



# Technical Assistance Report

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Project Number: 47074  
Capacity Development Technical Assistance (CDTA)  
December 2013

## People's Republic of China: Establishing a Regional Knowledge Hub on Green Growth and Eco- Compensation

(Financed by the Multi-Donor Trust Fund under the Water  
Financing Partnership Facility)

## CURRENCY EQUIVALENTS

(as of 15 November 2013)

Currency unit	–	yuan (CNY)
CNY1.00	=	\$0.1640
\$1.00	=	CNY6.0947

## ABBREVIATIONS

ADB	–	Asian Development Bank
CAU	–	China Agricultural University
EARD	–	East Asia Department
PES	–	payment for ecosystem services
PRC	–	People's Republic of China
TA	–	technical assistance

## TECHNICAL ASSISTANCE CLASSIFICATION

<b>Type</b>	–	Capacity development technical assistance (CDTA)
<b>Targeting classification</b>	–	General intervention
<b>Sector (subsector)</b>	–	Agriculture and natural resources (water-based natural resources management, land-based natural resource management, fishery, forestry, agriculture and rural sector development), water supply and other municipal infrastructure and services (water supply and sanitation, waste management)
<b>Themes (subthemes)</b>	–	<b>Environmental sustainability</b> (natural resources conservation, urban environmental improvement, global and regional transboundary environmental concerns), regional cooperation and integration (other regional public goods), capacity development (institutional development)
<b>Location (impact)</b>	–	National (high), rural (low), urban (low), regional (high)
<b>Partnership</b>	–	Multi-Donor Trust Fund under the Water Financing Partnership Facility

## NOTE

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

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## I. INTRODUCTION

1. During the 2012 country programming mission, the Government of the People's Republic of China (PRC) requested capacity development technical assistance (TA) from the Asian Development Bank (ADB) for establishing a regional knowledge hub on green growth and eco-compensation in the PRC. In August 2013, a fact-finding mission visited the PRC and reached an understanding with the government on the TA project's impact, outcome, output, cost estimates and financing plan, implementation arrangements, and the consultants' terms of reference. The design and monitoring framework is in Appendix 1.<sup>1</sup>

## II. ISSUES

2. Since the 1990s, the growth rates of the economies of Asia and the Pacific have been among the highest in the world. The strong economic growth lifted more than half a billion of the region's people out of poverty and raised their living standards. However, this success has been achieved at enormous cost to the environment. Rapid industrialization and urbanization have been accompanied by accelerated exploitation of natural resources and a massive increase in the discharge of pollutants.

3. Environmental degradation results when valuable services provided by natural ecosystems are not properly priced within the market. Currently, economic instruments for creating such markets or promoting the sustainable management of natural resources are not fully in place. This is leading to an unequal distribution of ecological and economic benefits between protectors of natural resources and those who benefit from their efforts. As a result, natural ecosystems continue to be degraded or lost. Indeed, the failure of society to compensate for conserving the environment contributes to the rapid and environmentally damaging changes to ecosystems that are taking place in the world. The PRC is a case in point.

4. The concept of green growth emerged amid concerns over increasing resource constraints and growing environmental risks that could threaten social stability and economic development. The countries of Asia and the Pacific have committed to green growth policies in response to the challenges of sustainable development and the growing demand for a transition to green growth. In the region, priority strategies identified for green growth include reforming the economic incentives framework, promoting sustainable infrastructure development, and facilitating investments in natural capital.<sup>2</sup> In the PRC, the government's new leadership has shifted its strategic thinking to embrace ideas of green growth summarized as "ecological civilization," and has made it a top priority of the government's agenda.<sup>3</sup>

5. Since 2000, eco-compensation, or payment for ecosystem services (PES), has become a useful tool to support green growth strategies in the region.<sup>4</sup> It creates incentives for

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<sup>1</sup> The TA first appeared in the business opportunities section of ADB's website on 24 May 2013.

<sup>2</sup> ADB, Economic and Social Commission for Asia and the Pacific, and the United Nations Environment Programme. 2012. *Green Growth, Resources and Resilience*. Bangkok.

<sup>3</sup> Ecological civilization is now not only gaining a significant foothold in the PRC, but also constitutes a new path for PRC's environmental protection that contributes to global sustainable development. Ecological civilization has been incorporated into decision document (Decision 27/8) by the 27th Governing Council of the United Nations Environmental Program (First Universal Session).

