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History of the document

Version	Date	Nature of revision
01	30 December 2011	This CCBA PDD is submitted in combination with an AR-CDM PDD, so some sections in the CCBA PDD briefly indicate which chapter of the AR-CDM PDD already contains the relevant information - avoiding in this manner the dublication of information.

I. Basic Data:

1) The title of the CCB Standards project activity:

>> Afforestation of Degraded Shengle Ecological Zone in Helinge'er of Inner Mongolia, China

2) The version number of the document:

>> Version 01

3) The date of the document:

>> Date of the document: 13/10/2012

II. General Section:

G.1 Original Conditions in the Project Area (Required)

G.1.1 Describe the location of the project and basic physical parameters (e.g., soil, geology, climate).

>>

Location of the project: see AR-CDM PDD section A.2 for details.

Basic physical parameters: see AR-CDM PDD section A.3 for details.

G.1.2 Describe the types and condition of vegetation within the project area:

>> Vegetation in the project region is a mixture of mid-Asia flora, north China flora and Mongolia steppe flora. There is a distinct vertical vegetation zone in the east and south of the project area, e.g., from bottom to top of mountains, Stipa steppe, thyme community and wormwood community; rose (*Rosa xanthine*) and almond (*Prunus pedunculata*) shrub vegetation; sparse forests including Chinese pine, birch and poplar; and hardhack community. Vegetation in the hilly area in the mid and north of the project area belongs to zonic temperate steppe, dominated by stipa. However, natural Stipa steppe was damaged due to historical repeated cultivation, and replaced by secondary communities such as thyme, perennial lespedeza, wormwood, *Ostriopsis davidiana*, seabuckthorn, etc. Natural vegetation in the west and southwest of the project area has been extinct due to long-term cultivation.

All the project lands are non-forest lands over 50 years. The vegetation is mainly composed of herbaceous plants dominated by stipa (*Stipa* sp.), thyme (*Thymus* sp.) and wormwood, with more or less shrub species such as Caragana (*Caragana* sp.) and Seabuckthorn (*Hippophae* sp.). There is no 批 pre-project growing trees on project lands.

G.1.3	The boundaries of the project area and the project zone:

>> The shp files of specific geographical positions (longitude, latitude) at each corner of each of 21 parcels, produced by GIS, will be provided to DOE for validation.

G.1.4	Current carbon stocks within the project area(s), using stratification by land-use or vegetation type and methods of carbon calculation (such as biomass plots, formulae, default values) from the Intergovernmental Panel on Climate Change's 2006 Guidelines for National GHG Inventories for Agriculture, Forestry and Other Land Use (IPCC 2006 GL for AFOLU) or a more robust and detailed methodology:

>>The consolidated afforestation and reforestation baseline and monitoring methodology "Afforestation and reforestation of degraded land" (AR-ACM0001/Version 05.2.0) is applied.

The proposed project activity complies with the conditions under which the chosen methodology applies, which has been demonstrated in AR-CDM PDD section B.2.

Visual assessment was applied to estimate vegetation crown cover of each parcel of land, and dominated species of pre-project trees, shrubs and herbaceous plants were recorded. For lands with shrub crown cover over 5%, sampling were applied to measure crown cover of shrubs for each shrub crown cover class visualized, i.e., 5-30%, 30-60% and >60%. The size of sampling plots is 20 meters by 20 meters. At least one plot should be measured for every 25 ha of lands and at least 10 sampling plots for each class should be measured. The sampling plots were selected systematically on ArcGIS platform, for which the project area was divided into grid of 25 ha and the cross point of the grid was chosen as the southwest corner of the sampling plot. Precision level of the measurement is 20% at 90% confidence level. In case of the precision level is not met, additional sampling should be randomly added.

Vegetation baseline survey indicates that the lands to be planted in the proposed project activity are currently non-forested, barren lands, covered mainly by herbaceous plants stipa (Stipa sp.), thyme (Thymus sp.) and wormwood. There are no pre-project living trees. The total vegetation crown cover is 15-60%, including 1,937.72 ha of lands with shrub crown cover less than 5%, and 252.99 ha of lands with shrub crown cover in a range 6-25% (15% in average, 10 sampling plots, 19% precision level at 90% confidence level). The main shrub species are Caragana (Caragana sp.) and Seabuckthorn (Hippophae sp.). See Table Annex 3 0 1 for details. The project lands are therefore stratified into two baseline strata based on shrub crown cover as shown in Table C-0 1 and Figure C.0.5.

Pre-project carbon stock in living biomass of woody vegetation on project sites was estimated following the methodological tools for "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities" (Version 02.1.0), as below.

Trees

Based on baseline vegetation survey, no pre-project living trees were found, therefore, the pre-project carbon stock in living tree biomass ($C_{TREE\_BSL,t=0}$) is set as zero, i.e.

$$C_{TREE\_BSL,t=0} = 0$$

Shrubs

Pre-project carbon stock in living biomass of shrubs is estimated using equation (30) of the methodological tool applied,

$$C_{SHRUB,t=0} = \frac{44}{12} * CF_S * (1 + R_S) * \sum_i A_{SHRUB,i,t=0} * B_{SHRUB,i,t=0} \qquad \textbf{(G.1)}$$

where:

$C_{SHRUB,t=0}$	Carbon stock in shrub biomass within the project boundary at the start of the project (t=0); t CO_2-e
CF_S	Carbon fraction of shrub biomass; t C (t.d.m.)$^{-1}$. IPCC default value of 0.50 t C (t.d.m.)$^{-1}$ is used
R_S	Root-shoot ratio for shrubs; dimensionless. Default value 0.40 is used
$A_{SHRUB,i,t=0}$	Area of shrub biomass stratum i at the start of the project (t=0); ha
$B_{SHRUB,i,t=0}$	Shrub aboveground biomass per hectare in shrub biomass stratum i at the start of the project (t=0); t d.m. ha^{-1}
i	_1, 2, 3, … shrub biomass strata delineated on the basis of shrub crown cover_
t	_1, 2, 3, … years counted from the start of the AR project activity_

Based on the methodological tool applied, aboveground shrub biomass per hectare ($B_{SHRUB,i,t=0}$) is estimated as follows:

(a) For those areas where the shrub crown cover is less than 5%, the aboveground shrub biomass per hectare is considered negligible and hence accounted as zero, i.e., $B_{SHRUB,i,t=0}$ =0;

(b) For those areas where the shrub crown cover is 5% or more, aboveground shrub biomass per hectare is estimated as follows:

$$B_{SHRUB,i,t=0} = BDR_{SF} * B_{FOREST} * CC_{SHRUB,i,t=0} \qquad \textbf{(G.2)}$$

Where:

BDR_{SF}	Ratio of shrub biomass per hectare in land having a shrub crown cover of 1.0 and default above-ground biomass content per hectare in forest in the region/country where the project is located; dimensionless. The default value 0.10 is used.
B_{FOREST}	Default above-ground biomass content in forest in the region/country where the project is located; t d.m. ha^{-1}
$CC_{SHRUB,i,t=0}$	Crown cover of shrubs in shrub biomass stratum i at the start of the project (t=0) expressed as a fraction; dimensionless

There are 32,025 hectare of forests with a total standing volume 2,007,600 m^3 in the project county where the proposed project is located. This gives 62.69 m^3 standing volume per hectare. Around 93% of forests are composed of Mongolia scotch pine, Chinese pine, poplar and larch. Weight mean biomass expansion factor (BEF=1.871) and wood density (0.394) are estimated based on parameters used by the GHG inventory in land use change and forestry sector of the second national climate

change communication and applied. This gives $B_{FOREST} = 46.21$ t d.m. ha^{-1}. Finally the pre-project carbon stock in living biomass of shrubs is estimated and summarized in Table G.1 below.

Table G.1 carbon stock in living biomass of shrubs

Baseline Stratum ID	Area (ha)	Crown cover of shrubs	Aboveground biomass of shrubs (t d.m. ha^{-1})	C stock in shrub biomass (t CO$_2$)
BSL-1	1,937.72	<0.05	0	0
BSL-2	252.99	0.15	0.69	450
Total	**2,190.7**			**450**

G.1.5 A description of communities located in the project zone, including basic socio-economic and cultural information that describes the social, economic and cultural diversity within communities (wealth, gender, age, ethnicity etc.), identifies specific groups such as Indigenous Peoples and describes any community characteristics.

>> The proposed project activity is located in 13 villages of 4 townships in Helinger'er County, Inner Mongolia Autonomous Region, P.R.China, with a total area of 2,190.71 ha on 21 parcels of lands (see AR CDM PDD table A-0-1 for details).

Agriculture and husbandry are the main source of income for local communities in the project area. However, production is subjected to natural disasters such as sand storm, droughts and hailstone. Food productivity is very low and the mean per capita annual income in the project areas is only US$470 with the lowest around US$ 202. Income of some natural villages was much lower. For example the annual per capita income in Houquan village was US$110. Around 5.3 per cent of rural people are ethnic minority and around 74 per cent of population are living below national poverty line[1] (see AR CDM PDD Table E-0-1 for details). The annual income per capita of all project villages is lower than the average level of the relevant project towns/townships and county. The low per capita incomes highlight the chronic and extreme poverty in rural China, and the project county is among China's poorest.

Roads to the most of the project village are very poor and difficult to pass under rainy or snowing weather. Clean water resources for villagers and livestock are unavailable in most of project villages. They mainly depend on rivers for drinking water. Some of villages have little coverage of mobile network.

To maximize the socio-economic benefit, the afforestation design was prepared with a participatory approach. PRA methods were adopted in interviewing and consulting with farmer households in the project areas to understand the local farmers/communities' preferences, wishes and concerns, so that the proposed project activity would better respond to their desires for livelihood development. The procedures and methods applied for the PRA process is detailed in AR-CDM PDD section F.1, and the comments received is summarized in the AR-CDM PDD section F.2.

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[1] The latest poverty line in China is RMB 2300 (US$ 360) per capita per year.

<table>
<tr><td>G.1.6</td><td>A description of current land use and customary and legal property rights including community property in the project zone, identifying any ongoing or unresolved conflicts or disputes and identifying and describing any disputes over land tenure that were resolved during the last ten years (see also G5)..</td></tr>
</table>

>> Currently all 2,190.71 ha of project lands are defined for forestry purpose by local government. 1,665.59 ha of lands have grazing. However, grazing is illegal activities because all lands within the project boundary are legally defined as forestry land. See AR CDM PDD Table Appendix 8-0-1 for details.

All land are collectively owned by village, however 57.34 ha of lands are contracted to individual household for a period 30 years. There is no on-going or unresolved land ownership/tenure conflict or dispute.

Based on information collected through interviewing with local foresters and elders in communities, the lands proposed to be planted had been natural forests historically, including Chinese pine forest and temperate deciduous broadleaf forest as those existing in Daqingshan Nature Reserve, Erlongshitai forest park and Aguimiao Nature Reserve in the north, northeast and southwest of the project area, respectively. However, as the project area is located in the transitional zone from agriculture to husbandry, these forests were destroyed and converted to non-forest lands before 1950s. Moreover the project area has been degrading due to severe soil erosion, desertification, and overgrazing and agricultural cultivation.

<table>
<tr><td>G.1.7</td><td>A description of current biodiversity within the project zone (diversity of species and ecosystems) and threats to that biodiversity, using appropriate methodologies, substantiated where possible with appropriate reference material.</td></tr>
</table>

>> See AR-CDM PDD section A.3. The biodiversity information on project lands was collected during baseline survey, which covers plants, amphibians, small and large mammals, birds and insects. Various biodiversity indicators for different biotic communities was used for analysis as follow.

Flora

5 randomly selected sub-plots (2m×2m) within baseline sampling plots was used to record the species, population, coverage density or abundance, and frequency to assess the plant diversity.

Fauna

The types and numbers of wild animals and their features that are closely related to the flora, sample strips was ramdomly selected from different vegetation types. Under the help of GPS, surveyors move along with the route used for wild animal baseline survey at a speed of 1.5-2 km per hour, and record the findings on the way. The record include the species and numbers of animals, the sound of howl/chirp, remnants, traces and etc., and the distance and angles between the recorded place and the place that animals are appeared, should be also recorded.

Disturbance (threat)

Human disturbance information was collected during the sampling plot and strips survey. Recorded information include disturbance types (such as hunter, medicine collector, burning, grazing, tourism

and bamboo flowering etc.), time (current, 1-2 days, 3-10 days and over 10 days) and intensity (intense, mediam and slight).

G.1.8 An evaluation of whether the project zone includes any of the following High Conservation Values (HCVs) and a description of the qualifying attributes.

1.8.1 Globally, regionally or nationally significant concentrations of biodiversity values:

  a. protected areas

  b. threatened species

  c. endemic species

  d. areas that support significant concentrations of a species during any time in their lifecycle (e.g. migrations, feeding grounds, breeding areas).

