third Plenary of the 18th Central Committee of the Communist Party of China)

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
<p><b>Outcome</b></p> <p>NDRC's capacity for evaluating the impact of eco-compensation programs in the PRC's key ecological function zones and assessing the overall performance of the local administrations enhanced</p>	<p>By 2017</p> <p>a. The NDRC provides leadership in organizing at least two consultation and dissemination workshops to share information on the proposed GEP approach (2015 baseline: 0).</p>	<p>a. NDRC's annual report and TA final review mission report</p>	<p>The NDRC fails to effectively communicate the proposed GEP approach to relevant counterparts at the provincial level, and the approach receives limited buy-in at the provincial level.</p>
<p><b>Outputs</b></p> <ol style="list-style-type: none"> <li>1. GEP accounting methodology and approach developed</li> <li>2. Recommendations for evaluating effectiveness of targeted eco-compensation schemes and performance of local level administration prepared</li> <li>3. Key stakeholders related to GEP accounting trained and lessons learned from national pilot projects and international experience shared</li> </ol>	<p>By 2017</p> <ol style="list-style-type: none"> <li>1a. Three pilot studies for GEP completed in targeted provinces (2015 baseline: 0)</li> <li>1b. Draft GEP technical guidelines prepared (2015 baseline: 0)</li> <li>2a. Draft report with recommendations for NDRC for evaluating effectiveness of targeted eco-compensation schemes prepared (2015 baseline: 0)</li> <li>3a. At least one seminar, one training, and one international information-sharing workshop on assessing eco-compensation impacts conducted (2015 baseline: 0)</li> <li>3b. At least two study tours for key government stakeholders organized (2015 baseline: 0)</li> </ol>	<ol style="list-style-type: none"> <li>1a–b. Interim and final technical and progress reports of the TA project</li> <li>2a. Interim and final technical and progress reports of the TA project</li> <li>3a. Workshop proceedings and seminar reports</li> <li>3b. Study tour reports</li> </ol>	<ol style="list-style-type: none"> <li>1. Because it is new and being pilot-tested in the PRC, technical experts and the government do not reach a consensus on the methodology of the GEP accounting approach.</li> </ol>

### Key Activities with Milestones

1. GEP accounting methodology and approach developed
  - 1.1. Prepare methodology and approach paper for GEP accounting (by Q2 2016)
  - 1.2. Organize workshops and seminars for experts and key sector agencies to discuss draft GEP methodology and approach paper (by Q2 2016)
  - 1.3. Implement pilot studies for GEP accounting in targeted provinces (Q2–Q3 2016)
  - 1.4. Organize provincial and national level seminars and workshops to discuss the findings of the pilot studies (Q2–Q3 2016)
  - 1.5. Develop draft technical guidelines for GEP accounting based on the results of the pilot studies and stakeholder consultation (by Q3 2016)
2. Recommendations for evaluating effectiveness of targeted eco-compensation schemes and performance of local level administration prepared
  - 2.1. Prepare preliminary draft report with recommendations for evaluating the effectiveness of eco-compensation schemes based on GEP accounting, results of pilot studies under output 1, and other relevant criteria (by Q3 2016)
  - 2.2. Organize national and local seminars to discuss draft technical guidelines on eco-compensation effectiveness evaluations and local administration performance (Q3–Q4 2016)
  - 2.3. Revise report with recommendations for NDRC on approach and criteria to be used for the evaluation of local level administration performance based on lessons learned abroad and GEP accounting approaches (Q4 2016–Q1 2017) [GCD].
3. Key stakeholders related to GEP accounting trained and lessons learned from national pilot projects and international experience shared
  - 3.1. Organize and undertake foreign study tours to provide NDRC and other key stakeholders with an understanding of how ecological improvement indicators can be used to assess performance of local administrations of NDRC and other relevant agencies (Q3 and Q4 2016).
  - 3.2. Prepare a knowledge product on the key TA findings, focusing on the application of GEP as a tool to assess effectiveness of eco-compensation programs (Q1 2017) [GCD].
  - 3.3. Organize an international knowledge-sharing seminar on evaluating the impacts of payments for ecosystem services and eco-compensation programs (Q2 2017) [GCD].