<sup>4</sup> In the context of this TA report, "payment for ecological services" (PES) refers to programs that involve actual financial transactions or relate to a market. On the other hand, "eco-compensation" refers to the broader inputs for developing PES schemes and building a PES market, such as the policies, laws, capacity building, and institutional

sustainable ecosystem services, addresses livelihood issues for the rural poor, and provides sustainable financing for protected areas. The PRC has one of the largest PES arrangements in the world to protect its degraded watersheds. This scheme has sought to improve environmental management outcomes by using fiscal transfers or direct payments between key stakeholders to align the social and private costs and benefits of environmental protection. A national eco-compensation ordinance is now being developed. Viet Nam has also taken the important step of providing a legal basis for PES, which has facilitated investments by hydropower companies and water utilities in watershed management. There are many PES-like arrangements on a smaller scale in other countries in the region.

6. Another important PES-related development is the creation of markets for carbon emission reductions from reducing emissions from deforestation and forest degradation (REDD). REDD-plus investments provide a unique opportunity to address both climate change and rural poverty while protecting fragile ecosystems, conserving biodiversity, and sustaining resource-dependent livelihoods.<sup>5</sup> In Asia and the Pacific, the Mekong Basin, Indonesia, Papua New Guinea, Solomon Islands, and Vanuatu are poised to become significant participants in these actions and are among their largest beneficiaries (footnote 2).

7. The initiative to establish a regional knowledge hub on green growth and eco-compensation grew from a series of consultations in connection with the preparation of various knowledge products and knowledge-sharing events.<sup>6</sup> Since 2009, three international conferences on eco-compensation and PES have been held. These events were attended by representatives from developing member countries (DMCs) (including Cambodia, the PRC, the Lao People's Democratic Republic, Thailand, and Viet Nam); members of the Organisation for Economic Co-operation and Development (including Australia, Japan, the Netherlands, and the United States); and ADB departments (the East Asia Department [EARD], the Regional and Sustainable Development Department, South Asia Department, and the Southeast Asia Department). The participants agreed that there is an urgent need for networking to share knowledge and innovations on eco-compensation and PES in the region as its role in supporting green growth becomes increasingly prominent.

8. Demand for knowledge solutions for green development is intensifying as the PRC transits to middle-income status and its environmental challenges mount. Eco-compensation is clearly on the top-level policy agenda. The communique of the recently concluded Third Plenum of the 18th Party Congress states that "to build Ecological Civilization,... PRC must set 'redlines' for ecological protection and adopt user-pay and eco-compensation mechanisms." The PRC is also paying growing attention to knowledge partnerships to share its development experiences and learn from other developing countries. Many developing countries are also interested in PRC's development experiences and lessons. Recognizing the key role of knowledge generation and application to development in its Strategy 2020, ADB has been supporting knowledge cooperation among its DMCs.<sup>7</sup> Against this backdrop, ADB has conducted various

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coordination that is also a part of both enabling environments to perform their natural services and enabling PES schemes to succeed.

<sup>5</sup> REDD-plus also includes conservation and sustainable management of forests and the enhancement of forest carbon stocks.

<sup>6</sup> ADB. 2010. *An Eco-Compensation Policy Framework for the People's Republic of China: Challenges and Opportunities*. Manila; ADB. 2010. *Payments for Ecological Services and Eco-compensation: Practices and Innovations in the People's Republic of China*. Manila; ADB. 2011. *Eco-Compensation for Watershed Services in the People's Republic of China*. Manila.

<sup>7</sup> ADB. 2008. *Strategy 2020: The Long-Term Strategic Framework of the Asian Development Bank, 2008–2020*. Manila.

consultations with the PRC on its possible sponsorship of a knowledge hub through the National Development and Reform Commission (NDRC), the leading agency for preparing the National Eco-Compensation Ordinance.

9. During the PRC country programming mission in December 2012, the Ministry of Finance, the NDRC, and ADB agreed on the importance of establishing a knowledge hub on green growth and eco-compensation to further promote mutual learning and sharing of knowledge, practices, and innovations on eco-compensation within the PRC, and between the PRC and other DMCs.

10. Establishing such a knowledge hub is consistent with ADB's Water Operational Plan, Environment Operation Directions, and Knowledge Management Directions and Action Plan.<sup>8</sup> In particular, eco-compensation can create economic incentives to effectively implement integrated water resources management in river basins. It is also in line with ADB's PRC country partnership strategy, 2011–2015, which supports the government's goal of building a harmonious society by promoting environmentally sustainable development.<sup>9</sup> The proposed knowledge hub will also assist in mainstreaming knowledge-sharing activities in the priority sectors of the country partnership strategy.

