Brief Introduction of “Facilitating Reforestation for Guangxi Watershed Management in Pearl River Basin Project”

中国广西珠江流域治理再造林项目简介

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A. Background 背景

- In 2003, Guangxi Government applied US$100 million loan to the World Bank for implementing Guangxi Integrated Forestry Development and Conservation Project (GIFDCP). In order to achieve multi-goals concerning project economic, social and environmental benefits, the following activities were carried on:
  
  1) applying US$100 million loan to the World Bank for establishing 200,000 hectares of timber plantation;
  
  2) Promoting forest regeneration and vegetation rehabilitation in approximately 100,000 hectares
multiple-use protection forests, including establishing a bio-carbon pilot of approximately 4,000 hectares of multiple use protection forests for carbon sequestration and test carbon trade processes, the latter also namely "Facilitating reforestation for Guangxi Watershed Management in Pearl River Basin Project";

3) Strengthening biodiversity conservation in five nature reserves with global significant, by taking use of GEF granted fund of US$ 5.25 million;

4) Improving Guangxi forestry sustainable development capacity.

GIFDCP got approval from the World Bank's Board of Executive Directors on Dec.14, 2006.
"Facilitating reforestation for Guangxi Watershed Management in Pearl River Basin Project" is the first forest carbon sequestration project in light of relevant regulations of the Clean Development Mechanism (CDM) under the Kyoto Protocol during project preparation and implementation. Methodology of reforestation on degraded land based on this project is the first approved A/R methodology validation by CDM Executive Board.
B. Objectives 目标

1) To sequester CO2 through forest restoration in small watershed areas; 通过在小流域的森林恢复活动吸收二氧化碳 (CO2);

2) To enhance biodiversity conservation by increasing the connectivity of forests adjacent to nature reserves; 通过提高周边森林和自然保护区之间的连接性，增强生物多样性保护；

3) To improve soil and water erosion control; 控制水土流失；

4) To generate income for local communities. 增加当地社区的收入。
C. Description of the project activity 项目活动概述

C.1 Location 位置

The project activity is located in Cangwu County (in the Eastern part of map) and Huanjiang County (in the Northern part of map), Guangxi Zhuang Autonomous Region, in southern China.

项目区位于中国南部广西壮族自治区苍梧县(地图的东部)和环江县(地图的北部)。
C.2 Project activity 项目活动

C.2.1 2000 ha in Huanjiang County

- 830 ha on sites neighboring Mulun National Nature Reserve and Jiuwanshan National Nature Reserve, and around 1,170 ha on sites between them.

包括：830公顷邻近木论国家级自然保护区和九万山国家级自然保护区，1170公顷位于两个保护区之间。
Species and afforestation models 树种和再造林模式

- *Pinus massoniana* mixed with *Liquidambar formosana* (1,050 ha); 马尾松和枫香混交林1050公顷；
- *Cunninghamia lanceolata* mixed with *L. formosana* (450 ha); 杉木和枫香混交林450公顷；
- *Eucalyptus* sp (500 ha). 桉树纯林500公顷。

Harvest 主伐年限

- *Eucalyptus* 9 years 桉树9年
- *Liquidambar* 17year 枫香17年
- *Cunninghamia, Pinus* ＞30 years 杉木、马尾松 ＞30年。
C.2.2  2000 ha in Cangwu County

Plantation established on sites with severe soil and water erosion. 造林地点位于水土流失严重地区.
Species and afforestation models 树种和再造林模式

*Pinus. massoniana* mixed with *Quercus griffithii* (600 ha); 马尾松和大叶栎混交林600公顷；
*Pinus. massoniana* mixed with *Schima. superba* (900 ha); 马尾松和木荷混交林900公顷；
*Eucalyptus* sp (500 ha). 桉树纯林500公顷。

Harvest 主伐年限

*Quercus.* 7 years 大叶栎7年
*Eucalyptus.* 9 years 桉树9年
*Schima.* 17 year 荷木17年
*Pinus.* ＞30 years 马尾松＞30年
C.3 Species selection 树种的选择

Species selection by considering 树种选择的依据

- farmers/communities interests(surveyed); 农户/社区的兴趣和意愿（调查）;
- companies interests(value of associated forest products);公司的利益（林产品估算）;
- carbon sequestration rates;碳吸收的比率;
- biodiversity enhancement;生物多样性保护;
- water and soil erosion control.水土流失控制;

All species are native to the area except eucalyptus.除桉树外，所有树种都是本地种.
C.4. Technology to be employed by the project activity 项目活动采用的技术

One of the main technologies which will be employed under this project is reforestation through direct planting with environmental-friendly techniques on degraded lands. Good practice guidance and successful national and international technologies, as well as experiences gained from the World Bank financed forestry projects will also be adopted. The national technical standard will be strictly followed.