>> Please see AR-CDM PDD section A.3 for detail information regarding the protected area, threathened species and endemic species in the project zone. The project zone does not support significant concentrations of a species during any time in their lifecycle.

1.8.2 Globally, regionally or nationally significant large landscape-level areas where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance

>> The project area is located in the south of Daqingshan Mountain of the Yingshan Mountain range in the mid-Inner Mongolia, and the joint of Mongolia Plateau and Loess Plateau. The project area falls on the corridor between two of China's 32 terrestrial priority conservation areas (e.g., the West Ordos – Helanshan Mountain – Yingshan Mountain priority conservation area and the Taihangshan Mountain priority conservation area), as listed in the China Biodiversity Conservation Strategy and Action Plan , issued by the Ministry of Environmental Protection[2], issued by the Ministry of Environmental Protection. See AR-CDM PDD section A.3 for more information.

1.8.3. Threatened or rare ecosystems:

There are 20 key ecosystem types in the project regions, among which 15 types are protected ecosystems in the nature reserves, such as forests ecosystems of picea, Chinese pine etc., and steppe of *Stipa* sp. (S. *baicalensis*, S. *grandis, S. tianschanica Roshev. var. gobica, S. glareosa*), *Tamarix* sp. community, *Achnatherum splendens* meadow, *Filifolium sibiricum* steppe, *Spiraea* sp. Shrubland, *Leymus chinensis* steppe, *Festuca ovina* steppe[3]. However, due to high pressure from local communities, these ecosystems have been facing threat.

1.8.4. Areas that provide critical ecosystem services (e.g., hydrological services, erosion control, fire control)

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[2] The Ministry of Environmental Protection. 2010. China Biodiversity Conservation Strategy and Action Plan (2011-2030)

[3] TNC. 2012. China biodiversity priority conservation area identification and gap analysis technical report (in press)

>> Due to severe soil/wind erosion and desertification as well as human disturbance, most of the projects lands are severely degraded. If the current situation remains, the lands will degrade further and the soil/wind erosion and desertification will become increasingly severe (see also AR CDM PDD section B.2 for details). Through establishing 2,190.71 ha of forests on degraded lands that suffer from severe soil and wind erosion, desertification and human disturbance, using native species, the proposed activities will greatly increase the forest cover in project region, and assist the control of both soil/wind erosion and desertification in this area.

1.8.5. Areas that are fundamental for meeting the basic needs of local communities (e.g., for essential food, fuel, fodder, medicines or building materials without readily available alternatives)

>> The project area is located in the transition zone from forests to steppe. Agriculture and husbandry are the main source of income for local communities in the project area. Therefore the project zone are fundamental for meeting the basic needs of local communities, such as food, fuel, medicines and building materials (see also AR-CDM PDD Section E).

1.8.6. Areas that are critical for the traditional cultural identity of communities (e.g., areas of cultural, ecological, economic or religious significance identified in collaboration with the communities).

>> There are no cultural relics and/or cultural reserve that have been identified in the project area, and consequently, no damage to non-replicable cultural property will occur under the proposed project activity. Meanwhile, the project does not involve any sites for local social gatherings or other spiritual activities, thus the project activities will not impact the normal local gatherings and religious activities.

G.2 Baseline Projections (Required)

G.2.1	Describe the most likely land-use scenario in the absence of the project following IPCC 2006 GL for AFOLU or a more robust and detailed methodology, describing the range of potential landuse scenarios and the associated drivers of GHG emissions and justifying why the land-use scenario selected is most likely

>> A/R Methodological tool "Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities" was followed to identify the baseline scenario.

The following procedures are used to identify credible alternative land use scenarios to the proposed project activity:

a） Analyzing the historical and existing land-use / land-cover changes and identifying key factors that influence the land-use / land-cover change over times: Collected information demonstrates that the lands to be afforested have been non-forests for at least 50 years. Currently the project lands are mainly covered by herbaceous plants with a few shrubs (see Section H and Annex 3 for detail description).

b） Interviews with local farmers and staff from local forestry bureau indicate that crown cover of both tree and non-tree vegetation has been decreasing in recent decades due to soil and wind

erosion as well as desertification (see Section H and Annex 3). Under the current conditions, the land will continue to degrade and soil/wind erosion as well as desertification will accelerate. This will result either in the continued decrease of the carbon stocks both in living biomass and soils, or at least, maintenance of these stocks at a low level (see also section C.2 for the demonstration of the land degradation).

c） National, local and sectoral land-use policies or regulations**:** Since the 1980s, China has successively issued and revised a series of laws and administrative regulations related to forestry. These have included, among others, the Regulations for Implementing the Forest Law, the Regulations for Grain for Green, the Regulations for the Protection of Wild Plants and Animals, the Regulation for Nature Reserve, the Regulation for Forest Fire Control, and the Regulation for Forest Diseases and Pests Control, etc. In the 1990s, to encourage forestation, China initiated a policy that would bring direct benefit to those who planted trees. Villages that owned lands were permitted to contract with farmers to use village land for forestry purposes. The contracts were long term; up to 30-50 years or more. Within this period, the right to use the land will not be changed and the land-use contract can be prolonged should the farmers apply.

To facilitate the restoration of forest resources, the Chinese Government has launched several programs over the past years, including the Grain for Green Program (started in 2001) that subsidized farmers to convert cropland on steep slopes to forests (the Grain for Green), the Intensively Managed Commercial Timber Plantation Base Program (started in 2000), the Natural Forest Conservation Program (launched in 1998), as well as 3N (northeast, north and northwest) Sheltering Forest Construction Program.

d） Regional forestation rate and their relevance to the proposed project activity: There were some forestations in the project county. Around a half of forestation was conducted on cropland under the Grain for Green Program, and a half was implemented under 3N Sheltering Forest Construction Program. Cropland that was planted, usually is not a type of the proposed project lands. Under the Grain for Green Program, government subsidizes around 4,600 US$/ha for farmers to take forestation on desertified farmland within 8 years and it was decided to extend the subsidy period, however the only conversion of farmland to forest is eligible for the subsidy while tree planting on other types of lands is not eligible. Other forestation activities were invested by State Government, but the investment criteria was around 230 US$/ha in the past and increased to around 700 US$/ha more recently. The criteria can only cover labour cost for site preparation, without any fund for seedlings, planting, weeding and forest managing. As a result, such forestation failed frequently in most cases. Part of the project lands is failed planted lands through such forestation. Hence, to increase the survival rate, such forestation was conducted on lands with good site conditions. Moreover, due to the high inflation in China in recent years, the price of seedlings and other materials as well as labour and transportation costs are increasing rapidly. This further prevents local communities from forestation on the degraded lands. Therefore, with the proposed project activity, the governmental subsidy for afforestation on cropland will not be reduced and the forestation on degraded land will not be impacted.

The whole project area has been legally planned by local governments for forestry purposes on which other land uses such as agriculture and grazing are prohibited under China's well enforced forest law. Therefore, the identified realistic and credible land-use scenarios that would have

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occurred on the land within the proposed project boundary in the absence of the proposed project activity are:

- The proposed project not undertaken as an A/R CDM project;
- Continuation of current degraded and degrading barren lands.

G.2.2 Document that project benefits would not have occurred in the absence of the project, explaining how existing laws or regulations would likely affect land use and justifying that the benefits being claimed by the project are truly 'additional' and would be unlikely to occur without the project

>>Barriers analysis indicate that project benefits (the land use scenario "the proposed project not undertaken as an AR CDM project" as identified in Section G.2.1) would not have occurred in the absence of the project, as elaborated below.

a) Investment barriers

- Lack of access to credit: The project lands are collectively owned by local village. No credit mechanisms exist for local communities to make long-term investment in plantation forestry. Agriculture and husbandry are the main income source for local communities in the project area. However, agricultural productivity is very low due to unfavourable climate. Helinge'er is categorized as "national poverty county" as assessed by the State Council[4]. The income of farmers in the project villages is lower than relevant town/townships and county level. The mean annual income per capita in the project areas is only US$ 460 with the lowest at US$ 202. It was US$110 for the poorest natural village (see Section G.1 for details). It is extremely difficult for local communities to afford the high initial plantation establishment investment.

- Debt funding not available for this project activity: There is no opportunity to get long-term commercial loans from banks for the purpose of forestation in the project area due to the unfavourable climate, high risk and the economical unattractiveness degraded lands.

b) **Technological barriers:** Local communities usually do not have access to quality seed sources and also lack the necessary skills to produce high quality seedlings and to perform successful tree planting. In addition they lack the knowledge and experience to prevent planted trees from fire, and attack by pest and disease.

The alternative land use scenario "the proposed project not undertaken as an AR CDM project" identified above can be eliminated from land use scenarios due to barriers faced. The alternative land use (continued status as barren land with agricultural cultivation or grazing) does not face the above-mentioned barriers.

G.2.3 Calculate the estimated carbon stock changes associated with the 'without project' reference scenario described above. This requires estimation of carbon stocks for each of the land-use classes of concern and a definition of the carbon pools included, among the

[4]http://www.cpad.gov.cn/publicfiles/business/htmlfiles/FPB/liszlcx/201103/164347.html

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> classes defined in the IPCC 2006 GL for AFOLU.

>> The carbon stock changes associated with the 'without project' reference scenario described above are estimated following the consolidated afforestation and reforestation baseline and monitoring methodology "Afforestation and reforestation of degraded land" (AR-ACM0001/Version 05.2.0). Under the applicability conditions of the methodology appled:

- Changes in carbon stock of above-ground and below-ground biomass of non-tree vegetation is conservatively assumed to be zero for all strata in the 'without project' reference scenario, i.e., $\Delta C_{SHRUB\_BSL,t} = 0$;

- It is expected that the 'without project' dead wood and litter carbon pools will not show a permanent net increase. It is therefore conservative to assume that the sum of the changes in the carbon stocks of dead wood and litter carbon pools is zero for all strata in the 'without project' reference scenario, i.e., $\Delta C_{DW\_BSL,t} = 0$, and $\Delta C_{LI\_BSL,t} = 0$;

- Since carbon stock in SOC is unlikely to increase in the 'without project' reference scenario, the change in carbon stock in SOC may be conservatively assumed to be zero for all strata in the 'without project' reference scenario, i.e., $\Delta C_{SOC\_BSL,t} = 0$.

Based on the baseline survey, there is no pre-project living trees, i.e., $\Delta C_{TREE\_BSL,t} = 0$. Therefore carbon stock changes associated with the 'without project' reference scenario ($\Delta C_{BSL,t}$) are:

$$\Delta C_{BSL,t} = \Delta C_{TREE\_BSL,t} + \Delta C_{SHRUB\_BSL,t} + \Delta C_{DW\_BSL,t} + \Delta C_{LI\_BSL,t} + \Delta C_{SOC\_BSL,t} = 0$$

Where t represent $1, 2, 3, . t^*$ years elapsed since the start of the project activity

> **G.2.4** Describe how the 'without project' reference scenario would affect communities in the project zone, including the impact of likely changes in water, soil and other locally important ecosystem services.

>> Agriculture and husbandry are the main source of income for local communities in the project area. However, production is subjected to natural disasters such as sand storm, droughts and hailstone. Food productivity is very low and the mean per capita annual income in the project areas is very low and around 74 per cent of population are living below national poverty lines (see AR CDM PDD section E.1 for details) . Roads to the most of the project village are very poor and difficult to pass under rainy or snowing weather. Clean water resources for villagers and livestock are unavailable in most of project villages. They mainly depend on rivers for drinking water. Some of villages have little coverage of mobile network.

Due to severe soil/wind erosion and desertification as well as human disturbance, most of the projects lands are severely degraded. If the current situation remains, the lands will degrade further and the soil/wind erosion and desertification will become increasingly severe.

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G.2.5 Describe how the 'without project' reference scenario would affect biodiversity in the project zone (e.g., habitat availability, landscape connectivity and threatened species)

>> Without project the land-use will be continuation of current barren lands or illegal grazing lands, and the lands will degrade further. At the same time, the local communities in poverty will bring a higher pressure on the nature conservation. This will have the huge threat to habitat of wild animals and plants, and negativly impact the biodiversity.

G.3 Project Design & Goals (Required)

G.3.1 Provide a summary of the project's major climate, community and biodiversity objectives.

>> The proposed project activity will be implemented in Helinge'er County, Hohhot, Inner Mongolia. Located in the north edge of Loess Plateau with annual mean precipitation around 400mm, the proposed project area belongs to arid and semiarid climate and transitional zone from forests to steppe, and has been suffering from severe drought, desertification, soil erosion and other hazards (windstorm and sandstorm). The project lands have been un-forested land since 1950s. The project area also fall within the corridor between two of China's biodiversity priority conservation areas, West Ordos-Helanshan Mountain-Daqingshan Mountain and Taihangshan Mountain, as listed in the China Biodiversity Conservation Strategy and Action Plan issued by the Ministry of Environmental Protection. Local communities of the project areas live below the poverty line of China. To contribute to the local sustainable development, the proposed project activity, afforestation of Degraded Shengle Ecological Zone in Helinge'er of Inner Mongolia, China, aims to:

- Sequester carbon dioxide and mitigating climate change;
- Enhance biodiversity conservation and climate change adaptation by increasing the connectivity of forests among nature reserves and priority conservation areas;
- Control soil erosion and desertification;
- Generate income for local communities.

