



United Nations Development Programme

Country: China

PROJECT DOCUMENT

Payment for Watershed Services in the Chishui River Basin for the Conservation of Globally Significant Biodiversity

Project Title:

UNDAF Outcome(s):

Outcome 1: Government and other stakeholders ensure environmental sustainability, address climate change, and promote a green, low carbon economy

Expected CP Outcome(s): Outcome 4: Low carbon and other environmentally sustainable strategies and technologies are adapted widely to meet China's commitments and compliance with Multilateral Environmental Agreements; and Outcome 5. The vulnerability of poor communities and ecosystems to climate change is reduced

Expected CPAP Output (s): Output 4.1 Policy and capacity barriers for the sustained and widespread adoption of low carbon and other environmentally sustainable strategies and technologies removed, and Output 5.1 A strengthened policy, legal, institutional framework for the sustainable use of land, water, the conservation of biodiversity, and other natural resources in fragile ecosystems is enforced.

Executing Entity/Implementing Partner: Ministry of Environmental Protection

Implementing Entity/Responsible Partners: Guizhou Provincial Environmental Protection Department

Brief Description

The Chishui River is one of the most important tributaries of the upper Yangtze River, because of its diverse landscapes, richness in biodiversity and abundance in water resources. It is the only major tributary of the Upper Yangtze that remains free-flowing without a mainstream dam. The Chishui River Basin (CRB) is an important storehouse of biodiversity, lying within the Upper Yangtze Freshwater Ecoregion and the Guizhou Plateau Broadleaf and Mixed Forests Terrestrial Ecoregion. The basin also lies on the eastern margin of the Mountains of Southwest China biodiversity hotspot, and contains part of the China Danxia World Heritage Site. The basin has globally significant fish populations, with 112 species of which 28 are endemic to the Upper Yangtze (27.2% of its endemic fish diversity).

Significant environmental degradation has taken place in the Chishui River Basin, due in large part to unsustainable land use practices with marginalized farming communities increasingly cultivating steep slopes, resulting in deforestation, soil erosion, sediment and nutrient loading of the river, hydrological impacts and loss of biodiversity. The Guizhou Provincial Government and riparian municipalities have already made significant investments towards achieving environmental protection in the CRB to ensure clean water supply to downstream industries. However, this has been inadequate to address the extensive watershed degradation. As a result, both water quality and dry season flows have been impacted, affecting downstream users.

The long term solution proposed by this project is to operationalise and mainstream a market-based system for Payment for Watershed Services (PWS) within China's existing eco-compensation policies and programmes that will support large scale changes in land use over the long term, coupled with integrated watershed management that takes account of biodiversity and ecological functions as well as development needs. However, two principal barriers currently hamper the realisation of this long term solution: the weak enabling framework and institutional capacity for PWS implementation and upscaling; and insufficient know-how for the establishment and implementation of viable PWS mechanisms for biodiversity conservation.

In the GEF alternative scenario, the accomplishment of river basin management objectives that include sustaining and restoring ecosystem services and biodiversity, rural poverty alleviation, sustainable land use management as well appropriate economic development, will be enabled by the introduction of a PWS system which is harmonized with existing eco-compensation schemes for greater cumulative impact. The potential of

PWS to address large scale environmental degradation challenges, its potential for application in other parts of China, as well as the national conservation priority placed on the Chishui River Basin have led the Government of China to present this project for GEF support. In particular the GEF project will provide significant direct assistance towards realizing the MEP's plans to introduce PWS as an integral part of national eco-compensation policy and plans, as well as Guizhou Province's plans to rehabilitate the ecology of the CRB.

The project's goal is to contribute to the conservation and sustainable use of globally significant biodiversity in China. Its objective is to operationalize a replicable PWS scheme in the Chishui River Basin to stimulate land and natural resource use systems that conserve biodiversity and sustain ecosystem processes. This will be accomplished through two outcomes, the first aiming to establish a systemic and institutional framework for PWS development and management at municipal and provincial levels, including the mainstreaming of PWS and biodiversity conservation into relevant policies, plans and regulations. The second outcome aims to demonstrate an operational PWS scheme in a sub-watershed of the Chishui River in Guizhou. Through this, PWS will be operationalised on-the-ground in the CRB, between upstream farming communities as ecosystem service providers and the Guizhou Environmental Protection Department as initial buyer and intermediary, to negotiate with the end users such as downstream industrial companies to pay for the ecosystem services provided. The introduction of PWS will initially be demonstrated in part of one sub-catchment area, then integrated with eco-compensation schemes in line with the objectives of a proposed catchment management plan for the demonstration sub-watershed. The PWS scheme and related land use changes will then be replicated and upscaled with the aim of reducing external pressures on the ecology of the river basin, including protected areas that support an array of globally threatened and endemic species. The project aims to catalyse private sector financing for conservation, and the institutionalisation of PWS as a watershed-based biodiversity conservation mechanism which at the same time delivers livelihood improvements in an equitable manner. This has potential to leverage significant additional funding to support sustainable land management and biodiversity conservation across China.

Programme Period:	48 months	Total resources required (total project funds)	\$ 17,908,676
Atlas Award ID:	00079397	Total allocated resources (UNDP managed funds)	
Project ID:	00089388	UNDP	\$ 500,000
PIMS #	4822	GEF	\$ 1,908,676
Start date:	July 2014	Other (partner managed resources)	
End Date	June 2018	o Government	\$ 15,500,000
Management Arrangements	NIM		
PAC Meeting Date	TBD		

Agreed by (Government):

Date/Month/Year

Agreed by (Executing Entity/Implementing Partner):

Date/Month/Year

Agreed by (UNDP):

Date/Month/Year

Table of Contents

SECTION I: Elaboration of the Narrative	7
PART I: Situation Analysis	7
Introduction	7
Context and global significance	8
Threats, Root causes and Impacts	26
Long-term solution and barriers to achieving the solution.....	31
Introduction to Project site interventions	33
Stakeholder analysis.....	34
Baseline analysis	37
PART II: Strategy	42
Project Rationale and Policy Conformity.....	42
Project Goal, Objective, Outcomes and Outputs/activities	46
Project Indicators.....	61
Risks and Assumptions	64
Incremental reasoning and expected global, national and local benefits	68
Cost-effectiveness	72
Project consistency with national priorities/plans:	73
Country Ownership: Country Eligibility and Country Drivenness	75
Sustainability and Replicability	75
PART III: Management Arrangements	77
Implementation Arrangements.....	77
Project Management.....	79
PART IV: Monitoring and Evaluation Plan and Budget	80
Monitoring and reporting	80
PART V: Legal Context.....	85
SECTION II: STRATEGIC RESULTS FRAMEWORK (SRF) AND GEF INCREMENT	86
PART I: Strategic Results Framework, SRF (formerly GEF Logical Framework) Analysis.....	86
Indicator framework as part of the SRF	86
Part II: Incremental Cost Analysis.....	92
SECTION III: Total Budget and Workplan	97
SECTION IV: ADDITIONAL INFORMATION	103
PART I: Other agreements	103
Co-financing Letters.....	103
PART II: Organogram of Project.....	104
PART III: Terms of Reference for key project staff.....	105
Project Manager	105
Project Assistant.....	107
Overview of Inputs from Technical Assistance Consultants	108
PART IV: Stakeholder Involvement Plan.....	114
Project Annexes.....	122
Annex 1. Endemic Fishes of the Upper Yangtze River in Chishui River	122
Annex 2. Protected Areas of the Chishui River Basin.....	123
Annex 3. Institutional Functions of Key Stakeholder Agencies	126
Annex 4. Additional Information on Eco-compensation Schemes.....	130
Annex 5. Community Consultation Record, Site Profile and Baseline Survey Information for Wuma Sub-Watershed PWS Demonstration Area	133
Annex 6. Baseline Information on Chishui River Basin in Guizhou	135
Annex 7. Capacity Development Scorecards	148
Annex 8. Ecosystem Health Index.....	149
Annex 9. GEF Biodiversity Tracking Tool.....	163
Annex 10. Environmental and Social Screening Summary	164
Annex 11. Letter of Agreement for UNDP Direct Project Services	173

List of Figures and Tables

Figure 1. The location of the Chishui River Basin in the Yangtze River Basin.	9
Figure 2: The Chishui River Basin	11
Figure 3. Fish Protection Areas in the Upper Yangtze River	12
Figure 4. Nature Reserves in the Guizhou part of Chishui River Basin	13
Figure 5. Average Runoff at Maotai Station (million m ³)	14
Figure 6. Temperature Variation at Decade-intervals in CRB (1970-2010).....	15
Figure 7. Precipitation Variation at Decade-intervals in CRB between 1970-2010 (mm)	15
Table 1. Government Plans on the Chishui River Basin.....	23
Figure 8. Location of the Wuma River valley in the Chishui River Basin	33
Table 2. Stakeholders involved in the project indicating their roles and responsibilities	34
Table 3. Project contribution towards GEF 5 Biodiversity Programme indicators.....	43
Table 4. Elaboration of Project Indicators	61
Box 1. Risk Assessment Guiding Matrix.....	65
Table 5. Project Risks Elaboration, Assessment and Mitigation Measures	66
Table 6. M&E Activities, Responsibilities, Budget and Time Frame.....	84
Table 7. Incremental Cost Matrix	95
Table 8. Overview of Inputs from Technical Assistance Consultants	108
Table 9: Stakeholder participation principles	115
Table 10. Suggested members of PSC, PPCC and Local Stakeholder Committees:	116
Table 11. Coordination and collaboration with Related GEF Financed Initiatives	119

Acronyms and Abbreviations

ADB	Asian Development Bank
APR	Annual Progress Report
ARR	Annual Review Report
BD	Biodiversity
BTOR	Back To Office Report
BWP	Biennial Work Plan
CAS	Chinese Academy of Sciences
CBD	Convention on Biological Diversity
CDR	Combined Delivery Report
CI	Conservation International
CITES	Convention on International Trade in Endangered Species
CNR	County level Nature Reserve
CNY	Chinese currency unit (Renminbi or Yuan, also RMB)
CPAP	Country Programme Action Plan
CR	Critically Endangered (IUCN red list category)
CRB	Chishui River Basin
CWMC	Changjiang Water Management Commission (under MWR)
EA	Executing Agency
EAAFP	East Asian – Australasian Flyway Partnership
ECBP	EU-China Biodiversity Programme
EHI	Ecosystem Health Index
EIA	Environmental Impact Assessment
EN	Endangered (IUCN red list category)
EPB	Environmental Protection Bureau
EU	European Union
GDF	Guizhou Department of Finance
GDP	Gross Domestic Product
GEF	Global Environment Facility
GEPD	Guizhou Environmental Protection Department
GFD	Guizhou Forestry Department
GFiD	Guizhou Finance Department
GIS	Geographical Information System
GPAC	Guizhou Provincial Agriculture Commission
GTA	Guizhou Tourism Administration
GWRD	Guizhou Water Resources Department
Ha	Hectare
IA	Implementing Agency
IBA	Important Bird Area
IAS	Invasive Alien Species
IUCN	International Union for the Conservation of Nature
IW	(Project) Inception Workshop
M&E	Monitoring and Evaluation
MEA	Multilateral Environmental Agreement
MEP	Ministry of Environmental Protection
MEP-FECO	Foreign Economic Cooperation Office of Ministry of Environmental Protection
MOF	Ministry of Finance
MoU	Memorandum of Understanding
MSL	Mainstreams of Life (UNDP GEF Programme)
MWR	Ministry of Water Resources

NBCSAP	National Biodiversity Conservation Strategy and Action Plan
NEX	National Execution
NGO	Non-Governmental Organization
NNR	National Nature Reserve
NPD	National Project Director
NPMO	National Project Management Office
NR	Nature Reserve
NRDC	National Reform and Development Commission
NT	Near-threatened (IUCN Red List Category)
PA	Protected Area (6 IUCN categories including nature reserves)
PES	Payment for Environmental Services
PIF	Project Identification Form (for GEF)
PIMS	Project Information Management System
PIR	Project Implementation Review
PM	Project Manager
PNR	Provincial Nature Reserve
PPG	Project Preparation Grant (for GEF)
PPR	Project Progress Report
PRC	People's Republic of China
PSC	Project Steering Committee
PSCM	Project Steering Committee Meeting
PWS	Payment for Watershed Services
Ramsar	Ramsar Convention on Wetlands of International Importance
RCU	(UNDP-GEF) Regional Coordinating Unit
RMB	Chinese currency unit (Renminbi or Yuan, also CNY)
RTA	Regional Technical Advisor (of UNDP)
SEA	Strategic Environmental Assessment
SFA	State Forestry Administration
SMART	Specific, Measurable, Achievable, Relevant and Time-bound
SO	Strategic Objective
SP	Strategic Programme
SPMO	Sub-Project Management Office
SRF	Strategic Results Framework
TOR	Terms of Reference
TNC	The Nature Conservancy (international conservation NGO)
UN	United Nations
UNDP	United Nations Development Programme
UNDP-CO	UNDP Country Office
UNDP EEG	UNDP Environment and Energy Group
UNFCCC	United Nations Framework Convention on Climate Change
UNDAF	United Nations Development Assistance Framework
USD / US\$	United States Dollar
VU	Vulnerable (IUCN Red List Category)
WWF	World Wide Fund for Nature (international conservation NGO)
Y1, Y2, etc.	Year 1, Year 2 , etc.

SECTION I: Elaboration of the Narrative

PART I: Situation Analysis

INTRODUCTION

1. The Chishui River is one of the most important tributaries of the upper Yangtze River, because of its diverse landscapes, richness in biodiversity and abundance in water resources. It is also the only major free-flowing tributary of the Upper Yangtze, without a mainstream dam. Significant environmental degradation has taken place in the Chishui River Basin (CRB), in common with many other parts of the Yangtze River Basin and other river basins in China. This has been due in large part to unsustainable land use practices which have seen marginalized poor farming communities increasingly cultivating steep slopes with annual crops, resulting in deforestation, soil erosion, sediment and nutrient loading of the river, and hydrological impacts.

2. The Guizhou Provincial Government and riparian municipalities have already made significant investments towards achieving environmental protection, including a planning and regulatory framework, investment in eco-compensation schemes, and profound steps to prevent river pollution and ensure clean water supply for downstream industries. However, the above-mentioned measures continue to have little impact on the extensive underlying problem of watershed degradation due to unsustainable land use practices, in particular agricultural expansion on steep slopes and related deforestation resulting in soil erosion, sediment and nutrient loading, loss of biodiversity, and a continuing downward spiral of environmental degradation and poverty in marginalized farming communities. In common with the national situation, there has been little or no mainstreaming of biodiversity and ecosystem services into land uses, development planning and sectoral planning.

3. This project, therefore, aims to augment existing approaches with additional market-based mechanisms (with public sector involvement) that will support large scale changes in watershed land use over the long term, coupled with integrated watershed management to address biodiversity and ecological functions as well as development needs. Specifically, the project aims to introduce a market-oriented Payment for Watershed Services (PWS) system, where PWS can be considered a subset of Payment for Ecosystem Services (PES) which GEF defines loosely as “arrangements between buyers and sellers of environmental goods and services in which those that pay are fully aware of what it is that they are paying for, and those that sell are proactively and deliberately engaging in resource use practices designed to secure the provision of the services.”¹

4. However, the lack of a clear official framework, capacity and resources, and insufficient experience in managing market-oriented Payment for Watershed Services (PWS) schemes are barriers to the development of PWS schemes. The global and national biodiversity significance of the CRB, lying within the Upper Yangtze Freshwater Ecoregion and the Guizhou Plateau Broadleaf and Mixed Forests Terrestrial Ecoregion, and the Mountains of Southwest China biodiversity hotspot, the ongoing threats to its biodiversity,

¹ GEF 2012. Payment for Ecosystem Services. Report prepared by J. Cavelier and I Munro Gray. Global Environment Facility, Washington DC. 20pp.

the barriers impeding sustainable watershed management, and the potential of PWS to address large scale environmental degradation challenges across China, have led the Government to prioritize this project for GEF support. In particular the GEF project will provide significant direct assistance towards realizing the MEP's plans to introduce PWS as an integral part of national eco-compensation policy and planning, as well as Guizhou Province's plans to sustain and rehabilitate the ecological character of the Chishui River Basin.

5. The project aims to establish a PWS mechanism in the Chishui River Basin to catalyse land use systems that will conserve biodiversity and ecosystem processes. This will be accomplished through building capacity for a systemic and institutional framework for PWS development and management at municipal and provincial levels, including the mainstreaming of PWS and biodiversity conservation into relevant policies, plans and regulations. Secondly, it will provide practical demonstration of an operational PWS scheme at a pilot scale in a sub-watershed of the Chishui River in Guizhou between upstream farming communities as ecosystem service providers and the Guizhou EPD as initial buyer and intermediary, engaging downstream industries as end users to pay for the ecosystem services provided. This will then be scaled up to the whole demonstration watershed through the development and initial implementation of a catchment management plan. PWS implementation will be mainstreamed into existing national eco-compensation policy and provincial practices in Guizhou, facilitating a streamlined programmatic approach whereby PWS together with a suite of eco-compensation instruments contribute towards shared objectives that include hydrological and water quality objectives, sustaining aquatic biodiversity (especially the globally significant fish populations), supporting landscape conservation approaches that link and strengthen protected area buffer zones, and provide sustainable benefits to local communities. The methodology will be encapsulated in guidelines and prepared for systematic upscaling to other Chishui tributary catchments in Guizhou Province, and then to tributaries in Sichuan and Yunnan. Through mainstreaming into national eco-compensation policy, the PWS approach synchronized with existing eco-compensation mechanisms will provide a model for replication across China. It will produce valid knowledge and more importantly, it will establish a benchmark for financing watershed conservation through PWS as a flexible and innovative mechanism that effectively engages the private sector, in collaboration with the public sector where appropriate.

CONTEXT AND GLOBAL SIGNIFICANCE

Environmental and biodiversity context

6. The Chishui River is a first order tributary on the right bank of the Upper Yangtze River Basin, upstream of Three Gorges Dam (**Figure 1**). Arising in the Tanggula Mountains on the Tibetan Plateau and with a length of 6,380 km, the Yangtze River (known in Chinese as the Changjiang) is the largest river in China and the third largest in the world. The Yangtze River Basin drains an area of 1.8 million square km, 18.8% of China's land area before flowing into the East China Sea. The Upper Yangtze River Basin (defined as the catchment upstream from Three Gorges Dam at Yichang) drains an area of c.1 million km² and contains over 50,000 km of perennial rivers and streams. The Upper Yangtze River has a total length of 4500 km. Overall, the Yangtze River flows through 11 provinces receiving on its way more than 100 large or small tributaries.

7. Some 80% of the Yangtze River's drainage area is suitable for productive activities, rare amongst the world's large river basins. It is of cultural importance as the birthplace of Chinese civilization, and since China's reform and opening-up, the Yangtze River Economic Belt has rapidly risen up into a 'driving wheel' for the Chinese economy. The total population in the Yangtze River Basin reaches 400 million, about one third of China's total population. There are nearly 200 cities scattered across the basin, including Shanghai, Chongqing, Wuhan, Nanjing and Chengdu and Guiyang.



Figure 1. The location of the Chishui River Basin in the Yangtze River Basin.

8. The Yangtze River basin is endowed with rich natural resources, most of which are being comprehensively exploited. The annual total runoff, hydropower resources, available freshwater and navigation resources are all ranked number one in China. It has abundant water resources, with a mean annual discharge of $31,900 \text{ m}^3/\text{s}$ and mean annual runoff of $9.513 \times 10^{11} \text{ m}^3$. The total water availability per year in the basin amounts to 996 billion cubic meters on long term mean basis, accounting for 36.5% of China's total. It means there is 0.56 million cubic meters of water per square km, 1.9 times the country's average. Consequently, the basin now serves as the source of water diversions to the North through planned East, Central and West Routes. The Yangtze River has abundant hydropower resources, with a theoretical potential of 277,808 MW, technically exploitable potential of 256,270 MW, and estimated annual power output of 1.1879 trillion kWh, equivalent to 40%, 48% and 49% respectively of those of the nation's totals. The economically viable exploitation potential of hydropower in the Basin reaches 60% of China's total, which explains the fact that the Basin continues to be the national focus for hydropower development². While of great economic significance, these hydropower developments may induce universal, comprehensive and permanent eco-environmental problems, especially

² Source: Changjiang Water Resources Commission <http://eng.cjw.gov.cn/eng-about.asp>

including adverse impacts to fish resources – therefore there is a need for harmonization of hydropower developments with fish resources conservation³.

9. The Yangtze River Basin is a globally significant centre for aquatic biodiversity. It supports 361 native fish species, of which 148 are endemic⁴, representing the highest fish species richness and endemism of any river in the Palearctic region⁵. 267 native fish species occur in the Upper Yangtze River Basin, including 118 species endemic to the UYRB⁶. The Upper Yangtze River exhibits pronounced habitat heterogeneity across its reaches as a result of its meteorological, hydrological, physiographical and geological differences. With its abundant water resources and rich biodiversity, the Upper Yangtze River has been identified as an eco-functional barrier on the Yangtze River and a key area for ecological restoration. Currently, the Upper Yangtze is experiencing critical changes to its ecosystems through multiple ecological threats including glacier retreat, grassland degradation, serious soil and water loss, and reduction of river run-off. Combined with a sharp decrease in forest coverage, the increased area and intensity of soil erosion are the most urgent issues in the basin, and the natural ecology has been subjected to significant damage⁷.

10. The Chishui River Basin (CRB) (**Figure 2**) is a large tributary on the south bank of the upper Yangtze River Basin, and forms the border between the Yunnan-Guizhou Plateau and the Sichuan Basin. The length of its main stream is 444 km, and the total area of the water basin is 1,893,200 ha, of which 12% is situated in Yunnan Province, 62.3% in Guizhou Province (initial area of intervention), and 25.7% in Sichuan Province. Among the upper Yangtze's nearly 50 major tributaries, the Chishui River is one of the most important due to its diverse landscapes, richness in biodiversity and abundance in water resources. Notably, the Chishui River is also the only major tributary whose mainstream has not been dammed, thus retaining its free-flowing condition.

11. The Chishui River Basin is an important storehouse of biodiversity, lying within the Upper Yangtze Freshwater Ecoregion, and the Guizhou Plateau Broadleaf and Mixed Forests Ecoregion⁸. The Guizhou Plateau is a cool, cloudy realm of jumbled limestone pinnacles and rivers. Karst limestone, derived from the calcareous shells of Paleozoic marine organisms, was deposited in deep sedimentary layers, then forced to the surface as a result of the same tectonic activity that built the Himalaya. Subtropical vegetation clings to the steep slopes, and some rare animal species still find refuge here. Original forests have been almost completely destroyed, except for those within protected areas, and deforestation and poaching are ongoing threats to this ecoregion. The river basin also lies on the eastern margin of Conservation International's Mountains of Southwest China biodiversity hotspot⁹, and contains the Chishui Danxia block (27,364 ha plus a buffer zone of 44,814 ha) of the China Danxia World Heritage Site (82,151 ha plus buffer zone of 218,357 ha) lies in the lower reaches of the Chishui. Danxia landscapes developed on continental red terrigenous

³ He Y, Wang J, Lek S, Cao W, Lek-Ang S. 2009. Structure of endemic fish assemblages in the Upper Yangtze River Basin. *River Res. Applic.* 27:59-75.

⁴ Fu C, Wu J, Chen J, Wu Q, Lei G. 2003. Freshwater fish biodiversity in the Yangtze River Basin of China: patterns, threats and conservation. *Biodiversity and Conservation* 12:1649-1685.

⁵ Nelson JS. 1994. *Fishes of the World*. Wiley, New York. Also Matthews WJ. 1998. *Patterns in Freshwater Fish Ecology*. Chapman and Hall, New York.

⁶ Chang J. 2006. Evaluation of Rare and Endemic Fish Resources in the Upper Reaches of the Yangtze River. Report to The Nature Conservancy China Program. Institute of Hydrobiology, Chinese Academy of Sciences, Wuhan.

⁷ Sun HL. 2008. *Ecological and environmental problems in the upper Yangtze River*. China Environmental Science Press: Beijing.

⁸ <http://worldwildlife.org/science/wildfinder/>

⁹ http://www.conservation.org/where/priority_areas/hotspots/asia-pacific/Mountains-of-Southwest-China/Pages/default.aspx

sedimentary beds influenced by endogenous forces (including uplift) and exogenous forces (including weathering and erosion). The inscribed site comprises six areas found in the sub-tropical zone of south-west China. They are characterized by spectacular red cliffs and a range of erosional landforms, including dramatic natural pillars, towers, ravines, valleys and waterfalls. These rugged landscapes have helped to conserve sub-tropical broad-leaved evergreen forests, and host many species of flora and fauna, about 400 of which are considered rare or threatened¹⁰.

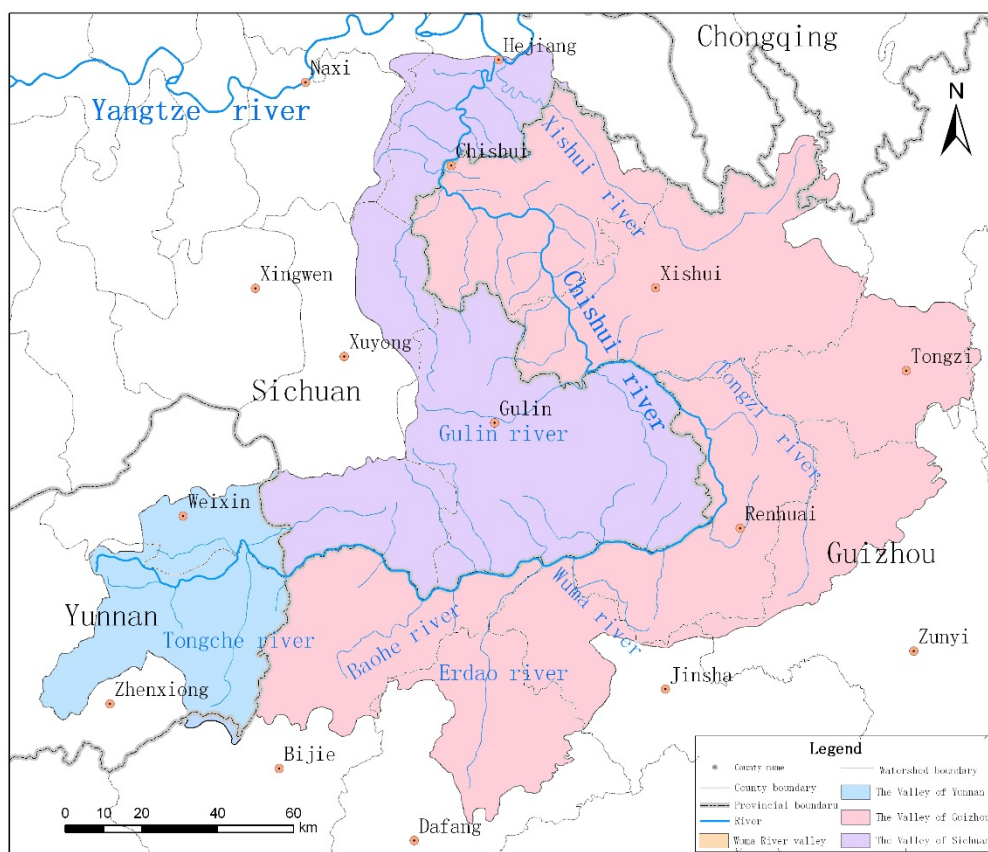


Figure 2: The Chishui River Basin

12. At least 257 families, 883 genera and 1,700 species of flowering plants have been documented (just within the three national nature reserves in the mid and downstream zones of the Chishui River). Many of these are ancient species of endemic plants. There are more than 70 species of rare and protected animals and plants, including 38 national key protection plants (I, II and III levels), five kinds of 1st Class Protection Animals and 27 kinds of 2nd Class Protection Animals. Rare plants include the flagship species Spiny Tree-fern *Alsophila spinulosa* and Dove Tree *Taxus chinensis*.

13. Globally threatened animals of the Guizhou Plateau Broadleaf and Mixed Forests Ecoregion¹¹ include Mammals: Dhole *Cuon alpinus* (EN), Chinese Pangolin *Manis pentadactyla* (EN), Chinese forest musk deer *Moschus berezovskii* (EN), South China Tiger *Panthera tigris amoyensis* (EN – likely extinct in the wild), François's leaf monkey *Trachypithecus francoisi* (EN), Clouded Leopard *Neofelis nebulosa* (V), while other mammals present include Tufted Deer *Elaphodus cephalophus* and Chinese Muntjac

¹⁰ <http://whc.unesco.org/en/list/1335>; Wu Lin 2010. Chishui Danxia. Guizhou People's Press, Guiyang. 128pp.

¹¹ Source: <http://www.globalspecies.org>

Muntiacus reevesi. Birds: Scaly-sided Merganser *Mergus squamatus* (EN) (overwinters on rivers) and Reeve's Pheasant *Symaticus reevesi* (VU). Among the bird species endemic to the Upper Yangtze Basin are Golden Pheasant *Chrysolophus pictus*, Lady Amherst's Pheasant *C. amherstiae* and Temminck's tragopan *Tragopan temminckii*. Reptiles: Reeves Turtle *Chinemys reevesii* (EN), Wattle-necked Soft-shelled Turtle *Palea steindachneri* (EN), Big-headed Turtle *Platysternon megacephalum* (EN) and Beal's Eyed Turtle *Sacalia bealei* (EN). Amphibians: Chinese giant salamander *Andrias davidianus* (CR), *Leptobranchium boringii* (EN), Leishan spiny toad *Leptobranchium leishanense* (EN), Yunnan Paa Frog *Nanorana yunnanensis* (EN), *Odorrana wuchuanensis* (CR) and Boulenger's Paa frog *Quasipaa boulengeri* (EN).

14. The conservation significance of the area is amplified by the fact that the Chishui river is the only tributary in the upper reaches of the Yangtze river that has not been dammed—meaning that key ecological processes have largely been maintained, although the river system faces significant stresses from land degradation and hydrological engineering development. The Chishui River Basin is a vital habitat and spawning place for precious and characteristic fish in the Upper Yangtze River Basin, as it was selected as the location of a National Nature Reserve for the Conservation of Rare and Endemic Fish in the Upper reaches of the Yangtze River (see **Figure 3**). There are 17 families, 72 genera and 112 species of fish alone, of which 28 species are endemic to the Upper Yangtze River Basin, representing some 27.2% of the total endemic fish diversity of the Upper Yangtze River Basin. In addition, most of the cave fish and aquatic organisms in the upper watershed are Chinese endemic species. Some of these species have been extirpated elsewhere in the upper Yangtze as a result of the changes in hydrological and ecological conditions that have occurred following construction of the Three Gorges Reservoir. See **Annex 1** for a list of endemic fish species in the Chishui River.

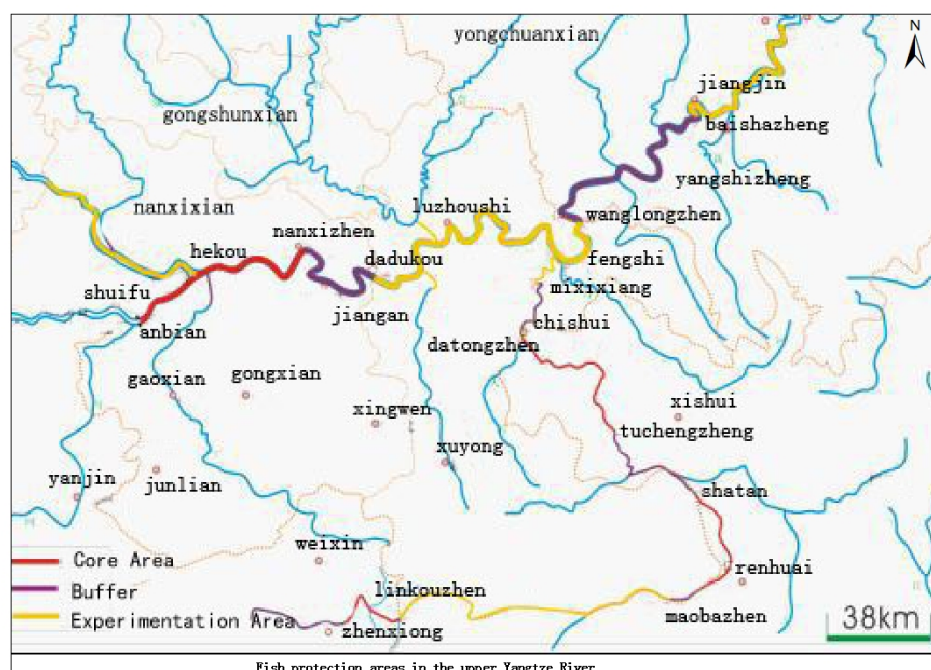


Figure 3. Fish Protection Areas in the Upper Yangtze River

15. There are four National Nature Reserves (NNRs) in the Chishui River Basin: the NNR for the Conservation of Rare and Endemic Fish in the Upper reaches of the Yangtze River, Guizhou Chishui *Alsophila Spinulosa* NNR, Guizhou Xishui NNR of Mid-subtropics

Evergreen BroadLeaf Forest, and Sichuan Huagaoxi NNR, as well as 16 provincial or city-level nature reserves, and 16 county-level nature reserves on the protection of fishes, wild animals and plants (see **Figure 4** and **Annex 2** for details).



Figure 4. Nature Reserves in the Guizhou part of Chishui River Basin

16. There are a total of 800 towns and villages located within the Chishui river watershed, with an estimated population of approximately 10 million people of which more than 80% depend on smallholder, largely subsistence-based, farming for their livelihood. As much as 45% of households fall under the absolute poverty line. 40% of the populace are ethnic minorities. This river basin is typical of the situation prevailing across watersheds in China in terms of the economic disparity evident between upstream and downstream areas. The per capita GDP of Zhenxiong County, the source of the Chishui River (upstream), was RMB4 ,007 (634 USD) in 2010; while the per capita GDP of Renhuai City, located in the middle reaches of the river basin, was RMB 36,632 (5.799 USD). Renhuai City, the County capital, is tagged as China's Wine Capital. The city has a concentration of manufacturing enterprises, which collectively register annual sales of RMB 12.69 billion (almost 2 billion USD). This accounts for over 90% of the local industrial value added of the County. These companies abstract water from the Chishui river and their financial prospects are dependent on the quality of water. This is however, being undermined as a result of watershed degradation.

Watershed Management Context for the Chishui River Basin

Problem Identification

17. With rapid socio-economic development, the environment in the basin is being threatened by pursuit of economic growth. The increase of water consumption for riparian industries in particular, as well as urban growth and agricultural uses, coupled with continuing deforestation of watershed slopes for crops (mid stream), and mining (upper stream) has resulted in depleted forest coverage, low water conservation capacity and consequent impacts on aquatic ecology and the habitats of wild animals and plants.

Threats to Biodiversity

18. First, the decreased flow and inadequate water in the river greatly affected populations of fish and other aquatic life. Furthermore, the inadequate water flow is easily polluted, causing harm to aquatic organisms. Secondly, deforestation has destroyed native plants; and cultivation of crops in mountainous areas has converted habitats of wild animals. Big floods in the 1990s eroded soils from steep farmland, then the water decreased (some fishes disappeared) and animals such as leopard disappeared.

Decrease in Water Quantity

19. The data from Maotai Hydrological station show that the runoff of Chishui River decreased continuously from 1960s (Fig 2-1). The same occurred in Wuma River. There is no Hydrological Station on Wuma, but resident villagers (over 60 years old) interviewed along Wuma River have mentioned that the volume of Wuma River has definitely decreased. The shortage of water supply in the dry season is significant as water intake for industrial production takes place at this time.

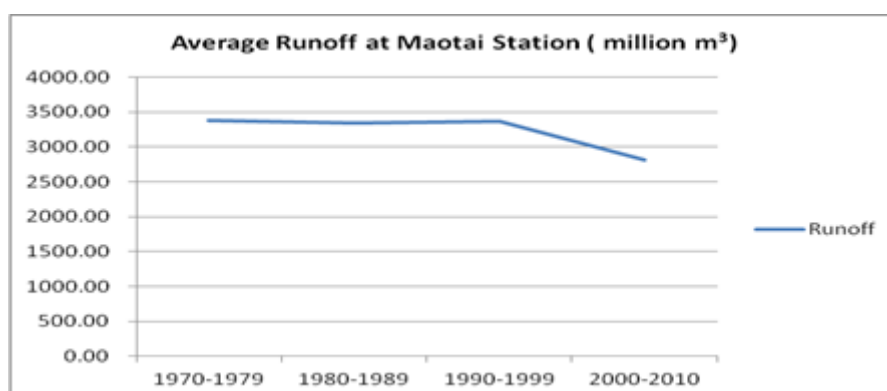


Figure 5. Average Runoff at Maotai Station (million m³)

Causes of the Problems

20. Causes for decreasing water runoff may include a variety of factors from natural^[12] to anthropogenic. After the analysis on variation of precipitation and temperature,^[13] the investigation in communities indicates that natural factors actually had little impact on the problems as shown in Figures 6 and 7 .

[12] The precipitation, according to the data from Guizhou Meteorological Bureau, decreased from 274.73mm in 1970 to 262.95 mm in 2000s. The average temperature changed from 9.5 °C in 1970s to 10. °C in 1970s to 10.

precipitation changed little between decade-intervals.

[13] Data sourced from Guizhou Weather Bureau.

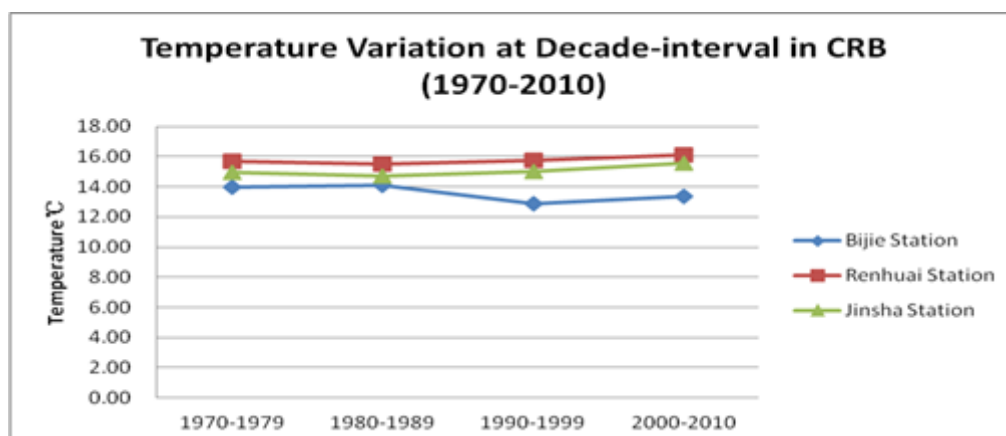


Figure 6. Temperature Variation at Decade-intervals in CRB (1970-2010)

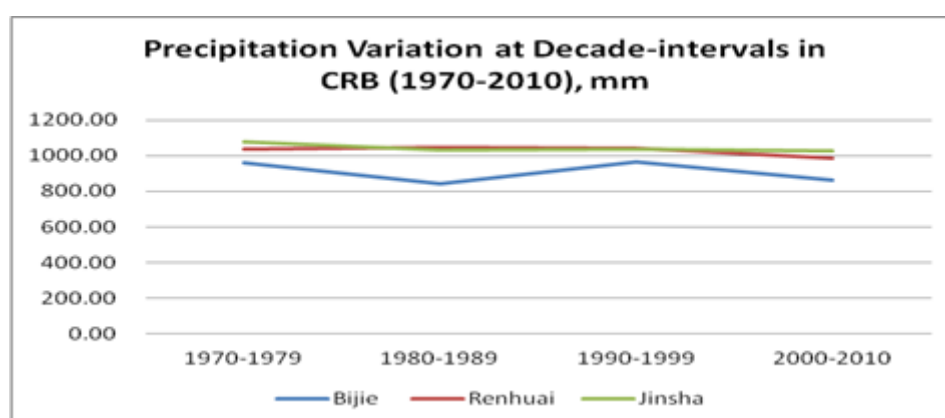


Figure 7. Precipitation Variation at Decade-intervals in CRB between 1970-2010 (mm)

In recent decades, rapid social and economic development has seriously impacted the ecosystem in the upstream areas. This has resulted in a loss of the natural filtering capacity of the soil and a decreased water soil-storage/conservation capacity. In Chishui River Basin for example, the forest coverage rate decreased from 35% in 1950 to 21% to day. This represents 10.09 m³/s loss of average flow during the dry season^[14]. At the end of 1990s, the governments from provincial to local began to implement the policy of “Returning Farmland to Forest”. The environment showed some improvement. However, because of limited financial support, and the single plant (bamboos) with low short term economic benefits, farmers did not take proper care of these plants. And even under proper care, it takes a long period of time (about 10-15 years) to become a mature forest with adequate water conservation capacity. Some of the newly planted trees were cut down to plant other crops with higher and faster economic returns for the poor farmers. Understandably short term economic benefits prevailed over long term water conservation practices.

21. In addition to these problems, there is the fact that there is extensive farming on slopes over 25°, which need to be returned to forestry in the watershed. Cultivation of steep slopes for subsistence agriculture is an old practice among poor farmers in the water basin. When local companies negotiated with the farmers for the planting and buying of organic sorghum the farmers did not hesitate to enter into agreement. However, the only available lands to plant sorghum were steep slopes, some with a gradient of over 25°. This land use

[14] Data sourced from Chishui River Basin Comprehensive Planning (2011) edited by Yangtze River Water Resources Committee.

contributed significantly to the decrease in water filtering capacity of the soil as well as the loss of the soil natural water storage capacity. These practices contributed towards the decrease in water flow downstream and low forest coverage, impacting the operations of the companies that have supported the unsustainable expansion of sorghum cultivation.

Sustainable Watershed Management

22. A range of efforts are being made to improve environmental protection in the Chishui River Basin, described below in terms of the multiple overlapping planning frameworks, eco-compensation programmes by various agencies and protected area network. Yet there is little visible reversal of watershed degradation trends (with the exception of considerable successes in water pollution control), which are linked to marginalized poor farming communities (average monthly incomes of less than USD100 per household) which have been expanding cultivation on to steep slopes driven by land shortage and local demand for sorghum. Without a shift in land use patterns, this vicious cycle will continue to aggravate poverty, environmental degradation and stresses on communities. Mechanisms such as PES/PWS that can enable the flow of significant public and private sector finance to introduce more sustainable watershed management practices, linked to delivery of ecosystem services (clean water supply) downstream, have potential to break such degradation and poverty cycles. However, they also need to be linked to be placed within an integrated river basin management framework in order to achieve biodiversity conservation objectives.

Institutional context

National government agencies involved in watershed management

23. Watershed management involves a range of national government agencies in China, principally including the: Ministry of Water Resources (MWR), Ministry of Environmental Protection (MEP), State Forestry Administration (SFA), Ministry of Agriculture (MOA), National Development and Reform Commission (NDRC), Ministry of Land and Resources (MLR), State Tourism Administration (STA), and Ministry of Finance (MOF).

24. At the regional level, a series of river basin management commissions have been established under MWR, with the **Changjiang Water Resources Commission (CWRC)** covering the Chishui River Basin, as one of the Yangtze (Changjiang) River's first order tributaries. At present, water resources in the Yangtze River basin are managed in a pattern combining national management with local regional management. Dispatched by MWR, CWRC has been authorized by the State to carry out its water administration mission in the Yangtze River basin. Its main tasks are to implement integrated water resources management, in terms of being in charge of comprehensive harness of – rivers, channel and lakes, as well as development and management of key water projects which are of control importance, and carried out planning, management, coordination, supervision and service-providing for the purpose of promoting river training and the integrated development and protection of water resources in the basin. See **Annex 3** for further information on its functions.

Provincial government agencies having a role in Chishui watershed management

25. The provincial and county governments have their own counterpart agencies. For example, **Guizhou Provincial Government** has its Environmental Protection Department

(EPD), and Renhuai City has its Environmental Protection Bureau (EPB). The following agencies have responsibilities regarding the management of the Chishui River Basin management. They have counterpart agencies in Yunnan and Sichuan Provinces with similar responsibilities related to national and their respective provincial legislation.

26. The following agencies have responsibilities regarding watershed management in the Guizhou portion of the Chishui River Basin: **Guizhou Provincial Environmental Protection Department (EPD)** - in charge of environmental management of Chishui River Basin (Guizhou section), **Guizhou Provincial Department of Water Resources (DWR)** - in charge of water resources management of the Chishui River Basin, **Guizhou Provincial Agricultural Commission (PAC)** - in charge of agricultural management including crop farming, animal raising, fishery and aquaculture, etc. **Guizhou Provincial Fishery Bureau** affiliated with Guizhou PAC is in charge of the protection of the wild aquatic resources, and manages the Chishui River National Nature Reserve for Endangered and Unique Fishes in Upper Yangtze River Basin (Guizhou section). **Guizhou Provincial Forestry Department (FD)** is in charge of forestry management, wetland management, nature reserve management and wild animal and plants management. **Guizhou Provincial Development and Reform Commission (DRC)** is in charge of master plan development and coordination of all the other sectors of Guizhou province. **Guizhou Provincial Tourism Administration (PTA)** - is in charge of tourism management. See **Annex 3** for further information on the responsibilities of each of these agencies.

27. **Guizhou Provincial Financial Department (FiD)** - is in charge of the financial management of Guizhou provincial government, and has much to do with the eco-compensation programs of the government. Guizhou FiD, Guizhou EPD, Guizhou DWR, and People's Bank of China Guiyang Branch jointly designed and eco-compensation program in the Qingshui River Basin in 2010, launched by the Guizhou Provincial Government on 1 January 2011. Guizhou FiD, Guizhou EPD, and Guizhou DWR jointly designed an eco-compensation program in the Hongfeng Lake watershed in 2012, launched by Guizhou Provincial Government on 1 September 2012. See the **Baseline section** for further information on these programs.

Local governments in Guizhou having a role in Chishui watershed management

28. In addition to the provincial agencies of the above-mentioned sectors, the municipal and county/city governments in the Chishui River Basin also play important roles in the watershed management.

29. Below the Guizhou Provincial Government in the Chishui River Basin, there are Bijie Municipal Government, Zunyi Municipal Government, and Renhuai City Government. There are ten county level governments in the Chishui River Basin, of which three counties or districts are in Bijie Municipality, and six are in Zunyi Municipality. Below Bijie Municipal Government, there are Jinsha County Government, Dafang County Government, and Qixingguan District Government. Below Zunyi Municipal Government, there are Honghuagang District Government, Huichuan District Government, Zunyi County Government, Tongzi County Government, Xishui County Government, and Chishui City Government.

30. According to China's Environmental Protection Law, a local government is responsible for the environmental quality and protection within its jurisdiction area. This

means that Bijie and Zunyi Municipal Governments and Renhuai City Government are responsible for the environmental quality and protection in their respective areas.

31. The provincial government agencies make the policies, standards and regulations regarding the Chishui River, and provide some funds. The local governments implement programs with provincial funds and/or their own financial resources to meet the policy targets and environmental standards.

Policy and Legislative context

National Policy Framework on Eco-compensation

32. The central government began to call for establishment of an eco-compensation mechanism in 2005 and ever since then such an ambition has appeared in high level government policy papers such the 11th and 12th National Five-year Plans^{15and16}, the 17th and 18th CCP¹⁷ Party Congress reports¹⁸, and Premier reports to the National People's Congress in the past years.

33. In 2010, the State Council launched the process of eco-compensation legislation, which is led by the National Development and Reform Commission (NDRC). NDRC released the draft outline of the Eco-compensation Regulation in 2011 and set out the eco-compensation policy framework.

34. In the present eco-compensation policy framework, both public financial transfers and market based deals are encouraged. Ten fields are listed as being eligible for public financial transfers, i.e. for forest, grassland, wetland, wilderness, watershed, soil, mining, marine environment, development prohibited regions, and development restricted regions. The envisaged market based mechanisms include direct deals between upstream communities and downstream water users, water rights trading, permit trading, carbon trading, eco-labeling, and over-the-counter deals, etc.

35. In April 2013, the State Council reported to the Standing Committee of the National People's Congress on progress and prospects for eco-compensation in China. In this report¹⁹, Chishui River Basin and other 4 watersheds²⁰ are proposed for piloting watershed eco-compensation in the near future.

Eco-compensation schemes at the national level

36. The National Government of China piloted the **Forest Ecological Benefit Compensation Program** in 2001 and it was formally launched in 2004. In addition to the

¹⁵ China 11th Five-year Plan. http://www.gov.cn/ztl/2006-03/16/content_228841.htm

¹⁶ China 12th Five-year Plan. http://www.gov.cn/2011lh/content_1825838.htm

¹⁷ The Chinese Communist Party, the ruling party of China.

¹⁸ 18th Party Congress Report. <http://cpc.people.com.cn/n/2012/1118/c64094-19612151.html>

¹⁹ State Council Report on Eco-compensation Progress to the Standing Committee of the National People's Congress. http://www.npc.gov.cn/npc/xinwen/2013-04/26/content_1793568.htm

²⁰ The other 4 watersheds are Dong River in Jiangxi and Guangdong provinces, Jiulong River in Fujian province, Luan River in Hebei and Tianjin, and Dongjiang Lake in Hunan province.

national level forest with ecological benefits, almost all the provinces have their provincial level forest with ecological benefits, which are funded by the provincial governments.

37. From 2008, the National Government of China has implemented an eco-compensation program under which each of the National Key Ecological Function Counties receives public financial transfer from the National Government for the ecological services they provide. There are 16 counties in Guizhou Province that have been designated National Key Ecological Function Counties and covered by the public transfer program, of which three counties are located in the Chishui River Basin: Bijie City (Qixingguan), Dafang County, and Jinsha County. See the **Baseline section** for details.

