



Overview of Project for Restoration of Goverdhan Ecology

Introduction:

Goverdhan Parvat of Vrindavan occupies a major part in Hindu mythology and culture due to its intimate relationship with Lord Krishna, the eighth avatar of Vishnu born in Dwapar yug. The holy mountain has been revered for approximately past 5000 years by devout Hindus. The name Goverdhan implies a land of many cows and would certainly have had a very rich ecology to support lacs of cows mentioned in the scriptures.

The last few decades have witnessed a rapid decline in the environmental value of the area, the most visible of which is the excessively polluted condition of the Yamuna waters. It is envisaged to restore the biological diversity of Goverdhan and its immediate environs to the past verdant glory under the present project.

Basis of Proposals - Activities to be undertaken

1. Establishment of Nursery of Native Goverdhan Plant Species of 5 lac plants on 5 hectare @ Rs 60 per plant (total Rs 3 Cr over a period of 5 years, Y1 = 1 Cr, Y2 = 0.75 Cr, Y3 = 0.75 Cr, Y4 = 0.25 Cr, Y5 = 0.25 Cr) with special emphasis on medicinal herbs.

Species - Tamal (*Diospyros cordifolia*), Kadamb (*Mitragyna parviflora*), Kareel (*Capparis aphylla*), Dhau (*Anogeissus parvilora*), Jamun (*Syzygium cumini*), Kanju (*Holoptelia integrifolia*), Ber (*Zizyphus mauritiana*), Chonkar (*Prosopis spicigera*), Barna (*Crataeva religiosa*), Bael (*Aegle marmelos*), Amaltas (*Cassia fistula*), Aphoh (*Tecomella undulata*), Pilkhan (*Ficus infectiria*), Gular (*Ficus glomerata*), Peepul (*Ficus religiosa*), Shatavari (*Asparagus racemosus*), Giloy (*Tinospora cordifolia*), etc.

The appendix may be consulted for detailed choice of native tree, shrub, climber species.

These plants should be ready to be planted in Y4 and Y5 and will be used for afforestation of the following venues:

- Traditional 'Vans' and 'Upvans' of Braj



- Social Forestry in Rural areas
 - Congested township and villages
 - Vacant lots in Urban and Rural areas
 - River banks
 - Large infrastructural congregations in the form of residential colonies, government complexes, educational institutions, temples, Highway avenues, etc.
 - The different Parikrama margs
 - Household gardening, even in multistory complexes
2. Nursery for indigenous fodder grasses on 1 hectare @ Rs 6 lacs over 5 years for developing fodder for the cows kept in Gaushalas of Vrindavan.
3. Biodiversity Survey of the Vanas, Up-vanas and Kunds of Vrindavan by dedicated team of nature science experts, project period 6 months and LS cost Rs 10.0 lacs.
The team will consist of Dr S Chandola, IFS (Retd), Dr GS Rawat, Head of Botany Department, Wildlife Institute of India, Dehradun, Dr Amit Kotia, Taxonomist, University of Rajasthan, Jaipur and 6 research assistants as well as members of the local Forest Department.
4. Plantation of shade species along Choti Parikrama of Goverdhan Parvat. Planting of 12,000 plants @ Rs 2250 per plant (total cost Rs Rs 2.7 Crore) is proposed during the first three years (500 plants in Y1, 1500 plants in Y2 and 3000 plants in Y3).
Species: Kadamb (*Mitragyna parviflora*), Tamal (*Diospyros cordifolia*), Kareel (*Capparis aphylla*), Dhau (*Anogeissus parvilora*), Jamun (*Syzigium cumini*), Kanju (*Holoptelia integrifolia*), Barna (*Crataeva religiosa*), Bael (*Aegle marmelos*), Amaltas (*Cassia fistula*), Aphoh (*Tecomella undulata*), Pilkhan (*Ficus infectiria*), Gular (*Ficus glomerata*), Peepul (*Ficus religiosa*),
Only tall planting of robust plants will be done in tree guards at a distance of 3 metres within the row and at 3mx3m where space for more than one line is available. Provision shall be made for 5 irrigations during summer and 2 irrigations in winter. This will also include extra security provisions, community engagement budgets and cultivation resources.



5. Cleaning of Kund water with the help of Roorkee University IIT. The University has promised to loan the ACTIFLO water treatment machine and the BTVP has to bear the cost of its transportation from Roorkee to Goverdhan/Vrindavan in addition to some rudimentary cost of consultancy for the engineers who will accompany and run it. A LS Cost of Cost LS Rs 20 lacs is proposed on this activity.
It has been informed by Prof Kazmi of IIT Roorkee that the ACTIFLO machine cleans up to 1000 cubic meters of water per day which means it can treat 1 million litres of water per day!!
6. An exhaustive survey of the Kunds of Goverdhan will be initiated to study and record the water quality, water holding capacity, inlets of water, source of NPL (Non-Point Loads), means of sustainable treatment etc. It is proposed to assign this study to IIT Roorkee who have a separate Hydrology Department and have the requisite experience for the study and for suggesting necessary measures for the correction of the problem. This activity is expected to cost Rs 20 lacs over 3 years.
7. Citizens of Goverdhan will be encouraged to plant tulsi on a war footing in their houses, shops and lands wherever and to whatever extent available. Plants will be given free and the cost of raising 50000 pots of Tulsi should work out to be approximately Rs 20 lacs.
8. An awareness program and community outreach effort that integrates the local residents of Govradhan, temples and ashrams of Braj, tourists and other relevant communities. The programs will focus on gaining community participation in the study (identification of ancient species across Braj), protection, rehabilitation efforts, detailed education for tourists and locals aswell as establishment of localized nurseries and charities that can contribute resources to the ongoing efforts. The program will be known as 'Love Braj' - #LoveBraj - The estimated cost would be 30 Lakhs spread over three years.