G.3.2 Describe each project activity with expected climate, community and biodiversity impacts and its relevance to achieving the project's objectives

>> To achieve the objectives of the proposed project activity, 2,190.71 hectare (ha) of tree-shrub mixed forests will be established by direct planting on degraded lands in 13 villages of 4 towns/townships in Helinge'er County, started from July 20th 2012. The main planting models/tree species are Mongolian Scotch pine (Pinus sylvestris var. mongolica, 47.06 ha), Chinese pine (Pinus tabulaeformis, 7.65 ha), Chinese pine + Seabuckthorn (719.48 ha), Mongolian Scotch pine + apricot (Armeniaca sibirica) (877.70 ha) and Mongolian Scotch pine + seabuckthorn (538.82 ha). It is expected to produce 215,837 tCO2 equivalent of long-term CER within 30 years crediting period, with an annual mean of 7,195 tCO2 equivalent. All species used are native to local, without any invasive alien species or genetically modified organisms.

Both the operating entity (Hesheng Forest Silviculture Co. Ltd.) and local farmers hold a view that the proposed project activity will contribute to poverty alleviation and environment (e.g.,

biodiversity conservation and soil erosion and desertification control), thus contribute to sustainable development.

In the proposed project activity, local farmers/communities will contribute lands. The operating entity will invest in forest establishment (including site preparation, seedling, planting, weeding, etc.), provide technical inputs, project preparation (including PDD preparation, validation, registration, verification, etc.) and manage the plantations during the crediting period, as well as take the natural and investment risks. The shareholding contractual arrangements will be made between the farmers/ communities, the operation entity and local governments with regard to establishment of the plantation, the management responsibilities, inputs and benefit sharing. During the crediting period the farmers/communities will share 60 per cent of income from wood and non-wood products and the operation entity will share 40 per cent. All carbon credits produced by the proposed project during the crediting period will belong to the operation entity. After the end of the crediting period, the plantation to be established will be completely owned by farmers/communities.

| **G.3.3** | Provide a map identifying the project location and boundaries of the project area(s), where the project activities will occur, of the project zone and of additional surrounding locations that are predicted to be impacted by project activities (e.g. through leakage). |

>> The proposed project activity is located in 13 villages of 4 townships in Helinger'er County, Inner Mongolia Autonomous Region, P.R.China (See Figure G.1 below). The shp files of specific geographical positions (longitude, latitude) of each parcel, produced by GIS, have been provided to DOE for validation.

Figure G.1 Project zone of the proposed project activity

G.3.4	Define the project lifetime and GHG accounting period and explain and justify any differences between them. Define an implementation schedule, indicating key dates and milestones in the project's development.

>>

Starting date: July 20th 2011

Project lifetime: 30 years 0 month

GHG accounting period: 30 years 0 month, same as the project lifetime

Planting period: four years from the project starting date.

Forest management period: from 5th year to the end of the project.

Based on the site conditions, the proposed project activity will plant following tree and shrub species native to project area:

- Mongolian Scotch Pine: *Pinus sylvestris* var. mongolica

- Chinese pine: *Pinus tabulaeformis*

- Apricot: *Armeniaca sibirica*

- Seabuckthorn*: Hippophae* sp.

See section A.4 in the AR CDM PDD for detail technology to be employed.

G.3.5 Identify likely natural and human-induced risks to the expected climate, community and biodiversity benefits during the project lifetime and outline measures adopted to mitigate these risks.

>> **Risk analysis and countermeasures:**

- **Fire risk:** This can be alleviated through:
  1) Technical and awareness training to local farmers/communities;
  2) Strengthening patrolling and monitoring: permanent patrollers wil be employed;
  3) Enhancing the fire-break belt. This can be incorporated with existing road and temporary roads construction;
  4) Controlling fire source: In the fire-risk season entrance to the project area will be controlled by establishing entrance approval procedures; and any prescribed burning or other fire use within or surrounding the project lands shall be approved by local authority.
  5) A mixed species arrangements will be adopted to reduce fire risks.

- **Pest risk:** In the project area there has been no outbreak of pest insects and disease in forests with species to be planted. However, to avoid any pest risk, all seedlings used in the proposed A/R CDM project activities will be bred in local nurseries using seed collected from local seed orchard or parent trees. All seedlings used shall be certified, quarantined and tagged, i.e., each batch of seedlings should have quality certificate, quarantine certificate and tag indicating the production area and quality grade. In addition, there is a complete forest pests monitoring system from provincial level, county level and town/township level. A mixed species arrangements will also be adopted to reduce pest risks.

- **Site preparation:** The site preparation will disturb the vegetation and soil in the planting sites. The main technical measures taken to mitigate the impact is to plant the trees with a low density (630-1333 trees/shrub per hectare), and retain the existing vegetation as much as possible. The site preparation will be done along the contours of the slope to reduce soil loss. Therefore, the site and soil preparation will have minor temporary negative impact on the original soil and vegetation.

- **Herbicide and pesticide application:** Improper herbicide and/orpesticide application would

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be harmful to the natural environment, by polluting the soil, water and air, as well posing a threat to wildlife. However, under the proposed A/R CDM activity, site preparation and weeding will be conducted manually without any herbicide application. Environmentally friendly measures will be adopted such as mixture planting, seed and seedling quarantine, and biological measures to control pests and diseases will be adopted. Therefore, the use of pesticide will be limited.

- **Fertilization:** In the proposed project activity, no synthetic fertilizers (not only N-fertilizers) will be applied. F

- **Drought**: Extreme drought may negatively impact the survival rate of young trees, plantation productivity (growth rate and timber output), and increase fire risk and pest risk of forest to be implemented. Countermeasures against this risk include:

  1) Those native tree and shrub species that are most adaptable to local climatic, soil, water and temperature conditions will be chosen for the forestation.

  2) Primary forests that share the same conditions as those in the project zone will be chosen as seed trees.

  3) The nursery sites will also be located in the vicinity of the planting sites where the conditions are very much the same.

  4) After planting operations are completed, soils will be timely recovered in the planting pits to reduce and avoid erosion, and a tiny ridge along down slope side of the pits will be made to allow more raining water inflow into the pits.

  5) In the case of unavoidable natural disasters, rescue measures, such as enrichment planting will be done in areas where young trees and seedlings are affected so that the loss from such damages will be minimized to the maximum extent.

None of these risks and/or negative impacts is considered to be significant.

G.3.6 Demonstrate that the project design includes specific measures to ensure the maintenance or enhancement of the high conservation value attributes identified in **G1** consistent with the precautionary principle

>>Following specific measures in the project design can ensure the maintenance or enhancement of the biodiversity and soil and water conservation of the project zone:

- Restoration of the degraded and degrading land in corridor among the nature reserves and priority conservation area will enhance the connectivity of habitats;

- Forests will be established by mixing species;

- All species to be planted are native to local;

- Minimizing disturbance on original vegetation and soil;

- No synthetic fertilizer will be applied;

- All on-site activity will be conducted manually;

- Income to be created by the project will alleviate the pressure of local communities on forest ecosystems and wildlife conservation;

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- Chemical pesticide is not likely to apply (see Section G.3.5 above);

- Any seed used will be quarantined;

- All seedlings will be cultured at local.

> **G.3.7** Describe the measures that will be taken to maintain and enhance the climate, community and biodiversity benefits beyond the project lifetime.

>>There is no harvest within the project life. Based on Chinese Forest Law and Regulations, any harvesting shall get harvest license, which avoid any illegal logging or deforestation and ensure that plantation will remain for up to 100 years as a result to maintain and enhance the climate and biodiversity benefits long beyond the project lifetime.

In the proposed project activity, local farmers/communities and other land users own timbers and non-wood forest products to be produced by the project beyond the project lifetime. The timber revenue, majority of revenue from the project, will come gradually after the end of the project lifetime, up to 100 years.

> **G.3.8** Document and defend how communities and other stakeholders potentially affected by the project activities have been identified and have been involved in project design through effective consultation, particularly with a view to optimizing community and stakeholder benefits, respecting local customs and values and maintaining high conservation values.

>> To maximize the socio-economic and conservation benefit and respect local customs, the project was designed with a participatory approach. PRA methods were adopted in interviewing and consulting with farmer households to understand their preferences, wishes and concerns, so that the proposed project activity would better respond to their desires for livelihood development. The concerns and comments received have been fully considered in the project design. The PRA process, method and comments and concerned received, and the response are summarized in AR-CDM PDD section F.

The local farmers will participate in the project activity throughout the project lifetime including site preparation, planting, weeding, protection and other forest management activities, and earning direct benefits during the project lifetime. This ensures the frequent communication and consultation between project managers and all community groups about the project and its impacts to facilitate adaptive management throughout the life of the project. In addition, project stakeholders meeting will be hold at least once a year to facilitate the continuous communication and consultation.

To ensure the continuance of the communication and consultation process throughout the project lifetime, following procedures will be implemented:

(1) Staff from Helinge'er forestry bureau and the project entity will periodically communicate with rural communities to learn and solve any concern, conflict, technical issues and wishes of local communities and individual farmers;

(2) Forest patrollers employed by the project at each community to conduct daily patrolling on project lands will keep daily communication with local communities, and solve relevant issues if

possible. Any unresolved issues will be reported to Helinge'er forestry bureau and the project entity who will immediatly take actions to solve relevant issues. Any unresolved issues at project county level will be reported to the Lao Niu Special Fund for Ecological Restoration (LNSFER) executive board;

(3) The LNSFER executive board will conduct periodic communication and consultation with Helinge'er forestry bureau, once a season during forest establishment period (five years after planting) and thereafter at least once a year during the project lifetime;

(4) The meeting of the project expert group will be held twice a year during forest establishment period and thereafter once a year during the project lifetime to solve any technical issues received. Additional expert group meeting will be held in case any emergent technical issue;

(5) The LNSFER executive board will convene a meeting at least once a year to solve important issues. Instant LNSFER executive board meeting will be convened in case of any unresolved important issue.

G.3.9 Describe what specific steps have been taken, and communications methods used, to publicize the CCBA public comment period to communities and other stakeholders and to facilitate their submission of comments to CCBA.

>> The project implementation entity will take a lead to distribute key project documents to affected communities and stakeholders (farmer households, villages, county and town/township government). A notification will be prepared in Chinese. The notification will include following information.

- **When:** starting date and deadline for comments;

- **Where:** path to access the CCB PDD and relevant information;

- **How:** the way to submit comments to CCBA

Inner Mongolia Forestry Department and Helinge'er forestry bureau will supervise and facilitate the information distribution. The forestry bureau is the important regional office. There is a forestry workstation in each town/townships, which is the most grass roots forestry administrative unit and deal with all of the forestry issues concerned local famer. The workstation always maintains a close relationship with local community to ensure their management more effective, so as to form a propaganda and exchange platform of policy and regulations from the national and provincial government and feedback from communities.

In order to make an easy channel for local forest farmers, public notice boards and community broadcasts are always used to publicize project information, and some public services counters will be setup to offer project documentation and publicity material to the local stakeholders. In some communities involved in this project, the project documentation will be delivered by forestry workstation staff. All of project documentation including summary of CCBA PDD for local stakeholder will be compiled in Chinese. For illiterate people, oral informing will be applied in addition to broadcast.

All stakeholders participated in the decision-making of investment and revenue sharing was transparent to each participator. So there is no confidential information between all participators includeing stakeholder, land owner, project antity, and local forest govermant.

One week before the deadline, stakeholders will be reminded by public notice boards and broadcasts of each community. Participants may submit their comments directly through CCBA website, or entrust others to submit on behalf of them (especially for illiterate or under-educated farmers).

G.3.10 Formalize a clear process for handling unresolved conflicts and grievances that arise during project planning and implementation.

>> Corresponding procedures have been formulated to cope with the conflicts and opinions that may arise amongst the community villagers, nature reserves and other stakeholders in the entire lifetime of the project - from project development, to project implementation and completion.

（1） Before project implementation starts, experts will be invited to conduct in-depth surveys on the socio-economics, cultures and histories, ethnic folkways and customs, as well as the production and livelihood practices in the proposed project areas. They will also project potential conflicts and grievances that may be encountered during project implementation.

（2） To conduct community surveys, through participatory community interviews and villager meetings, for an in-depth understanding of the socio-economics, landuse, land tenure, income sources, status of land resources management, awareness, technical know-how, tree species of preferences, technology, financial difficulties, farming household participation and project needs, etc in the communities; and also for identifying the conflicts and grievances that may potentially arise during project lifetime.