Eco-compensation schemes in Guizhou and other provinces

38. There have been two eco-compensation schemes initiated by the Guizhou Provincial Government up to now. One is the Qingshui River Eco-compensation Program, and the other is the Hongfeng Lake Basin Eco-compensation Program. The examples of the Xin'an River Eco-compensation Program (Anhui Province) and Jiangxi Five Rivers Headwater Area Eco-compensation Program are provided in the **Baseline section** (See also **Annex 4** for details).

Eco-compensation, PES and PWS

39. The PES concept has been about arrangements between buyers and sellers of environmental goods and services in which those that pay are fully aware of what it is that they are paying for, and those that sell are proactively and deliberately engaging in resource use practices designed to secure the provision of the services²¹.

40. In this project document, Payments for Watershed Services (PWS) and Payment for Environmental Services (PES) are used somewhat interchangeably, but it should be recognized that PWS is actually a subset of PES where watershed services are at least one of the environmental services being targeted.

41. Eco-compensation is a broader concept in China. Li Wenhua, who headed the China Council for International Cooperation on Environment and Development (CCICED) Taskforce on Eco-compensation, defined eco-compensation as a form of public regulation to adjust the relationship between the different actors and stakeholders affecting ecosystem services and the environment on the basis of ecosystem service values, cost for ecological conservation, opportunity cost, and via means of the government and market mechanisms, so as to protect and sustainably use ecosystem services. Eco-compensation refers to both incentives (i.e., compensation for a right that is foregone in order to maintain a certain ecosystem service, or a "reward") and disincentives (i.e., charges for the loss of or damage to ecosystems and natural resources)²².

42. Eco-compensation includes programs that:

- (i) involve direct payments from the government to individual and community-level suppliers of ecosystem services to ensure and improve ecosystem service provision;

²¹ GEF 2012. Payment for Ecosystem Services. Report prepared by J. Cavelier and I Munro Gray. Global Environment Facility, Washington DC. 20pp.

²² China Council for International Cooperation on Environment and Development, 2006. Eco-compensation Mechanism and Policies. CCICED Task Force on Eco-compensation Mechanism and Policies. Beijing: Science Press

- (ii) compensate households, communities, or regional governments for regulatory takings associated with environmental policy (e.g., as a result of the creation of protected areas or restricted development zones for conservation, and the associated introduction of land-use restrictions or requirements);
- (iii) create horizontal frameworks of cooperation and financial transfers between different regional or administrative levels of government to ensure and improve ecosystem service provision by clarifying and better apportioning responsibilities and costs;
- (iv) adjust or introduce fees, levies, taxes, tax-breaks, or subsidies on resource uses to increase funding for or to incentivize conservation, environmental management, and/or restoration;
- (v) increase upper-to-lower-level government financial transfers to better fund environmental management; and
- (vi) compensate regions, especially in the PRC's less developed west, for past and current extractive and environmentally damaging resource uses as part of the country's economic development²³.

43. In short, eco-compensation is a broader concept which includes PES/PWS. PES/PWS follows the beneficiary pays principle, while eco-compensation also includes mechanisms which follow the polluter pays principle.

National level policy applying to the Chishui River Basin

44. The **Changjiang Water Resources Commission** (CWRC) of the MWR plays a key role in coordinating the development of the Yangtze River Basin, implementing national laws and with capacity to create its own regulations relating to the river basin. **The Chishui River Basin Master Plan** (2011) was drafted by the CWRC. This sets out the principles of Chishui watershed management, i.e. watershed protection is the priority in Chishui River Basin as against development and utilization. The **goal of the Master Plan** is to protect the Chishui River Basin up to the standards which are suitable as the habitat of the unique and endangered fish species and for the water security for key industries.

45. The Master Plan divides the Chishui River into three zones, i.e. development prohibited zone, reserved zone, and development zone. The *Development Prohibited Zone* is the 417 km mainstream of the Chishui River. This provides habitat of the unique and endangered fish species of the upper Yangtze River Basin. No dam is allowed in the zone. The *Reserved Zone* consists of the major tributaries of the Chishui River, where some degree of development is possible but must be based on further research and feasibility study. It is 210 km in length. The *Development Zone* is 372 km long in the tributaries of the Chishui River, where dams and other development is allowed.

46. The Master Plan also calls for establishment of an eco-compensation mechanism in the Chishui River Basin in its section 5.7 and sets out principles such as the “beneficiaries pay” principle.

Guizhou provincial policies and regulations

²³ Zhang Q., T. Lin, M. Bennett and L. Jin, 2010. An Eco-compensation Policy Framework for the People's Republic of China. Manila: ADB publication

47. Guizhou Provincial Government has established policies and regulations regarding Chishui watershed management. In 2007, Guizhou Provincial Government approved and began to implement the **Ecological Function Protection Plan for Upper Reaches of Chishui River in Guizhou Province** (Upper Reach Plan). This Plan covers 188 km of the Chishui River from the starting point of the Chishui River in Guizhou to Renhuai City. Four counties are involved in this Plan, i.e. Qixingguan, Dafang, Jinsha, and Renhuai. One of the key goals of the Upper Reach Plan is to assure the water and environmental security for local manufacturing production. It sets the Maotai Water Source Protection Area, which is from Jiucang River outlet to Maotai water intake point of Yuwo in the Chishui mainstream, with 42 km of protected stream and a protected area of 133 km². Within this area, development and construction are prohibited, and no animal raising, aquaculture or water-based recreation is allowed.

48. In 2011, Guizhou Provincial Government promulgated the **Guizhou Chishui River Basin Protection Regulation** (Chishui Protection Regulation)²⁴. Article 7 of the Chishui Protection Regulation requires the Provincial Government and lower level local governments in the River Basin to set up a Special Fund for Chishui Watershed Protection. Article 8 of the Chishui Protection Regulation requires the establishment of an eco-compensation mechanism in the Chishui River basin, which is now in operation (see **Baseline section**).

49. In April 2013, Guizhou Development and Reform Commission drafted and submitted to the Provincial Government the **Guizhou Chishui River Basin Protection Plan**, which was approved in June 2013. This Plan divided the Guizhou Chishui River Basin into three functional zones. The upper reach from Bijie to Renhuai is designated the *Water Conservation and Ecological Rehabilitation Zone*. The middle reach in Renhuai and Xishui is the *Ecological Industry Development Zone*. The lower reach in Chishui City is the *Natural Heritage Protection Zone*. Local manufacturing industries will be further developed and expanded in the Ecological Industry Development Zone in Renhuai and Xishui.

50. In June 2013, Guizhou Provincial Environmental Protection Department drafted and submitted the **Guizhou Chishui River Basin Environmental Protection Plan (2013-2020)**, which was approved by the Provincial Government. This Plan divided the Chishui River Basin into 3 areas, i.e. *Ecological and Environmental Protection Area* (from Bijie to Wuma River outlet of the Chishui mainstream, accounting for 27% of the Chishui watershed); *Ecological and Environmental Rehabilitation Area* (from Wuma River outlet to Tongzi River outlet, accounting for 61% of the Chishui watershed); and *Ecological and Environmental Control Area* (from Xi River outlet to Chishui City, accounting for 12% of the Chishui watershed). In the Ecological and Environmental Protection Area, upstream of the Maotai company, any development of polluting industries is prohibited. In general, economic development corresponds with the restrictions specified in the overlapping regional plans. The zoning within the plans is relatively consistent towards the overall goal of protecting water quality, even though the specified zones are not identical between different plans (see **Table 1**).

51. The following general observations can be drawn regarding this suite of plans:

- The various plans were drafted by different sectors, each focusing on different aspects of Chishui River Basin management, as follows:
 - The Changjiang Water Resources Commission's Plan (see below for further

²⁴ Guizhou Chishui River Basin Protection Regulation. http://www.gzrd.gov.cn/pages/show_dffg.aspx?id=656

information) focuses on water resources management and is sensitive to where a dam can or cannot be built and how water resources should be used;

- The EPD's Plan focuses on environmental protection, concerned primarily about what environmental protection measures should be taken and where;
 - The Provincial DRC's Plan focuses on both industrial development and environmental protection, with its emphasis on industrial development, detailing where and what industries could be developed in the Chishui River Basin.
- CWRC's Plan delineated more areas as development-prohibited areas, i.e. the whole mainstream of the Chishui River, 417 km long. While all the Guizhou Provincial Plans allow development in the middle and lower reaches of Chishui River Basin. This is not consistent. CWRC is an agency directly under MWR operating above Guizhou provincial level.
 - Guizhou DRC's Plan term is up to 2015, following the division of the Five-year Plan which is dominated by the DRC at various levels of government. All the other Plans' term is up to 2020 from the planned year.

Table 1. Government Plans on the Chishui River Basin

Plan	Drafting agency	Year of Issue	Term planned	Zoning presented	Features
Ecological Function Protection Plan for Upper Reaches of Chishui River in Guizhou Province	Guizhou Provincial Environmental Protection Department (EPD)	2007	2006-2020	Covers 188 km of the Chishui River from the starting point of the Chishui River in Guizhou to Renhuai City	<p>It only deals with the upper reaches of the Chishui River Basin in Guizhou Province.</p> <p>It sets the Maotai Water Source Protection Area, which is from Jiucang River outlet to Maotai water intake point of Yuwo in the Chishui mainstream, with 42 km of protected stream and a protected area of 133 km². Within this area, development and construction are prohibited, and no animal raising, aquaculture or water-based recreation is allowed.</p>

The Chishui River Basin Master Plan	Changjiang Water Resources Commission (CWRC)	2011	2008-2020	<p>The Master Plan divides the Chishui River Basin into three zones, i.e. Development Prohibited Zone, Reserved Zone, and Development Zone.</p> <ul style="list-style-type: none"> - The Development Prohibited Zone is the 417 km mainstream of the Chishui River. This provides habitat of the unique and endangered fish species of the upper Yangtze River Basin. No dam is allowed in the zone. - The Reserved Zone consists of the major tributaries of the Chishui River, where some degree of development is possible, but must be based on further research and feasibility study. It is 210 km in length. - The Development Zone is 372 km long in the tributaries of the Chishui River, where dams and other development are allowed. 	<p>It covers all the three provinces of Yunnan, Guizhou, and Sichuan. It also covers all the tributaries of the Chishui River.</p> <p>It is drafted by an agency other than Guizhou Province.</p> <p>All the mainstream (417 km) is designated as “Development Prohibited Zone”.</p> <p>It deals primarily with water resources management rather than watershed management.</p>
Guizhou Chishui River Basin Protection Plan	Guizhou Development and Reform Commission	2013-June	2012-2015	<p>It divides the Chishui River Basin into three zones.</p> <ul style="list-style-type: none"> - The upper reach from Bijie to Renhuai is designated the <i>Water Conservation and Ecological Rehabilitation Zone</i>. - The middle reach in Renhuai and Xishui is the <i>Ecological Industry Development Zone</i>. - The lower reach in Chishui City is the <i>Natural Heritage Protection Zone</i>. 	<p>It covers all the Chishui River Basin in Guizhou province.</p> <p>Development in the middle reaches of Chishui River Basin is encouraged. A number of industrial development parks are planned in the middle reaches.</p> <p>It deals with both environmental protection and industrial development.</p>

Guizhou Chishui River Basin Environmental Protection Plan (2013-2020)	Guizhou Provincial Environmental Protection Department	2013-June	2013-2020	<p>This Plan divided the Chishui River Basin into 3 areas, i.e.</p> <ul style="list-style-type: none"> - <i>Ecological and Environmental Protection Area</i> (from Bijie to Wuma River outlet of the Chishui mainstream, accounting for 27% of the Chishui watershed); - <i>Ecological and Environmental Rehabilitation Area</i> (from Wuma River outlet to Tongzi River outlet, accounting for 61% of the Chishui watershed); and - <i>Ecological and Environmental Control Area</i> (from Xi River outlet to Chishui City, accounting for 12% of the Chishui watershed). 	<p>It covers all the Chishui River Basin in Guizhou province.</p> <p>It deals with environmental protection, but doesn't deal with industrial development in the Chishui River Basin.</p>
---	--	-----------	-----------	---	---

THREATS, ROOT CAUSES AND IMPACTS

52. China has become the 2nd largest economy in the world. With 22% of the world's human population to feed, the country has only 9% of the world's tillable land and 6% of global freshwater reserves. The consequences are over-exploitation of resources, declining groundwater levels, worsening pollution, and shrinking habitats for China's rich animal and plant life. These pressures are highly evident in the Yangtze River Basin, owing to its long history of settlement, large population size (one third of China's population) and massive economic growth. Some indications of its enormous industrial development are an increase in cargo throughputs at Yangtze River ports from 400 million tons in 2000 to nearly 1.2 billion tons in 2008 – number one position in the world; a 20 billion m³ increase in total water consumption between 2000 and 2007; and a 10.3 billion ton increase in effluent discharge between 1999 and 2007²⁵. In common with much of the Upper Yangtze River Basin, the biodiversity of the Chishui River Basin's watersheds faces growing anthropogenic pressures, including the following threats.

53. *Habitat loss, fragmentation and land degradation:* Habitat loss is the single greatest threat to biodiversity in the Chishui River Basin. Original forest types exist within the protected areas, but are almost completely gone outside, except for inaccessible patches. Available habitats for wildlife are shrinking as more and more lands are converted for agriculture and fragmented by industrial, urban and infrastructure development. In the context of the project's focus on sustainable watershed management, conversion to agricultural use is the main concern, being responsible for the largest losses in natural habitat in sloping river valleys. The forest cover in upstream areas has decreased from 30% of the area extant in the 1950s to the current 20%²⁶. Subtropical vegetation including *Alsophila spinulosa* (Hook.) R.M.Tryon (Spiny Tree-fern) and *Davidia involucrata* Baill. (Dove Tree) is particularly threatened.

54. About 60% of land in the Chishui River Basin is prone to soil erosion, among which 20% is heavily eroded. Observed contributing factors include widespread coal mining and farming on sloping lands. About 43% of the total cultivated land in the watershed is located on steep slopes with gradients over 25°. The expansion of crops on to steep lands is related to the limited availability of good farmland on flatlands in the steep valleys. Planting of organic sorghum (without the use of pesticides) has been encouraged by the local government and financially supported by the Maotai company in order to prevent pollution of the Chishui River by agrochemicals, also providing local farmers with guaranteed prices through dedicated contracts. The authorities are reluctant to enforce land use regulations on poor rural farming communities, especially when such contracts offer them a degree of economic security. The resulting unsustainable land use on steep slopes causes severe water losses and soil erosion, as well as threatening terrestrial and aquatic biodiversity by fragmenting remaining terrestrial habitats and increasing sedimentation and turbidity in wetlands. In addition, about 62% of Guizhou lands are karst mountains with exposed stones. They are subject to stone desertification if not well treated, threatening biodiversity and becoming more vulnerable to climate change.

55. *Overexploitation:* Widespread consumption of wild animals and plants for food and traditional Chinese medicine, coupled with weak legal protection and enforcement has led to

²⁵ WWF China Programme. 2011. Yangtze Conservation and Development Report 2009. Executive Summary.

²⁶ Guizhou Provincial Government, 2012. Guizhou Provincial Strategy and Action Plan on Biodiversity Conservation.

an accelerated loss of species and genetic biodiversity. Over 15% of the higher plant species in China are endangered and a large number of 5,000 species of medical and other economically valuable plants species in the upper Yangtze River are threatened by overharvesting, exacerbated by increasing market values. Examples include hedgehog, pangolin, wild *Gastrodia elata*, *Eucommia ulmoides*, *Taxus chinensis*, *Magnolia biloba*, *Dendrobium nobile*, etc. In the Chishui River Basin, fish species such as *Psephurus gladius* (Chinese paddlefish) and a large number of endemic *Cyprinidae* species including *Rhinogobio ventralis*, *Procypris rabaudi* (rock carp) are seriously threatened due to overharvesting. While not aiming to directly address over-exploitation, the project would result in long term rehabilitation of available habitat for wild fauna and flora, supporting population recovery.

56. *Invasive alien species (IAS)*: IAS have high potential to threaten native biodiversity through competition, predation, and alteration of communities and habitats, and have had a major impact in parts of China (e.g. Amazonian apple snail damage to ricefields in Guangxi). Crofton weed *Ageratina adenophora*, alligator weed *Alternanthera philoxeroides*, water hyacinth *Eichhornia crassipes*, Amazonian apple snail *Pomacea maculata*, red-eared slider *Trachemys scripta*, and other invasive species have impacted ecosystems and biodiversity in Guizhou. A particular risk for the CRB is the potential for introduced fish species used in aquaculture to impact valuable native fish populations. PWS interventions supported by the project will specifically avoid the use of any alien species for reforestation and promote the use of diverse local native species for reforestation supported by eco-compensation schemes. The project will not support aquaculture that uses fish species from outside the CRB.

57. *Pollution*: The pollution threat to the Chishui River Basin includes soil run off, inappropriate application of fertilizers and insecticides, sewage emissions from towns and pollution from paper mills and coal mines. Guizhou is now accelerating its industrialization process, which will increase the volume of effluents and likely result in more water pollution, although this has been offset in recent years by significant efforts to close polluting paper mills and coal mines in the CRB (see baseline section). Rivers, lakes and reservoirs in Guizhou are polluted to different degrees at present. As an indication, about 332,986 tons of COD was discharged into water bodies in 2012 in Guizhou, along with 38,755 tons of ammonium nitrogen. Zunyi and Bijie (both in the CRB) are the top two municipalities which emit large amounts of COD and ammonium nitrogen²⁷. The existing planning framework for the CRB places strong controls over polluting industries but has had little effect on non point source pollution arising from watershed degradation, which this project aims to address.

58. The water quality of the Chishui River below Maotai Town is deteriorating due to industrial expansion, with increased discharge of wastewater, and decreased water runoff due to increased abstraction. There are about 2,000 companies in Renhuai City, which produce 3.6 million tons of wastewater annually and 60% of the wastewater is discharged into the Chishui River without any treatment. The COD concentration of the wastewater from this industry can be as high as 70,000 mg/L, which is heavily polluting²⁸. Planned industrial expansion will demand 15 million m³ additional water from the Chishui River, and discharge 12 million m³ more wastewater.

²⁷ Guizhou Environmental Quality Bulletin 2012. <http://www.gzhjbh.gov.cn/hjzl/hjzlzkgb/51739.shtml>

²⁸ In contrast, the COD concentration of Class III water is 20 mg/L according to GB3838-2002 of China surface water quality standard.

59. Agricultural non-point source pollution also contributes significantly to water quality deterioration, as some 43% of cultivated land is located on slopes over 25°, mostly for annual crops. The 749-1286 mm of annual rainfall in the Chishui River Basin will wash out some of the fertilizers in the soil into the Chishui River. The total nitrogen concentration in the Chishui River is higher in upstream than in downstream reaches, and higher in some of the tributaries than in the mainstream. This pollution distribution pattern is correlated with the distribution of sloping farmland in the Chishui River Basin.

60. Although all eight counties in the Chishui River Basin have wastewater treatment plants in their county seats, only five townships out of 100 in the Chishui River Basin have wastewater treatment facilities. This result of this is that only 65% of domestic wastewater is collected and treated in the river basin.

61. *River regulation and demand for water resources:* As of 2011, there were 2 medium-sized reservoirs and 255 small-sized reservoirs in the Chishui River Basin, and plans for the construction of a further 16 medium-sized reservoirs with a total storage capacity of 234 million m³ by 2020²⁹. However, Zunyi plans to build 16 medium sized reservoirs in the coming 10 years³⁰ (8 more than indicated in the river basin masterplan). One of these is Dashaba Reservoir in Renhuai, primarily to supply water to two industrial parks. Renhuai City plans to invest in an additional two medium-sized reservoirs and 14 small-sized reservoirs³¹. The planned Suoluoping Reservoir (15.87 million m³) will be located on the Yukong River, a tributary of the Wuma River, which discharges into the Chishui River 36km upstream of Renhuai, to provide water supply for Renhuai new urban districts, Taichang Town and industrial parks, a small amount to Wuma town and irrigation. Thus, even with no mainstream dams, a significant portion of the Chishui's annual discharge will be withdrawn for a variety of uses in the near future, its flows will become increasingly regulated and reduced, and an increasing portion of the river system will be inaccessible to fish in the lower and middle reaches. The planned expansion of local manufacturing industry will demand an additional 15 million m³ water from the Chishui River (see above), adding to the pressure on available water resources. While the project focuses on sustainable watershed management, it will also seek to raise awareness and influence threats to aquatic biodiversity through inputs to river basin planning and sectoral policies.

62. *Climate change:* Recorded climate change across the Yangtze River Basin has included an increase in average temperature of 0.33°C in the 1990s, and an increase of 0.71°C from 2001-2005. There was a distinct change in the spatial distribution of precipitation over the period 1961 to 2005, with increased precipitation in the middle-lower basin and lower precipitation in the Jialingjiang and Sichuan Basins. Forecast changes over the next 50 years indicate a rise in annual average temperature in the Yangtze River Basin. Precipitation changes are likely to include greater inter-annual and decadal fluctuations, a more concentrated rainy season and longer dry season.³²

Root causes

Rapid Economic Development and Rural Marginalization

²⁹ Yangtze River Commission's Master Plan of Chishui River Basin, 2011.

³⁰ Zunyi 12th Five-year Plan for Water Resources Development

³¹ Renhuai 12th Five-year Plan for Investment

³² WWF China Programme. 2011. Yangtze Conservation and Development Report 2009.

63. With a population of 34 million people in 2010, Guizhou is the poorest of China's 31 provinces (GDP per capita income of USD 2,541³³) and a less-developed region. Guizhou Provincial Government has adopted a rapid industrialization development strategy. As a consequence, and with a growing population to feed, agriculture is driven to the sloping lands and mountains. Poor farmers have limited land on which to make a living, and such communities become caught in a vicious cycle of poverty and ecosystem deterioration, one contributing to the other. Within a system of social and economic exclusion their livelihoods can only be realized by unsustainable land use practices (deforestation and cultivation of steep slopes), resulting in environmental degradation and further aggravating their poverty.

64. Facing the conflicts between economic development and ecosystem protection, increasingly more capital is being invested in economic development and less is spent on conservation. Municipal and county governments are encouraged to emphasize economic development over nature conservation because both local governments and their officials' performance are evaluated with a lot of weight placed on economic development indicators - and no biodiversity conservation indicators.

Lack of Information and Awareness

65. Government and civil society lack or have poor access to sufficient ecological data and analytical information on social economy to inform their decisions. Conservation efforts are inconsistently monitored and evaluated, and when they are, the resulting information is not openly shared among interested parties and decision-makers. Therefore, it is difficult to accumulate institutional memory and benefit from lessons learned. Lack of sufficient information and awareness has led repeatedly to policies that do not take biodiversity conservation into consideration. In general, people recognize the importance of forests for resources and erosion control and the importance of clean air and clean water to human health, however, the ecological value of biodiversity in human life is less informed.

66. Furthermore, the ecological impact of development and economic policy is often ignored simply because the importance of biodiversity is not understood. Development policies often set economic growth as the most important criterion for evaluation. At perhaps the most fundamental level, failure to value biodiversity is a root cause of environmental degradation. A sustainable approach to conservation must inform communities, businesses and government of their connection to nature and offer alternative lifestyle choices.

67. This region contains extremely complex patterns in the distribution of biodiversity. Existing information is scattered and often non-accessible to non-specialist audiences. Information on biodiversity and conservation in the region therefore needs to be managed for effectively and made more accessible to ensure its use to inform the development and implementation of policies, projects and programs³⁴.

Lack of Capacity

68. Even when stakeholders are motivated to protect biodiversity, their financial, technical, and management capacities are often insufficient. Leadership capacity is lacking at many levels - government, community and nature reserves - and impedes all aspects of conservation action, from policymaking to grassroots initiatives. Environmental and conservation professionals such as reserve staff often have inadequate training or preparation.

³³ WWF report to ADB, 2012.

³⁴ Based on material from CEPF 2002. Ecosystem Profile. Mountains of SouthWest China Hotspot.

69. With the trend towards privatization, communities will play an increasingly important role in China's civil society. Sustainable resource use will increasingly depend on improving capacities for self-governance at the community level. The social awareness and skills on resource management at village level, which integrate with traditional indigenous social systems, will be critical.

70. Capacity, in turn, depends on training. Few universities and institutes offer multidisciplinary training to solve environmental problems such as sustainable watershed management and biodiversity conservation. Capacity building is an urgent need in this region and throughout China³⁵.

Impacts on biodiversity and ecosystem functions

71. The above-mentioned threats have had a major impact on Guizhou's biodiversity and ecosystem functions, not to mention human health and economic losses. While the Chishui River remains the only tributary of the Upper Yangtze without a mainstream dam, there are numerous small and medium-sized reservoirs in its catchment, significant deforestation and soil erosion as a result of unsustainable land uses, infrastructure development has had significant environmental impacts, and industrial demands for water supply are increasing coupled with increasing effluent volumes. Cumulatively, these pressures are resulting in the fragmentation and loss of natural terrestrial and aquatic habitats, disruption of the natural hydrological regime in the river system, changes in the local water cycle, and pushing rare species towards local and some cases global extinction. These include Chinese forest musk deer *Moschus berezovskii* (EN), South China Tiger *Panthera tigris amoyensis* (EN – likely extinct in the wild), Clouded Leopard *Neofelis nebulosa* (V), Leopard *Panthera pardus* (NT) and Reeve's Pheasant *Syrnaticus reevesi* (VU). Native fauna such as Chinese Pangolin *Manis pentadactyla* (EN) and Chinese giant salamander *Andrias davidianus* (CR), and flora such as Guizhou *Radix bupleuri*, Yinbeiye *Codonopsis pilosula*, and other herbs valuable for Traditional Chinese Medicine are also in decline due to overexploitation.

72. Significant declines in fish populations have been observed across the upper Yangtze River Basin³⁶. Some 28 fish species endemic to the upper reaches of the Yangtze River depend on the Chishui river basin for their long-term survival. Many of these species have been extirpated elsewhere in the upper Yangtze as a result of the changes in hydrological conditions that have occurred following construction of the Three Gorges Reservoir. Several of these species are threatened by overexploitation as well as human impacts on the aquatic environment. The principal threats impacting the Rare and Endemic Fish NNR are shipping lanes, water intake projects, sand dredging, over-fishing, water pollution and water-related construction³⁷.

73. In addition to wild species, many local breeds of domestic animals and crops are disappearing in Guizhou, such as Qianbei black hog, Guanling hog, Baixi hog, Jiangkou Luobo hog, Gaojiao chicken, Aijiao Chicken etc. These local breeds have declined by 90%.

³⁵ Based on material from CEPF 2002. Ecosystem Profile. Mountains of SouthWest China Hotspot.

³⁶ Yu X, Luo T & Zhou H. 2005. Large-scale patterns in species diversity of fishes in the Yangtze River Basin. Biodiversity Science 13:473-495.

³⁷ Conservation Action Plan of the Rare and Endemic Fish NNR

LONG-TERM SOLUTION AND BARRIERS TO ACHIEVING THE SOLUTION

74. The long term solution proposed by this project is to operationalise and mainstream a market-based system for PES/PWS within China's existing eco-compensation policies and programmes, thus protecting biodiversity and ecological stability within the process of national economic development. China's Eco-Compensation Programme (in reality a suite of programmes implemented by different agencies) provides an important contribution towards addressing the myriad pressures facing China's biodiversity and ecological stability. However, it is insufficient in itself to provide the financial resources and incentivize economic behaviour on a large enough scale to accomplish biodiversity conservation and environmental protection and rehabilitation policy goals. There is a need to augment such fiscal transfers with market-based PES/PWS schemes that channel payments from corporate (private sector and government) buyers to local communities supplying ecosystem services, with a view to altering their economic behaviour and curbing adverse changes in land use that are leading to the loss of biodiversity and ecosystem functions. The project will demonstrate the application of this approach to the Chishui River Basin, focusing initially on the maintenance of water quality and river flows as key marketable ecosystem services, while simultaneously targeting biodiversity conservation and socio-economic goals. However, two principal barriers currently hamper the realisation of this long term solution, described as follows.

Barrier 1. Weak enabling framework and institutional capacity for PWS implementation and upscaling

75. A market based PES system will require the establishment of institutions responsible for brokering payments—mapping and monitoring ecosystem services and biodiversity values, making performance based payments based on changes in land use and corresponding ecosystem functionality, verification and certification of the services and the enforcement of contracts with buyers and sellers. Currently, the managerial capacity to undertake these various functions at provincial and municipal levels is a major constraint.

76. Moreover, there is a need to integrate biodiversity management and watershed management practices so that efforts to secure water quality and river flows also address biodiversity needs (e.g. conservation of priority habitats, connection of habitat blocks, and restoration of riparian and aquatic habitats to support fish populations and other biodiversity). Currently, reforestation and grassland restoration schemes take little consideration of biodiversity conservation needs in their design (for instance, using bamboo monocultures in the Chishui basin).

77. In particular, capacity for monitoring and assessing biodiversity status and pressures needs to be installed, in conjunction with measures to improve the monitoring of ecosystem services. Biodiversity monitoring and assessment is currently unsystematic, under-resourced and poorly equipped, especially in a poor province like Guizhou. It should principally focus on native habitats, fish populations and other nationally protected and globally threatened species. The capacity for biodiversity monitoring and management even in key nationally protected areas such as the *Rare Fishes Protection Zone of the Upper Yangtze River NNR* is chronically underfunded and under-staffed. Strengthened linkages between research organizations and management agencies and more efficient knowledge-sharing platforms are needed to inform the development of sustainable watershed management practices that help protect and restore biodiversity.

78. Market based PWS schemes need to be jointly programmed with fiscal transfer measures—with the latter funds being deployed to improve the development and enforcement of sustainable land use practices in addition to financing supporting infrastructure. There is a need to define acceptable biodiversity-friendly land uses and codify management measures to promote their uptake in land use plans. Clearly PES/PWS will not discourage all types of land uses—the trigger price for the uptake of biodiversity friendly land use versus incompatible land use impacting conservation needs to be determined (this will include the additional costs of intensifying agriculture in sustainable way to compensate for lands taken out of production). This price will need to be used as a benchmark to determine payment levels. Moreover, measures need to be put in place to regulate and mitigate land uses that cannot be compensated through PES/PWS payments, such as water engineering projects.

79. Finally, numerous government agencies regulate and support different aspects of land and natural resource use (agriculture, forestry, fisheries, pollution control amongst others). There is an important need to mainstream biodiversity conservation into their strategies and operations and to coordinate activities to ensure that they are not working at cross purposes with PES/PWS schemes, but rather contribute towards their objectives in a streamlined manner.

Barrier 2. Insufficient know-how on the establishment and implementation of viable PWS mechanisms for biodiversity conservation

80. In the Chishui River Basin, major industries that rely on dry season river flows for their water supply are facing current operational constraints due to inadequate flows, yet these same industries have major expansion plans backed by all levels of government. In addition, biodiversity values that include globally significant fish populations face severe stress and are vulnerable to pollution and other human impacts during lengthening low flow periods. Unsustainable land use practices by upstream farming communities are largely responsible for watershed degradation, impacting these dry season flows. Yet existing policy and economic instruments – including enforcement of laws to protect steep slopes – have proven to be largely ineffective in reversing such watershed degradation. The introduction of PWS can provide a significant new instrument that would connect well-resourced downstream users with impoverished small communities upstream, providing a mechanism for financial flows that would – over time - enable sustainable land uses, provision of ecosystem services (improved water quality and river flows), biodiversity conservation and poverty alleviation.

81. A key barrier to the operationalisation of a market based PWS scheme is the lack of successful working models, which secure ecosystem services (water quality and supply) and biodiversity. While there are examples of eco-compensation schemes targeting water quality improvements in Guizhou and elsewhere in China (see Baseline section), PWS is as yet undemonstrated in China. Therefore, there is a clear need to demonstrate the full process involved in the initiation and implementation of a working PWS scheme at the local level, that takes into account the Chinese policy, administrative, socio-economic, cultural and environmental conditions. This will include the need for development of local capacity for the full range of activities involved, from identifying prospective sellers and buyers of ecosystem services, to bundling of payments on the buyers side and organising suppliers into groups (eg village cooperatives), to sustainable land management techniques, the management of PWS contracts, and monitoring and evaluation of the services provided.

82. The integration of PWS and eco-compensation schemes also needs to be demonstrated at the local level, in order to show how different schemes can be combined towards achieving shared environmental and socio-economic objectives, including various government agencies, local communities and the private sector.

INTRODUCTION TO PROJECT SITE INTERVENTIONS

83. While the project scope concerns the introduction of a payment for watershed services (PWS) system for the Chishui River Basin, implementation will focus on the portion of the river basin in Guizhou Province (with plans for subsequent upscaling and replication in Sichuan and Yunnan), and the pilot demonstration component will focus on the watershed of the Wuma River, a main tributary on the right bank of the Chishui River entering its mainstream some 38 km upstream of Renhuai City (**Figure 5**).

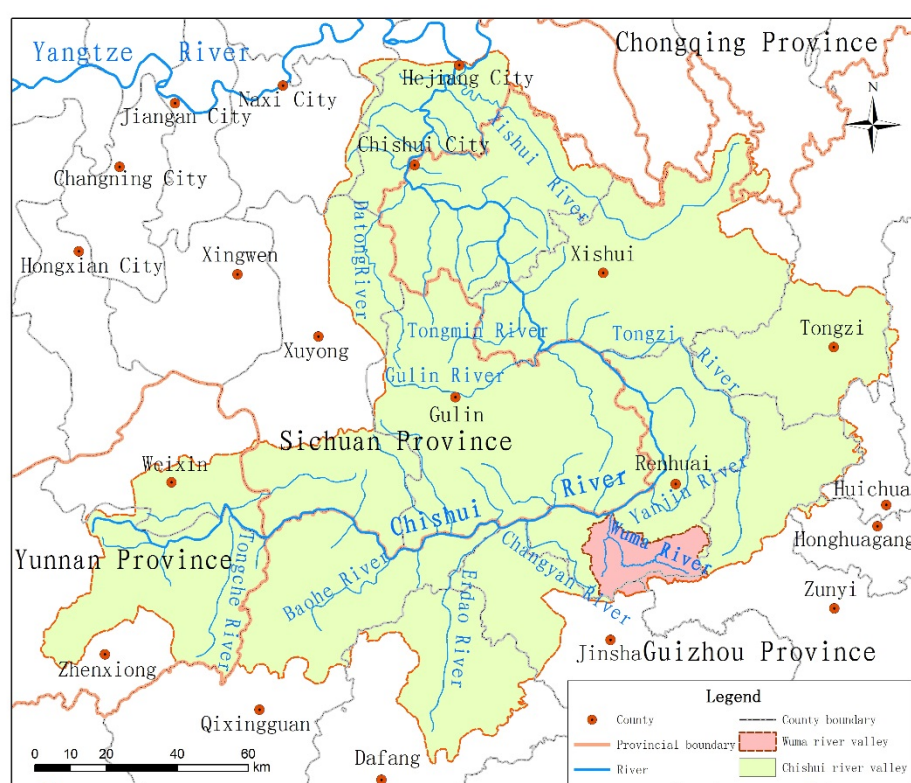


Figure 8. Location of the Wuma River valley in the Chishui River Basin

84. The Wuma valley itself does not present any special biodiversity values beyond those of the Chishui River Basin overall – it contains one county nature reserve, it lies in the *Ecological and Environmental Rehabilitation Area* of the Chishui River Basin according to the Guizhou Chishui River Basin Environmental Protection Plan (2013-2020), and most of the land is used for farming practices or is under forest cover.

85. However the Wuma River watershed is highly suitable for the pilot demonstration of a Payment for Watershed Services scheme for a number of reasons. First the core hydrological problem has been defined as a lack of adequate dry season flows of high quality (at least Class II) water in the Chishui River to support the growing demands of downstream industries and urban development in Renhuai City, while at the same time providing adequate

baseline flows to support the river's ecological functions (especially its globally important fish populations). Secondly, the Wuma River discharges into the Chishui mainstream only 13 km upstream of the main water intake for Renhuai's key industrial park, providing a direct contribution to the quantity and quality of water available. Thirdly, the land use practices of farming communities in the Wuma valley are for the most part unsustainable and result in the systematic deterioration of the ecosystem and its service provision capacity, exemplifying similar problems across the Chishui River Basin – it is therefore representative. These unsustainable practices directly affect downstream water users - a stable supply of good quality water in the Wuma River is an important contribution towards the security of the downstream industries in Renhuai. Fourthly, the farming communities in the Wuma valley live at or below the poverty line and are in need of development assistance to improve their livelihood security while simultaneously improving ecological stability and conditions for biodiversity. The Wuma catchment has a total population of 132,200 (in 2010), including Han (122,500), Miao (2525), Yilao (or Gelao) (2675), Yi (1530) and Buyi (2370) ethnicities. Thus part of the Wuma watershed is managed by ethnic minorities with land management and resource use rights. The PWS pilot component aims to demonstrate the viability of a long term mechanism to achieve these twin conservation and development goals. Further information about the demonstration area, including a site profile, record of community consultations and baseline information is given in **Annex 5**.

STAKEHOLDER ANALYSIS

86. During the project preparation stage, a preliminary stakeholder analysis was undertaken in order to identify key stakeholders, assess their interests in the project and define their roles and responsibilities in project implementation. See the Stakeholder Participation Plan in Section IV Part IV for the major categories of stakeholders identified, their roles and responsibilities in the project, and the project's approach for stakeholder involvement. **Table 2** lists the key stakeholders and their roles associated with this project.

Table 2. Stakeholders involved in the project indicating their roles and responsibilities

Stakeholders	Relevant roles in the project
Ministry of Environmental Protection (MEP)	Through its Foreign Economic Corporation Office (FECO), MEP is the national executing agency for this project providing the national project director, hosting the National Project Management Office and ensuring quality and timely results monitoring and reporting of the project. The bureau is also responsible for reporting to the CBD, and hosts the National GEF Secretariat office. Land management responsibility for the project area, however, rests with the provincial governments in the CRB (Guizhou, Yunnan and Sichuan).
Ministry of Finance	GEF Operational Focal Point (OFP). Coordination and implementation of GEF projects
Changjiang Water Management Commission	Under the Ministry of Water Resources (MWR), the CWMC enforces and exercises the water administrative functions as enacted in the Water Law and authorized by the MWR. Functions include integrated river basin management, flood control, soil conservation, basin master plan preparation, water resources protection and water project development.
Guizhou Provincial Government	Leadership and coordination for implementation of the project, hosting the project management office within its Environmental Protection Department. Responsible for provincial administration, development planning and implementation, as well as planning and financing for watershed management. Other provincial agencies such as the Development Reform

	Commission, Land Resources Department, Forestry Department, Tourism Department, Water Resources Department, etc., will coordinate with the EPD under the provincial government's guidance to implement the PES project. While their roles are summarized below, see Annex 3 for further information on their responsibilities.
Standing Committee of People's Congress of Guizhou Province	Responsible for coordination of legislation and regulation functions in Guizhou, including the provincial regulation for Chishui River Basin protection.
Yunnan and Sichuan Provincial Governments	Provincial governments for the other two riparian provinces of the Chishui River Basin. They represent key partners for transboundary river basin cooperation under the Guizhou Province Chishui River Basin Conservation Ordinance, building on the Summit Forum on Conservation and Development of Chishui River Basin attended by the three riparian provinces in 2008. Their involvement in this project will concern familiarization and learning about the PWS approach, setting the stage for post-project upscaling and replication of the PWS approach to the whole river basin; as well as coordination with Guizhou provincial authorities on transboundary river basin management issues.
Guizhou Environmental Protection Department	The provincial executing agency for the project, hosting the Sub-Project Management Office. Responsible for environmental management, GEPD's functions include overseeing implementation of national environmental laws and standards in Chishui River Basin; drafting provincial regulations and standards on environmental protection; publishing the status of the environmental situation; drafting and implementing the environmental protection plan in the Chishui River Basin; drafting the environmental function zoning plan in the Chishui River Basin; managing environmental protection funds of various kinds; supervising water pollution control in the Chishui River Basin; supervising nature reserves; reviewing and approving EIA reports; and carrying out environmental monitoring and reporting of statistics.
Guizhou Development Reform Commission	Guizhou DRC is in charge of master plan and coordination of all the other sectors of Guizhou province, with the following responsibilities: draft the economic and social development master plan, long-term plan, five-year plan, and special plans for pillar industries and hi-technologies; balance development among regions; approve government investment projects; and manage circular economy and eco-compensation: policies and programs.
Guizhou Financial Department	Guizhou FD is in charge of the financial management of Guizhou provincial government, and it has much to do with the eco-compensation programs of the government. The main responsibilities of Guizhou FD include: manage government subsidies, and special funds; and manage grants and loans from international financial organizations and foreign governments. In the context of this project Guizhou FD is a key player in the design of financial mechanisms for PWS and eco-compensation schemes.
Guizhou Provincial Agricultural Commission (and Fisheries)	<p>Guizhou PAC is in charge of agricultural management including crop farming, animal raising, fishery and aquaculture, etc. including the following responsibilities in the Chishui River Basin: supervise land tenure transfer and mediate land conflicts; propose agricultural structural change; assess the agricultural products quality: monitoring and standards; extend agricultural technologies; train rural labourers for both agricultural and non-agricultural skills; protect agricultural resources including wild aquatic resources; and draft agriculture and environmental protection plan. Guizhou Provincial Fishery Bureau affiliated with Guizhou PAC is in charge of the protection of the wild aquatic resources, and manages the NNR for Rare and Endemic Fishes in Upper Yangtze River Basin (Guizhou section).</p> <p>The PAC will be an important stakeholder in enabling transition towards more sustainable agricultural practices in the demonstration watershed, as</p>

	well as a source of expertise for extension services and monitoring and conserving the Chishui's important fish populations.
Guizhou Forestry Department	Guizhou Forestry Department is in charge of forestry management, wetland management, and wild animal and plants management. Its functions include forest planning, management, protection, and reforestation including forest-related eco-compensation programmes. It also manages nature reserves and species protection programmes. An important partner for watershed management, in terms of reforestation, harmonizing eco-compensation schemes with PWS schemes and supporting biodiversity conservation.
Guizhou Water Resources Department	In charge of water resource management in CRB including: draft the provincial water resources plan, including water allocation, water supply, water utilization, and flood/drought control; draft water saving, water resource protection and water functional zoning plans; monitor water quantity and water quality of rivers and lakes; mediate water conflicts between regions; manage water and soil conservation: plan, monitoring, supervision, and control. A key player in watershed and river basin management, including hydrological monitoring, development control planning and maintenance of water quality and quantity in the river system.
Guizhou Tourism Administration	GTA is in charge of tourism management, including: carrying out national laws and policies and draft provincial tourism policies and development plans; manage tourism sites; and supervise rural tourism and eco-tourism.
Local Governments – Bijie, Zunyi, and Chishui Municipalities, Renhuai City, Wuma and other townships in Wuma Valley	The municipal Environmental Protection Bureaus will be target institutions for capacity building on the coordination and management of PWS/PES schemes. In particular, their potential roles include monitoring and evaluation of land use changes, environmental changes, poverty reduction and other impacts deriving from PWS related activities. The pilot demonstration project will focus on Wuma Township in the Wuma River valley, under Renhuai City. Therefore Renhuai Environmental Protection Bureau will play a key role in coordinating the demonstration activities. See the Stakeholder Involvement Plan and Annex 3 for more detail on stakeholders involved in the demonstration component.
National institutes of environmental sciences and local universities (including Guizhou Normal University, China Agricultural University, Yangtze Fisheries Institute.	Key providers of technical expertise on geographical, hydrological, ecological and socio-economic issues, including fisheries and freshwater ecology. The project will collaborate with them for species and ecosystem conservation work, and they would collaborate for systematic biodiversity monitoring and knowledge sharing activities of the project.
Media	Key partners for publicity and information dissemination about the Project. Targeted efforts will be made to engage the media throughout project implementation.
Urban Communities	Key users and beneficiaries of the water resources and biodiversity. They have a potential role in local habitat conservation, controlling of poaching, and natural resource management. Key participants of the project at the local level.
Farming Communities	Key resource users and potential sellers of ecosystem services. Implementers of changes in land use patterns from subsistence agriculture to sustainable agriculture. Direct beneficiaries of alternative livelihood interventions and increasingly consulted during project planning processes. See the Stakeholder Involvement Plan and Annex 3 for details of the selected communities for the demonstration activities. The communities have expressed their willingness to participate in the project's PWS demonstration activities. The Wuma watershed includes Miao (2525), Yilao (or Gelao)(2675), Yi (1530) and Buyi (2370) minority populations.
International Agencies (ADB, EU, etc.) and NGOs (WWF, TNC, etc.)	Have capacity to provide technical advice on subjects including PES/PWS, watershed management tools, ecoregional assessment, biodiversity monitoring, community participation and education and awareness. These

	organizations can provide knowledge, experience and lessons learned, as well as technical support to the project. They are also potential implementers and co-financiers of project activities (see coordination with related initiatives in the Stakeholder Involvement Plan)
Private businesses (manufacturing companies, water utility companies, tourism companies)	Potential end-buyers of the ecosystem services (primarily clean water supply for industries and urban areas; high quality landscapes and natural environment for tourism companies), which will work towards internalising the related environmental costs in their operational costs.

BASELINE ANALYSIS

87. As described in the threats and underlying causes section, significant environmental degradation has taken place in the Chishui River Basin, in common with many other parts of the Yangtze River Basin. This has been due in large part to unsustainable land use practices which have seen marginalized poor farming communities increasingly cultivating steep slopes with annual crops, resulting in deforestation, soil erosion, sediment and nutrient loading of the river, and hydrological impacts that include a “flashier” system with more intense and rapid runoff during the rainy season and a more pronounced dry season with lower flows. The pressure on water resources has risen mainly due to increasing industrial demands as well as for irrigation, threatening the minimum dry season flows required to sustain ecological functions and globally significant populations. These impacts have resulted in extensive loss and fragmentation of natural habitats in the Chishui River Basin as well as major pressure on its globally significant plant and animal resources. In response, Guizhou provincial government has taken significant steps towards the zoning and regulation of development in the river basin, waste treatment and environmental protection.

88. As a component of the Yangtze River Basin, **the Chishui River Basin Master Plan** (2011), was prepared by the CWRC, setting out the principles of Chishui watershed management, i.e. watershed protection is the priority in Chishui River Basin as against development and utilization. The **goal of the Master Plan** is to protect the Chishui River Basin up to the standards which are suitable as the habitat of the unique and endangered fish species and for the water security for the production of Maotai and other branded product industries. The Master Plan divides the Chishui River into three zones, i.e. development prohibited zone, reserved zone, and development zone. The Master Plan also calls for establishment of an eco-compensation mechanism in the Chishui River Basin in its section 5.7 and sets out principles such as the “beneficiaries pay” principle.

89. The provincial and municipal authorities in Guizhou Province are aware of the importance of maintaining high water quality and uninterrupted flows as well as the ecosystem functions and biodiversity of the Chishui river basin and have introduced a number of initiatives to balance river basin management needs (see also the **policy and legislative context section** for further information).

90. In 2007, Guizhou Provincial Government approved and began to implement the **Ecological Function Protection Plan for Upper Reaches of Chishui River in Guizhou Province** (Upper Reach Plan). This Plan covers 188 km of the Chishui River from the starting point of the Chishui River in Guizhou to Renhuai City. Four counties are involved in this Plan, i.e. Qixiangguan, Dafang, Jinsha, and Renhuai. One of the key goals of the Upper Reach Plan is to assure the water and environmental security for industrial production. It sets

the Maotai Water Source Protection Area, which is from Jiucang River outlet to Maotai water intake point of Yuwo in the Chishui mainstream, with 42 km of protected stream and a protected area of 133 km². Within this area, development and construction are prohibited, and no animal raising, aquaculture or water-based recreation is allowed. A budget of RMB 2.6 billion (around 411 million USD) has been voted over the period through to 2020 for the construction of pollution control infrastructure in towns and villages.

91. In 2011, Guizhou Provincial Government promulgated the **Guizhou Chishui River Basin Protection Regulation** (Chishui Protection Regulation)³⁸. Article 7 of the Chishui Protection Regulation requires the Provincial Government and lower level local governments in the River Basin to set up a Special Fund for Chishui Watershed Protection. Article 8 of the Chishui Protection Regulation requires the establishment of an eco-compensation mechanism in the Chishui River basin. The Guizhou Provincial Government set up its provincial level Special Fund for Chishui River Basin Environmental Protection, and provided CNY 5 million in 2011, CNY 20 million in 2012, and CNY 40 million in 2013 to the Special Fund. The annual fund inputs are expected to reach CNY50 million by 2015.

92. In April 2013, Guizhou Development and Reform Commission drafted and submitted to the Provincial Government the **Guizhou Chishui River Basin Protection Plan**. This Plan divided the Guizhou Chishui River Basin into three functional zones. The upper reach from Bijie to Renhuai is designated the *Water Conservation and Ecological Rehabilitation Zone*. The middle reach in Renhuai and Xishui is the *Ecological Industry Development Zone*. The lower reach in Chishui City is the *Natural Heritage Protection Zone*. Local manufacturing industries will be further developed and expanded in the Ecological Industry Development Zone in Renhuai and Xishui. A number of industry parks will be established and planned industrial expansion is expected to demand 15 million m³ of more water from the Chishui River, and discharge 12 million m³ of more wastewater.

93. In June 2013, Guizhou Provincial Environmental Protection Department drafted and submitted to the Provincial Government the **Guizhou Chishui River Basin Environmental Protection Plan (2013-2020)**. This Plan divided the Chishui River Basin into 3 areas, i.e. *Ecological and Environmental Protection Area* (from Bijie to Wuma River outlet of the Chishui mainstream, accounting for 27% of the Chishui watershed); *Ecological and Environmental Rehabilitation Area* (from Wuma River outlet to Tongzi River outlet, accounting for 61% of the Chishui watershed); and *Ecological and Environmental Control Area* (from Xi River outlet to Chishui City, accounting for 12% of the Chishui watershed). In the Ecological and Environmental Protection Area, upstream of the Maotai company, any development of polluting industries is prohibited.

