Bohal Concise Micro Plan

Himachal Pradesh Forest Ecosystem Services
(HP-FES) Project

Ministry of Environment, Forest and Climate Change

Himachal Pradesh Forest Department

german cooperation
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Programme/project description:
Indo-German Biodiversity Programme
Conservation and Sustainable Use of Biodiversity in India - Himachal Pradesh Forest Ecosystem Services Project (HP-FES)
The project aims to enable the Forest Department of Himachal Pradesh to introduce the Forest Ecosystem Services (FES) approach in the state's forest management system.
HP-FES

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On behalf of
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Shimla, 2019

Micro Plan for Bohal

Himachal Pradesh Forest Ecosystem Services
(HP-FES) Project

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Introduction

Forest Ecosystem Services Approach

Forests provide people with numerous services and goods like fuelwood, timber, fodder, fruits etc. They also regulate abundant aspects of the environment like water, air purity and micro climate which benefit people in many ways. These goods and services are together termed as "Ecosystem Services".

The ecosystem services derived from forests are referred to as "Forest Ecosystem Services" (FES). The FES approach states that forests are managed to produce services required for human well-being.

As demands and importance for these services differ much within society, a key element of the FES approach is to manage forests that enable a supply of FES prioritised by stakeholders, giving due importance to the remaining goods and services.

HP-FES Project Background

The Indian and German Governments are working together in many areas that are important for our society. GIZ, in collaboration with the Himachal Pradesh Forest Department (HPFD), is implementing the Himachal Pradesh Forest Ecosystem Services (HP-FES) Project on behalf of BMZ (GIZ's commissioning party). The HP-FES project aims at integrating the Forest Ecosystem Services (FES) approach into the state's forest management.

Important stakeholders are consulted to identify the set of ecosystem services for which the forest is managed. Together with them, the FES that are derived from the forest are listed and prioritised. Based on this, a management plan like this one is developed.

CHAPTER- 2

Bohal Forest Ecosystem Services Vision

Forests are ecosystems that need a long time for their development. The project can guide the plan for only two years or so. This is hardly anything, considering that the forests can be hundreds of years old. Therefore, it is important that a forest management has a long term vision and that the plan of today is in line with the long term vision.

Long Term Vision (30 years)

1. Water:

a. Increased flow of water in springs is sustained despite climatic hostilities.
b. Increased PES incentive contributes in economic upliftment of communities of Bohal

2. Fuelwood and Fodder:

a. Fuel and fodder supply is increased to meet out the demand of Bohal village.
b. Increase in income and employment opportunities due to enhanced availability of leaf fodder and fuel.
c. Visible changes in forest structure.

3. Forest:

a. Proportion of dense forest increases up to 10 % of the base value.

Measures:

a. VFDS ensures equitable usufruct sharing, regulated use of forest and protection against fire, illicit felling.

Mid Term Vision (15 years)

1. Water:

a. Increased flow of water in springs is sustained
b. Protection incentive for PES is substantially increased.

2. Fuelwood and Fodder:

a. Regenerated areas have attained pole stage forest with moderate density

3. Forest:

a. Proportion of dense forest increases up to 5 % of the base value.

Measures:

a. VFDS strictly protects plantation against lopping/illicit cutting.
b. Review of PES agreement for rational enhancement of protection incentives.

Short Term Vision (5 years)

1. Water:

a. Reduced silt load in run-off
b. Increased water flow in targeted springs up to 10 % of base discharge

2. Fuelwood and Fodder:

a. Treated areas have well grown sapling stage plantations with 90 per cent survival.

3. Forest:

a. Reduced silt load in run-off due to grass cover.

Measures:

a. Effective protection of forest and plantation by VFDS is carried out.
b. Conflicts in usufruct sharing are resolved by VFDS.
c. VFDS is enabled to get funds from other donors / development agencies.

First 2 years of 5 year Project Period

1. Water:

a. Soil and water conservation related planned activities implemented.
b. Set up a baseline and system for measuring spring water flows and run off silt load.

2. Fuelwood and Fodder:

a. Plantation of multi-purpose fodder yielding broad leaf tree spp. carried out with survival percentage up to 80 percent
b. VFDS ensures protection of plantation against grazing and fire.
c. Grass yield from treated area increased upto 50 per cent.

3. Forest:

a. More forest area closed for grazing
b. VFDS members are motivated for actively involved in forest protection and management.

Measures:

a. Degraded and denuded areas are brought under regeneration and plantation
b. Rules for protection and usufruct sharing are framed and followed.
c. Soil and water conservation measures are planned and implemented.