（3） During the project design, the general opinions regarding selection of planting plots, tree species, afforestation techniques and management practise, as well as income sharing mechanism have been reviewed and adopted when deemed appropriate.

（4） The completed project design was feedbacked to the communities to solicit their comments and suggestions, and to necessitate timely adjustments.

（5） The planting operations, and tending and management of established plantations will avail community labour. This will allow the community villagers to participate in project implementation themselves and find out, and seek for solutions to, the conflicts and grievances in the projects.

（6） The staff from Helinge'er forestry bureau and forestry station as well as the project entity will periodically contact with rural communities to collect conflicts and grievances of local communities and individual farmers. Forest patrollers employed by project entity in each project site will play an important role of treating with ordinary conflicts and grievances, and and report to township forest stations, Helinge'er forestry bureau and project entity about unresolved conflicts and grievances. In the same way, the communities can express their conflicts and grievances to the forest patrollers directly, or to local forest forest station or Helinge'er forestry bureau, in writtern or oral way. Hearing and reporting conflicts and

grievances are one of responsibility of forest patrolling. Upon receiving grievance, project entity and local forest agency shall contact and discuss with relevant community or other stakeholders who have grievance to resolve the grievance. Any unresolved grievance at project county and project entity level will be reported to LNSFER executive board;

（7） Upon receiving the report of grievance the LNSFER executive board will convene a meeting to find a solution.

（8） A written response to grievances shall be sent to relevant community and/or other stakeholders within 30 days after receiving the grievance.

（9） Before the launch of this project, the project entity has came to an agreement with all stakeholders and land owners to guarantee that either party should undertake an obligation and legal liability to make this project shape up. So, if there is any conflict or grievance that can not be solved by negotiation, judicial process should be adopted.

> **G.3.11** Demonstrate that financial mechanisms adopted, including projected revenues from emissions reductions and other sources, are likely to provide an adequate flow of funds for project implementation and to achieve the anticipated climate, community and biodiversity benefits.

>> In the proposed A/R CDM project activity, local farmers/communities will contribute lands. The operating entity will invest in forest establishment (including site preparation, seedling, planting, weeding, etc.), provide technical inputs, project preparation (including PDD preparation, validation, registration, verification, etc.) and manage the plantations during the crediting period, as well as take the natural and investment risks. The shareholding contractual arrangements will be made between the farmers/ communities, the operation entity and local governments with regard to establishment of the plantation, the management responsibilities, inputs and benefit sharing. During the crediting period the farmers/communities will share 60 per cent of income from wood and non-wood products and the operation entity will share 40 per cent. All carbon credits produced by the proposed project during the crediting period will belong to the operation entity. After the end of the crediting period, the plantation to be established will be completely owned by farmers/communities.

> **G4 Management Capacity and Best Practices (Required)**

> **G.4.1** Identify a single project proponent which is responsible for the project's design and implementation. If multiple organizations or individuals are involved in the project's development and implementation the governance structure, roles and responsibilities of each of the organizations or individuals involved must also be described

>>***Project Design:***

The project is developed by The Nature Conservancy (TNC) China in cooperation with Hesheng Forest Silviculture Co. Ltd. (the project entity) and Helinge'er forestry bureaus.

- **TNC China**: Responsible for the overall design of the project, coordinating the project development, training on A/R CDM rules and methodology and CCB standard, providing guidance for baseline survey, and PDD development.

- **Project entity**: Responsible for the baseline survey and PRA process, including the development of relevant SOP of the survey;

- **Helinge'er forestry bureau:** Responsible for planting and forest management design, providing logistic support and participating field work of the baseline survey and PRA process, and coordinating and communicating with local communities.
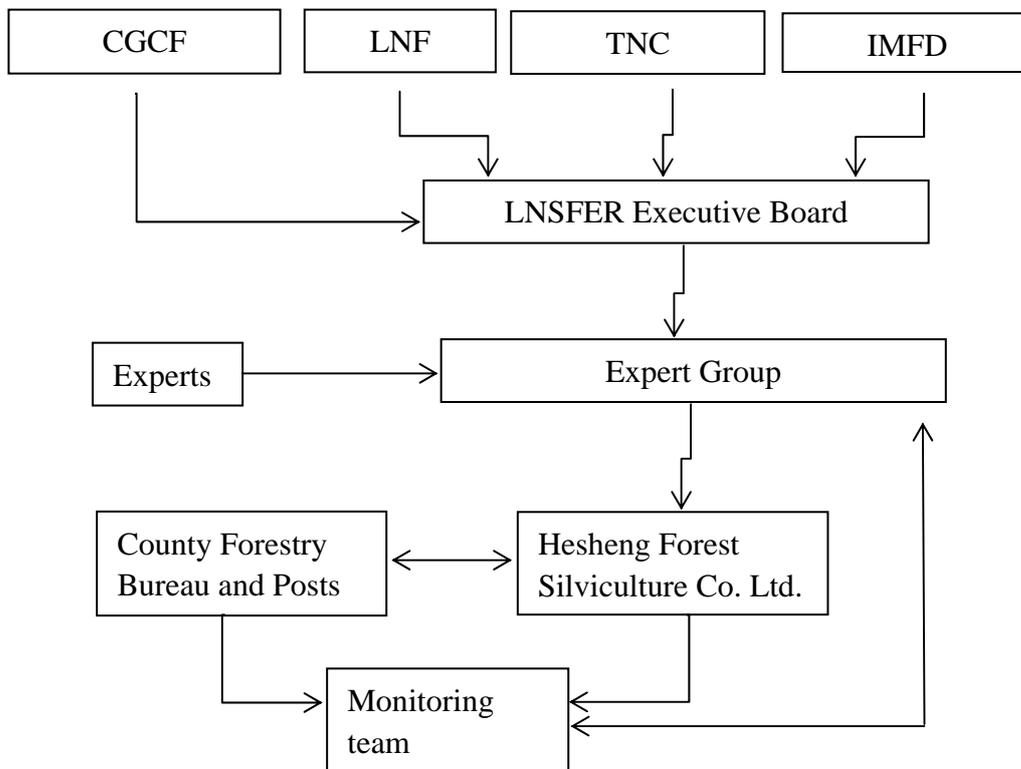
Project Implementation:

The project stakeholders include China Green Carbon Foundation (CGCF), Lao Niu Foundation, Inner Mongolia Forestry Department (IMFD), The Nature Conservancy (TNC), Hesheng Forest Silviculture Co. Ltd., Helinge'er County Forestry Bureau and involved communities. The local forestry agencies, i.e., Inner Mongolia Forestry Department, Holinger'er Forestry Bureaus, Inner Mongolia Research Institute of Forestry, Inner Mongolia Forestry Inventory and Planning Institute, The Nature Conservancy China Program, University of Inner Mongolia and Agricultural University of Inner Mongolia etc. will provide technical consultation and guidance, including training courses, conduct quality control to the preparation and implementation of the proposed A/R CDM project activity, and develop and implement the proposed project.

To facilitate the development and implementation of the project, the Lao Niu Special Fund for Ecological Restoration (LNSFER) was jointly established by CGCF, LNF, IMFD and TNC, governed by LNSFER Executive Board. The LNSFER Executive Board, composed of the representatives from CGCF, LNF, IMFD and TNC, is responsible for major decision-making, instruction, approval and supporting of the overall implementation.

An expert group has also been established to support the work of the LNSFER Executive Board. The expert group is composed of 5-7 experts and representative from the LNSFER Executive Board. The responsibilities of the expert group are:

- To review and approve forestation design;
- To review project budget and delivery;

- To review and approve survival checking plan and project monitoring plan;

- To organize independent third party to verify forestation and monitoring activities;

- To review forestation verification report, monitoring report; and

- To conduct quality assurance.

To monitor actual net GHG removals by sinks, an operation and management structure is prepared as shown in figure below. It should be noted that Hesheng Forest Silviculture Co. Ltd. and Helinge'er county forestry bureau will be responsible for daily monitoring and data management and Hesheng Forest Silviculture Co. Ltd. and Helinge'er will conduct the quality assurance of the daily data collection.

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> **G.4.2** Document key technical skills that will be required to implement the project successfully, including community engagement, biodiversity assessment and carbon measurement and monitoring skills. Document the management team's expertise and prior experience implementing land management projects at the scale of this project. If relevant experience is lacking, the proponents must either demonstrate how other organizations will be partnered with to support the project or have a recruitment strategy to fill the gaps.

>> Key technical skills include techniques for forest establishment and management including seedlings preparation, site and soil preparation, planting, weeding, forest management, and forest fire and pest insect and disease control, etc; and skills for biodiversity assessment and carbon measurement and monitoring.

The project entity, Hesheng Forest Silviculture Co. Ltd., is a private company with major business on seedling cultivation, forestation and forest management. It has established over 1000 hectare of forests in Inner Mongolia through directing tree planting, with survival over 90 per cent. It has established 6 nurserys with 20 tree and shrub species and over 10 million seedlings in stock. The company has also employed many local consultants who have expertise and rich experience in forestation, seedling cultivation and forest management.

The Helinge'er forestry bureaus and its forestry stations at town/township level have been implementing forestation, forest management, forestry administration and technical training for local

communities, and have rich experience and skills for forest establishment and management including coordination with local communities.

TNC China has been working on biodiversity survey and assessment for many years in China and has developed a set of relevant methods and SOP and accumulated rich experience. TNC China has also successfully developed several CCB and AR CDM projects in China. It also involved in the carbon measurement for the first monitoring and verification of two registered AR CDM projects by providing technical consultation on the SOPs for field measurement and the carbon credit calculation.

G.4.3	Include a plan to provide orientation and training for the project's employees and relevant people from the communities with an objective of building locally useful skills and knowledge to increase local participation in project implementation. These capacity building efforts should target a wide range of people in the communities, including minority and underrepresented groups. Identify how training will be passed on to new workers when there is staff turnover, so that local capacity will not be lost.

>> The training to the communities and farmers is an important part of the project activities. The training aims to build the capacity of community members to actively design, implement, and monitor project activities. The implementation entity, Helinge'er forestry bureau and its forestry stations will organize training for local communities to extend the improved forestation technologies and assist them in understanding and addressing problems during the implementation of the proposed project activity, both on-site and off-site, which mainly include seed and seedling selection, nursery management, site preparation, planting and pest and fire management. The participants have been taught how to participate in project design process through PRA process. The community representatives conducted field survey with forestry technicians and discussed about tree species they prefer to plant. Local communities will also be trained through direct participating of the forest establishment and forest management. Any new employed workers shall be trained. The training will be also provided to communities on monitoring method for the members of monitoring groups. In addition, the education and training concerning health, safety and security for the farmers will be provided immediately before on-site activities using instruction developed. Study tours for the farmer representatives to visit, share experience and learn from each other in the project areas will be put in practice.

During the project design, a wide range of groups including female, poorers and ethnic minorities have been invited for consultation process and training. Follow-up training program will be also given to a range of people expecially under-represented groups. Female and other under-represented groups will have equal opportunity to participate in the project including labours' employment and training.

G.4.4	Show that people from the communities will be given an equal opportunity to fill all employment positions (including management) if the job requirements are met. Project proponents must explain how employees will be selected for positions and where relevant, must indicate how local community members, including women and other potentially underrepresented groups, will be given a fair chance to fill positions for which they can be trained.

>> The proposed project activity will create a large amount of temporary employment opportunities from planting, weeding, etc. It will also create many long-term job positions for plantation

maintenance and management during the project lifetime (see AR-CDM PDD Table E-0-3). Most employment opportunities will be taken by the local farmers/communities involved in the proposed project activity and others whose lands do not fall within the project boundary in case of insufficient labor supply from local communities. In case of any position available, information will be posted on public board of local villages and announced through village broadcast. Any villagers feel free to apply the posted positions. The ethnic minority groups and female will have equal rights to access the employment opportunities if the job requirements are met. At the same situation, priority will be given to members from poor households, ethnic minority and women. In case the number of positions, e.g., the fixed long-term position for forest patrolling, is limited (less than the number of applicants), applicants will get the position on rotation basis.

G.4.5 Submit a list of all relevant laws and regulations covering worker's rights in the host country. Describe how the project will inform workers about their rights. Provide assurance that the project meets or exceeds all applicable laws and/or regulations covering worker rights and, where relevant, demonstrate how compliance is achieved

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>> Relevant laws and regulations covering worker's rights in China include "Labor Law of the People's Republic of China" and "China Company Law". At the time of the employment, a task contract will be signed with a representative employee (the head of a employee group) following the Chinese Law for Employment Contract, in which relevant laws and regulations will be mentioned as the basis of the contract, so that if there is conflict between the employers and workers, the worker has rights to complain and seek for the local county worker association for arbitration to protect their interests. The representative employee then will have an oral agreement with each worker in the group. Oral agreement is a business-as-usual for the temporary employment.