94. The substantial range of baseline measures and investments made by Guizhou Province for the protection of the Chishui River Basin can be seen in **Annex 6**, where **Table 1** shows completed baseline activities, totalling in excess of 5.057 billion CNY up to 2013. **Table 2 in Annex 6** shows the planned baseline activities on both development and watershed protection in Bijie, Zunyi and Chishui municipalities, including some 190 million CNY on wastewater management; while **Table 3 in Annex 6** shows the planned baseline activities on biodiversity protection in Guizhou Province, totalling 2.863 billion CNY over the period 2012 up to 2020.

³⁸ Guizhou Chishui River Basin Protection Regulation. http://www.gzrd.gov.cn/pages/show_dffg.aspx?id=656

National Policy Framework on Eco-compensation

95. At the national level, the Government has been implementing the Eco-Compensation Programme (ECP) since 2005. A large number of the government-led compensation schemes have been implemented with a massive investment exceeding US\$ 90 billion in existing and planned schemes. The Eco-Compensation Programme, also known as a “mechanism” is a broad heading under which a wide range of policies and programmes have been developed. These include a growing number programmes that are experimenting with different types of PES schemes. However, schemes under the Eco-Compensation Programme are typically based on a fiscal transfer from the national government to provincial governments, for pollution abatement and the conservation and restoration of forests, wetlands, and grasslands.

96. While in theory the Eco-Compensation Programme addresses issues of nature conservation and establishes payment schemes to finance them, including PES as a market mechanism, in practice no working payment for watershed services has been established in the country. This is mainly due to the fact that the government is struggling with issues such as property rights and equitable distribution of costs and benefits. Moreover the eco-compensation funds are not being utilised to directly reward the implementers of conservation actions with a clear disconnect between conservation and livelihood issues. This means that the eco-compensation funds are not necessarily rewarding directly the implementers of conservation actions (service providers). A new mechanism which will form part of the “tool box” for the Eco-Compensation Programme is needed which directly involves resource managers as the ecosystem service providers in a negotiated contractual agreement with the service buyers. Such a mechanism will act as a financing mechanism for biodiversity conservation incentivising the local land/resource users and managers to change their practices to enhance conservation.

97. In April 2013, the State Council reported to the Standing Committee of the National People’s Congress on progress and prospects for eco-compensation in China. In this report³⁹, Chishui River Basin and other 4 watersheds⁴⁰ are proposed for piloting watershed eco-compensation in the near future.

Eco-compensation schemes at the national level

Forest Ecological Benefit Compensation Program

98. The National Government of China piloted the **Forest Ecological Benefit Compensation Program** in 2001 and it was formally launched in 2004. Under this Program, forest owners or managers will be paid at a rate of CNY 5/mu/year⁴¹ for maintaining national level and state owned forest with ecological benefits. The payment rate was increased to CNY 10/mu in 2010 for private or collectively owned forests, and it may be further increased to be CNY 15/mu in 2013. The program has covered an area of 1.87 billion mu of forest.

99. In addition to the national level forest with ecological benefits, almost all the provinces have their provincial level forest with ecological benefits, which are funded by the provincial governments. For example, Jiangxi Province has 32.36 million mu of national

³⁹ State Council Report on Eco-compensation Progress to the Standing Committee of the National People’s Congress. http://www.npc.gov.cn/npc/xinwen/2013-04/26/content_1793568.htm

⁴⁰ The other 4 watersheds are Dong River in Jiangxi and Guangdong provinces, Jiulong River in Fujian province, Luan River in Hebei and Tianjin, and Dongjiang Lake in Hunan province.

⁴¹ 15 mu = 1 ha

level forests with ecological benefits, and 18.62 million mu of provincial level forests with ecological benefits. Jiangxi Provincial Government provided CNY237 million of provincial funds, adding to CNY 273 million of national funds, to make sure that owners/managers of all the forests with ecological benefits are paid CNY10.5/mu each year.

Public Transfer for Key Ecological Function Counties

100. From 2008, the National Government of China has implemented an eco-compensation program under which each of the National Key Ecological Function Counties receives public financial transfer from the National Government for the ecological services they provide. The counties covered by the program has increased to 466 counties around China and the total transfer amounted to CNY 42 billion in 2013 from CNY 37.2 billion in 2012. The Ministry of Finance manages the Program and transfers the fund to the provincial department of finance, which is further transferred to the county financial bureau. Every three years, each provincial department of finance, jointly with the provincial EPD and other related agencies, will assess the environmental and other public services performance of each county receiving the transfer, and decides the reward for those counties showing good performance and penalty for those showing bad performance. It seems that this review mechanism is not well implemented.

101. There are 16 counties in Guizhou Province that have been designated National Key Ecological Function Counties and covered by the public transfer program, of which three are located in Chishui River Basin: Bijie City (Qixingguan), Dafang County, and Jinsha County. The transfer fund for Guizhou Province was CNY546 million in 2008, and CNY282 million in 2009.

Eco-compensation schemes in Guizhou

102. There have been two eco-compensation schemes initiated by the Guizhou Provincial Government up to now. One is the Qingshui River Eco-compensation Program, and the other is the Hongfeng Lake Basin Eco-compensation Program (see **Annex 4**). There are two existing eco-compensation programs in Wuma Township. One is the Ecological Forest Compensation Program (EFCP): area: 69,245.74 mu with a compensation rate of CNY 9.75/mu. The other is the Sloping Land Conversion Program (SLCP): 2,953.82 mu with a subsidy rate of CNY 134/mu; and 6,300 mu with a subsidy rate of CNY 245/mu⁴². The Guizhou Provincial Eco-compensation Method in the Chishui River Basin is reportedly still in process for internal comment and revision, and is therefore not available at present.

Eco-compensation schemes in other provinces

103. Two examples of eco-compensation schemes related to the provision of good quality water to downstream users are the Xin'an River Eco-compensation Program (Anhui Province), and the Jiangxi Five Rivers Headwater Area Eco-compensation Program.

104. Under the **Xin'an River Eco-compensation Program** the Xin'an River Watershed Water Environment Compensation fund was established jointly by the central finance and Anhui and Zhejiang, with the central finance contributing CNY 300 million while Zhejiang and Anhui each contributed CNY 100 million. According to the Plan, and with oversight by the Ministry of Environmental Protection, Zhejiang will provide a compensation fund of CNY 100 million to Anhui if the latter meets specified water quality standards. On the other hand, if the water quality provided by Anhui is worse than the standard, Anhui will provide a

⁴² Source: Renhuai EPB, January 2014

compensation fund of CNY 100 million to Zhejiang. If the basic standard is met, neither side will provide compensation payments. The CNY 300 million contribution from the central finance will be allocated as a directional compensation to Anhui. It is also specified that the compensation fund will be specially used in water environment protection and pollution control in Xin'an River Watershed. The pilot implementation period of the scheme is initially 3 years (from 2012 to 2014).

105. Jiangxi Province has five rivers running into Poyang Lake, which subsequently drains into the Yangtze River. To protect Poyang Lake and the five rivers, Jiangxi Provincial Government initiated **the Jiangxi Five Rivers Headwater Area Eco-compensation Program** in 2008, in which 13 counties in the headwater areas of the five rivers are receiving an amount of payment for providing clean water to the downstream areas. The total payment has increased annually from CNY 50 million in 2008 to CNY 175 million in 2012. The payment received by a county is determined by its headwater area (20% weight) and the water quality at the river outlet (80% weight). A county with a large headwater area will receive more payment, and a county providing more clean water will receive more payment. The payment fund is provided by Jiangxi Provincial Government and managed by the Provincial Financial Department.

National Ecological and Conservation Assessments

106. At national level, MEP is leading two efforts relevant to the prioritization of areas for biodiversity conservation and provision of ecosystem services. The first is to implement the new system of Ecosystem Function Conservation Areas (EFCAs) that will span 24% of China's land area (including the GEF project area in Guizhou). EFCAs are designed to secure biodiversity, soils, and water resources, and to mitigate floods and prevent sandstorms. InVEST models are being used to quantify service provision and impacts on human well-being under alternative zoning scenarios intended to target conservation and development for highest public benefit⁴³. This initiative on EFCAs is led by the Chinese Research Academy of Environmental Sciences.

107. The second is the National Assessment of Ecosystems from 2000-2010, a large programme initiated by MEP with the Ecosystem Center of the Chinese Academy of Sciences providing technical support on use of the InVEST model (partially applied, not including Guizhou Province). The tasks are broken down to province level, for example, the Guizhou Province assessment was coordinated by Guizhou EPD and Guizhou Normal University provided technical support. The final report is expected to be released in 2014. These massive initiatives open a new paradigm for integrating conservation and human development to achieve improved outcomes for both."

Protected Areas

108. While this project does not directly address protected area management, it will contribute towards reducing external pressures on the PA system in the Chishui River Basin. At the national level, China has made significant efforts to conserve its biodiversity: by the end of 2012, 2,669 nature reserves had been established in China, covering 14.94% of China's total land area which is 2.9% higher than the global average⁴⁴. In the Guizhou part of the Chishui River Basin, the government has designated 130 nature reserves covering 5.5%

⁴³ Source: http://naturalcapitalproject.org/pubs/NatCap_InVEST_Brochure.pdf

⁴⁴ Source: MEP, 2013. The Status Report of China's Environment.
http://big5.mep.gov.cn/gate/big5/jcs.mep.gov.cn/hjzl/zkgb/2012zkgb/201306/t20130606_253396.htm

(961,000 ha) of the provincial territory. While most of these protected areas are designated to conserve terrestrial ecosystems, the Ministry of Agriculture and the State Council for the Three Gorges Dam Project have jointly established a NNR for Rare and Endemic Fish in the Upper Yangtze River Basin, to partly compensate for the major ecological impacts of the dam project. The annual expenditure on PA management in Guizhou Province is estimated to be approximately US\$1,700,000.

NGO Initiatives

109. Please refer to **Section IV Part IV** (Stakeholder Involvement Plan – collaboration with related initiatives) for information on baseline NGO activities in the Chishui River Basin, including WWF and TNC.

PART II: Strategy

PROJECT RATIONALE AND POLICY CONFORMITY

Fit with the GEF Focal Area Strategy and Strategic Programme

110. The project aims to trigger a shift from land use practices that result in land degradation and loss of ecosystem functions and biodiversity towards sustainable land uses that are compatible with conservation goals for the biodiversity-rich Chishui River Basin in Guizhou Province, using payment for watershed services (PWS) as an additional mechanism to provide the incentives needed to achieve the desired shift in land uses. The project will introduce market-oriented PWS mechanisms to complement the government-administered Eco-Compensation Programme⁴⁵. This will increase the conservation “toolbox”—the selection of PES tools that can be used or combined to suit different circumstances on the ground.

111. The project advances the goals of GEF BD-2 “Mainstream Biodiversity Conservation and Sustainable Use into Production Landscapes, Seascapes and Sectors”. It is aligned with outcome 2.1: Increase in sustainably managed landscapes and seascapes that integrate biodiversity conservation, through clearly addressing the issue of currently non-sustainable agricultural practices by poor farmers upstream. Land use changes will directly influence biodiversity conservation, in particular the aquatic biodiversity. Through replication of good land management practices in the river basin, it will directly reduce threats to both terrestrial and aquatic biodiversity within the protected areas in the basin.

112. The project directly addresses Output 2.2: National and sub-national land use plans that incorporate biodiversity and ecosystem services valuation. Valuation of ecosystem services is a key component of the project particularly as a pilot which will be scaled up. Also, it is a pre-requisite for a business agreement between buyers (downstream industries that require river water supply) and sellers (upstream farmers) of ecosystem services (stable flow of good quality water), and will be integrated in the local land use plans. At the national level, the Ministry of Environmental Protection in collaboration with the Guizhou Provincial Government will jointly endeavour to mainstream biodiversity and ecosystem services in the

⁴⁵ The Eco-Compensation Programme provides funding for the management of: (i) nature reserves, (ii) key ecological function areas, (iii) mineral development areas, and (iv) watersheds. However, the existing eco-compensation mechanisms are mostly for pollution control based on the polluter-pays principle or a fiscal transfer from the national government to local government to undertake land management to secure environmental public goods. There is however no obligation for the fund to be appropriated for biodiversity conservation per se, nor for compensating those individuals who bear the opportunity costs of conservation management.

land use plan, realigning the key ecological function zones and protected areas. Implementation of PWS schemes will mainstream biodiversity conservation and sustainable use in upstream farming area and the middle stream industrial sector of Chishui river, totally covering 670,000 ha. The project also aims to catalyse private sector investment in China for biodiversity conservation in the long term.

113. The project will also address Outcome 2.2 Measures to conserve and sustainably use biodiversity incorporated in policy and regulatory frameworks, contributing towards Output 2.1 policies and regulatory frameworks for production sectors. While Guizhou has already developed significant plans and regulations for the environmental protection of its part of the Chishui River Basin, these do not include PWS as a potentially significant mechanism for achieving their goals, and the application of Eco-compensation programmes is not systematically applied or harmonized towards centralized ecosystem service and biodiversity conservation goals. Consequently, the project aims to mainstream PWS into Guizhou provincial policies, regulations and plans, including the Regulation on Ecological Compensation, Guizhou Provincial Chishui River Protection Act, 13th Five-Year Environmental Policy regulations, and Planning of Ecosystem Function Area in the Upstream of Chishui River Basin. It also aims to place PWS within the context of national and provincial eco-compensation policies, programmes and plans and to demonstrate harmonized application for greater cumulative impact on the sustainability of watershed management and biodiversity conservation.

114. The project will contribute to the achievement of GEF's main indicators under this priority programming area as follows (**Table 3**).

Table 3. Project contribution towards GEF 5 Biodiversity Programme indicators

Relevant GEF-5 BD Strategic Program (SO)	Expected outcomes	Relevant GEF-5 BD Indicators	Project contribution to GEF-5 BD Indicators
GEF BD-2 objective: Mainstream Biodiversity Conservation and Sustainable Use into Production Landscapes, Seascapes and Sectors	Outcome 2.1: Increase in sustainably managed landscapes and seascapes that integrate biodiversity conservation	Landscapes and seascapes certified by internationally or nationally recognized environmental standards that incorporate biodiversity considerations measures in hectares and recorded by GEF tracking tool.	The GEF project will contribute directly towards the sustainable management of watersheds in the Chishui River Basin within Guizhou Province totaling 1,179,464 ha and specifically towards the improved management of a demonstration area of at least 7,000 ha in the Wuma River watershed through a PWS mechanism integrated with Eco-Compensation programmes
	Outcome 2.2: Measures to conserve and sustainably use biodiversity incorporated in policy and regulatory frameworks	Policies and regulations governing sectoral activities that integrate biodiversity conservation as recorded by the GEF tracking tool as a score.	PWS and biodiversity conservation is mainstreamed into Guizhou provincial policies, regulations and plans, including the Regulation on Ecological Compensation, Guizhou Provincial Chishui River

Relevant GEF-5 BD Strategic Program (SO)	Expected outcomes	Relevant GEF-5 BD Indicators	Project contribution to GEF-5 BD Indicators
			Protection Act, 13 th Five-Year Environmental Policy regulations, and Planning of Ecosystem Function Area in the Upstream of Chishui River Basin

115. China's commitment to biodiversity conservation is evident in its signature to the Convention on Biological Diversity (CBD) in 1992, and its active participation in other MEAs including the Ramsar Convention (also signed in 1992, with 46 Ramsar sites totaling over 4 million hectares as of November 2013), National Wetland Conservation Plan (2002-2030), National Wetland Conservation Program (2004-2030) and Aquatic Wildlife Conservation Action Plan; CITES (1981), WHC (1985) and UNFCCC (1992). Migratory waterbirds dependent upon wetland habitats are covered by various bilateral agreements including the China – Australia Migratory Birds Agreement, and 19 wetlands have been listed for the Flyway Site Network under the East Asian – Australasian Flyway Partnership.

116. The project will contribute towards national implementation of CBD Articles 6 (General measures for conservation and sustainable use – including integrating biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies), 8 (*In situ* conservation), and 11 (Incentive measures for the conservation and sustainable use of biodiversity). In addition, the project directly addresses CBD Decision X/2 on the CBD Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets, contributing towards Targets 3 and 4 under Strategic Goal A “address underlying causes of biodiversity loss by mainstreaming biodiversity across government and society” and Targets 6, 7 and 8 under Strategic Goal B “Reduce the direct pressures on biodiversity and promote sustainable use”.

117. The project's emphasis on improving the sustainability of watershed management will directly contribute towards national implementation of a range of Ramsar Resolutions, including the following: X.1 - The Ramsar Strategic Plan 2009 – 2015 (especially strategies 1.3 (Policy, legislation and institutions), 1.4 (Cross-sectoral recognition of wetland services), 1.10 (Private Sector) and 1.11 (Incentive measures)); X.3 - The Changwon Declaration (including ensuring adequate water to support ecological functions, role of wetlands in buffering impacts of climate change on society, and innovative financing instruments); XI.13 and X.28 (Poverty alleviation); XI.20 (Promoting sustainable investment by public and private sectors); and X.19 (Integrated guidance on river basin management).

Rationale and summary of GEF Alternative

118. This Project aims to establish a Payment for Watershed Services (PWS) mechanism in the Chishui River Basin to catalyse land use systems that will conserve biodiversity and ecosystem processes.

119. **In the baseline situation**, significant environmental degradation has taken place in the Chishui River Basin, in common with many other parts of the Yangtze River Basin and

other river basins in China. This has been due in large part to unsustainable land use practices which have seen marginalized poor farming communities increasingly cultivating steep slopes with annual crops, resulting in deforestation, soil erosion, sediment and nutrient loading of the river, and hydrological impacts. The Guizhou Provincial Government and riparian municipalities have already made significant investments towards achieving environmental protection in the Chishui River Basin. This has included a planning and regulatory framework for protection of the CRB in Guizhou Province including zoning certain types of development to maintain the river's water quality, investment in eco-compensation schemes such as re-foresting slopes with bamboo, and profound steps to prevent river pollution, including closing large numbers of paper mills, liquor factories, other factories and mines. This has involved substantial foregone economic development opportunities with little compensation, especially in the upstream areas such as Bijie municipality, in order to ensure clean water supply to downstream industries. There has also been investment in waste treatment infrastructure.

120. However, without GEF investment in the proposed project, the above-mentioned measures will continue to assist water quality in the Chishui River Basin but will have little impact on the extensive underlying problem of watershed degradation due to unsustainable land use practices, in particular agricultural expansion on steep slopes and related deforestation. This will continue to result in soil erosion, sediment and nutrient loading, loss of biodiversity, and a continuing downward spiral of environmental degradation and poverty in marginalized poor rural farming communities. The lack of available information and understanding about the river system's ecological processes and biodiversity will continue to constrain their integration into watershed management practices.

121. Therefore, there is a need for GEF intervention to augment the existing approaches with additional market-based mechanisms that will support large scale changes in watershed land use over the long term, coupled with integrated watershed management that ensures that water resource management takes account of biodiversity and ecological functions as well as development needs. The lack of a clear official framework, capacity and resources, and insufficient experience in managing successful market-oriented PWS schemes are obstacles to their development.

122. **In the alternative scenario enabled by the GEF**, the accomplishment of river basin management objectives that include sustaining and restoring ecosystem services and biodiversity, rural poverty alleviation, sustainable land use management as well appropriate economic development, will be enabled by the introduction of a PWS system which is harmonized with existing eco-compensation schemes for greater cumulative impact. This will be accomplished through addressing the principal barriers identified in the situation analysis through a systematic approach. The potential of PWS to address large scale environmental degradation challenges, its potential for application in other parts of China, as well as the national conservation priority placed on the Chishui River Basin in view of its globally significant flora and fauna and outstanding nature reserves have led the Government of China to present this project for GEF support. In particular the GEF project will provide significant direct assistance towards realizing the MEP's plans to introduce PWS as an integral part of national eco-compensation policy and planning, as well as Guizhou Province's plans to sustain and rehabilitate the ecological character of the Chishui River Basin.

123. The Objective of the Project is to establish a Payment for Watershed Services (PWS) mechanism in the Chishui River Basin to catalyse land use systems that will conserve

biodiversity and ecosystem processes. This will be accomplished through two outcomes, the first aiming to establish a systemic and institutional framework for PWS development and management at municipal and provincial levels, including the mainstreaming of PWS and biodiversity conservation into relevant policies, plans and regulations. The second outcome aims to demonstrate an operational PWS scheme in a sub-watershed of the Chishui River in Guizhou. Through this, PWS will be operationalised on-the-ground in the Chishui river basin, between upstream farming communities as ecosystem service providers and the Guizhou EPD as initial buyer and intermediary, to negotiate with the end users such as downstream industrial companies to pay for the ecosystem services provided. The introduction of PWS will initially be demonstrated in part of one sub-catchment area, then integrated with eco-compensation schemes in line with the objectives of a proposed catchment management plan for the demonstration sub-watershed. The PWS scheme and related land use changes will then be replicated and upscaled with the aim of reducing external pressures on the ecology of the river basin, including protected areas that support an array of globally threatened and endemic fauna and flora. The project aims to catalyse private sector financing for conservation, and the institutionalisation of PWS as a watershed-based biodiversity conservation mechanism which at the same time delivers livelihood improvements in an equitable manner.

PROJECT GOAL, OBJECTIVE, OUTCOMES AND OUTPUTS/ACTIVITIES

124. **The project's goal** is to contribute to the conservation and sustainable use of globally significant biodiversity in China. **The project objective** is to operationalize a replicable PWS scheme in the Chishui River Basin to stimulate land and natural resource use systems that conserve biodiversity and sustain ecosystem processes. In the process, it will also improve the livelihoods of poor farming communities.

125. In order to achieve the above objective, and based on a barrier analysis (see Section I, Part I), which identified: (i) the problem being addressed by the project; (ii) its root causes; and (iii) the barriers that need to overcome to actually address the problem and its root causes, the project's intervention has been organised into two interconnected components (in line with the concept presented at PIF stage). **Component 1** will address the weak adequacy of the enabling framework and institutional capacity for PWS implementation and upscaling within Guizhou province, including the managerial capacity to oversee PWS programmes, strengthened integration of biodiversity conservation within watershed management practices, improved capacity for monitoring, assessment and sharing of information on biodiversity, coordination of PWS with fiscal transfer schemes, strengthened regulation of land uses, mainstreaming of biodiversity conservation in the strategies and plans of sectoral agencies, and engagement of the private sector in supporting PWS. **Component 2** aims to address the barrier concerning the relative absence of successful working PES/PWS models that secure ecosystem services and biodiversity in China – whereby insufficient experience and know-how on the establishment of viable PWS mechanisms is a constraint for its uptake as a potentially valuable mechanism to supplement and support the variety of eco-compensation programmes currently in progress. This will include the need for development of local capacity for the full range of activities involved, and developing a mechanism whereby PWS can be coordinated with existing eco-compensation programmes to achieve watershed management and biodiversity conservation objectives.

126. The two components will result in the following project outcomes:

Outcome 1: *Systemic and institutional framework for PWS development and management established at municipal and provincial levels for the Chishui River Basin within Guizhou Province.* This will be achieved through a wide range of measures that will install capacity for PWS implementation at local and provincial levels, strengthen the monitoring, assessment and exchange of information on biodiversity and ecosystem services, mainstream PWS into policies, plans and programmes, facilitate private sector involvement in PWS initiatives, and develop management guidelines and methodological protocols for scaling up and replicating PWS across the Chishui River Basin as well as to other river basins in China.

Outcome 2: *Pilot PWS scheme(s) are demonstrated in selected sub-watersheds of the Chishui River Basin in Guizhou Province.* The pilot PWS scheme will be demonstrated initially in the Wuma River watershed through a systematic process leading towards the finalization and implementation of PWS agreements between local farming communities and the provincial government, which will then negotiate with potential downstream buyers. The replication of the PWS approach to further communities within the Wuma watershed will then be promoted, and supported by a mechanism that articulates eco-compensation schemes with PWS within the context of a catchment management plan for the whole watershed. Monitoring of biodiversity, specific ecosystem services and livelihoods will measure the impact of the pilot scheme on the natural environment and local community livelihoods, and support implementation of the PWS agreements.

Outcome 1: Systemic and institutional framework for PWS development and management established at municipal and provincial levels for the Chishui River Basin within Guizhou Province.

(Total Cost: USD 8,788,550; GEF USD 738,550, Co-financing USD 8,050,000)

127. This outcome will support the establishment of an enabling framework for biodiversity-oriented PWS mechanisms, so that the local governments and stakeholders will have systemic and institutional capacity to use PWS to ensure sound management of biodiversity and ecosystem services. The institutional framework will be built so as to facilitate the removal of the aforementioned barrier (weak enabling framework and institutional capacity for PWS implementation and upscaling) which constrains the successful implementation of PWS in support of biodiversity conservation. With guidance and support from MEP-FECO, the project will build the capacity of the provincial Environmental Protection Department (EPD) and municipal Environmental Protection Bureaus (EPB) and corporate actors doing business within the Chishui River Basin (**Output 1.1**). An office in charge of planning and managing PWS mechanisms will be established within the provincial EPD, with capacity installed for systematically developing, supervising and scaling up pro-conservation PWS mechanisms across the Chishui River Basin. This will include capacity for systematic monitoring of the expected biodiversity impacts arising through the implementation of PWS schemes (such as improvements in the conservation status of key habitats and species), through capacity building, application and evaluation of a Ecosystem Health Index scorecard and development of a standardized biodiversity and ecosystem services indicator framework for PWS (**Output 1.2**).

128. At the policy level, the project will seek to influence the introduction of PWS in relevant regulations, policies, plans and budgets (**Output 1.3**). This will mainstream PWS

within the broader national and provincial eco-compensation policy and planning frameworks, and seek to mainstream biodiversity conservation within watershed management and sectoral plans and programmes. It will aim to install mechanisms that regulate types of land uses that PES cannot compensate (eg river engineering projects) and provide for tradeoffs between different land-uses. This is expected to result in the codification of land use restrictions in the provincial development plan and accompanying land use plan. The project will also seek to stimulate private sector interest in supporting PWS initiatives through targeted outreach activities, including linkage with existing and emerging business forums for conservation, development of private-public partnerships and the introduction of an eco-labelling scheme for companies that contribute (**Output 1.4**).

129. Finally, building on the lessons learned from the roll out of PWS under Outcome 2, the project will support MEP-FECO and the provincial EPD to scale up PWS through sharing of best practice guidelines and lessons learned. It will also support engagement of the Sichuan and Yunnan provincial governments to introduce PWS concepts and prepare the way for upscaling across the entire Chishui River Basin taking into account biodiversity conservation priorities (**Output 1.5**).

130. The outputs necessary to achieve this outcome are described below.

Output 1.1 Capacity for planning and managing PWS mechanisms is developed within Guizhou Provincial EPD and Municipal EPBs within Chishui River Basin

131. MEP-FECO will lead in the development of national policy, strategy and technical guidelines regarding the incorporation of PWS into existing Eco-compensation frameworks. Under the overall guidance and direction of MEP-FECO, Guizhou EPD will play the leading role in the planning, management and oversight of PWS mechanisms in the province. The EPD has already gained some experience through preliminary work preparing the way for PWS led by WWF China Programme and supported by ADB, and has the motivation, mandate and backing of MEP and the Provincial Government to take on this role. The provincial plans and regulations on the Chishui River Basin⁴⁶ support the provincial EPD's position as a coordinating body in collaboration with municipal EPB offices. The municipal EPB offices of Bijie, Chishui, Renhuai and Zunyi will be responsible for on-the-ground implementation of PWS schemes in their respective territories under the direction and coordination of the provincial EPD. While familiar with the implementation of eco-compensation programmes and environmental protection duties, they are generally not familiar with PWS/PES mechanisms.

132. The baseline capacity of Guizhou EPD and the four EPBs to plan and manage PWS was assessed during the PPG period (see **Annex 7**) in order to identify key areas for capacity development and the level of support required and to set appropriate capacity development targets (see **SRF**). Accordingly, the results indicated that only a basic level of readiness existed, mainly related to the implementation of existing eco-compensation programmes. Therefore, substantial improvements in capacity will be required through systematic training provision. In addition, the baseline assessment indicated overlapping responsibilities between various sectoral agencies for eco-compensation / PES / PWS scheme implementation. Therefore strengthened coordination and information sharing mechanisms are needed to

⁴⁶ Including the Regulation on Ecological Compensation, Guizhou Provincial Chishui River Protection Act, 13th Five-Year Environmental Policy regulations, and Planning of Ecosystem Function Area in the Upstream of Chishui River Basin

ensure harmonization of approaches towards common objectives and avoidance of overlap and redundancy.

133. The provincial EPD will host the GEF Sub-Project Management Office (SPMO) (see the **Management Arrangements** section), providing a continual source of project management experience that will directly support the establishment of the Provincial PWS office in addition to targeted capacity development inputs. In order to maximize the benefits of GEF project management, it is proposed that the SPMO's Provincial Project Coordinator will subsequently head the Provincial PWS Office, with support from the same provincial level project management team, and inheriting the SPMO's equipment and information management systems to ensure continuity of operation as the project comes to an end. The operations of the SPMO will be fully cofinanced by Guizhou EPD to facilitate this transition in a sustainable manner. The National PMO at MEP-FECO will provide management oversight and technical support to the SPMO.

134. The establishment of an office in charge of planning and managing PWS mechanisms within the provincial EPD, will include the building of capacity for developing, supervising and scaling up pro-conservation PWS mechanisms in the Chishui River Basin. Capacity will be installed to undertake the following functions: (i) identifying, mapping and monitoring ecosystem services and land use changes using GIS tools (including InVEST); (ii) establishing equitable and transparent payment mechanisms; (iii) undertaking independent monitoring, verification and certification of watershed services rendered; and (iv) mechanisms for enforcement in case of non-compliance with contract provisions. MEP-FECO staff will organize and participate in the training to facilitate upscaling of the approach to other watersheds in China.

135. The prioritization of watersheds for PWS and other interventions based on the convergence of socio-economic development and biodiversity conservation interests through evaluation tools, and the monitoring of ecosystem services specified in PWS agreements will also be conducted, with appropriate capacity building conducted for EPD, EPB and MEP-FECO staff. There are a range of tools available for such watershed planning and prioritization purposes, including InVEST⁴⁷, eco-regional assessment⁴⁸, and RIOS⁴⁹. InVEST has already been applied in China through the two MEP-led initiatives – the National Assessment of Ecosystems from 2000-2010 (although not in Guizhou) and the Ecosystem Function Conservation Areas (EFCAs) (see **Baseline Analysis** for further information). It is proposed that InVEST be pilot tested for the demonstration watershed through Output 2.4, and plans for its use in upscaling PWS across the CRB in relation to biodiversity conservation priorities should be reviewed subsequently in Output 1.5. The application of InVEST requires GIS analysis capability, such as the 3S approach that has been applied elsewhere in China⁵⁰.

⁴⁷ <http://www.naturalcapitalproject.org/InVEST.html>

⁴⁸ Michael Heiner, Xinhai Li, Ruidong Wu, Peng Zhao, Qian Yu, Longzhu Wang, Shuang Zhang, Jing Bi. 2008. China Biodiversity Conservation Blueprint Project. Upper Yangtze River Basin Pilot Study: Freshwater Ecoregional Assessment. The Nature Conservancy, Beijing.

⁴⁹ <http://www.naturalcapitalproject.org/RIOS.html>

⁵⁰ For example, see: Liu C, Sun Y, Liu L and Zhang S. 2010. 3S-Based Wetland Habitat Information Management System In Songnen Plain, China. In: Prentice C (ed). UNEP/GEF Siberian Crane Wetland Project – Project Completion Workshop Proceedings. <http://www.scwp.info/proceedings/Final%20Papers/21%20-%20Wetland%20Habitat%20Information%20Management%20System%20for%20Songnen%20Plain.pdf>

136. The assessment and monitoring of ecosystem services should also take account of and new emerging tools (e.g. TESSA⁵¹), and the actual tools applied should be appropriate for the local context, therefore final selection of the actual monitoring and assessment techniques will be decided by project management. Training will also be provided in the use of a standardised Ecosystem Health Index to assess the impacts of PWS interventions and related information management for sharing of biodiversity information (see **Output 1.2**). Training in the use of such approaches may be supported by study visits to other project sites elsewhere in China (eg the UNDP/GEF CBPF-MSL project sites) and PWS sites overseas (eg WWF⁵² and TNC⁵³ experience in Indonesia, Tanzania⁵⁴, Latin America, etc; PES introduction in Vietnam⁵⁵).

137. The Provincial EPD and Renhuai City EPB will coordinate with upstream communities and private enterprises based in Renhuai City regarding their capacity and willingness to enter into PWS contracts with the provincial government. Efforts to engage upstream communities will primarily be developed through Outcome 2 of the project, although any necessary policy and planning adjustments to enable the demonstration activities will be supported here. The provincial EPD will liaise with the downstream enterprises regarding the formulation of policy proposals aiming at internalizing environmental externalities (placing the market value of watershed services as a real cost) in their accounting books, and coordinate with them regarding the development of business proposals for the buying/selling of watershed services. MEP-FECO will coordinate the mainstreaming of PWS approaches into national policy and strategy, and its promotion and application to other river basins in China.

Output 1.2 A standardized biodiversity and ecosystem services indicator system is developed to assess the impacts of PWS schemes

138. One of the barriers identified during project preparation has been the lack of integration of biodiversity considerations in watershed management practices. Therefore, while some environmental improvements have been achieved, such as ensuring adequate water quality standards, little progress has been made towards the maintenance, connection and rehabilitation of natural habitats and ensuring that reforestation efforts contribute towards native biodiversity as well as soil stabilization and local livelihoods. The lack of easily accessible and understandable information on biodiversity to include in planning and decision-making is also part of this problem. To address this issue, the project will develop a standardized system of biodiversity and ecosystem services monitoring, including testing and

⁵¹For example TESSA. See: Peh, K. S.-H., Balmford, A. P., Bradbury, R. B., Brown, C., Butchart, S. H. M., Hughes, F. M. R., Stattersfield, A. J., Thomas, D. H. L., Walpole, M. and Birch, J. C. 2013. TESSA: A toolkit for rapid assessment of ecosystem services at sites of biodiversity conservation importance. *Ecosystem Services* 5: e51-e57. <http://dx.doi.org/10.1016/j.ecoser.2013.06.003>; and Peh, K. S.-H., Balmford, A. P., Bradbury, R. B., Brown, C., Butchart, S. H. M., Hughes, F. M. R., Stattersfield, A. J., Thomas, D. H. L., Walpole, M. and Birch, J. C. (2013) *Toolkit for Ecosystem Service Site-based Assessments (TESSA)*. Available at: <http://www.birdlife.org/datazone/info/estoolkit>

⁵²http://wwf.panda.org/who_we_are/wwf_offices/philippines/wwf_philippines_our_solutions/index.cfm?uProjectID=PH0951

⁵³ See examples of Water Funds quoted in: Goldman, R.L., Benitez, S., Calvache, A., and Ramos, A. 2010. Water funds: Protecting watersheds for nature and people. The Nature Conservancy, Arlington, Virginia.

⁵⁴ http://www.watershedmarkets.org/casestudies/Tanzania_Uluguru.htm

⁵⁵ See for example:

<http://www.ecologyandsociety.org/vol17/iss4/art10/>;

http://www.un.org/waterforlifedecade/green_economy_2011/pdf/biodiversity_protection_cases_vietnam.pdf

evaluating the Ecosystem Health Index (EHI) developed under the UNDP/GEF supported CBPF Mainstreams of Life Programme⁵⁶, as well as reviewing other potential methodologies.

139. With support from experienced international and local consultants, capacity for monitoring biodiversity and ecosystem services will be introduced systematically for at least 12 staff from MEP-FECO, Guizhou EPD, Bijie EPB, Chishui EPB, Renhuai EPB and Zunyi EPB as well as other agency staff (eg managers of the NNRs in the Chishui River Basin), and applied to the pilot PWS activities in the demonstration watershed. Under the EHI system, “ecosystem health” is taken to be the suitability of a site to continue to provide secure conditions for survival of component species and delivery of key ecological services, including resilience to climate and other changes. The EHI itself is not an evaluation, but a dynamic, constantly varying index that reflects biodiversity health, just as a financial index reflects economic performance. It has the following uses:

- EHI provides a baseline against which targets for maintaining or achieving a given level of health can be set;
- EHI can be used as a results based indicator of project achievement and impacts;
- EHI can indicate where the project is succeeding or failing and allow revision of activity efforts throughout the project;
- For protected areas, EHI is complimentary to the GEF Management Effectiveness Tracking Tool in project M & E.

140. EHI baselines (see **Annex 8** for an example) will be established in Year One following capacity building for the pilot demonstration watershed (exact units to be decided at project inception). Implementation of site monitoring protocols to obtain EHI scores (see **Annex 8**) will be progressively enhanced through training related to specific monitoring parameters including identification and surveillance of indicator species, habitat condition, water supply, water quality, etc. The EHI scorecard should ideally be applied annually (some parameters require more frequent measurement), but as a minimum it should be repeated at project midterm and completion. Its usefulness will be reviewed during project implementation and compared with other indicator systems for PWS, resulting in a proposal for a standardized indicator system for use in PWS schemes that would be included in guidelines for upscaling and replicating PWS to other watersheds.

141. It should be noted that the purpose of the EHI scorecard is to monitor the changes in ecosystem health (including biodiversity) that are anticipated as outcomes of improved watershed management practices. Surveillance of the provision of specific ecosystem services through PWS schemes will be need to be conducted as a direct part of PWS agreement implementation (according to specified parameters and standards). Monitoring of upstream livelihood improvements will also be conducted in relation to PWS implementation. The EHI methodology is capable of monitoring all levels of biodiversity, tailored to the specific conditions at the selected sites. This will be applied following the exact definition of the PWS pilot sites.

⁵⁶ MacKinnon J. August 2012. Consultancy report of Biodiversity Monitoring Consultant for GEF Main Streams of Life Programme, China (Project No. 000802496). Unpublished report to UNDP.

142. Given the global significance of the Chishui River's fish populations, and the direct relevance of PWS in the river basin to the health of these populations, the project will also support capacity building for the monitoring of fish populations in the river basin, including a baseline survey of the Wuma River. This will build on existing approaches and monitoring protocols that have been developed and tested within the Yangtze River Basin, and involve collaborative work with experienced organizations such as The Nature Conservancy (TNC) and the Yangtze River Fisheries Research Institute. The goal will be to establish an operational standardized fish monitoring regime that can be applied systematically to measure the biodiversity impacts of PWS schemes, including a documented adopted monitoring protocol.

143. While significant terrestrial biodiversity occurs in the Chishui River Basin (see the **Situation Analysis** section), it is difficult to link the rehabilitation of degraded watersheds through PWS to short term changes in the distribution and abundance of key species or natural habitats (unless these are linked to specific pilot PWS areas). Therefore, change in forest cover (through replanting using native species) is used as a proxy indicator in the Strategic Results Framework. The EHI is flexible enough to incorporate the monitoring of individual species as well as habitats based on the actual local situation.

Output 1.3 PWS is mainstreamed into related policies, plans and regulations to regulate land uses, facilitate land use trade-offs, and integrate its implementation with eco-compensation schemes

144. At the Policy level, the Project will seek to influence the introduction of PWS as part of the mandate of the Legislative Task Force for Regulations on Ecological Compensation (Provincial DRC). Guizhou has the Regulation on Protection of Chishui River Basin (2011), in which there is a brief sentence to promote Eco-compensation programmes in CRB, which can broadly be taken to include PWS although it does not specifically mention this term. The Eco-compensation Regulation at national level remains in draft so it is not yet in effect. However, MEP-FECO will seek to integrate PWS as a component of eco-compensation approaches into national policy, plans and regulations based on project experience and drawing on lessons learned at the provincial level.

145. The Project will also work closely with the EPD in order to introduce budget provisions into the "Planning of Ecosystem Function Area in the Upstream of Chishui River Basin" so that at least 1% of its total budget is allocated for up-scaling activities thus assuring the sustainability of the Programme. Also, the project will seek to mainstream PWS into related policies including the Regulation on Ecological Compensation and other provincial level regulations such as those under the "Guizhou Provincial Chishui River Protection Act", as well as in the 13th Five-Year Environmental Policy regulations, aiming to install mechanisms for: (i) regulating land uses to control certain types of land uses that PWS cannot compensate (such as river engineering projects), and (ii) assessing and negotiating tradeoffs of different land-uses. This is expected to result in the codification of land use restrictions in the provincial development plan and accompanying land use plan.

146. Building on preliminary review of the policy, regulatory and planning framework for PWS and sustainable watershed management, the project will support input from a national expert on environmental policy analysis to provide a more detailed analysis of provincial policies, regulations and plans, identify gaps and weaknesses, facilitate a consultation process involving all related provincial agencies to develop specific recommendations for

improvements to existing policies and plans, and provide continued advice towards their official adoption by the provincial government. The MEP-FECO project team and officials responsible for developing national level policies, regulations or plans will organize these consultation meetings, thus facilitating input from experienced national agency staff and the upscaling of policy recommendations to the national level.

147. The land use restrictions and zoning of the Chishui River System in the following plans will be reviewed for consistency, and recommendations made concerning measures to strengthen biodiversity conservation, including restrictions on hydrological engineering such as dams and waterways for shipping on the Chishui mainstream and ecologically sensitive tributaries. the Ecological Function Protection Plan for Upper Reaches of Chishui River in Guizhou Province (Upper Reach Plan, 2007), the Guizhou Chishui River Basin Protection Regulation (Chishui Protection Regulation, 2011)⁵⁷, the Chishui River Basin Master Plan (CWRC, 2011), the Guizhou Chishui River Basin Protection Plan (Guizhou DRC drafted in April 2013) and the Guizhou Chishui River Basin Environmental Protection Plan (Guizhou EPD, 2013-2020).

148. The establishment of payments under PWS has to be based on proper valuation of the watershed services in question. Without this information it is not possible to estimate the payment, let alone construct a payment system. Indicative cost-benefit analysis must be conducted to accomplish this (see Output 2.1). Establishing the legal basis for the PWS system is part of the scaling up component of the programme which includes appropriation of the mechanism by local authorities and other stakeholders. This, which is a measurement of sustainability, includes the development of adequate national and provincial policy which guarantees long term enforcement within an adequate legal framework.

Output 1.4 Private sector involvement in PWS is promoted and incentivized through introduction of an eco-labelling scheme

149. The project will develop and implement a strategy to engage the private sector in PWS in CRB, as the principal end users and buyers of watershed ecosystem services. With the assistance of an international consultant, this will build on existing efforts by Guizhou EPD, WWF and other organizations, and provide incentive for involvement through the establishment of an eco-labelling scheme for participating companies. The eco-labelling scheme will be officially endorsed by MEP, and criteria will be established for awarding the eco-label to companies contributing as buyers (or potentially also in other ways) to PWS schemes.

150. A Guizhou business forum meeting will be convened on the theme of PWS, sustainable watershed management and biodiversity conservation for the Chishui River Basin, aiming to raise awareness and promote engagement of the business community in the province, including keynote presentations on PWS, panel discussion, report and media involvement. The strategy for engagement of the private sector will review potential linkages with existing and emerging business forums for conservation, and towards the end of the project, communicate the project's experiences using the forums to a wide range of private sector companies in China, with the aim of catalysing business sector financing for biodiversity conservation, including potential participation in PES/PWS initiatives. Private

⁵⁷ Guizhou Chishui River Basin Protection Regulation. http://www.gzrd.gov.cn/pages/show_dffg.aspx?id=656

sector involvement will be supported by strategic outreach efforts supported by the project's communications consultant.

Output 1.5 Best Practice guidelines, methodological protocols and lessons learned are shared for scaling-up and replicating PWS in additional watersheds in the Chishui River Basin and other watersheds in China

151. Following on from the capacity development and mainstreaming activities in Outcome 1, and the pilot demonstration activities under Outcome 2 that aim to provide a working model of PWS agreements on the ground, the project will support the provincial EPD to scale up PWS throughout the Chishui River Basin in Guizhou through a series of enabling measures.

152. First, best practice guidelines will be developed highlighting the conditions under which PWS works most effectively in selected landscapes in China. These will be developed through a participatory process led by MEP-FECO and the provincial EPD and involving the key stakeholders in PWS demonstration activities (and related stakeholders with an interest or potential to participate in future PWS initiatives), which in itself will contribute towards capacity development. An international expert on PWS, national expert on PES and eco-compensation schemes and the Project Manager will provide technical assistance and help facilitate the process. These Guidelines will assist in the linking of the Government top-down approach to conservation with the more open, voluntary and participatory approach of market mechanisms. It will also emphasize a more holistic approach to biodiversity conservation and sustainable land management than a single-focused programme designed to control pollution. The Guidelines will also provide a basis for the elaboration of specific strategies regarding the mainstreaming of conservation measures into local government and sectoral development policies. In short, the Guidelines, as an integral part of the enabling framework, will provide Government staff and interested stakeholders with a useful tool to overcome the barriers, including lack of interest or knowledge, that have so far prevented the development of sustainable conservation policies.

153. The best practice guidelines and methodological protocols for scaling-up and replicating PWS in additional watersheds along the Chishui River Basin will be drafted by end of Year three, and training in their application will be provided to all provincial and municipal EPB offices in the river basin, with the guidelines being finalized by the end of the project.

154. Secondly, lessons learned during the demonstration activities and related processes will be distilled, documented and widely disseminated, so that they are available to inform the potential introduction of PWS in other parts of China. These will be compiled as materials for different audiences, included in an illustrated project completion report aimed at professional audiences, and made available online through a project website.

155. In addition to these knowledge sharing outputs, it is proposed that the project coordinates an outreach programme aimed at strengthening collaboration between the riparian provinces of the Chishui River Basin. This will aim to provide support to the annual meeting mechanism on eco-environmental protection of the Chishui River involving the provincial governments of Guizhou, Sichuan and Yunnan initiated by WWF China in April 2011 (with possible extension to include the Changjiang Water Resources Commission). These meetings provide opportunities to share information about the ecological condition of

the watersheds, current and planned water resource management initiatives, and current and planned environmental protection initiatives including PWS, eco-compensation schemes and protected area system strengthening. These meetings provide an entry point for introducing the concept of rolling out PWS across the river basin, and for initiating study visits and exchanges between the three provinces to consolidate experience and share the outcomes of the project's demonstration work on PWS in Component 2.

156. The development and targeting of outreach materials will be guided by a project communications strategy, which will be updated annually, with implementation led by a part time local communications consultant, who will also coordinate development and maintenance of the project website, and relations with the media including press releases and on-site visits. It is suggested that materials on fish diversity and conservation in the Chishui River should be supported to raise awareness of this key biodiversity value.

157. Upscaling and replication of PWS schemes and harmonized eco-compensation programmes for sustainable watershed management will be guided by the application of an eco-regional assessment approach to identify threats to the freshwater ecosystem and biodiversity and identify priorities for protection, building on the freshwater ecoregional assessment piloted for the Upper Yangtze River Basin by TNC⁵⁸. It is proposed that training be provided in the use of InVEST⁵⁹ to key project staff, pilot testing linked to the Catchment Management Plan be conducted for the demonstration watershed through Output 2.4, and plans for its use in upscaling PWS across the CRB in relation to biodiversity conservation priorities should be reviewed subsequently through this output. MEP-FECO will play a significant role in determining and guiding the approach used for upscaling, with a view to its promotion and application at national level.

Outcome 2: Pilot PWS scheme(s) are demonstrated in selected sub-watersheds of the Chishui River Basin in Guizhou Province

(Total Cost: USD 7,498,126; GEF USD 998,126; Co-financing USD 6,500,000)

158. In tandem with **Outcome 1** and in order to remove the second barrier, the project will support the establishment of PWS schemes in sub-watersheds within the Chishui River Basin, in order to generate uptake of biodiversity friendly land use options. The project will start with piloting of a biodiversity-oriented PWS mechanism in the Wuma sub-watershed where buyers (the provincial government in the first instance, with potential to broker further agreements with downstream industries) and sellers upstream (villages in the sub-watershed) have been identified and assessed during project preparation.

159. It should be noted that the proposed PWS intervention in the selected section of the Chishui River watershed (the Wuma River sub-watershed) is a pilot test. It is not yet the PWS mechanism at work, which will only take place once the pilot has reached readiness for scaling up efforts. The pilot will inform relevant stakeholders about the conditions under which PWS best operates in a manner superior to other options aimed at solving the hydrological/livelihood problems in question. It will also indicate the extent of the required

⁵⁸ See: Michael Heiner, Xinhai Li, Ruidong Wu, Peng Zhao, Qian Yu, Longzhu Wang, Shuang Zhang, Jing Bi. 2008. China Biodiversity Conservation Blueprint Project. Upper Yangtze River Basin Pilot Study: Freshwater Ecoregional Assessment. The Nature Conservancy, Beijing.

⁵⁹ The InVEST tool (Integrated Valuation of Ecosystem Services and Tradeoffs) provides a packaged approach that can be used to determine priorities for watershed planning based on the valuation of ecosystem services (ES), allowing decision-makers to assess trade-offs associated with alternative policy options and identify areas where investment in protecting and restoring ES can enhance human development and biodiversity conservation.

intervention - scaling-up above and beyond the area covered in the pilot test) according to the needs of the water users downstream. Finally, it will provide a valuation mechanism so that water service providers (sellers) and water users (buyers) can enter into long term business agreements within institutional and policy frameworks operating or created as regulatory guidelines.

