Ecology and Biodiversity Conservation Plan

For

Proposed 45 KLPD Molasses Based Distillery Plant

At Gut. No. 55-58, Village Chorakhali, Tahsil Kallam

Dist. Osmanabad, Maharashtra

Prepared for

Dharashiv Sakhar Karkhana Ltd.

Ecology and Biodiversity Conservation Plan

Preamble

The Ecology and Biodiversity Conservation Plan (EBCP) sets out the strategy for ecological impact mitigation and long-term management of project site. The long-term management of the site would provide natural conservation and enhancement of the region. The plan provides:

- Strategy for greenbelt development
- Suitable native species for plantation
- Detailed designs for habitat creation and enhancement measures
- Strategy for conservation of Endemic & Endangered species
- Program for monitoring and review

In first phase of EBCP, along with greenbelt development and enhancement of ecology, conservation of existing ecology in the region is very essential. The natural flora in the region is of evergreen & deciduous type. Hence, greenbelt development should be contiguous to that of native ecology. Plantation of exotic and evergreen trees would lead to destruction of native ecosystem as well as evergreen flora may not survive due to arid climate in the region. Enhanced native ecology will naturally develop avian and reptile ecology by providing suitable habitats for nesting and roosting. On successful implementation of greenbelt in first phase, special efforts can be made to increase mammalian population in second phase.

Workers deployed during construction activities should be sensitized about ecology. Maximum efforts should be taken to prevent them from hunting birds, snakes or cutting trees for fuel.

The best available technologies that ameliorate the negative impacts of the project on the local vegetation and wildlife should be incorporated into the construction designs.Wastewater shall not be released in to the any natural stream of project site, during dry season. Construction material shall be transported in closed trucks and maximum care should be taken to avoid dust during handling.

Development of Green Belt in and around project site

The greenbelt development plan aims at overall enhancement in the existing environmental conditions of the study area. The plan is developed with following objectives.

- Prevention of land degradation due to activities during construction phase
- Enhancing the forest cover for increasing the biodiversity of the region
- Providing aesthetic value to the project area
- Enhancing the ecological equilibrium of the area
- Combating soil erosion

A detailed survey was conducted with respect to diversifying existing flora and fauna condition etc in the project area for development of greenbelt around project components. The greenbelt plan has been formulated considering the parameters such as climate, soil types etc. Greenbelt around project location will attenuate dust emission and noise during construction.

Location of Green belt development

Construction of temporary shelters of locally available materials such as bamboo and grass around the growing saplings is recommended in the summer, to help the plants withstand the hot sun.

Nursery Development

Nurseries would be developed with 6 to 8 seedlings per sq meter for potted plants. On an average range to 1.5 acres of land is required for nursery development. Nursery saplings would be developed for species such as *Coconut, Tamarindus, Bauhinia racemosa etc.*

Butea monosperma and Holarrhena pubescens Methods like seed sowing and grafting shall be adopted. Detailed list attached .

Plantation-process

Pits measuring approximately 2'x2'x2' would be dug where the soil is reasonably deep, and, pits measuring approximately 3'x3'x3' where the soil is shallow or gravelly. Expose the pits to direct sunlight for about 15 days.

If the soil at the site is reasonably good, pits may be filled with 80% site-soil + 20% composted cow-dung. About 200 gm neem-cake and leaf-litter, grass or agricultural residue should be added. If the soil at the site is poor, pits should be filled with 35% site-soil + 35% fertile soil (from an external source) + 30% composted cow-dung. Neem-cake and other organic matter may be added as in the previous instance.

Saplings should ideally be planted after the annual rains begin. The saplings would need to be watered once the rains cease.

General Guidelines Regarding the Plantation-plan

The original topography and vegetation of the site must be retained, that newly-planted saplings may get the benefit of their natural micro-climate and may survive with relatively less inputs.

Soil from the site should be used for the plantation, as far as possible, and supplemented with external nutrients only where necessary.

Chemical fertilizers or pesticides must be avoided, as they reduce soil-quality and integrity, as also, the food/medicinal value of plants. Locally available leaf-litter, grass-cuttings, agricultural residue, compost or other organic material may be used as supplementary plant-nutrients.

Ground-vegetation should be allowed to shed seeds before cutting or mowing it for mulch. This would leave behind a seed-bank to flourish in the next growing-season, providing a natural source of mulch for the following year.