G.4.6 Comprehensively assess situations and occupations that pose a substantial risk to worker safety. A plan must be in place to inform workers of risks and to explain how to minimize such risks. Where worker safety cannot be guaranteed, project proponents must show how the risks will be minimized using best work practices..

>> Possible risks for the workers include:

- Application of chemicals and pesticides for the control of pests and diseases may harm workers, specifically,

  - ✓ At the time of dilution of chemicals and pesticides, high concentration of original chemicals may harm workers without mask;

  - ✓ Leakage of chemicals and pesticides may burn skin of workers without protection clothes;

  - ✓ Leakage of chemicals and pesticides may pollute drinking water in case they are leaked to water sources

- Falling rocks triggered during site preparation, transplanting, tending and patrolling may cause personal injuries;

- Forest fires and the suppression operations may bring risks to workers;

All these risks can be minimized by best practices. Safety operation regulations and technical guidelines will be formulated to copy with possible risks that may harm workers. Training courses will be organized to raise safety awareness of workers, including teaching workers the best practices and informing workers of relevant risks and the ways to minimize the risks. All workers shall be trained before performing specific work. Safety managers will full participate in the filed work to ensure that such internal control procedures as follow will play a role of avoiding the potential risks:

- Measures for minimizing risk due to the application of chemicals and pesticides:

  (a) training to forest management staff, local communities and workers on

  ✓ Risk of specific types of chemicals and pesticides on health and environments;

  ✓ Best practices in application of chemicals and pesticides;

  ✓ Know-how for equipment operation;

  ✓ Know-how for clothes: long-sleeve clothes, mouth mask, gloves, shoes, etc;

  ✓ Application of chemicals and pesticide only at windless period;

  ✓ Store chemicals and pesticide at places in accessible for children;

  ✓ Best practice for disposal of waste chemicals and pesticide and their package.

  (b) Monitoring the application of chemicals and pesticide, re-training in case of no best practice found.

- A safety assurance staff, which takes charge of safety supervision.

- Safety manual will be distributed to workers.

- During project implementation, the safety assonance staff will participate in full process of the supervision of project implementation so that the potential risks can be detected in time and accidents avoided.

- In the field work, it's prohibited to carry out all kinds of works on a vertical line at the same time, including soil preparation, tree planting and weeding. Instead, all workers shall work on a same land contour.

- All field works must avoid extreme weather such as in or after rainstorm, extremely high temperature, and strong wind.

- Each working group will be equipped with a portable rescue package to deal with minor injur.

- Provide good logistics to ensure that every worker have enough drinking water and food.

G.4.7 Document the financial health of the implementing organization(s) to demonstrate that financial resources budgeted will be adequate to implement the project.

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1. Management letter

2. Latest Audit Report

3. Balance Sheet and Revenue and Expense Statement for prior fiscal or calendar year

G5 Legal Status and Property Rights (Required)

G.5.1 Submit a list of all relevant national and local laws and regulations in the host country and all applicable international treaties and agreements. Provide assurance that the project will comply with these and, where relevant, demonstrate how compliance is achieved

>> China has successively issued and revised a series of laws and administrative regulations related to forestry. These have included, among others, the Forest Law, the Regulations for Implementing the Forest Law, the Regulations for Grain for Green, the Regulations for the Protection of Wild Animals, the Regulations for the Protection of Wild Plants, the Regulation for Nature Reserve, the Regulation for Forest Fire Control, and the Regulation for Forest Diseases and Pests Control, Facilitation for Land Tenure Reform of Collective-owned Forestry Land, etc. The recent land tenure reform policy allows collectively owned lands to be contracted to individual farmer household. The proposed project will not break relevant laws and regulations. Contrary, this project can help to facilitate the enforcement of regulations and policies for stopping illegal grazing.

G.5.2 Document that the project has approval from the appropriate authorities, including the established formal and/or traditional authorities customarily required by the communities

>>The project proponent is applying for the Letter of Approval from National Development and Reform Commission.

G.5.3 Demonstrate with documented consultations and agreements that the project will not encroach uninvited on private property, community property, or government property and has obtained the free, prior, and informed consent of those whose rights will be affected by the project

>> All the project lands are collectively owned (by villages), among which 57.34 ha of lands are contracted to individual household for a period 30 years with starting date from 2011 to 2041. All of them have the right to use their own lands. Under the contractual arrangement in the proposed project activity, local communities, individuals and relevant entities that own the land use right will offer the lands for planting on 100 percent voluntary basis, as a return, they own will share 60 per cent of income from wood and non-wood products. After the end of the crediting period, the plantation to be established will be completely owned by farmers/communities. The contractual arrangement will be established on voluntary basis and fixed by contracts. Therefore, the implementation of the project will not encroach uninvited on private and community property.

G.5.4 Demonstrate that the project does not require the involuntary relocation of people or of the activities important for the livelihoods and culture of the communities. If any relocation of habitation or activities is undertaken within the terms of an agreement, the project

proponents must demonstrate that the agreement was made with the free, prior, and informed consent of those concerned and includes provisions for just and fair compensation.

>> The project area is severely degraded barren lands on which local communities do not rely for their livelihood and culture of the communities. Therefore, the project will not cause any relocation of people.

G.5.5 Identify any illegal activities that could affect the project's climate, community or biodiversity impacts (e.g., logging) taking place in the project zone and describe how the project will help to reduce these activities so that project benefits are not derived from illegal activities..

>> Currently all project lands are defined for forestry purpose by local government. Among them 525.12 ha of lands are barren lands without any pre-project management activity, and 1,665.59 ha of lands have grazing. However the grazing is illegal. As a result of the implementation of the proposed project, the land parcels will be enclosed after planting to prevent planted young trees from being disturbed by human activities or illegal grazing, until the stand canopy closure. Therefore the pre-project illegal activities would not affect the project's climate, community or biodiversity benefits.

G.5.6 Demonstrate that the project proponents have clear, uncontested title to the carbon rights, or provide legal documentation demonstrating that the project is undertaken on behalf of the carbon owners with their full consent. Where local or national conditions preclude clear title to the carbon rights at the time of validation against the Standards, the project proponents must provide evidence that their ownership of carbon rights is likely to be established before they enter into any transactions concerning the project's carbon assets..

>> To effectively promote and govern CDM project activities in China, the Chinese government issued the Measures for Operation and Management of Clean Development Mechanism Projects in China on Oct 12, 2005 and revised on August 3 2011, effective immediately. Based on the Measures, the Chinese Government allows any sponsor to apply, invest in, and implement a CDM project activity as long as it meets basic requirements stipulated in the Measures. The right of access to the sequestered carbon belongs fully to participants after Chinese government taxes 2% of transfer value[5].

III. Climate Section

CL1 Net Positive Climate Impacts (Required)

CL.1.1 Estimate the net change in carbon stocks due to the project activities using the methods of calculation, formulae and default values of the IPCC 2006 GL for AFOLU or using a more robust and detailed methodology. The net change is equal to carbon stock changes with the project minus carbon stock changes without the project (the latter having been estimated in G2). This estimate must be based on clearly defined and defendable assumptions about how project activities will alter GHG emissions or carbon stocks over

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[5] http://cdm.ccchina.gov.cn/

> the duration of the project or the project GHG accounting period.

>> See Section G.2.3 for carbon stock changes without the project and AR-CDM PDD Section B.7 for carbon stock changes with the project.

CL.1.2 Estimate the net change in the emissions of non-CO_2 GHG emissions such as CH_4 and N_2O in the with and without project scenarios if those gases are likely to account for more than a 5% increase or decrease (in terms of CO_2-equivalent) of the project's overall GHG emissions reductions or removals over each monitoring period.

>> There will be no biomass burning during site preparation and forest management, and based on the methodology applied there will be no non-CO_2 GHG emissions from clearing, burning and decay of existing vegetation due to implementation of an A/R CDM project activity.

CL.1.3 Estimate any other GHG emissions resulting from project activities. Emissions sources include, but are not limited to, emissions from biomass burning during site preparation, emissions from fossil fuel combustion, direct emissions from the use of synthetic fertilizers, and emissions from the decomposition of N-fixing species.

>> There will be no biomass burning during site preparation, no machinery use, no synthetic fertilizer application as well as no N-fixing species to be used in the project. Therefore GHG emissions from these emission sources will not occur.

CL.1.4 Demonstrate that the net climate impact of the project is positive. The net climate impact of the project is the net change in carbon stocks plus net change in non-CO2 GHGs where appropriate minus any other GHG emissions resulting from project activities minus any likely project-related unmitigated negative offsite climate impacts.

>> see AR-CDM PDD Section B.7 and table B-0-3 for the ex ante estimate of the actual net GHG removals by sinks.

CL.1.5 Specify how double counting of GHG emissions reductions or removals will be avoided, particularly for offsets sold on the voluntary market and generated in a country with an emissions cap.

>> ~~The net GHG removals generated by the project will be sold on the voluntary market for voluntary purpose~~. The Host country (China) has no emission cap.

CL.2 Offsite Climate Impacts ("Leakage") (Required)

CL.2.1 Determine the types of leakage that are expected and estimate potential offsite increases in GHGs (increases in emissions or decreases in sequestration) due to project activities. Where relevant, define and justify where leakage is most likely to take place.

>> See AR-CDM PDD Section B.7.1

CL.2.2 Document how any leakage will be mitigated and estimate the extent to which such impacts will be reduced by these mitigation activities..

>> See AR-CDM PDD Section B.8.3.

CL.2.3 Subtract any likely project-related unmitigated negative offsite climate impacts from the climate benefits being claimed by the project and demonstrate that this has been included in the evaluation of net climate impact of the project (as calculated in CL1.4).

>> See AR-CDM PDD Section B.7.3.

CL.2.4 Non-CO2 gases must be included if they are likely to account for more than a 5% increase or decrease (in terms of CO2-equivalent) of the net change calculations (above) of the project's overall off-site GHG emissions reductions or removals over each monitoring period.

>> No off-site non-CO2 emissions likely occurs.

CL.3 Climate Impact Monitoring (Required)

CL.3.1 Develop an initial plan for selecting carbon pools and non-CO2 GHGs to be monitored, and determine the frequency of monitoring. Potential pools include aboveground biomass, litter, dead wood, belowground biomass, wood products, soil carbon and peat. Pools to monitor must include any pools expected to decrease as a result of project activities, including those in the region outside the project boundaries resulting from all types of leakage identified in CL2. A plan must be in place to continue leakage monitoring for at least five years after all activity displacement or other leakage causing activity has taken place. Individual GHG sources may be considered 'insignificant' and do not have to be accounted for if together such omitted decreases in carbon pools and increases in GHG emissions amount to less than 5% of the total CO2-equivalent benefits generated by the project. Non-CO2 gases must be included if they are likely to account for more than 5% (in terms of CO2-equivalent) of the project's overall GHG impact over each monitoring period. Direct field measurements using scientifically robust sampling must be used to measure more significant elements of the project's carbon stocks. Other data must be suitable to the project site and specific forest type..

>> Selected carbon pools and non-CO2 GHG to be monitored are presented in table CL.1 and table CL.2 below. The monitor frequency is once every 5 years after the initial monitoring.

Table CL.1 Carbon pools selection

Carbon pools	Accounted for	Justification/Explanation
Above-ground biomass	Yes	Major carbon pool subjected to project activity
Below-ground biomass	Yes	Major carbon pool subjected to project activity
Dead wood	Yes	Carbon stock in this pool is likely to increase in project compared to the baseline.
Litter	Yes	carbon stock in this pool is likely to increase in project compared to the baseline.
Soil organic carbon	Yes	carbon stock in this pool is likely to increase in project compared to the baseline.

Table CL.2 Emission sources and GHGs included in or excluded from accounting

Sources	Gas	Included/ excluded	Justification/Explanation
Burning of woody biomass	CO2	Excluded	Carbon stock decreases due to burning are accounted as a change in carbon stock
	CH4	Included	Burning of woody biomass for the purpose of site preparation or as part of forest management can lead to significant levels of emissions of methane
	N2O	Included	Burning of woody biomass for the purpose of site preparation or as part of forest management can lead to significant levels of emissions of nitrous oxide

CL.3.2 Commit to developing a full monitoring plan within six months of the project start date or within twelve months of validation against the Standards and to disseminate this plan and the results of monitoring, ensuring that they are made publicly available on the internet and are communicated to the communities and other stakeholders.

>> See AR-CDM PDD Section B.8 for the full monitoring plan. The Chinese version of the monitoring plan will be developed upon the completion of the validation and disseminate within twelve months. The monitoring plan will be made available to public on the website of the PNSFER. Hard copies of the monitoring plan will be distributed among local stakeholders by implementation entity, Helinge'er forestry bureau and forestry stations and forest patrollers. At the same time, public notice boards and community broadcasts will be used to publicize information regarding how to access to the monitoring plan through internet. Technical taff from forestry bureau and its stations will also explain the monitoring plan to local farmers, especially to illiterate or under-educated farmers.