Micro plan Objective

To maximise the Forest Ecosystem Service values being derived from the Birni forest of Bohal, and incorporate the forest ecosystem services into the forest management.

CHAPTER- 3
Data Collection Results

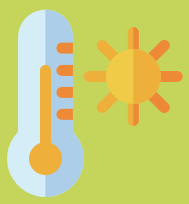
Environmental Data

ELEVATION RANGE: 1600m - 2100m

Precipitation

Annual Average Precipitation:	2125.6 mm
Rain %:	100%
Snow %:	0%
Maximum Rainfall Recorded:	3341.7 mm in 1988
Minimum Rainfall Recorded:	1376.2mm in 1991

Temperature



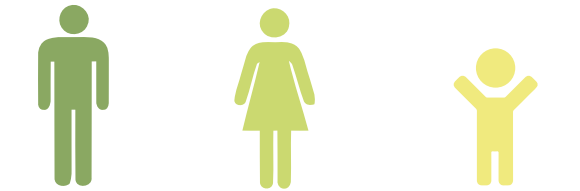
Monthly mean temperature:	10.3 - 24.3 °C
Mean maximum temperature:	15.3 - 30.0 °C
Mean minimum temperature:	5.30 - 20.1 °C
Dry months:	April, October, November

Forest types and area

Area	Forest Type
9C1b : 16.0 ha	Chir Pine
12C1a : 20.0 ha	Ban Oak

Demographic Data

POPULATION

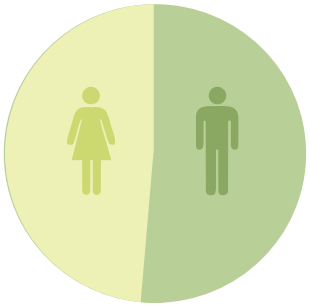


47%
165 Males

46%
160 Females

7%
23 Children

GENDER RATIO



There are 970 females against 1000 males

LIVESTOCK

Sheep + Goat: 1200+1100

Cows: 45

Bullocks: 10

Horses + Mules: 6+4

Buffaloes: 3

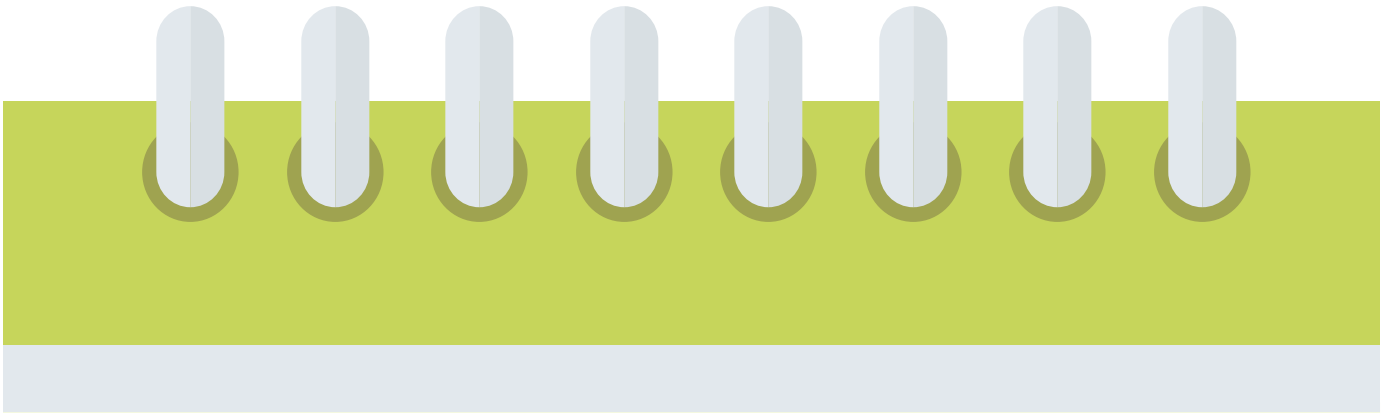
OCCUPATION

S.No.	Job Type	No. of Individuals	No. of Households
1.	Government	9	8
2.	Private	6	6
3.	Self Employed	6	6
4.	Agriculture/ Horticulture	6	6
5.	Wage Labour	Men: 17 Women: 30	

