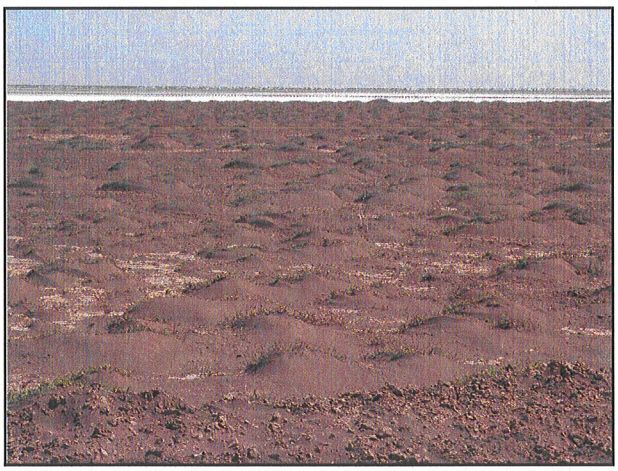
RESTORATION OF SHELTERBELT IN COASTAL REGION OF ANAND & AHMEDABAD DISTRICT OF GUJARAT



A PROJECT PROPOSAL SUBMITTED TO
COASTAL SALINITY PREVENTION CELL
AHMEDABAD

FOUNDATION FOR ECOLOGICAL SECURITY
ANAND

CONTENTS

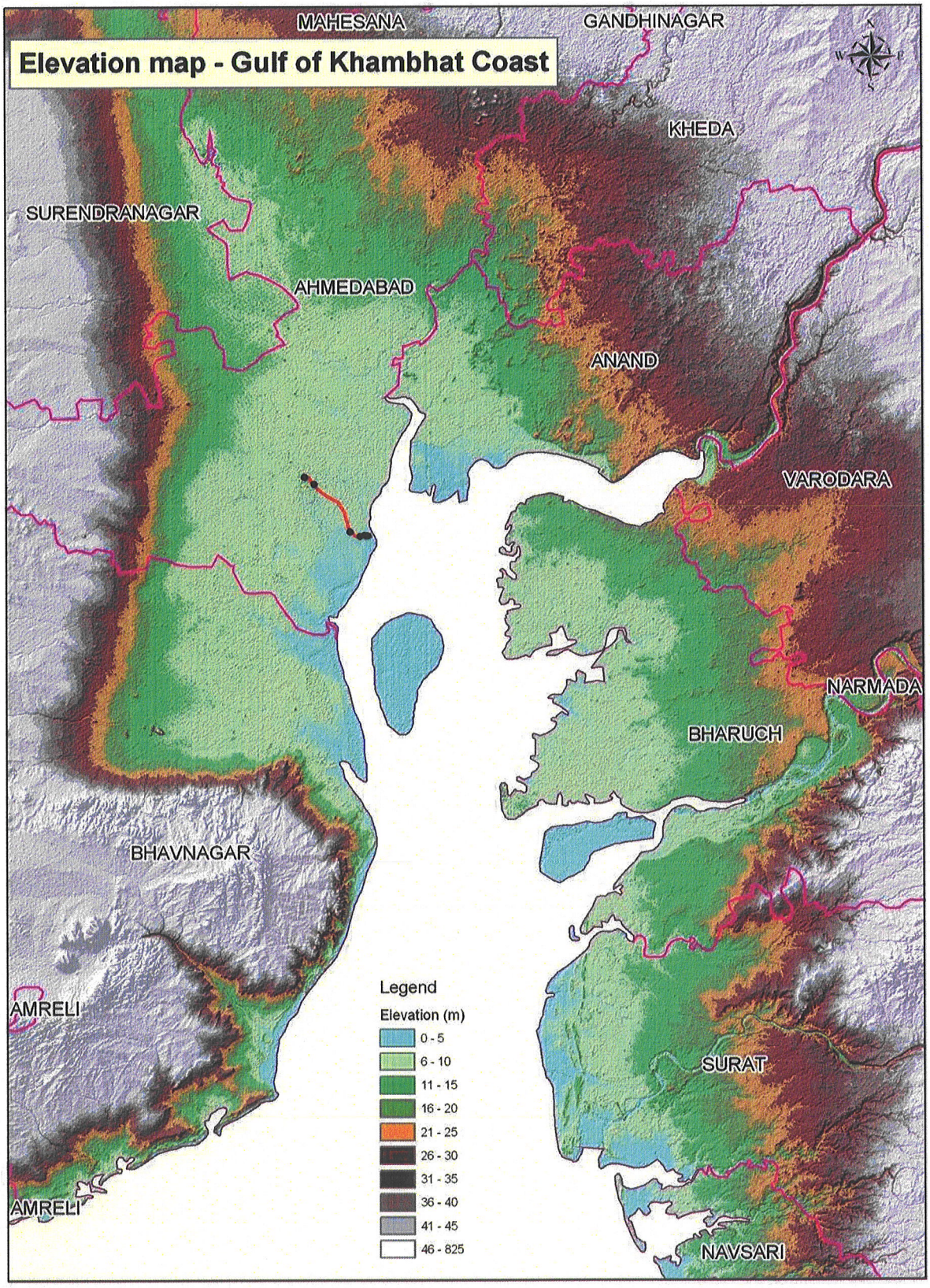
1. Introduction

The problem of salinity in coastal areas is a national problem and requires detailed studies in all the coastal slates. The development of such areas- requires special attention because they have remained neglected since long and the developmental efforts of the post-independence plan era have also not generally reached there for want of proper strategy, infrastructure and impediments due to backwardness.