160. The Wuma River is one of the 27 main level tributaries of the Chishui River, and the most important tributary in Renhuai, entering the Chishui at Aokou, some 13 km upstream of the main water intake of Renhuai's largest industrial company. The 45 km long Wuma sub-watershed covers 43,185 ha including four townships – Changgang, Wuma, Luban and Maoba and a total population of 132,200 (in 2010),⁶⁰ including Han (122,500), Miao (2525), Yilao (or Gelao)(2675), Yi (1530) and Buyi (2370) ethnicities⁶¹. Thus part of the Wuma watershed is managed by ethnic minorities with land management and resource use rights. The terrain is steep, with sloping fields over 25° occupying 35% of the watershed. Forest cover in the watershed has been reduced to 16,678 ha (32.68%), well below the MEP's standard of 70% and the provincial government's standard of 47%. The situation in Wuma Town is more severe, with only 28.86% forest coverage and 41.07% of land occupied by sloping fields over 25° (comprising 82.27% of all its sloping fields).⁶² There is one nature reserve in the river basin – Zunyi Sunjia Dalin county nature reserve (see **Annex 2**).

161. The Wuma watershed is a microcosm of watersheds in the Chishui River Basin, characterised by environmentally unsustainable and low-yield farming practices. Unsustainable land use causes severe water losses and soil erosion. In the last 10 years the erosion rate at the middle of the Chishui river basin has increased from 3% to 29%. Both the Chishui and Wuma Rivers are rain-fed, with available records showing a decline in dry season flows from the 1960s to present, largely attributable to the loss in water conservation capacity resulting from deforestation. The main recent driver for deforestation in Wuma watershed has been the steady increase in the price of sorghum, the main feedstock for a key local manufacturing industry, which is planted on steep slopes due to lack of available arable land in the steep valleys. Paradoxically, the industry itself is now feeling the impacts of these crop changes in the form of reduced dry season flows. The ecological degradation upstream is aggravated by significant economic disparities between upstream and downstream dwellers. Land tenure in the area is characterised by collective ownership of community land. Individuals and organisations can acquire land use rights to farm on some plots. Guizhou Province officials have been working in the area and have ascertained the local willingness to participate in a PWS mechanism.

162. The Wuma River watershed is highly suitable for the pilot demonstration of a PWS scheme for a number of reasons. First the core hydrological problem has been defined as a lack of adequate dry season flows of high quality (at least Class II) water in the Chishui River to support the growing demands of downstream industries and urban development in Renhuai City, while at the same time providing adequate baseline flows to support the river's ecological functions (especially its globally important fish populations). Secondly, the Wuma River discharges into the Chishui mainstream only 13 km upstream of the main water intake for Renhuai's key industrial park, providing a direct contribution to the quantity and quality of water available. Thirdly, the land use practices of farming communities in the Wuma valley are for the most part unsustainable and result in the systematic deterioration of the

⁶⁰ Department of statistics of Renhuai City. *The Statistical Yearbook of Renhuai*, 2011.

⁶¹ Data from 6th National Census

⁶² Local consultant. Interpreted from satellite image (2010) of Chishui River Basin

ecosystem and its service provision capacity, exemplifying similar problems across the Chishui River Basin – it is therefore representative. These unsustainable practices directly affect downstream water users - a stable supply of good quality water in the Wuma River is an important contribution towards the security of the downstream industries in Renhuai. Fourthly, the farming communities in the Wuma valley live at or below the poverty line and are in need of development assistance to improve their livelihood security while simultaneously improving ecological stability and conditions for biodiversity. Having confirmed the willingness of the pilot communities to participate through PPG consultations, the PWS pilot component aims to demonstrate the viability of a long term mechanism to achieve these twin conservation and development goals. Further information about the demonstration area is given in **Annex 5**.

163. Building on baseline studies during project preparation, the project will support public consultations in the pilot communities with a view to designing the PWS mechanism and a Memorandum of Understanding will be signed between potential buyers and sellers signalling their approval to enter into land use changes activities. The provincial government has agreed to buy the ecosystem services in the first instance, with the intention of brokering further agreements with downstream industries in due course.

164. The project will facilitate the steps needed to establish a working PWS mechanism (**Output 2.1**), including the definition, assessment and valuation of the ecosystem services to be provided; establishment of village organizations to bundle the supply of ecosystem services; TA on capacity development of community land users to modify land use practices; and the brokering of PWS agreements (**Output 2.2**) between the communities and the provincial government. Once agreements are signed, the project will facilitate their implementation, including public-private partnerships where appropriate, and introduce scientific monitoring for biodiversity and ecosystem services to measure the impact of intervention (PWS mechanism) on livelihoods among upstream farmers and biodiversity in the area of intervention (**Output 2.3**). The financial impact of service provision (stable flow of quality water) among water users downstream will be also monitored. Finally, the project will support the development and initial implementation of a watershed-wide catchment management plan (**Output 2.4**) based on valuation of ecosystem services and the assessment of tradeoffs taking biodiversity conservation into account, providing a framework for expanding the pilot PWS work to other village communities within the Wuma catchment, **especially those with minority ethnic groups**. The project component development has fully taken into account the STAP advisory notes on PES.⁶³

The outputs necessary to achieve this outcome are described below.

Output 2.1 PWS pilot mechanism established in Wuma sub-watershed, generating uptake of biodiversity friendly land use options.

⁶³ The STAP advisory note identifies four potential threats to PES effectiveness: (i) non-compliance with contractual conditions; (ii) poor administrative selection (i.e. contracts are offered to areas or individuals who are not in the best position to supply environmental services cost-effectively); (iii) special demand spillovers (a.k.a., general equilibrium effects, or “leakage”) whereby protecting a resource in one location pushes pressure onto resources elsewhere; and (iv) adverse self-selection, where people would have supplied the contracted PES service or activity even in the absence of a payment. Therefore every GEF PES project proposal is expected to describe design choices to minimize these threats and specify indicators that will permit one to evaluate the importance of these threats in the project.

165. A PWS pilot mechanism will be established in the Wuma sub-watershed of the Chishui River Basin, generating uptake of biodiversity friendly land use options that enhance the quality and spatial coverage of forest and grassland habitats, and conservation of globally significant species. The project will facilitate the following steps needed to establish a working PWS mechanism, based on experiences and lessons learned in Asia and globally:

- a) Ecosystem services in the selected sub-watershed are defined, selected, measured and assessed (including opportunity costs, transaction costs and maintenance costs);
- b) The marketable value of the selected ecosystem services is determined;
- c) Cost-Benefit Analyses will be undertaken to demonstrate the financial advantages of PWS;
- d) Livelihood analyses are conducted to establish levels, spread, causes of poverty among farming communities and impacts upon biodiversity;
- e) Legal institutional analyses are conducted to identify positive and negative factors that may prevent, halt or facilitate PWS development;
- f) Prospective sellers and buyers are identified, village organizations established to bundle the supply of ecosystem services by communities, to reduce transaction costs and to ensure cost effectiveness in payment distribution;
- g) Capacity of community land users to modify land use practices is enhanced through technical assistance and extension on biodiversity friendly land use practices. This will include the introduction of best practices for sustainable land management (erosion control, reforestation, terracing, appropriate cash crops, organic farming) so as to decrease pressures on biodiversity and ecosystem services.
- h) PWS agreements are brokered between sellers (village cooperatives) and buyers (initially, the provincial government will provide financing, with subsequent engagement of downstream water users).

166. During project preparation, baseline studies identified the ecosystem services to be delivered as the increased supply of good quality water during the dry season. This will need to be quantified (actual discharge of the Wuma River at a monitoring station to be established at the downstream boundary of the pilot area over a specified period) and the quality standard agreed (in terms of specific parameters required by downstream users such as TSS, Total N, Total P, BOD, COD, NH₄-N). In the case of this project, the parameters should reflect standards for sustaining river fisheries as well as the needs of downstream industrial users. The marketable value of the water services will then be determined in relation to demand, current market prices and financial capacity of the downstream industrial users.

167. The initial buyer of the ecosystem services will be the Guizhou EPD, which will negotiate with the end users such as downstream industrial companies to pay for the ecosystem services provided. Guizhou EPD has further indicated that there is already a dedicated account for Chishui watershed protection, managed by the Water Division of the provincial EPD. The provincial government provides financial inputs to the fund's account (this will represent a principal source of co-financing for the project). Downstream enterprises and the local government will also provide counterpart funds to support activities towards the rehabilitation of the Chishui watershed. When land use changes are involved, the provincial Forestry Department and Water Resources Department will step in (as the provincial EPD focuses mainly on water quality management in the Chishui watershed).

168. Stakeholders that are interested in the provision of watershed environmental services can be roughly divided into direct demand (or service users), and indirect demand (or

beneficiaries). In this case, the provincial government will act as a beneficiary. Beneficiaries for watershed environmental services may be derived from several sources, including national and local governments and international agencies. International agencies can play a key role in providing conservation or development grants to pilot schemes until downstream groups adopt the payments (as this project is doing with GEF support). Additionally, in the public interest the national or other level of government may pool strategic watershed services, which cannot be realistically financed by downstream demand, among service buyers.

169. The sellers will be an initial group of upstream villages that have been selected during project preparation according to their hydrological and livelihood profiles. Thus those villages that account the most for the hydrological problem downstream (deforestation, soil erosion and water quality deterioration) will be included in the pilot. Xienong Village has been identified as the initial point of entry for the demonstration pilot, with three participating village communities (see the **Stakeholder Participation Plan** and **Annex 5** for details of the selection rationale and profiles of the villages).

170. In order to ensure compliance with UNDP/GEF requirements for inclusion (see the ESSP and Stakeholder involvement Plan), equitable involvement in project implementation and sharing of benefits, and monitoring of actual participation achieved, a national consultant on gender and minority empowerment will be supported by the project under this output. This position will also raise awareness and provide guidance and training to PWS TA subcontractors, provincial and municipal government agencies and project staff on the benefits of gender and minority empowerment as an integral part of the project's approach.

171. Examples of activities typical of PWS interventions in similar situations in other countries include changes in land use with the following inputs (from a WWF project in Peru): Agriculture with Agroforestry; Agroforestry with contour furrows; Agroforestry with terraces; Silvopasture with new sowing; Silvopasture with reforestation; Reforestation; and Forest Protection (Riparian zone restoration, Fruit orchards and Fire prevention are other examples of land use activities). Measurements of surface runoff and suspended sediment were made in erosion plots installed in the villages of the catchments, and information was collected from control plots without intervention as well as plots with project interventions. Poverty in rural areas is often connected to subsistence agricultural practices. Benefits to the suppliers of watershed services in watershed "hot spots" (centers of degradation under focus) were quite substantial. These gains resulted from land use changes which emphasized combined farming which maximized the use capacity of soil complemented with an improved agricultural technological package. Optimized management of natural resources was reflected in higher yields per crop. Food security is gained and excess production directed to the market increases significantly the income of participating farmers.

Output 2.2 PWS agreements are established for the provision of watershed services.

172. Long-term financial agreement(s) will be established, specifying conditions for operation (value of service; mode of payment; delivery of service) agreed upon by the buyers (provincial government as broker / initial buyer) and sellers (village cooperatives) of watershed services, and operationalized. Once the agreements are signed, the project will support their implementation, which will eventually include public-private partnerships, and operational monitoring and verification (**Output 2.3**). This output will support consultations,

facilitation and technical assistance for the development of such PWS agreements, including seeking the involvement of the private sector as end-users of the services provided, as part of the demonstration of a market-based approach to PWS.

Output 2.3 The impacts of PWS implementation on land use changes, delivery of ecosystem services, biodiversity and livelihoods are monitored, assessed and reported

173. Participatory scientific monitoring for biodiversity and ecosystem services will be conducted on a regular basis from the onset of the project, providing a means of involvement, benefit and learning for project participants. It will measure the impact of intervention (PWS mechanism) on livelihoods among upstream farmers and biodiversity in the area of intervention (see **Output 1.2** for further information on the development of monitoring approaches, with the EHI (**Annex 8**) being evaluated during project implementation for biodiversity and ecosystem health monitoring). The financial impact of service provision (stable flow of quality water) among water users downstream will be also monitored. The project will support the operationalisation of the participatory monitoring and verification system, measuring the impact of intervention through the PWS mechanisms on land use changes (actual delivery of ecosystem services), biodiversity and livelihoods using standards and indicators derived from baseline information. This will be based on detailed workplans for the monitoring and verification system, progress reports with monitoring results, and a final report at the end of the pilot project detailing results, reviewing the methods used and including recommendations for improvement. Training in participatory monitoring will be provided to members of selected farming communities (and downstream users, as appropriate) involved in the demonstration projects; as well as to municipal governments to monitor and enforce compliance. The ensuing changes in land management practices are expected to regenerate the service provision capacity of these selected watersheds, while maintaining and enhancing habitats for terrestrial and aquatic species.

Output 2.4 Catchment management plan for Wuma River valley demonstrates a framework for integrating PWS with eco-compensation and regulatory mechanisms for sustainable watershed management

174. The total area of sloping arable land in the Wuma valley (covered by 4 towns) is 7,637 ha, of which 4,085ha is sloping land over 25°. This is too large an area to be feasibly addressed at the same level of detail as applied for the three villages during the project's four year period, therefore the project will coordinate the development process for a multiple-stakeholder catchment management plan (CMP) that would cover the whole Wuma catchment area, setting goals for biodiversity conservation, ecosystem service and sustainable livelihoods, zoning the watershed for different land uses, and identifying priorities to be addressed through a combination of mechanisms: PWS, harmonized eco-compensation scheme interventions⁶⁴ (eg for reforestation) and enforcement of point source pollution sources. The CMP would take into account the baseline survey conducted during project preparation (see **Annex 5**) and demonstrate the application of InVEST⁶⁵ to value ecosystem services and assess land use management tradeoffs (training would be provided through Output 1.1).

⁶⁴ See Baseline section for information on existing eco-compensation schemes in Wuma Township

⁶⁵ Or potentially RIOS, a new tool which is geared specifically towards PWS / Water Funds

175. Implementation of the CMP would be started during the project period (assuming no delays occur in its approval), including initial steps to upscale the PWS pilots to other villages, prioritizing areas under the management of ethnic minorities, in conjunction with consideration of environmental and feasibility criteria. The CMP will represent a practical and replicable output of the project with strong potential to be applied to other sub-watersheds of the Chishui River Basin, demonstrating how coordinated regulation, eco-compensation fund investments and PWS can be combined to systematically improve watershed management, based on a rapid assessment of the value of ecosystem services. Effective implementation will require inter-agency cooperation towards shared goals (involving environment, agriculture, water resources, forestry, local administration, etc). The CMP would include a monitoring and review mechanism with indicators for measuring achievement of its objectives, incorporating the biodiversity and ecosystem service provision goals of the PWS pilot schemes.

PROJECT INDICATORS

176. The project indicators contained in Section II / Part II (Strategic Results Framework) include only impact (or ‘objective’) indicators and outcome (or ‘performance’) indicators. They are all ‘SMART’⁶⁶.

177. The project may however need to develop a certain number of process-oriented indicators to compose the ‘M&E framework’ at the demonstration site level. For this reason, the establishment of a ‘site-level M&E framework’ is envisaged for the demonstration activities in Component 2. This site-level framework feeds into the project’s overall M&E framework, and will pilot the application of the standardized biodiversity scorecard developed in Component 1. These indicators are also expected to feed into the project’s overall M&E framework. It is envisaged that the project’s overall M&E framework (see Part IV below) will build on UNDP’s existing M&E Framework for biodiversity programming.

178. The organisation of the logframe is based on the general assumption that: *if* (Outcome 1) a systemic and institutional framework for PWS development and management is established at municipal and provincial levels for the Chishui River Basin within Guizhou Province; and *if* (Outcome 2) pilot PWS scheme(s) are demonstrated in selected sub-watersheds of the Chishui River Basin in Guizhou Province; *then* a replicable PWS scheme will be operationalized in the Chishui River Basin to stimulate land and natural resource use systems that conserve biodiversity and sustain ecosystem processes. This logic is based on the barrier and root-cause analysis carried out during the PPG phase (refer to Section I, Part I, chapter ‘Long-term solution and barriers to achieving the solution’).

179. In turn, the choice of indicators was based on two key criteria: (i) their pertinence to the above assumption; and (ii) the feasibility of obtaining / producing and updating the data necessary to monitor and evaluate the project through those indicators. The following are therefore the project’s key indicators (**Table 4**).

Table 4. Elaboration of Project Indicators

⁶⁶ Specific, Measurable, Achievable, Relevant and Time-bound.

INDICATOR	EXPLANATORY NOTE
At Objective level: To operationalize a replicable PWS scheme in the Chishui River Basin to stimulate land and natural resource use systems that conserve biodiversity and sustain ecosystem processes	
1. PWS and biodiversity conservation are mainstreamed into national and Guizhou provincial policies, regulations and plans by the end of the project as indicated by the GEF Biodiversity Tracking Tool	See the GEF Biodiversity Tracking Tool ⁶⁷ This indicator aims to record the project's success in having PWS and biodiversity conservation mainstreamed into national and Guizhou provincial policies, regulations and plans, including the Regulation on Ecological Compensation, Guizhou Provincial Chishui River Protection Act, 13 th Five-Year Environmental Policy regulations, and Planning of Ecosystem Function Area in the Upstream of Chishui River Basin. Official approval of the demonstration PWS scheme will be a key sub-indicator. Official provincial government notifications should provide confirmation of the approved documents.
Sustained presence of globally significant fish populations in the Chishui River system, as indicated by monitoring of river stretches immediately downstream of pilot PWS sites using a standardized monitoring protocol.	This indicator will use a standardized monitoring protocol to assess changes in the Chishui River system's key biodiversity value – its assemblage of endemic fish species typical of the Upper Yangtze. Following adoption of the monitoring protocol and related capacity building, it will be applied annually to obtain comparable results. Please note that changes in biological systems will generally take longer than the 4 year project period. Monitoring will be applied to those river stretches immediately downstream of pilot PWS interventions, including the Wuma River and part of the Chishui mainstream. Analysis of monitoring results should take particular note of other factors affecting these fish populations, including fishing, river engineering works and other forms of pollution before making conclusions about the impacts of this project. The baseline is given in Annex 1 - a list of endemic fishes of the Upper Yangtze River in the Chishui River (2007), although a more up to date baseline will be obtained early in the project supported by capacity building.
Provincial government investment in eco-compensation / PWS schemes in Chishui River Basin is sustained at CNY 50 million per year from 2015 and supports replication to other watersheds	Official records of annual allocations to the Guizhou Provincial Government Special Fund for Environmental Protection in Chishui River Basin; purposes assigned to Guizhou EPD budget allocations include PWS replication to other watersheds.
Land Use Change restrictions codified in provincial development / land use plans through inputs to the following 5 year plans reduce threats to aquatic habitats and biodiversity in the CRB.	This indicator should show changes in the restrictions codified in provincial development / land use plans through inputs to the following 5 year plans that will reduce threats to aquatic habitats and biodiversity along the Chishui River mainstream and its ecologically sensitive tributaries. These should include project recommendations for land use improvements and their incorporation in official plans. This indicator is significant to show biodiversity conservation mainstreaming into water resource management plans and practices – addressing a major threat to the Chishui's globally significant fish populations. Relevant plans include: the Ecological Function Protection Plan for Upper Reaches of Chishui River in Guizhou Province (Upper Reach Plan, 2007), the Guizhou Chishui River Basin Protection Regulation (Chishui Protection Regulation, 2011) ⁶⁸ , the Chishui River Basin Master Plan (CWRC, 2011), the Guizhou Chishui River Basin Protection Plan (Guizhou DRC drafted in April 2013) and the Guizhou Chishui River Basin Environmental Protection Plan (Guizhou EPD, 2013-2020).

⁶⁷ Annex 9

⁶⁸ Guizhou Chishui River Basin Protection Regulation. http://www.gzrd.gov.cn/pages/show_dffg.aspx?id=656

INDICATOR	EXPLANATORY NOTE
At Outcome 1 level – Systemic and institutional framework for PWS development and management established at municipal and provincial levels for the Chishui River Basin within Guizhou Province	
An office in charge of planning and managing PWS mechanisms along the Chishui River within Guizhou province is established within Guizhou provincial EPD.	<p>Dedicated PWS office established within Guizhou provincial EPD with at least 2 staff and an annual operational budget of at least USD 50,000 by end of Year 3. Information available from Guizhou EPD.</p> <p>Note that the National Project Management Office will be located in MEP-FECO, and sub-PMO at Guizhou EPD. The PMOs will facilitate the establishment of the permanent PWS office in Guizhou EPD by the end of the project.</p>
Improved capacities of provincial and municipal environmental protection offices for implementing PES/PWS as shown by an increase in scores in the Capacity Development Scorecard	A draft PWS capacity development scorecard was developed and used to provide baseline scores for Guizhou EPD (provincial level), and Bijie, Chishui, Renhuai and Zunyi EPBs (municipal level) as indicated in the SRF. See Annex 7 for details. Scores for each question were summed and divided by the total possible score (some questions may not be applicable) in order to reach the total percentage score. The same scorecard should be completed including explanatory notes at project midterm and completion in order to assess progress.
At least 12 staff from MEP-FECO, Guizhou EPD, Bijie EPB, Chishui EPB, Renhuai EPB and Zunyi EPB trained and given official mandate to monitor biodiversity and ecosystem services impacts arising through PWS schemes and harmonized eco-compensation programmes.	Capacity building, establishment of a monitoring protocol, demarcation of pilot areas and establishments of baselines for biodiversity and ecosystem service monitoring will be conducted during the first year of the project, including provision of training to the EPD and EPB staff and other relevant stakeholders for its application. This information should be verifiable through project reports. In addition, the trained staff should be given the mandate through MEP-FECO and Guizhou EPD to monitor the impacts of PWS schemes and eco-compensation schemes that will contribute towards the same objectives, which should be verifiable through official communications from Guizhou EPD. Monitoring of biodiversity and ecosystem services including evaluation of the Ecosystem Health Index Scorecard ⁶⁹ should be applied at least annually to assess the impacts of the project's demonstration activities in Wuma sub-watershed under Component 2.
An ecolabelling scheme is established for companies participating in PWS schemes and taken up by the private sector	The project aims to develop a MEP-endorsed ecolabelling scheme to provide incentive for private sector companies to participate in PWS agreements as buyers of ecosystem services. The ecolabelling scheme would provide public recognition for their involvement, potentially with different grades according to the level of contribution involved, based on agreed criteria. A target of at least three companies participating in the scheme has been set.
Institutional capacity of Guizhou EPD reaches readiness for PWS implementation and replication	<p>Management guidelines and methodological protocols for scaling-up and replicating PWS in additional watersheds along the Chishui River Basin are produced by Guizhou EPD and training in their application is provided to all provincial and municipal EPB offices in the river basin.</p> <p>PWS management guidelines and methodological protocols to be drafted by end of Year 3, used for outreach through training workshops for all EPD/EPB provincial and municipal offices in CRB in Year 4, and finalized by end of project. The indicator should record the exact title and date of completion of draft and final guidelines / methodological protocols, as well as the dates and participants (position, agency, office location) attending the training courses.</p>
At Outcome 2 level – Pilot PWS scheme(s) are demonstrated in selected sub-watersheds of the Chishui River Basin in Guizhou Province	
PWS agreement(s) for pilot	This indicator should state the name of the agreement, date of signature,

INDICATOR	EXPLANATORY NOTE
areas within the demonstration sub-watershed including a long-term financial agreement are agreed upon by buyers and sellers of specified watershed services and operationalized.	parties and part of the sub-watershed covered. Associated long term financial agreements should also be recorded.
Area of the selected demonstration sub-watershed under biodiversity friendly land use by community land managers	This indicator should state the areas (in hectares) covered by both PWS agreements and associated eco-compensation schemes in the demonstration sub-watershed (target of at least 7,000 ha). These schemes should contribute towards the wider implementation of the proposed catchment management plan for the watershed, including biodiversity conservation, ecosystem service delivery and sustainable livelihood development objectives. The term “biodiversity friendly” land use is taken as: sustainable watershed management compliant with conditions spelt out in the PWS Agreements, and in line with the biodiversity conservation objectives of the Catchment Management Plan for the demonstration sub-watershed.
Change in land use supporting biodiversity within demonstration sub-watershed, indicated by a 10% increase in forest cover in pilot demonstration areas from the time of PWS agreement signature	This indicator aims to show how PWS agreements contribute towards improved conditions for biodiversity as shown by positive changes in forest cover. The 2010 baseline condition is based on GIS remote sensing analysis by the PPG local consultants at Guizhou Normal University. The assessment should be repeated in Year 4 before project completion using the same methodology for consistency. The remote sensing analysis should be supported by systematic qualitative observations on the ground that show either removal of forest cover or rehabilitation / replanting.
10% increase in average annual per capita income of farming households participating in PWS pilot demonstration	Changes in average annual per capita income of farming households participating in PWS pilot demonstration as recorded by socio-economic surveys of communities participating in PWS pilot. Minimum of three surveys at start of PWS pilot, midterm and project completion for same households. Note that financial benefits are likely to take one or two years to be fully realized, allowing for establishment of new land uses and livelihoods (beyond any PWS compensation involved).
Improvements in ecosystem health as indicated by Ecosystem Health Index scorecard	EHI scores show increasing trend for selected area(s) based on regular assessments. Baseline to be established in Year One, defining areas for assessment and developing tailored monitoring protocol (see Annex 8 for details and examples). EHI to be repeated at midterm and project completion as minimum, ideally annually with some parameters more often.
Positive trend indicating improvement in status of key ecosystem services specified in PWS agreement(s)* <i>*Parameters and detailed baseline measurements to be determined in Year One of Project</i>	Parameters will need to be confirmed in context of ES to be provided in potential PWS agreements. This depends on the exact needs of the buyers and the feasible provision of such services. Baseline for ecosystem services specified in PWS agreement to be established during project implementation period, associated with capacity building for participatory monitoring conducted by pilot communities under supervision / independent verification of Guizhou EPD/EPB offices.

RISKS AND ASSUMPTIONS

180. The project strategy, described in detail within this project document, makes the following key assumptions in proposing the GEF intervention:

- Baseline conditions in the selected areas can be extrapolated with high confidence level to other watershed areas in China and lessons learnt can be successfully disseminated.
- Increased awareness and capacity will lead to a change in behaviour with respect to the integration of biodiversity conservation concerns into watershed management policies and practices.
- Payment for watershed services will gradually become a national priority for China as knowledge and information is made available.

181. During project preparation, risks were updated from what has been presented at the PIF stage, elaborated and classified according to UNDP/GEF Risk Standard Categories⁷⁰, and assessed according to criteria of ‘impact’ and ‘likelihood’ (see **Box 1 and Table 5** below). These risks and the mitigation measures will be continuously monitored and updated throughout the project, and will be logged in ATLAS and reported in the PIRs. The UNDP Environmental and Social Screening Procedure (see **Annex 10**) has been applied during project preparation and did not identify any significant environmental or social risks associated with the proposed project. In general, the project will contribute positively towards the conservation of biodiversity and maintenance of ecological stability in the Chishui River Basin, as well as towards a strengthened policy and regulatory framework for PWS through which indigenous and local communities have increased potential to benefit from agreements with downstream water users, as well as from improved land use sustainability.

Box 1. Risk Assessment Guiding Matrix						
Likelihood	Impact					
		CRITICAL	HIGH	MEDIUM	LOW	NEGLIGIBLE
	CERTAIN / IMMINENT	Critical	Critical	High	Medium	Low
	VERY LIKELY	Critical	High	High	Medium	Low
	LIKELY	High	High	Medium	Low	Negligible
	MODERATELY LIKELY	Medium	Medium	Low	Low	Negligible
	UNLIKELY	Low	Low	Negligible	Negligible	Considered to pose no determinable risk

⁷⁰Includes the following eight categories: environmental; financial; operational; organizational; political; regulatory; strategic; and other.

Table 5. Project Risks Elaboration, Assessment and Mitigation Measures

Identified Risks	Category	Impact	Likelihood	Risk Assessment	Elaboration of Risks	Mitigation Measures
Potential buyers of PWS services opt for a different water supply solution	STRATEGIC	HIGH	MODERATELY LIKELY	MEDIUM	Major water consuming industries opt for water engineering solutions to ensure guaranteed water supplies when they need it, instead of long term sustainable land use practices supported by PWS	Even if major water consuming industries opt for water engineering solutions to ensure guaranteed water supplies to meet future production targets, they are still likely to take some water from the Chishui River in view of their refined traditional processing techniques. PWS will remain viable for this reason, and also to protect water quality and flows for other downstream users. In addition, PWS works well in the context of protecting catchment areas for water storage reservoirs. PWS as promoted by this project should therefore represent a cost-beneficial solution for the private sector as well as local and provincial governments.
PWS buyers / sellers lack capacity to fulfil terms of agreement	OPERATIONAL	HIGH	UNLIKELY	LOW	Buyers and/or sellers of watershed services show willingness to participate in a PWS mechanism but lack the capacity to pay a market price for the service or to deliver the service adequately (failure of the contingency principle)	The Guizhou provincial government has been identified as the buyer of the watershed services according to preliminary discussions, with potential to mediate and underwrite the contracting of services to other buyers (eg downstream industries). It is therefore clear that the buyer does have the capacity to pay a market price for the service. During the PPG, an assessment of potential service providers (pilot communities) was conducted, and capacity building plans will be developed to ensure the adequate capacity will be in place for successful PWS establishment.
Upstream communities lack willingness to change land uses as part of PWS agreements	OPERATIONAL	HIGH	UNLIKELY	LOW	Upstream farming communities, as providers of the ecosystem services covered in the PWS agreements through changes in land use patterns, are unwilling to participate in PWS initiatives.	The pilot communities selected for the initial PWS demonstration activities to be supported by the project were consulted during PPG phase and expressed their willingness to participate in PWS activities as long as their income did not diminish. In the short term, technical assistance by the project should control this risk while PWS agreements are under development, and subsequently the terms of the PWS agreements should ensure that they are fully compensated and in fact benefit from changes towards more sustainable land use
Long time needed to implement PWS effectively at scale may cause loss of interest	OPERATIONAL	HIGH	MODERATELY LIKELY	MEDIUM	The small scale of the pilot demonstration(s) and the time and resources required to achieve upscaling in order to deliver agreed ecosystem services at	The project aims to mainstream PWS schemes into broader eco-compensation policies and programmes, thereby supporting its upscaling more rapidly over larger areas with land-use changes financed initially by other eco-compensation schemes that are targeted at

					sufficient scale fail to raise interest of buyers and attract confidence in PWS as a viable approach at large watershed level	achieving the same environmental and socio-economic goals.
Long time required to achieve delivery of services under PWS may affect willingness of buyers to participate	OPERATIONAL	HIGH	MODERATELY LIKELY	MEDIUM	Mismatch of time scales between financial payments (relatively short to medium term) and environmental changes (relatively long term) impacts the credibility of the PWS mechanism. Financial benefits especially for sellers can be delivered in 1 to 4 years. Ecosystem restoration effectiveness to deliver services may take more than 10 years.	Demonstration sites must be planned so as to show in a relatively short time (4 years) both economic and ecological benefits of the mechanism at a reduced scale. Rigorous scaling up techniques will follow up showing with reasonable certainty the delivery of services within an acceptable time frame, with transitional support from eco-compensation schemes as needed. Cost benefit analysis conducted by the project managers jointly with buyers/sellers should show benefits across time which cannot be achieved under the “business as usual scenario”. Performance based payment schemes will structure financing to ensure that part payment (amount to be determined) will be paid upon certified delivery of ecosystem services. However, an <i>ex ante</i> component of the payment will also be needed to encourage uptake of new land use management systems and farming methods.
Delays in establishing a suitable legal – institutional framework for PWS may impact implementation of PWS agreements	REGULATORY	HIGH	MODERATELY LIKELY	MEDIUM	Legal –Institutional framework might be either inadequate to establish formal contractual association between buyers and sellers, or required adjustments may take more time to be in place than buyers, sellers or the ecosystem can afford to wait without losing interests/confidence in the PWS mechanism.	An assessment of the legal and institutional framework for PWS establishment has been conducted and plans for improvements through the project have been proposed in Component 1. This included a capacity assessment of provincial and municipal level agencies to manage and oversee the implementation of a PWS system, and capacity development activities. This will reduce the risk of the PWS mechanism establishment prolonging beyond the project period.
Climate change impacts affect proposed land use changes under PWS	ENVIRONMENTAL	MEDIUM	MODERATELY LIKELY	LOW	Climate change increases the risks of natural disasters (e.g. droughts, floods, landslides, fires) in project sites impacting the effectiveness of proposed land use changes.	The Project’s demonstration activities will improve mitigation/adaptation measures in high risk areas vulnerable to droughts and floods. Project activities in selected sites will include water harvesting techniques to deal with droughts; and reforestation, agro-forestry, and terracing of slopes to deal with the latter. In addition, project managers will work in cooperation with China Biodiversity Partnership Framework (CBPF) Project which deals with climate change risks.

INCREMENTAL REASONING AND EXPECTED GLOBAL, NATIONAL AND LOCAL BENEFITS

182. **The incremental approach can be summarised as follows:** The Objective of the Project is to establish a Payment for Watershed Services (PWS) mechanism in the Chishui River Basin to catalyse land use systems that conserve biodiversity and ecosystem processes and at the same time deliver livelihood improvement in an equitable manner. The Government of China (MEP) and Guizhou Provincial Government have clearly identified the introduction of PWS to augment existing Eco-compensation programmes and regulatory controls on land use as national and provincial priorities and are already making significant investments towards achieving environmental protection in the Chishui River Basin. This has included a planning and regulatory framework for protection of the CRB in Guizhou Province including zoning certain types of development to maintain the river's water quality, investment in eco-compensation schemes such as re-foresting slopes with bamboo, and profound steps to prevent river pollution, including closing large numbers of paper mills, liquor factories, other factories and mines. This has involved substantial foregone economic development opportunities with little compensation, especially in the upstream areas such as Bijie municipality, in order to ensure clean water supply to downstream industries. There has also been investment in waste treatment infrastructure.

183. **Without GEF investment in the proposed project,** the above-mentioned measures will contribute towards relatively clean water in the Chishui River Basin, although planned industrial expansion will create further challenges and they will have little impact on the extensive underlying problem of watershed degradation due to unsustainable land use practices, in particular agricultural expansion on steep slopes and related deforestation to grow annual cash crops such as sorghum driven by local demand. This will continue to result in soil erosion, sediment and nutrient loading, loss of biodiversity, and a continuing downward spiral of environmental degradation and poverty in marginalized poor rural farming communities. The lack of available information and understanding about the river system's ecological processes and biodiversity will continue to constrain their integration into watershed management practices. Both water abstraction for the local manufacturing industry and regulation of the river system are accelerating, with ambitious plans for reservoirs and waterway development up to 2020, which will impact flows in the main river and its tributaries, reducing its capacity to receive pollution loads and adding further stress to valuable fish populations.

184. Therefore, there is a need for GEF intervention to augment the existing approaches with additional market-based mechanisms that will support large scale changes in watershed land use over the long term, coupled with integrated watershed management that ensures that sectoral practices including water resource management take greater account of biodiversity and ecological functions as well as development needs. The lack of a clear official framework, capacity and resources for PWS, and insufficient experience in managing successful market-oriented PWS schemes remain barriers to their development. The land use changes planned through PWS must be introduced as valid, appealing, practical and doable, alternatives to current practices. PWS will remain a viable option even if major water consuming industries opt for water engineering solutions to ensure guaranteed water supplies to meet future production targets, as they are still likely to take some water from the Chishui River in view of their refined traditional processing techniques, and PWS is also highly effective for protecting catchment areas for water storage reservoirs. PWS as promoted by

this project should therefore represent a cost-beneficial solution for the private sector as well as local and provincial governments.

185. **In the alternative scenario enabled by the GEF**, the accomplishment of river basin management objectives that include sustaining ecosystem services and biodiversity, rural poverty alleviation, sustainable land use management as well appropriate economic development, will be enabled by the introduction of a PWS system which is harmonized with existing eco-compensation schemes for greater cumulative impact. The potential of PWS to address large scale environmental degradation challenges, its potential for application in other parts of China, as well as the national conservation priority placed on the Chishui River Basin in view of its globally significant flora and fauna and outstanding nature reserves have led the Government of China to present this project for GEF support. In particular the GEF project will provide significant direct assistance towards realizing the MEP's plans to introduce PWS as an integral part of national eco-compensation policy and planning, as well as Guizhou Province's plans to sustain and rehabilitate the ecological character of the Chishui River Basin.

186. The Objective of the Project is to establish a Payment for Watershed Services (PWS) mechanism in the Chishui River Basin to catalyse land use systems that will conserve biodiversity and ecosystem processes. This will be accomplished through two outcomes, the first aiming to establish a systemic and institutional framework for PWS development and management at municipal and provincial levels, including the mainstreaming of PWS and biodiversity conservation into relevant policies, plans and regulations. The second outcome aims to demonstrate an operational PWS scheme in a sub-watershed of the Chishui River in Guizhou. Through this, PWS will be operationalised on-the-ground in the Chishui river basin, between willing and able upstream farming communities as ecosystem service providers and the Guizhou EPD as initial buyer and intermediary, to negotiate with the end users such as downstream industrial companies to pay for the ecosystem services provided. The introduction of PWS will initially be demonstrated in part of one sub-catchment area, then integrated with eco-compensation schemes in line with the objectives of a proposed catchment management plan for the demonstration sub-watershed. The PWS scheme and related land use changes will then be replicated and upscaled with the aim of reducing external pressures on the ecology of the river basin, including protected areas that support an array of globally threatened and endemic fauna and flora. The project aims to catalyse private sector financing for conservation, and the institutionalisation of PWS as a watershed-based biodiversity conservation mechanism which at the same time delivers livelihood improvements in an equitable manner.

187. The added value of the proposed PWS intervention is that it integrates conservation and development, hitherto relatively independent components, into a coherent whole of structurally articulated variables so that the service provision capacity of the ecosystem is restored allowing for the continuous growth of public-private cooperation (water users downstream) while, at the same time, establishing strong foundations to construct sustainable livelihoods among poor farmers upstream. This is one of the key differences between PWS and the Eco-Compensation programme. The UNDP-GEF contribution is towards the scientific testing of the adequacy and applicability of the PWS finance mechanism for conservation under specified conditions. It aims at constructing a valid and reliable conservation/development mechanism which adds value to current public efforts. Once the pilot testing is concluded, it is up to the public and private stakeholders to see to its proper use either by scaling-up within the same watershed or by replicating it in other

watersheds. In this manner a significant contribution is possible to address the decades-long effort to effectively and efficiently integrate conservation and development paradigms.

188. **Global Environmental Benefits:** The immediate global benefits are improved management of 1,893,200 ha of ecosystems in the Chishui River Basin – thus improving the conservation status of the Mountains of Southwest China global biodiversity hotspot⁷¹, the Upper Yangtze Freshwater Ecoregion, the Guizhou Plateau Broadleaf and Mixed Forests Ecoregion⁷² and, and the Chishui Danxia block of the China Danxia World Heritage Site. Through establishment of the PWS pilot, land use management will be initially improved over an area of at least 7,000 ha, having a positive impact on habitats covering 1,179,464 hectares in the biodiversity-rich Chishui watersheds within the Guizhou Province. Furthermore, the security of the protected areas in Guizhou's part of the river basin (see **Annex 2**) would be enhanced from improved land use, biodiversity management and improved connectivity. Collectively, this will benefit an important assemblage of globally threatened, endemic and ancient relict species including the flagship species Spiny Tree-fern *Alsophila spinulosa* and Dove Tree *Taxus chinensis* (see the **Situation Analysis section** for details). The project will contribute directly towards improved conditions for the globally important fish populations in the Chishui River Basin, including the National Nature Reserve for the Conservation of Rare and Endemic Fish in the Upper reaches of the Yangtze River. There are 112 species of fish alone, of which 28 are endemic to the Upper Yangtze River Basin, representing some 27.2% of the total endemic fish diversity of the Upper Yangtze River Basin (see **Annex 1**).

National socio-economic benefits

189. Establishment of the PWS mechanisms and development of the systemic and institutional capacity needed for their implementation will yield significant socioeconomic benefits at local and river basin levels. The PWS scheme will include a system for monitoring changes in income levels. The project's initial intervention in the Wuma catchment will focus on communities in Xienong village, within Wuma township, who will be the direct beneficiaries of the demonstration pilot. In addition, the population of Wuma town (population 30,000) and the overall Wuma watershed (population 132,200) will also benefit indirectly through the improved land use sustainability arising from implementation of the catchment management plan.

190. The benefits arising from the PWS schemes include improved environmental conditions, improved livelihoods and also payments made under the PWS schemes themselves from the buyers to the service providers. The last will be determined through Cost Benefit Analysis, taking into account the actual valuation of the services provided under each agreement according to local market values. It should also be noted that environmental returns (i.e. changes in water quantity or quality) take a significantly longer time than changes in livelihood, which the PWS programme must be able to balance. For reference (only), payments for eco-compensation programmes in Wuma Township include CNY 146.25/ha/year for the Ecological Forest Compensation Fund programme; and CNY 3,675/ha/year for the Sloping Land Conversion Programme⁷³.

⁷¹http://www.conservation.org/where/priority_areas/hotspots/asia-pacific/Mountains-of-Southwest-China/Pages/default.aspx

⁷²<http://worldwildlife.org/science/wildfinder/>

⁷³ Source: Source: Renhuai Environmental Protection Bureau, 2014. Personal communication with Prof. Jin Leshan.

191. The downstream industries in the city of Renhuai (population 630,000) are expected to be eventual buyers of ecosystem services (high quality flows of river water) through the PWS scheme(s), thus representing the long term beneficiaries of environmental improvements in upstream watersheds. This will contribute towards sustainable employment and the security of the city's economy. In addition, Renhuai City government will benefit through sustained investment flows and related tax revenue. Guizhou Provincial government will also benefit from steady improvements in environmental quality in the river basin as a destination for investment and tourism.

192. As the scheme is expanded, more sub watersheds will introduce PWS as a conservation and development tool, ultimately benefiting up to 10 million people in the Chishui River Basin. These actions will have national impacts, as the only main river in China not crossed by a mainstream dam will be protected through innovative conservation finance mechanisms, and the approach is considered for replication in other river basins as part of MEP's national policies and programmes.

193. Concerning gender, it has been demonstrated in several studies that biodiversity conservation efforts are more effective and efficient when women and vulnerable groups are empowered to participate as equal partners in information sharing and generation, education and training, technology transfer, organizational development, and policy development. In line with UNDP and GEF affirmative action policies, project preparation included a gender disaggregated baseline assessment of the pilot communities for the demonstration component. This indicated that women have little say in decision-making, with 100% of family heads being male. Women are typically engaged in housework, childcare and farming activities, while the men are increasingly working outside the community, increasing the burden on women to manage domestic affairs and care for children and the elderly. The project will proactively consider women's involvement in the demonstration activities, especially as they are more involved in agricultural activities. The development of alternative livelihood options for women that are more well aligned to their family roles will be reviewed and supported as steep lands are taken out of production or transferred to more suitable perennial crops. Key lessons that will be integrated into this project include providing spaces for separate meetings and trainings with women to build their technical skills and capacities, supporting female champions and facilitators to complement (not threaten) traditional leadership, and using the strengths of local traditions as the basis for culturally appropriate and representative decision-making processes both within communities and in multi-stakeholder settings.

194. The pilot projects will work closely with community facilitators, community-based organisations, and NGOs to ensure that the partner communities are integrally involved in all aspects of the project and in locally appropriate ways. In order to ensure that these concerns are proactively incorporated into workplans and implementation procedures, the project will be guided by a part time consultant on gender and minority empowerment throughout implementation. This position will also review and report annually on the effectiveness of gender and ethnic minority participation. In addition, the project's impact on gender and minority groups has been reviewed in the ESSP (see **Annex 10**), identifying no significant negative impacts and an overall positive response.

COST-EFFECTIVENESS

195. The project's approach of addressing barriers to the introduction of PWS as an integral component of eco-compensation programmes at river basin level (including the weak enabling framework and institutional capacity for PWS implementation; and insufficient experience and know-how for the establishment of viable PWS mechanisms to support biodiversity conservation) is cost-effective in that it will have broad applicability at provincial and national levels, with the intention of demonstrating a model for upscaling and replication to other river basins across China, supported by the developing national policy on eco-compensation incorporating PWS/PES under MEP's leadership.

196. While the Guizhou provincial government will act as an initial buyer of ecosystem services in the demonstration component of this project, it will facilitate the involvement of major private sector companies in taking up the end user costs for the watershed services provided (a secure supply of good quality water). Such private sector contributions to PWS schemes have huge potential to finance land use changes towards more sustainable watershed management and biodiversity conservation across China, representing a major new source of revenue that would supplement baseline government investment.

197. The total GEF investment of \$2,090,000⁷⁴ for this project will leverage a minimum of \$16 million in cofinancing including \$15.5 million from MEP and Guizhou provincial government, a highly cost-effective ratio of 7.65. While valuation has yet to be conducted of the ecosystem services available in the Chishui River Basin, experience elsewhere suggests that the returns on this investment will – in the long term – be many times greater, benefiting biodiversity conservation, the livelihoods of impoverished farming communities, and downstream industries and populations. Importantly, systematic improvements in the supply of clean water over the long term will reduce constraints for economic development in riparian municipalities, yielding major economic benefits. The payments anticipated under PWS agreements will similarly benefit impoverished upstream areas that have been forced to forego industrial development opportunities in order to maintain the environmental quality of the river system.

198. The mainstreaming of PWS into provincial watershed management and sectoral practices in combination with existing eco-compensation programmes will be a cost-effective investment in terms of project impact as well as for MEP and Guizhou EPD's subsequent operations. The project's approaches in mainstreaming the uptake of sustainable land uses and conservation measures across multiple sectors, involving a range of stakeholders including local communities and the private sector, and building capacity of the provincial and municipal EPD are expected to lead to cost-effective watershed management that avoids duplication of work, reduces biodiversity degradation and loss of ecosystem services from incompatible land uses and development practices, and ensures the sharing of timely information and resources.

199. Given that Guizhou is one of the least developed provinces in China, the receipt of GEF resources channelled through UNDP will be a source of pride for the provincial government, which facilitates political commitment to take difficult decisions on issues such as inter-agency coordination towards integrated watershed management, the mainstreaming

⁷⁴ Includes agency fee

of biodiversity conservation into development plans and sectoral practices, and concessions on land uses.

PROJECT CONSISTENCY WITH NATIONAL PRIORITIES/PLANS:

A.2 NATIONAL STRATEGIES AND PLANS OR REPORTS AND ASSESSMENTS UNDER RELEVANT CONVENTIONS:

200. The project is consistent with national policy elements of the 12th National Five-year Plan, National Biodiversity Conservation Strategy and Action Plan (2011-2030), National Wetland Conservation Plan (2002-2030), National Wetland Conservation Program (2004-2030), Aquatic Wildlife Conservation Action Plan, as well as national programmes and provincial development plans.

201. In 2003, the Central Government, under the leadership of the Communist Party, adopted the “rational development” concept as the new national development strategy. It calls for sustainable, integrated, and harmonious development for China’s future in order to transition towards a vision of ecological and sustainable future. Such paradigm shift has set forest and wetland conservation and restoration on top of the national agenda. In the same year, the State Council adopted China’s National Wetland Conservation Program (2004-2030), and in 2004, the State Council issued its first circular order on wetland management, which urges all provincial governments to develop policy and management measures for wetland conservation. In 2009, the Central Government called for pilot wetland eco-compensation schemes to secure the maintenance of the multi-functions of wetlands along with the harmony between nature and people. Under this framework, cross-sectoral plans and sector plans identified wetland biodiversity conservation and management as priorities.

202. In 2010, the Chinese Government began implementation of the *China National Biodiversity Strategy and Action Plan (2011 – 2030)* which charts out the goals and guiding principles for achieving biodiversity conservation over the next two decades. The project directly supports implementation of NBSAP Priority Domain 1 “To improve the policy and legal system (governing) biodiversity conservation and sustainable use”. This explicitly stipulates that China will “improve ecological compensation policies, expand their coverage and increase investments” to support conservation and address the conservation financing gap. The NBSAP classifies the Chishui River Basin as a “priority inland terrestrial and aquatic biodiversity conservation area”. It is also within the “Limestone Area of West Guangxi and South Guizhou in Priority Areas of Biodiversity Conservation” within one of the eight ecoregions under the NBSAP namely the Mountainous and Hilly Areas in Central South and West China⁷⁵. The Government has accordingly designated the Chishui River Basin as a priority landscape for the roll out of a PWS scheme to secure water quality and to create an incentive for the sustainable management of biodiversity by local communities.

203. The project also advances the objectives of the *China Eco-Compensation Programme* that has been in place since 2005. The Programme aims to diversify and accelerate implementation of PES mechanisms, according to the “*Guiding Framework for Carrying out PES*” issued by the Ministry of Environmental Protection (MEP) in 2007. In 2010, the

⁷⁵ The region includes the entire area of Guizhou Province and part of Henan, Hubei, Hunan, Chongqing, Sichuan, Yunnan, Shaanxi and Gansu and covers an area of 910,000 square kilometers. Four out of the 32 terrestrial/freshwater priority biodiversity areas fall under this ecoregion, including the Limestone Area of West Guangxi and South Guizhou (No.21 on the priority biodiversity conservation area map in the NBSAP), in which Chishui River Basin is located.

Government launched a legislative reform programme for PES, tasking the National Development and Reform Commission (NDRC) with the further development of needed enabling policies and regulations. Last, the *Twelfth Five-Year Plan for Economic and Social Development (2011)* identifies as a need the further operationalisation of PES schemes.