### Project Management Activities

Mobilize team of experts, develop study framework, and complete inception activities by month 3 from the TA effectiveness date

Prepare inception report with detailed approach and implementation arrangements and organize inception workshop by month 4

Organize interim review mission and meeting and prepare mission report by month 10

Prepare the final report summarizing key results and the way forward by month 15

Organize final review mission by month 16 and submit revised final report by month 17

The projected starting point for the time lines of project management activities is the estimated TA effectiveness date of 1 January 2016.

### Inputs

Asian Development Bank: \$600,000

Note: The government will provide counterpart support in the form of counterpart staff, necessary data, office space, local transportation to the project sites, pilot testing, workshop costs, and other in-kind contributions.

### Assumptions for Partner Financing

Not applicable.

GCD = governance and capacity development, GEP = gross ecosystem product, NDRC = National Development and Reform Commission, PRC = People's Republic of China, Q = quarter, TA = technical assistance.  
Source: Asian Development Bank.

**COST ESTIMATES AND FINANCING PLAN**  
(\$'000)

<b>Item</b>	<b>Amount</b>
<b>Asian Development Bank<sup>a</sup></b>	
1. Consultants	
a. Remuneration and per diem	
i. International consultant	76.0
ii. National consultants	262.5
b. International and local travel	17.5
c. Reports and communications	10.0
2. Training, seminars, and conferences <sup>b</sup>	192.0
3. Surveys	12.0
4. Miscellaneous administration and support costs <sup>c</sup>	10.0
5. Contingencies	20.0
<b>Total</b>	<b>600.0</b>

Note: The technical assistance is estimated to cost \$750,000, of which contributions from the Asian Development Bank are presented in the table above. The government will provide counterpart support in the form of counterpart staff, necessary data, office space, local transportation to the project sites, pilot testing, workshop costs, and other in-kind contributions. The value of government contribution is estimated to account for 20% of the total technical assistance cost.

<sup>a</sup> Financed by the Asian Development Bank's Technical Assistance Special Fund (TASF-other sources).

<sup>b</sup> The two study tours currently planned include visits to Switzerland (the Organisation for Economic Co-operation and Development, the World Wide Fund for Nature, and the International Union for the Conservation of Nature); the United Kingdom (the United Nations Environment Programme-World Conservation Monitoring Centre); Kenya (the United Nations Environment Programme); Canada (the Convention on Biological Diversity) and the United States (the World Bank). Other planned activities will raise participants' understanding of the Water Quality Trading Program in New York and wetland banking initiatives in the United States..

<sup>c</sup> Includes costs for office operations, secretarial services, miscellaneous travel expenses, and other unanticipated administrative costs.

Source: Asian Development Bank estimates.

## OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

### A. Introduction

1. The Asian Development Bank (ADB) technical assistance (TA) to the People's Republic of China (PRC) will require an estimated 3 person-months of international and estimated 37 person-months of national consulting services. One international specialist, a deputy team leader and ecosystem management specialist will be engaged. The project will require seven national specialists—a team leader and ecosystem management specialist, an eco-compensation policy specialist, an environmental economist, an environmental monitoring specialist, a statistics specialist, a social development specialist, and remote sensing and geographic information system specialist. Consultants will be engaged on an individual basis in accordance with the Guidelines on the Use of Consultants (2013, as amended from time to time). Table A3 provides a breakdown of the required expertise.

**Table A3: Breakdown of Consulting Expertise**

International Position	Person-Months	National Position	Person-Months
Ecosystem management specialist and deputy team leader	3	Ecosystem management specialist and team leader	7
		Eco-compensation policy specialist and deputy team leader	6
		Environmental economist	5
		Environmental monitoring specialist	5
		Statistics specialist (to develop a gross ecosystem product system that will be compatible with the current system of evaluation of performance of local administrations)	5
		Social development specialist	5
		Remote sensing and geographic information system specialist	4
		<b>Total:</b>	<b>3</b>

Source: Asian Development Bank estimates.