Report on Development of Coastal AreasAffected by Salinity,
(NATIONAL COMMITTEE ON THE DEVELOPMENT OF BACKWARD AREAS)
November, 1981Planning Commission Government of India New Delhi

Though the need for special effort for saline area has been recognized since the last two decades, it continues to be a major concern for the country especially in the coastal areas. In 2004, National Commission of Farmers revealed in its report that the ecological foundations of sustainable agriculture such as land, water, biodiversity, forests and the atmosphere are under varying degrees of anthropogenic pressures. Water table is going down and land degradation and soil salinisation are on the rise. The commission has recommended that the economy of coastal villages needs to be strengthened through sustainable use of natural resources. The Parthasarthy Committee in its report on the viable strategies/mechanisms for meaningful implementation of DPAP, DDP and IWDP has identified the Coastal area of Gujarat as a special area and has suggested that the present guidelines for watershed development may not be exactly feasible for implementation and special provisions in the guidelines for watershed development in these areas need to be introduced.

Gujarat has the longest coastline of all the states in India - 1,600 km (one third of the total Indian Coastline of 4,800 km). Sea water ingress which was observed to a distance of 2.5 - 4.5 km from the coast in 1971 had encroached inland to a distance of 5.0 - 7.5 km. from the coast in 1977. An increase in the ratio of CL / CO_3, HCO_3 was also noted towards the coast, indicating considerable mixing of seawater with local ground water. Due to this, both quality and crop yields in the coastal belts of Saurashtra and Kutch, known for cultivation of high value cash crops (rice, wheat, sugarcane, mango, coconut, garden vegetables, etc.) decreased to one-tenth to one-third of the original yields. Similar impact has been witnessed in the area of Gulf of Khambhat too.


Elevation map - Gulf of Khambhat Coast
MAHESANA
GANDHINAGAR
KHEDA
SURENDRANAGAR
AHMEDABAD
ANAND
VARODARA
NARMADA
BHARUCH
BHAVNAGAR
AMRELI
AMRELI
SURAT
NAVSARI
Legend
Elevation (m)
0 - 5
6 - 10
11 - 15
16 - 20
21 - 25
26 - 30
31 - 35
36 - 40
41 - 45
46 - 825

Along the Gujarat coastline, the characteristics of Gulf of Khambhat are unique and are known for its vast saline mudflats and an estuarine complex along the coast. Gulf of Khambhat situated between 20 30' N to 22 20' N longitude and 71 45' E to 72 53' E latitude, is 70 km wide and 130 km long indentation on the western shelf of Indian coast between Saurashtra Peninsula and the main land of Gujarat. Nine rivers including the Narmada, Tapi, Mahi and Sabarmati meet Bay of Khambhat and drains water from a catchment of about 1.5 lakh Km^2. The Bay of Khambhat receives 45% of silt along with the water that flows into the sea. Stretches of the mud flats are influenced by marine deposition and by river action. The gulf has a marshy coastline on all sides and is also dotted with small islands locally described as 'bhets'. The area is rich in oil and natural gas and ONGC has more than 100 wells in the region. A Thermal Power Station is based at Dhuvaran, which is the biggest gas-based power station of the state and gets supply of gas from Lunej and Khambhat.

Meteorological data
Average rainfall – 550 to 650 mm.
Average duration – 15 June to 15 September.
Average temperature: 17^0c to 30^0c in winter, 35^0c to 45^0c in summer
Average wind velocity - 10 to 20 km/h.
Average Humidity - 70%

2. Context

The proposed project area is spread along the costal line of gulf of Khambhat from Lunej to Vadgam village in Khambhat and from Buranpura to Mingalpur in Dhandhuka Taluka of Anand and Ahmedabad District respectively. The region is locally known as Bhal because of the barrenness, which is because of the high salinity. The area is characterized by extensive mud flats of 6-8 km wide distributed all along coast of the Gulf, except along the Narmada estuary. The depth of the sea varies from 5 ft to 100 ft at the distance of 2 to 8 kms from the coastline due to inconsistency in the deposition of silt carried by the rivers. Big tides are observed in the ocean two-three times a year that sometimes inundates the agricultural lands. These tides have a velocity of about 40 km per hour and waves upto 3 to 4 meter are observed which creates a kind of big whirlpool after it enters into the river Mahi causing erosion of the banks and sometimes

changing the position of the mudflats.

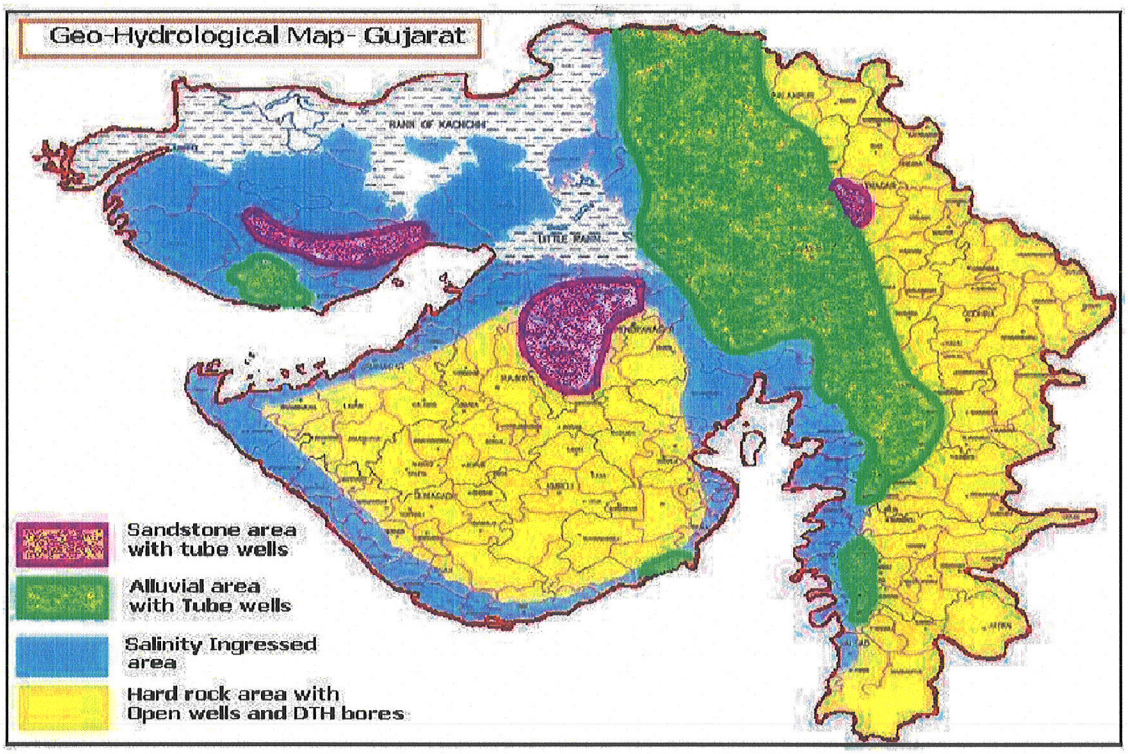
Since the natural systems of salinity control mechanisms like mangroves and coastal vegetation are severely degraded in the region, communities are facing serious threats from the increasing salinity thereby becoming more fragile and finding it difficult to cope with the changing environmental conditions. The mangroves and the coastal vegetation, which once acted as natural barrier for the salt-laden winds, have disappeared totally and now the agriculture system has become susceptible to several problems - the most severe being high salt levels both in the soil carried in wind and water sprays, and physical damage faced by the vegetation from strong winds. As the tidal waves recede, high amount of salt get deposited on the mudflats, which is carried into the inland due to coastal winds up to 15-20 kilometers, especially during summer. Salt is carried by wind and is deposited on the plants and onto the soil. It causes severe leaf burn and defoliation; over time the plants become stunted and fail to thrive, especially those growing on the seaward side. The problem gets compounded as salt accumulates in the soil, which adversely affects agriculture.