204. The *12th National Five-year Plan (2011-2015)* urges environmental protection and sustainable growth, enhancing “ecological conservation and restoration.” Project related objectives include:

- 4.5 Strengthen the poverty alleviation effort in the remote region, in particular minority resident region.
- 4.6 Implementation of National Key Ecological Function Zoning Strategy.
- 5.1 Proactively respond to global climate change, and strictly control GHG emission, improve forest carbon sequestration and increase forested areas;
- 5.2 Development of an adaptation mechanism to respond to climate change, in particular to enhance adaptation capacity of nature ecosystems, e.g., forests and wetlands;
- 5.3 Reduce energy consumption, improve water use efficiency, promote integrated and intensive land use, rational exploration of mining resources;
- 5.4 Expand the strength of environmental protection. In particular, to ensure safe drinking water, and clean soil and air.
- 5.5 Promote ecological conservation and restoration. (1) development of eco-security shelterbelt: Focus on the national key ecological function zones, in combination of the restricted development zones (protected areas), including the Loess Plateau in Sichuan and Yunnan; (2) To establish an eco-compensation mechanism as soon as possible; (3) Further implementation of key ecological restoration programs, consolidate natural forest protection program, grain for green program, protection of grassland and wetlands; and (4) Strengthen hydrological infrastructure development, and enhance the management of rivers and lakes, in particular ... the Yangtze River, Poyang Lake, Dongting Lake, through combined flood retention area development, to reduce flood risks.
- 10.1 Deepen natural resource price reform, such as water price, and environmental fees;
- 10.2 Establish and improve trading mechanism for environmental resources’ property transfer.
- 15.2 Strengthen coordination and management of sector planning.

205. China has adopted policies, strategies and plans for the conservation and sustainable use of wetlands including the National Wetland Conservation Plan (2002-2030) and Aquatic Wildlife Conservation Action Plan. According to the National Wetland Conservation Program (2004-2030), by 2030, the number of wetland nature reserves will be increased to 713 and the number of Ramsar sites shall be increased to 80. More than 90% of natural wetlands shall be protected effectively. In total, 1,404,000 ha of wetlands will be restored. It is also planned that 53 national wetlands conservation and wise use demonstration pilots will be set up. All these actions will ensure a comprehensive legislation, monitoring and scientific-research for wetland PAs in China.

206. The project is also in line with the *China Biodiversity Partnership and Framework for Action* (CBPF), which is China’s primary investment strategy for biodiversity conservation through the GEF and other partners. In particular, this project will contribute directly and substantially to Results 4, 6, 13 and 21 of the agreed CBPF Framework. See the **Stakeholder Involvement Plan** for project connections with the CBPF and the UNDP/GEF CBPF Mainstreams of Life Programme.

COUNTRY OWNERSHIP: COUNTRY ELIGIBILITY AND COUNTRY DRIVENNESS

207. China's commitment to biodiversity conservation is evident in its signature to the Convention on Biological Diversity (CBD) in 1992, and its active participation in other MEAs including the Ramsar Convention (also signed in 1992, with 46 Ramsar sites totaling over 4 million hectares as of November 2013), CITES (1981), WHC (1985) and UNFCCC (1992). China has remained steadfast in its commitments under CBD including implementation of Articles 6 (General measures for conservation and sustainable use – including integrating biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies), 8 (*In situ* conservation), and 11 (Incentive measures for the conservation and sustainable use of biodiversity).

208. The project is consistent with national policy elements of the 12th National Five-year Plan, National Biodiversity Conservation Strategy and Action Plan 2011-2030 (NBCSAP v2, 2010), National Wetland Conservation Plan (2002-2030), National Wetland Conservation Program (2004-2030), Aquatic Wildlife Conservation Action Plan, and provincial development plans and national programmes (see above section). These all add up to a clear commitment on behalf of the government to ensure adequate protection and restoration of the natural environment of the country to protect biodiversity, maintain vital ecosystem functions and help regulate climate.

209. As host of the national GEF Secretariat office, national CBD focal point and national executing agency for this project, the MEP has both strong ownership and an over-riding interest in its success. The project will directly contribute towards the further development of the MEP's National Eco-compensation Programme by diversifying and accelerating the implementation of PES mechanisms, according to the "Guiding Framework for Carrying out PES" issued by the Ministry of Environmental Protection (MEP) in 2007. The MEP has been involved in both the development of the PIF and this project document and has committed substantial co-financing (USD 500,000) to enable implementation of the full sized project. MEP is also an executing partner of the GEF-supported CBPF.

SUSTAINABILITY AND REPLICABILITY

210. The project is innovative in the national context, as PWS is a new emerging field in China (as in many developing countries) and the project will enable this approach to be mainstreamed with baseline eco-compensation programmes towards more sustainable watershed management, environmental protection and biodiversity conservation in line with national priorities. The project's demonstration component will lead the way in piloting PWS agreements in China, as well as facilitating a more collaborative approach towards the governance of natural resources at watershed level.

211. **The Environmental and Social Screening Procedure (ESSP)** was followed during project preparation, as required by the ESSP Guidance Note of the UNDP. Accordingly, the environmental and social sustainability of project activities will be in compliance with the Environmental and Social Screening Procedure for the project (please see **Annex 10** for the full ESSP summary). The ESSP identified no significant issues for this project that would result in negative environmental and social impacts. Overall, the project is expected to result in major long term positive impacts for biodiversity conservation and local and indigenous

communities in the Chishui River Basin (there are no indigenous people in the selected demonstration communities, but some Gelao people live in a remote part of the Wuma headwaters).

212. Environmental sustainability: will be achieved through improved watershed management within the scope of PWS agreements and catchment management plans, which will provide financial and technical support for changes in land use, especially towards protecting steep slopes through reforestation, agro-silviculture, terracing, and other measures, thus improving soil conservation and also the water conservation capacity of the land. Areas requiring intervention will be prioritized, including the strengthening of riparian buffer zones and buffer zones for protected areas, as well as connecting habitat blocks as far as possible. The project will seek to mainstream biodiversity conservation within watershed management practices as well as related sectoral practices (eg reforestation and water resource management), leading to widespread improvements in production landscapes, and also reducing pressures on protected areas. Watershed rehabilitation will also increase the resilience of the natural environment, local communities and downstream industries in the face of climate change, anticipated future developments and environmental change, and improve conditions for globally significant native fish populations.

213. Financial sustainability: The multiple layers of provincial plans for the Chishui River Basin in Guizhou (see below) provide a framework for the significant baseline investment in environmental protection in the Chishui River Basin in Guizhou, demonstrating the provincial government's strong commitment towards goals consistent with the project's objective. The high level of cofinancing committed to the project within the same framework (the Special Fund for Chishui River Basin Environmental Protection under the Guizhou Chishui River Basin Protection Regulation (2011)) is strong assurance of its continued support for sustaining the project's outcomes after completion.

214. In addition, the establishment of a new financial mechanism for watershed management through PWS and the reinvestment of funds obtained through PWS agreements into sustainable watershed management supported by this project, will provide a sustainable source of financial support in the long term that will contribute towards the conservation of global significant biodiversity, as well as increasing benefits to local communities. The project will provide ecological stability including a sustainable flow of ecosystem services, reducing constraints for downstream economic development and eco-tourism.

Social sustainability: will be improved through the project's demonstration interventions to build the capacity of local communities for sustainable watershed management. PWS provides a mechanism whereby downstream users of ecosystem services (water in this case) pay upstream providers for guaranteed supply. This source of financing can support transitions to more sustainable land uses, alternative livelihoods, introduction of new technologies and provision of extension services, providing direct benefits to the communities involved through equitable disbursement mechanisms. The participatory and multi-sectoral approach will help to bridge differences and create stronger shared understanding of the nexus between environmental sustainability and socio-economic well-being.

215. Institutional sustainability: The project has the strong ownership and support of MEP and Guizhou provincial government, and is well aligned towards supporting the implementation of the national policy and programme on eco-compensation under MEP, as

well as a range of regulations and plans for the Chishui River Basin including the Chishui River Basin Master Plan (2011), the Ecological Function Protection Plan for Upper Reaches of Chishui River in Guizhou Province (2007), Guizhou Chishui River Basin Protection Regulation (2011) and Guizhou Chishui River Basin Protection Plan (2013) (see the **institutional and policy context and baseline sections**). The project will establish an office for PWS planning, management and oversight in Guizhou EPD and build capacity for PWS management amongst staff of the provincial EPD and the EPBs of the three riparian municipalities in the Chishui River Basin. The project's management arrangements will ensure that all institutional levels are involved in project coordination and working closely together.

216. Institutional sustainability is also underpinned by the fact that baseline activities during project preparation have already included extensive consultation with stakeholders at all levels, including local communities in the demonstration watershed as well as a wide range of sectors, and that the project will support a continued inclusive and consultative approach supported by awareness raising measures in order to systematically introduce the PWS framework.

217. Replication: The outcomes of the project will be scaled up through the dissemination of project results, lessons learned and experiences including the development of guidelines and documentation of best practices in the piloting of PWS agreements. This will be achieved through making project information available in a timely manner through the MEP online and in hard copy. The sharing of benefits with local communities through PWS agreements is likely to incentivize involvement in PWS processes by other communities in the demonstration watershed, and enhance the uptake of this approach across the Chishui River Basin and eventually elsewhere in China.

218. The project's approach is incremental, seeking to upscale and replicate the PWS approach step by step, starting initially with three villages in the demonstration watershed, expanding this to other villages in the same watershed and coupling it with eco-compensation scheme interventions within the framework of a catchment management plan. This approach will then be ready for replication in other Chishui sub-watersheds in Guizhou as well as in Yunnan and Sichuan. The project will engage the provincial governments of Yunnan and Sichuan through Guizhou EPD, supporting annual meetings on environmental protection and rehabilitation of the river basin, and exchanges and information sharing towards harmonized approaches for river basin management.

PART III: Management Arrangements

IMPLEMENTATION ARRANGEMENTS

219. The project's implementation and execution arrangements will focus on maintaining strong collaboration and cooperation, and avoid duplication of effort, among biodiversity conservation related initiatives in China during the implementation period. The Ministry of Environmental Protection (MEP) is the national government institution responsible for the daily execution and coordination of the project and will serve as the government *Executing Agency* (EA). UNDP is the sole *GEF Implementing Agency* (IA) for the project. The project is nationally executed (NEX), in line with the Standard Basic Assistance Agreement between the UNDP and the Government of China, and the Country Programme Action Plan (CPAP). Other executing partners include: Guizhou Provincial Environmental Protection Department

and the Environmental Protection Bureaus of Bijie, Chishui, Renhuai and Zunyi who each will have specific roles to play concerning the execution of the project components.

Project Oversight

220. Oversight of project activities will be the responsibility of the Project Steering Committee (PSC). Day-to-day operational oversight will be ensured by UNDP, through the UNDP Country Office in Beijing, and strategic oversight by the UNDP/GEF Regional Technical Advisor (RTA) responsible for the project. This oversight will include ensuring that the project practices due diligence with regard to UNDP's Environmental and Social Screening Procedure (see **Annex 10** for details). The structure of project management and oversight arrangements is shown in the organogram in **Section IV Part II** below.

221. The *MEP* will take overall responsibility for project execution, and the timely and verifiable attainment of project objectives and outcomes, but will report to the PSC. MEP will provide support to, and inputs for, the implementation of all project activities, and recruitment of project staff and contracting of consultants and service providers with the advice from and involvement of the UNDP. International procurement will be mainly handled by the UNDP upon request of the MEP. MEP will nominate a high level official (Deputy Director-General of the Foreign Economic Cooperation Office (MEP-FECO)) who will serve as the *National Project Director (NPD)* for project implementation. The NPD will be responsible for providing government oversight and guidance for project implementation. The NPD will not be paid from the project funds, but will represent a Government in-kind contribution to the Project.

222. The *UNDP Country Office (UNDP-CO)* will be responsible for: (i) providing financial and audit services to the project; (ii) overseeing financial expenditures against project budgets approved by the PSC; (iii) appointment of independent financial auditors and evaluators; and (iv) ensuring that all activities including procurement and financial services are carried out in strict compliance with UNDP/GEF procedures. A UNDP staff member will be assigned the responsibility for the day-to-day management and control over project finances.

The *Project Steering Committee (PSC)* will be convened by the MEP. The PSC will be chaired by the NPD (the Deputy Director-General of MEP-FECO), and include the following stakeholders: Ministry of Finance, Guizhou Provincial Environmental Protection Department and UNDP. PSC membership and terms of reference will be finalized during the Project Inception Workshop. The PSC will serve as the project's coordination and decision-making body. It will meet according to necessity, but not less than once each year, to review project progress, approve project work plans and approve major project deliverables. The PSC is responsible for ensuring that the project remains on course to deliver products of the required quality to meet the outcomes defined in the project document. The PSC's role will include: (i) overseeing project implementation; (ii) approving annual project work plans and budgets, at the proposal of the Project Manager (PM), for submission to UNDP; (iii) approving any major changes in project plans or programmes; (iv) providing technical input and advice; (v) approving major project deliverables; (vi) ensuring commitment of resources to support project implementation; (vii) arbitrating any conflicts within the project and/or negotiating solutions between the project and any parties beyond the scope of the project; (viii) overall

project evaluation and (ix) ensuring that UNDP Environmental and Social Screening Procedure safeguards are applied to project implementation.

PROJECT MANAGEMENT

Project Management at the central level

223. The day-to-day administration of the project will be carried out by a *National Project Management Office* (NPMO) hosted by MEP-FECO consisting of the NPD, Project Manager (PM), a Project Assistant, and other co-financed support staff as required. The project staff will be recruited following UNDP and MEP/EPD recruitment procedures. The PM will, with the support of the Project Assistant, manage the implementation of all project activities, including: (i) preparation/updates of project work and budget plans, record keeping, accounting and quarterly and annual progress reporting; (ii) drafting of terms of reference, technical specifications and other documents as necessary; (iii) identification, proposal of project consultants to be approved by the PSC, coordination and supervision of consultants and suppliers; (iv) organization of duty travel, seminars, public outreach activities and other project events; and (v) maintaining working contacts with project partners at the central and provincial levels, including substantial time at the SPMO providing guidance, oversight and training to provincial level project staff.

224. The PM is accountable to the MEP and the PSC for the quality, timeliness and effectiveness of the activities carried out, as well as for the use of funds. The PM will produce Biennial Work Plan and Budget Plans to be approved by the PSC. These plans will provide the basis for allocating resources to planned activities. The PM will further produce quarterly operational reports and Annual Progress Reports (APR) for submission to the PSC. These reports will summarize the progress made by the project versus the expected results, explain any significant variances, detail the necessary adjustments and be the main reporting mechanism for monitoring project activities. The PM will also be technically supported by contracted national and international service providers. Recruitment of specialist services for the project will be done by the PM in consultation with the UNDP and the MEP. The PM will also liaise and work closely with all partner institutions to ensure good coordination with other complementary national programmes and initiatives. The organogram for project management (see **Section IV Part II**) illustrates the working relationship between all the main project implementing parties or bodies.

Project Management at the Provincial and Site Levels

225. MEP-FECO will subcontract Guizhou EPD to undertake project management at provincial and local levels. Under this arrangement, a Sub-Project Management Office (SPMO) will be hosted by Guizhou EPD. It is proposed that the SPMO should be co-located with the planned provincial PWS office in order to maximize opportunities for capacity building and streamlining of functions. The SPMO will be staffed by a co-financed Provincial Project Coordinator and Provincial Project Assistant, with other cofinanced support staff as required.

226. Under the supervision and coordination of the SPMO at Guizhou EPD, a capacity building programme will be carried out for the four riparian EPB offices in Guizhou Province

– Bijie, Chishui, Renhuai and Zunyi, in Component 1 of the project. Project management for the implementation of Component 2 activities located at the pilot demonstration sites in Wuma River sub-watershed will be coordinated by the SPMO in collaboration with Renhuai Environmental Protection Bureau.

227. Stakeholder involvement at provincial and local levels will be achieved through the convening of a Provincial Project Coordination Committee. This will secure consultation and inputs from related provincial and local government departments, the private sector, demonstration area representatives, and technical experts from universities, NGOs, related projects, etc. The PPCC will meet at least twice each year and aim to keep stakeholders regularly informed about project plans and progress, to ensure that implementation is well informed about related initiatives and opportunities, and seek opinions and inputs on technical issues.

228. Site level demonstration activities will be guided by Stakeholder Committees involving local government agencies and local community partners involved in implementing the activities in Wuma sub-watershed. There will be equitable participation of women and ethnic minorities (where present) on local level committees and groups related to project activities including community co-management, training and awareness activities. See the **Stakeholder Participation Plan in Section IV Part IV** for further details.

PART IV: Monitoring and Evaluation Plan and Budget

MONITORING AND REPORTING⁷⁶

229. Project monitoring and evaluation will be conducted in accordance with established UNDP and GEF procedures and will be provided by the project team and the UNDP Country Office (UNDP-CO) with support from the UNDP/GEF Regional Coordination Unit in Bangkok. The Strategic Results Framework in **Section II Part I** provides performance and impact indicators for project implementation along with their corresponding means of verification. The BD-2 Tracking Tool (see **Annex 9**), Capacity Assessment Scorecards (see **Annex 7**) and Ecosystem Health Index scorecard (**Annex 8**) will all be used as instruments to monitor progress. The M&E plan includes: inception report, project implementation reviews, quarterly and annual review reports, and mid-term review and final evaluation. The following sections outline the principal components of the M&E Plan and indicative cost estimates related to M&E activities (see **Table 6** below). The project's M&E Plan will be presented and finalized in the Project's Inception Report following a collective fine-tuning of indicators, means of verification, and the full definition of project staff M&E responsibilities.

230. A Project Inception Workshop will be conducted with the full project team, relevant government counterparts, co-financing partners, the UNDP-CO and representation from the UNDP-GEF Regional Coordinating Unit, as well as UNDP-GEF (HQs) as appropriate. A fundamental objective of the Inception Workshop will be to assist the project team to understand and take ownership of the project's goal and objective, as well as finalize

⁷⁶ As per GEF guidelines, the project will also be using the BD 1 Management Effectiveness Tracking Tool (METT). New or additional GEF monitoring requirements will be accommodated and adhered to once they are officially launched.

preparation of the project's first Biennial Work Plan (BWP) and annual and quarterly activity plans on the basis of the Strategic Results Framework. This will include reviewing the logframe (indicators, means of verification, assumptions), imparting additional detail as needed, and on the basis of this exercise, finalizing the BWP with precise and measurable performance indicators, and in a manner consistent with the expected outcomes for the project.

Monitoring responsibilities and events

231. A detailed schedule of project review meetings will be developed by the project management, in consultation with project implementation partners and stakeholder representatives and incorporated in the Project Inception Report. Day-to-day monitoring of implementation progress will be the responsibility of the Project Manager based on the project's BWP, activity plans and its indicators. Specific targets for the first year implementation progress indicators together with their means of verification will be developed at the Inception Workshop and included in the BWP. Targets and indicators for subsequent years would be defined annually as part of the internal evaluation and planning processes undertaken by the project team.

232. Measurement of impact indicators related to PWS targets will occur according to the schedules defined in the Inception Workshop. The measurement of these will be undertaken through subcontracts or retainers with relevant institutions. Periodic monitoring of implementation progress will be undertaken by the UNDP-CO through quarterly meetings with the Implementing Partner, or more frequently as deemed necessary. This will allow parties to take stock and to troubleshoot any problems pertaining to the project in a timely fashion to ensure smooth implementation of project activities.

233. Annual Monitoring will occur through the PSC Meetings (PSCM). This is the highest policy-level meeting of the parties directly involved in the implementation of a project. The project will be subject to PSCMs at least two times a year. The first such meeting will be held within the first six months of the start of full implementation.

234. The Project Manager in consultations with UNDP-CO and UNDP-GEF RCU will prepare a UNDP/GEF PIR during the months of June-August. In addition, the Project Manager, in consultation with UNDP-CO will prepare an Annual Review Report (ARR) by the end of January and submit it to PSC members at least two weeks prior to the PSCM for review and comments. The ARR will be used as one of the basic documents for discussions in the PSCM. The Project Manager will present the ARR (and if needed the PIR) to the PSC, highlighting policy issues and recommendations for the decision of the PSCM participants. The Project Manager also informs the participants of any agreement reached by stakeholders during the PIR/ARR preparation on how to resolve operational issues. Separate reviews of each project component may also be conducted if necessary. The PSC has the authority to suspend disbursement if project performance benchmarks are not met. Benchmarks will be developed at the Inception Workshop, based on delivery rates, and qualitative assessments of achievements of outputs.

235. The terminal PSCM is held in the last month of project operations. The Project Manager is responsible for preparing the Terminal Report and submitting it to UNDP-CO and UNDP-GEF RCU. It shall be prepared in draft at least two months in advance of the terminal PSCM in order to allow review, and will serve as the basis for discussions in the PSCM. The

terminal meeting considers the implementation of the project as a whole, paying particular attention to whether the project has achieved its stated objectives and contributed to the broader environmental objective. It decides whether any actions are still necessary, particularly in relation to sustainability of project results, and acts as a vehicle through which lessons learnt can be captured to feed into other projects.

236. UNDP Country Offices and UNDP-GEF RCU as appropriate, will conduct yearly visits to project sites based on an agreed upon schedule to be detailed in the project's Inception Report/Biennial Work Plan to assess first hand project progress. Any other member of the Project Steering Committee can also accompany.

Project Reporting

237. The Project Manager in conjunction with the UNDP-GEF extended team will be responsible for the preparation and submission of the following reports that form part of the monitoring process. The first six reports are mandatory and strictly related to monitoring, while the last two have a broader function and the frequency and nature is project specific to be defined throughout implementation.

238. A Project Inception Report will be prepared immediately following the Inception Workshop. It will include a detailed Biennial Work Plan divided in quarterly time-frames detailing the activities and progress indicators that will guide implementation during the first year of the project. An Annual Review Report (ARR) shall be prepared by the Project Manager and shared with the Project Steering Committee. As minimum requirement, the ARR shall consist of the Atlas standard format for the Project Progress Report (PPR) covering the whole year with updated information for each element of the PPR as well as a summary of results achieved against pre-defined annual targets at the project level. The ARR should consist of the following sections: (i) project risks and issues; (ii) project progress against pre-defined indicators and targets and (iii) outcome performance. The Project Implementation Review (PIR) is an annual monitoring process mandated by the GEF. Once the project has been under implementation for a year (from the CEO approval date), a Project Implementation Report must be completed by the CO together with the project team. Quarterly progress reports: Short reports outlining main updates in project progress will be provided quarterly to the local UNDP Country Office and the UNDP-GEF RCU by the project team. UNDP ATLAS Monitoring Reports: A Combined Delivery Report (CDR) summarizing all project expenditures, is mandatory and should be issued quarterly following the finalization of the quarterly progress reports. The following logs should be prepared: (i) The Issues Log is used to capture and track the status of all project issues throughout the implementation of the project. (ii) the Risk Log is maintained throughout the project to capture potential risks to the project and associated measures to manage risks; and (iii) the Lessons Learned Log is maintained throughout the project to capture insights and lessons based on good and bad experiences and behaviours. Project Terminal Report: During the last three months of the project the project team will prepare the Project Terminal Report. Periodic Thematic Reports: As and when called for by UNDP, UNDP-GEF or the Implementing Partner, the project team will prepare Specific Thematic Reports, focusing on specific issues or areas of activity. Technical Reports are detailed documents covering specific areas of analysis or scientific specializations within the overall project. As part of the Inception Report, the project team will prepare a draft Reports List, detailing the technical reports that are expected to be prepared on key areas of activity during the course of the

Project, and tentative due dates. Where necessary, this Reports List will be revised and updated, and included in subsequent APRs.

External Evaluations

239. The project will be subjected to at least one independent external review and one evaluation: An independent Mid-Term Review will be undertaken at the mid-point of the project lifetime. The Mid-Term Review will determine progress being made towards the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Furthermore, it will review and update the ESSP report. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term review will be decided after consultation between the parties to the project document. The ToR for this Mid-term review will be prepared by the UNDP CO based on guidance from the UNDP-GEF Regional Coordinating Unit.

240. An independent Final Evaluation will take place three months prior to the terminal Project Steering Committee meeting, and will focus on the same issues as the mid-term review. The final evaluation will also look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental goals. The Final Evaluation should also provide recommendations for follow-up activities. The ToR for this evaluation will be prepared by the UNDP CO based on guidance from the UNDP-GEF Regional Coordinating Unit.

Learning and Knowledge Sharing

241. The project will develop a communications strategy in the first year, which will be updated annually and implementation supported by a communications, education and awareness specialist. This will include capturing and disseminating lessons learned, for review at PSC meetings in order to inform the direction and management of the project, and shared with project stakeholders as appropriate. A project completion report will document the project's achievements and lessons learned at the end of the project. Results from the project will also be disseminated within and beyond the project intervention zone through a number of existing information sharing networks and forums.

Branding and Visibility

242. Full compliance is required with UNDP's Branding Guidelines and guidance on the use of the UNDP logo. These can be accessed at <http://web.undp.org/comtoolkit/reaching-the-outside-world/outside-world-core-concepts-visual.shtml>. Full compliance is also required with the GEF Branding Guidelines and guidance on the use of the GEF logo. These can be accessed at http://www.thegef.org/gef/GEF_logo. The UNDP and GEF logos should be the same size. When both logs appear on a publication, the UNDP logo should be on the left top corner and the GEF logo on the right top corner. Further details are available from the UNDP-GEF team based in the region.

Audit Clause

243. The Government will provide the Resident Representative with certified periodic financial statements, and with an annual audit of the financial statements relating to the status of UNDP (including GEF) funds according to the established procedures set out in the

Programming and Finance manuals. The Audit will be conducted according to UNDP financial regulations, rules and audit policies by the legally recognized auditor of the Government, or by a commercial auditor engaged by the Government.

244.

Table 6. M&E Activities, Responsibilities, Budget and Time Frame

Type of M&E activity	Responsible Parties	Budget US\$ <i>Excluding project team staff time</i>	Time frame
Inception Workshop	Project Coordinator UNDP CO UNDP GEF	10,000	Within first two months of project start up
Inception Report	Project Team UNDP CO	None	Immediately following IW
Measurement of Means of Verification for Project Purpose Indicators	Project Manager will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members	To be finalized in Inception Phase and Workshop. Indicative cost: 15,000.	Start, mid and end of project
Measurement of Means of Verification for Project Progress and Performance (measured on an annual basis)	Oversight by Project Manager Project team	To be determined as part of the Biennial Work Plan's preparation and updated annually. Indicative cost: 5,000 (annually); total: 20,000	Annually prior to ARR/PIR and to the updating of biennial work plans
ARR and PIR	Project Team UNDP-CO UNDP-GEF	None	Annually
Quarterly progress reports	Project team	None	Quarterly
CDRs	Project Manager	None	Quarterly
Issues Log	Project Manager UNDP CO Programme Staff	None	Quarterly
Risks Log	Project Manager UNDP CO Programme Staff	None	Quarterly
Lessons Learned Log	Project Manager UNDP CO Programme Staff	None	Quarterly
Mid-term Review	Project team UNDP- CO UNDP-GEF Regional Coordinating Unit External Consultants (i.e. evaluation team)	40,000	At the mid-point of project implementation.
Final Evaluation	Project team, UNDP-CO UNDP-GEF Regional Coordinating Unit External Consultants	40,000	At the end of project implementation

Type of M&E activity	Responsible Parties	Budget US\$ <i>Excluding project team staff time</i>	Time frame
	(i.e. review team)		
Terminal Report	Project team UNDP-CO local consultant	0	At least one month before the end of the project
Lessons learned	Project team UNDP-GEF Regional Coordinating Unit (suggested formats for documenting best practices, etc)	12,000 (average 3,000 per year)	Yearly
Audit	UNDP-CO Project team	20,000	Yearly
TOTAL indicative COST <i>Excluding project team staff time and UNDP staff and travel expenses</i>		US\$ 157,000	

PART V: Legal Context

245. This Project Document shall be the instrument referred to as such in Article I of the Standard Basic Assistance Agreement between the Government of the People's Republic of China and the United Nations Development Programme, signed by the parties on January 29, 1979. The host country-implementing agency shall, for the purpose of the Standard Basic Assistance Agreement, refer to the government co-operating agency described in that Agreement.

246. The UNDP Resident Representative in Beijing is authorized to effect in writing the following types of revision to this Project Document, provided that he/she has verified the agreement thereto by the UNDP-EEG Unit and is assured that the other signatories to the Project Document have no objection to the proposed changes:

- a) Revision of, or addition to, any of the annexes to the Project Document;
- b) Revisions which do not involve significant changes in the immediate objectives, outputs or activities of the project, but are caused by the rearrangement of the inputs already agreed to or by cost increases due to inflation;
- c) Mandatory annual revisions which re-phase the delivery of agreed project inputs or increased expert or other costs due to inflation or take into account agency expenditure flexibility; and
- d) Inclusion of additional annexes and attachments only as set out here in this Project Document.

SECTION II: STRATEGIC RESULTS FRAMEWORK (SRF) AND GEF INCREMENT

PART I: Strategic Results Framework, SRF (formerly GEF Logical Framework) Analysis

INDICATOR FRAMEWORK AS PART OF THE SRF

Project's Development Goal: To contribute to the conservation and sustainable use of globally significant biodiversity in China

Objective/ Outcome	Indicator	Baseline	End of Project target	Source of Information	Risks and assumptions
Objective: To operationalize a replicable PWS scheme in the Chishui River Basin to stimulate land and natural resource use systems that conserve biodiversity and sustain ecosystem processes	PWS and biodiversity conservation are mainstreamed into national and Guizhou provincial policies, regulations and plans by the end of the project as indicated by the GEF Biodiversity Tracking Tool.	See GEF BD Tracking Tool ⁷⁷ . Existing national and provincial policies, regulations and plans do not refer to PWS as an operational mechanism. While biodiversity conservation is included in the existing plans such as “Guizhou Chishui River Basin Environmental Protection Plan (2013-2020)” and there is the Guizhou Provincial Strategy and Action Plan for Biodiversity Conservation (2012-2020), it is not fully integrated into other policies, regulations and plans.	See GEF BD Tracking Tool targets. PWS and biodiversity conservation mainstreamed into national and Guizhou provincial policies, regulations and plans, including the Regulation on Ecological Compensation, Guizhou Provincial Chishui River Protection Act, 13 th Five-Year Environmental Policy regulations, and Planning of Ecosystem Function Area in the Upstream of Chishui River Basin. Official approval of the demonstration PWS	Official MEP and Guizhou provincial government notifications; project reports. GEF BD2 Tracking Tool completed at project preparation stage, midterm and project completion.	<u>Risks:</u> - Potential buyers of PWS services opt for a different water supply solution - PWS buyers / sellers lack capacity to fulfil terms of PWS agreements - PWS providers lack the willingness to change land use practices through PWS agreements - Long time needed to implement PWS effectively at scale may cause loss of interest

⁷⁷ See Project Document **Annex 9** for the GEF Biodiversity Tracking Tool baseline assessment

Objective/ Outcome	Indicator	Baseline	End of Project target	Source of Information	Risks and assumptions
			scheme.		<ul style="list-style-type: none"> - Long time required to achieve delivery of services under PWS may affect willingness of buyers to participate - Delays in establishing a suitable legal – institutional framework for PWS may impact implementation of PWS agreements - Climate change impacts affect viability of proposed land use changes under PWS
	Sustained presence of globally significant fish populations in the Chishui River system, as indicated by monitoring of river stretches immediately downstream of pilot PWS sites using a standardized monitoring protocol.	Baselines to be established in Year One following confirmation of pilot sites and methodology ⁷⁸	Annual monitoring using standardized protocol confirms presence of the same species in stretches of the Chishui River system immediately downstream of pilot PWS sites	Project reports	<ul style="list-style-type: none"> - Fish populations in CRB may be affected by other factors including releases, fishing, point source pollution and river engineering works <p><u>Assumption:</u></p> <ul style="list-style-type: none"> -The Chinese Central Government and Guizhou Provincial Government are committed to investing in PWS demonstration in the context of expanding China's eco-compensation programme as a means of arresting water pollution, land degradation and biodiversity loss
	Provincial government investment in eco-compensation / PWS schemes in Chishui River Basin is sustained at CNY 50 million per year from 2015 and supports replication of PWS to other watersheds	Guizhou Provincial Government Special Fund for Environmental Protection in Chishui River Basin – allocation for 2013 of RMB 40 million	Guizhou Provincial Government Special Fund for Environmental Protection in Chishui River Basin – annual allocations consistently reach RMB 50 million and support replication of PWS to other watersheds	Guizhou Provincial Government official documents	
	Land use change restrictions codified in provincial development / land use and water resource plans through inputs to the following 5 year plans reduce threats to aquatic habitats and biodiversity in the CRB.	While existing plans protect water quality in the CRB, sectoral plans continue to exert serious impacts on biodiversity, including waterway development for shipping and river regulation on tributaries.	Land use change restrictions codified in provincial development / land use and water resource plans through inputs to the following 5 year plans reduce threats to aquatic habitats and biodiversity in the CRB.	Recommendations of project supported review group; incorporation of recommendations in official publication of Guizhou provincial land use plans for	

⁷⁸ See **Annex 1** for a list of endemic fishes of the Upper Yangtze River in the Chishui River (2007). Note the risk applying to this indicator – careful analysis of the range of factors affecting the fish populations is required in order to assess monitoring results.

Objective/ Outcome	Indicator	Baseline	End of Project target	Source of Information	Risks and assumptions
				next 5 year period.	
Outcome 1: Systemic and institutional framework for PWS development and management established at municipal and provincial levels for the Chishui River Basin within Guizhou Province	Outputs: 1.1 <i>Capacity for planning and managing PWS mechanisms is developed within Guizhou Provincial EPD and Municipal EPBs within Chishui River Basin</i> 1.2 <i>A standardized biodiversity and ecosystem services indicator system is developed to assess the impacts of PWS schemes</i> 1.3 <i>PWS is mainstreamed into related policies, plans and regulations to regulate land uses, facilitate land use trade-offs, and integrate its implementation with eco-compensation schemes</i> 1.4 <i>Private sector involvement in PWS is promoted and incentivized through introduction of an eco-labelling scheme</i> 1.5 <i>Best Practice guidelines, methodological protocols and lessons learned are shared for scaling-up and replicating PWS in additional watersheds in the Chishui River Basin and elsewhere in China</i>				
	An office in charge of planning and managing PWS mechanisms along the Chishui River within Guizhou province is established within Guizhou provincial EPD.	No dedicated office or staff for PWS coordination within Guizhou EPD	Dedicated PWS office established within Guizhou provincial EPD with at least 2 staff and an annual operational budget of at least USD 50,000 by end of Year 3.	MEP and Guizhou EPD official communications	Risks: - Long time needed to implement PWS effectively at scale may cause loss of interest - Long time required to achieve delivery of services under PWS may affect willingness of buyers to participate - Delays in establishing a suitable legal – institutional framework for PWS may impact implementation of PWS
	Improved capacities of provincial and municipal environmental protection offices for implementing PES/PWS as shown by increased scores in the Capacity Development Scorecard	Capacity Development Scorecard baselines ⁷⁹ : Guizhou EPD: 41% Bijie EPB: 38% Chishui EPB: 35% Renhuai EPB: 35% Zunyi EPB: 39%	Capacity Development Scorecard Targets: Guizhou EPD: 85% Bijie EPB: 75% Chishui EPB: 75% Renhuai EPB: 80% Zunyi EPB: 75%	Project reports on Capacity Development Scorecard at project preparation, mid term and project completion.	

⁷⁹ See Project Document **Annex 7** for scorecard baseline results

Objective/ Outcome	Indicator	Baseline	End of Project target	Source of Information	Risks and assumptions
	At least 12 staff from MEP-FECO, Guizhou EPD, Bijie EPB, Chishui EPB, Renhuai EPB and Zunyi EPB trained and given official mandate to monitor biodiversity and ecosystem services impacts arising through PWS schemes and harmonized eco-compensation programmes.	No staff trained to date.	At least 12 staff trained and given official mandate to monitor biodiversity and ecosystem services impacts arising through PWS schemes and harmonized eco-compensation programmes.	Project reports; MEP and Guizhou EPD official communications	<p>agreements</p> <p><u>Assumption:</u> -The Chinese Central Government and Guizhou Provincial Government are committed to investing in PWS demonstration in the context of expanding China's eco-compensation programme as a means of arresting water pollution, land degradation and biodiversity loss</p>
	An ecolabelling scheme is established for companies participating in PWS schemes and taken up by the private sector	No ecolabelling scheme exists for PWS schemes in China at present	Ecolabelling scheme is established and at least three companies meeting criteria for engagement in PWS schemes are awarded the label	Project reports; MEP and Guizhou EPD official communications	
	Institutional capacity of Guizhou EPD reaches readiness for PWS implementation and replication	Existing capacity for PWS implementation requires development and is not ready for implementation or replication. No PWS guidelines available at provincial / river basin level	Management guidelines and methodological protocols for scaling-up and replicating PWS in additional watersheds along the Chishui River Basin are produced by Guizhou EPD, training in their application is provided to all provincial and municipal EPB offices in the river basin.	Project reports.	

Objective/ Outcome	Indicator	Baseline	End of Project target	Source of Information	Risks and assumptions
	Outputs: 2.1 PWS pilot mechanism established in Wuma sub-watershed, generating uptake of biodiversity friendly land use options 2.2 PWS agreements are established for the provision of watershed services 2.3 The impacts of PWS implementation on land use changes, delivery of ecosystem services, biodiversity and livelihoods are monitored, assessed and reported 2.4 Catchment management plan for Wuma River valley demonstrates a framework for integrating PWS with eco-compensation and regulatory mechanisms for sustainable watershed management				
Outcome 2. Pilot PWS scheme(s) are demonstrated in selected sub-watersheds of the Chishui River Basin in Guizhou Province	PWS agreement(s) for pilot areas within the demonstration sub watershed including a long-term financial agreement are agreed upon by buyers and sellers of specified watershed services and operationalized.	No PWS agreements exist for the pilot demonstration areas	PWS agreement(s) for the pilot areas within the demonstration sub-watershed including a long-term financial agreement are agreed upon by buyers and sellers of specified watershed services and operationalized.	Project reports; legal documents for PWS agreement(s)	Risks: - Potential buyers of PWS services opt for a different water supply solution - PWS buyers / sellers lack capacity to fulfil terms of PWS agreements - PWS providers lack the willingness to change land use practices through PWS agreements - Long time needed to implement PWS effectively at scale may cause loss of interest - Long time required to achieve delivery of services under PWS
	Area of the selected demonstration sub-watershed under biodiversity friendly land use ⁸⁰ by community land managers	Land use in demonstration sub-watershed is currently unsustainable, with increasing deforestation, cultivation of annual crops on steep slopes over 25° gradient, causing biodiversity loss, soil erosion and reduced water conservation capacity ⁸¹	No less than 7,000 hectares of the selected demonstration sub-watershed is under biodiversity friendly land use by community land managers	Project reports	

⁸⁰ Sustainable watershed management compliant with conditions spelt out in the PWS Agreements, and in line with the biodiversity conservation objectives of the Catchment Management Plan for the demonstration sub-watershed.

⁸¹ For details, see **Annex 5**, based on Dan Wenhong and Peng Sitao. November 2013. Report of Payment for Watershed Services. (Baseline study for PPG Phase). Unpublished report.

Objective/ Outcome	Indicator	Baseline	End of Project target	Source of Information	Risks and assumptions
	Change in land use supporting biodiversity within demonstration sub-watershed, indicated by a 10% increase in forest cover in pilot demonstration areas from the time of PWS agreement signature	The forest cover in Wuma sub-watershed was 16,678 ha (32.68% of total land) in 2010; and 3,408 ha (28.86% in the Wuma Township) part of the watershed ⁸²	10% increase in forest cover in pilot demonstration areas from time of PWS agreement signature	Project reports; monitoring of habitats using remote sensing / GIS land cover analysis	may affect willingness of buyers to participate - Delays in establishing a suitable legal – institutional framework for PWS may impact implementation of PWS agreements
	10% increase in average annual per capita income of farming households participating in PWS pilot demonstration ⁸³	Baseline average income for 2013 ⁸⁴ (RMB) Baiyangtun: 7396 Majiapo: 6561 Jiaotong: 6661	Average annual per capita income increases at 10% per annum over baseline after 2 years into PWS pilot project.	Project reports; socio-economic surveys of communities participating in PWS pilot	- Climate change impacts affect viability of proposed land use changes under PWS <u>Assumption:</u> - Local government and community leaders recognize sufficient potential value in a PWS pilot demonstration to participate in the project
	Improvements in ecosystem health as indicated by Ecosystem Health Index	Baseline EHI score to be determined in Year One for selected pilot area(s)	EHI scores show increasing trend for selected area(s) based on annual assessments	Project reports; EHI scorecards	
	Positive trend indicating improvement in status of key ecosystem services specified in PWS agreement(s)* <i>*Parameters and detailed baseline measurements to be determined in Year One of Project</i>	Estimated dry season runoff for the Wuma River 2000-2009 was 43.90 million m ³ . No water quality data are available. ⁸⁵ Baseline for ecosystem services specified in PWS agreement to be established during project implementation period.	Trend of stable or slight improvement in status of water quality / quantity provided by demonstration area by end of project, according to terms of PWS agreement(s).	Project reports	

A detailed activity list and a chronogram of activities per output is under development and will be finalised upon project inception.

⁸² Dan Wenhong and Peng Sitao. November 2013. Report of Payment for Watershed Services. (Baseline study for PPG Phase). Unpublished report.

⁸³ Guizhou Provincial Government has set this same 10% target in its Twelfth Five-Year Development Plan

⁸⁴ Dan Wenhong and Peng Sitao. November 2013. Report of Payment for Watershed Services. (Baseline study for PPG Phase). Unpublished report.

⁸⁵ For estimated historical trends in runoff, see: Dan Wenhong and Peng Sitao. November 2013. Report of Payment for Watershed Services. (Baseline study for PPG Phase). Unpublished report.

Part II: Incremental Cost Analysis

247. **Baseline trends** – significant environmental degradation has taken place in the Chishui River Basin, in common with many other parts of the Yangtze River Basin and across other river basins in China. This has been due in large part to unsustainable land use practices which have seen marginalized poor farming communities increasingly cultivating steep slopes with annual crops, resulting in deforestation, soil erosion, sediment and nutrient loading of the river, and hydrological impacts that include a “flashier” system with more intense and rapid runoff during the rainy season and a more pronounced dry season with lower flows. Pressure on available water resources has risen mainly due to increasing industrial demands as well as for irrigation, threatening the minimum dry season flows required to sustain ecological functions and globally significant fish populations. These impacts have resulted in extensive loss and fragmentation of natural habitats in the Chishui River Basin as well as major pressure on its globally significant plant and animal resources.

248. The Government of China (MEP) and Guizhou Provincial Government have clearly identified the introduction of PWS to augment existing Eco-compensation programmes and regulatory controls on land use as national and provincial priorities and are already making significant investments towards achieving environmental protection in the Chishui River Basin. This has included a planning and regulatory framework for protection of the CRB in Guizhou Province including zoning certain types of development to maintain the river’s water quality, investment in eco-compensation schemes such as re-foresting slopes with bamboo, and profound steps to prevent river pollution, including closing large numbers of paper mills, liquor factories, other factories and mines. This has involved substantial foregone economic development opportunities with little compensation, especially in the upstream areas such as Bijie municipality, in order to ensure clean water supply to downstream industries. There has also been investment in waste treatment infrastructure, although this is far from comprehensive.

249. **Without GEF investment in the proposed project**, the above-mentioned measures will contribute towards relatively clean water in the Chishui River Basin, but will have little impact on the extensive underlying problem of watershed degradation due to unsustainable land use practices, in particular agricultural expansion on steep slopes and related deforestation. This will continue to result in soil erosion, sediment and nutrient loading, loss of biodiversity, and a continuing downward spiral of environmental degradation and poverty in marginalized poor rural farming communities. The lack of available information and understanding about the river system’s ecological processes and biodiversity will continue to constrain their integration into watershed management practices. Both water abstraction for local manufacturing industry and regulation of the river system are accelerating, with ambitious plans for reservoirs and waterway development up to 2020, which will impact flows in the main river and its tributaries, reducing its capacity to receive pollution loads and adding further stress to valuable fish populations.

250. Therefore, there is a need for GEF intervention to augment the existing approaches with additional market-based mechanisms that will support large scale changes in watershed land use over the long term, coupled with integrated watershed management that ensures that sectoral practices including water resource management take account of biodiversity and ecological functions as well as development needs. The lack of a clear official framework,

capacity and resources for PWS, and insufficient experience in managing successful market-oriented PWS schemes are remain barriers to their development.

251. Global environmental objective – the project will contribute towards GEF's Biodiversity 2 Objective – to mainstream biodiversity conservation and sustainable use into production landscapes, seascapes and sectors. Specifically, the project will contribute directly towards the sustainable management of watersheds in the Chishui River Basin within Guizhou Province totaling 1,179,464 ha, and towards the improved management of a demonstration area of at least 7,000 ha in the Wuma River watershed through a PWS mechanism integrated with Eco-Compensation programmes. Through the project intervention, PWS and biodiversity conservation will be mainstreamed into Guizhou provincial policies, regulations and plans, including the Regulation on Ecological Compensation, Guizhou Provincial Chishui River Protection Act, 13th Five-Year Environmental Policy regulations, and Planning of Ecosystem Function Area in the Upstream of Chishui River Basin. It will also be mainstreamed into national policy on eco-compensation through MEP-FECO and promoted for application to other river basins in China.

252. In the alternative scenario enabled by the GEF, the accomplishment of river basin management objectives that include sustaining ecosystem services and biodiversity, rural poverty alleviation, sustainable land use management as well appropriate economic development, will be enabled by the introduction of a PWS system which is harmonized with existing eco-compensation schemes for greater cumulative impact. This will be accomplished through addressing the principal barriers identified in the situation analysis through a systematic approach. The potential of PWS to address large scale environmental degradation challenges, its potential for application in other parts of China, as well as the national conservation priority placed on the Chishui River Basin in view of its globally significant flora and fauna and outstanding nature reserves have led the Government of China to present this project for GEF support. In particular the GEF project will provide significant direct assistance towards realizing the MEP's plans to introduce PWS as an integral part of national eco-compensation policy and planning, as well as Guizhou Province's plans to sustain and rehabilitate the ecological character of the Chishui River Basin.

253. The Objective of the Project is to establish a Payment for Watershed Services (PWS) mechanism in the Chishui River Basin to catalyse land use systems that will conserve biodiversity and ecosystem processes. This will be accomplished through two outcomes, the first aiming to establish a systemic and institutional framework for PWS development and management at municipal and provincial levels, including the mainstreaming of PWS and biodiversity conservation into relevant policies, plans and regulations. The second outcome aims to demonstrate an operational PWS scheme in a sub-watershed of the Chishui River in Guizhou. Through this, PWS will be operationalised on-the-ground in the Chishui river basin, between willing and able upstream farming communities as ecosystem service providers and the Guizhou EPD as initial buyer and intermediary, to negotiate with the end users such as downstream industrial companies to pay for the ecosystem services provided. The introduction of PWS will initially be demonstrated in part of one sub-catchment area, then integrated with eco-compensation schemes in line with the objectives of a proposed catchment management plan for the demonstration sub-watershed. The PWS scheme and related land use changes will then be replicated and upscaled with the aim of reducing external pressures on the ecology of the river basin, including protected areas that support an array of globally threatened and endemic fauna and flora. The project aims to catalyse private

sector financing for conservation, and the institutionalisation of PWS as a watershed-based biodiversity conservation mechanism which at the same time delivers livelihood improvements in an equitable manner.

254. The added value of the proposed PWS intervention is that it integrates conservation and development, hitherto relatively independent components, into a coherent whole of structurally articulated variables so that the service provision capacity of the ecosystem is restored allowing for the continuous growth of public-private cooperation (water users downstream) while, at the same time, establishing strong foundations to construct sustainable livelihoods among poor farmers upstream. This is one of the key differences between PWS and the Eco-Compensation programme. The UNDP-GEF contribution is towards the scientific testing of the adequacy and applicability of the PWS finance mechanism for conservation under specified conditions. It aims at constructing a valid and reliable conservation/development mechanism which adds value to current public efforts. Once the pilot testing is concluded, it is up to the public and private stakeholders to see to its proper use either by scaling-up within the same watershed or by replicating it in other watersheds. In this manner a significant contribution is possible to address the decades-long effort to effectively and efficiently integrate conservation and development paradigms.

255. **System boundary** - the project intervention will operate at several inter-connected scales. The first component will primarily address the installation of PWS systemic and institutional capacity at Guizhou provincial EPD and within the four riparian municipality EPBs in Guizhou (Bijie, Chishui, Renhuai and Zunyi). It will also aim to mainstream PWS and biodiversity conservation into relevant development policies, regulations and plans, with special concern for the water resources management sector.

256. For the demonstration component, there will be three interconnected approaches – first the pilot PWS demonstration at three village communities in Wuma valley; secondly the development and initial implementation of a catchment management plan for the whole Wuma valley including the next step in PWS upscaling to a few more villages; and thirdly the application of harmonized eco-compensation schemes and regulatory measures targeted at priority areas in the Guizhou portion of the Chishui River Basin with the aim of achieving common biodiversity and ecosystem service provision objectives in line with the catchment management plan.

257. The approach will be documented and prepared for upscaling and replication, both in Guizhou and in the other riparian provinces of Yunnan and Sichuan through outreach mechanisms, exchange visits and training in order to build interest and capacity. At national level, the outcomes of the project will inform the elaboration of MEP's national policy and programmes on Eco-compensation to include PWS/PES mechanisms, as well as the business community as a potential vehicle for public-private partnerships towards securing essential ecosystem services such as clean water supply. Baseline and incremental costs have been assessed over the PPG period and four-year life span of the project.