Financial requirement and budgeting: Rs Lacs

S No	Activity	Y1	Y2	Y3	Y4	Y5	Total	Target
1	Nursery	00	75	75	25	25	300	Grow 5 lac plants
2	Grass	2	1	1	1	1	6	1 ha



	Nursery							
3	Biodiversity survey	10	-	-	-	-	10	Plant Survey
4	Parikrama Avenue	27	81	162	-	-	270	12000 plants
5	ACTIFLO	20	-	-	-	-	20	LS
6	Hydrological survey	8	6	5	1	-	20	LS
7	Tulsi pot plants	5	5	5	3	2	20	50000 tulsi pots
8	Awareness Prog	8	7	5	5	5	30	LS
	Total	70	175	253	35	33	676	

Expected Outcomes of Project:

1. Raising of 5,00,000 plants of species that constituted the earlier vegetation of Braj and have become rare and endangered now. These plants will assist the recovery of the primeval vegetation of Braj and also of associated wildlife species, especially birds.
2. The revival of native fodder grass species that sustained the hundreds of thousands of cows of Braj.
3. Biodiversity survey will help to focus on the existing native vegetation of erstwhile Braj and will provide a base line to future interventions.
4. Plantation of avenue plantation will provide much needed shade of native species of Krishna's time to visiting pilgrims and devotees. It will also aid in focusing attention towards conservation of these species.
5. Use of ACTIFLO will provide an immediate means of enhancing the water quality of Kunds.
6. Hydrological study will provide a basis for action to clean and treat the water bodies "kunds" of Braj.
7. Encouragement of planting of "Vrinda" (Tulsi) will foster a return to the earlier environment of Vrindavan.
8. Greater awareness to sustain the activity of restoration of the historical atmosphere of 'Vrindavan'.



With the objective of restoration of the ecology of this holy area, Braj Vikas Teerth Parishad may designate “Ecological Partnerships” as their partner/consultant for purposes of restoration of the ecology of Braj Bhumi area and authorize it to represent them before other governmental and non-governmental agencies. The required budgetary provisions may also be kindly sanctioned.

APPENDIX

Botanical reconnaissance of Goverdhan Hill and surrounding area

A brief foray on the Aravalli quartzite formation of Goverdhan Hill revealed a harshly xerophytic assemblage of plants that are adapted to severe drought.

The dominant species was Dhau (*Anogeissus pendula*) which forms dense patches on the rocky slopes of the formation. Dhau is a very slow grown species the leaves of which are also very rich in protein and serve as important source of fodder to ungulates during lean periods. Some individuals of *Anogeissus* found on Goverdhan Hill were assessed to be more than 300 years old.

The species encountered were as follows:

S No	Vernacular Name	Botanical name with Comments	
TREE SPECIES			
1.	Dhau	<i>Anogeissus pendula</i>	On hill ridge and slopes
2.	Kanju	<i>Holoptelia integrifolia</i>	On hill ridge and foot hill
3.	Pilu	<i>Salvadora oleoides</i>	On hill slopes
4.	Jhal	<i>Salvadora persica</i>	On hill ridge and slopes
5	Kaner	<i>Nerium odorum</i>	On ridge
6.	Kataran	<i>Capparis sepiaria</i>	On hill ridge and slopes
7.	Chonkar, Jhand	<i>Prosopis spicigera</i>	On foot hill
8.	Barna	<i>Crataeva religiosa</i>	On foot hill
9.	Bael	<i>Aegle marmelos</i>	On foot hill
10.	Amaltas	<i>Cassia fistula</i>	On foot hill
11.	Kadamb, Kaem	<i>Mitragyna parvifolia</i>	On foot hill
12.	Khor, Kumta	<i>Acacia senegal</i>	On hill ridge and slopes
13.	Raeru	<i>Acacia leucophloea</i>	On hill ridge and slopes
14.	Babool	<i>Acacia arabica</i>	On foot hill
15.	Aphoh	<i>Tecomella undulata</i>	On ridge
16.	Pilkhan	<i>Ficus infectoria</i>	On foot hill
17.	Tamal, Pasendu	<i>Diospyrous cordifolia</i>	On foot hill