The water analysis of the area shows the total dissolve sodium (TDS) is 37760 mg 1^{-1}, which means the water quality is very saline and is categorized as bittern water. The electrical conductivity (EC), Ph and sodium absorption rate (SAR) of the soil are 16.2, 7.7 and 23.89 respectively, which indicates very high alkalinity. The effects of salinity are quite visible in every sphere of life with direct impacts on the production systems. Agriculture development is restricted owing to these problems. On less saline soils, the cultivation of paddy and wheat finds scope. While the average per household land holding of the proposed project villages is 4.36 hectares (which is about twice from average land holding in the state 2.62 hectares), the productivity of the lands is as low as 25%

Properties	Saline soils	Saline alkali soils	Alkali soil
Electrical conductivity (dS m^{-1})	>4.0	>4.0	<4.0
PH	<8.5	>8.5	>8.5
Sodium Absorption Rate	< 15	> 15	> 15

Water quality	TDS
Fresh water	<500 mg 1^{-1}
Brackish water	500-1500 mg1^{-1}
Brackish water	1500-5000 mg 1^{-1}
Saline water	> 5000 mg 1^{-1}
Brine water	35,000 mg 1^{-1}
Bittern water	>35,000mg 1^{-1}

because of the salinity in un-irrigated systems. The situation is better in case of canal-irrigated systems. Further, the area faces limited options in terms of ground water usage for irrigation as the ground water is contaminated because of salinity ingress to a distance of 5.0 - 10 km. from the coast. Saline water is encountered in shallow dug wells at about 10-20 ft. Though the area in Khambhat is covered with canal network of River Mahi, region comes at the tail end and distant fields do not get sufficient irrigation. The villages of Dhandhuka do not have access to any form of irrigation.



The agricultural lands along the coast are highly marginalized and returns from agriculture are abysmally low, in certain cases even left fallow for years. Due to high salinity and lack of irrigation support, 3147 hectares of private land are left fallow every year in the district as farmers are unable to recover the cost of cultivation. According to farmers, salt accumulation in such land is increasing each year and gradually it would become totally barren and unfertile if it were not protected from the salt ingress.

Though region has vast stretches of revenue wastelands and has the highest ratio of land availability per animal in the district, the per capita cattle population is quite low at 1.52 (in comparison to a district average of 1.50), which is due to low fodder productivity

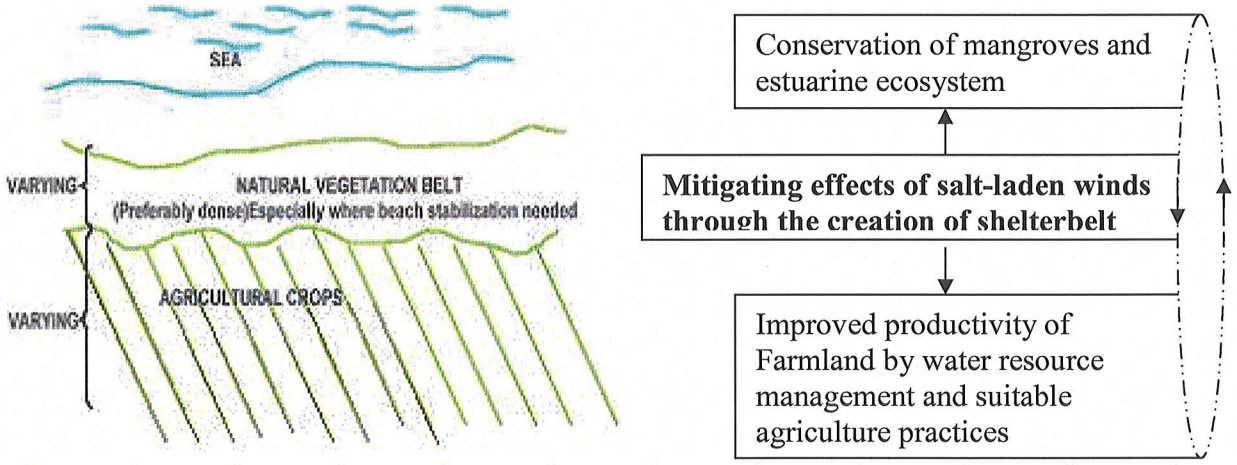
in these lands. Most of the households have cattle and a major part of fodder comes from the agriculture fields. Dependency on common land is mainly for small ruminants and camel, which are reared mainly by the Bharwar community. The high salinity levels in soil affect the growth of natural vegetation in general, and only few grasses - luni (Suaeda fruticosa), luno (Suaeda maritima), morad (Suaeda nudiflora), Del (Aleuropus legopoidis) grow naturally. Therefore, common land that could be major resource for the animal keepers does not support animal production system significantly. Lack of fresh water availability is also a major hindrance in the cattle rearing. Sub-surface water is contaminated due to saline ingress and therefore cannot be used for cattle drinking and other purposes. Village ponds are the only source for cattle drinking but many of them become dry during the summers and villagers are forced to migrate along with their herds to Charotar area.