258. **Summary of costs:** the Baseline associated with this project is estimated at US\$152 million. The GEF Alternative has been costed at US\$ 168.286 million. The total Incremental Cost to implement the full project is US\$ 16.286 million. Of this amount, \$1.97 million is requested from GEF. GEF funds have leveraged US\$ 16.0 million in co-financing for the Alternative strategy. Costs have been estimated for four years, the duration of the planned project. These costs are summarized below in the incremental costs matrix (**Table 7**).

Table 7. Incremental Cost Matrix

Cost/Benefit	Baseline (B)	Alternative (A)	Increment (A-B)
BENEFITS			
Global benefits	<p>Baseline policy, regulatory and planning frameworks contribute to water quality in CRB but fail to address widespread watershed degradation, deforestation, erosion and biodiversity loss.</p> <p>Eco-compensation schemes support environmental improvements but are inadequate to achieve large scale improvements in watershed management to secure biodiversity and ecosystem services.</p>	<p>Capacity for managing and implementing PWS to achieve both ecosystem service provision and biodiversity conservation objectives established and mainstreamed into provincial policies, regulations and plans in order to address watershed degradation and biodiversity loss. Increased financial support for sustainable watershed management from both public and private sector sources.</p> <p>PWS scheme demonstrated in sub-watershed, improving sustainability of watershed management, biodiversity conservation and ecosystem service delivery (clean water flows). PWS approach coupled with harmonized eco-compensation schemes to achieve implementation of catchment management plan, for upscaling and replication to other watersheds across CRB and elsewhere.</p>	<p>Threats to globally significant biodiversity from habitat destruction and pollution and external pressures on nature reserves within CRB are reduced.</p> <p>Improved watershed management increases quality and dry season flows of water in Chishui River system, sustaining aquatic biodiversity including globally significant fish populations.</p>
National and local benefits	<p>Ecosystem services in CRB have been seriously impacted by watershed degradation arising from unsustainable agriculture, deforestation, pollution and impacts of economic development</p> <p>Downstream water users now face operational limitations caused by impacts on water cycle, especially reduced dry season flows</p>	<p>Ecosystem services in CRB rehabilitated through improved sustainability of watershed management through PWS, including reforestation, improved protection of natural habitats, soil and water conservation, and reduced impacts of sectoral development practices.</p> <p>Improved watershed management through PWS has long term positive influence on water cycle, improving both water quality and dry season flows as water storage capacity of watershed vegetation and soil is restored.</p>	<p>Ecosystem services provide a sustainable flow of benefits to downstream users while upstream land users receive financial support for sustainable watershed management practices through PWS agreements, and benefit from improved environmental quality.</p> <p>Downstream water-consuming urban areas and industries receive sustainable water supplies, enabling sustainable development, tourism, fisheries and public health.</p>
COSTS			
Outcome 1: Systemic and institutional framework for PWS development and management established at municipal and provincial levels for the Chishui River Basin within Guizhou Province	Baseline: \$142,000,000	Alternative: \$150,788,550	<p>GEF \$738,550 COF \$8,050,000 TOTAL \$8,788,550</p>

Cost/Benefit	Baseline (B)	Alternative (A)	Increment (A-B)
Outcome 2: Pilot PWS scheme(s) demonstrated in selected sub-watersheds of the Chishui River Basin in Guizhou Province	Baseline: \$10,000,000	Alternative: \$17,498,126	GEF \$998,126 COF \$6,500,000 TOTAL \$7,498,126
Project Management			PM - GEF \$172,000 PM - COF \$1,450,000 PM - TOTAL \$1,622,000 Agency Fees \$181,324 TOTAL GEF: \$1,908,676 TOTAL COF: \$16,000,000
TOTAL COSTS	Baseline: \$152,000,000	Alternative: \$168,286,676	TOTAL IC \$16,286,676

SECTION III: Total Budget and Workplan

Award ID:	00079397	Business Unit:	CHN10
Project ID:	00089388	Project Title:	Payment for Watershed Services in the Chishui River Basin for the Conservation of Globally Significant Biodiversity
PIMS #	4822	Implementing Partner (Executing Agency)	Ministry of Environmental Protection (MEP); Ministry of Finance (MOF); Guizhou Environmental Protection Department
Award Title:	Payment for Watershed Services in Chishui River Basin		

GEF Outcome/ Atlas Activity	Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Acct Code	Atlas Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Total (USD)	Budget Note
COMPONENT 1: Institutional Framework for PWS	MEP	62000	GEF	71300	International Consultants	18,000.00	18,000.00	18,000.00	0	54,000.00	1
				71300	Local Consultants	35,100.00	39,100.00	33,100.00	25,100.00	132,400.00	2
				71600	Travel	25,000.00	38,000.00	31,000.00	18,100.00	112,100.00	3
				72100	Contractual Services - Company	51,000.00	146,000.00	128,000.00	47,000.00	372,000.00	4
				72200	Equipment	25,000.00	0	0	0	25,000.00	5
				74200	Audio-visual and printing production costs	4,000.00	10,000.00	5,000.00	15,000.00	34,000.00	6
				74500	Miscellaneous	3,000.00	2,000.00	2,000.00	2,050.00	9,050.00	7
					Total	161,100.00	253,100.00	217,100.00	107,250.00	738,550.00	
COMPONENT 2: PWS Demonstration	MEP	62000	GEF	71200	International Consultants	0	18,000.00	0	0	18,000.00	8
				71300	Local Consultants	2,000.00	14,000.00	14,000.00	2,000.00	32,000.00	9

				71600	Travel	2,000.00	25,000.00	19,000.00	12,000.00	58,000.00	10
				72100	Contractual Services - Company	108,000.00	193,000.00	273,000.00	277,000.00	851,000.00	11
				72200	Equipment	10,000.00	10,000.00	0	0	20,000.00	12
				74200	Audio-visual and printing production costs	0	0	10,000.00	0	10,000.00	13
				74500	Miscellaneous	2,000.00	2,000.00	2,626.00	2,500.00	9,126.00	14
					Total	124,000.00	262,000.00	318,626.00	293,500.00	998,126.00	
PROJECT MANAGEMENT	MEP	62000	GEF	71300	Local Consultants	34,665.00	34,665.00	34,665.00	34,665.00	138,660.00	15
				71600	Travel	4,000.00	4,000.00	4,000.00	4,000.00	16,000.00	16
				72200	Equipment	6,500.00	0	0	0	6,500.00	17
				74500	Miscellaneous	2,000.00	2,000.00	2,000.00	1,028.00	7,028.00	18
				74500	UNDP Cost Recovery	953.00	1,906.00	953.00	0.00	3,812.00	19
					Total	48,118.00	42,571.00	41,618.00	39,693.00	172,000.00	
TOTAL PROJECT						333,218.00	557,671.00	577,344.00	440,443.00	1,908,676.00	

Summary of Funds					
Source	Year 1	Year 2	Year 3	Year 4	Total
GEF	333,218.00	557,671.00	5,773,44.00	440,443.00	1,908,676.00
Government	3,875,000.00	3,875,000.00	3,875,000.00	3,875,000.00	15,500,000.00
UNDP	125,000.00	125,000.00	125,000.00	125,000.00	500,000.00
Total	4,333,218.00	4,557,671.00	4,577,344.00	4,440,443.00	17,908,676.00

Budget Notes	
Component 1	
1	Output 1.2 – IC on Biodiversity and Ecosystem Services Monitoring (6 weeks @ \$3000 = \$18,000); Output 1.4 – IC on PWS (6 weeks @ \$3000 = \$18,000); Output 1.4 – IC on Business and Conservation Strategy (6 weeks @ \$3000 = \$18,000). Total \$54,000
2	Outputs 1.1-1.5 – National Expert on PWS Strategy Development (58 weeks at \$1000 = \$58,000); Output 1.2 - National Expert on Biodiversity Monitoring and Assessment Specialist (8 weeks @ \$1000 = \$8,000); Output 1.3 - National Expert on legal, regulatory and policy analysis (20 weeks @ \$1,000 = \$20,000); Output 1.4 – National Expert on PWS/Eco-compensation guidelines (8 weeks @ \$1,000 = \$8,000) and National Communications consultant (96 weeks @ \$400 = \$38,400). Total \$74,400
3	Travel for NC inputs: Outputs 1.1 to 1.5 - National Expert on PWS Strategy Development \$8,000; Output 1.2 – National Expert on Biodiversity Monitoring and Assessment \$6000; Output 1.3 - National Expert on legal, regulatory and policy analysis \$12,000; Output 1.4 – National Expert on PWS/Eco-compensation guidelines (\$6,000) and National Communications \$8,000. Total \$32,000; Travel for IC Inputs to C1: Output 1.2 – IC on biodiversity and ecosystem services monitoring (EHI) (\$6000); Output 1.4 – IC on PWS (\$6,000); Output 1.4 – IC on business and conservation strategy (\$4,000). Total \$16,000. Output 1.1 and 1.2: national and international travel for training participants (\$56,100); Total: \$112,100.
4A	Output 1.1. Subcontracted services for provision of capacity building for provincial and municipal EPD/EPB offices for the following functions as a minimum: (i) mapping and monitoring ecosystem services and land use changes using GIS tools (including InVEST); (ii) establishing transparent payment mechanisms; (iii) undertaking independent verification and certification of watershed services rendered; and (iv) mechanisms for enforcement in case of non-compliance with contract provisions. Total = \$200,000.
4B	Output 1.2: Subcontracted services for capacity building for fish monitoring and its application to the stretches of the Wuma River and Chishui River mainstream as an indicator for PWS scheme impacts. Training, testing and application of monitoring protocols developed elsewhere in Yangtze River Basin in collaboration with experienced organizations. Documentation of the adopted monitoring protocol (subtotal \$70,000). Output 1.4: Technical assistance on application of ecoregional assessment approach to guide up-scaling and replication across CRB (subtotal \$30,000). Total = \$100,000.
4C	Output 1.1: 4. Operational support for PWS management by EPB offices to facilitate mainstreaming into eco-compensation programmes. It is expected that co-financing will cover these costs during year 4. \$5,000 per year x 4 EPB offices = \$20,000. Output 1.3: Operational support for the consultation process required to mainstream PWS, sustainable watershed management incorporating biodiversity conservation into provincial policies, regulations and plans, including organizational costs for meetings, printing of supporting documents, etc. (\$14,000). Output 1.4: Operational support for outreach programme for Chishui River Basin management, including convening of annual meetings (4 x \$3000) and dissemination of technical information and targeted awareness materials (\$4,000), and exchange visits between the riparian provinces to review watershed management issues and solutions (6 x \$2000). Total = \$28,000. Convening of a Guizhou business forum meeting on the theme of PWS, sustainable watershed management and biodiversity conservation for the Chishui River Basin, aiming to raise awareness and promote engagement of the business community in the province, including keynote presentations on PWS,

	panel discussion, report and media involvement (\$10,000). Total \$38,000. Grand total: \$72,000.
5	Equipment support for PWS management by EPD and EPB offices including 1 computer, printer/fax/copier, 1 digital camera, IT accessories, software, etc with allowance of \$5000 per office x 5 offices (\$25,000).
6	Output 1.4. Design, editing, translation and publication of technical and outreach materials based on project lessons learned including PWS, integrated watershed management and fish biodiversity materials (\$19,000), an illustrated full colour project completion report that fully documents the main activities and learning achieved through the project (\$10,000), and electronic versions of materials made available through a project website (\$5,000). Total: \$34,000
7	Contingency for possible exchange rate fluctuations and miscellaneous costs associated with organizing specialized meetings for the development of the PWS systemic and institutional framework (venues, catering, facilitation, interpretation etc.).
Component 2	
8	Output 2.4: International Catchment Management Planning Specialist - 30 days at \$600/day (\$18,000)
9	Output 2.1: National consultant on Gender and Minority Empowerment - part time input over 4 years (32 weeks at \$500 / week) = \$16,000. Output 2.4: 2. NC – Watershed Management and Biodiversity Conservation Specialist – 16 weeks at \$1000/week = \$16000.
10	Output 2.1: Travel for NC on Gender and Minority Empowerment - DSA for 40 days in CRB at 1290 RMB/day = \$8600, plus 4 return internal flights at \$400 = \$1600; Total = \$11,000 (rounded up). Output 2.4: Travel for IC: Catchment Management Planning Specialist - two visits to CRB of 5 days each (Guiyang DSA of \$211/day x 10 = 2110, plus flights estimated \$3000. Total \$6,000 (rounded up); travel for NC: Watershed Management and Biodiversity Conservation Specialist - DSA for 40 days in CRB at 1290 RMB/day = \$8600, plus 4 return internal flights at \$400 = \$1600; Total = \$11,000 (rounded up). Local, national and international training \$30,000. Total: \$58,000
11A	Output 2.1: Subcontracted services to provide technical assistance for the demonstration of an operational PWS scheme at the pilot site. This will include support for a) defining, selecting, measuring and assessing ES; b) determining the marketable value of the selected ecosystem services; implementation of Cost-Benefit Analyses to demonstrate the financial advantages of PWS; c) identification of prospective sellers and buyers of ES, village cooperatives established to bundle the supply of ecosystem services by communities, and to ensure cost effectiveness in payment distribution; d) capacity development for community land users to modify land use practices through technical assistance and extension on biodiversity friendly land use practices; and e) PWS agreements are brokered between sellers (village cooperatives) and buyers (initially, the provincial government, with subsequent engagement of downstream water users). \$200,000. Output 2.2: Subcontracted services for the facilitation of consultations and technical assistance for the development and implementation of PWS agreements (would be packaged with subcontract for PWS TA in Output 2.1). \$20,000. Total \$220,000.
11B	Output 2.1: Operational support for the implementation of PWS demonstration activities, including convening local stakeholder meetings, providing materials for local communities (for activities such as terracing, re-forestation, planting buffer strips, irrigation water conservancy, soil protection, crop change, alternative livelihood introduction, etc), allowances for local facilitators, etc. Total \$400,000.

11C	Output 2.3: Subcontracted technical assistance for the operationalisation of the pilot participatory PWS monitoring and verification system, measuring the impact of intervention through the PWS mechanisms on land use changes, delivery of ecosystem services, biodiversity and livelihoods using standards and indicators derived from baseline information (\$10,000/year). Includes production of detailed workplans for the system, progress reports with monitoring results, and final report at end of pilot project detailing results, reviewing methods used and including recommendations for improvement. (\$40,000). This will also include project M&E plan costs (see Table 6 of project document and section H of CEO Endorsement) including: Contracted services for Midterm and Terminal Evaluations including: International Project Evaluators, National Project Evaluators and associated travel for evaluators (total \$80,000); specific studies and monitoring associated with developing MoV for project indicators (\$15,000) and annual measurement of MoV (\$20,000); annual project audit (\$20,000); Production, translation and printing of a project completion report in popular full colour format, documenting key project achievements, best practices and lessons learned (\$12,000); costs associated with inception meeting planning and reporting (\$10,000). M&E Plan subtotal \$157,000. Total: \$197,000.
11D	Output 2.4: Operational support for development and initial implementation of the Catchment Management Plan for Wuma Valley demonstration area, including collection of baseline information, creation of GIS maps, piloting InVEST analysis, consultation meetings and training. \$34,000.
12	Output 2.3: Specialized M&V equipment for monitoring changes in fish populations, water flow, water quality, and ecological changes for PWS pilots. Estimated at \$20,000.
13	Output 2.4: Design, editing, translation, printing and dissemination of Baseline Situation Analysis and Catchment Management Plan for Wuma River Sub-watershed. \$10,000.
14	Contingency for possible exchange rate fluctuations and miscellaneous costs associated with organizing meetings related to capacity building activities (venues, catering, facilitation, interpretation etc.).
Project Management Costs	
15	Project management supports Project Manager (US\$550 x 150 weeks). Total \$82,500. Project Assistant (US\$270/w x 208 weeks) Total \$56,160. Combined total \$138,660. In addition, a Provincial Project Coordinator and Provincial Project Assistant will be wholly cofinanced by Guizhou EPD throughout the project duration, manning the Sub-Project Management Office located at Guizhou EPD.
16	Travel associated with project management
17	Office equipment for project management unit, including computers (2), printer/fax/copier (1), digital camera (1), IT accessories, software, etc.
18	PMO operational communications costs (email, internet, telephones); contingency for possible exchange rate fluctuations;

19	<p>UNDP Direct Project Service/Cost recovery charges for recruitment of 4 international consultants at \$953 each (total \$3812) requested by the MEP to UNDP for executing services as indicated in the Agreement in Annex 11 of the Project Document. In accordance with GEF Council requirements, the costs of these services will be part of the executing entity's Project Management Cost allocation identified in the project budget In accordance with GEF Council requirements, the costs of these services will be part of the executing entity's Project Management Cost allocation identified in the project budget. DPS costs would be charged at the end of each year based on the UNDP Universal Pricelist (UPL) or the actual corresponding service cost. The amounts here are estimations based on the services indicated, however as part of annual project operational planning the DPS to be requested during the calendar year would be defined and the amount included in the yearly project management budgets and would be charged based on actual services provided at the end of that year.</p>
----	--

SECTION IV: ADDITIONAL INFORMATION

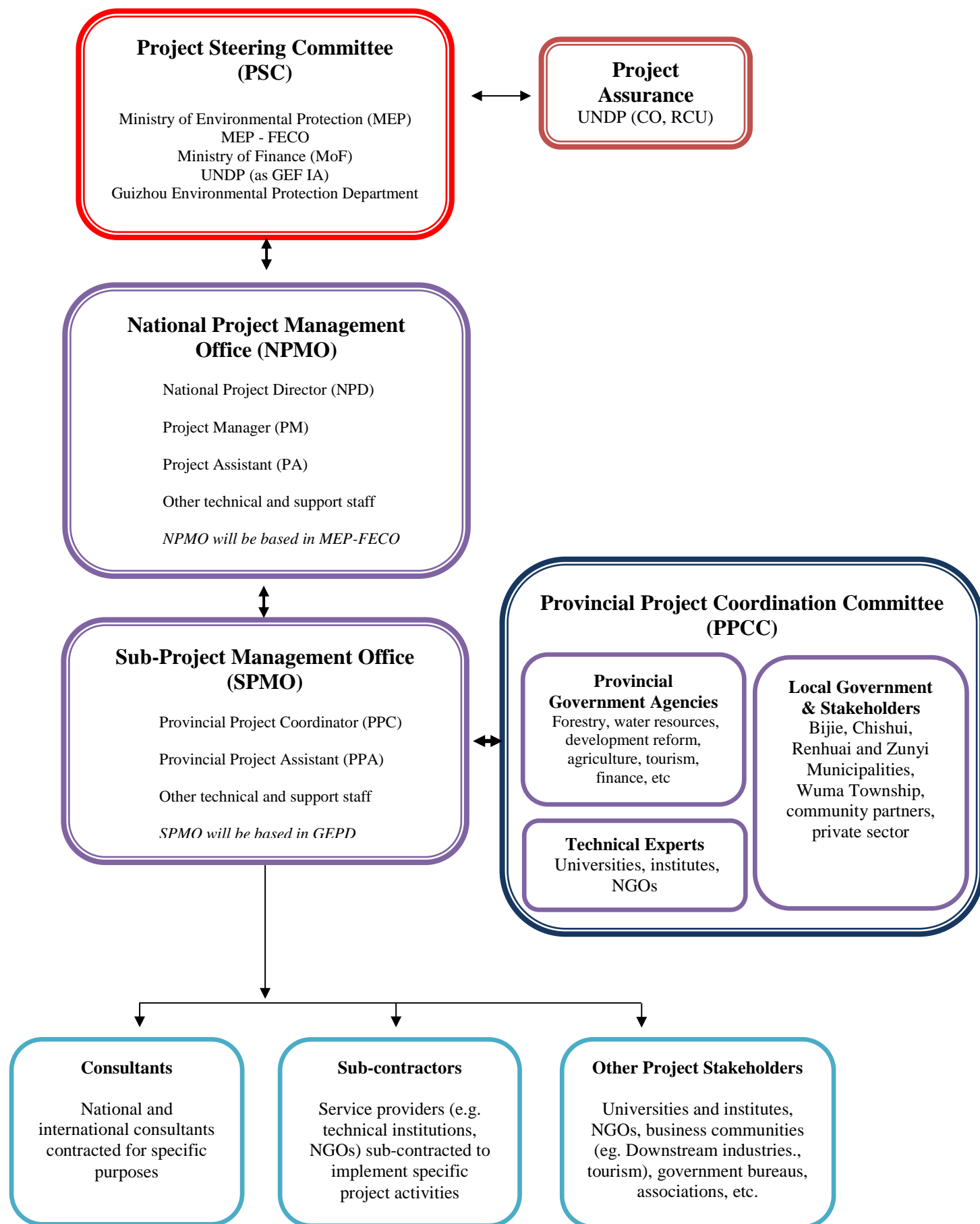
PART I: Other agreements

CO-FINANCING LETTERS

-- See separate file—

[filename]

PART II: Organogram of Project



PART III: Terms of Reference for key project staff

PROJECT MANAGER

Background

259. The Project Manager (PM), will be a locally recruited national selected based on an open competitive process. He/She will be responsible for the overall management of the project, including the mobilization of all project inputs, supervision over project staff, consultants and sub-contractors. The PM will report to the UNDP CO in close consultation with the host institution for all of the project's substantive and administrative issues. From the strategic point of view of the project, the PM will report on a periodic basis to the Project Steering Committee (PSC). Generally, the PM will be responsible for meeting government obligations under the project, under the national execution modality (NEX). He/She will perform a liaison role with the Government, UNDP and other UN Agencies, NGOs and project partners, and maintain close collaboration with other donor agencies providing co-financing.

Duties and Responsibilities

- Supervise and coordinate the production of project outputs, as per the project document;
- Mobilize all project inputs in accordance with UNDP procedures for nationally executed projects;
- Prepare TORs for contractors or subcontractors and ensure contractors' deliverables;
- Supervise and coordinate the work of the National and Sub-Project Management Offices, all project staff, consultants and sub-contractors, including significant time spent at the SPMO to provide oversight, guidance and training to local staff;
- Coordinate the recruitment and selection of project personnel;
- Prepare and revise project work and financial plans, as required by MEP and UNDP;
- Coordinate and oversee implementation of the project's monitoring and evaluation plan;
- Liaise with UNDP, MEP, relevant government agencies, and all project partners, including donor organizations and NGOs for effective coordination of all project activities;
- Facilitate administrative backstopping to subcontractors and training activities supported by the Project;
- Oversee and ensure timely submission of the Inception Report, Combined Project Implementation Review/Annual Project Report (PIR/APR), Technical reports, quarterly financial reports, and other reports as may be required by UNDP, GEF, MEP and other oversight agencies;
- Disseminate project reports and respond to queries from concerned stakeholders;
- Report progress of project to the steering committees, and ensure the fulfilment of steering committees directives.
- Oversee the exchange and sharing of experiences and lessons learned with relevant integrated conservation and development projects nationally and internationally;
- Ensure the timely and effective implementation of all components of the project;
- Oversee implementation of the stakeholder participation plan and assist community groups, municipalities, NGOs, staff, students and others with development of essential

skills through training workshops and on the job training thereby upgrading their institutional capabilities;

- Coordinate and assist scientific institutions with the initiation and implementation of all field studies and monitoring components of the project
- Assist and advise the teams responsible for communications and awareness raising ; and
- Carry out regular, announced and unannounced inspections of all sites and the activities of the project demonstration site management units.
- Ensure that UNDP Environmental and Social Screening Procedure safeguards are applied to project implementation.

Qualifications

- A university degree (MS or PhD) in a subject related to natural resource management or environmental sciences;
- At least 10 years of experience in natural resource management (preferably in the context of watershed / environmental planning and management);
- At least 5 years of project/programme management experience;
- Working experience with ministries, national or provincial institutions concerned with natural resource management and environmental protection is a plus, but not a requirement;
- Ability to effectively coordinate a large, multi-stakeholder project;
- Ability to administer budgets, train and work effectively with counterpart staff at all levels and with all groups involved in the project;
- Strong drafting, presentation and reporting skills;
- Strong computer skills, in particular mastery of all applications of the MS Office package and internet search;
- Strong knowledge about the political and socio-economic context related to the protected area system, biodiversity conservation and wetlands management at national, provincial and municipal levels;
- Excellent writing communication skills in Chinese; and
- A good working knowledge of English is a requirement.

PROJECT ASSISTANT

Background

260. The Project Assistant will be locally recruited based on an open competitive process. He/she will be responsible for the overall administration of the project. The Project Assistant will report to the Project Manager. Generally, the Project Assistant will be responsible for supporting the Project Manager in meeting government obligations under the project, under the national execution modality (NEX).

Duties and Responsibilities

- Collect, register and maintain all information on project activities;
- Contribute to the preparation and implementation of progress reports;
- Monitor project activities, budgets and financial expenditures;
- Provide oversight, guidance, training and assistance on establishing and maintaining applicable administrative procedures to local staff at the SPMO through regular visits;
- Advise all project counterparts on applicable administrative procedures and ensure their proper implementation;
- Maintain project correspondence and communication;
- Support the preparations of project work-plans and operational and financial planning processes;
- Assist in procurement and recruitment processes;
- Assist in the preparation of payments requests for operational expenses, salaries, insurance, etc. against project budgets and work plans;
- Follow-up on timely disbursements by UNDP CO;
- Receive, screen and distribute correspondence and attach necessary background information;
- Prepare routine correspondence and memoranda for Project Manager's signature;
- Assist in logistical organization of meetings, training and workshops;
- Prepare agendas and arrange field visits, appointments and meetings both internal and external related to the project activities and write minutes from the meetings;
- Maintain project filing system;
- Maintain records over project equipment inventory; and
- Perform other duties as required.

Qualifications

- A post-school qualification (college diploma, or equivalent);
- At least 5 years of administrative and/or financial management experience;
- Demonstrable ability to administer project budgets, and track financial expenditure;
- Demonstrable ability to maintain effective communications with different stakeholders, and arrange stakeholder meetings and/or workshops;
- Excellent computer skills, in particular mastery of all MS Office programmes;
- Excellent written communication skills; and
- A good working knowledge of English and Chinese.

OVERVIEW OF INPUTS FROM TECHNICAL ASSISTANCE CONSULTANTS

Table 8. Overview of Inputs from Technical Assistance Consultants

Consultant	\$/ Person Week	Person Week	Tasks and Inputs
For Project Management / Monitoring & Evaluation			
Local / National contracting			
Project Manager	\$550	150	<p>The Project Manager is responsible for overall coordination of the project activities and timely and quality delivery of project outputs. S/he will:</p> <ul style="list-style-type: none"> ▪ Supervise and coordinate the production of project outputs, as per the project document; ▪ Mobilize all project inputs in accordance with UNDP procedures for nationally executed projects; ▪ Supervise and coordinate the work of the National and Sub-Project Management Offices, all project staff, consultants and sub-contractors; ▪ Coordinate the recruitment and selection of project personnel; ▪ Prepare and revise project work and financial plans, as required by UNDP; ▪ Liaise with UNDP, relevant government agencies, and all project partners, including donor organizations and NGOs for effective coordination of all project activities; ▪ Facilitate administrative backstopping to subcontractors and training activities supported by the Project; ▪ Oversee and ensure timely submission of the Inception Report, Combined Project Implementation Review/Annual Project Report (PIR/APR), Technical reports, quarterly financial reports, and other reports as may be required by UNDP, GEF, MEP and other oversight agencies; ▪ Disseminate project reports and respond to queries from concerned stakeholders; ▪ Report progress of project to the steering committees, and ensure the fulfillment of Project Steering Committee directives. ▪ Oversee the exchange and sharing of experiences and lessons learned with relevant community based integrated conservation and development projects nationally and internationally; ▪ Ensures the timely and effective implementation of all components of the project; ▪ Assist community groups, townships, NGOs, staff, students and others with development of essential skills through training workshops and on the job training thereby upgrading their institutional capabilities; ▪ Coordinate and assists scientific institutions with the initiation and implementation of all field studies and monitoring components of the project ▪ Ensure good communication on project results and lessons, liaising with media and stakeholders. ▪ Carry out regular, announced and unannounced inspections of all sites and the activities of any project site management units.
Project Assistant	\$270	208	<p>Project Assistant will be responsible for overall administration of the project. S/he will:</p> <ul style="list-style-type: none"> ▪ Collect, register and maintain all information on project activities; ▪ Contribute to the preparation and implementation of progress reports; ▪ Monitor project activities, budgets and financial expenditures; ▪ Advise all project counterparts on applicable administrative procedures and ensure their proper implementation; ▪ Maintain project correspondence and communication; ▪ Support the preparations of project work-plans and operational and financial planning processes; ▪ Assist in procurement and recruitment processes;

Consultant	\$/ Person Week	Person Week	Tasks and Inputs
			<ul style="list-style-type: none"> Assist in the preparation of payments requests for operational expenses, salaries, insurance, etc. against project budgets and work plans; Follow-up on timely disbursements by UNDP CO; Receive, screen and distribute correspondence and attach necessary background information; Prepare routine correspondence and memoranda for Project Managers signature; Assist in logistical organization of meetings, training and workshops; Prepare agendas and arrange field visits, appointments and meetings both internal and external related to the project activities and write minutes from the meetings; Maintain project filing system Maintain records over project equipment inventory; and Perform other duties as required.
For Technical Assistance			
Outcome 1			
Local / National contracting			
PWS Strategy Development Specialist	1,000	58	<p>Output 1.1: Systemic and institutional framework for PWS development and management</p> <p>Working closely with Guizhou EPD, subcontracted services providers, and contracted experts:</p> <ul style="list-style-type: none"> Provide strategic guidance and oversight for capacity building for PWS development and management for Guizhou EPD and Bijie, Chishui, Renhuai and Zunyi EPBs through subcontracted training provision Provide oversight and guidance for the establishment and equipping of provincial PWS office at Guizhou EPD with capacity for developing, supervising and scaling up pro-conservation PWS mechanisms in the Chishui River Basin. Provide strategic guidance for capacity building including the application of tools such as <i>InVEST</i> Facilitate and guide the strengthening of coordination and information sharing mechanisms for harmonization of PWS and Eco-Compensation schemes <p>Output 1.2: Biodiversity and ES impacts of PWS monitored</p> <p>Working closely with the International Biodiversity and Ecosystem Services Monitoring Specialist and others, the Specialist will:</p> <ul style="list-style-type: none"> Provide strategic guidance on monitoring and reporting requirements for PWS to Guizhou EPD / EPB staff and other key stakeholders Provide technical assistance towards establishing monitoring protocols and baselines for PWS demonstration sites that incorporate biodiversity requirements. Provide project oversight on technical assistance and quality control for monitoring for PWS demonstration sites during the project period. Identify lessons learned and provide recommendations regarding monitoring techniques for inclusion in PWS guidelines. <p>Output 1.3: PWS mainstreamed into policies, plans and regulations</p> <p>Working closely with the International PWS specialist, National Regulatory and Policy Analysis Specialist, National PWS/Eco-Compensation Specialist and others, the Specialist will:</p> <ul style="list-style-type: none"> Provide strategic oversight and guidance for analysis of policies, regulations and plans as they relate to sustainable watershed management and PWS, including all related sectors and development plans Assist in identifying gaps, weaknesses and overlaps in the existing policy and

Consultant	\$/ Person Week	Person Week	Tasks and Inputs
			<p>planning framework as it relates to sustainable watershed management and PWS</p> <ul style="list-style-type: none"> Provide strategic guidance regarding the impacts of water engineering policies and plans on aquatic biodiversity in the Chishui River Basin, especially fish populations, and the mitigation of such impacts Participate in consultations involving related government agencies to develop specific recommendations for improvements to existing policies and plans Facilitate the official adoption of policy and planning recommendations by the national and provincial governments, especially regarding upscaling of policy recommendations to national level. Document and apply the lessons learned on mainstreaming as a contribution towards upscaling and replication of PWS and the integration of biodiversity conservation into watershed management. Update the GEF BD2 Tracking Tool as required for Project M&E <p>Output 1.4: Private sector involvement in PWS</p> <p>In close cooperation with the IC on business and conservation strategy development and national communications consultant:</p> <ul style="list-style-type: none"> Provide guidance and oversight for development and implementation of a strategy to engage the private sector in PWS in CRB Facilitate development and MEP endorsement of eco-labelling scheme for private sector involvement in PWS <p>Output 1.5: Best Practice guidelines for scaling-up PWS</p> <p>Working closely with the National Eco-compensation/PWS specialist, International PWS specialist, National Legal, Regulatory and Policy Analysis Specialist, International Catchment Management Planning Specialist and others</p> <ul style="list-style-type: none"> Coordinate the design and implementation of a participatory process led by the provincial EPD and involving the key stakeholders in PWS demonstration activities towards the development of best practice guidelines highlighting the conditions under which PWS works most effectively in selected landscapes in China. Provide strategic guidance for development of the guidelines, adopting a holistic approach to biodiversity conservation and sustainable land management that goes beyond the current emphasis on pollution control, and encompasses climate change adaptation Provide strategic guidance on the harmonization of PWS within eco-compensation programmes and catchment management planning in order to achieve shared biodiversity conservation, ecosystem service delivery and livelihood objectives Provide oversight and strategic guidance for the strategy for upscaling and replication of PWS across the Chishui River Basin and other river basins in China
Biodiversity and Ecosystem Services Monitoring Specialist	1,000	8	<p>Output 1.2: Biodiversity and ES impacts of PWS monitored</p> <p>Working closely with the Project Manager, International Biodiversity and Ecosystem Services Monitoring Specialist and others, the EHI Specialist will:</p> <ul style="list-style-type: none"> Provide capacity building support to Guizhou EPD / EPB staff and other key stakeholders on EHI monitoring and reporting procedures; Provide technical assistance towards establishing EHI monitoring protocols and baselines for PWS demonstration sites. Provide technical assistance and quality control for subsequent EHI monitoring for PWS demonstration sites during the project period. Review and report on EHI monitoring effectiveness before project completion, identifying lessons learned and providing recommendations

Consultant	\$/ Person Week	Person Week	Tasks and Inputs
			regarding use of the EHI monitoring approach in PWS guidelines.
Legal, Regulatory and Policy Analysis Specialist	1,000	20	<p>Output 1.3: PWS mainstreamed into policies, plans and regulations</p> <p>Working closely with the Project Manager, International PWS specialist, National PWS/Eco-Compensation Specialist and others, the EHI Specialist will:</p> <ul style="list-style-type: none"> ▪ Based on preliminary analysis during project preparation, conduct a detailed analysis of provincial policies, regulations and plans as they relate to sustainable watershed management and PWS, including all related sectors and development plans ▪ Identify gaps, weaknesses and overlaps in the existing policy and planning framework as it relates to sustainable watershed management and PWS ▪ Specifically review the impacts of water engineering policies and plans on aquatic biodiversity in the Chishui River Basin, especially fish populations, and propose recommendations to mitigate such impacts ▪ Facilitate a consultation process involving related provincial and local government agencies to develop specific recommendations for improvements to existing policies and plans ▪ Facilitate the official adoption of policy and planning recommendations by the provincial government. ▪ Document the lessons learned on mainstreaming as a contribution towards upscaling and replication of PWS and the integration of biodiversity conservation into watershed management. ▪ Assist Project Management in updating the GEF BD2 Tracking Tool
PWS / Eco- Compensation Specialist	1,000	8	<p>Output 1.5: Best Practice guidelines for scaling-up PWS</p> <p>Working closely with the Project Manager, International PWS specialist, National Legal, Regulatory and Policy Analysis Specialist, International Catchment Management Planning Specialist and others, the PWS/ Eco-Compensation Specialist will:</p> <ul style="list-style-type: none"> ▪ Facilitate a participatory process led by the provincial EPD and involving the key stakeholders in PWS demonstration activities towards the development of best practice guidelines highlighting the conditions under which PWS works most effectively in selected landscapes in China. ▪ Review the implementation of PWS demonstration activities in Wuma Valley and identify lessons learned ▪ Provide technical assistance for development of the guidelines, adopting a holistic approach to biodiversity conservation and sustainable land management that goes beyond the current emphasis on pollution control, and encompasses climate change adaptation ▪ Provide guidance on the harmonization of PWS within eco-compensation programmes and catchment management planning in order to achieve shared biodiversity conservation, ecosystem service delivery and livelihood objectives ▪ Provide input on strategy for upscaling and replication of PWS across the Chishui River Basin and other river basins in China
Communications Consultant	400	96	<p>Output 1.5: Best Practice guidelines for scaling-up PWS</p> <p>The consultant will work with a wide range of project staff, stakeholders and contractors across all outputs but especially 1.5 and 1.4 to ensure that the project has a major impact on awareness levels concerning PWS and sustainable watershed management across the scope of the project, including the demonstration watershed, riparian municipalities in Guizhou and across the whole CRB, including a wide range of sectors and target audiences. Key inputs will include:</p> <ul style="list-style-type: none"> ▪ Preparation and annual updating of the project's communication and awareness

Consultant	\$/ Person Week	Person Week	Tasks and Inputs
			<p>strategy</p> <ul style="list-style-type: none"> ▪ Baseline surveys and monitoring to determine the effectiveness of targeted awareness measures for specific audiences on specific issues, including women and minorities ▪ Engaging key target groups including decision-makers and private sector companies ▪ Coordinating the development and maintenance of the project website and uploading news on project activities and documents ▪ Leading relations with the media including press releases and on-site visits. ▪ Working with pilot PWS project managers to design, plan and deliver targeted awareness programmes to address specific watershed degradation issues (e.g. deforestation, soil erosion, pollution and waste disposal, etc.), to support sustainable watershed management and biodiversity conservation through the PWS pilots ▪ Working with the International Consultant on Business and Conservation Strategy to implement a strategy to engage the private sector in PWS in CRB ▪ Assisting in the organization of a Guizhou business forum meeting on the theme of PWS, sustainable watershed management and biodiversity conservation for the Chishui River Basin, aiming to raise awareness and promote engagement of the business community ▪ Publicizing the development, launch and uptake of the eco-labelling scheme for private sector involvement in PWS ▪ Logging information and reporting on awareness activities
International / Regional and global contracting			
International Biodiversity and Ecosystem Services Monitoring Specialist	3,000	6	<p>Output 1.2: Biodiversity and ES impacts of PWS monitored</p> <p>Working closely with the Project Manager, National Biodiversity and Ecosystem Services Monitoring Specialist and others, the International Biodiversity and Ecosystem Services Monitoring Specialist will:</p> <ul style="list-style-type: none"> ▪ Design and lead on providing training programmes to Guizhou EPD / EPB staff and other key stakeholders on biodiversity and ecosystem services monitoring and reporting procedures to support PWS interventions; ▪ Lead on defining and documenting EHI monitoring protocols for PWS demonstration sites; ▪ Provide technical assistance and quality control for establishment of EHI baselines for PWS demonstration sites. ▪ review the effectiveness of EHI for PWS monitoring in comparison with other indicator systems used for PWS internationally, and propose a standardized approach for inclusion in guidelines for upscaling and replicating PWS.
International PWS Specialist	3,000	6	<p>Output 1.5: Best Practice guidelines for scaling-up PWS</p> <p>Working closely with the Project Manager, national PWS/Eco-compensation specialist, National Legal, Regulatory and Policy Analysis Specialist, International Catchment Management Planning Specialist and others, the International PWS Specialist will:</p> <ul style="list-style-type: none"> ▪ Design and provide technical guidance and assistance for a participatory process led by the provincial EPD and involving the key stakeholders in PWS demonstration activities towards the development of best practice guidelines highlighting the conditions under which PWS works most effectively in selected landscapes in China. ▪ Review the implementation of PWS demonstration activities in Wuma Valley and identify lessons learned ▪ Provide technical advice for development of the guidelines, adopting a holistic approach to biodiversity conservation and sustainable land management that goes beyond the current emphasis on pollution control, and encompasses

Consultant	\$/ Person Week	Person Week	Tasks and Inputs
			<p>climate change adaptation</p> <ul style="list-style-type: none"> Provide technical advice on the harmonization of PWS within eco-compensation programmes and catchment management planning in order to achieve shared biodiversity conservation, ecosystem service delivery and livelihood objectives Provide input on strategy for upscaling and replication of PWS across the Chishui River Basin and other river basins in China
International Business and Conservation Strategy Development Specialist	3,000	6	<p>Output 1.4: Private Sector involvement in PWS Promoted</p> <p>Working closely with the Project Manager, national and international PWS/Eco-compensation specialists, Communications Consultant and others, the International PWS Specialist will:</p> <ul style="list-style-type: none"> Conduct a review of the potential for engaging the private sector in PWS initiatives in the Chishui River Basin, including SWOT analysis of related business sectors; Design a communications strategy for engaging the private sector in Public-Private Partnerships related to PWS agreements in the Chishui River Basin; Develop and implement a strategy to engage the private sector in PWS in CRB, as the principal end users and buyers of watershed ecosystem services. This will build on existing efforts by Guizhou EPD, WWF and other organizations, and provide incentive through the design and establishment of an MEP-endorsed eco-labelling scheme for participating companies. Develop a proposal for a Chishui business forum meeting to be convened by the project in order to raise awareness of PWS-related opportunities, including outline agenda, supporting documents and suggested participants list
Outcome 2			
Local / National contracting			
Gender and minority Empowerment Specialist	\$500	32	<p>Output 2.1: PWS Demonstration</p> <p>Working closely with the Project Manager, consultants and local stakeholders, the Specialist will:</p> <ul style="list-style-type: none"> Raise awareness and provide guidance and training to PWS TA subcontractors, provincial and municipal government agency and project staff on the benefits of gender and ethnic minority empowerment Provide guidance to project management, PWS TA subcontractors and local stakeholders regarding compliance with UNDP/GEF requirements for inclusion (see the ESSP and Stakeholder involvement Plan), equitable involvement in project implementation and sharing of benefits Review and provide input to project Biennial Work Plan updates on gender and minority participation in planned project activities in relation to perceived needs, seeking to ensure affirmative action for equitable involvement and benefit sharing Visit pilot communities in the demonstration sub-watershed annually to conduct an assessment of the actual levels of gender and minority disaggregated participation achieved during relevant project activities, and report to project management on the results, with recommendations for improvement. Document lessons learned and best practices for use in project management and outreach, in association with the project's communications consultant
Watershed Management and Biodiversity Conservation Specialist	\$1,000	16	<p>Output 2.4: Catchment Management Planning</p> <p>Working closely with the Project Manager, international CMP Specialist, provincial and local stakeholders and other consultants, the Specialist will:</p> <ul style="list-style-type: none"> Coordinate the development process for a multiple-stakeholder catchment management plan (CMP) that covers the whole Wuma catchment area, setting goals for biodiversity conservation, ecosystem service and sustainable

Consultant	\$/ Person Week	Person Week	Tasks and Inputs
			<p>livelihoods, zoning the watershed for different land uses, and identifying priorities to be addressed through a combination of mechanisms: PWS, harmonized eco-compensation scheme interventions (eg for reforestation) and enforcement of point source pollution sources.</p> <ul style="list-style-type: none"> ▪ The CMP will include a monitoring and review mechanism with indicators for measuring achievement of its objectives, incorporating the biodiversity and ecosystem service provision goals of the PWS pilot schemes, and EHI and fish monitoring approaches developed by the project. ▪ Facilitate the consultation process required to compile the CMP, provide technical guidance and quality control, and develop recommendations for replication to other watersheds within the Chishui River Basin and elsewhere in China ▪ Document lessons learned for project management and for inclusion in PWS guidelines.
International / Regional and global contracting			
International Catchment Management Planning Specialist	3,000	6	<p>Output 2.4: Catchment Management Planning</p> <p>Working closely with the Project Manager, national CMP Specialist and provincial and local government, and other stakeholders, the specialist will:</p> <ul style="list-style-type: none"> ▪ Share international examples and guidelines for catchment management planning to provincial and local government agencies and project staff; ▪ Provide technical guidance on the information management requirements for formulating a CMP for Wuma Watershed; ▪ Provide technical guidance and training on the consultation process, structure and contents of a CMP for Wuma Watershed, including monitoring and review aspects. ▪ Provide initial drafting input, including a full outline of the CMP, ensuring integration of PWS, Eco-compensation scheme and regulatory contributions towards sustainable watershed management.

PART IV: Stakeholder Involvement Plan

Information dissemination and consultation during the PPG

261. The PPG phase included consultations with the project's key stakeholders at the national, provincial and local levels. A field trip was carried out in Guizhou Province, visiting all four municipalities in the Chishui River Basin, convening stakeholder meetings including briefings about PWS and the project in Guiyang and in each municipality, including downstream industry representatives. The demonstration sub-watershed (Wuma) was visited and the proposed communities for involvement in the demonstration activities were investigated in detail by the local consultants, including gender issues, and their willingness to participate in the project's PWS demonstration activities was confirmed (see record of community consultations in **Annex 5**). All related government institutions were consulted during project development, as were research and academic institutions and NGOs on specific issues. Stakeholder consultation meetings were convened at the provincial level, including presentation and review of project activities in the draft project document. Project design was a participatory process, in line with UNDP's and GEF's requirements.

Approach to stakeholder participation

262. The project's approach to stakeholder involvement and participation is premised on the principles outlined in **Table 9** below.

Table 9: Stakeholder participation principles

Principle	Stakeholder participation will:
Value Adding	Be an essential means of adding value to the project
Inclusivity	Include all relevant stakeholders
Accessibility	Be accessible and promote involvement in decision-making process
Transparency	Be based on transparency and fair access to information; main provisions of the project's plans and results will be published in local mass-media
Fairness	Ensure that all stakeholders are treated with respect in a fair and unbiased way
Accountability	Be based on a commitment to accountability by all stakeholders
Constructive	Seek to manage conflict positively and to promote the public interest
Redress	Seek to redress inequity and injustice
Capacity building	Seek to develop the capacity of all stakeholders
Needs Based	Be based on the perceived and real needs of all stakeholders
Flexible	Be flexibly designed and implemented
Rational and Coordinated	Be rationally planned and coordinated, and not on an <i>ad hoc</i> basis
Excellence	Be subject to on-going reflection and improvement

263. The project will focus stakeholder engagement at two levels of intervention: (i) working with national, provincial and local public institutions and agencies in order to strengthen their capacity to consolidate, expand and effectively manage the PA System and to align project activities with government's strategic priorities; and (ii) working directly with civil society organisations, formal and informal resource users (rights holders), private landowners and individuals to strengthen collaborative relationships for participatory PWS schemes, mitigate impacts of sectoral practices, and optimise the benefits arising from project activities.

Stakeholder involvement plan

264. During the project preparation stage, a preliminary stakeholder analysis was undertaken in order to identify key stakeholders, assess their interests in the project and define their roles and responsibilities in project implementation. This included the collection of baseline socio-economic information on the proposed pilot communities, informing them about the project's planned PWS activities and confirming their willingness to participate in demonstration activities (see **Annex 5**). A full Stakeholder Involvement Plan remains to be prepared upon project inception. **Table 2** in the Stakeholder Analysis section of the Situation Analysis describes the major categories of stakeholders identified, and their roles envisaged in the project.

265. The project proposes a mechanism to achieve broad-based stakeholder involvement in the project preparation and implementation processes. Stakeholder participation will include the following components (see **Table 10**):

- Project Steering Committee (PSC)
- Provincial Project Coordination Committee
- Stakeholder Committees at site level

Table 10. Suggested members of PSC, PPCC and Local Stakeholder Committees:

Project Steering Committee (PSC)	Provincial Project Coordination Committee	Stakeholder Committees (for demonstration area)
Ministry of Environmental Protection (MEP); MEP – FECO; Ministry of Finance (MoF); UNDP (as GEF IA); Guizhou Environmental Protection Department; Invited experts as needed.	Provincial Government Agencies: Forestry, water resources, development reform, agriculture, tourism, finance, etc. Local Government & Stakeholders: Bijie, Chishui, Renhuai and Zunyi Municipalities, Wuma Township, community partners, private sector Technical Experts: Universities, institutes, NGOs, etc.	Local community leaders; Contracted staff; Local Government (Township); Private sector organizations and businesses; Invited experts as needed.

Long-term stakeholder participation

266. The project will provide the following opportunities for long-term participation of all stakeholders, with a special emphasis on the active participation of local communities, and enhancement of inter-sectoral coordination for PWS as part of sustainable watershed management:

267. Decision-making – through the establishment of the Project Steering Committee. The establishment of the structure will follow a participatory and transparent process involving the confirmation of all key project stakeholders; conducting one-to-one consultations with all stakeholders; development of Terms of Reference and ground-rules; inception meeting to agree on the constitution of the PSC.

268. Capacity building – at systemic, institutional and individual levels – is one of the key strategic interventions of the project and will target all stakeholders that have the potential to be involved in brokering, implementing and/or monitoring management agreements related to activities in and around the reserves. The project will target especially organizations operating at the community level to enable them to actively participate in developing and implementing PWS agreements. Women and indigenous / ethnic minority groups will be proactively considered for capacity building activities based on specific needs assessments.

269. Communication - will include the participatory development of an integrated communication strategy. The communication strategy will be based on the following key principles:

- providing information to all stakeholders;
- promoting dialogue between all stakeholders;
- promoting access to information.