18.	Vingar, Kakra	<i>Meytinus emarginata</i>	
19.	Vilayati Babool	<i>Prosopis juliflora</i>	On hill ridge and slopes
SHRUBS AND SMALL TREES			
20.	Dobin	<i>Dalbergia paniculata</i>	On foot hill
21.	Shatavari	<i>Asparagus recemosus</i>	On ridge
22.	Gorakh ganja	<i>Aerva lanata</i>	On ridge
23.	Duddhi	<i>Wrightia tinctoria</i>	On hill slope
24.	Jal jamani	<i>Cocculus hirsutus</i>	On foot hill
25.	Sarphunka	<i>Tephrosia purpurea</i>	On ridge
26.	Vasuki, Arusa	<i>Adhatoda vasica</i>	On ridge
27.	Kareel	<i>Capparis aphylla</i>	On hill ridge and slopes
28.	Hingoth	<i>Balanites aegyptica</i>	On ridge
29.	Jharber	<i>Zizyphus nummularia</i>	On ridge
30.	Jhau	<i>Tamarix spp</i>	On foot of hill
31.	NA	<i>Salsola sensu</i>	On way to Barsana
GRASSES			
32.	NA	<i>Aristida adscencionis</i>	On hill slope
33.	NA	<i>Sporolobus diander</i>	On hill slope
34.	NA	<i>Cynodon dactylon</i>	On foot of hill
35.	NA	<i>Chrysopogon fulvus</i>	On hill slope
36.	NA	<i>Chrysopogon serrulatus</i>	On hill slope
37.	NA	<i>Themeda quadrivalvis</i>	On hill slope
38.	NA	<i>Apluda mutica</i>	On hill slope
HYDROPHYTES			
39.		<i>Wulffia spp</i>	In Bihari van farm pond

Prosopis juliflora, known in central America as Mesquite, is an EXOTIC species that is invading the terrain and obliterating the native fauna. It can be seen spreading aggressively in vacant lots all over the entire area and needs to be controlled urgently before it permanently destroys the local species. It spreads fast through seed germination and through root suckers, the former having a viability of several decades.

It is pertinent to mention here that this may not have been the best time of the year to conduct a botanical traverse as most of the species are in dormancy (leaf fall) and a survey in March and later again after onset of monsoon is liable to



bring out many more species that were not legible now. Accordingly, some of the species that are likely to be found here in more favorable times are Kheep (*Leptadaenia sparlum*), Jawaasa (*Alhagi camelorum*), Ratanjot (*Arnebia hispidissima*) and Gillirgitta (*Ceropegia bulbosa*).

The team also took the opportunity to visit the Yamuna River bank near Shergarh and it was shameful to see the pathetic extent of pollution of the water of this holy river. A strong stench arose from the water surface and the chocolate brown water quality appeared to be wholly unable to support any type of life. In short, unless a 'Crusade' mode is adopted to restore the river and its catchment, the situation may go out of hand and be rendered to a point beyond redemption.

Action to be taken immediately:

It is beyond any doubt that the **sustainable** restoration of the Braj ecology will compulsorily require fortification of the natural tree/shrub/grass cover, i.e., by restoring the native plants of the area. In addition, the kunds of Braj will also have to be revived. **The ultimate target/central theme of all restorative activity in Braj should necessarily be revival of River Yamuna.** With these objectives in view, the following action points are listed for immediate action:

1. A large nursery of native species of plants shown in the table above may be established near Vrindavan immediately. To start with this nursery should be about 50 acres (20 Ha) that may progressively be increased to group of nurseries over 100 ha for growing 1 crore plants. As the species are largely xerophytic in nature it may take between 4-5 years to raise plants of good size and quality. Later Braj bhumi can source native plants in large numbers to outlying districts of Agra, Eta, Mainpuri etc for similar restoration work.
2. The Braj bhumi area may be divided into zones or targets of action for plantation of native species of plants with separate specific prescriptions/plans/schemes such as -
 - Traditional 'Vans' and 'Upvans' of Braj
 - Rural areas
 - Congested township and villages
 - Vacant lots
 - River banks



- Large infrastructural congregations in the form of colonies, educational institutions, temples
 - The different Parikrama margs
 - Household gardening, even in multistory complexes
3. In addition to other plants, a comprehensive scheme may be drawn up for large-scale cultivation of Tulsi (*Ocimum sanctum*) by farmers of Braj. There is no reason why the roadsides of Braj may not be filled with Tulsi among the avenues.
 4. A comprehensive scheme may also be drawn up for encouraging Braj farmers to adopt organic cultivation
 5. Immediate testing of the water of the 'Kunds' of Braj bhumi for TDS and TSS followed by establishment of water cleaning mechanisms.
 6. It should be appreciated that the cows of Braj with its large Gaushalas are an integral part of Braj ecology and along with the management of the vegetation and the water of Braj, they too should become the object of management action in this direction.
 7. The Braj bhumi area is thickly congested and outreach, extension and communication with the local community should form a critical part of efforts to save the ecology of Braj.
 8. Efforts should be started to have Goverdhan Hill and the 'Vans and Upvans' to be proposed as a UNESCO cultural and natural "World Heritage Site"