World Bank-financed Jiangxi Poyang Lake Basin and Ecological Economic Zone Small Town Development Demonstration Project

Ruijin City Mianjiang River (Lucao Lake) Wetlands Protection and Utilization Subproject

Environmental Codes of Practice

For

Afforestation

Institute of Poyang Lake Eco-economics, Jiangxi University of Finance and Economics
Beijing Huaqing Lishui Environmental Technology Co., Ltd.
Environmental Engineering Technology Development Center, Jiangxi Academy of Sciences
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Table of Contents

1 Overview ...............................................................................................................................................3
    1.1 Purpose and Significance ..............................................................................................................3
    1.2 Major Legal Documents for Reference .........................................................................................3
2. Environmental Protection Measures at Design Stage ....................................................................4
    2.1 Design of Afforestation Model ....................................................................................................4
    2.2 Selection of Afforested Areas of The Project ..............................................................................4
3. Environmental Protection Measures at Construction Stage ..........................................................5
    3.1 Cleaning of Afforested Areas ........................................................................................................5
    3.2 Soil Preparation of Afforested Areas ............................................................................................5
4. Soil Erosion .........................................................................................................................................6
5. Selection and Layout of Tree Species (Varieties) .............................................................................6
6. Cultivation and Management of Forests ............................................................................................7
    6.1 Weed Control and Scarification ....................................................................................................7
    6.2 Fertilization .....................................................................................................................................7
    6.3 Irrigation .........................................................................................................................................7
7. Integrated Management of Plant Diseases and Pests ........................................................................7
8. Fire Prevention of Forests ...................................................................................................................8
9. Felling and Skidding ..........................................................................................................................8
    9.1 Felling ............................................................................................................................................9
    9.2 Skidding .......................................................................................................................................9
10. Forest Management Access Roads ..................................................................................................9
1. Overview

1.1 Purpose and Significance

The Environmental Codes of Practice is formulated to guide the isolation and protection work of Ruijin City Mianjiang River (Lucao Lake) Wetlands Protection and Utilization Subproject of World Bank-financed Jiangxi Poyang Lake Basin and Ecological Economic Zone Small Town Development Demonstration Project in order to further strengthen the eco-environment benefit during the implementation of the project, and minimize or eliminate potential negative impacts on the natural environment in order to realize all eco-environment benefit objectives expected under the project.

1.2 Major Legal Documents for Reference

1. Relevant laws and regulations of the People’s Republic of China

(1) Environmental Protection Law of the People's Republic of China, December 26, 1989;

(2) Forestry Law of the People's Republic of China, January 1, 1985;

(3) Land Administration Law of the People's Republic of China, 1999.01.01;

(4) Law of the People's Republic of China on Water and Soil Conservation, March 1, 2011;


(6) Regulations on Forest Disease and Pest Control of the People's Republic of China, December 18, 1989;

(7) Regulations for Plant Quarantine of the People's Republic of China, May 13, 1992;

(8) Forest Fire Prevention Regulations, January 1, 2009;

(9) Law of the People's Republic of China on Water and Soil Conservation, August 1, 1993;

(10) Regulations of the People's Republic of China on Nature Reserves, December 1, 1994;

(11) Regulations on Conversion of Farmland to Forests, January 20, 2003;

(12) Interim Measures for Administration of Forestation Quality, July 28, 2010;

(14) Detailed Rules of Jiangxi Province on Safe Construction

2. Guidelines of World Bank
   (1) Business Guideline 4.01 Environmental Assessment;
   (2) Environmental, Health and Safety Guidelines of International Financial Company.
   (3) Safeguard documents of the World Bank and other documents

2. Environmental Protection Measures at Design Stage

2.1 Design of Afforestation Model

(1) Optimized project design and plan help minimize potential negative impacts on the environment.

(2) The project design and plan are far away from such environmentally sensitive areas as wildlife habitats and natural and cultural relics. The construction progress is rationally arranged to shorten the land occupation time.

(3) Each afforested area shall have five tree species at minimum, in order to strengthen the protection work for biodiversity in the areas.

(4) Rational collocation of tree species and cautious selection of tree species ensures security of native tree species and avoid interference of exotic tree species.

(5) Rational afforestation density is selected according to local conditions.

(6) The selection of the construction site shall avoid immovable cultural relics. In special circumstances, the site of the cultural relic unit shall be protected as far as possible.

2.2 Selection of Afforested Areas of the Project

(1) Any existing forests with a canopy density of more than 0.2 shall not be selected.