270. The project's design incorporates several features to ensure on-going and effective stakeholder participation in the project's implementation. The mechanisms to facilitate involvement and active participation of different stakeholder in project implementation will comprise a number of different components:

i) Project inception workshop

273. The project will be launched by a multi-stakeholder workshop. This workshop will provide an opportunity to provide all stakeholders with the most updated information on the project, refine and confirm the work plan, and will establish a basis for further consultation as the project's implementation commences.

ii) Constitution of the Project Steering Committee (PSC)

274. The PSC will be constituted to ensure consistent representation of the key stakeholders throughout the project's implementation. The representation, and broad terms of reference, of the PSC are described in the Management Arrangements in Part III of the Project Document. Membership has been restricted to key stakeholders in order to facilitate efficient decision-making, compensated by the addition of the Provincial Project Coordination Committee to enable input from a wide range of provincial stakeholders.

iii) Establishment of the National Project Management Office (NPMO)

275. The NPMO will take direct operational responsibility for facilitating stakeholder involvement and ensuring increased local ownership of the project and its results. The NPMO will be located in MEP-FECO, and a Sub-Project Management Office in the Guizhou Environmental Protection Department in Guiyang to ensure coordination among key stakeholder organizations at the provincial level during the project period.

iv) Constitution of the Provincial Project Coordination Committee (PPCC)

276. The PPCC will be constituted to ensure broad representation of stakeholders at provincial and local levels throughout the project's implementation. The representation and general functions of the PPCC are described in the Management Arrangements in Part III of the Project Document.

v) Establishment of local working groups

277. At the activity level, local or specialist working groups (e.g., PWS outreach team, sustainable agriculture extension team, gender and minority empowerment team, ecosystem services and biodiversity monitoring team, catchment management plan development team) will be established as required, to facilitate the active participation of affected institutions, organisations and individuals in the implementation of the respective project activities. Different stakeholder groups may take the lead in each of the working groups, depending on their respective mandates. There will be equitable representation of women and ethnic minorities on site stakeholder committees and groups related to community co-management, alternative livelihoods and awareness activities.

vi) Project communications

278. The project will develop, implement and annually update a communications strategy to ensure that all stakeholders are informed on an on-going basis about: the project's objectives; the project's activities; overall project progress; and the opportunities for stakeholders' involvement in various aspects of the project's implementation.

vii) Implementation arrangements

279. A major part of the demonstration activities planned under Component 2 of this project have specifically been designed to directly involve and provide benefits to local stakeholders, based on consultations conducted during the PPG phase in which the willingness of the selected pilot communities was confirmed (see **Annex 5**), and which will apply the principle of free prior and informed consent to the establishment of PWS agreements. In fact, the whole ethos of the PWS intervention is to enable financial and technical support to impoverished upstream farming communities through facilitating the development of agreements with downstream users of ecosystem services (focusing on water flows and quality). However, this is not a poverty alleviation project – in return the pilot communities (and eventually all communities in the watershed, **including ethnic minority communities**) must agree – following transparent and truthful explanation of the consequences - to changes towards more sustainable land use, through re-forestation, changes in crops, slope and soil protection measures, etc. In the short term, the participating communities will receive assistance for making such changes, which will also include the creation or development of new opportunities for sustainable or alternative livelihood options based on feasibility assessments. In the long term, the combination of secure, sustainable livelihoods coupled with improved environmental conditions should lead to widespread socio-economic improvements, breaking the downward spiral of poverty and environmental degradation. Women and indigenous / minority groups will be proactively considered for participation in sustainable livelihood activities based on these assessments. **This will include the prioritization of ethnic minority communities for replication of the PWS pilots, in conjunction with the consideration of environmental and feasibility criteria.**

viii) Formalizing cooperative governance structures

280. The project will actively seek to formalize cooperative governance structures at the level of communities and townships, to ensure the on-going participation of local stakeholders in the planning and management of demonstration activities for sustainable watershed management according to the PWS agreements.

ix) Capacity building

281. All project activities are strategically focused on building capacity – at systemic, institutional and individual levels – of the key stakeholder groups to ensure sustainability of initial project investments. The project will also seek to raise public awareness of the value and importance of the ecosystem services and biodiversity secured through sustainable watershed management and effective habitat conservation and rehabilitation.

Coordination with related initiatives

282. The current project is the only planned national PWS project in China financed by GEF. However, linkages and synergies will be sought through coordination with the GEF projects listed in **Table 11** below.

Table 11. Coordination and collaboration with Related GEF Financed Initiatives

GEF Financed Initiatives / Interventions	How collaboration with the project will be ensured
UNDP/GEF CBPF Priority Institutional Strengthening and Capacity Development to Implement the China Biodiversity Partnership and Framework for Action ⁸⁶	<p>Implementation of the present project will significantly contribute to achievement of various CBPF results described below. Coordination will be achieved through review of opportunities for synergies and shared learning at PSC level, as both MEP and UNDP are on the PSCs for both projects. Cross representation of NPDs and Project Managers at PSC meetings for the two projects is suggested. UNDP CO should facilitate such cross-representation.</p> <p>(1) the project will leverage private investment for biodiversity conservation through the PWS mechanism, and therefore increase financial flows to biodiversity conservation, contributing to result 4 “Financial flows to biodiversity conservation increase over current baseline”; (2) As buyers and sellers of eco-services in pilots, communities and private sector’s roles in biodiversity will be significantly strengthened compared with the current government-dominating picture, contributing to Result 6 “Communities, NGOs and private sector play an adequate role in biodiversity conservation”; (3) By encouraging private investment in organic farming of cash crops in targeted river basins, local livelihoods will be improved. Biodiversity conservation and poverty alleviation activities will become more mutually supportive, contributing to Result 13 “Biodiversity conservation and poverty alleviation programmes in China are mutually supportive”; (4) A critical consideration of the project is to facilitate land use change towards sustainable management through various project activities, to minimise anthropogenic damage to habitats, thus conserve biodiversity, contributing to Result 21 “Land-use planning and management systems contribute effectively to conserving biodiversity”.</p>
UNDP/GEF CBPF Mainstreams of Life - Wetland PA System Strengthening Programme and its national project: CBPF: Strengthening the management effectiveness of the sub-system of wetland protected areas for conservation of globally significant biodiversity	<p>The present project will complement the UNDP/GEF CBPF-Main Streams of Life Programme through the development of an enabling framework for PWS as well as establishment of actual financing mechanisms. These are likely to have application for financing conservation in and around wetland nature reserves (the MSL Programme focuses in strengthening the wetland PA system) and strengthening national policy for sustainable financing of wetland conservation in line with the national project under the MSL Programme. The introduction of sustainable watershed management supported by PWS can potentially play a huge role nationwide in reducing the external pressures on both river systems and wetland PAs, thus complementing the MSL programme.</p> <p>Coordination with the CBPF MSL National Project is proposed through cross-representation of the NPDs or Project Managers at respective PSC meetings. UNDP CO should facilitate such cross-representation.</p>

283. In addition to the above GEF projects, the present project will also closely coordinate its work with other relevant initiatives.

284. First, the project is closely related to an initiative supported by the Asian Development Bank (ADB) geared to developing national eco-compensation policy legislation

⁸⁶ See: http://www.undp.org/content/china/en/home/operations/projects/environment_and_energy/priority-institutional-strengthening-and-capacity-development-to.html

as well as related knowledge products on the ecosystem market in China. WWF with a \$ 50,000 grant from ADB is working on the project entitled “*Public-Private-Partnership: Pilot Development of a Mechanism for Payment for Watershed Services in Chishui Watershed*”. The present project will build directly on the initial efforts supported by ADB and WWF to engage with local stakeholders to start developing a foundation for a viable PWS mechanism in the watershed. Close coordination has been developed during the PPG phase, when discussions were held with ADB. Subsequent collaboration will be ensured through direct contact between the PMO and the ADB/WWF initiative, and invitation of representatives to the PSC meetings. Collaboration with WWF going forward could be significant in view of the organization’s past work in the area, which established an MoU between WWF China and Guizhou Environmental Protection Department (2011-2015) prioritizing PES technical support; and initiation of an annual meeting mechanism on eco-environmental protection of Chishui River among three provinces in April 2011.

285. In addition, ADB is financing a 12 month project from January 2014 entitled: *Development of Public-Private Funding Mechanism for Chishui Watershed Protection*. Local implementation will be led by Guizhou International Cooperation Center for Environmental Protection. Coordination with this initiative will be achieved through Guizhou EPD as the project’s provincial level executing agency.

286. Integrated river basin management in the Chishui River Basin is an important part of *the EU-China River Basin Management Programme* (RBMP). The vision of the RBMP is to make a significant contribution to China’s national goals for the water sector and achieve “sustainable management and use of China’s water resources that are compatible with socio-economic development”. The RBMP is structured in five components. The component of Yangtze River Integrated River Basin Management is working in Chishui River which has been chosen as a pilot site to promote and replicate policies, plans and measures for integrated river basin management. The GEF supported project builds on experiences and information produced through the RBMP. Moreover, it will add significant value to the ongoing initiative by realising PWS as a finance mechanism which includes the private sector as well as poor farming communities in negotiated transactions for the delivery of properly valued watershed services as well as for biodiversity conservation.

287. The Nature Conservancy (TNC) Yangtze team aims to safeguard the vitality of the Yangtze River basin by preserving its biodiversity and ecosystem services through mitigating the impacts of hydropower and flood control infrastructure, protecting fish populations and managing fishery resources, including multi-stakeholder conservation strategies and hydropower sustainability funds⁸⁷. Specific activities relevant to the present project include fish conservation and monitoring. First, the *Conservation Action Plan of the Rare and Endemic Fish National Nature Reserve at the Upper Yangtze River*. Working with Southwest University and the Yangtze Fishery Commission, eight key targets, nine key threats and fifty-eight actions have been recognized. Due to the importance of its habitats and fish species, the Chishui River Ecosystem is one of the eight key targets for conservation attention, as well as being a priority for the present project.

288. Secondly, a Monitoring Protocol for fish populations has been developed in order to standardize the monitoring methods used by different agencies and institutes in the Yangtze River Basin and facilitate scientific assessments. Working with the Yangtze River Fisheries

⁸⁷ <http://www.greatriverspartnership.org/en-us/Pages/default.aspx>

Research Institute, a Handbook for quantitative sampling of fish populations in the Yangtze and its major tributaries has been published, so as to standardize monitoring methods on river fishes, including sampling tools, operational steps and methods. Capacity development training and on-site practice of this monitoring handbook are promoted and expected with partners cooperation. Such collaboration would be valuable for the present project, as a contribution to capacity development on the monitoring of globally significant biodiversity in the Chishui River Basin, with direct relevance to the impacts of PWS schemes.

289. Thirdly, by applying an Eco-Regional Assessment tool, threats for freshwater ecosystem and biodiversity have been analyzed and 24 priority protected areas along the Yangtze River were recognized in order to provide a scientific baseline for decision making on conservation actions. The application of this approach to the Chishui River Basin has potential to identify key areas for conservation attention through the upscaling and replication of PWS schemes, eco-compensation programmes for sustainable watershed management. TNC is also in the process of identifying pilot sites for climate change adaptation / mitigation analysis, with potential for collaboration with the present project.

290. Finally, both TNC and WWF are partners in the Natural Capital Project <http://www.naturalcapitalproject.org/> with experience of developing and applying tools such as InVEST to facilitate PES and PWS approaches towards biodiversity conservation and sustainable land management, and have the technical capacity to assist the project.

Project Annexes

Annex 1. Endemic Fishes of the Upper Yangtze River in Chishui River

Species	Class of protection	Endangered category	Unique in CRB
<i>Acipenser dabryanus</i>	I	CR	+
<i>Sinibrama change</i>		NE	+
<i>Psephurus gladius</i>	II	EN	
<i>Ancherythraculter kurematsui</i>		NE	+
<i>Ancherythraculter wangi</i>		NE	+
<i>Ancherythraculter nigrocanda</i>		NE	+
<i>Hemiculter tchangii</i>		NE	+
<i>Schizothorax prenanti</i>		NE	
<i>Schizothorax chongi</i>		NE	+
<i>Schizothorax davidi</i>		NE	+
<i>Procypris rabaudi</i>	II	VU	+
<i>Sinogastromyzon szechuanensis</i>		NE	
<i>Sinogastromyzon sichangensis</i>		NE	
<i>Euchiloglanis davidi</i>		NE	
<i>Paracobitis potanini</i>		NE	
<i>Botia reevesae</i>		NE	+
<i>Parabotia bimaculata</i>		NE	+
<i>Leptobotia elongate</i>		VU	+
<i>Leptobotia rubrilabris</i>		NE	+
<i>Hemimyzon abbreviate</i>		NE	
<i>Metahomaloptera omeiensis omeiensis</i>		NE	
<i>Megalobrama pellegrini</i>		NE	
<i>Coreius guichenoti</i>		NE	
<i>Rhinogobio cylindricus</i>		NE	
<i>Rhinogobio ventralis</i>		NE	
<i>Platysmacheilus nudiventris</i>		NE	
<i>Gobiobotia boulengeri</i>		NE	+
<i>Sinilabeo rendahli</i>		NE	
<i>Sinocrossocheilus guizhouensis</i>		NE	+

Source: Dan Wenhong and Peng Sitao. 2013. Report of Payment for Watershed Services. Unpublished Report. Original data sourced from: WANG Zhongsuo, JIANG Luguang, HUANG Mingjie, etc. Biodiversity Status and its Conservation Strategy in the Chishui River Basin [J]. Resources and Environment in the Yangtze Basin. Vol.16 No.2, Mar.2007(175-180).

Annex 2. Protected Areas of the Chishui River Basin

Table 1. List of National Nature Reserves in Chishui River Basin

No	Name	Location	Area(ha)	Protected Objects	Time of Initial Construction	Administration of Approval of Initial Construction	Level, Time and Administration of Approval
1	Guizhou Chishui <i>Alsophila Spinulosa</i> Nature Reserve	Chishui	13300	<i>Alsophila spinulosa</i> , <i>Camellia Luteoflora</i> and Wild Plants and Forest Ecology	Oct,1984	Guizhou Provincial People's Congress	National, Oct,1992 State Council
2	Guizhou Xishui National Nature Reserve of Mid-subtropics Ever-green Broad Leaves	Xishui County	51911	Wild plants and Animals	Sept,1994	Guizhou Provincial People's Congress	National, Dec,1997 State Council
3	National Nature Reserve of Rare and Endemic Fish in Yangtze River Upper Stream Area	Chishui	6425	Rare and Endemic Fishes	Oct,2000	Xishui County People's Congress	National, 2005 State Council
4	Sichuan Huagaoxi National Nature Reserve	XV Yong County	23827	Wild Plants	Oct,1998	Sichuan Provincial People's Congress	National, 2003 State Council

The data of Nature Reserves(from Tab 1-2 to 1-5) are sourced from the websites of EPD of Guizhou, Sichuan and Yunnan:

Guizhou Environmental Protection Department . <http://www.gzhjbh.gov.cn/zrst/zrbhq/41711.shtml>

Sichuan Environmental Protection Department. http://www.schj.gov.cn/xgk/auto355/201303/t20130330_1923.html?keywords

Yunnan Environmental Protection Department. http://www.ynepb.gov.cn/zrst/zrbhq/201210/t20121009_35981.html

Table 2. List of Provincial National Nature Reserves in Chishui River Basin

No	Name	Location	Area(ha)	Protected Objects	Time of Initial Construction	Administration of Approval of Initial Construction	Level, Time and Administration of Approval
1	Gulin Huangjing Nature Reserve	Gulin County	36522	Forest Ecosystem	Mar, 2002	Sichuan Provincial People's Congress	Provincial, 2011

Table 3. List of City- Level Nature Reserves in Chishui River Basin

No	Name	Location	Area(ha)	Protected Objects	Time of Initial Construction	Administration of Approval of Initial Construction	Level, Time and Administration of Approval
1	Tongzi Baijing Nature Reserve	Tongzi County (Guizhou)	2542	Forest Ecosystem	1985	People's Congress of Zunyi City	City-level, 2005
2	Tianxiandong Nature Reserve	Naxi, Luzhou City (Sichuan)	5230	Forest Ecosystem	1998	Luzhou City People's Congress	City-level
3	Niutan White Crane Nature Reserve	Lu County (Sichuan)	1000	Wild Animals	2000	City People's Congress	City-level
4	Fubao Nature Reserve	Hejiang County (Sichuan)	38000	Forest Ecosystem	1989	City People's Congress	City-level
5	Nantan White Crane Nature Reserve	Hejiang County (Sichuan)	512	Wild Animals	2004	City People's Congress	City-level
6	Erlang Nature Reserve	Gulin County (Sichuan)	1500	Forest Ecosystem	2000	City People's Congress	City-level
7	Yuanjiawan Nature Reserve	Zhenxiong County (Yunnan)	1634	Forest Ecosystem and Wild Plants and Animals		City People's Congress	City-level, 2003
8	Daxueshan Nature Reserve	Weixin County (Yunnan)	2153.3	Forest Ecosystem and Wild Plants and Animals		City People's Congress	City-level, 2003
9	Yina Nature Reserve	Zhenxiong County (Yunnan)	685	Forest Ecosystem and Wild Plants and Animals		City People's Congress	City-level, 2003

Table 4. List of Selected County-Level Nature Reserves in Guizhou Part of Chishui River Basin

No	Name	Location	Area(ha)	Protected Objects	Time of Initial Construction	Administration of Approval of Initial Construction	Level, Time and Administration of Approval
1	Zunyi Sunjia Dalin Nature Reserve	Zunyi Hongguan (Guizhou)	3000	Wild plants and Animals	2004, 11	Zunyi County People's Congress	County-level, Nov,2004
2	Xishui Big Cedar Nature Reserve	Taiping Village, Town of Donghuang, Xishui (Guizhou)	9	Chinese Cedar and its Environment	200003	Xishui County People's Congress	County-level, Mar, 2000
3	Chishui Natural Forest Nature Reserve	Chishui City (Guizhou)	28000	Mid-subtropics Ever-green Broad Leaves Forest	199012	Chishui County People's Congress	County-level, Dec, 1990
4	Bijie Zhaozi Mountain Nature Reserve	Biejie Zhaozi Mountain (Guizhou)	2513	Forest Ecosystem	200112	Bijie People's Congress	County-level, Dec, 2001
5	Lengshuihe Nature Reserve	Jinsha County (Guizhou)	8133	Mid-subtropics Ever-green Broad Leaves Forest	1992	Jinsha People's Congress	County-level,1992
6	Jinsha Fokienia Hodginsii Nature Reserve	Jinsha County (Guizhou)	150	Fokienia Hodginsii and its Environment	1999	Jinsha People's Congress	County-level,1999

Source: Dan Wenhong and Peng Sitao. 2013. Report of Payment for Watershed Services. Unpublished Report.

Annex 3. Institutional Functions of Key Stakeholder Agencies

National Institutional Framework for Watershed Management

Watershed management involves several government agencies in China such as the:
Ministry of Water Resources (MWR),
Ministry of Environmental Protection (MEP),
State Forestry Administration (SFA),
Ministry of Agriculture (MOA),
National Development and Reform Commission (NDRC),
Ministry of Finance (MOF),
Ministry of Land and Resources (MLR),
State Tourism Administration (STA),

Changjiang Water Resources Authority

The mission and functions of the Changjiang Water Resources Authority under the MWR are as follows⁸⁸:

- To organize and supervise the enforcement of Water Law and other relevant laws; to exercise the water administrative functions as enacted in the Water Law and authorized by the MWR.
- Organize preparation of Basin master plan and special-themed plans, and oversee their implementation.
- Deploy preparatory work and technical review for the planned projects.
- Integrated water resources management in the Basin.
- Flood operation; guidance, coordination and supervision on flood control and drought relief activities in the Basin.
- Water resources protection in the Basin.
- Construction and management of central government funded water projects; guidance and supervision for river development projects.
- Unified management of river sand extraction, including supervision, coordination and guidance.
- Organize implementation of soil conservation in priority areas, including soil loss control, dynamic monitoring, supervision and guidance.
- Operation and management of State owned assets of water projects.

Provincial government agencies having a role in Chishui watershed management

The provincial governments and county governments have their own counterpart agencies. For example, Guizhou Provincial Government has its Environmental Protection Department (EPD), and Renhuai City has its Environmental Protection Bureau (EPB). The following agencies have responsibilities regarding the management of the Chishui River Basin management. They have counterpart agencies in Yunnan and Sichuan Provinces with similar responsibilities related to national and their respective provincial legislation.

Guizhou Provincial Environmental Protection Department (EPD)

⁸⁸ Further information available at: <http://eng.cjw.gov.cn/>

Guizhou EPD is in charge of environmental management of Chishui River Basin (Guizhou section), which includes the following aspects⁸⁹:

- Carry out the national environmental laws and standards in Chishui River Basin;
- Draft the provincial regulations and standards on environmental protection in Chishui River Basin;
- Issue and publish the status of the environmental situation in the Chishui River Basin;
- Draft and implement the environmental protection plan in the Chishui River Basin;
- Draft the environmental function zoning plan in the Chishui River Basin;
- Manage the environmental protection funds of various kinds;
- Supervise water pollution control in the Chishui River Basin;
- Supervise the nature reserves;
- Review and approve the environmental impacts assessment reports of investment;
- Carry out the environmental monitoring and statistics;

Guizhou Provincial Department of Water Resources (DWR)

Guizhou DWR is in charge of water resources management of the Chishui River Basin, which includes the following aspects⁹⁰:

- Carry out the national laws on water resources;
- Draft the provincial water resources plan, including water allocation, water supply, water utilization, and flood/drought control.
- Implement the water drawing permit policy, and water resources fee policy;
- Issue and publish the provincial water resources bulletin;
- Supervise the hydrology work;
- Draft the water saving policy;
- Draft the water resource protection plan;
- Draft the water function zoning plan;
- Monitor the water quantity and water quality of rivers and lakes;
- Mediate the water conflicts between regions;
- Propose water price, tax, credit and financial policies;
- Direct agricultural water use and rural drinking water issues;
- Manage the water and soil conservation: plan, monitoring, supervision, and control;

Guizhou Provincial Agricultural Commission (PAC)

Guizhou PAC is in charge of the agricultural management including crop farming, animal raising, fishery and aqua-culture, etc. with the following responsibilities in the Chishui River Basin⁹¹:

- Carry out the national agricultural laws and policies;
- Draft the agricultural development plan;
- Supervise the land tenure transfer and mediate the land conflicts;
- Propose the agricultural structural change;
- Assess the agricultural products quality: monitoring and standards;

⁸⁹ Guizhou Provincial Environmental Protection Department official website:

<http://www.gzhjbh.gov.cn/jgk/jgzz/21621.shtml>

⁹⁰ Guizhou Provincial Department of Water Resources official website:

<http://www.gzmr.gov.cn/NodeNews.aspx?NodeID=101>, and http://www.110.com/fagui/law_186487.html

⁹¹ Guizhou Provincial Agricultural Commission official website:

http://www.qagri.gov.cn/Sites/MainSite/List_2_47237.html

- Extend agricultural technologies;
- Train rural labors for both agri- and non-agricultural skills;
- Protect the agricultural resources including wild aquatic resources;
- Draft agriculture and environmental protection plan,

Guizhou Provincial Fishery Bureau affiliated with Guizhou PAC is in charge of the protection of the wild aquatic resources, and manage the Chishui River National Nature Reserve for Endangered and Unique Fishes in Upper Yangtze River Basin (Guizhou section).

Guizhou Provincial Forestry Department (FD)

Guizhou FD is in charge of forestry management, wetland management, and wild animal and plants management with the following aspects⁹²:

- Carry out the national forestry laws and policies;
- Draft and implement provincial forestry plan;
- Manage the provincial forestry fund;
- Organize tree planting and forest protection programs for soil erosion prevention etc.
- Supervise the natural forest protection programs, sloping land conversion programs, and other forest and environment programs;
- Manage the forest and wild animals, and wetland nature reserves,
- Issue the list of protected animals and plants;

Guizhou Provincial Financial Department (FiD)

Guizhou FiD is in charge of the financial management of Guizhou provincial government, and it has much to do with the eco-compensation programs of the government. The main responsibilities of Guizhou FiD include⁹³:

- Carry out the public financial transfer of the national government, and propose the provincial financial balance;
- Manage government subsidies, and special funds;
- Manage the Integrated Agricultural Development Program;
- Manage the grant and loan from the international financial organizations and foreign governments;
- Assess the performance of government investment;

Guizhou FiD, Guizhou EPD, Guizhou DWR, and People's Bank of China Guiyang Branch jointly designed and eco-compensation program in the Qingshui River Basin in 2010, and the program was launched by the Guizhou Provincial Government on 1 January 2011.

Guizhou FiD, Guizhou EPD, and Guizhou DWR jointly designed an eco-compensation program in the Hongfeng Lake watershed in 2012, and the program was launched by Guizhou Provincial Government on 1 September 2012.

Guizhou Provincial Development and Reform Commission (DRC)

Guizhou DRC is in charge of master plan and coordination of all the other sectors of Guizhou province, with the following responsibilities⁹⁴:

⁹² Guizhou Provincial Forestry Department official website: <http://www.gzforestry.gov.cn/pages/neiye.aspx?fenlei=54>

⁹³ Guizhou Provincial Financial Department official website: <http://www.gzcz.gov.cn/xxgk/zzjg/jgjj/index.shtml>

- Draft the economic and social development master plan, long-term plan, five-year plan, and special plans for pillar industries and hi-technologies;
- Balance the development among regions;
- Approve government investment projects;
- Manage circular economy and eco-compensation: policies and programs

Guizhou Provincial Tourism Administration (PTA)

Guizhou PTA is in charge of tourism management in Guizhou province. It's responsibilities include⁹⁵:

- Carry out the national laws and policies and draft the provincial tourism policies and development plans;
- Manage the tourism sites;
- Supervise the rural tourism and eco-tourism;

Local governments in Guizhou having a role in Chishui watershed management

In addition to the provincial agencies of the above-mentioned sectors, the municipal and county/city governments in the Chishui River Basin also play important roles in the watershed management.

Below the Guizhou Provincial Government in the Chishui River Basin, there are Bijie Municipal Government, Zunyi Municipal Government, and Renhuai City Government. There are ten county level governments in the Chishui River Basin, of which three counties or districts are in Bijie Municipality, and six are in Zunyi Municipality. Below Bijie Municipal Government, there are Jinsha County Government, Dafang County Government, and Qixingguan District Government. Below Zunyi Municipal Government, there are Honghuagang District Government, Huichuan District Government, Zunyi County Government, Tongzi County Government, Xishui County Government, and Chishui City Government.

According to China's Environmental Protection Law, a local government is responsible for the environmental quality and protection within its jurisdiction area. This means that Bijie and Zunyi Municipal Governments and Renhuai City Government are responsible for the environmental quality and protection in their respective areas.

The provincial government agencies make the policies, standards and regulations regarding the Chishui River, and provide some funds. The local governments implement programs with provincial funds and/or their own financial resources to meet the policy targets and environmental standards.

⁹⁴ Guizhou Development and Reform Commission official website: <http://www.gzdpc.gov.cn/col/col395/index.html>

⁹⁵ Guizhou Provincial Tourism Administration official website: <http://www.gztour.gov.cn/daohang.asp>

Annex 4. Additional Information on Eco-compensation Schemes

Eco-compensation schemes in Guizhou

There have been two eco-compensation schemes initiated by the Guizhou Provincial Government up to now. One is the Qingshui River Eco-compensation Program, and the other is the Hongfeng Lake Basin Eco-compensation Program.

Qingshui River Eco-compensation Program

This program was proposed by Guizhou Provincial Environmental Protection Department (EPD), Guizhou Provincial Financial Department, Guizhou Provincial Department of Water Resources (DWR), and China People's Bank Guiyang Branch, and it was approved in 2009 and formally launched in 2011 by Guizhou Provincial Government.

The Qingshui River runs from Qiannan Municipality to the downstream Qiandongnan Municipality in southeastern Guizhou Province. If the upstream Qiannan has river water which is worse than the specified quality standard at the section bordering downstream Qiandongnan, Qiannan will have to pay a compensation levy to the Provincial Government (30%) and to Qiandongnan Municipal Government (70%) at the following rates: Total phosphorus: CNY 3600/ton; and Fluoride: CNY 6000/ton.

Guizhou EPD is responsible for monitoring the water quality, and Guizhou DWR is responsible for monitoring the water quantity. Guizhou Financial Department is responsible for levying the compensation. Upstream Qiannan compensated downstream Qiandongnan CNY5.5 million in 2010 in the pilot phase of the program.

Water pollution in the Qingshui River has been reduced significantly after the program was implemented. The total phosphorus concentration at the bordering water section has decreased from 15.23 mg/L in 2008 to 3.87 mg/l in 2011, and the fluoride concentration decreased from 3.03 mg/lL in 2008 to 1.94 mg/L in 2011 according to the monitoring data of the Guizhou EPD.

Hongfeng Lake Basin Eco-compensation Program

This Program was proposed in 2007 by Guizhou EPD, Guizhou DWR, and Guizhou Financial Department, and was formally launched in 2012 by Guizhou Provincial Government.

Hongfeng Lake is the water source for drinking water supply to Guiyang, the capital city of Guizhou Province. There are two major rivers running from Anshun Municipality into the Hongfeng Lake in Guiyang Municipality, i.e. Yangchang River, and Taohuayuan River.

The target water quality is Class III of China Surface Water Standard GB3838-2002. The water quality of the intake water sections is monitored by the Guizhou EPD, and its quantity monitored by Guizhou DWR. Guizhou Financial Department will manage the cash flow of compensation.

If the water running into the lake is better than Class III, then downstream Guiyang will pay compensation to upstream Anshun. If the water running into the lake is worse than Class III, then upstream Anshun will pay compensation to downstream Guiyang. The compensation rates are CNY 4000/ton for COD, CNY 20,000/ton for NH₄-N, and CNY 20,000/ton for total phosphorus.

Monitoring of water quality has shown mixed results. The concentration of total phosphorus decreased from 0.099 mg/L in 2008 to 0.083 mg/L in 2009, but the concentration of ammonium nitrogen (NH₄-N) increased from 0.083 mg/L in 2008 to 0.164 mg/L in 2009.

Eco-compensation schemes in other provinces

Xin'an River Eco-compensation Program

Xin'an River originates in Xiuning County under the administration of Huangshan Municipality of Anhui Province. Flowing west-east through Anhui and Zhejiang, Xin'an River has a total length of 358 km and a watershed area of 11,000km². It flows into Zhejiang Province at Jiekou Town, Shexian County of Anhui Province and through Qiandao Lake, Fuchun River and Qiantang River into the East China Sea. Xin'an River has a main stream section of 242km in Anhui Province and a watershed area of 6,261 km², accounting for 55% of the total watershed area. Anhui water flowing into Qiandao Lake contributes more than 60% of the total inflow into the lake.

In March and September 2011, the Ministry of Finance and the Ministry of Environmental Protection successively issued the Implementation Plan for starting the Water Environment Compensation Pilot Project in Xin'an River Watershed, symbolizing the official commencement of the implementation of China's first inter-provincial watershed eco-compensation mechanism⁹⁶.

The basic principle to be followed in such projects is that responsibilities shall be clearly defined to enable all parties to assume their responsibilities; the local governments will play a principal role while the central government will fulfill its duties of supervision and management; compensation will be made based on the monitoring results to facilitate pollution control.

The Xin'an River Watershed Water Environment Compensation fund was established jointly by the central finance and Anhui and Zhejiang, with the central finance contributing CNY 300 million while Zhejiang and Anhui each contributed CNY 100 million. According to the Plan, the Ministry of Environmental Protection will organize Anhui and Zhejiang to jointly monitor the inter-provincial water quality and assess the water quality along a cross section at the provincial border as the basic standard. If the water quality provided by Anhui is better than the basic standard, Zhejiang will provide a compensation fund of CNY 100 million to Anhui. On the other hand, if the water quality provided by Anhui is worse than the basic standard, Anhui will provide a compensation fund of CNY 100 million to Zhejiang. If the basic standard is met, neither side will provide compensation payments. The CNY 300

⁹⁶ According to Doc. No. 123 jointly issued by the Ministry of Finance and the Ministry of Environmental Protection in September 2011 named Implementation Plan of Water

million contribution from the central finance will be allocated as a directional compensation to Anhui.

It is also specified that the compensation fund will be specially used in water environment protection and pollution control in Xin'an River Watershed. The scheme uses the average water quality of the three years of 2008 to 2010 of Xin'an River as the basic standard for water quality assessment. The water quality indicators include potassium permanganate index (COD_{mn}), ammonia nitrogen (NH₄-N), total phosphorus (TP) and total nitrogen (TN). The Jiekou cross section on the provincial border is the specified monitoring cross section subject to monthly monitoring. The water quality monitoring results are to be verified by China National Environment Monitoring Center (CNEMC) and provided to the Ministry of Environmental Protection and the Ministry of Finance as the basis for watershed compensation assessment. The pilot implementation period of the scheme is initially 3 years (from 2012 to 2014).

Jiangxi Five Rivers Headwater Area Eco-compensation Program

Jiangxi Province has five rivers running into Poyang Lake, which subsequently drains into the Yangtze River. To protect Poyang Lake and the five rivers, Jiangxi Provincial Government initiated an eco-compensation program in 2008, in which 13 counties in the headwater areas of the five rivers are receiving an amount of payment for providing clean water to the downstream areas.

The total payment has increased annually from CNY 50 million in 2008 to CNY 175 million in 2012. The payment received by a county is determined by its headwater area (20% weight) and the water quality at the river outlet (80% weight). A county with a large headwater area will receive more payment, and a county providing more clean water will receive more payment.

The payment fund is provided by Jiangxi Provincial Government and managed by the Provincial Financial Department. The water quality is monitored by the Provincial Environmental Protection Department. In this case, water quantity is not involved.

A comprehensive assessment of the environmental impacts of the Program has not been done, but discrete monitoring data show positive results amidst the interaction of multiple variables. This has encouraged Jiangxi Provincial Government to invest more funds into the program.

Annex 5. Community Consultation Record, Site Profile and Baseline Survey Information for Wuma Sub-Watershed PWS Demonstration Area

Record of Consultation with Local Communities

In order to ensure that the local communities were properly consulted and their views and concerns taken on board, the local consultant team conducted several visits to the communities in Xienong village during the PPG phase. The structured interviews made in Baiyangtun, Majiapo and Jiaotong communities included two parts (household interviews and overall community level interviews).

The first part consisted of household interviews, which focused on the following items: population structure of the family which included total population, gender, age groups, occupation, education etc; income and expenditure including livelihood, main source of income, expenditure on education, daily life and agriculture production, etc; health care (medical insurance, medical treatment, births and some other items related to health); land use (the quantity of farmland and proportion of different crops); community enterprises.

Their comments revealed that each of the households interviewed has more than two children; most of the villagers did not accept high school education and had to engage in agricultural production or temporary workforce nearby. So, the main income is agriculture production (mostly sorghum) and migrant work, the income depends a lot on sorghum plantation.

Table 1. Interviews of households in the communities

Date	Community interviewed	Interviewers	Remarks
4th July, 2013	Baiyangtun community	Li liang, He zefeng, Wei chaohong, Wen zhongwei, Tang yuandong, Peng sitao	Population, social economy, education, health care, religion, employment, livelihood etc of the household
5th July, 2013	Jiaotong community	Li liang, He zefeng, Wei chaohong, Wen zhongwei, Tang yuandong, Peng sitao	Population, social economy, education, health care, religion, employment, livelihood etc of the household
6th July, 2013	Majiapo community	Li liang, He zefeng, Wei chaohong, Wen zhongwei, Tang yuandong, Renweijun, Peng sitao	Population, social economy, education, health care, religion, employment, livelihood etc of the household
7th July, 2013	The three communities	Li liang, He zefeng, Wei chaohong, Wen zhongwei, Tang yuandong, Renweijun, Peng sitao	Population, social economy, education, health care, religion, employment, livelihood etc of the household; the willingness to participate in PWS

The second part was to determine the overall situation of the communities, given that the household interviews could not cover all of the villagers in each community. This structured interview was mainly designed for the head of each community. And the interview questions were mainly as follows: the total land area of the community; the total population of the community; the production of sorghum of the community; the situation of other agricultural

products; the compensation for forest land; the situation of exceptional poverty; population migration; the sense of historical changes in water; the possible causes of changes in water and river bed; possible solutions to address the problems; interest in PWS, etc.

Table 2. Community level interviews

Date	Community interviewed	Interviewer	Remarks
4th July, 2013	Baiyangtun community	Peng sitao	Overall situation of the community: land use, population, education, employment, gender, sense of the change of water in Wuma, interests in PWS etc.
5th July, 2013	Jiaotong community	Peng sitao	Overall situation of the community: land use, population, education, employment, gender, sense of the change of water in Wuma, interests in PWS etc.
6th July, 2013	Majiapo community	Peng sitao	Overall situation of the community: land use, population, education, employment, gender, sense of the change of water in Wuma, interests in PWS etc.

The comments received during these interviews revealed the overall profile of each community. Most of the land was used to plant sorghum for cash income, and they were not satisfied with the deterioration of the environment. They believe that the deforestation in the 1970s-1980s decreased the water volume and narrowed the river bed, and then some fishes disappeared. They expressed concern about improving the environment, but they weren't clear about how and who should do this.

Additional questions were specially designed, including: "Are you interested in PWS? Would you like to participate in PWS programs?" The answers of the three communities' heads were the same: "Yes, if income will not be decreased". So, from these interviews, the villagers realized the significant correlation between forest and water, and awareness of biodiversity was enhanced (before this, they just knew that some animals and plants had disappeared).

Site Profile and Baseline Survey Information

See attached report

Annex 6. Baseline Information on Chishui River Basin in Guizhou

Table 1. Completed baseline activities on Chishui watershed protection

Source: government plans of Bijie, Zunyi, Chishui; information collected during the field visit during 7-14 June 2013 and follow-up.

Location	Project	Component	Objective	Budget (million CNY)	Year
Bijie municipality	Coal mine wastewater treatment	- 7 coal mines wastewater is treated - 10 coal mines are closed	Pollution control		Up to 2013
	Shutdown of polluting factories	- Shut down 76 sulfur factories - Shut down 2 brick factories - Shut down 10 small liquor factories	Pollution control		Up to 2013
	Sloping land conversion program	- Convert 53,000 mu ⁹⁷ (3,533.51 ha) sloping land	Erosion control		Up to 2013
	Stone desertification treatment	- Covering 57,000 mu (3,800.19 ha)	Rural development		Up to 2013
	Water and soil conservation	- Covering 13.4 km ²	Erosion control		Up to 2013
	Afforestation	- Covering 27,000 mu (1,800.09 ha)	Erosion control		Up to 2013
Zunyi municipality	Water and soil conservation	- Covering 287 km ² -	Erosion control		Up to 2013
	Mitigation of stone desertification	- Covering 367 km ² -	Rural development	146	2008-2013
	Afforestation	- 510,000 mu (34,001.7 ha)	Erosion control	150	Up to 2013
	Domestic wastewater treatment plants	- 3 county seat WWTPs - Zhongshui township WWTPs	Pollution control	500	Up to 2013

⁹⁷ One Chinese mu = 0.06667 hectares / One hectare = 15 Chinese mu

Location	Project	Component	Objective	Budget (million CNY)	Year
		- Maotai WWTPs phase II			
	Liquor industry wastewater treatment	- 9 blocks of liquor industry wastewater treatment project	Pollution control	1,000	Up to 2013
Chishui City	Shut down Huayi paper mill	- Production capacity 20,000 tons/year of paper pulp.	Pollution control		2007
Wuma township	Shut down Wuma small paper mills	- Shut down 279 small paper mills along the Wuma River	Pollution control		2008
	Shut down Wuma small liquor factories	- Shut down 500 small liquor factories along the Wuma River	Pollution control		2008
	Restructuring coal mines	- Integrated 68 coal mines into 40	Pollution control		2008
Zunyi municipality	Fish release in the Chishui River	- 1.4 million fish are released	Biodiversity conservation		2005-2013
	Rural environmental restoration	- Covering 20 villages	Pollution control	7.17	
	Water and soil conservation	- Covering 1999 km ² , including terracing, afforestation, access limit, conservation tillage, small dykes and ponds etc.	Erosion control	154	1995-2013
Chishui City	Qianbei Bamboo Paper Mill	- Production capacity of 200,000 tons/year of paper pulp	Industry development	3,100	2012

Table 2 Planned activities on Chishui River Basin development and watershed protection

Source: government plans of Bijie, Zunyi, Chishui; information collected during the field visit during 7-14 June 2013 and follow-up.

Activities contributing towards watershed protection are shown in italics

Location	Project	Component	Objective	Budget (million CNY)	Year
Bijie Municipality	<i>Forest Protection</i>	- Ban logging of any natural forests; - Protect strictly the existing 1,418 km ² of forests with ecological benefits.	<i>Prevention of soil erosion</i>		2012-2015
	<i>Sloping land conversion program</i>	- 35,350 ha of sloping farmland (25° or more) be converted into forests	<i>Prevention of soil erosion</i>		2012-2015
	<i>Mitigation of stone desertification</i>	- Covering 180 km ² in Qixiangguan, Dafang, and Jinsha	<i>Treatment of stone desertification</i>		2012-2015
	<i>Soil erosion mitigation</i>	- With small dykes, ponds, small watershed management, and terracing etc. in 1,044 km ² of areas	<i>Prevention of soil erosion</i>		2012-2015
	<i>Standard animal farming program</i>	- Construction of ecological animal farms	<i>Non-point source pollution control</i>		2012-2015
	<i>Domestic wastewater treatment plant</i>	- Build each at towns of Qingshuipo, Yanzikou, Xiaojichang, Haizijie, Huguantun.	<i>Domestic wastewater treatment</i>		2012-2015
	<i>Featured agriculture</i>	- Flower growing in Leshan - Medicine herb growing in Qixingguan - Gong Tea in Jinsha - Citrus growing in Qixingguan - Organic sorghum in Jinsha	<i>Rural development</i>		2012-2015
	<i>Tourism site development</i>	- Hot spring in Qixingguan - Natural landscape in Gala; - Ethnic historic heritage in Datun; - Eagle Cave in Yanzikou - Former battle fields in Jimingsansheng; - Forest park in Dafang; - Lengshui River landscape; - Yi ethnic history and culture	<i>Rural development and alternative livelihood</i>		2012-2015
Bijie	<i>Ecological Resettlement</i>	- Resettle 16,697 households in fragile	<i>Poverty reduction</i>		2012-2015

Location	Project	Component	Objective	Budget (million CNY)	Year
Municipality		<i>environment</i>			
	Coal mining	- Develop 15 coal mines	Industry development	8,600	2012-2020
	Thermal power plant	- Bijie thermal power plant phase II with capacity of 2*350,000 kw - Yangjiawan power plant with capacity of 2*660,000 kw	Industry development		2012-2015
	Coal chemical	- Bijie coal chemical phase II with production capacity of 800,000 tons/year of methyl alcohol, and 350,000 tons/year of dimethyl ether	Industry development		2012-2015
	Liquor industry development	- Increase the liquor production to 12,000 tons per year with value of CNY 500 million	Industry development		2012-2015
Renhuai and Zunyi	Liquor industry park	- Renhuai Band Liquor Industry Park - Xishui Liquor Industry Park - Liquor Industry National Park - Liquor Industry Provincial Park	Liquor industry development		2012-2015
	Coal mining and thermal power plant	- 13 coal mines development - 2 thermal power plant construction - Tongzi Circular Economy Industrial Park (mining and power plant) - Xishui coal chemical	Industrial development		2012-2015
	Hi-tech development	- New material development - IT technology development - Biochemical technology	Industrial development		2012-2015
	Tourism development	- Red history tourism; - Maotai liquor industry tourism - <i>Sunjia Dalin Forest Park</i> - <i>Xianren Mount Bamboo tourism</i> - <i>Jinhai Cultural tourism</i> ; - Luban battle field relics	Tourism development		2012-2015
	Domestic wastewater treatment plant	- 17 township WWTPs in Renhuai and	Pollution control		2012-2015

Location	Project	Component	Objective	Budget (million CNY)	Year
		Zunyi			
	Highway construction	<ul style="list-style-type: none"> - Hangrui Express (Zunyi and Bijie sections); - Xiarong Express (Bijie-shengji) - Zunchi Express (Zunyi-Chishui); - Xide Express (Xishui-Dejiang)' - Renchi Express (Renhuai-Chishui); - Chishui-Changsha Highway - Chishui-Xuyong Highway - Chishui Circular Highway - Chishui-Gulin Highway - Chishui-Hejiang Highway 	Infrastructure	14,300	2012-2020
	Railway construction	<ul style="list-style-type: none"> - Guizhou-Chongqing express railway; - Chengdu-Guizhou express railway; - Zunyi-Luzhou railway; - Gulin-Xishui-Tongzi railway 	Infrastructure	17,600	2013-2020
	Waterway and shipping	<ul style="list-style-type: none"> - Chishui River Waterway expanded (Maotai-Hejiang) - Xishui Waterway; - Tucheng-Maotai waterway 	Infrastructure		2012-2020
	Airport	- Renhuai Maotai airport	Infrastructure	1,500	2013-2020
Zunyi	<i>Zunyi County seat wastewater collection</i>	- <i>Construct 43.9 km of sewage pipeline</i>	<i>Wastewater treatment</i>	<i>55.45</i>	<i>2012-2013</i>
Renhuai	<i>Renhuai City Wastewater Treatment Plant phase II</i>	<ul style="list-style-type: none"> - <i>Canglong WWTP with treatment capacity of 3,000 ton/day</i> - <i>Yanjin WWTP with treatment capacity of 5,000 ton/day</i> 	<i>Wastewater treatment</i>	<i>75.87</i>	<i>2010-2013</i>
Chishui City	<i>Chishui City Sewage Pipeline phase II</i>	<ul style="list-style-type: none"> - <i>Construct 56 km of pipeline</i> - <i>Build 2 pump stations</i> 	<i>Wastewater treatment</i>	<i>59</i>	<i>2012-2013</i>
Tongzi County	Tongzi Power Plant	<ul style="list-style-type: none"> - 2*600MW, - Production capacity 6.6 billion KWh/y 	Energy	4,800	2008-2013

Table 3. Planned activities on biodiversity protection in Guizhou*Source: Guizhou Action Plan of Biodiversity Protection 2012-2020*

Project	Component	Objective	Budget (million CNY)	Year
Baseline survey in biodiversity hotspots	<ul style="list-style-type: none"> - County based survey of biological resources including wild life and economic animals and plants and fungi; - Biodiversity database, county unit - GPS based samples and pictures - Biodiversity monitoring system 	Establish the biodiversity baseline information	50	2012-2020
Baseline survey of aquatic biodiversity in rivers and wetlands	<ul style="list-style-type: none"> - Wetland types - Land tenure - Fauna and flora - Protection and management status 	Set the baseline information on biodiversity in rivers and wetlands	8	2012-2015
4 th survey of biological resources valuable for Traditional Chinese Medicine (TCM)	<ul style="list-style-type: none"> - Update the distribution, production, value and values - Database of TCM biological resources 	Update the biological resources for TCM	40	2012-2017
Germplasm resources investigation, protection and utilization of wild tea tree, fruit trees and local fine varieties and its wild relatives plant	<ul style="list-style-type: none"> - Field survey - Establishment of in situ conservation - Study on propagation techniques 	Devoting resources to identification to networked and standardized	18	2012-2017
Investigation and collection of crop germplasm resources	<ul style="list-style-type: none"> - Set up a Germplasm information database - Study on the breeding technology and industrialization technology 	Establish sharing platform and technical support system	5	2012-2017
《Red book of rare and endangered plants and animals in Guizhou 》	<ul style="list-style-type: none"> - understanding the resources background of wild fauna and flora species - Describe each level of classification status, clear and morphological characteristics, endangered category population status, quo dangerous factors, protective measures and Suggestions to raise (culture) breeding condition 	Determination of the rare and endangered species of Wild Fauna and flora list	4	2012-2017
biodiversity information sharing platform and	<ul style="list-style-type: none"> - To repair Zunyi medical college of 	Establish a fully	20	2012-2020

Project	Component	Objective	Budget (million CNY)	Year
the construction of the digital herbarium	amphibians and reptiles herbarium - Update biological resources network database - Investigation into the basic situation of protection of natural areas in Guizhou Province	functional resources specimen database and information system		
The comprehensive assessment of biodiversity	- Establish biodiversity evaluation index and comprehensive evaluation system - Evaluation of diversity status, biological evolution trend	A systematic evaluation of the biodiversity status ,main threats and management effect	20	2012-2015
Establishment of biodiversity variation trend monitoring, early warning system and information network	- The amphibious animal as important representative for long-term monitoring - Development biodiversity and environmental monitoring of Chishui River Basin	Construct a multi-level, multi type ecological monitoring network	40	2012-2020
Establishment of biological genetic resources immigration inspection and testing system	- To establish a database of biological species resources in Guizhou immigration - Development or integration of portable devices and kits for species identification - Improve the existing biological and Germplasm exit inspection and quarantine system	Development alien species environmental risk assessment techniques, the establishment of alien invasive species monitoring and early warning system	10	2012-2017
The Investigation and Control of harmful invasive alien species Eupatorium	- Development of digital databases - Eupatorium conduct province-wide Survey - Eupatorium gradually replaced by the use of industrial developmen	From the intercept control, clear alternative and other ways to curb the spread of Eupatorium hazards	20	2012-2017
Building and complement the provincial natural protection network system	- Construct reasonable, complete and suitable nature reserve network system - Based on investigation of national and provincial nature reserve - Promote a batch of reserve level	Make nature reserve constructing planning, and set up provincial natural protection network system	50	2012-2017

Project	Component	Objective	Budget (million CNY)	Year
		initially		
Strengthen the construction of nature reserve	<ul style="list-style-type: none"> - Provide training to improve professional quality of preserve managers - Provide the fixed fund to managers - Improve the management ability and manager enthusiasm 	Improve the management ability of nature reserve	50	2012-2015
The demonstration project of community sustainable development in nature reserve	<ul style="list-style-type: none"> - Carry out a variety business in 2-3 nature reserve chosen - Demonstration project of sustainable development and biodiversity protection 	Choose some communities to carry out the livelihood improvement and biodiversity protection in order to get a win-win situation	40	2012-2017
The construction of demonstration project base of rare wild animals protection in Guizhou province	<ul style="list-style-type: none"> - Construct 11 national first or secondary key protected animals and rare animal protection and special breeding base in Guizhou province 	Save a batch of national first or secondary key protected animals and rare animals in Guizhou province	75	2013-2020
The construction of protection system of the provincial plant germplasm resource in another place	<ul style="list-style-type: none"> - Complete germplasm conservations and research functions - Protect important and endangered plant seeds - Preserve the germplasm gene 	Enlarge the provincial botanic garden repository samples of plant germplasm preservation, and strengthen the construction of seed stock station	10	2012-2017
The construction of demonstration area of important plant for off-site protection	<ul style="list-style-type: none"> - Establish rare and endangered wild medicinal plants facilities and artificial breeding bases - Make experiment on tending and cultivating rare wild medicinal plants - Study rare and endangered medicinal plant resources saving and its substitutes 	Solve the problem of short supply of plant resource and great market demand	10	2012-2020