### III. THE TECHNICAL ASSISTANCE

#### A. Impact and Outcome

11. The impact of the proposed knowledge hub will be enhanced knowledge and practices on green growth in DMCs. The outcome of the TA will be a mechanism for knowledge sharing on green growth and eco-compensation.

#### B. Methodology and Key Activities

12. The knowledge hub is expected to produce the following outputs: (i) the knowledge hub's charter and operational plan developed, during which the institutional framework of the knowledge hub, and stakeholders and target audience will be identified, and a communication and marketing plan will be prepared; (ii) a bilingual website for green growth and eco-compensation established; (iii) a database on green growth and eco-compensation established, composed of international and national best practices and case studies; (iv) annual progress reports on green growth and eco-compensation published; and (v) an annual knowledge sharing conference on green growth and eco-compensation organized.

13. The knowledge hub will cover the nine key areas of the PRC's eco-compensation program targets: forestland, grasslands, wetlands, water, marine resources and ecosystems, desertified areas and wastelands, mining zones, key ecological function areas, and development-restricted areas. The TA will include case studies focusing on watershed services as these services (i) depend on scale and location, and (ii) require innovative approaches to ensure that key communities participate in land-use changes in a coordinated manner and at

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<sup>8</sup> ADB. 2011. *Water Operational Plan*. Manila; ADB. 2013. *Environment Operational Directions, 2013–2020*. Manila; ADB. 2013. *Knowledge Management Directions and Action Plan, 2013–2015: Supporting "Finance ++" at the Asian Development Bank*. Manila.

<sup>9</sup> ADB. 2012. *People's Republic of China: Country Partnership Strategy, 2011–2015*. Manila.

the necessary scale and level of aggregation.<sup>10</sup> These case studies will focus on three general groups: (i) those grappling with ways to better coordinate watershed management across jurisdictional boundaries; (ii) those directly targeting better management in the upper watersheds of reservoirs and river systems that are important sources of drinking water; and (iii) those involved in water rights trading and water quality trading.

14. In establishing the knowledge hub, ADB will engage consultants and supervise the TA activities. ADB's Water Community of Practice will co-organize an annual eco-compensation conference with the knowledge hub. ADB staff, including those from knowledge support departments, will also participate in the TA as speakers and resource persons in the regional conference on eco-compensation, and in the steering committee or working group to guide the further development of the knowledge hub.

15. An international consultant will be engaged to network with the knowledge centers, universities, or government agencies of other DMCs in South, Southeast, Central, West, and East Asia. He or she will collect and organize relevant materials and make these available on the knowledge hub's website. He or she will also help organize DMC participation in the workshops and seminars.

16. The knowledge hub will collaborate closely with the ongoing activities for regional knowledge sharing initiatives, particularly the existing knowledge hubs with universities in the PRC. In 2009, ADB and PRC's Ministry of Finance established a knowledge sharing platform to (i) promote cooperation among developing countries on key development issues, (ii) contribute to sound development management and policy making, and (iii) promote regionally inclusive development. Each year, the knowledge sharing platform conducts workshop on a different theme. Based on this experience, several knowledge hubs have been set up in PRC universities' centers of excellence to further enrich knowledge sharing experiences between the PRC and other DMCs.<sup>11</sup>

17. After the knowledge hub has been established, the NDRC, with support from ADB, will seek complementary funding from other sources, including national and local government, and collaborating partner organizations in and outside the region.

18. The knowledge hub will involve collaboration with members of civil society, private companies, and international partners. Partnerships with research centers in and outside the region will be promoted under the knowledge hub. In particular, the knowledge hub will establish partnerships with the Global Green Growth Institute, Ecosystem Marketplace, the Food and Agriculture Organization of the United Nations, the Center for International Forestry Research, Forest Trends, and the Consultative Group on International Agricultural Research Challenge Program for Water and Food, all of which conduct work on PES.

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<sup>10</sup> Other types of services, for example, carbon sequestration, methane emissions reduction, and carbon emissions reduction do not depend on a particular location (i.e., the same amount of carbon can be sequestered from trees grown in many different areas) or scale (i.e., the amount of carbon in individual trees sequestered generally depends on how many other trees exist in the same forest, not how much total land is enrolled in the eco-compensation program). A unit of carbon in one area is equal to a unit of carbon in another. This makes a common market possible in which a variety of buyers and sellers can transact. In contrast, the management of water quantity and quality, and control of water and soil erosion require moderate to high levels of coordination, as well as innovative approaches.

<sup>11</sup> The knowledge hubs include the Urban Knowledge Hub set up in 2010 and the Asia-Pacific Center for Water Security in 2011.