Burning of land must be avoided, as it reduces soil-quality, and harms the ground-vegetation, amphibians, reptiles and ground-nesting birds.

Dumping of waste on the soil must be avoided. Non-biodegradable waste must be carefully collected and safely disposed. Biodegradable waste should be collected and processed, that it may be used to enrich the site-soil.

Water-saving practices, such as drip-irrigation and mulching, are recommended.

Suggested Tree-species:

Local flora is selected to maintain and improve the biodiversity of the region as follows,

Sr.	Botanical Name	Common Name
	Roadside	
1	*Cocos nucifera*	Coconut
2	*Bombax ceiba*	Katesavar
3	*Tamarindus indica*	Chinch
4	*Terminalia ariuna*	Arjun
5	*Santalurn album*	Chandan
6	*Ponaamemia oinnata*	Karani
7	*Azadirachta indica*	Neem
8	*Butea monosoerma*	Palas
9	*Albizzia lebbek*	Sirus
10	*Svzvaium cumini*	Jamun
11	*Madhuca longifolia*	Moha
	For environmental contribution	
16	*Acasia catechu*	Khair
17	*Actino daphnangustifolia*	Pisa
18	*Aegle marmelos*	Bel
19	*Aphanamixis polystachya*	Raktarohida
20	*Bauhinia racemosa*	Apta
21	*Canariumstrictum*	Raldhup
22	*Catunaregum spinosa*	Gela
23	*Dalbergia latifolia*	Phanshi
24	*Gnidia glauca*	Rametha
25	*Holarrhena pubescens*	Kuda
26	*Mammea suriga*	Surangi

Strategy for conservation of Endemic & Endangered species:

- The Endemic & Endangered species of the site must be retained,
- Area where Endemic & Endangered species must demarked,
- Area must be declared as no disturbance zone, restricted entry without permission

The given layout represents plantation scheme of 10.11 hectare. As described earlier plants are recommended in 60 m^2 area. Hence, combinations of species to be planted in each block are given in this table. Based on this layout proposed diversity of greenbelt in future can be calculated. According to suggested plan species composition of each hectare will be as follows.

Sr.	**Botanical Name**	**Common Name**	**Quantity**
	Roadside		
1	*Cocos nucifera*	Coconut	150
2	*Bombax ceiba*	Katesavar	50
3	*Tamarindus indica*	Chinch	100
4	*Terminalia ariuna*	Arjun	100
5	*Santalurn album*	Chandan	150
6	*Ponaamemia oinnata*	Karani	200
7	*Azadirachta indica*	Neem	200
8	*Butea monosoerma*	Palas	75
9	*Albizzia lebbek*	Sirus	50
10	*Svzvaium cumini*	Jamun	25
11	*Madhuca longifolia*	Moha	50
	For environmental contribution		
16	*Acasia catechu*	Khair	50
17	*Actino daphnangustifolia*	Pisa	50
18	*Aegle marmelos*	Bel	50
19	*Aphanamixis polystachya*	Raktarohida	50
20	*Bauhinia racemosa*	Apta	130
21	*Canariumstrictum*	Raldhup	25
22	*Catunaregum spinosa*	Gela	20

23	*Dalbergia latifolia*	Phanshi	25
24	*Gnidia glauca*	Rametha	50
25	*Holarrhena pubescens*	Kuda	75
26	*Mammea suriga*	Surangi	50
	Roadside		
1	*Cocos nucifera*	Coconut	150
2	*Bombax ceiba*	Katesavar	50
3	*Tamarindus indica*	Chinch	100
4	*Terminalia ariuna*	Arjun	100
5	*Santalurn album*	Chandan	150
6	*Ponaamemia oinnata*	Karani	200
7	*Azadirachta indica*	Neem	200
8	*Butea monosoerma*	Palas	75
9	*Albizzia lebbek*	Sirus	50
10	*Svzvaium cumini*	Jamun	25
11	*Madhuca longifolia*	Moha	50
	For environmental contribution		
16	*Acasia catechu*	Khair	50
17	*Actino daphnangustifolia*	Pisa	50
18	*Aegle marmelos*	Bel	50
19	*Aphanamixis polystachya*	Raktarohida	50
20	*Bauhinia racemosa*	Apta	130
21	*Canariumstrictum*	Raldhup	25
22	*Catunaregum spinosa*	Gela	20
23	*Dalbergia latifolia*	Phanshi	25
24	*Gnidia glauca*	Rametha	50
25	*Holarrhena pubescens*	Kuda	75
26	*Mammea suriga*	Surangi	50