LAND HOLDING

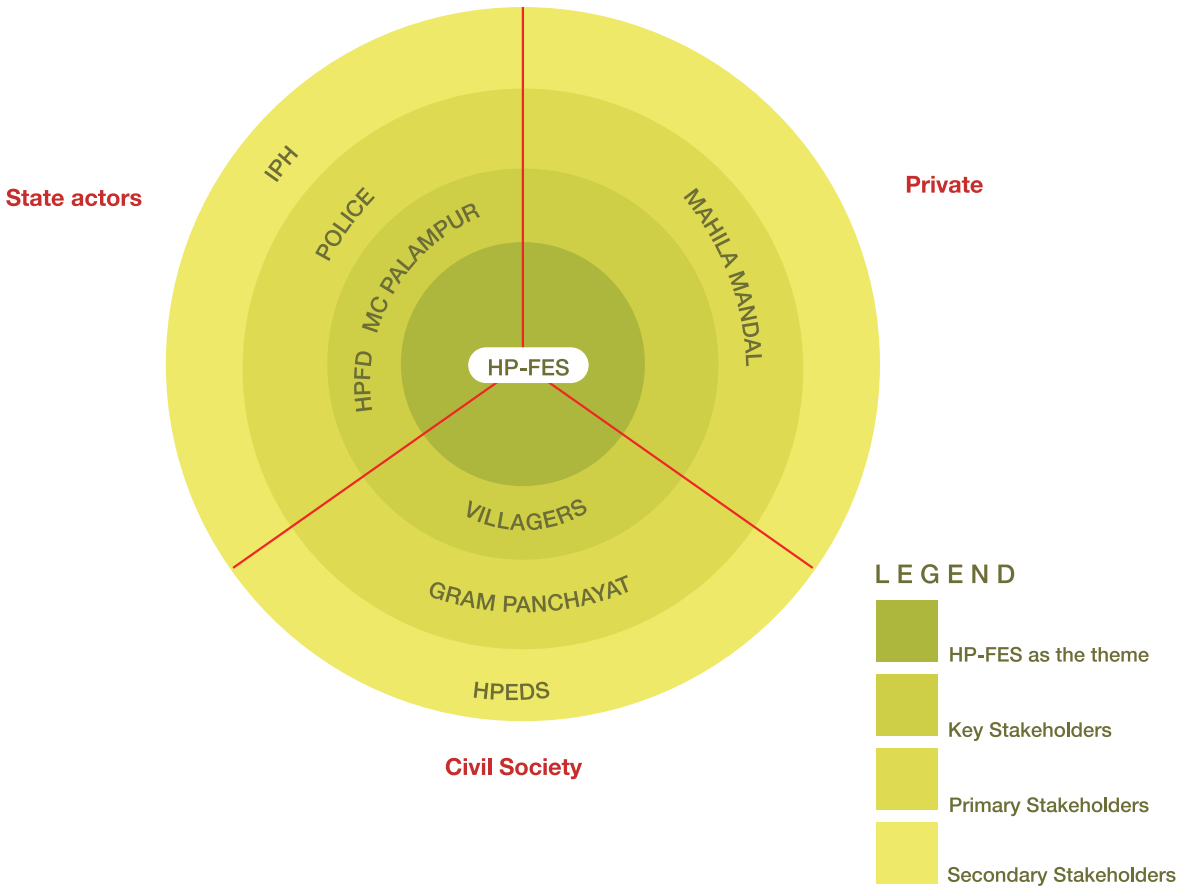
S.No.	Land Holding Type	No. of Households
1.	Marginal	72
2.	Small	2
3.	Medium	—
4.	Large	—

Seasonality of Labour Distribution



Seasonal activity & climatic events	Months											
	J	F	M	A	M	J	J	A	S	O	N	D
Wage Labour												
Agri/ Horticulture												
Migration												
Rain												
Snow												
Frost												
Number of labour people available	45	45	45	45	0	0	45	45	0	0	0	30

Major Stakeholders



The inner most circle consists of the key stakeholders, followed by primary and seconday stakeholders with HP-FES as the theme.
The 3 categories represent as to which class does each stakeholder belong.

Category/ Class	Key Stakeholders	Primary Stakeholders	Secondary Stakeholders
Civil Society	Villagers (Forest users)	Gram Panchayat, Mahila Mandal	HP Eco Development Society (HPEDS) Holta
Private	———	———	———
State	HPFD & Wildlife Wing of HPFDMC Palampur	MC, Palampur	Department of Irrigation and Publich Health