IV. Community Section

CM.1 Net Positive Community Impacts (Required)

CM.1.1 Use appropriate methodologies to estimate the impacts on communities, including all constituent socio-economic or cultural groups such as indigenous peoples (defined in G1), resulting from planned project activities. A credible estimate of impacts must include changes in community well-being due to project activities and an evaluation of the impacts by the affected groups. This estimate must be based on clearly defined and defendable assumptions about how project activities will alter social and economic well-being, including potential impacts of changes in natural resources and ecosystem services

> identified as important by the communities (including water and soil resources), over the duration of the project. The 'with project' scenario must then be compared with the 'without project' scenario of social and economic well-being in the absence of the project (completed in G2). The difference (i.e., the community benefit) must be positive for all community groups.

>> See AR-CDM PDD Section E. It should be noted that there is almost no income from the project lands as the lands are degraded and degrading barren lands under the baseline scenario. The only exception is the lands with illegal grazing from which land owners have limited income from grazing. However, under the project scenario, the income from grazing would not be reduced as there are sufficient lands available for taking the stock to be displaced from the project lands. Therefore, the income from the "with project" scenario estimated in AR-CDM PDD Section E is a net benefit compared to the "without project" scenario.

CM.1.2 Demonstrate that no High Conservation Values identified in G.1.8.4-6 will be negatively affected by the project

>> These are demonstrated as below:

High Conservation Values identified in G.1.8.4: As described in section G.1.8.4, the project zone is important for controlling sandification and desertification. Most of the projects lands are severely degraded and suffers from serious sandification and desertification that directly threaten nearby croplands and drinking water sources. Forestation on these degraded lands would enhance hydrological service and control sandification and desertification, rather than negatively impacted.

High Conservation Values identified in G.1.8.5: Most project lands have grazing (1,665.59 ha) which can provide limited benefits for local communities. However the grazing is illegal activity as the project lands are defined by local government as forestry purpose lands. Furthermore, as demonstrated in AR CDM PDD Section B.7.1, the existing grazing lands outside the project boundary can accommodate all grazing animals currently within the project activities. Therefore, the implementation of the project will not negatively impact the basic needs of local communities. Contrary, as presented in section G.1.5, most of the communities in the project zone are living under the national poverty line. Compared to almost limited income under without project scenario, the project will largely increase income of the local communities through employment, non-timber forest products, etc (see also AR-CDM PDD section E.1).

High Conservation Values identified in G.1.8.6: As explained in section G.1.8.6 above, forestation of degraded barren lands will have no negative impact on traditional cultural of local communities.

CM.2 Offsite Stakeholder Impacts (Required)

CM.2.1 Identify any potential negative offsite stakeholder impacts that the project activities are likely to cause.

>> No potential negative offsite stakeholder impacts have been identified. In contract the project will bring benefits to the offsite communities, e.g., providing additonal employment opportunity,

improving local environment, controlling sandification and desertification of the project zone as well as regulating hydrological flow beyond the project zone.

> **CM.2.2** Describe how the project plans to mitigate these negative offsite social and economic impacts

>> Although there is no significant negative offsite community impact, the monitoring plan including the mitigation measures to address any potential risks will be implemented.

> **CM.2.3** Demonstrate that the project is not likely to result in net negative impacts on the well-being of other stakeholder groups.

>> The project does not create any negative social and economic impacts within and beyond the project areas. On the contrary, as part of the seeds and seedlings, as well as labour forces will be mobilized from the adjacent communities of the project sites, these opportunities will bring them substantial economic benefits. The project will also bring offset environmental benefits including improving local environment, controlling sandification and desertification of the project zone as well as regulating hydrological flow. Therefore, this project will create positive offsite impacts for both the communities within and beyond the project sites.

> **CM3 Community Impact Monitoring (Required)**

> **CM.3.1** Develop an initial plan for selecting community variables to be monitored and the frequency of monitoring and reporting to ensure that monitoring variables are directly linked to the project's community development objectives and to anticipated impacts (positive and negative).

>> Indicators in table CM.1 and table CM.2 will be applied to assess the changes as a result of implementation of this project.

Table CM.1 Monitoring Indicators for villages

Natural village: _____ Administrative Village: _____ Town/Township: _____ .
County:_____ .

Monitoring Indicators	At the start of project	At the time of monitoring
Number of households		
- Ethinc minority		
- Households in poverty		
- Households with lands within the project		
- Households that benefits from the project		
Population:		
- Ethinc minority		
- In poverty		
- Numbers that benefit from the project		
Income per capita (Yuan)		
Forestation area (ha)		

- Project forestation area (ha)		
Grazing land (ha)		
Number of livestock (head)		
- grazing livestock (head)		
- Livestock in lot (head)		
Road (km)		
Participation of project activities (person-day)		
- Site and soil preparation		
- planting		
- weeding		
- tending		
- forest protection:		
- thinning		
- harvesting		
- other activities		
Participating in training (person-time)		
Income from project employment (Yuan)		
Income from non-timber forest products (Yuan)		
Income from timber products (Yuan)		
Income from carbon credit (Yuan)		
Percentage of participation of ethnic minority groups in project activities (%)		
Percentage of women's participating in project activities (%)		
Affects on local culture and tradition		

Table CM.2 Monitoring Indicators for Household

Name: _____Ethnic:_____ Natural Village: _____Administrative Village: _____.
Town/Township: _____County : _____.

Monitoring Indicators	At the start of project	At the time of monitoring
Per capita income (Yuan)		
fuel wood consumption (ton)		
Number of grazing livestock (head)		
Number of livestock in lot (head)		
Area of lands owned within the project (ha)		
Participation of project activities (person-day)		
Income from project (Yuan)		
Participating in training (person-time)		
Comments and concerns:		

CM.3.2 Develop an initial plan for how they will assess the effectiveness of measures used to maintain or enhance High Conservation Values related to community well-being (G1.8.4-6) present in the project zone.

>> Indicators relevant to community-related HCVs have been included in Section CM.3.1 above and these indicators will be monitored (see Section CM.3.3 below)

> **CM.3.3** Commit to developing a full monitoring plan within six months of the project start date or within twelve months of validation against the Standards and to disseminate this plan and the results of monitoring, ensuring that they are made publicly available on the internet and are communicated to the communities and other stakeholders.

>> To in-depth track the socia-economic changes resulted from the project activities in the rural communities and households, and understand issues raised and difficulties encountered during the project implementation, as well as their opinions and comments on the project activities, so as to adjust and improve the project activities in a timely manner, a PRA process will be conducted once every five years (at the same time of the climate impact monitoring), as described below.

Procedures:

a) **Establishing PRA team**: The teams will be set up to conduct the PRA process, which consists of social experts, project officers, local government officials and technical staff with various background (forestry, sociology and ecology) from Helinge'er forestry bureaus and township forestry stations;

b) **Developing SOPs for the field PRA process;**

c) **Training:** A training workshop will be held for discussing and training of PRA teams in order to ensure all PRA members fully understand the purposes, contents, procedures and specific methods of the PRA field survey;

d) **Preparation:** Developing detail PRA field survey plan including responsibility of each member of PRA team; and contacting with relevant towns/townships and informing them PRA plan.

e) **PRA survey:** conducting PRA survey following SOPs.

Methods

a) **Village meeting**: A meeting of farmer representatives will held in villages sampled. The general agenda are:

(i) Introducing PRA team members and the purpose, procedures, methods and time schedules of the PRA process;

(ii) Explaining the way of villagers' participation;

(iii) Collecting information regarding the project progress, social-economic and environmental benefits shared from the projects, existing problems/difficulties encountered by local communities during the project implementation, as well as comments and suggestions on improvement of the project.

b) **Semi-structured interviews:** This includes VIP interview, farmer household interview and group interview

(i) Interviewing of VIP: including villager leaders, distinguished villagers, elder villagers and head of ethnic minority.

(ii) Interviewing of household: Some farmer households will be selected for the interview. The interviewed households shall cover rich household, poor household, new inhabitant household, etc.

(iii) Group interview: Villagers are grouped based on gender, age classes or land use types. The group interviews were conducted together with village meeting.

c) **Questionnaire**: Questionnaire forms will be developed and distributed among different stakeholders, including farmer households, village committees, township governments, local forest stations and forestry bureaus and nature reserves.

V. Biodiversity Section

B.1. Net Positive Biodiversity Impacts (Required)

B.1.1 Use appropriate methodologies to estimate changes in biodiversity as a result of the project in the project zone and in the project lifetime. This estimate must be based on clearly defined and defendable assumptions. The 'with project' scenario should then be compared with the baseline 'without project' biodiversity scenario completed in G2. The difference (i.e., the net biodiversity benefit) must be positive.

>>The biodiversity baseline survey on the project lands includes plants, mammals, rodents, amphibians, crawler and birds. The random sample with the same size and orientation as the carbon baseline survey (see annex 3 for the baseline information) was used to survey the plant biodiversity and rare and endangered species. The rail- snare was used to survey the species and community of amphibian, crawler and rodent. Two random sample along-line surveys were carried out across each site biyearly to search and track record any individual, spoor, dejection of mammal and birds, and confirm the specie. Based on baseline survey no protected or endangered species and IUCN species have been found on the proposed project lands. These lands currently have low biodiversity. As described in AR CDM PDD Section B.2, the project lands are degraded and degrading land and will continue to degrade under the baseline scenario. Therefore biodiversity with the baseline will remain low or continue to reduce.

The restoration of native ecosystem through the project will provide significant positive biodiversity benefits by:

- Restoring forest vegetation on degraded lands in-between nature reserves will create additional buffer zone and corridors, hence enhance the connectivity between forests, and provide much needed expansion of important wildlife habitat areas. This will facilitate gene flow through allowing once-isolated wildlife groups to interact and enhance the viability of their populations.

- Generating increased income to local communities from the proposed project activity. This will reduce the tendency of local communities to degrade biodiversity through practices such

as illegal grazing, illegal poaching and NTFP collection (such as Chinese medicine collection) in the nature reserves, and hence alleviate conflicts between conservation and economic activities of local communities.

Therefore, The 'with project' scenario will produce the net biodiversity benefit compared to "with baseline" scenario.

B.1.2 Demonstrate that no High Conservation Values identified in G1.8.1-3 will be negatively affected by the project.

>> As described in AR-CDM PDD section A.3, there is no protected or endangered species and IUCN species have been found on the proposed project lands. These lands currently have low biodiversity. On the other hands, the project will bring a high biodiversity benefits (see AR-CDM-PDD Section D.1 for detail description). Therefore, no High Conservation Values identified in G1.8.1-3 will be negatively affected by the project including: 1) threatened and protected species in the project area, 2) large landscape-level areas where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance, 3) threatened or rare ecosystems.

B.1.3 Identify all species to be used by the project and show that no known invasive species will be introduced into any area affected by the project and that the population of any invasive species will not increase as a result of the project.

>> All the tree and shrub species as listed in Section G.3.4 above are native to local. These species have been selected through community participation and none of them belongs to invasive species.

B.1.4 Describe possible adverse effects of non-native species used by the project on the region's environment, including impacts on native species and disease introduction or facilitation. Project proponents must justify any use of non-native species over native species..

>> No invasive species will be used in the project.

B.1.5 Guarantee that no GMOs will be used to generate GHG emissions reductions or removals.

>> All seedlings used in the proposed project activities will be bred in local nurseries using seed collected from local seed orchard or parent trees. No GMOs will be used in the project.

B2 Offsite Biodiversity Impacts (Required)

B.2.1 Identify potential negative offsite biodiversity impacts that the project is likely to cause.

>> No potential negative offsite biodiversity impacts have been identified.

B.2.2 Document how the project plans to mitigate these negative offsite biodiversity impacts.

>> No potential negative offsite biodiversity impacts have been identified.

B.2.3 Evaluate likely unmitigated negative offsite biodiversity impacts against the biodiversity benefits of the project within the project boundaries. Justify and demonstrate that the net effect of the project on biodiversity is positive.

>> No potential negative impacts have been identified due to the environmental-friendly techniques adopted in the proposed project activity, e.g., avoidance of slash and burn and overall tillage, choice of native species and their mixed spatial arrangement, etc.

B3 Biodiversity Impact Monitoring (Required)

B.3.1 Develop an initial plan for selecting biodiversity variables to be monitored and the frequency of monitoring and reporting to ensure that monitoring variables are directly linked to the project's biodiversity objectives and to anticipated impacts (positive and negative).

>> It is planned that biodiversity monitoring will be carried out based on a five-year cycle to cover plants, amphibians, small and large mammals, birds and insects. Various biodiversity indicators for different biotic communities will be used for analysis as follow.