(2) Afforested areas are not permitted to be located within natural habitats and natural or cultural relic protection zones, 2,000m from the periphery of buffer areas of various protection zones, the required protection distance from protected material or cultural resources, 50m at both sides of main rivers and 20m at both sides of tributaries.
(3) Any sloping field with a gradient of more than 35° is not permitted to be selected as an afforested area.

(4) Priority shall be given to bush woods and secondary open forests that could play the role as local wildlife habitats and shelters.

3. Environmental Protection Measures at Construction Stage

3.1 Cleaning of Afforested Areas

(1) Original vegetation belts shall be preserved, and exposed surface soil shall be covered with deadwoods and leaves. Natural vegetation on the top of hills, at the foot of hills, in valleys and at the river bank shall be preserved.

(2) In any block with a gradient of more than 15℃, bushes and weeds that hinder the afforestation activity could be removed by blocks or belts.

(3) Removed bushes and weeds shall be piled up between belts or planting holes for natural decay and decomposition.

(4) Native generations on the top of hills and hillside and at the foot of hills shall be preserved.

(5) During the cleaning of forests, protection zones within a specific range shall be preserved at both sides of rivers according to span, flow, cross section and stability of river way.

(6) During the cleaning of the afforested areas, disease, rotten, lodged and mechanically damaged woods shall be cleaned, bushes in forests shall be cut off, disease and rotten woods shall be disposed by technicians of county forest protection stations. Random stacking is prohibited to avoid transmit pathogens.

3.2 Soil Preparation of Afforested Areas

(1) Hole reclamation, band reclamation or whole reclamation shall be selected for soil preparation according the gradient of afforested areas. The ground-breaking area shall be controlled below 25%. See Table 1 for the relationship between the selection of soil preparation modes and the gradient of forests. Meanwhile, ecological fences shall be set for soil preparation and excavation on rocky-desertified land areas with a gradient of more than 25℃.

<table>
<thead>
<tr>
<th>Gradient of forests</th>
<th>Soil preparation modes</th>
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<tbody>
<tr>
<td>&lt;15℃</td>
<td>Whole reclamation</td>
</tr>
<tr>
<td>16-25℃</td>
<td>Hole reclamation, band reclamation along contour lines or terrace soil preparation</td>
</tr>
</tbody>
</table>
A 10-meter-wide vegetation protection belt shall be preserved between the edge of afforested areas and farmlands. In case of whole reclamation on long slope surface, a 20-meter-wide native vegetation protection belt shall be preserved at an interval of 100m.

During the course of soil preparation, cultural relics shall be reported to reduce water loss and soil erosion and minimize the negative impacts.

Soil preparation and plantation shall be linked to shorten the exposure time of plant holes.

4. Soil Erosion

The existing vegetation on forests shall be preserved, and sciophilous and shade-tolerant vegetation shall be cultivated.

Ground-cover plants shall be recovered and protected.

Soil and water conservation measures shall be adopted for newly built forest ways

5. Selection and Layout of Tree Species (Varieties)

Native tree species are recommended in order to strengthen the protection for biodiversity. Good seed source of native tree species are selected for family or clone-based afforestation, in order to enhance their capacity against plant diseases and insect pests and reduce the threats of plant diseases and insect pests. New exotic tree species and invasive tree species are not introduced.

During the afforestation design and construction, original native tree species and bushes shall be utilized as far as possible, associated native tree species shall be planted to simulate the landscape pattern of as natural forests, in order to promote the protection, recovery and updating of natural plant communities.

Multiple three species and varieties shall be laid out in harmony, and the continuous planting areas of single tree species or variety shall be controlled. In the rebuilt mingled forest model, the number of dominant tree species shall not be more than 70% of the total number.

The continuous planting area of single three species shall strictly controlled, with the small-scale planting areas of each rebuilt forest of no more than 20hm², and the small-scale planting areas of each recovered forest of no more than 35hm².
(5) During afforestation design and layout, wildlife corridors generated from the existing native vegetation shall be preserved, with the general width ranging between 50~100m.

(6) In-hole scarification, weed control and stone press are conducted for cultivation of seedling forests. Surface vegetation out of holes and cultivated weeds are preserved. After the establishment, the forests shall be timely cultivated to ensure rational forest stand structures and promote the growth of under-bushes and weeds. The collection of deadwoods and leaves are prohibited in order to enhance the water conserving efficiency and maintain the soil fertility.

(7) Miscellaneous manures, organic fertilizers and formula fertilizers are recommended to improve oil structure and fertility.

(8) Scarification, weed control, intercropping, irrigation, fertilization and sanitation felling shall be conducted for woods, and measures adverse to environmental protection shall be controlled.