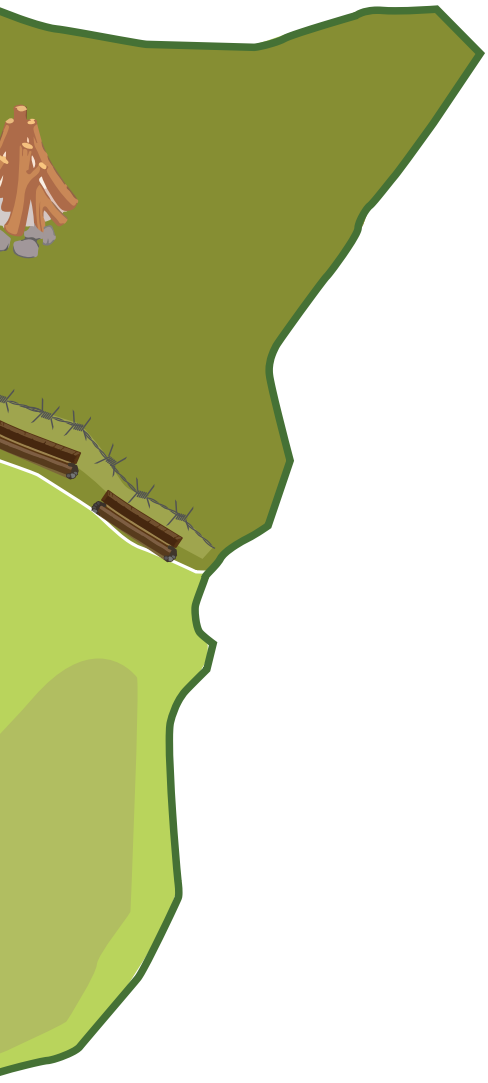
CHAPTER- 4

Rankwise Priority Forest Ecosystem Services

RANK	FOREST ECOSYSTEM SERVICE
1.	 Water Regeneration
2.	 Soil Conservation
3.	 Fuelwood
4.	 Fodder
5.	 Air
6.	 Aesthetics and Recreation (Symbol Copyright: Flat icons)

Priority and Intervention Map

The above map consists of the forest boundary, the areas for the prioritised Forest Ecosystem Services and the interventions and activities which will be done in order to maximise these services



N

LEGEND

	Water
	Fodder and fuelwood
	Fuelwood
	Barbed wire fencing
	Nala plantation
	Check dam
	Check wall
	Contour trenches
	Activity area
	Soil conservation
	Streams
	Springs
	Compartment boundary
C1, C2	Compartment numbers
1	FES zone number

DISCLAIMER: This map is only for marking the forest boundaries and not for any legal purpose.

Zonewise Management

1.

COMPARTMENT	FOREST ECOSYSTEM SERVICE	INTERVENTION AND ACTIVITY
C2		Dry masonry check walls and check dams. (cement and mortar)
		Broad leaved species in contour trenches.
		Bamboo along the banks of streams to prevent soil erosion.
		No grazing

1.

COMPARTMENT	FOREST ECOSYSTEM SERVICE	INTERVENTION AND ACTIVITY
C1 and C2		Ban Oak + Bauhinia + Robinia
		Barbed wire fencing to check grazing.

COMPARTMENT	FOREST ECOSYSTEM SERVICE	INTERVENTION AND ACTIVITY
C2		Protection from forest fires

Activity Plan and Budgeting

Activity plan for enhancing ground water recharge and control of soil erosion

FES Zone	C. No.	Activities	First Year	Second Year		Third Year		Fourth Year		Fifth Year		Total
1.	C2	Check walls in Dry stone masonry (Number - 12)	60,520	-	-	-	-	-	-	-	-	60,520
		Check Dams in Cement Mortar Stone Masonry. (Number - 1)	25,500	-	-	-	-	-	-	-	-	25,500
		Stone Paving of Natural Resource Access Path (500m)	41,560			-	-	-	-	-	-	41,560
		Rejuvenation of one water Source	8,640	-	-	-	-	-	-	-	-	8,640

Activity Plan for Planting of Broad-Leaved Species to Improve Spring Water Flow

FES Zone	C. No.	Activities	Details	First Year	Second Year	Third Year	Fourth Year	Fifth Year	Total
1.	C2	Plant cost*	6500 plants	142565	-	-	-	-	142565
		Labour Cost	Contour and Trenches (400 m)	22345	-	-	-	-	22345
			Digging and filling pits (4 ha) **	237309	-	-	-	-	237309
		Material and supply	-	121582	-	-	-	-	121582
	Total Cost of Plantation			**523801**	-	-	-	-	**523801**
	Maintenance		6500 plants in 4 ha	-	19280	10680	6400	-	36360
	Grand Total (FES Water)			**523801**	**19280**	**10680**	**6400**	-	**560161**

* Plants to be used for this activity: Ban oak (*Quercus incana*), Deodar (*Cedrus deodar), Robinia pseudoacacia* and *Arundinaria falcate.* ** It includes digging 60 cm^3 pits (number=1400) and 45cm^3 pits (number=5100), filling pits, planting, barbed-wire fencing and mulching