### B. Terms of Reference

2. **Ecosystem management specialist and team leader** (national, 7 person-months). The ecosystem management specialist and team leader should have (i) a postgraduate degree in environmental planning, environmental management, or a related field; (ii) 10 or more years of experience in ecosystem management; (iii) demonstrated experience in eco-compensation projects; (iv) experience in the development of methodologies for monitoring eco-compensation projects and familiarity with the gross ecosystem product (GEP) concept or similar approaches; and (v) proficiency in the English language. As the team leader, the specialist will be responsible for the delivery of the TA outputs, as well as for the daily coordination and supervision of the team of consultants. The specialist will undertake the following tasks:

- (i) Review and refine the terms of reference of the remaining national consultants in consultation with National Development and Reform Commission (NDRC), ADB, and the international ecosystem management specialist.
- (ii) Develop the detailed study framework and assign work to relevant specialists in the team in consultation with ADB and the executing agency.
- (iii) Develop outlines of the TA inception, interim, and final reports and compile inputs from the TA team and the stakeholder feedback. The team leader will be responsible for drafting and finalizing the inception, interim, and final reports.
- (iv) Maintain close coordination with ADB and the executing agency and within the TA team.
- (v) Lead the review and evaluation of the process, approaches, and mechanisms currently being applied to monitoring and assessing eco-compensation projects

and ecosystem benefits. This review should include an assessment of monitoring indicators, data gathering, and management and performance assessment, as well as the necessary consultation workshops.

- (vi) Lead the implementation of the pilot studies for GEP.
- (vii) Prepare a preliminary draft report with recommendations for evaluating the effectiveness of eco-compensation schemes using GEP accounting based on the results of the pilot studies and other relevant criteria.
- (viii) Revise the preliminary report to the NDRC on the recommendations on the approach and criteria to be used to evaluate the performances of local administrations based on lessons learned abroad from the study tours and literature review and GEP accounting approaches.
- (ix) Function as the leading expert on GEP and its application in monitoring eco-compensation programs.
- (x) Take responsibility for day-to-day liaison with the NDRC and other national and provincial government agencies supporting the TA-related work.
- (xi) Manage and ensure timely implementation of the project activities.
- (xii) Supervise the national consultants in the implementation of the pilot studies and the drafting of the study reports and other related reports.
- (xiii) Responsible for collating the inputs from the consultants.
- (xiv) Responsible for the delivery of the final TA outputs and the quality control of various reports.
- (xv) Help the executing agencies coordinate potential public relations and communications issues.
- (xvi) Organize and give presentations at workshops and seminars.
- (xvii) Carry out other tasks necessary to accomplish the TA objectives.

3. **Ecosystem management specialist and deputy team leader** (international, 3 person-months). The specialist should have (i) a postgraduate degree in ecosystem management, environmental management, or a relevant field; (ii) 10 or more years of research and policy experience in environmental policy and strategy, environmental planning, and environmental management; (iii) demonstrated experience in payments for ecosystem services or eco-compensation projects; and (iv) fluency in written and spoken English. Work experience in the PRC will be an advantage. The specialist will undertake the following tasks:

- (i) Support the team leader to refine the overall study framework and the GEP concept; the scope of the pilot studies; and the outlines of the inception, interim, and final TA reports.
- (ii) Prepare a review report on international best practices in the monitoring of the effectiveness of eco-compensation-type programs.
- (iii) Identify appropriate agencies and organizations in the countries to be visited for a foreign experience review mission and liaise with agencies and organizations on the mission's program and objective.
- (iv) Help the team leader prepare participants for the international study review missions.
- (v) Review reports prepared by the team and provide comments.
- (vi) Support the team leader in consolidating the inputs from the team specialists and conduct a technical review and edit of the final report.
- (vii) Contribute to the drafting and review of the inception, interim, and final TA reports.
- (viii) Participate in project's inception, midterm, and final workshops and other seminars presenting or discussing the findings of the TA.
- (ix) Prepare a knowledge product on the key TA findings.



