CMPA Technical Report Series

29

Baseline study on the Biodiversity Awareness in Selected Marine and Coastal Areas in Gujarat

November 2016

FOREST DEPARTMENT GOVT. OF GUJARAT

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On behalf of:

Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety

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Indo-German Biodiversity Programme
Conservation and Sustainable Management of Coastal and Marine Protected Areas

CMPA Technical Report Series No. 29
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Authors
Alka Tomar, Center for Environment Communication (CEC)

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Indo-German Biodiversity Programme (IGBP),
GIZ-India, A-2/18, Safdarjung Enclave,
New Delhi - 110029, India
E-Mail: biodiv.india@giz.de
Web: www.giz.de
http://indo-germanbiodiversity.com/

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Responsible
Director, Indo-German Biodiversity Programme

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Disclaimer

This study has been financed through a contract with the Project on "Conservation and Sustainable Management of Existing and Potential Coastal and Marine Protected Areas" (CMPA), of the Indo-German Biodiversity Programme. The Project is jointly implemented by the Ministry of Environment, Forests and Climate Change (MoEF&CC), Government of India, and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB).

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LIST OF ACRONYMS

BCC: Biodiversity Communication Centre

BMC: Biodiversity Management Committee

BMUB: German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety

CBD: Convention on Biological Diversity

CEC: Centre for Environment Communication

CEPA: Communication, Education & Public Awareness

CMPA: Coastal and Marine Protected Areas

DD: Doordarshan

ETV: Eenadu Television

GIZ: Deutsche Gesellschaft für Internationale Zusammenarbeit

ICE: Information, Communication and Education

ICZM: Integrated Coastal Zone Management

MoEF&CC: Ministry of Environment, Forests and Climate Change

NGO: Non-governmental Organisation

PBR: People's Biodiversity Register

UTV: United Television

BACKGROUND

Indo-German Cooperation on Biodiversity

Recognising the importance of conserving and sustainably using coastal and marine biodiversity, the Governments of India and Germany have fostered a partnership for the implementation of dedicated programmes aimed at enhanced conservation of India's biodiversity, in line with the objectives of the Convention on Biological Diversity (CBD). Protecting the environment takes centre stage, in unison with the principle of sustainable development and enhancement of human well-being.

The CMPA Project

The Conservation and Sustainable Management of Existing and Potential Coastal and Marine Protected Areas (CMPA) project is one of the flagship projects of the Indo-German technical cooperation supporting the CBD's Aichi targets. The Project is funded by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) and implemented by the Ministry of Environment, Forests and Climate Change (MoEF&CC), Government of India, and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) on behalf of BMUB.

The current project on the Biodiversity in Marine & Coastal Areas, Inland-Wetland Ecosystem and Forest Ecosystems for selected Marine and Coastal Areas in India addresses the status of conservation measures and what more needs to be done at the following project sites: **Goa** - Dr Salim Ali Bird Sanctuary (Chorao) **Gujarat** - Gosa Bara Wetland and Madhavpur Turtle Area (Porbandar), Khijadiya Wildlife Sanctuary (Jamnagar) **Maharashtra** - Thane Creek (Mumbai), Velas Coast (Ratnagiri), and Ansure Creek (Ratnagiri).

The project aims at facilitating measures that result in the following outputs:

- Participatory processes for the management of areas identified for conservation of biodiversity have been implemented;
- A capacity development system for the sustainable management of coastal and marine protected areas has been made available in Gujarat;
- Relevant stakeholders are aware of – and sensitised for – the importance of conserving biodiversity in coastal and marine areas.

PROJECT OVERVIEW

The study "Baseline Research on the Awareness on Biodiversity in Selected Marine and Coastal Areas" is for establishing benchmark on the information and awareness levels of relevant stakeholders in respect to the importance of conserving marine and coastal biodiversity in areas they are directly concerned with. The scope of work also includes analysing the results of the benchmark and contributes in the recommendations for impact-oriented information, education and communication (IEC) strategies for the concerned project sites in Gujarat.