3. Conceptual framework

Following factors are responsible for the salinity in this region.

- Inherent Salinity: The area is affected by salinity due to tide ingress, inundation through creeks and ground water contamination because of salinity ingress.
- The region has saucer shaped topography and therefore due to this tidal water gets trapped in the low-lying area of intermediate zone. Water evaporates after some time and a layer of salt particles is deposited on the surface making a loose sheet. These salt particles move further towards inland zone through wind erosion and get deposited on the agriculture fields.

To address the salinity ingress in these areas, there is a need to control the causes of inherent salinity as well as that of salinity due to salt-laden winds blowing towards the hinterland. The intervention plan attempts to understand the interplay between different parts of coastal region i.e. the sea, the saline mudflats and the hinterland and design a framework for reducing the impact of salinity ingress on the agriculture and thereby the livelihoods of the communities living along the coast. The design envisaged is a mix of physical intervention and a land-use change/modification to address the problem.



Restoration of inter-linkages among different ecosystems of coastal region

While the raised bunds across the tides would considerably help in controlling the inundation of the farmlands because of the tides fortnightly/occasionally, the vegetative shelterbelt would help in reducing the impact of the salt-laden winds on agriculture. The shelterbelt of salinity tolerant species along the coastal line would help in reducing the impact of the salt-laden wind in the adjacent farmlands. The intervention would help in increasing the land under agriculture and improve the productivity of the agricultural crops. In addition, the reduction in salinity of the mudflats due to soil-moisture conservation measures would help in increasing fuelwood availability and improving the fodder productivity as well as its quality. The contiguous stretches of the regenerated area are also expected to help in providing critical faunal habitat and also slowly help in the restoration of the mangroves and the estuarine ecosystem.

Salinity Control Measures: Efforts and Experience

FES Experience

FES has been associated with a few villages in the Khambhat region for the last 15 years and assisted the village communities in the process of revegetation of the saline mudflats and the protection and management of the resources. In the initial period, the high salt levels in the soil and the salt laden winds were difficult to combat and led to the mortality of a lot of saplings planted. Except Prosopis juliflora, no other species could withstand the levels of salinity. After years of protection, natural regeneration of local species like Salvadora persica and Azadirachta indica are visible. Soil tests reveal that electrical conductivity and pH levels of the soil have dropped considerably and the standing vegetation has been functioning as a natural barrier to the salt-laden winds that affect farmlands adjoining the coast. The deposition of salt on the adjoining private fields has reduced significantly allowing the farmers to take up wheat and paddy cultivation on lands that were earlier left fallow. The vegetation is also meeting the fuel wood and fodder needs of the community,

Vegetation as 'Shelter belt': A case of Navagambara, Khmabat

Navagambara, is a village adjoining the coast in Khambhat Taluka of Anand District. The Navagambara Tree Growers' Cooperative Society (TGCS) was organized in 1987 and registered in January 1988 with intent to develop the common lands to cater to the fuel and fodder needs of the community. An area of 80 hectares of revenue wasteland was leased to the TGCS and developed as a shelterbelt.

Results

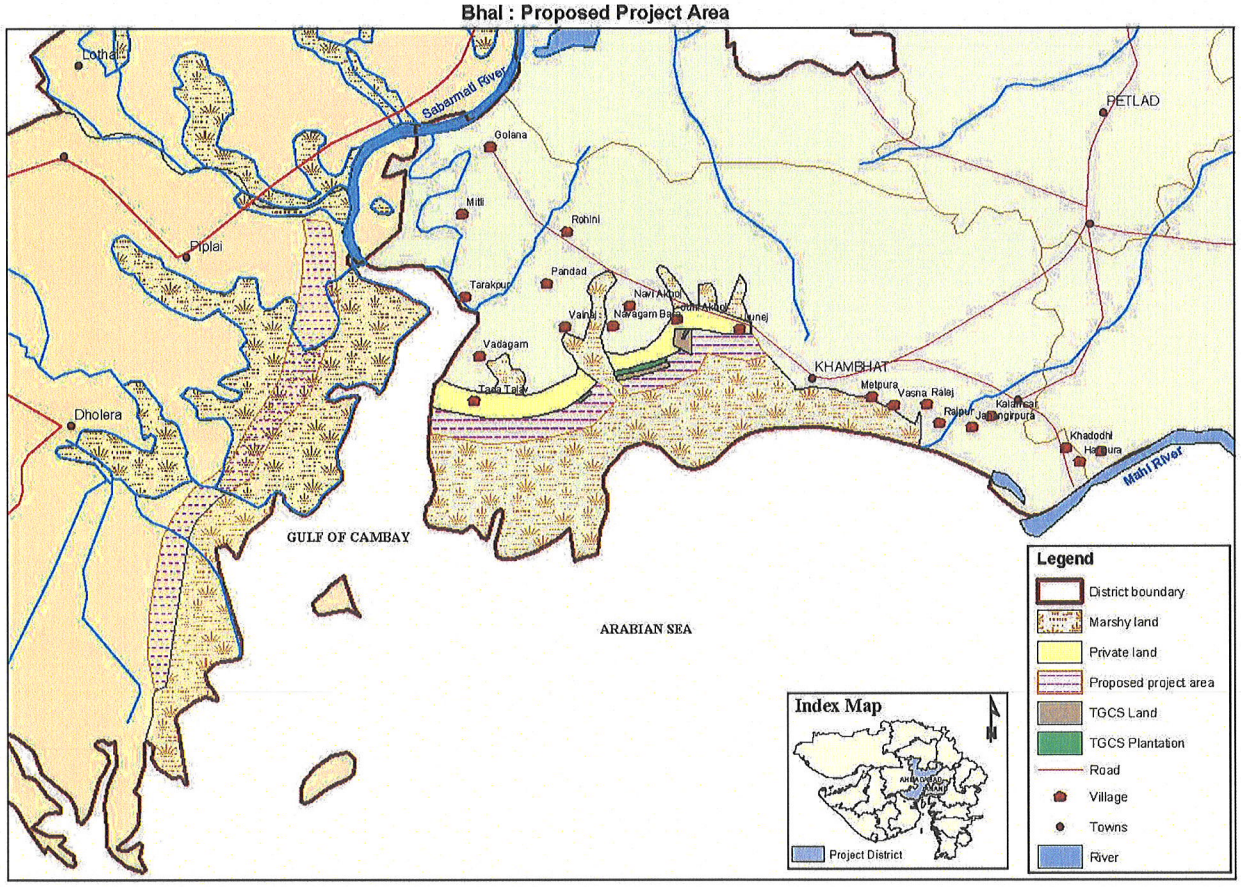
- The standing vegetation of Prosopis on the saline mud flats now acts as a windbreak to the salt-laden winds from the sea. This has significantly reduced the deposition of salt on the adjoining private fields allowing the farmers to take up cultivation on 22 ha of land that were otherwise left fallow earlier. It is experienced that salt spray effect has been reduced considerably up to 4-5 km area from shelterbelt.
- The condition of the soil in the TGCS land improved considerably over the past ten years. The pH of the soil improved from 8.29 in 1988 to 7.27 in 2002 and the electrical conductivity has improved from 18 to 3.5 in the same period. Now, the protected common land is showing indications of assisting the growth of *Salvadora persica* and other grasses, which have come up naturally.
- It has made us realize that plantation of continuous stretch of trees as shelterbelt would help in protecting large stretch of agricultural lands from saline winds. While allowing for reclamation of fallow lands, these also serve to better the quality of common lands and allow for the regeneration of native species of vegetation and habitats for local biodiversity. A total of 217 MT fuel wood has been procured from TGCS plantation in this period.