Flora

5 randomly selected sub-plots (2m×2m) within permanent sampling plots for carbon stock chage monitoring will be used to monitor the species, population, coverage density or abundance, and frequency (table B.1) to assess the changes of plant diversity, and the following evaluation index will be used:

Simpson's diversity index，D

$$D = 1 - \sum_{i=1}^{S} p_i^2 = 1 - \sum_{i=1}^{S} (\frac{N_i}{N})^2$$

Where N_i is the population of species i，N is the total population of all plants in the sample plot。

Shannon-Weiner index，H

$$H = - \sum_{i=1}^{S} P_i \ln P_i$$

Where: S is the total amount of species，Pi is the population the inverse proportion of species i in all plant species.

Table B.1 Field Monitoring Template for Flora Sample Plots

(1) Location: _____Village_____Town/township_____County
_____Compartment _____Sub-compartment; GPS Coordinates: Longitude _____,
Latitude _____.
(2) Serial No. of sample plot: _____, area of sample plot: ___m^2;

(3) Landform and physiognomy: physiognomy: _____ altitude: ____; slope aspect: ____; degree
  of slope :____;location of slope:

(4) Type of vegetation _____**; species:__** （filling in the following table）

(5) Traces of wild animals (including footmarks, dejecta, caves and footprints of rodent animals
and etc):_____;

(6) The status that rodent animals damage to the project land: _____.

Serial No.	shrub				herbage			
	Name	Number (plants/clump)	Average height (m)	Average coverage (%)	Name	Number (plants/clump)	Average height (m)	Average coverage （%）
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

Surveyor: _____date:

Fauna

Based on the wild animal baseline survey, and the types and numbers of wild animals and their
features that are closely related to the flora, typical and permanent sample strips will be selected
from different vegetation types. The selected sample strips should meet the criterion of typical,
permanent and practical, so as to ensure the comparability of the data, and to realize the long-term
and precise monitoring of the distribution and changes of the wild animals in the project areas.

Under the help of GPS, surveyors move along with the route used for wild animal baseline survey at
a speed of 1.5-2 km per hour, and record the findings on the way. The record include the species and
numbers of animals, the sound of howl/chirp, remnants, traces and etc., and the distance and angles
between the recorded place and the place that animals are appeared, should be also recorded (table
B.2 below). Special attention should be put on the selected monitoring species.

Table B.2 Field Monitoring Record Template for Wild Animals in Sample Strips

Sample strip serial No.:_____ The length of the sample strip:_____

Location:_____Natural village _____Adminstrative village (Branch farm)_____Town/Township (farm)_____county

Start - end point, ending point , inflexion point, and coordinates of animal appeared and disappeared point			Type	Number	Gender	Age phase	The distance and angles from the recoded points		Type of habitat (flora type/dominant plant species)	Type of traces
Location	Latitude and longitude	Altitude （m）					Distance （m）	Angles （°）		

Surveyor: Date: Weather:

Notes: (1) Age phase divided into: adult, sub-adult, young, baby, and unclear; (2) type of trace: body, howl/chirp, dejecta, loitering marks, nest/holes, claw marks, footmarks, marks on the trees, chewing materials, and others.

> **B.3.2** Develop an initial plan for assessing the effectiveness of measures used to maintain or enhance High Conservation Values related to globally, regionally or nationally significant biodiversity (G1.8.1-3) present in the project zone.

>> The effectiveness of measures used to maintain or enhance HCVs will be assessed at a five year interval, as follow:

Range: Based on the monitoring in the project as described in Section B.3.1, distribution range of species contained in G1.8.1 b-d and G.1.8.2 in the project zone will be assessed.

Habitat area: Changes in the habitat area and quality for species contained in G1.8.1 b-d and G.1.8.2 in the project zone will be assessed.

Landscape connectivity: Changes in the landscape and habitat connectivity, including forest fragmentation and the area and connectivity of rare or protected ecosystem in the project zone will be analysed.

> **B.3.3** Commit to developing a full monitoring plan within six months of the project start date or within twelve months of validation against the Standards and to disseminate this plan and the results of monitoring, ensuring that they are made publicly available on the internet and are communicated to the communities and other stakeholders.

>> See Section B.3.1. The Chinese version of the monitoring plan will be developed upon the completion of the validation and disseminate within twelve months. The monitoring plan will be made available to public on the website of the LNSFER. Hard copies of the monitoring plan will be distributed among local stakeholders by implementation entity, Helinge'er forestry bureau and forestry stations and forest patrollers. At the same time, public notice boards and community broadcasts will be used to publicize information regarding how to access to the monitoring plan through internet. Technical staff from forestry bureau and stations will also explain the monitoring plan to local farmers, especially to illiterate or under-educated farmers.

V. Golden Level Section

GL.1 Climate Change Adaptation Benefits (Optional)

> **GL.1.1** Identify likely regional climate change and climate variability scenarios and impacts, using available studies, and identify potential changes in the local land-use scenario due to these climate change scenarios in the absence of the project

>> Based on the second National Assessment Report of Climate Change in China[6], the mean air temperature in China increased by 0.5-0.8^{0}C per 100 years since 1880, and it was 0.23 ^{0}C per 10 years from 1951 to 2009. There was no significant change of precipitation in China in last 50 years. The magnitude and trend of climate changes vary with geographical area. The warming in South China is much less that North China. Since 1951 the mean air temperature increased by 0.37 ^{0}C per 10 years in the Northwest China, 0.30^{0}C per 10 years in the Northeat China and 0.22 ^{0}C per 10

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[6] The Editorial Board of the Second National Assessment Report of Climate Change in China. 2011. The Second National Assessment Report of Climate Change in China. Chinese Science Press

years in the North China, while it was 0.12-0.16^{0}C per 10 years in the Central and South China. At the same time, annual precipitation in the North and Northeast China decreased gradually, showing an apparent increasing trend of temperature and aridity. The intensity and frequency of extreme climatic events (heatwave, snowstorm, rainstorm, drought, etc) increased significant. Especially in the north part of China, drought is the dominant climatic disaster.

By the end of the 21st century, mean air temperature in China will increase by 2.5-4.6 ^{0}C, more significant than global changes. No significant change of precipitation in South China is expected but intensity and frequency of rainstorm is expected to increase significantly.

Since 1961, the mean annual temperature in the Helinge'er increased by 0.42^{0}C per 10 years, higher than the level of Inner Mongolia (0.38^{0}C per 10 years) and national level (0.24 ^{0}C per 10 years), particularly in last 20 years. The mean annual temperature increased by 0.77^{0}C and 0.45^{0}C in 1990s and early this century, respectively. There is no significant change in precipitation (Figure V.1). This indicates a more arid trend in the project area.

In the recent years, occurrences of extreme climatic conditions due to climate change have become more and more frequent, for example, in some localities of the project areas, heavy-precipitation weather in short timespan causing the worst floods.Extreme drought occurred frequently in recent years.

It was projected that compared to 1961-1990 level, the mean annual temperature in Helinge'er will increase by 3.3^{0}C and 5.4^{0}C by 2050 and 2100. The annual precipitation will increased by 158 mm and 211 mm. This results a slight increase of humidity (Figure V.2 and Figure V.3).

Under the climate change scenario in the absence of the project, the land degradation and landscape fragmentation would deteriorate, and the project lands would keep as barren lands as they have been for many years. Both biodiversity and local communities would be more negatively impacted. To maintain livelihood, illegal grazing and illegal agricultural cultivation are expected to expand, which will lead to more serious land degradation and more significant impact on desertification and biodiversity.

Figure V.1 Changes in temperature and precipitation in last 50 years[7]

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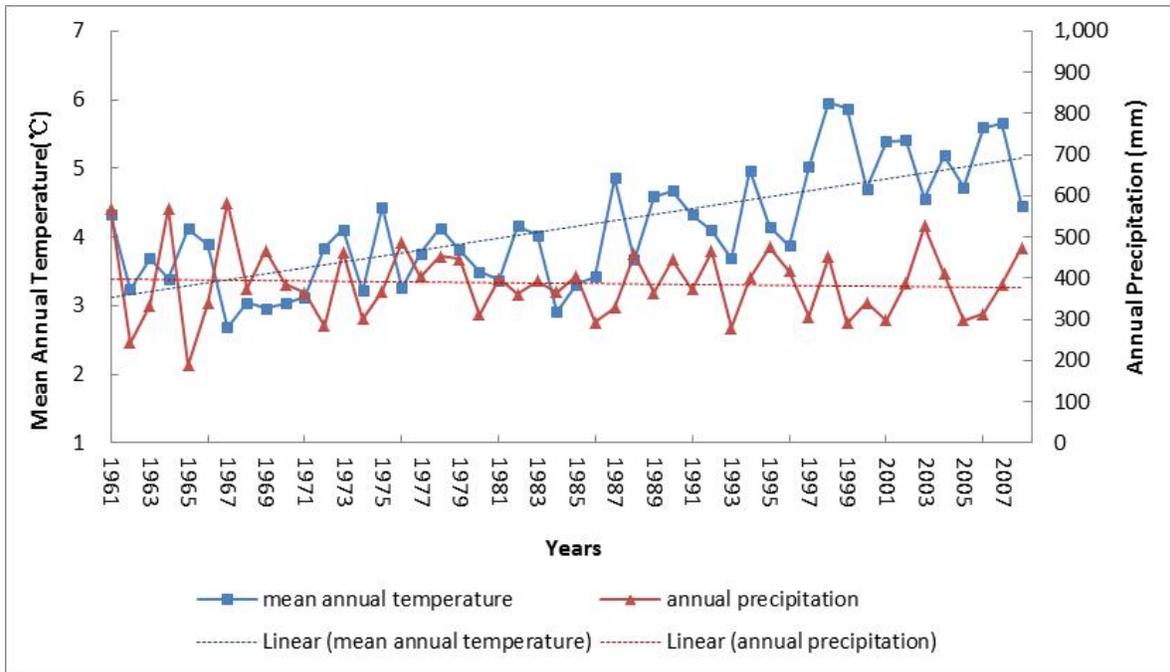
[7] Derived from: Xu Y, Gao X J, Shen Y, et al. 2009. A daily temperature dataset over China and its application in validating a RCM simulation. Adv Atmos Sci., 26 (4): 763–772. Xie P P, Yatagai A, Chen M Y, et al. 2007. A gauge-based analysis of daily precipitation over East Asia. J Hydrol, 8 (3): 607–626.

Figure V.2 Changes in temperature in Helinge'er in 2050 and 2100 as compared to present[8]
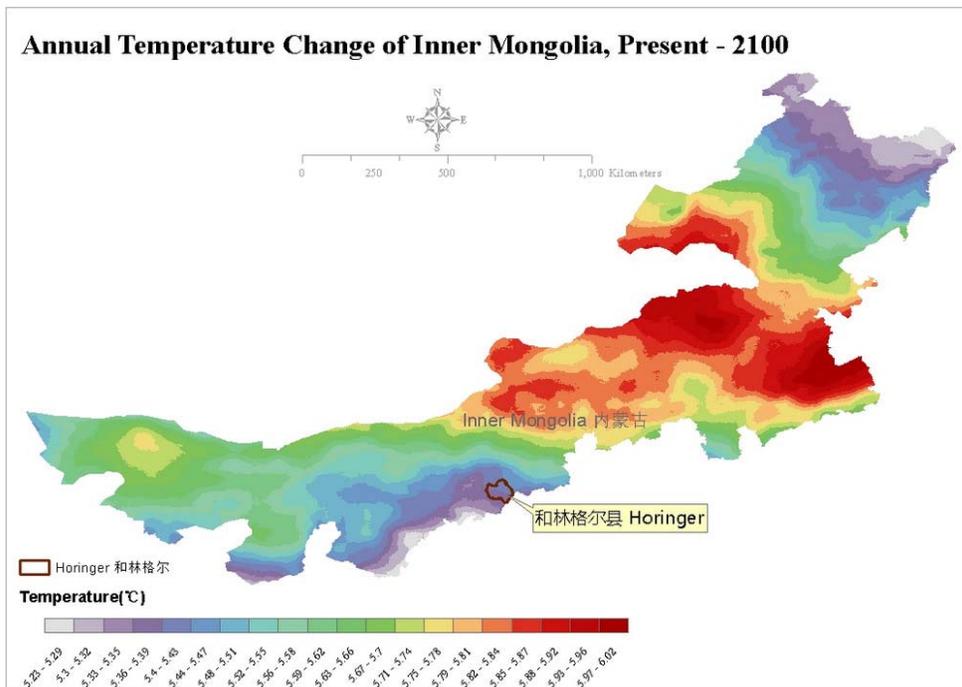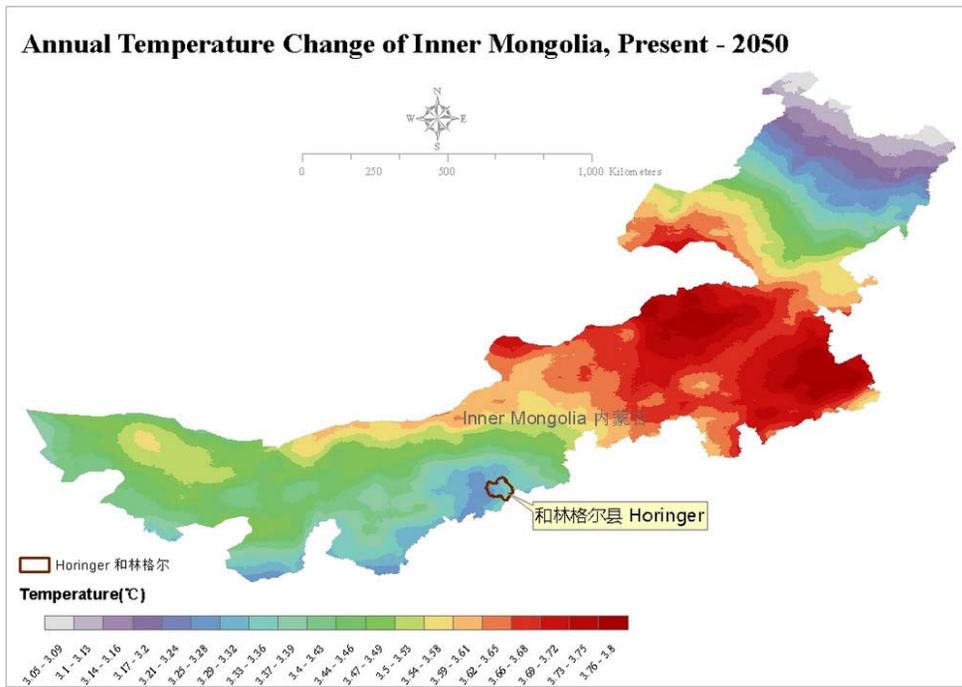
[8] Data sources: Gao X J, Shi Y, Zhang D F, et al. 2011. Uncertainties in monsoon precipitation projections over China: results from two high resolution RCM simulations. Climate Res., Submitted. Gao, X.J., Shi, Y., Zhang, D.F., Giorgi, F. A high resolution climate change simulation of the 21st century over China by RegCM3. China Science