采用环境友好技术进行植树再造林。当地优秀的实践经验、国内外好的技术，以及世界银行贷款林业项目取得的经验将得到运用。本项目还将严格遵循国家的技术标准。
Geographical Information System (GIS) and Geographical Positioning System (GPS) will be employed in the verification and monitoring of the implementation of the project activity. The local forestry agencies will provide technical consultation and guidance, including training courses, and conduct quality control to the preparation and implementation of the project activity.

项目活动将使用地理信息系统和全球定位系统核查和监测项目的实施，设置永久固定标准地进行生物量监测。当地各级林业部门将提供包括培训在内的技术咨询和指导，并对拟议的清洁发展机制项目活动的准备和实施进行质量控制。
C.5 Land Tenure and production arrangements and management models

Lands are owned by the local villages /communities. and subcontracted to farmers for plantation establishment management.

Model 1 - farmers/communities and forest company (3560ha); 模型一：农民/社区与林场/公司股份合作 (3560公顷);

Model 2 - Farmers group (440ha). 模型二:农户小组 (440公顷).
D. Project preparation and implementation procedure 项目准备和执行程序

- new project methodology 新的项目方法学
- Project Idea Note 项目概念设计书 (PIN)
- Letter of intent for purchase 采购意向函
- Emission Reductions Purchasing Agreement 购碳协议
- Monitoring report 监测报告
- Verification Report 核查报告
- Certification report 核证报告
- Ask for issuance of CER 提出签发CERs
- CDM执行理事会EB
- Project participator 项目参与方
- Administrative Committee of World Bank Bio-carbon Fund or other buyers 世行生物碳基金管委会或其他买家
- DOE A or B 指定的经营实体DOE A
- Project investor 项目投资方
- Monitoring 监测
- Verification and Certification 核查与核证
- Certification report 核证报告
- Issuance of CERs 签发CERs
- National Development and Reform Commission approval 国家发改委批准
- Validation /registration 审定/注册
- Investment and implementation 投资与执行
- Approval 批准
- Project Design Document 项目设计文件
- CERs CDM
- EB Issuance of CERs 执行理事会签发CERs
Since the project preparation began at 2004, 2 years has been past till project launching on Apr. 1, 2006. Now afforestation is finished, entering into tending and managing period. Monitoring will start from 2009.

该项目从2004年开始准备，至2006年4月1日启动实施，历时2年。目前已基本完成造林，进入抚育和管护期，2009年开始监测。
The BioCarbon Fund Manager - Mr. Benoit Bosquet penetrating into project area for project identification

Joanneum Research Bernhard Schlamading (Methodology Specialist) carrying out further investigation and guidance in project areas

2004年9月世行生物碳基金管理委员会负责人深入项目区认定项目

方法学专家深入项目区实地考察与指导
Biomass survey of existing vegetation on plantation site

Sociology specialist from China Forestry Academy (Prof. Li Weichang) carrying out social assessment in local communities

造林地现有植被生物量调查

中国林科院社会学专家李维长教授亲临社区进行社区评估
Conference between Specialists from DOE and Project Sponsor on project information

Technical negotiation between Project Sponsor and the Trustee of the BioCarbon Fund
E. Application of a methodology 采用的方法

The methodology “Reforestation of degraded land” (AR-AM0001) is applied. 项目采用CDM执行理事会批准的“退化土地再造林方法学”(AR-AM0001)

E.1 Title and reference of the approved baseline methodology applied to the project activity 项目活动选取该方法学的理由及适用性

The methodology applied was derived from the project activity. The project activity complies with the conditions under which the chosen methodology applies in the following ways: 所采用的方法学源自本项目，项目活动符合所选方法学的应用条件，具体是:

1) The project activity will not lead to a shift of pre-project activities outside the project boundary. 项目活动不会导致项目边界外项目前活动的改变.
2) Lands to be reforested have been severely degrading over the last decades and are degrading.再造林地已在过去几十年来严重退化，并在继续退化。