According to the field survey, a vast revenue waste area is lying barren along the coastal line in Khambhat taluka of Anand district and Dhandhuka taluka of Ahmedabad. Farmland, which are adjacent to these common land become fallow since years due to high rate of salt ingress through wind and tides. Therefore, there is high possibility of replicating the Navgambara experience in neighboring areas.

4. Objectives of the proposed Project

The proposed project envisages the creation of a shelterbelt bordering the agricultural lands of the coastal villages on either side of the Gulf of Khambhat, i.e. in Khambhat taluka in Anand and Dhandhuka taluka in Ahmedabad district. The initiative would involve beginning a process of restoration through revegetation, soil and moisture conservation measures and strengthening community institutions for governance of natural resources.

Bhal : Proposed Project Area



The objectives of the proposed project are to improve rural livelihoods by:

- Developing a shelterbelt along the coast to reduce the impact of tidal ingress and salt-laden winds on farmlands through appropriate revegetation and soil and moisture conservation measures.

- Assisting in increasing that area under agriculture and improving the productivity through the creation of the shelterbelt and also demonstrating suitable agriculture and water management practices for enhancing coastal livelihoods.
- Strengthening institutional mechanisms that would improve the governance of the natural resources and aid collective action.

5. Strategic Orientation & Work Components

The proposed project would help in creating a continuous strip of windbreak on 2000 Ha of revenue wasteland (mud flats) from Buranpura to Mingalpur (25 KM) in Dhandhuka (10 villages) and Lunej to Vadgam (16 KM) in Khambhat taluka, which would assist in controlling salinity ingress in lands of 16 adjacent villages and improve the agriculture productivity of about 1000 ha.

a. Creation of Shelterbelt to reduce the impact of Salt-laden winds

Coastal winds damage plants in several ways: by carrying salt deposits and accumulating in the soil; causing stunting as a result of long-term exposure to salt laden winds, and; leaf drop and shoot dieback due to abrading of leaf tissues and salt accumulation on the foliage. It has been found that shelterbelt can act as a barrier that prevents or slows down the prevailing wind, therefore, is paramount in the protection of the vegetation in the inland. Secondly, during high tide, the seawater inundates the agricultural lands once or twice a year, which increases the salinity of the soil and makes agriculture difficult. A mechanical barrier would be created to stop the tidal water entering into the plot and thereby reducing the scope for direct contamination of soil by the tidal waters.

The effort would be to create a vegetative wind break that would help in checking the saline ingress in farming land adjacent to coastal line. A strip of 1/2 Km. X 25 Km. (1250 Ha.) and 1/2 Km. X 16 Km. (800 Ha.) would be developed as shelterbelt through regeneration of suitable species in Dhandhuka and Khambhat taluka respectively. A series of activities including construction of tidal regulators to prevent seawater intrusion and block bunds to assist in leaching out of salinity during monsoon would have to be

undertaken. Regeneration/revegetation of salt-tolerant species and other appropriate grass species would be undertaken to help create the shelterbelt/ natural barrier for salt-laden winds.

b. Reclamation of saline affected farmland

Due to high ingress of salt in the farmlands adjoining the coast, many farmers have abandoned agriculture for many years now, which has further degraded the quality of soil. While it is expected that the creation of the shelterbelt will help in reducing the damage due to salt-laden winds and checking the salt contamination in farmlands, efforts would be made towards restoring the soil fertility and making the farmland suitable for farming. Demonstration of proper farming practices, alternative cropping patterns, crop choices, efficient water management mechanisms, etc conducive to saline areas would be attempted under the project. Suggestive lists of activities that may be undertaken are,

- Construction of farm bunding and farm ponds to conserve the fresh water of rain. It would help in life-saving irrigation and assist in leaching salts from upper layer of soil.
- Promotion of intercropping of saline tolerant horticulture/crop species with cultivation of crops to optimize the land productivity.
- Carry out trials of other technical recommendation of various research in saline affected area for increasing the effectiveness of project activities on farm land, like green houses, lobster production etc.

c. Appropriate technologies and alternatives for drinking water

Salt contamination of water takes place in both surface and subsurface region. The ground water in the areas proposed under the project is already saline and the communities depend mainly on the water harvested in their village ponds for their domestic use. The drinking water is supplied through piped water from an irrigation tank in Kanewal and the irrigation water from Mahi canal network. The proposed villages lie at the tail end of both the drinking water and irrigation network and therefore the supply is erratic and not reliable.