### C. Cost and Financing

19. The TA is estimated to cost \$400,000, of which \$300,000 will be financed on a grant basis by the Multi-Donor Trust Fund<sup>12</sup> under the Water Financing Partnership Facility. The government will provide counterpart support in the form of office space, administrative staff, workshop facilities, and other in-kind contributions.

### D. Implementation Arrangements

20. The executing agency for the TA will be ADB. A memorandum of understanding, which sets out the scope of cooperation between ADB's EARD and the NDRC, will be signed by both parties. A joint EARD–NDRC steering committee will guide the strategic direction of the knowledge hub, and a joint working group will oversee daily activities under the TA.

21. The China Agricultural University (CAU) will be engaged on a single-source selection basis in accordance with ADB's Guidelines on the Use of Consultants (2013, as amended from time to time). An international consultant will be hired separately as an individual consultant. CAU is the preeminent natural resources management school in the PRC and is the best qualified institution to lead and implement an eco-compensation knowledge research and sharing in collaboration with the NDRC. CAU is selected to support this knowledge hub on the basis of its (i) vision and leadership in green growth, particularly for resource efficiency and eco-compensation; (ii) focus on supporting social development and inclusive growth; (iii) experienced international and national specialists; (iv) experience in disseminating state-of-the-art eco-compensation knowledge; and (v) adequate human and financial resources. CAU also provides a postgraduate (Master's and doctoral) program on eco-compensation for international students from Africa and Southeast Asia.

22. The single-source selection method was agreed upon in consultation with ADB's Operations Services and Financial Management Department because CAU has exceptional qualifications and experience for the assignment. It is the leading institution in the area of eco-compensation in the PRC and has the experts most qualified to conduct and coordinate research in this field.

23. The TA will be implemented from 1 January 2014 to 30 June 2015. Disbursements under the TA will be carried out in accordance with ADB's *Technical Assistance Disbursement Handbook* (2010, as amended from time to time). As CAU will be implementing ADB projects independently for the first time, financial management training will be given through the PRC Resident Mission or EARD when TA implementation starts.

## IV. THE PRESIDENT'S DECISION

24. The President, acting under the authority delegated by the Board, has approved ADB administering technical assistance not exceeding the equivalent of \$300,000 to be financed on a grant basis by the Multi-Donor Trust Fund under the Water Financing Partnership Facility to the Government of the People's Republic of China for Establishing a Regional Knowledge Hub on Green Growth and Eco-Compensation, and hereby reports this action to the Board.

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<sup>12</sup> Contributors: the governments of Australia, Austria, Norway, Spain, and Switzerland. Administered by ADB.



## DESIGN AND MONITORING FRAMEWORK

<b>Design Summary</b>	<b>Performance Targets and Indicators with Baselines</b>	<b>Data Sources and Reporting Mechanisms</b>	<b>Assumptions and Risks</b>
<p><b>Impact</b></p> <p>Enhanced knowledge and practices on green growth in DMCs</p>	<p>By 2020:</p> <p>DMC governments demonstrate adoption of green growth strategies or practices in international workshops</p>	<p>International workshops compendia</p>	<p><b>Assumption</b></p> <p>DMCs are committed to implement green growth strategies.</p>
<p><b>Outcome</b></p> <p>A mechanism for knowledge sharing on green growth and eco-compensation</p>	<p>By 2015:</p> <p>A medium-term operational plan for the knowledge hub is in place</p>	<p>Knowledge hub's annual progress reports</p>	<p><b>Risk</b></p> <p>There is a lack of political will in the DMCs to implement changes in environmental management.</p>
<p><b>Outputs</b></p> <p>1. Knowledge hub's charter and operational plan developed</p> <p>2. A bilingual website for green growth and eco-compensation established</p> <p>3. A database on green growth and eco-compensation established</p> <p>4. Annual progress reports on green growth and eco-compensation published</p> <p>5. An annual knowledge sharing conference on green growth and eco-compensation organized</p>	<p>MOU between ADB and NDRC signed and knowledge hub launched by March 2014</p> <p>Knowledge hub established and staffed by April 2014</p> <p>Work plan and communication plan prepared by May 2014</p> <p>Website launched by September 2014</p> <p>Database established by December 2014</p> <p>Annual progress report published by December 2014</p> <p>An annual knowledge sharing conference held by November 2014</p>	<p>Signed MOU and institutional framework</p> <p>Work plan and communication plan</p> <p>Reports and statistics on website usage</p> <p>Annual progress report</p>	<p><b>Assumptions</b></p> <p>Consultants are hired and complete their work on time.</p> <p>Stakeholder and target audience consultation take place.</p> <p><b>Risks</b></p> <p>There is a lack of political will to implement change in environmental management.</p>