With the mission, 'Communicating for Creating Sustainable Societies', Centre for Environment Communication (CEC) is committed to raising awareness among children, youth, and adults proactively on environmental issues and promoting action to concretise the awareness. Under the aegis of its thematic Biodiversity Communication Centre (BCC), CEC is working towards mainstreaming biodiversity conservation among the people, at large, and the youth, specifically. CEC has been entrusted to undertake this study with the below mentioned objectives and scope of work.

This report presents the outputs of the Baseline Research on the Awareness on Biodiversity in Selected Marine and Coastal Areas" for the Khijadiya Bird Sanctuary (Jamnagar).

Objectives and Scope of Work

Objectives of the work are three-fold:

(a) Establish a benchmark on the information and awareness levels of relevant stakeholders in respect to the importance of conserving marine and coastal biodiversity in areas they are directly concerned with. The benchmark indicators will be based on statistically supported results obtained during field surveys, the indicators could comprise (but are not limited to):

- Individual level of general awareness on environmental issues.
- Site-specific knowledge of conservation issues.
- Knowledge about benefits derived from site-specific ecological services.
- Level of willingness to change personal behaviour (or income generating activities) in order to conserve the coastal environment.
- Perception of the future in respect to the state of the environment.

(b) Analyse the results of the benchmark and recommend impact-oriented information, education and communication strategies at the concerned project sites i.e. Gosa Bara Wetland Complex, Porbandar and Khijadiya Bird Sanctuary, Jamnagar.

(c) Organise a two-day film festival on one of the project sites to engage the stakeholders in celebrating and appreciating the coastal biodiversity.

About CEC

Centre for Environment Communication (CEC) is committed to raising awareness among children, youth, and adults proactively on environmental issues and promoting action to concretise the awareness. Through consistent and sustained call for awareness and action, CEC aims to gradually engender behaviour change, at large, towards environment and make its conservation a part of our daily concerns towards creating a good life. CEC has collaborated with UNICEF, UNESCO, GIZ, PLAN INDIA, DELHI GOVERNMENT, and UNITED NATIONS FOUNDATION for its various projects. www.cecin.org

Mission: Communicating for Creating Sustainable Societies

APPROACH AND METHODOLOGY

Desk Review and Background Paper

CEC developed a detailed background paper for the expected results, possible stakeholders, duration and timeline based on the initial field visit undertaken in December first week. The detail note included a methodology for the implementation of the baseline survey, stakeholders' selection, sample size, contents of questionnaires, and methods of analysis. Detailed discussions were held with the GIZ staff and other organisations involved in the research studies as per the objectives of the assignment. Some documents were also referred for deeper understanding of the project, stakeholders and the communication gaps and needs i.e.

- 12th Meeting of the Conference of the Parties to the Convention on Wetlands (Ramsar, Iran, 1971): Resolution XII.9
- Handbook 6: Wetland CEPA
- ICZM Report of World Bank on communication assessment of Marine National Park

Based on the above discussions, field visits and referred documents, CEC identified the need for information with reference to all stakeholders to create a universe of stakeholders truly representative of the project sites and according to the priority of the project.

Overview of Project Sites

Khijadiya Bird Sanctuary, Jamnagar: Khijadiya Bird Sanctuary is a combination of incredible diversity of ecosystems, which has marine and fresh water habitats, marshy lands, mangroves, prosopis, mudflats, saltpans, creeks, forest scrub, sandy beaches, and even farmlands bordering the area. The sanctuary is home to approx 220 species of resident and migratory birds, that provides birdwatchers with a delightful chance to sight rare birds in large numbers.