The team is discussing with Water and Sanitation Management Organisation (WASMO) for an integrated water conservation and supply programme in the proposed villages in collaboration with International Water Management Institute (IWMI). The shelf of activities include roof water harvesting, recharging ground water for the improvement of water supply and its quality, revitalizing water bodies, water purification through reverse osmosis method and improving the present water distribution system. This component would help in revitalizing the rural livelihoods, especially that of animal husbandry which is largely constrained by water shortage in summer months. No financial assistance would be necessary under the component from CSPC.

Promotion of non-renewable energy sources would be undertaken so as to wean away the communities from depleting the shelterbelt for the want of fuelwood. Energy conservation efforts to minimize the fuel wood demand for cooking and kitchen related needs would be provided at subsidized costs. No financial assistance would be necessary under the component from CSPC.

d. Strengthening institutional mechanisms

Conservation, protection and judicious use of resources depend on establishing strong governance function at the community level. Crafting and strengthening strong community institutions is the first critical aspect of this process. These institutions at the first level ensure the sustainability of site level restoration actions, which with the capacity building and collective action can translate into better governance in all spheres of village life. Operational rules and regulations developed by the community at the village level with broad principles of conservation would be the core of the intervention strategy. The communities would have the responsibility for the protection and maintenance of the resource. Gram Sabha (village meeting), which ensures participation from all sections of the community, would be the supreme decision-making body in the village.

Since, the functioning of coastal ecosystem depends on interaction between fresh and saline water at a larger scale, it is critical to understand the impact of human activities on this unique combination. A second layer of institutional structure is envisaged, which would ideally be the cluster of micro-level institutions and the associated Panchayats of the area to discuss the issues faced by them in the social-economical-ecological perspective they are situated. Also keeping in mind the complexity of such process, there is a need for these institutions to involve experts, different government departments, other agencies and local leaders in setting up an effective governance structure.

e. Building up Dialogue and Discussion

Project would enter into discussions with the communities, which would center on realistic and dynamic assessment of the coastal ecosystem, maintaining the diverse practices that have sustained it, productivity enhancement of their resource base (both agriculture and common lands) and efficient utilization of the scarce resources. Attempts would be made to make relevant knowledge and ideas accessible to communities, which are encouraged and assisted in finding creative solutions, through networking and assistance from other agencies, to other natural resources and local governance related issues also.

The effectiveness of such dialogue and discussions will depend on a prolonged association, which is flexible and responsive enough to accommodate imperatives and requirements raised by the specific micro situations. While village plans prepared by the communities would provide the basis for the nature, extent and duration of our association, we envisage the likely association of atleast five to seven years with the communities. Developing plans, systems and tools for community leaders and preparing a pool of trainers would help in augmenting the capacities of village institutions in dealing with the challenges of natural resource management, opportunities and constraints of improving farm productivity and coping strategies for mitigating risks.

Education, social mobilization and regulation will therefore be the key pillars of the coastal ecological and livelihood security systems through the project. The elementary principle of successful translation of project objectives rests on community's preparedness, understanding, search for alternatives and the use of appropriate technologies to counter the adverse conditions. The involvement of the community in the process depends on the way they see the changes that are happening in the system and its effects of the revival on their livelihoods; the way they are able to bring a balance between the supply and the demand of the services, and; the way they interact with the other villages in the coast for the maintenance of the critical life support systems. A quarterly newsletter would provide a medium to discuss issues and share best practices across villages.

6. Expected outcomes

Implementation of the project for a period of five years would result in 16 villages in the coastal areas of Anand and Ahmedabad districts creating a vegetative shelterbelt of 2000 hectares spanning about 40 km stretch in length (16kms along Khambhat and 25 kms along Dhandhuka), on both sides of the Gulf of Khambhat. The shelterbelt would have a direct impact on improvement in productivity of about 1000 hectares of agriculture lands in the adjoining lands. The response to regeneration efforts is expected to be slow because of the long history of degradation and high salinity of the fringe lands; the survival in the initial years is expected to be low, particularly in areas facing the sea.

Demonstration of proper farming practices, alternative cropping patterns, appropriate crop choices, efficient water management mechanisms, etc conducive to saline areas would be taken up in about 100 hectares under the project. This would have a replicable effect on at least 1000 hectares of land during the project period. Impact assessments would bring to surface information on increased productivity and exhibit incremental gains in farming systems.

Institutional arrangements for the safeguard and upkeep of shelterbelt and water resources would be visible. As the setting and level of discussion in each of the institution would vary – the development of the resource (shelterbelt), improvement in the agriculture and integration of processes would be at different levels of scale and intensity. However, processes on integration of various components of the coastal ecosystem, an assessment of their status and a proactive course of action would be evolved by the communities within and across habitations.

About 20% of the project would be raised as co-finance for the project, with a perspective for overall development of the area. While communities are expected to contribute a portion of the project expenses, either through labour or cash, the aspects of rainwater harvesting and alternatives for drinking water would be leveraged from the government programmes. The energy conservation measures, environmental awareness programmes and a portion of administrative costs would be met by FES from its resources.

7. Project Management and Budget

The proposed project would be spread over a period of five years and would be coordinated by the team based at Anand. The habitation/village level institutions would be the direct beneficiaries of the project. FES is already working with few of these communities and their village institutions and the proposed areas are villages that are already in contact with FES. The communities would be involved in every stage of planning at the habitation/village level. The Project would work in close partnership with the District Rural Development Agency, agriculture and horticulture department and civil society groups in identifying issues, analyzing causes and effects and in determining course of action.