<b>Activities with Milestones</b>	<b>Inputs</b>														
<p><b>1. Knowledge hub's charter and operational plan developed</b></p> <p>1.1 Charter, institutional framework, and operational plan created by April 2014</p> <p>1.2 Stakeholder and target audience assessment made by April 2014</p> <p>1.3 Communication and marketing plan created by May 2014</p> <p>1.4 Meeting of joint steering committee conducted by June 2014</p> <p><b>2. A bilingual website for green development and eco-compensation established</b></p> <p>2.1 Website design, format, and logo developed for review by steering committee by May 2014</p> <p>2.2 Information on eco-compensation collected in soft and hard copy by May 2014</p> <p>2.3 Website tested and populated by July 2014</p> <p>2.4 Website launched by September 2014</p> <p>2.5 Website continuously maintained and populated (part-time) by December 2014</p> <p><b>3. A database on green growth and eco-compensation established</b></p> <p>3.1 Database design, format, and structure discussed within the working group by June 2014</p> <p>3.2 Good practices on laws, regulations, and technical guidelines collected in soft and hard copy by July 2014</p> <p>3.3 Case studies on payments for ecosystem services and eco-compensation (with a coherent format) collected in soft and hard copy by August 2014</p> <p>3.4 Database established and maintained by December 2014</p> <p><b>4. Annual progress reports on green growth and eco-compensation published</b></p> <p>4.1 Outline, format, and structure discussed at the working group by July 2014</p> <p>4.2 Information and documents collected in soft and hard copy by August 2014</p> <p>4.3 Draft annual progress report prepared for review of the steering committee by October 2014</p> <p>4.4 First annual progress report published by December 2014</p> <p><b>5. An annual knowledge sharing conference on green growth and eco-compensation organized</b></p> <p>5.1 Conference preparation initiated by July 2014</p> <p>5.2 Resource persons identified and contracted by August 2014</p> <p>5.3 Participants contacted by September 2014</p> <p>5.4 Conference held by November 2014</p> <p>5.5 Conference proceedings, knowledge products, and newsletter prepared, edited, and published by May 2015</p>	<p><b>Multi-Donor Trust Fund<sup>a</sup> under the Water Financing Partnership Facility: \$300,000</b></p> <table border="1" data-bbox="959 369 1435 783"> <thead> <tr> <th data-bbox="959 415 971 447"><b>Item</b></th> <th data-bbox="1317 384 1422 447"><b>Amount (\$'000)</b></th> </tr> </thead> <tbody> <tr> <td data-bbox="959 447 1117 478">Consultants</td> <td data-bbox="1349 447 1422 478">233.1</td> </tr> <tr> <td data-bbox="959 478 1214 541">Trainings, seminars, and workshops</td> <td data-bbox="1365 510 1422 541">30.0</td> </tr> <tr> <td data-bbox="959 541 1174 573">Communications</td> <td data-bbox="1365 541 1422 573">10.0</td> </tr> <tr> <td data-bbox="959 573 1206 657">Report preparation, production and transmission</td> <td data-bbox="1365 636 1422 667">2.90</td> </tr> <tr> <td data-bbox="959 657 1230 741">Miscellaneous administration and support costs</td> <td data-bbox="1365 720 1422 751">12.0</td> </tr> <tr> <td data-bbox="959 741 1149 772">Contingencies</td> <td data-bbox="1365 741 1422 772">12.0</td> </tr> </tbody> </table> <p>Note: The government will provide counterpart support in the form of office space, administrative staff, workshop facilities, and other in-kind contributions.</p>	<b>Item</b>	<b>Amount (\$'000)</b>	Consultants	233.1	Trainings, seminars, and workshops	30.0	Communications	10.0	Report preparation, production and transmission	2.90	Miscellaneous administration and support costs	12.0	Contingencies	12.0
<b>Item</b>	<b>Amount (\$'000)</b>														
Consultants	233.1														
Trainings, seminars, and workshops	30.0														
Communications	10.0														
Report preparation, production and transmission	2.90														
Miscellaneous administration and support costs	12.0														
Contingencies	12.0														

ADB = Asian Development Bank, DMC = developing member country, MOU = memorandum of understanding, NDRC = National Development and Reform Commission, PRC = People's Republic of China, WFPF = Water Financing Partnership Facility.