Project	Component	Objective	Budget (million CNY)	Year
Guizhou domestic animal germplasm resources bank and off-site protection	<ul style="list-style-type: none"> - Onsite protection; - Offsite protection; - Germplasm bank 	Protect the local domestic animal resources	100	2012-2020
Caohai Lake Basin biodiversity protection	<ul style="list-style-type: none"> - Biodiversity survey' - Watershed health evaluation - Ecological rehabilitation - Pollution abatement 	Restore the Caohai Lake biodiversity	1500	2012-2017
Guizhou karst reservoir eutrophication control	<ul style="list-style-type: none"> - Eutrophication modeling; - Research of karst reservoir eutrophication - Eutrophication control technology 	Control karst reservoir eutrophication	100	2012-2020
Base of aquatic resources for release into the rivers	<ul style="list-style-type: none"> - Chishui River fish protection station - Yangtze River station for fish release - Zhu River station for fish release 	Restore the aquatic resources in rivers	100	2012-2017
Protection system of genetic resources, and traditional knowledge	<ul style="list-style-type: none"> - Survey of genetic resources - Survey of traditional knowledge and related genetic resources; - Protection and sharing system 	Build database	5	2012-2017
Karst region biodiversity protection and economic development	<ul style="list-style-type: none"> - Select 3 typical karst counties for thorough survey - Biodiversity valuation - Direct and indirect cost estimation of protection; - Modeling of the relationship between biodiversity protection and economic development 	Sustainable development of karst counties	5	2012-2015
Qiannan biodiversity hotspot: protection and coordination with economic development	<ul style="list-style-type: none"> - Indicator system - Mapping the biodiversity in Qiannan - Economic structural investigation and plan - Draft the blueprint of the protection 	Conserve the biodiversity in Qiannan	1	2012-2015
Qiannan stone desertification area rehabilitation	<ul style="list-style-type: none"> - Extension of mitigation technology - Explore new technology - Management innovation 	Mitigate stone desertification in Qiannan	15	2012-2017
Carbon sink monitoring in stone	<ul style="list-style-type: none"> - GIS based database 	Understand the carbon	10	2012-2015

Project	Component	Objective	Budget (million CNY)	Year
desertification areas	- Monitoring and evaluation system	sink mechanism in karst regions		
Chishui River Basin biodiversity protection	- Biodiversity survey in Chishui River Basin; - Scientific evaluation of biodiversity in Chishui River Basin - Monitoring system	Protection biodiversity in Chishui River Basin	50	2012-2020
Offsite protection of featured flowers and plants of Guizhou	- Offsite protection base in Wudang - Demonstration base in Baiyun - Germplasm resources protection base in Bailidujuan	Species biodiversity protection	50	2012-2020
Biodiversity protection in Huang-guo-shu scenic park	- Biodiversity rehabilitation in 6 scenic areas in Huang-guo-shu park	Protect biodiversity in Huang-guo-shu	220	2012-2017
Biodiversity conservation in Shibing Yuntai Mountain natural relics	- Biodiversity survey - Biodiversity evaluation - Biodiversity conservation	Conserve the biodiversity in Shibing Yuntai Maintain	11.5	2012-2015
Biodiversity conservation in non-timber forest product development	- Survey of non-timber forest products - Model of biodiversity protection in non-timber forest product development - Training for local communities	Conserve biodiversity in non-timber forest product development	30	2012-2020
Biodiversity conservation technology	- Biodiversity indicator system - Ecological valuation - Biodiversity modelling	Biodiversity technology development	50	2012-2020
Biodiversity education, training and advocacy	- Film 20 video pictures in Chishui and other biodiversity hotspots; - Education programs in schools - Biodiversity curriculum in universities	Public awareness of biodiversity	20	2012-2020
The preparation to build biodiversity conservation foundation in Guiyang	- Definite the aim, constitution and identification of conservation foundation - Integrate the biodiversity protection and green development - Strength the cooperation with China biodiversity conservation & green development foundation	Achieve to be the pilot province of mechanism for ecological compensation, which can build the biodiversity	0.5	2012-2014

Project	Component	Objective	Budget (million CNY)	Year
		conservation foundation		
The construction of protection and monitoring system of the important potable water source-Hongfeng lake and Baihua lake in Guiyang	<ul style="list-style-type: none"> - Monitor the biodiversity and management system of two lakes - The construction of biodiversity protection platform and biodiversity management system - Monitor and research the biodiversity key region and alien pest invasion in two lakes - Utilize the 3s to construct biodiversity protection and monitoring digital platform 	Construct the regional biodiversity protection system, and build the biodiversity monitoring system in air, water and land three levels	15	2012-2018
The status survey and early warning control system of alien pest in Guiyang	<ul style="list-style-type: none"> - Build the monitoring spot in grass root level - Construct the monitoring and prediction integrated control network of pest, which provide the pest invasion prediction of middle-short term 	Investigate the alien pest invasion, and construct the pest monitoring system	6	2012-2015
The construction of biodiversity monitoring system in Guiyang	<ul style="list-style-type: none"> - Build the municipal biodiversity monitoring system - Learn the dynamic change in regional species resource - Monitor the human disturbance on biodiversity - Monitor the invasion of alien species 	in order to protect resource and sustainable development monitor the dynamic changes of environment quality, climate changes and biodiversity long-term	20	2012-2020
The construction of important wetland monitoring system in Guiyang	<ul style="list-style-type: none"> - Construct at least 8 important wetland monitoring network - Monitor the current situation and integrate the material information 	Construct the important wetland monitoring system which monitor and analyze the wetland biodiversity	8	2012-2017
The construction of biodiversity information management system in Guiyang	<ul style="list-style-type: none"> - Construct the database of biodiversity in Guiyang - Form the biodiversity information 	Construct the distributed system, and form the biodiversity	6	2012-2017

Project	Component	Objective	Budget (million CNY)	Year
	management system in Guiyang - Put forward the biodiversity information sharing mechanism	information network, which favor the scholar to search information		
The current situation and evaluation of biodiversity in Nanming river of Guiyang	- Research the biodiversity current situation of Nanming river - Set series of indicators of the diversity of different organisms - Make reference of the protection and utilization of biodiversity in Nanming river	Make the scientific evaluation for government based on the current situation of biodiversity in Nanming river	2	2012-2014
The construction and management of nature reserve and natural heritage sites	- Investigate the resource background of biodiversity in Guiyang - Build the database of biodiversity - Identify the biodiversity key regions - Construct 3 municipal nature reserve, 1 provincial nature reserve and 1 national nature reserve (or natural heritage area) in 10 years	Try to construct 3 municipal nature reserve, 1 provincial nature reserve and 1 national nature reserve (or natural heritage area) in 10 years	50	2012-2020
The impact assessment on biodiversity of large-scale project in Guiyang	- Set the biodiversity evaluation index system of different kinds of large-scale project - Take prevention measures and countermeasures of the building project may hurt the environment biodiversity - Predict and analyze the effect on biodiversity of proposed large-scale building	Set biodiversity assessment guidance of large-scale project in Guiyang	10	2012-2020
The identification and protection of key regional biodiversity and key species in Guiyang	- Identify the key regional biodiversity in Guiyang - Identify the key species - Enact the protection measures of key region and key species - Sustainable utilization of biological resource	Identify the key region and key species in ecosystem, and achieve sound development in biodiversity and ecosystem in Guiyang	3	2012-2015
The value and protection of the biodiversity in	- City ecological environment	Set the strategy and	5	2012-2015

Project	Component	Objective	Budget (million CNY)	Year
Guiyang	<ul style="list-style-type: none"> - Improvement the relationship between human and natural system - Improvement the relationship between biology and environment in natural system - Sustainable development in Guiyang 	the value research of biodiversity in Guiyang		

Annex 7. Capacity Development Scorecards

See Attached files with baseline scorecards for:

Guizhou Environmental Protection Department

Bijie Environmental Protection Bureau

Zunyi Environmental Protection Bureau

Renhuai Environmental Protection Bureau

Chishui Environmental Protection Bureau

Annex 8. Ecosystem Health Index

Summary and Example Baseline and Monitoring Protocol.

Summary of the Ecosystem Health Index (EHI) Methodology

Definition: Ecosystem Health is taken to be the suitability of a site to continue to provide secure conditions for survival of component species and delivery of key ecological services, including resilience to climate and other changes.

Objective: EHI is not an evaluation. It is a dynamic, constantly varying index that reflects biodiversity health, just as a financial index reflects economic performance.

- EHI provides a baseline against which targets for maintaining or achieving a given level of health can be set
- EHI can be used as a results based indicator of project achievement and impacts
- EHI can indicate where the project is succeeding or failing and allow revision of activity efforts throughout the project
- EHI is complementary to the Management Effectiveness Tracking Tool (METT) in project monitoring and evaluation.

Introduction: Ecosystem health is reflected in the ability of a site to maintain its biodiversity values and ecological functions. These will vary significantly from site to site. The index developed to assess this health has three components: 1) score of habitat suitability for maintaining important biodiversity; 2) status of that biodiversity and 3) the broader environmental context. The score does not necessarily indicate stability. Many wetland sites are very dynamic but what we are interested in is the ability of the biota to adapt to or even thrive with the changes. This will become increasingly important as climate and water flow patterns change. A simple scoring system is recommended to give the results transparency and robustness. Each site using this index should undertake a baseline survey which also selects indicators and target species for subsequent surveys. Indicators should include key wetland birds, important aquatic fauna – fish, molluscs; selected indicator insects; endangered mammals; major components of vegetation; incidence of Alien Invasive Species (AIS).

The index establishes a snapshot value at the time of surveying; can relate present scores against baselines established at an earlier date, identifying trends in the different indicators; and can establish reasonable targets for improvement for each different indicator, and compare current state against identified targets.

While a human body may appear healthy in not showing much physical deterioration, we can identify several indicators of lifestyle that certainly constitute health threats (excessive drinking and smoking habits, lack of sleep, lack of inoculation, living in a region of known diseases, poor hygiene habits, lack of medical facilities, etc.). In the same way, we can recognize several threats to ecosystem health in the external context that may not be immediately reflected in the condition of habitat or status of species. Such indicators include the levels of external development threats, the level of secure legal protection, and the level of human use pressures being applied or expected in the future.

Use of the EHI Scoresheet

1. Establish the monitoring team

Should include manager, ecologist, consultant, local experts and if possible local community member(s).

2. Classify and map the main habitat types

The scoring of the habitat sub-index requires assessing whether the extent, diversity, connectivity and condition of key habitats is maintained. For this it is necessary to classify, map, and measure the extent and status of specific habitats. For ease of work and subsequent analysis it is recommended to use a simple hierarchical habitat classification. An example for Poyang Lake is given below but it is not important to follow any formal classification system and use of whatever classification is already used by management or researchers in the area is usually adequate. If no suitable classification is already in use, it is recommended to follow the classification system of Wetlands International (see the Asian Wetlands Inventory Handbook⁹⁸) for wetland types. For terrestrial vegetation, use classifications in current use at local level. Google maps can be downloaded from the internet and provide a basis for mapping different recognizable vegetation formations. These can then be compared with later imagery to monitor changes in distribution. Use of GIS is useful but not essential. Once mapped, the area of habitat types can be calculated by counting dots on transparent sheets. Retain maps and results for future comparisons.

Suggested habitat classification and hierarchy (example only; not comprehensive for China⁹⁹)

Ist Order	2nd Order	3rd Order	4th Order
Water bodies	Natural Fresh water	Lakes	Open Lake
			Shallows
			Small Lake
		Rivers	Large River
			Small River
	Artificial	Ponds	Reservoir
			Small Pond
Terrestrial	Barren	Sparse vegetation	Beach
			Mudflats
		No natural vegetation	Bare Land
			Urban area
	Arbour	Woodlands	Willows
			Poplar plantation
			Mixed plantations
			Natural mixed forest
		Scrub	Scrub
	Herbaceous	Marshes	Reed-beds
			Lotus-beds
		Grasslands	Miscanthus meadow
			Phalaris meadow
			Carex meadow
			Artemesia meadow

⁹⁸ Finlayson CM, Begg GW, Howes J, Davies J, Tagi K & Lowry J. 2002. A Manual for an Inventory of Asian Wetlands: Version 1.0. Wetlands International Global Series 10, Kuala Lumpur, Malaysia.

⁹⁹ For instance, marine and coastal wetland types are unrepresented except for "beach and mudflats".

3. Identify main threats to be monitored

- Key threats have already been identified for each project area at the PIF stage. These were reviewed at PPG stage.
- Additional threats can be tagged for attention when local teams are assembled or if unpredicted changes occur during the project cycle. There should be a good match between indicator species selected and the specific threats they indicate.

4. Identify suitable indicator species to be monitored

- Conservation target species (note - rarely seen species give little data)
- Commoner species that are sensitive to habitat quality – amphibians, dragonflies, birds
- Easily identified – large mammals
- Easily quantified (harvest levels of fish, crabs etc. or plants)
- Alien species of concern

5. Undertake baseline measurements

This will involve checking in the field, examining plans, maps and other documents, interviewing managers and local community members and undertaking status assessments of selected indicator species (this latter task should be incorporated into routine monitoring activities but baselines need to be established).

6. Calculate baseline indices

Pick the score for each indicator that best meets your observations. Most important is to complete the notes explaining on what basis this score was selected and listing the requirements that should be targeted by the project for improving this score. Identification of areas where improvement can be expected is the key to calculating the target index score that the project can realistically hope to achieve.

7. Periodically repeat measurements (minimum would be mid-term and end of project). Routine monitoring of indicator species should be more often than this and at least twice per year.

8. Analyze observed changes in relation to established targets

Note changes in relation to baseline or previous evaluations

9. Report results and feed into project planning revisions

Append full notes, maps, tables of scored species, or any data on human uses and activities, tourism entries etc. on which the answers were based. This is important as the next team to evaluate may be different and will need to see the basis for determining whether conditions are changing or getting worse.

It is recommended that the first 6 steps should have expert assistance, but local teams can undertake subsequent monitoring and scoring independently.

The EHI scorecard

The EHI scorecard is designed for simplicity and robustness. Different teams should reach similar scores. In our training exercises, robustness was tested. Five independent scorers

reached almost identical scores for Dongzhaigang NNR (mangroves) in Hainan and 6 different teams scored almost identical scores for Jiulongshan NNR (forest) in Hubei. Team members do not require high levels of literacy, biological knowledge or statistical skills. The EHI scorecard is designed to match and augment the Management Effectiveness Tracking Tool (METT) being used in GEF Biodiversity projects and can be filled out at the same time.

At national level, SFA should monitor EHI scores of focal sites, other wetland sites within project provinces and a selection of sites not directly affected by the project as part of overall monitoring of conditions and programme impacts.

The following are presented as examples of a baseline EHI scorecard (Genheyuan NWP, Inner Mongolia) and monitoring protocol (Dongzhaigang NNR, Hainan) from the UNDP/GEF MSL programme.

Genheyuan NWP is located in the central west slope of the Daxing'anling landscape, and within the jurisdiction of Genhe city in Hulun Buir League. It encompasses a long, narrow forested belt alongside the Genhe River just upstream from Genhe City, and occupies a total area of 59,060 hectares.

Dongzhaigang NNR is a coastal mangrove reserve located on the northern coast of Hainan Island just east of Haikou City. It covers 3,337 ha of mangrove forest and associated intertidal flats.

EXAMPLE OF EHI BASELINE SCORECARD AND MONITORING PROTOCOL

Name of Site: Inner Mongolia Genheyuan National Wetland Park		Wetland Ecosystem Health Index (EHI) Score sheet			Scored by (names): Wang Liancheng, Cui Guanghong	Date completed: Sep. 12, 2012
Issue	Criteria		Score: tick only one box per question		Comment/explanation	Target to improve?
Component 1. Habitat Health Assessment						
Habitat connectivity	Habitats severely fragmented by inhospitable barriers		0		Although the site is internally divided by roads and bridges, its integrity is still comparatively high and it is an integral patch of the whole forestlands. No dams or weirs are constructed within the site.	To continue to maintain the current status while restoring water flows underneath roads.
	Habitats fragmented but some connections or corridors remain		1			
	Habitats partly fragmented		2	2		
	Habitats enjoy good connectivity		3			
Habitat heterogeneity	Site composed of only one major habitat		0		Straddling on the western slope of the Daxing'anling landscape, the site includes the majority of habitats distributed in the region.	To retain current conservation efforts and strengthen collaboration with local NRs to mutually conserve wetlands and forests in the region.
	Site contains only a small proportion of full range of regional wetland habitats		1			
	Site contains most of regional representative habitats		2	2		
	Site contains mosaic of all representative habitats of regional wetland type		3			
Original habitat diversity retained	Range of original habitats severely reduced by habitat losses and changes		0		Although the site was harvested for timber for more than 60 years, all resource exploitation was conducted by strictly complying with applicable forest management standards. Therefore, the original habitats still	To reduce timber harvest and fishing catch, ban hunting and restore environment gradually.
	50-80% of original habitats still well represented		1			
	>80% of original habitats still well represented		2	2		
	Full range of original habitats all well represented		3			

				remain.	
Habitats degraded	Most habitats severely degraded in structure, composition or productivity	0		The site is slightly degraded due to historic timber harvest, soil removal, poaching, and fire.	To reduce timber harvest, ban hunting, converting forests into agricultural lands with fire, thin trees to restore degraded environment step by step.
	Some habitats severely degraded	1			
	Minor habitat degradation	2	2		
	All habitats in healthy natural condition	3			
Water pollution	Water toxic causing death of fish, molluscs and other biota, presence of toxic algae or plankton	0		The water quality reaches the Grade-I category as defined by Water Quality Classification Standard in China.	To prevent the river from contamination and pollution from tourism.
	Water visibly dirty or smelly, surface scum visible	1			
	Slight discoloration, smell or cloudiness apparent	2			
	Water remains clear and potable	3	3		
Sediment load	Water seriously loaded with erosion sediments	0		The water is clear although sometimes it cannot see the bottom of the river due to water level change resulting from season change.	To reduce timber harvest, enhance water storage capacity of the ecosystem of the site to restore the environment in the site.
	Water opaque, cannot see bottom of ponds, streams	1	1		
	Water fairly clear but contains significant sediment	2			
	Sediment levels entirely normal	3			
Oxygen levels	Severe hypoxia kills fish and molluscs	0		The oxygen level in the site is almost the same as that under its natural status since there are little human activities here.	To control human activities to maintain the site's near to pristine conditions as much as possible.
	Some signs of hypoxia, fish gulping at surface	1			
	Oxygen levels close to natural original figures	2	2		
	Oxygen levels remain at natural healthy levels	3			
Water supply	Water supply and water table seriously modified and damaging ecological functions	0		The water supply keeps its natural status but is increasingly subject to the impacts of climate change, e.g., drought and floods. There is no diversion of river courses but historic timber harvest contributes to a lower water storage capacity of the site.	To conserve remaining forest while restoring vegetation to retain water conservation capacity of the site and the whole catchment.
	Water supply modified by major diversions, drainage or extractions	1			
	Water supply peaks (droughts and floods) exaggerated by regional changes in flow	2	2		
	Water supply remains in original seasonal pattern	3			

Physical disturbance (construction, fish traps, barrages, noisy activity)	Site is transformed by artificial developments, structures or disturbances	0		Only few roads and facilities for reserve's management and conservation were constructed here.	To strictly control the development of varied construction activities.
	Site faces much disturbance from construction and disturbance	1			
	Minor structures or disturbances only	2	2		
	Original physical state preserved	3			
Disaster damage	Ecology irreversibly modified by natural or artificial disaster	0		The site faces an escalating frequency of fire occurrence due to climate warming.	To reduce human-induced activities, improve preparedness for preventing and putting out fire to minimize the loss caused by fire.
	Serious disasters frequent and ecological recovery period long	1			
	Severity and frequency of disasters increased through human activities but ecology shows high recovery rate	2	2		
	Frequency of disasters remains natural, capacity to recover remains high	3			
Design resilience (size, altitude, NS axis,lithology,dynamics,multiple catchments)	Site is too small, isolated and homogeneous to offer ecological resilience	0		The site is big enough to secure its high resilience.	The site is naturally connected with surrounding areas to form a wide-scale conservation cluster.
	Site is naturally vulnerable to change	1			
	Site enjoys moderate resilience design	2	2		
	Site enjoys natural high resilience	3			
Sub-total of habitat health risks		Sum score	22	% of total maximum 66.7%	Index (HI) =0.667
Component 2. Species Health Assessment					
Health of target species	All target species show declines	0		Moose (<i>Alces alces</i>), mountain hare (<i>Lepus timidus</i>) and Hazel grouse (<i>Bonasa bonasia</i>) declines based on current ad-hoc patrolling findings.	To strengthen conservation and restore habitats.
	Most target species show declines	1	1		
	Some target species show declines	2			
	All target species stable or increasing	3			
Health of vertebrate indicator species	All indicator species show declines	0		Indicator species, including fish and other vertebrate animals, generally declines.	To well conserve varied habitats (forest, wetlands, and etc.) and reduce illegal hunting.
	Most indicator species show declines	1	1		
	Some indicator species show declines	2			
	All indicator species stable or increasing	3			
Health of invertebrate indicator species	All indicator species show declines	0		Invertebrate indicator species generally goes	To reduce timber harvest and minimize the
	Most indicator species show declines	1	1		

	Some indicator species show declines	2		down.	utilization of forest pesticide to restore environment of the site.
	All indicator species stable or increasing	3			
Health of plant indicator species	All indicator species show declines	0		Indicator plants, e.g., <i>Chosenia arbutifolia</i> , declines.	To reduce timber harvest, prohibit illegal hunting and restore its natural conditions of the site.
	Most indicator species show declines	1	1		
	Some indicator species show declines	2			
	All indicator species stable or increasing	3			
Species diversity retained	Richness of faunal/floral communities irreversibly depleted	0		Species diversity retained although their abundance declines.	To conserve and restore the site well.
	Significant gaps appearing in reporting of local species	1			
	Minor reductions in species richness noticed	2			
	Site retains full original species diversity with high proportion of locally potential species	3	3		
Highest trophic carnivores still present	No high trophic carnivores remain at site	0		Although all high trophic carnivorous animals still exist in the site, their population size and distribution ranges have greatly shrunk.	To protect and restore environment while stopping poaching.
	Few carnivores remain at site	1			
	Some high trophic carnivores lost from local fauna	2	2		
	All high trophic carnivores or original fauna still present	3			
AIS resilience	AIS out of control and permanently replacing some local species	0		No invasive species recorded in the site (pls note that limited knowledge of reserve's staff might overestimate the score).	To strengthen conservation to prevent AIS from the site while establishing an emergency response plan.
	AIS degrading ecosystem functions or displacing local species	1			
	Some AIS noticed at site but not seriously damaging ecosystem or local species	2			
	No AIS established in site	3	3		
Breeding/wintering success of target species	High mortality on wintering/breeding areas of site	0		The survival of target species is influenced by altered climate and habitats.	To restore ecological environment while abating human disturbance.
	Survival of some species a concern	1			
	Moderate survival	2	2		
	Key species all surviving well at site	3			
Key new species using site	Total species no. dropping over time	0		No new species was found and species abundance remains stable.	To strengthen the management and restore the habitats by reducing the disturbance from the human activities.
	No new species recorded but species richness stable	1	1		
	Some new species (other than AIS) noted	2			
	No. of new colonizing species exceed local extinctions	3			

Economic harvest species (legal and illegal)	Uncontrolled overharvesting eliminating some species	0		Population size of economic species has declined due to intensive harvest activities.	To strictly manage natural resources harvest and well-organize collection activities and intensity.
	Harvesting results in serious declines in several species	1	1		
	Harvesting results in minor declines of some species	2			
	No harvesting, or harvesting appears entirely sustainable	3			
Mortality/disaster of key species (fires, droughts, floods, diseases)	Disasters have caused irreversible or long term declines to important species	0		It is difficult to restore the habitats that were destroyed by fire.	To put fire prevention first, strengthen the control of combustion sources preventing the fire damages. Speed up the restoration of damaged habitats by planting trees.
	Disasters have caused serious damage to important species	1	1		
	Disasters cause minor damage to some species	2			
	No diseases, disasters in recent years or species recovery fast and complete	3			
Sub-total of species health risks		Sum score	17	% of total maximum 51.5%	Index (CI) =0. 515
Component 3. Environmental Context Health Assessment					
Site boundaries and zones	Adequate boundaries not clearly marked or respected	0		The site's boundary is well defined on paper and only some sections are marked with on-site boundary markers/pillars/stones.	To further set up more boundary markers/boards stones to well inform public about the location of boundary of the site.
	Boundaries inadequate or not respected	1			
	Some boundaries marked, partially respected	2	2		
	Effective boundaries, zones in place and marked	3			
Legal framework	No legal protection for site	0		The site is legally established and is governed in line with applicable regulations and bylaws. There are no disputes in land tenure.	To further strengthen legal campaigns to increase environmental awareness of public.
	Weak legal protection or protection for only part of site	1			
	Legal status assured but some weaknesses remaining	2	2		
	Strong legal security and law enforcement procedures in place	3			
Tourism impacts	Tourism uncontrolled and causing serious damage and disturbance to site	0		Tourism is on its initial stage and is well managed up to now.	To further consolidate management, control the number of tourists and soundly design land zoning for tourism.
	Some controls in place but tourism exceeds safe carrying capacity	1			
	Tourism controlled by causing some negative impacts	2	2		
	Tourism absent or well controlled and within safe limits	3			
Human resource use pressures	Pressure on natural resources of site out of control	0		Only limited grazing and land use activities exist	To strictly control these activities to expand into
	High levels of collection or use of renewable resources	1			

	Low levels of pressure for resources or land-use (e.g. grazing)	2	2	surrounding the site.	the site while tapping alternative livelihood for local communities.
	No human pressure on resources, or pressures now contained by alternative livelihood program	3			
Additional threats or stresses from external developments (existing or planned)	Water diversion plans, dams, drainage would completely change nature of the site	0		There are extremely few physical construction activities in the site. Some previous settlements have been removed.	To strictly refrain development activities and move the residents out of the site.
	External developments negatively affect the ecosystem of site	1			
	Low risk or low impacts can be absorbed by ecosystem	2	2		
	No threats from external developments	3			
Local community relations	Local community alienated and oppose establishment of protected area on site	0		The local community supports the existence of the reserve. The site also contributes to increasing local residents' income through providing service opportunities for local communities.	To strengthen the communication, develop the co-management with the local communities, and manage the site strictly by establishing regular mechanisms and promoting economic development based on the environment protection.
	Local community accept existence of protected area but neutral and mostly not involved	1			
	Local community enjoy some benefits through employment or alternative livelihoods	2	2		
	Local communities strongly supportive; respect protected area and collaborate in protection, reporting work	3			
Sub-total of environmental context health risks		Sum score	12	% of total maximum 66.7%	Index (CI) =0.667
Overall EHI score (HI+SI+CI)/3 = (0.667+0.515+0.667)/3=0.616				Target identified for project	Index (CI) = 0.66

Name of Nature Reserve	Dongzhaigang Mangrove National Nature Reserve	Date Established: January, 1980	Management Agency: Hainan Dongzhaigang Mangrove National Nature Reserve Management Bureau	Size of NR (ha): 3337	Size of Core/Buffer (ha): 1635/1167.1
Date of Baseline: 1998		Date of EHI scoring: Jul. 27, 2012	Scoring Team: John MacKinnon, Wang Wenqing, Zhong Cairong, Chen He, and Chen Wei	EHI Scores: 0.468	
Schedule for Biodiversity Monitoring					
Name/Taxon	Baseline Status	Method for Monitoring	Timing	Trends/Threats	Comments
Target Species					
Osprey	Uncommon winter visitor	Total count	whenever sighted	Lack of perch or nesting trees	
<i>Heritiera littoralis</i> Aiton	Rare mangrove tree	Map each tree	annual		
Black-faced spoonbill	Uncommon winter visitor	Total count	whenever sighted	Declining	
<i>Pisodonophis boro</i> Rice Paddy Eel	Rare carnivorous fish	Sampling count	annual		
<i>Barringtonia</i> sp.	Rare associate tree of beach forests	Map each tree	annual		
Indicator Species					
Vertebrate Indicators					
Chinese pond heron	Common resident with colonial breeding site	Count nests and fledgling success from observation post	Spring, summer, autumn	Stable	

Common kingfisher	Occasional around coastal and on fish ponds	routine patrol sightings	routinely	Shortage of nesting banks	
Common greenshank	Resident and winter and passage migrant	Flock estimates from selected sample sites at low tide	weekly	Stable	
Little Egret	Common resident	Total counts from selected sample points at low tide	weekly	Declining	
Mudskippers	Common on healthy mud bars	Map areas with good populations	weekly	Declining	
Fish catch	Extensive harvesting	Sample fishermen catch	monthly	Declining	
Invertebrate Indicators					
Shrimps	Common, many species harvested	Question sample of fishermen	Monthly harvest		
Crabs	Common, many species harvested	Question sample of fishermen	Monthly harvest		
Mollusks	Common, many species harvested	Question sample of fishermen	Monthly harvest		
Dragonflies	Common and many species present	Record numbers and species of 2 families from moth trap	Weekly all year		
Plant Indicators					
Mangroves	Several formations	Map by type	Annual		
<i>Lumnitzera racemosa</i>	Rare type	Map by type	Annual		
<i>Casuarina</i> formation	beach Associate, limited habitat	Map by type	Annual		
Alien Invasive Species					
Bengal mangrove	Artificially introduced to several parts of reserve	Map planted areas, check natural spread	Annual	halt planting	
Tilapia	Increasingly common	Fisherman statistics/proportion of catch	Monthly	increasing	

False Zebra mussels	Found in drains and canals	Check ditches and drains	Annual check	?	
Cultivated oysters	Extensively farmed on posts in bay	Map plus fisherman statistics	Annual	increasing	
Human Activities					
Duck farms	Several fenced areas and some free ranging	Map and estimate bird numbers	Annual		
Oyster beds	Extensive within bay	Map and calculate production	Annual		
Ponds	encroaching into reserve in some sectors	Map	Annual		
Boats moored	Varies with weather	routine patrols	routinely		
Nets /traps erected	Some nets, thousands of accordion traps	Map and counts	routinely		
Routine Patrolling <u>(Vary timings and routes, use patrol form)</u>					
Rare and interesting sightings			weekly		
Indicator species			weekly		
Habitat condition			weekly		
Other human use			weekly		
Visitor Use					
Daily visitor numbers		Maintain daily records	Report weekly totals		
Visitor income		Maintain daily records	Report weekly totals		
Visitor facilities		Annual inventory	Each autumn		
Physical Parameters					
Climate details		Maintain records	standard recordings summed/average by month		
Water measurements		temp, oxygen, sediment load	monthly		
Pollution		note evidence, share data with EPB			Ideally should be targeted at specific

					problems that would be determined in the 1st year of project implementation– e.g. pollution from aquaculture and sewage (maybe ammonia, BOD, bacteria counts?); visual evidence of oil pollution
--	--	--	--	--	--

Annex 9. GEF Biodiversity Tracking Tool

The full Tracking Tool is annexed as an Excel workbook.

Annex 10. Environmental and Social Screening Summary

Name of Proposed Project: Payment for Watershed Services in the Chishui River Basin for Conservation of Globally Significant Biodiversity

A. Environmental and Social Screening Outcome

☐ Category 1. No further action is needed

Category 2. Further review and management is needed. There are possible environmental and social benefits, impacts, and/or risks associated with the project (or specific project component), but these are predominantly indirect or very long-term and so extremely difficult or impossible to directly identify and assess.

☒ Category 3. Further review and management is needed, and it is possible to identify these with a reasonable degree of certainty. If Category 3, select one or more of the following sub-categories:

☒ Category 3a: Impacts and risks are limited in scale and can be identified with a reasonable degree of certainty and can often be handled through application of standard best practice, but require some minimal or targeted further review and assessment to identify and evaluate whether there is a need for a full environmental and social assessment (in which case the project would move to Category 3b). See Section 3 of the Review and Management Guidance.

☐ Category 3b: Impacts and risks may well be significant, and so full environmental and social assessment is required. In these cases, a scoping exercise will need to be conducted to identify the level and approach of assessment that is most appropriate. See Section 3 of Review and Management Guidance.

B. Environmental and Social Issues (for projects requiring further environmental and social review and management)

The project aims to operationalize a replicable Payment for Watershed Services (PWS) scheme in the Chishui River Basin to provide an incentive to catalyse land and natural resource use systems that conserve biodiversity and ecosystem processes.

Environmental Impacts: The project explicitly aims to achieve overall positive environmental improvements with respect to environmental quality, ecosystem integrity and biodiversity conservation in order to achieve global environmental benefits. Environmental impacts are therefore

expected to be overwhelmingly positive. The planned Payment for Watershed Services (PWS) demonstration will also develop capacity and tools that can be used for replicating PWS schemes to produce larger positive environmental impacts elsewhere. A positive response was given to Question 4, item 1.1 (Would the proposed project result in the conversion or degradation of modified habitat, natural habitat or critical habitat), on the grounds that it will support land use changes in degraded watersheds aimed at reducing soil erosion, enhancing water storage capacity, and conserving biodiversity (i.e. positive changes).

Social Impacts: The project's social impacts are also expected to be largely positive. Establishment of the PWS mechanisms and development of the systemic and institutional capacity needed for their implementation will yield significant socioeconomic benefits at local and river basin levels. Guizhou is the poorest province in China, and the upstream farming communities that the project will engage in demonstration activities are marginalized and impoverished, a situation made worse by environmental degradation. The project will directly work with selected communities in the target area, Wuma catchment, who will be direct beneficiaries of the project. These communities have been consulted during project preparation, made aware of the benefits of PWS and agreed to participate in PWS pilot activities as long as incomes are not affected adversely (see **Annex 5**). Local officials have indicated that other communities in the demonstration sub-watershed provided the same feedback, including ethnic minorities. None of the selected pilot communities have ethnic minorities, although Miao, Yilao (Gelao), Yi, Buyi and others are present in the Wuma sub-watershed. The project has been designed, and will actively monitor progress during implementation, to ensure there will be no negative impacts on locally resident ethnic groups, women, men or children, and to ensure that benefit-sharing related to any PWS payments that are realised during project implementation will be equitable and directed to those who actually provide the watershed services to be sold. Overall, the project is intended to catalyze the flow of significant private sector funding from downstream industries and urban areas to stimulate sustainable watershed management in impoverished upstream areas, with significant intermediary financial support from the provincial government.

Question 4, item 8.1 was answered as “possibly” on the grounds that the project is likely to have impacts on women's and men's ability to use, develop and protect natural resources and other natural capital assets, through supporting land use changes that improve the sustainability of land management practices.

C. Next Steps (for projects requiring further environmental and social review and management):

During the project implementation, the following needs to be ensured.

1. In order to measure the biodiversity and environmental benefits of project implementation and to ensure that there will be no adverse environmental impact, the project's comprehensive M&E Plan

including impact indicators in the SRF should be fully implemented and annually reviewed. Significant capacity building resources have been allocated to ensure that this can be accomplished. In reality, this relates to nearly all project outputs, but particularly to Output 1.2 (capacity building for EHI and fish monitoring) and Output 2.3 (the impacts of PWS implementation are monitored, reported and assessed), which will have a strong emphasis on capacity building for participatory monitoring involving pilot communities.

2. The Stakeholder Involvement Plan has specified mechanisms for the engagement of stakeholders at all levels. Particular attention will be paid to obtaining free prior informed consent for participation in PWS agreements, building on consultations during the PPG phase. While formal commitment will be needed through an MoU between communities and Local Government for the PWS agreement(s), the reality is that the tangible, practical commitment of the pilot communities can only be achieved through a participatory capacity building (learning by doing) process for both local communities and Government authorities. They have to be convinced it is to their advantage both financially and politically, to protect the environment by adhering to the PWS mechanism. This capacity building and consultation process will be conducted for the pilot demonstration under Output 2.1, resulting in PWS agreements under Output 2.2.

3. Affirmative action for the involvement and benefit of women and ethnic minorities (where present) in demonstration activities will be promoted, monitored and reported on throughout the project, through the engagement of a national consultant on Gender and Minority Empowerment under Output 2.1. Capacity building needs of the stakeholders including local communities (both men and women) has been assessed during project preparation and integrated in the project design to ensure full involvement of different stakeholders, in particular those who are vulnerable.

4. The ESSP has been integrated into the overall project M&E Plan in Output 2.3 and will be regularly reviewed and updated to inform project management of the need for any mitigating actions.

ENVIRONMENTAL AND SOCIAL SCREENING CHECKLIST

Name of Proposed Project: Payment for Watershed Services in the Chishui River Basin for Conservation of Globally Significant Biodiversity

QUESTION 1

Has a combined environmental and social assessment/review that covers the proposed project already been completed by implementing partners or donor(s)?

Answer to Question 1: Yes

QUESTION 2

Do ALL outputs and activities described in the Project Document only fall within the following categories?

1. Procurement (in which case UNDP's Procurement Ethics and Environmental Procurement Guide need to be complied with)
2. Report preparation
3. Training
4. Event/workshop/meeting/conference (refer to Green Meeting Guide)
5. Communication and dissemination of results

Answer to Question 2: No

QUESTION 3

Does the proposed project include activities and outputs that support upstream planning processes that potentially pose environmental and social impacts or are vulnerable to environmental and social change (refer to Table 3.1 for examples)? (Note that upstream planning processes can occur at global, regional, national, local and sectoral levels)

Evaluation Result of Checklist Table 3.1: Yes

TABLE 3.1 EXAMPLES OF UPSTREAM PLANNING PROCESSES WITH POTENTIAL DOWNSTREAM ENVIRONMENTAL AND SOCIAL IMPACTS

1. Support for the elaboration or revision of global- level strategies, policies, plans, and programmes. For example, capacity development and support related to international negotiations and agreements. Other examples might include a global water governance project or a global MDG project.	No
--	----

2. Support for the elaboration or revision of regional-level strategies, policies and plans, and programmes. For example, capacity development and support related to transboundary programmes and planning (river basin management, migration, international waters, energy development and access, climate change adaptation etc.).	No
3. Support for the elaboration or revision of national-level strategies, policies, plans and programmes. For example, capacity development and support related to national development policies, plans, strategies and budgets, MDG-based plans and strategies (e.g. PRS/PRSPs, NAMAs), sector plans.	Yes
4. Support for the elaboration or revision of sub-national/local-level strategies, policies, plans and programmes. For example, capacity development and support for district and local level development plans and regulatory frameworks, urban plans, land use development plans, sector plans, provincial development plans, provision of services, investment funds, technical guidelines and methods, stakeholder engagement.	Yes

QUESTION 4

Does the proposed project include the implementation of downstream activities that potentially pose environmental and social impacts or are vulnerable to environmental and social change?

Evaluation Result of Checklist Table 4.1: Yes

TABLE 4.1 ADDITIONAL SCREENING QUESTIONS TO DETERMINE THE NEED AND POSSIBLE EXTENT OF FURTHER ENVIRONMENTAL AND SOCIAL REVIEW AND MANAGEMENT

1. Biodiversity and Natural Resources	
1.1 Would the proposed project result in the conversion or degradation of modified habitat, natural habitat or critical habitat?	Yes
1.2 Are any development activities proposed within a legally protected area (e.g. natural reserve, national park) for the protection or conservation of biodiversity?	No
1.3 Would the proposed project pose a risk of introducing invasive alien species?	No

1.4 Would the proposed project pose a risk of introducing invasive alien species?	No
1.5 Does the project involve the production and harvesting of fish populations or other aquatic species without an accepted system of independent certification to ensure sustainability (e.g. the Marine Stewardship Council certification system, or certifications, standards, or processes established or accepted by the relevant National Environmental Authority)?	No
1.6 Does the project involve significant extraction, diversion or containment of surface or ground water? For example, construction of dams, reservoirs, river basin developments, groundwater extraction.	No
1.7 Does the project pose a risk of degrading soils?	No
2. Pollution	
2.1 Would the proposed project result in the release of pollutants to the environment due to routine or non-routine circumstances with the potential for adverse local, regional, and transboundary impacts?	No
2.2 Would the proposed project result in the generation of waste that cannot be recovered, reused, or disposed of in an environmentally and socially sound manner?	No
2.3 Will the proposed project involve the manufacture, trade, release, and/or use of chemicals and hazardous materials subject to international action bans or phase-outs? For example, DDT, PCBs and other chemicals listed in international conventions such as the Stockholm Convention on Persistent Organic Pollutants, or the Montreal Protocol.	No
2.4 Is there a potential for the release, in the environment, of hazardous materials resulting from their production, transportation, handling, storage and use for project activities?	No
2.5 Will the proposed project involve the application of pesticides that have a known negative effect on the environment or human health?	No
3. Climate Change	
3.1 Will the proposed project result in significant greenhouse gas emissions? The Environment and Social Screening Procedure Guidance provides additional guidance for answering this question.	No
3.2 Is the proposed project likely to directly or indirectly increase environmental	No

and social vulnerability to climate change now or in the future (also known as maladaptive practices)? You can refer to the Environment and Social Screening Procedure Guidance to help you answer this question. For example, a project that would involve indirectly removing mangroves from coastal zones or encouraging land use plans that would suggest building houses on floodplains could increase the surrounding population's vulnerability to climate change, specifically flooding.	
4. Social Equity and Equality	
4.1 Would the proposed project have environmental and social impacts that could negatively affect indigenous people or other vulnerable groups?	No
4.2 Is the project likely to significantly impact gender equality and women's empowerment ?	No
4.3 Is the proposed project likely to directly or indirectly increase social inequalities now or in the future?	No
4.4 Will the proposed project have variable impacts on women and men, different ethnic groups, social classes?	No
4.5 Have there been challenges in engaging women and other certain key groups of stakeholders in the project design process?	No
4.6 Will the project have specific human rights implications for vulnerable groups?	No
5. Demographics	
5.1 Is the project likely to result in a substantial influx of people into the affected community(ies)?	No
5.2 Would the proposed project result in substantial voluntary or involuntary resettlement of populations? For example, projects with environmental and social benefits (e.g. protected areas, climate change adaptation) that impact human settlements, and certain disadvantaged groups within these settlements in particular.	No
5.3 Would the proposed project lead to significant population density increase which could affect the environmental and social sustainability of the project? For example, a project aiming at financing tourism infrastructure in a specific area (e.g. coastal zone, mountain) could lead to significant population density increase which could have serious environmental and social impacts (e.g. destruction of the area's ecology, noise pollution, waste management problems, greater work burden on	No

women).	
6. Culture	
6.1 Is the project likely to significantly affect the cultural traditions of affected communities, including gender-based roles?	No
6.2 Will the proposed project result in physical interventions (during construction or implementation) that would affect areas that have known physical or cultural significance to indigenous groups and other communities with settled recognized cultural claims?	No
6.3 Would the proposed project produce a physical “splintering” of a community? For example, through the construction of a road, powerline, or dam that divides a community.	No
7. Health and Safety	
7.1 Would the proposed project be susceptible to or lead to increased vulnerability to earthquakes, subsidence, landslides, erosion, flooding or extreme climatic conditions? For example, development projects located within a floodplain or landslide prone area.	No
7.2 Will the project result in increased health risks as a result of a change in living and working conditions? In particular, will it have the potential to lead to an increase in HIV/AIDS infection?	No
7.3 Will the proposed project require additional health services including testing?	No
8. Socio-Economics	
8.1 Is the proposed project likely to have impacts that could affect women’s and men’s ability to use, develop and protect natural resources and other natural capital assets? For example, activities that could lead to natural resources degradation or depletion in communities who depend on these resources for their development, livelihoods, and well-being?	Possibly
8.2 Is the proposed project likely to significantly affect land tenure arrangements and/or traditional cultural ownership patterns?	No
8.3 Is the proposed project likely to negatively affect the income levels or employment opportunities of vulnerable groups?	No
9. Cumulative and/or Secondary Impacts	

<p>9.1 Is the proposed project location subject to currently approved land use plans (e.g. roads, settlements) which could affect the environmental and social sustainability of the project? For example, future plans for urban growth, industrial development, transportation infrastructure, etc.</p>	<p>No</p>
<p>9.2 Would the proposed project result in secondary or consequential development which could lead to environmental and social effects, or would it have potential to generate cumulative impacts with other known existing or planned activities in the area? For example, a new road through forested land will generate direct environmental and social impacts through the cutting of forest and earthworks associated with construction and potential relocation of inhabitants. These are direct impacts. In addition, however, the new road would likely also bring new commercial and domestic development (houses, shops, businesses). In turn, these will generate indirect impacts. (Sometimes these are termed “secondary” or “consequential” impacts). Or if there are similar developments planned in the same forested area then cumulative impacts need to be considered.</p>	<p>No</p>

Annex 11. Letter of Agreement for UNDP Direct Project Services

Annex 11. Letter of Agreement for UNDP Direct Project Services

STANDARD LETTER OF AGREEMENT BETWEEN UNDP AND FOREIGN ECONOMIC COOPERATION OFFICE, MINISTRY OF ENVIRONMENTAL PROTECTION FOR THE PROVISION OF SUPPORT SERVICES

Dear Mme. LI Pei,
Deputy Director General of FECO, MEP

1. Reference is made to consultations between officials of the *Foreign Economic Cooperation Office, Ministry of Environmental Protection* (hereinafter referred to as "FECO/MEP") and officials of UNDP with respect to the provision of support services by the UNDP country office for the project. UNDP and FECO/MEP hereby agree that the UNDP country office may provide such support services at the request of FECO/MEP through its institution designated in the relevant project support document or project document, as described below.
2. The UNDP country office may provide support services for assistance with reporting requirements and direct payment. In providing such support services, the UNDP country office shall ensure that the capacity of FECO/MEP -designated institution is strengthened to enable it to carry out such activities directly. The costs incurred by the UNDP country office in providing such support services shall be recovered from the administrative budget of the office.
3. The UNDP country office may provide, at the request of FECO/MEP or its designated institutions, the following support services for the activities of the project:
 - (a) Identification and/or recruitment of project and programme personnel;
 - (b) Procurement of goods and services; and
 - (c) Other project related actions as needed and requested in addition to the country office's project oversight support covered under the GEF implementing Agency fee.
4. The procurement of goods and services and the recruitment of project personnel by the UNDP country office shall be in accordance with the UNDP regulations, rules, policies and procedures. Support services described in paragraph 3 above shall be detailed in an annex to the project support document or project document, in the form provided in the Attachment hereto. If the requirements for support services by the country office change during the life of a project, the annex to the project support document is revised with the mutual agreement of the UNDP Country Director and the designated institution.
5. The relevant provisions of the Standard Basic Assistance Agreement between the Government of China and the United Nations Development Programme in China signed on January 29 1979 (the "SBAA"), including the provisions on liability and privileges and immunities, shall apply to the provision of such support services. The Government shall retain overall responsibility for the nationally managed programme or project through its designated institution. The responsibility of the UNDP country office for the provision of the support services

described herein shall be limited to the provision of such support services detailed in the annex to the project support document or project document.

6. Any claim or dispute arising under or in connection with the provision of support services by the UNDP country office in accordance with this letter shall be handled pursuant to the relevant provisions of the SBAA and the project support document or project document.

7. The manner and method of cost-recovery by the UNDP country office in providing the support services described in paragraph 3 above shall be specified in the annex to the project support document.

8. The UNDP country office shall submit progress reports on the support services provided and shall report on the costs reimbursed in providing such services, as may be required.


9. Any modification of the present arrangements shall be effected by mutual written agreement of the parties hereto.

10. If you are in agreement with the provisions set forth above, please sign and return to this office three signed copies of this letter. Upon your signature, this letter shall constitute an agreement between the FECO/MEP and UNDP on the terms and conditions for the provision of support services by the UNDP country office for the project.



Steven Sabey
Deputy Country Director
United Nations Development Programme

March 7, 2014



LI Pei,
Deputy Director General
Foreign Economic Cooperation Office,
Ministry of Environmental Protection

March 14, 2014

Attachment

DESCRIPTION OF UNDP COUNTRY OFFICE SUPPORT SERVICES

1. Reference is made to consultations between the Foreign Economic Cooperation Office, Ministry of Environmental Protection, the institution designated by the Government of China and officials of UNDP with respect to the provision of support services by the UNDP country office for the nationally managed project *Payment for Watershed Services in the Chishui River Basin for the Conservation of Globally Significant Biodiversity*.

2. In accordance with the provisions of the letter of agreement signed on Feb. _____, 2014 and the project document, the UNDP country office shall provide support services for the project as described below.

3. Support services to be provided:

Support services (insert description)	Schedule for the provision of the support services	Cost to UNDP of providing such support services (where appropriate)	Amount and method of reimbursement of UNDP (where appropriate)
1. Recruiting four international specialists	To be recruited during 2014- 2019 as per AWP.	As per UPL, the service fee per case is US\$ 953.	ATLAS billing -Estimated amount: US\$ 3,812.

4. Description of functions and responsibilities of the parties involved:
Description of functions and responsibilities of the parties involved is as per the project document. UNDP country office will provide the services as stated above upon the request of the Foreign Economic Cooperation Office, Ministry of Environmental Protection. The reimbursement of the UNDP support cost will be recorded as per transactions based on the established UNDP financial regulations and rules.