A multidisciplinary team comprising of professionals from agriculture, forestry, engineering and social work background would implement the project. Linkages would be developed with the various government line departments, such as District Rural Development Agency (DRDA), Irrigation Department, Horticulture and Agriculture

Department of the Government of Gujarat. Experts from Anand Agricultural University, Anand; Water and Land Management Institute (WALMI), Anand; Central Soil Salinity Research Institute (CSSRI), Bharuch; and Sardar Patel University, Vallabh Vidyanagar, would support technical backstopping for the project.

a. Project Monitoring and Assessing Impact

The project will be implemented through an annual work plan system. The comprehensive Log Frame Analysis (LFA) is being prepared which would be used to assess the impact of the project. Internally the project would be monitored through reports, visits of the team coordinator/ project coordinator on a quarterly basis. Well-established management information, financial information and budget and work plan monitoring systems are already in place. Conceptual issues would be debated across organisation through interest groups. Annual visits of the Coastal Salinity Prevention Cell (CSPC) representatives to project areas and Annual Joint Project Review meetings would help in mid-course corrections. At the end of the project, an independent consultant decided mutually by CSPC and FES would do the evaluation.

b. Project Risks, Checks and Balances:

Risk	Probability	Impact	Management
Drought situation or Salinity ingress due to tidal waves	Medium	Mortality of saplings planted. Long term negative impact and may delay process by two years.	Plantation to be supplemented through extensive seeding. Bunds to be constructed to check tidal waves.
Low response from villages	Low	Unlikely but may lead to delay in the process	Include all leaders from the initiation of the process continuously.
Unfavourable policy developments	Medium	Unlikely but may lead to disruption in the process	Meetings with SLCC to remedy situation. Build public opinion and media campaigns to highlight issues faced in the Coastal Area.

Difficulties in raising funds as co-finance.	Medium	Unlikely to affect the day-to-day Project processes. Certain components may be delayed.	Multiple sources of funding to be explored from beginning.
Lack of coordination between Government, civil society and village representatives	Low	Plans and action may be limited to sectors or certain interests only	State and District Committees to take a more active role. Create and maintain informal networks.

8. Budget

The total budget for the five years project is Rs. 443.5 lakhs. An amount of Rs. 340.5 lakhs is requested from CSPC. The major contributors would be from Coastal Salinity Prevention Cell (CSPC), the beneficiaries themselves and a portion would be leveraged from various government schemes and programmes.

a. Budget for the project

Sl. No.	Project Activities	Budget (INR) (5 Years)	
A. Project Survey			
1.	Baseline data collection	1,00,000.00	
2.	Ecological Studies	30,000.00	
3.	Consultant Charges (for planning and technical backstopping)	50,000.00	
B. Community Organization Costs			
1.	Administrative expenses and Set of Records	1,00,000.00	
2.	Watch and Ward, record keeping	18,00,000.00	50% Co-finance
C. Creation of the Shelterbelt			
1.	Nursery	51,87,500.00	
2.	Soil and Moisture Conservation	98,00,000.00	10% Co-finance
3.	Plantation & Seeding	100,00,000.00	10% Co-finance
D. Enhancing Agricultural Productivity			
1.	Farm Bunding	5,00,000.00	20% Co-finance
2.	Private Plantation	6,00,000.00	100% Co-finance
3.	Demonstration of farming practices	6,40,000.00	20% Co-finance
4.	Innovation Fund	5,00,000.00	
E. Energy Conservation to reduce Biomass Demand			
1.	Chullah/Biogas/Pressure Cookers	20,00,000.00	100 % Co-finance
F. Rain water harvesting and provision of Drinking water			
1.	Rain water harvesting & drinking water for Human beings and Cattle	20,00,000.00	100 % Co-finance
G. Capacity Building			
1.	Skill Development trainings	1,20,000.00	
2.	Institutional Training and Exposure Visits	3,20,000.00	
3.	Environmental Awareness	2,00,000.00	100 % Co-finance
4.	Networks/Federations/Newsletter	1,50,000.00	
H. Support Functions			
1.	Capacity Building of Staff Members	2,00,000.00	
2.	Networking, Liaisoning with Government	2,00,000.00	
3.	Books, Periodicals, Study Reports	50,000.00	
4.	Project Monitoring	1,00,000.00	
I. Project Management Costs			
1.	Salaries	80,00,000.00	25% Co-finance
2.	Travel Costs	8,00,000.00	
3.	Recurring Expenses	8,00,000.00	50% Co-finance
J. Capital Expenses			
1	Computer/Printer/Camera/GPS	1,00,000.00	
Grand Total		**4,43,47,500.00**	
Co-finance		**1,03,08,000.00**	**23.24%**
Funds sought from CSPC		**3,40,39,500.00**	**76.76%**

b. Explanatory note on the Budget

Project Survey:

The project survey includes a detailed baseline survey at the household level and collection of secondary information to assist in the implementation of the project. A study on ecological aspects is planned to understand the species to be planted, seeding to be done, grasses to be sown etc and also understand the process of succession in the area. Plans for intervention would require assistance and technical backstopping from scientist and professionals working on the issue for which an amount of rupees fifty thousand has been budgeted as hiring charges. A total of rupees 1.80 lakhs has been budgeted under project survey.

Community organization cost:

The community organization costs include the set of records, administrative expenses and protection expenses. All financial and administrative records would be maintained at the village level, with the members of the executive committee or the secretary responsible for its maintenance. Watch and ward is an essential expenditure in the area as the revegetation plots are situated far off from the village and a watchman would be employed for the protection. Rupees 19 lakhs has been budgeted for the same and 50% of the cost of protection and record keeping would be shared by the community.

Creation of Shelter belt

About 2 million saplings would be planted in 2000 hectares of land @ 1000 saplings per hectare. Saplings would be developed in the decentralized nurseries, but shortages may be compensated through purchase from the forest department nurseries. Extensive seeding would also be undertaken in the area to compensate for the high mortality in the initial period. 2 million pits would be dug for the plantation. Rupees 152 lakhs has been budgeted for the creation of the vegetative shelterbelt. 10% of the planting and seeding expenses would be contributed by the community members or/and leveraged from other government programmes.