<sup>a</sup> Contributors: the governments of Australia, Austria, Norway, Spain, and Switzerland. Administered by ADB. Source: Asian Development Bank.

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

<b>Item</b>	<b>Amount</b>
<b>Multi-Donor Trust Fund under the Water Financing Partnership Facility<sup>a</sup></b>	
1. Consultants	
a. Remuneration and per diem	
i. International consultants	58.66
ii. National consultants	143.66
b. International and local travel	13.78
c. Reports and communications	17.00
2. Training, seminars, and workshops <sup>b</sup>	30.00
3. Communications <sup>c</sup>	10.00
4. Report preparation, production, and transmission <sup>d</sup>	2.90
5. Miscellaneous administration and support costs	12.00
6. Contingencies	12.00
<b>Total</b>	<b>300.00</b>

Note: The technical assistance (TA) is estimated to cost \$400,000, of which contributions from the Multi-Donor Trust Fund under the Water Financing Partnership Facility are presented in the table above. The government will provide counterpart support in the form of office space, administrative staff, workshop facilities, and other in-kind contributions. The value of government contribution is estimated to account for 25% of the total TA cost.

<sup>a</sup> Contributors: the governments of Australia, Austria, Norway, Spain, and Switzerland. Administered by the Asian Development Bank.

<sup>b</sup> Includes budget for resource persons, administrative assistance, and travel of some developing member country participants. ADB staff may serve as resource persons.

<sup>c</sup> This will be used for maintenance of website server.

<sup>d</sup> Includes budget for translation.

Source: Asian Development Bank estimates.

## OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

### A. Introduction

1. The technical assistance (TA) will establish a regional knowledge hub on green growth and eco-compensation. An inception report, interim report, draft final report, and final report will be delivered, including an executive summary summarizing key issues, findings, and recommendations. All outputs will be compiled into a draft final report and a final report. The memorandum of understanding between the East Asia Department (EARD) of the Asian Development Bank (ADB) and the National Development and Reform Commission (NDRC) will be the basis for implementing the activities. The China Agricultural University will be engaged on a single-source selection basis in accordance with ADB's Guidelines on the Use of Consultants (2013, as amended from time to time). The TA will be carried out by a team of consultants over 18 months intermittently for an estimated total of 28 person-months of national and 3 person-months of international consulting inputs.

### B. Terms of Reference

2. **Eco-compensation specialist and team leader** (national, 6 person-months). The team leader will have a graduate degree in environmental economics or equivalent. He or she will also (i) have at least 10 years of experience in developing and implementing market-based environmental policy instruments such as payment for ecosystem services (PES) and eco-compensation; (ii) be well networked with eco-compensation or PES-related international and national institutes; and (iii) have a demonstrated ability to manage a team; prepare reports; facilitate workshops; and work with civil society organizations, government, and local communities. He or she will serve as key contact person for communicating with ADB and the NDRC on the progress of knowledge hub development. The team leader will undertake the following tasks:

- (i) prepare the detailed TA methodology and work plan;
- (ii) lead TA implementation, including coordinating team inputs and ensuring timely delivery of project outputs;
- (iii) review, edit, and compile the inputs of other team members;
- (iv) support other team members in their assigned tasks;
- (v) draft the institutional framework and charter for the knowledge hub for review by the EARD–NDRC working group and approval by the EARD–NDRC steering committee;
- (vi) collate existing knowledge, documents, and tools on eco-compensation<sup>1</sup> and PES practices in the People's Republic of China (PRC) and other countries in English and Chinese, and publicize them in the knowledge hub and website;
- (vii) work with the watershed eco-compensation specialists to conduct related case studies;
- (viii) carry out a stakeholder analysis and prepare a list of potential partners and stakeholders in the PRC and internationally who might engage with the knowledge hub; and assess stakeholder demand for eco-compensation, PES, and green development knowledge;

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<sup>1</sup> The targeted areas include: forestland, grasslands, wetlands, water, marine resources and ecosystems, desertified areas and wastelands, and mining zones.

- (ix) draft a work plan, operational program, and communication plan for the knowledge hub;
- (x) oversee website and database development and content;
- (xi) arrange a regional workshop for knowledge sharing;
- (xii) produce an annual eco-compensation report; and
- (xiii) liaise with other actors in green development and eco-compensation who may want to partner with and support the knowledge hub in the future, and provide recommendations to the EARD–NDRC working group on how to develop and sustain the knowledge hub.