6. Cultivation and Management of Forests

6.1 Weed Control and Scarification
Herbicides are prohibited. The local cultivation method is recommended for the cultivation of seedling forests. Hole expansion, scarification and weed control are conducted for seedling forests, and natural vegetation in seedling forests shall be preserved. After weed control, vegetation residues shall be preserved in the land as ground cover. The collection of deadwoods and leaves are prohibited in order to enhance the water conserving efficiency and maintain the soil fertility.

6.2 Fertilization
Organic fertilizers are recommended. The time, frequency, quantity and method of fertilization shall conform to the characteristics and requirements of fertilizers, without random fertilization. The fertilization schemes shall be determined according to appropriate scientific research results or suitable oil and plant test results. Hole fertilization or band fertilization is required, and fertilizer spreading is strictly prohibited. Fertilizers shall be applied in the uphill direction of the holes and covered with soil to prevent nutrients loss and surface water pollution.

6.3 Irrigation
Such water-saving irrigation measures as precipitation interception with impounding reservoirs, coverage of planting holes with mulching films and macromolecule water-retaining agent are recommended, in order to enhance the effective utilization rate of natural precipitation and save local underground water resources.

7. Integrated Management of Plant Diseases and Pests
Integrated management of plant diseases and insect pests shall be conducted for the project forests, to ensure their healthy growth and development. Specific control measures are as follows:

(1) The proposed plant disease and insect pest control and management plan shall be
strictly carried out, and integrated plant disease and insect pest control techniques shall be promoted.

(2) Good forest management measures shall be selected to enhance the forest stand’s capacity against plant diseases and insect pests.

(4) Regular monitoring shall be conducted for severe pest species.

(5) Artificial weed control shall be adopted to ensure the quality of forest stand cultivation and the mentoring of environmental effect.

(6) Biological and physical control measures are recommended.

(7) Organic fertilizers are taken as the base fertilizer, supplemented by chemical fertilizers. Soil testing formula fertilizers are applied to balance the fertilization techniques. The fertilization quantity is determined according to different soil fertility and plant demands. The formula fertilization shall be carried out to rationally control the quantity of chemical fertilizers and adjust the proportion of N, P and K. microbial fertilizers shall be promoted.

(8) The plant disease and insect pest prediction and forecast works shall be specially strengthened in the plant disease and pest management plan of the project forests.

8. Fire Prevention of Forests
(1) The fire prevention work of the project forests is required to be included into the existing local forest fire management systems at all levels. Each afforestation unit is required to make a forest fire prevention plan, set up a fire management body and formulate detailed plans for fire prevention, public education, tour inspection, law enforcement and fire emergency handling.

(2) Each afforestation entity is required to make a forest protection and fire prevention plan both in the forms of governmental regulation or non-governmental regulation, designate fire prevention responsibility areas, assign forest guards according to the area of forests, and make report to the project office and the forest protection and fire prevention body on schedule.

(3) In afforestation design, consideration shall be given to the forest protection and fire prevention planning. Fireproofing belts are required for any forest block with a continuous area of more than 100hm2 to divide the block into small ones. The main fireproofing forest belt is 20m wide, while side fireproofing forest belts are 15m wide. Hima superba and waxberry are planted in fireproofing forest belts, with a line spacing of 2×2m.

9. Felling and Skidding
Thinning and regeneration felling are permitted with the aim of maintaining the environmental protection functions of rebuilt and recovered forests.
9.1 Felling
(1) The felling operations shall strictly comply with *Forestry Law* and *Code of Forest Harvesting Practice*.

(2) The felling operations for the purpose of cultivation and regeneration are only permitted in the project, whereas any felling operation for the commercial purpose is not permitted. Selective felling is recommended to maintain permanent vegetation and prevention functions of forests.

(3) Attention shall be given to protect under vegetation in the felling operation, while regeneration is required in the next year after the felling operation.

9.2 Skidding
(1) Logs shall be adopted for skidding as far as possible, instead of tree-length logging, in order to reduce the damage on surface vegetation and surface soil.

(2) Forest lanes shall be adopted as log ways as far as possible. Forest ways with a width of less than 1m could be opened when necessary.

10. Forest Management Access Roads
Forest management access roads are required to facilitate normal operation activities at the project site. Forest ways shall be designed before construction. In building forest management access roads, the existing forest lanes shall be utilized as far as possible. Such access roads shall be built along contour lines as far as possible, with the width ranging between 0.8~1.0m and the average density ranging between 30~80m/hm². Bushes, arbors and climbing plants shall be planted within the range of side slopes and road borders, in order to flourish vegetation on side slopes and slow down soil erosion. Large-scale excavation is prohibited for the construction of access roads to minimize the ground-breaking area and avoid soil erosion.
Map  Geographic Location of the Project

Ridong Reservoir Separation and Protection Forest