Activity plan for nala plantation with erosion controlling species

FES Zone	C. No.	Activities	Details	First Year	Second Year	Third Year	Fourth Year	Fifth Year	Total
1.	C2	Plant cost*	280 plants	3973	-	-	-	-	3973
		Labour Cost**		6324	-	-	-	-	6324
	Total Cost of Plantation			**10297**	-	-	-	-	**10297**
	Grand Total (Plantation for erosion control)			**10297**	-	-	-	-	**10297**
	Grand Total 5 (Plan) Hydrological functioning			**670318**	**19280**	**10680**	**6400**	-	**706678**

* Plant species to be used for this activity: Nirgal (*Arundinaria falcata*), Siaru (*Debregisea hypoleuca*), Williow (*Salix alba*)
** It includes Digging 280 pits 45cm3, filling, planting, carriage and mulching.

Activity plan for enrichment plantation of broad-leaf fodder species

FES Zone	C. No.	Activities	Details	First Year	Second Year	Third Year	Fourth Year	Fifth Year	Total
1.	C1 and C2	Plant cost*	1.5 ha and 2000 plants	64330	-	-	-	-	64330
		Labour Cost**		90302	-	-	-	-	90302
		Material and supply		75217	-	-	-	-	75217
	Total Cost of Plantation			**229849**	-	-	-	-	**229849**
	Maintenance		1.5 ha/2000	-	7230	4005	2400	-	13635
	Grand Total (FES Fodder)			**229849**	**7230**	**4005**	**2400**	-	**243484**
	Grand Total 5 (Plan) FES water & fodder			**900167**	**26510**	**14685**	**8800**	-	**950162 (9,50,160 INR)**

* Plant species to be used: Ban oak (*Quercus incana*), *Robinia pseudoacacia*, Khirak (*Celtis australis*) Biul (*Grewia oppositifolia*) and Kachnar (*Bauhinia variegata*). **It includes cost of digging 60 cm^3 & 45cm^3, filling pits, planting 1000 tall & 1000 normal plants of, mulching and barb wire fencing

CHAPTER- 5

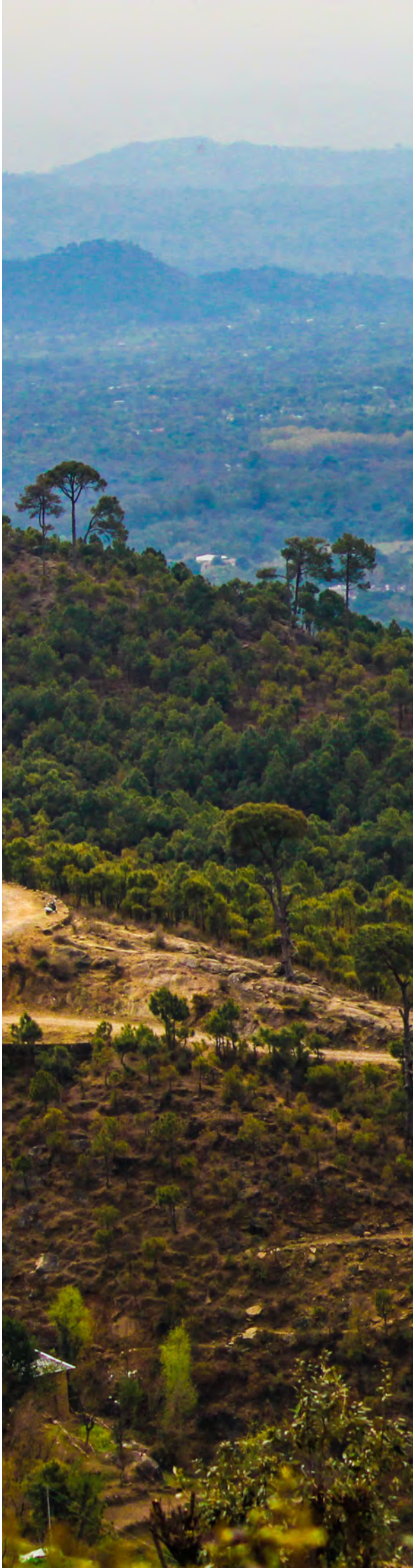
Monitoring and Evaluation

1. Increase in water supply

a. Water flow in dry areas.
b. Run off from the forest during the rainy season.

2. Increase in fodder availability

a. Broad leaved enrichment plantation for yielding fodder and grass.



VISITOR'S FEEDBACK

S. No.	Name	Address/ E-mail	Feedback

S. No.	Name	Address/ E-mail	Feedback

S. No.	Name	Address/ E-mail	Feedback

S. No.	Name	Address/ E-mail	Feedback

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