3. **Payment for ecosystem services specialist and deputy team leader** (international, 3 person-months). The specialist will have a graduate degree in environmental or resources economics or equivalent. He or she will also have (i) at least 10 years of experience in developing and implementing PES programs; (ii) demonstrated knowledge on international PES experiences; (iii) good network with PES-related international institutes; and (iv) demonstrated ability to manage a team; prepare reports; facilitate workshops; and work with civil society organizations, government, and local communities. Working closely with the team leader and other team members, the international PES specialist will undertake the following tasks:

- (i) support the team leader in preparing and finalizing the detailed TA methodology and work plan;
- (ii) network with the knowledge centers, universities, or government agencies of other developing member countries (DMCs) in South, Southeast, Central, West, and East Asia;
- (iii) lead the knowledge hub's efforts to establish partnership with the Global Green Growth Institute, Ecosystem Marketplace, Food and Agriculture Organization of the United Nations, the Center for International Forestry Research, Forest Trends, and the Consultative Group on International Agricultural Research Challenge Program for Water and Food;
- (iv) support, review, edit, and finalize the inception, interim, draft final, and final reports, including the annual report;
- (v) review, edit, and finalize the draft institutional framework and charter for the knowledge hub prepared by the team leader;
- (vi) collate existing knowledge, documents, and tools on PES practices in other countries in English and have these made available in the knowledge hub and website;
- (vii) provide outlines to the PES specialists for conducting related case studies;
- (viii) together with the team leader, prepare the stakeholder analysis and list of potential partners and stakeholders in the PRC and internationally who might engage with the knowledge hub; and assess stakeholder demand for eco-compensation, PES, and green development knowledge;
- (ix) refine the knowledge, documents, tools, and case studies on eco-compensation developed by the national specialists; make them easy to understand by international communities; and make these available in the hub, website, and database;
- (x) help develop international and private sector partners for the hub;
- (xi) support the team leader in the overseeing website and database development and content; and
- (xii) attend the related workshops and consultations and coordinate with international participants of the knowledge sharing workshops.

4. **Information technology specialist** (national, 4 person-months). The specialist will have a degree in computer science, information technology, or website development and at least 10 years of experience in developing and maintaining websites. Working closely with the team leader and other team members, the specialist will undertake the following tasks:

- (i) work with the team leader and deputy team leader to design the hub' website;
- (ii) lead the development of the website and database with guidance from other team members;
- (iii) provide advice to the team leader and other team members on how better to collate the knowledge, case studies, and documents;
- (iv) make the refined knowledge, documents, and case studies available on the hub website and database;
- (v) analyze international and national websites on green growth, eco-compensation, and PES, and innovatively link them to the hub's website;
- (vi) design the website with interactive and social media features; and
- (vii) undertake other tasks assigned by the team leader.

5. **Integrated watershed management specialist** (national, 3 person-months). The specialist will have a graduate degree in watershed management, environmental planning, or equivalent, and have at least 10 years of experience in designing and implementing watershed management programs, with emphasis on expertise and experience in market-based approaches and integrated watershed management tools and methodologies, especially regarding cross-jurisdictional watershed management. The specialist will undertake the following tasks:

- (i) provide inputs to draft the institutional framework and charter for the knowledge hub;
- (ii) collate current knowledge, documents, and tools on using eco-compensation tools to better manage watershed across jurisdictional boundaries in the PRC and other countries in both Chinese and English, and have these made available in the knowledge hub and on the website;
- (iii) with support from the team leader and deputy team leader, identify a long and short list of potential best practices or case studies that have used eco-compensation or PES tools to better manage watersheds across jurisdictional boundaries in the PRC and other countries;
- (iv) with support from the team leader and deputy team leader, prepare three or four case studies or knowledge products for knowledge sharing within the PRC and DMCs;
- (v) ensure that the knowledge products and case studies in English and Chinese are made available through the hub and website;
- (vi) provide support to the development of the website and database;
- (vii) assist the team leader in arranging and facilitating an international workshop for knowledge sharing; and
- (viii) provide recommendations to the EARD–NDRC working group and steering committee on how to develop and sustain the knowledge hub.