An additional amount of 98 lakhs has been budgeted for soil and moisture conservation, especially for the creation of the bund across the tide and the block bunds to assist in better survival and growth of the vegetative windbreak through leaching of the salts underground. 10% of the soil and moisture conservation expenses would be contributed by the community members or/and leveraged from other government programmes.

Enhancing Agricultural productivity:

Demonstration of best practices for farming in saline soils would be undertaken under the project. Farm bunds, farm ponds, crop demonstration, micro-irrigation and low cost green house are some of the options for trials. These activities would help mitigate the effects of salinity as well as help in improving farm incomes. A budget of rupees 22.4 lakhs has been allocated for the purpose of which rupees 5 lakh is kept as innovation fund. The community would undertake plantation on the farmlands themselves.

Energy conservation

In order to reduce the dependence on the shelterbelt and the demand for fuel wood, efforts would be made to encourage farmers to use energy conservation devices. We plan to install 1600 improved chulha, 100 biogas units and distribute 800 pressure cookers during the project period. An amount of rupees 20 lakhs would be necessary for the implementation, which would be shared by the community and FES.

Provision of drinking water

The coastal villages are facing acute drinking water problem. FES in collaboration with International Water Management Institute, Anand is preparing an action plan for project villages in Khambhat taluka. An amount of about 20 lakhs is proposed to be raised for the intervention in collaboration with WASMO. This activity would be initiated subject to the approval of the project proposal by WASMO.

Capacity building

It is the most significant input under the project, as the sustainability of the efforts would depend on the understanding of the community and the ownership of the concept.

Capacity building consists of skilled development training, exposure visits and institutional trainings for the members of the village institutions in a phased manner depending on the need of a particular institution. Networking with other organisations and publication of a newsletter would be a major strategy towards sharing our learning and dilemmas. Rs. 5.9 lakhs has been budgeted for the component.

Awareness for the next generation is also a critical part of the project, for which environment education programmes (EEP) would be undertaken. Rs. 2 lakhs planned for the EEP would be co-financed by FES from its EEP corpus funds.

Support functions

Support function is mainly meant to facilitate the implementation of the projects through capacity building of staff members, liaisoning with government officials and non-government agencies working in the project area and on similar issues, provision of books, periodicals and study reports. A budget of Rs. 4.5 has been allocated for the purpose. While the team members would monitor the progress of the project on a day-to-day basis, there is a necessity of monitoring the project on the basis of the benchmark surveys from time to time. It is envisaged that student interns would assist in the process. An amount of 1 lakh has been budgeted for the purpose.

Project Management cost

The project team in Anand would facilitate/implement the project. It is envisaged that a six-seven member team would be engaged for this project. Additionally partial involvement of the Team Leader, Team Coordinator from the Coordination Office and support staff (Accountant, Driver) would be necessary for the implementation of the project. An amount of Rs 80 lakhs has been budgeted with 25% of the amount to be co-financed by FES from different projects. An additional 10% of the total salary cost is budgeted for travel expenses of the staff in the project area.

Rs. 8 lakh has been budgeted for recurring expenditure (pertaining to propulsion, electricity charges, office rent, internet charges, repairs & maintenance, telephone & fax). 50% of recurring expenses would be shared by other projects.

Capital expenses

Rs. 1 lakh has been budgeted purchase of a computer, printer, camera and GPS under the project.

c. Work plan of first year (2007-08)

Organization of village institutions

Strengthening and nurturing village institutions where they exist, and crafting new village institutions where there aren't any would be the initial step towards the process of revegetating the common lands. While institutional set-up and regular contact exists in four villages in the Khambhat cluster, efforts would be made towards initiating the process in the rest of the villages in Khambhat and Dhandhuka clusters.

Project Survey

In addition to the information necessary on the ecological parameters, the detailed socio-economic survey would be undertaken at the household level in all the 16 villages. The detailed technical plan for the area would also be undertaken with the help of experts from different fields. The terms of reference with the village institutions would be signed between the village and FES with the clarity in the roles and responsibility of each partner in the implementation of the project.

Creation of shelterbelt

During the year, after the demarcation of land for the vegetative shelterbelt, the bund for tidal control would be initiated as a priority. To reclaim the common land by enhancing leaching process by rainwater, block bunds would be done in 300 hectares of land for in-situ conservation of rainwater. Along with the initiation of protection, extensive seeding of suitable species would be undertaken during the nonth of July/August 2007.

Enhancing agricultural productivity

While farm bunding and farm ponds would be taken up in the second year, preparations for the same would be initiated during the year. Crop trials would be initiated in few demonstration plots during the year (especially the rabi crops) so that the efforts could be replicated from the next financial year.

Capacity building

Capacity building would be the most important aspect of first years plan. Exposure visit to successful efforts for restoration of shelterbelt within and outside the project area would be organized for the members of the project villages. Visit would aim to build a vision for the area through the creation of the shelterbelt and improved agriculture in the area. Apart from this, training programs on technical and managerial aspects of planning and management of restoration activities would be imparted to the members. We would try and disseminate information regarding the best practices in saline areas through the quarterly newsletter. During the year environment awareness programs for children would be designed and conducted in six villages.

Energy conservation programme & provision for Drinking water

During the year, both the programmes would be initiated through discussions with Gujarat Energy Development Agency (GEDA)/ Sardar Patel Renewable Energy Research Institute (SPRERI) and WASMO respectively. About 240 improved stoves and fifteen biogas units would be installed in the six villages in addition to distribution of 20 pressure cookers at subsidized rates. Drinking water scheme would be implemented in two villages during the year by leveraging funds from WASMO.

Support Functions

While we would continue documenting our experiences and learning while implementing the project, efforts would be made to reach out to various institutions working on the salinity related issues and learn from their experiences. Interface with key actors like government officials, academicians, researchers, eminent persons working on similar issues would be undertaken so that a perspective plan for the area could be developed.