- (x) Provide input for other related technical tasks, as requested by the team leader.

4. **Eco-compensation policy specialist and deputy team leader** (national, 6 person-months). The specialist should have (i) a postgraduate degree in environmental policy, environmental economics, or a relevant field; (ii) 6 or more years of experience in environmental economics and policy, especially related to eco-compensation policies at the national and provincial levels in the PRC; (iii) demonstrated experience in eco-compensation projects; and (iv) proficiency in the English language. The specialist will undertake the following tasks:

- (i) Contribute to the development of the detailed study framework and methodology.
- (ii) Undertake an institutional and policy review of the national approaches and mechanisms currently being applied to the monitoring and assessing of eco-compensation projects and ecosystem benefits.
- (iii) Provide recommendations for improving the institutional organization and management for eco-compensation product accounting.
- (iv) Draft a policy guidance note on how GEP accounting can be implemented in the PRC.
- (v) Provide technical input on policy and institutional issues for the international knowledge-sharing seminar.
- (vi) Provide technical input for the TA workshops and seminars and support the team leader and the NDRC in organizing them.
- (vii) Support the team leader in all tasks related to the implementation of the pilot studies, the organizing of workshops, and the accomplishment of all the TA outputs.
- (viii) Undertake other related tasks assigned by the team leader.

5. **Environmental economist** (national, 5 person-months). The environmental economist should have (i) a postgraduate degree in environmental economics, environmental management, or a relevant field; (ii) 6 or more years of experience with research on the economics and the valuation of ecosystem services; (iii) demonstrated experience in eco-compensation-related projects and programs; and (iv) proficiency in the English language. The specialist will undertake the following tasks:

- (i) Contribute to the development of the detailed study framework and methodology.
- (ii) Support the team leader in the development of the methodology and approach paper for GEP accounting.
- (iii) Develop draft technical guidelines for GEP accounting based on the results of pilot studies and stakeholder consultation.
- (iv) Apply the GEP methodology to the selected pilot study areas.
- (v) Contribute to the preparation of detailed technical reports on case studies demonstrating the value of GEP accounting in the target study areas.
- (vi) Provide technical input for workshops and seminars at which experts and key sector agencies will discuss the draft GEP methodology.
- (vii) Provide technical input for workshops and seminars that will disseminate the findings and discuss technical guidelines for evaluating eco-compensation effectiveness and local administration performance.
- (viii) Provide technical inputs for the international knowledge-sharing seminar.

6. **Environmental monitoring specialist** (national, 5 person-months). The specialist should have (i) a postgraduate degree in environmental economics, environmental management, or a relevant field; (ii) 7 or more years of experience in ecosystem management and monitoring; (iii) demonstrated project-related experience with and understanding of eco-

compensation; and (iv) proficiency in the English language. The specialist will undertake the following tasks:

- (i) Contribute to the development of the detailed study framework and methodology.
- (ii) Support the team leader in the development of the methodology and approach paper for GEP accounting.
- (iii) Support the team leader in the development of appropriate ecosystem health indicators for monitoring eco-compensation programs and the GEP guidelines.
- (iv) Develop draft technical guidelines for GEP accounting based on the results of pilot studies and stakeholder consultation.
- (v) Apply the GEP methodology to the selected pilot study areas.
- (vi) Contribute to the preparation of detailed technical reports on case studies, demonstrating the value of the GEP accounting approach.
- (vii) Contribute to the development of the approach and criteria to be used for evaluating the performance of local administrations based on lessons learned abroad and GEP accounting approaches.
- (viii) Provide technical input for workshops and seminars at which experts and key agencies will discuss the draft GEP methodology.
- (ix) Provide technical input for workshops and seminars that will disseminate the findings and discuss technical guidelines for evaluating eco-compensation effectiveness and local administration performance.
- (x) Provide inputs for the planned international seminar.
- (xi) Provide substantial inputs to the TA reports.
- (xii) Participate in the TA workshops to present and discuss study findings.
- (xiii) Participate in capacity-building events and provide lectures and other technical inputs.
- (xiv) Undertake other related tasks assigned by the team leader.