6. **Watershed services specialist** (national, 3 person-months). The specialist will have a graduate degree in water resources management, hydrology, or equivalent, and have at least 10 years of experience in designing and implementing watershed eco-compensation programs. This specialist will have rich experiences in adopting eco-compensation to better manage the

upper watersheds of reservoirs and river systems that are important sources of drinking water. The specialist will undertake the following tasks:

- (i) collate current knowledge, documents, and tools on adopting eco-compensation to better manage the upper watersheds of reservoirs and river systems that are important sources of drinking water in the PRC and other countries, and post them in both Chinese and English in the knowledge hub and on the website;
- (ii) with support from the team leader and deputy team leader, identify a long and short list of potential best practices or case studies that have adopted eco-compensation to better manage the upper watersheds of reservoirs and river systems;
- (iii) with support from the team leader and deputy team leader, prepare three or four case studies or knowledge products for knowledge sharing within the PRC and DMCs, which may include the Miyun Reservoir in Beijing, and the Danjiangkou Reservoir for south–north water transfer; and
- (iv) liaise with other actors in PES and eco-compensation who may want to partner and support the knowledge hub in the future.

7. **Water rights trading and water quality trading specialist** (national, 3 person-months). The specialist will have a graduate degree in integrated water resources management, or water pollution management and planning, and have at least 10 years of experience in designing and implementing water (rights and quality) trading programs. The specialist will undertake the following tasks:

- (i) collate current knowledge, documents, and tools on water trading and water quality trading in the PRC and other countries in both Chinese and English, and make these available in the knowledge hub and on the website;
- (ii) with support from the team leader and deputy team leader, identify a long and short list of potential best practices or case studies that are related to water rights trading and water quality trading in the PRC and other countries;
- (iii) with support from the team leader and deputy team leader, prepare three or four case studies or knowledge products for knowledge sharing within the PRC and DMCs, which may include Tai Lake water quality trading, Chao Lake water quality trading, and water rights trading in Inner Mongolia and Ningxia Hui autonomous regions; and
- (iv) liaise with other actors in water rights trading and water quality trading who may want to partner and support the knowledge hub in the future.

8. **Communication specialist** (national, 3 person-months). The specialist will have a graduate degree in mass media, communication, or environmental management related fields, and also have at least 10 years of experience in developing communication strategies for environment-related operations. Working closely with the team leader, the deputy team leader, and other team members, the specialist will undertake the following tasks:

- (i) develop the communication plan;
- (ii) connect the knowledge hub with PES and eco-compensation communities in the PRC and abroad, such as Katoomba Group, Ecosystem Marketplace, Forest Trends, the Global Green Growth Institute, the World Resources Institute, the World Bank, and WWF; and
- (iii) communicate with the private sectors and tap their interests in partnering with the hub.

9. **Institutional and capacity building specialist** (national, 2 person-months). The specialist will have a degree in institutional development or capacity development related fields, and at least 10 years of experience. Working closely with the team leader and other team members, the specialist will undertake the following tasks:

- (i) conduct a survey of attitudes, needs, and suggestions of watershed services “users” including the government and private sectors for their perspective on the knowledge hub;
- (ii) assess potential mechanisms for institutional collaboration and coordination;
- (iii) organize and facilitate stakeholder meetings, TA planning workshops, and team meetings;
- (iv) formulate the program and organize the annual conferences and workshops; and
- (v) support the publication of the eco-compensation annual report.

10. **Strategy development specialist** (national 1 person-month). The specialist will have a graduate degree in management or environmental management related fields, and also have at least 10 years of experience in developing strategies for environment-related operations. Working closely with the team leader, deputy team leader, and other team members, the specialist will undertake the following tasks:

- (i) draft the institutional framework and charter for the knowledge hub;
- (ii) together with the team leader and deputy team leader, develop the strategy development plan;
- (iii) establish the monitoring system to assess the performance of the knowledge hub;
- (iv) provide support to the development of the website and database, and provide inputs to the workshops; and
- (v) provide recommendations to the EARD–NDRC working group and steering committee on how to develop and sustain the knowledge hub.

11. **Environmental economist** (national, 3 person-months). The environmental economist will have a graduate degree in environmental economics or environmental management related fields, and have at least 10 years of experience in environment-related operations. Working closely with the team leader, deputy team leader, and other team members, the environmental economist will undertake the following tasks:

- (i) provide inputs to the institutional framework, charter, and operational plan for the knowledge hub;
- (ii) Summarize the state of knowledge regarding ecosystem services processes and functions in a policy-relevant sense;
- (iii) draft the outlines of the chapters for the annual progress report, and compile the annual progress report based on the specialists’ inputs;
- (iv) collate knowledge, documents, and case studies for eco-compensation on forestland, grasslands, wetlands, water, marine resources and ecosystems, desertified areas and wastelands, and mining zones, and make these available on the website;
- (v) integrate the lessons from each case study and draft a knowledge product on it; and
- (vi) compare the rationales of eco-compensation in the PRC and PES in other countries, and explore the policy implications.