Figure V.3 Changes in precipitation in Helinge'er in 2050 and 2100 as compared to present[8]
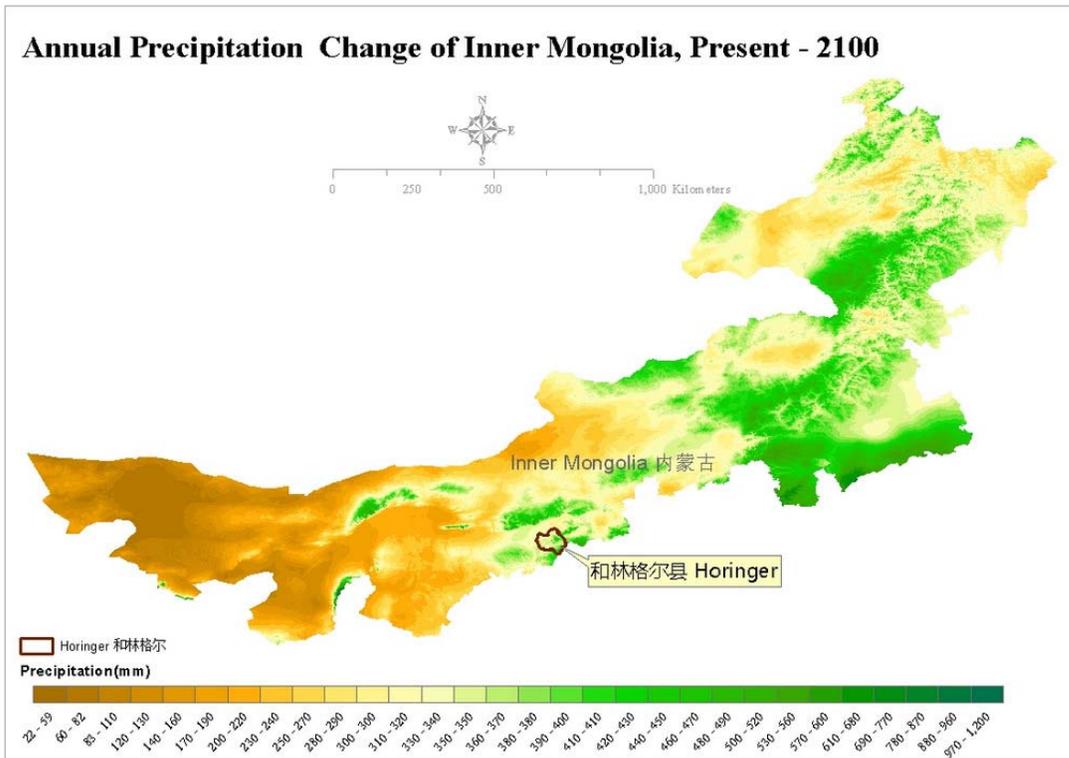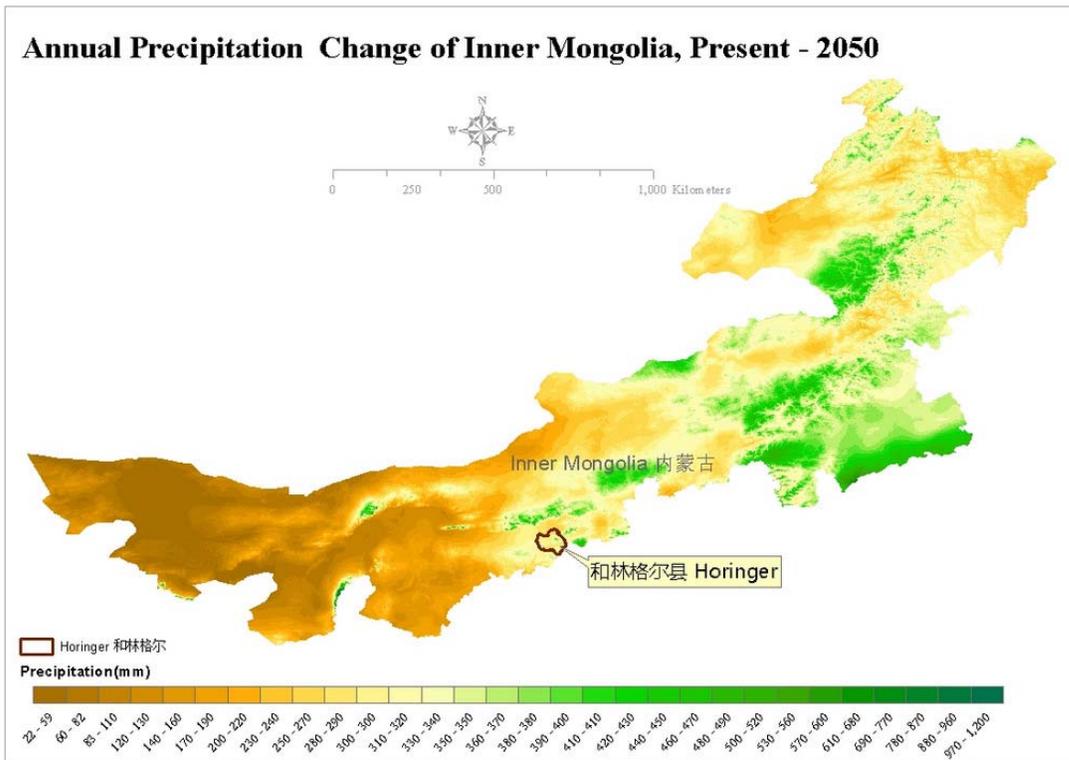
> **GL.1.2** Identify any risks to the project's climate, community and biodiversity benefits resulting from likely climate change and climate variability impacts and explain how these risks will be mitigated.

>> Identified risks to the project's climate, community and biodiversity benefits resulting from likely climate change and climate variability impacts include:

- Extreme drought may negatively impact the survival rate of young trees/shrubs, plantation productivity (growth rate) , and increase fire risk and pest risk of forest to be implemented;

- Increasing temperature may increase forest fire and pest risks.

During the project development, thorough inventories and surveys on the climate, vegetations, site conditions of the project areas, as well as the economy, cultures, production and livelihood practices in the adjacent communities of the project areas, have been conducted. We come to understand that such natural disasters as draughts, as a result of extreme climatic changes, are the critical factors that can affect the project implementation and its benefits. Countermeasures against these risks include:

- Those native tree and shrub species that are most adaptable to local climatic, soil, water and temperature conditions will be chosen for the forestation.

- Primary forests that share the same conditions as those in the project zone will be chosen as seed trees.

- The nursery sites will also be located in the vicinity of the planting sites where the conditions are very much the same.

- According to site conditions, tree and shrub species will be planted in a mixture pattern to enhance soil and water conservation, mitigate fire and disease risk.

- During planting operations, minimal-disturbance will be implemented. Neither slash-and-burn nor full-tillage will be applied to avoid damaging primary vegetation. No canals will be opened and gravity irrigation will not be applied so as to avoid changing surface runoff.

- After planting operations are completed, soils will be timely recovered in the planting pits to reduce and avoid erosion.

- In the case of unavoidable natural disasters, rescue measures, such as enrichment planting will be done in areas where young trees/shrubs and seedlings are affected so that the loss from such damages will be minimized to the maximum extent.

> **GL.1.3** Demonstrate that current or anticipated climate changes are having or are likely to have an impact on the well-being of communities and/or the conservation status of biodiversity in the project zone and surrounding regions.

>> The significant increase in temperature and slight increase in precipitation will negative impact the amount of freshwater, food production and annual net production of grass on grazing lands. As the agricultural production constitute the main source of income of local communities, this will decrease access to resources of importance for communities' livelihood and overall well-being (income, food and freshwater).

The expected increase of frequency and intensity of extreme weather (extreme drought) under the climate change scenario (as presented in Section GL.1.1), The increasing extreme weathers may also causes severe short of freshwater, enormous direct loss of agricultural (food and husbandry)

production in the project areas and its adjacent areas which may severely affect the normal daily living of community villagers. Extreme drought will also degrade or even complete damage forest ecosystem, as a result decrease access to resources of importance for communities' livelihood and overall well-being.

The degradation or damage of ecosystems to be causedby increasing frequency and intensity of extreme weather (extreme drought) will subject to degrade or damage habitats of rare and endangered species. In addition, the significant negative impacts on livelihoods and well-being of local communities, as described above, will increase pressure of local communities on nature reserve management, potentially increase the tendency of illegal activities (poaching, medicine collecting, logging and grazing) in the nature reserves, and as a result produce a negative impact on the biodiversity conservation.

GL.1.4 Demonstrate that the project activities will assist communities and/or biodiversity to adapt to the probable impacts of climate change.

>> Correspondingly, countermeasures against these issues have been taken to minimize such negative impacts, such as:

- Most of the project areas are located in-between the nature reserves, forestation of these degraded barren using native species will enhance the connectivity of forest ecosystems and habitats of wildlife, as a result will enhance adaptation of biodiversity to climate change impacts.

- As described in AR CDM PDD Section C.1 and Section D.1, the project will increase income and provide additional employment to the local communities, and help in the control of sandification and desertification, which will decrease communities' dependency on natural resources and agricultural production. To be increased income under the project scenario will also alleviate pressure of local communities on biodiversity conservation.

GL.2 Exceptional Community Benefits (Optional)

GL.2.1 Demonstrate that the project zone is in a low human development country OR in an administrative area of a medium or high human development country in which at least 50% of the population of that area is below the national poverty line.

>>No claimment on this point

GL.2.2 Demonstrate that at least 50% of households within the lowest category of well-being (e.g., poorest quartile) of the community are likely to benefit substantially from the project.

>> N/A

GL.2.3 Demonstrate that any barriers or risks that might prevent benefits going to poorer households have been identified and addressed in order to increase the probable flow of

benefits to poorer households.

>> N/A

GL.2.4 Demonstrate that measures have been taken to identify any poorer and more vulnerable households and individuals whose well-being or poverty may be negatively affected by the project, and that the project design includes measures to avoid any such impacts. Where negative impacts are unavoidable, demonstrate that they will be effectively mitigated.

>> N/A

GL.2.5 Demonstrate that community impact monitoring will be able to identify positive and negative impacts on poorer and more vulnerable groups. The social impact monitoring must take a differentiated approach that can identify positive and negative impacts on poorer households and individuals and other disadvantaged groups, including women.

>> N/A

GL.3 Exceptional Biodiversity Benefits (Optional)

GL.3.1 Vulnerability: Regular occurrence of a globally threatened species (according to the IUCN Red List) at the site:

>> No claimment on this point