7. **Statistics specialist** (national, 5 person-months). The specialist should have (i) an advanced university degree in statistics and/or economics, (ii) 5 or more years of experience with the PRC's current system for evaluating the performance of local administrations, and (iii) demonstrated experience in environmental statistics. The specialist will undertake the following tasks:

- (i) Conduct a comprehensive review and identify challenges and constraints related to the existing local administration performance evaluation system in the targeted pilot sites within the key ecological function zones.
- (ii) Provide substantial inputs to the inception, interim, and final TA reports.
- (iii) Provide input to development of a GEP accounting system that will be compatible with the current system for evaluating the performance of local administrations.
- (iv) Participate in the TA workshops to present and discuss study findings.
- (v) Conduct other related tasks assigned by the team leader.

8. **Social development specialist** (national, 5 person-months). The specialist should have (i) a postgraduate degree in social development or a relevant field, (ii) 6 or more years of experience with social development issues in the PRC, and (iii) demonstrated experience in eco-compensation-related projects and the social aspects of environmental restoration and management. The specialist will undertake the following tasks:

- (i) Contribute to the development of the detailed study framework and methodology.
- (ii) Contribute to the implementation of pilot studies by leading activities related to stakeholder consultation processes and the GEP approach.
- (iii) Provide technical input on social issues for the international knowledge-sharing seminar.

- (iv) Provide technical input for the workshops and seminars.
- (v) Provide substantial inputs to the TA reports.
- (vi) Conduct other related tasks assigned by the team leader.

9. **Remote sensing and geographic information system specialist** (national, 4 person-months). The specialist will obtain and analyze relevant remote-sensing data to support the assessment and mapping of the ecosystems in the targeted pilot sites. This will include analysis of the remote-sensing data and other relevant data, as agreed with the team leader. Preferably, the consultant will have (i) a university bachelor's degree or above in remote sensing and geographic information system or the equivalent, and (ii) at least 8 years of experience in analyzing remote sensing data and classifying land cover and land use based on different types of remote sensing data. Previous experience in mapping of land cover and distribution of different ecosystems types using remote sensing is preferred. The specialist will have the following responsibilities:

- (i) Prepare a detailed report on remote sensing data requirements at the inception phase, in consultation with the TA team leader. The report will include a brief methodology for the remote-sensing analyses and for using the data to support the work.
- (ii) Liaise with the relevant data providers to obtain relevant data sets that will be used to support the mapping of key ecosystems types and agricultural landscapes in the targeted ecological function zones based on the identified remote-sensing data needs.
- (iii) Take the lead in the analysis of the remote-sensing data to support the TA mapping requirements under the guidance of the team leader.
- (iv) Participate in the field surveys and exercises to determine ground truth when this is deemed necessary by the team leader.<sup>1</sup>
- (v) Provide written technical input to the remote-sensing component of the TA inception, interim, and final reports and the workshops, as required and requested by the team leader.
- (vi) Prepare reports and deliverables in a format agreed with the team leader.

### C. Reporting

10. The team leader will be responsible for the collation and compilation of the individual consultant reports. The consultants will submit the following reports: (i) an inception report by month 3, (ii) an interim report by month 10, (iii) a draft final report by month 15, and (iv) a final report 1 month after the final workshop. The inception report, revised interim report, revised draft final report, and revised final report should incorporate and address comments received from ADB, the executing and implementing agencies, and other invited reviewers.

11. All documents will be submitted to ADB and the executing agency in both the English and Chinese languages and in hard and electronic copies.

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<sup>1</sup> Ground truth is the accuracy of remotely sensed or mathematically calculated data based on data actually measured in the field. <http://support.esri.com/en/knowledgebase/GISDictionary/term/ground%20truth>