3) Unavailability of natural seed sources, and environmental conditions, do not permit the encroachment of natural forest vegetation.缺乏天然种源，加上目前的环境状况，使天然实现林地自然更新难以实现。

4) Lands will be reforested by direct planting in the project activity.项目活动中，土地将通过植苗造林建立森林。

5) The site preparation will not cause significant long-term net emissions from soil carbon.整地不会造成土壤碳长期性的净排放。

6) Plantation will be harvested with a minimum rotation of seven years and will be regenerated by direct planting or natural sprouting.再造林后采伐的轮伐期最短是七年，之后通过直接种植或者天然萌生实现更新。
7) Carbon stocks in soil organic matter, litter and deadwood will decrease more or increase less in the absence of the project activity, relative to the project scenario. 没有项目活动时土壤有机质、枯落物和枯死木中的碳贮量会比有项目活动时减少更多，或增加更少。

8) Due to the degraded feature of the lands, economical unattractiveness, identifiable barriers and remote feature of the lands, investors or local communities are prevented from using the land for economic revenue. Without the proposed A/R CDM project activity, the lands to be reforested will continue to degrade. Therefore the baseline approach of the methodology is the most appropriate choice for determination of the baseline scenario. 由于土地退化，经济上没有吸引力，存在的障碍以及再造林地处于偏远的山区，投资者和当地社区难以利用这样的土地取得经济收益。如果没有拟议的项目活动，这些可以再造林的土地将继续退化。方法学中的基线方法是确定基线方案的最为合适的选择。
E.2  Demonstration of the land eligibility and additionality of the project

E.2.1 Conditions of eligibility of land

1) The lands to be planted in the project activity have been non-forested barren lands since at least 1989. 再造林土地1989年12月31日以来一直为无林地；

2) The forest definition complies with the UNFCCC definition. 森林的定义符合联合国气候变化框架公约(UNFCCC)的定义；

3) Nonperformance afforestation activity, land not likely to become forest. 不实施再造林活动，土地不可能变为森林；

Eligibility of land proven by using land cover maps and interviews with land owners. 通过利用土地覆盖图和通过访问土地所有者证明土地的合格性.
Land use/cover map of Huanjiang County in 1989

Legend
- Road
- Chinese Fir
- Pine
- Other stand
- Barren land
- Shelter Stand
- Bamboo
- Fruit Garden
- Shrub land
- Other land
- Project Boundary

Scale 1:500000

land use/cover map of Huanjiang County in 1999

Legend
- County government
- Township government
- Village
- County boundary
- Township boundary
- Railway
- Road
- River

Legend
- Coniferous
- Broadleaves
- Needle and broadleaf mixed forest land
- Other forest land
- Grass land
- Barren land
- Others land
- Water
- Project boundary

Scale 1:500000
landscape to be planted 再造林地景观

lands covered mostly with grasses 林地上覆盖的主要草本植被
E.2.2 Additionality test 额外性检验

The steps as outlined in the additionality tool are followed to demonstrate that the project activity is additional and not the baseline scenario. Including:

1) Identification of alternatives to the project activity;
   确定项目活动替代方案；

2) Investment analysis； 投资分析

3) Barrier analysis Including investment barriers, Technological barriers, Institutional barriers and Market risks； 障碍分析，包括投资、技术和机构障碍以及市场风险；

4) Impact of CDM registration.注册清洁发展机制产生的影响分析。
F. Monitoring plan 监测计划

F.1 Monitoring content 监测内容

F.1.1 Monitoring the overall performance of the project activity, Including: 监测项目活动的执行情况，包括:

1) Monitoring actual project boundary; 项目活动边界的监测;

2) Monitoring the areas and quality of forest establishment to ensure the technical design described in section A is well-implemented; 项目造林活动的监测；

3) Monitoring of forest management. 森林管理监测.
F.1.2 Monitoring the actual net GHG removals by sinks data

Permanent sampling plots are used for sampling over time to measure and monitor changes in carbon stocks of the relevant carbon pools.

1) Systematic sampling with a random start position.
2) The total sum of samples (n) are estimated as per a criterion of Neyman of fixed levels of accuracy, according to Wenger (1984).
3) The size of plots is 400 m² (20m × 20m);
4) The growth (DBH and H) of individual trees on plots shall be measured at each time interval of monitoring.

5) The carbon stock changes in above- and below-ground biomass of living trees on each plot are estimated through Biomass Expansion Factors (BEF) method.