The site is surrounded by villages like Jambuda, Vibhapar, Khijadiya, Dhunvav, and Sachana. We selected the upstream and downstream villages Khijadiya and Jambuda. In this project site, the stakeholders include school students, villagers with occupation as brass industry workers, ship breaking unit workers, saltpan workers, farmers, farm labourers, plumbers, masons, animal grazers and businessmen surrounding the sanctuary; tourists and visitors such as wildlife photographers, birdwatchers visit the sanctuary in large number. The other stakeholders are government departments, corporate, tour operators, guides and NGOs. Schools followed by birdwatchers and government departments and colleges contribute significantly to the universe.

Field Visits

Meeting and Field-visit to Finalise Methodology and Framework of Baseline Studies: The CEC team undertook field missions along with the GIZ team and other partner organisations to the site in Gujarat from Dec 02 – 04, 2015. During the field missions, discussions were held on the methodology and key questions to create synergies between the various research studies. The team also had intense discussions on the catchment area of the project sites. The universe and the sample size of the awareness baseline were also reviewed and the forest department of both the sites provided strategic inputs.

Preliminary Visit: The CEC senior researchers visited both the project site from Jan 06 – 12, 2016 to finalise the sample size and to carry out a concept pretesting of the tools for understanding the knowledge level of the NGOs, bird watchers, tourist, government officials, photographers, tourists, villagers and general public on the indicators of the study. The tools and sample size was accordingly finalised.

Review Meeting: The CEC Team Leader attended the Midterm review meeting on 7 March 2016 at the CCF MNP office, Jamnagar. During this meeting an overview, methodology, and the baseline research key findings in the form of graphs and tables were presented.

Sample Size and Respondents

Table 1: Khijadiya Bird Sanctuary (Jamnagar), Gujarat

S No	Stakeholders	Total No (UNIVERSE)	Sample Size	Total Respondents
1.	Villages[1]	5	2	40
2.	Colleges	10	3	45
3.	Schools	10	3	45
4.	Tourists	100	30	30
5.	General Public	60	20	20
6.	Wildlife Photographers	60	6	6
7.	Bird Watchers	100	10	10
8.	Guides and Tour Operator	9	9	9
9.	NGOs[2]	5	5	5
10.	Govt Departments[3]	5	5	5
11.	Corporates[4]	1	1	1
	Total			**216**

Research Tools

The baseline research was conducted through a mix of quantitative (interview schedule for Villagers, school and college students, teachers, guides, tour operators, photographers, bird watchers, tourists and general public) and qualitative research (discussion guidelines for Government officials, NGOs and Corporates).

[1] **Village Khijadiya**: (Population: 2246 | Households: 443) | **Village Jambuda**: (Population: 3507 | Households: 739) | **Village Dhunvav: (**Population: 5285 | Households: 1110) | **Village Vibhapar: (**Population: 2600 | Households: 407) | **Village Sachana: (**Population: 5416 | Households: 859)

2 **NGOs:** Late J V Nariya Education & Charitable Trust (JVNT), Nava Nagar Nature Club, Lakhota Nature Club, Chaitanya Charitable Trust and Eco-development Committee

3 **Govt Departments:** Salinity Control Division; District Rural Development Agency (DRDA); District Watershed Development Unit; Mission Mangalam; Office of Mamlatdar, Revenue Department; Fisheries Department

4 **Corporate:** Saurashtra Chemicals

*Occupation of Households: Farmers, farm labourers, other labourers (brass industry workers, salt pan workers, ship breaking unit workers, plumbers, masons), animal grazers, job, businessmen

Anaylsis

The data gathered during the field visits in January and February 2016 were scrutinized and coded in the field by the interviewers and later in the office for consistency. The data entry and analysis has also been done. The results are disaggregated by project sites and by gender, occupation, age, and target groups.

The individual level of general awareness of all stakeholders in terms of their understanding and awareness of the biodiversity and environment issues has been assessed. Analysis was done on the knowledge level on some of floral and faunal species found in the project sites; benefits both tangible and intangible derived by the stakeholders; threats & solutions for the project sites; stakeholder's connectedness with the project sites; and their communication needs. Information was taken on what kind of communication mediums were preferred by stakeholders in their daily life. Respondents' future perception of the project sites was also taken. Suggestions were also taken from the respondents on the communication activities that can be conducted for increasing the awareness level of the stakeholders on the project sites.