Costing provided for landscaping:

Set up: 45 Lcas

O & m: 10.0 lacs/Annum

Conservation of Endangered animals

As per records of Division Forest office (Wild Life), Aurangabad and as per Notification dated 31st May 2017 for Yedshi Ramling Ghat Wildlife Sanctuary, Maharashtra. The study area i.e. 10km radius around project site shows yedshi sanctuary which is located about 8.5km from project site. As per Yedshi sanctuary map, our project site is located away from Eco sensitive Zone ,thus there no requirement to obtained NOC from wild life division. However as per MoEF& CC standard ToRs, we have prepared conservation status for endangered species available in Yedshi ramling Ghat wild life Sanctuary.

However within 500 m of the project site, no endangered animals and plant species were found. But within 10km radius area, Yedshi-Ramling Wildlife Sanctuary provides habitat for Chinkara, Hyena, Wolf, Wild bear, Fox, Black duck, Hares etc., was found within 500m to10 km periphery of the project site and its presence was supported by the local people.

The major faunal species recorded within Yedshi-Ramling Wildlife Sanctuary as follows,

S. no.	Common name	Zoological name
1	Striped Hyena	*Hyaena hyaena*
2	Wolf	*Canis lupus*
3	Indian fox	*Vulpes bengalensis*
4	Jackei(Khohar)	*Canis aureus*
5	Chinkara	*Gazella gazella*
6	Black buck (Kalwit)	*Antilope cervicapra*
7	Indian wild boar	*Sus scrofa*
8	Rhesus Macaque	*Macaca mulatta*
9	Indian hare	*Lepus nigricollius*
10	Porcupine(Sayal)	*Hystrix indica*
Birds and Reptiles		
1	Peafowl	*Pavo cristatus*
2	Teetar	*Francolinus pondicerianus*
3	Grey-headed myna	*Sturnia malabarica*
4	Chatak	*Clamator jacobinus*
5	Mungoose	*Herpestidae*

6	Python	*Python* sp.
7	Sasana	*Peregrine falcon*

Source: Division Forest office (Wild Life), Aurangabad

***Gazella gazella* (Chinkara)**

The Chinkara (Gazella gazella) is a species of gazelle widely but unevenly distributed. Its range coincides closely with that of the acacia trees that grow in these areas. It is mainly a grazing species, though this varies with food availability. They can survive for long periods of time without a water source. Instead, they acquire freshwater from succulents and dew droplets from plants. In order to conserve the habitat, it is recommended that the *Acacia* trees should be planted in sanctuary area in consultation with forest office to attract the animals.

***Canis lupas* (Indian Wolf)**

In general, Indian wolf is listed as least concern species in the IUCN red list. However, illegal poaching for meat continues and declines have been noted in different parts of India. Indian wolf are carnivores, which mean they eat meat as their main food source. They will also hunt hares, beavers, birds and fish. In order to conserve the habitat, it is recommended that the available 'remote area' (forests or rocky terrains) in the wolf-occupied regions determined the status of the wolf. Killing of adult wolves and pups was common throughout the range of the wolf. However, such killings were made largely by local sheepherders with small sheep holdings and not by nomadic shepherds who maintained large sheep herds. The forests in the area exist in small patches every few kilometers. Because each wolf pack ranges over large distances and is by and large a commensal species, we propose that the management of these small forest patches, considering them as components of a larger landscape, is the only effective conservation practice for the wolf.

***Antelope cervicapra* (Black Buck)**

In general, Black Buck is listed as least concern species in the IUCN red list. During the 20th century, blackbuck numbers declined sharply due to excessive hunting, deforestation and habitat degradation. Black Buck is being herbivores, blackbuck graze on low grasses,

occasionally browsing as well. They prefer sedges, fall witch grass, mesquite. The decline in population of the blackbuck is an indicator to the environmental degradation that is around us. In order to conserve the habitat, maintain their habitat area as open grasslands and avoid planting more trees in this area. Trees will not allow grass and herbs to grow, on which the blackbuck survives. Avoid construction and concreting, especially in the blackbuck habitat area. This is increasingly reducing the food availability of these animals.