Each plot's above- and below-ground biomass carbon stock changes are estimated using the Biomass Expansion Factors (BEF) method.
F.1.3 Monitoring GHG emissions by sources as the results of the project activity, including:

1) Decrease in carbon stock in living biomass of existing non-tree vegetation;

2) N2O emissions caused by nitrogen fertilization application.

F.1.4 Monitoring the leakage

Fossil fuel combustion from vehicles using for transporting seedling, labours, fertilizer, harvest products, etc., to and/or from project sites, as a result of the project activity, will emit greenhouse gases.
F.2 Accuracy and precision 精确性和精度

+-10% error at 95% confidence level.
以95%的置信度，误差为+-10%.

F.3 Quality Assurance and Quality Control (QA/QC) 质量和质量控制

To ensure the net anthropogenic GHG removals by sinks to be measured and monitored precisely, credibly, verifiably and transparently, a quality assurance and quality control (QA/QC) procedure will be implemented. 为确保人为净温室气体汇清除得到精确可靠、透明、可核查的测量监测，将实施质量保证和质量控制程序.
G. Estimation of net anthropogenic GHG removals by sinks

The net anthropogenic GHG removals by sinks as a result of the proposed A/R CDM project activity is anticipated to be over 770,000 tones of CO2 equivalent during the crediting period (between 1 April 2006 and 31 March 2036). By the year 2017: 462,013 t CO2-e.

In 2006年4月1日至2036年3月31日的计入期间，项目活动的人为净温室气体汇清除预期值超过770,000tCO2-e，到2017年为462,013tCO2-e.
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<th>Estimation of baseline net GHG removals by sinks (tones of CO2 e yr⁻¹)</th>
<th>Estimation of actual net GHG removals by sinks (tones of CO2 e yr⁻¹)</th>
<th>Estimation of leakage (tones of CO2 e yr⁻¹)</th>
<th>Estimation of net anthropogenic GHG removals by sinks (tones of CO2 e yr⁻¹)</th>
<th>Cumulative actual net GHG removals (tCO₂-e)</th>
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Carbon stock change of project scenario
Increase in GHG emissions
Leakage
Baseline net GHG removals by sinks
Net anthropogenic GHG removals by sinks
Actual net GHG removals by sinks
H. Benefit of the project 项目效益

H.1 Socio-economic benefit 社会经济效益

1) Demonstration for the implementation of forest carbon sequestration project in China and even in the world. 为中国乃到全球林业碳汇项目的实施起到示范作用.

2) Income generation 增加经济收入

- About 20,000 local farmers of 5,000 households will benefit from the project. 大约5,000个农户将受益于该项目.
- The total income is estimated at US$ 21.1 million within the crediting period, including:
  - US$ 15.6 million from employment; 劳务收益约1,560万美元;
  - US$ 3.5 million from sales of wood and non-wood products; 木材和非木质产品的销售收入350万美元;
  - US$ 2.0 million from sales of CERs. CERs销售收入200万美元.
3) Creating employment  创造就业
- The project activity will create about 5 million person-days of temporary employment opportunities;  项目实施活动将为社会提供约500万个工日的临时就业机会;
- It will also create 40 long-term job positions during the crediting period.  项目计入期内的管护工作还将产生40个长期工作岗位.

4) Sustainable fuelwood supply 可持续的薪柴使用
5) Strengthening social cohesion 提高社会凝聚力
6) Technical training and demonstration 技术培训示范
H.2 Environmental benefit 环境效益

1) Enhancing biodiversity and ecosystem integrity; 增强生物多样性和自然生态系统的联系；
2) Controlling soil erosion; 控制水土流失；
3) Regulating hydrological flows which in turn alleviates drought risk and reduces flooding risks, Improving environmental services; 调节气候、水文，减轻自然灾害，改善环境服务；
4) Building incentives to people to invest in sustainable land use; 鼓励居民投资于可持续的土地利用；
5) Improving watershed management and contributing to the outside of the project boundary and the ecosystem improvement along the Pearl River, through demonstration and extension of the project experience to other areas. 通过示范，推广项目经验至其它地区，同时改善项目边界外和珠江流域地区的生态系统。
Condition of forestland before plantation
造林前林地现状

Profile of the forestland after plantation established
造林后的林地概貌
The methodology “Reforestation of degraded land” (AR-AM0001): http://cdm.unfccc.int/EB/Meetings/022/eb22_repan17.pdf

Thank you!