Timeline and Deliverables

Table 2: Baseline Research Timeline and Deliverables

S No	Tasks and Deliverables	Timeline
1.	Assignment started	November 16, 2015
2.	Draft methodology and plan for baseline study is submitted	November 25, 2015
3.	Draft methodology and plan for baseline study is presented at a meeting in Gandhinagar, Porbandar and Jamnagar	December 02 - 04, 2015
4.	Final methodology and plan for baseline study is submitted	December 18, 2015
5.	Interim report submitted	January 05, 2016
6.	Conducting baseline research	January 06 – 12 and Feb 07 - 17, 2016
7.	Submission of draft report	February 29, 2016
8.	Midterm review meeting	March 07, 2016

BASELINE RESEARCH ANALYSIS AND KEY FINDINGS

Baselines are the "point zero" from where to measure the change from an intervention. A baseline is used to measure and observe progress from a starting point. Hence, its purpose is instrumental to facilitating reflection and reporting of change. *(IUCN: Monitoring and Evaluation in Livelihoods and Landscapes).*

The "Baseline Research on the Awareness on Biodiversity in Selected Marine and Coastal Areas" resulted from various sources. It comprised drawing up a questionnaire for each stakeholder group, a situation analysis "of the state and condition of people and ecosystem (including identification of trends and pressures), identification of major issues related to people and ecosystems that require attention, an analysis of key stakeholders – groups of people and institutions with a right, mandate and/or interest in resources and their management in the geographic area of the potential project". *(IUCN: Situation Analysis – An Approach and Method for Analyzing the Context of Projects and Programme)*, and collection of data from various stakeholders to be able to establish a benchmark on the awareness on biodiversity in selected marine and coastal areas at the project site, Khijadiya Bird Sanctuary, Jamnagar and recommend impact-oriented information, education and communication strategies through a mix of quantitative and qualitative research. This section will present the inferences from the baseline research analysis conducted under several parameters and put forth the key findings of the study.

The target audience at the project site was surveyed on a range of parameters to arrive at a holistic picture on their levels of awareness on the biodiversity in their region and critical issues related to it, which influenced their lifestyles. The parameters spanned their awareness levels on general environmental & conservation issues and specifically related to the site; the benefits they derive from site-specific ecological resources; their levels of willingness to change behaviours towards conserving the coastal environment; how they perceive the future with respect to the state of the environment, and finally, their communication needs – how do they best access information and knowledge related to their natural environment and what it means to them. A detailed analysis of these parameters helped CEC to arrive at key findings for the Khijadiya Bird Sanctuary (Jamnagar), Gujarat.

Respondent Information

The baseline in Jamnagar began with the gathering of preliminary information: understanding the profile of the respondents, which would significantly determine their response on issues related to the biodiversity of the region and its linkages with their lives. While conducting the survey, villagers returned the highest number of response, followed by students, and the general public. Most of the villagers had not studied beyond class 10 while many were illiterate. Higher levels of education, comprising largely graduates, was found among the tourists, public, teachers, and the students, respectively. Villagers were found to be engaged primarily in farming, with the maximum number of respondents across the categories of public, teachers, and tourists holding private jobs.

Table 3: Respondent's Occupation

(in percentage)

Occupation	Villagers	General Public	Tourists	Teachers	Wildlife photographers	Bird watchers	Guides
Govt service	5	0	0	83	0	0	11
Private job	10	35	47	7	0	0	44
Unemployed	3	0	0	0	0	0	0
Farming	38	0	13	0	0	0	0
Fishing	0	0	0	0	0	0	11
Daily wage labour	3	10	0	0	0	0	0
Business	13	40	20	0	67	100	22
Housewife	20	15	17	3	0	0	0
Retired	8	0	3	0	0	0	11
Not Applicable	3	0	0	0	33	0	0

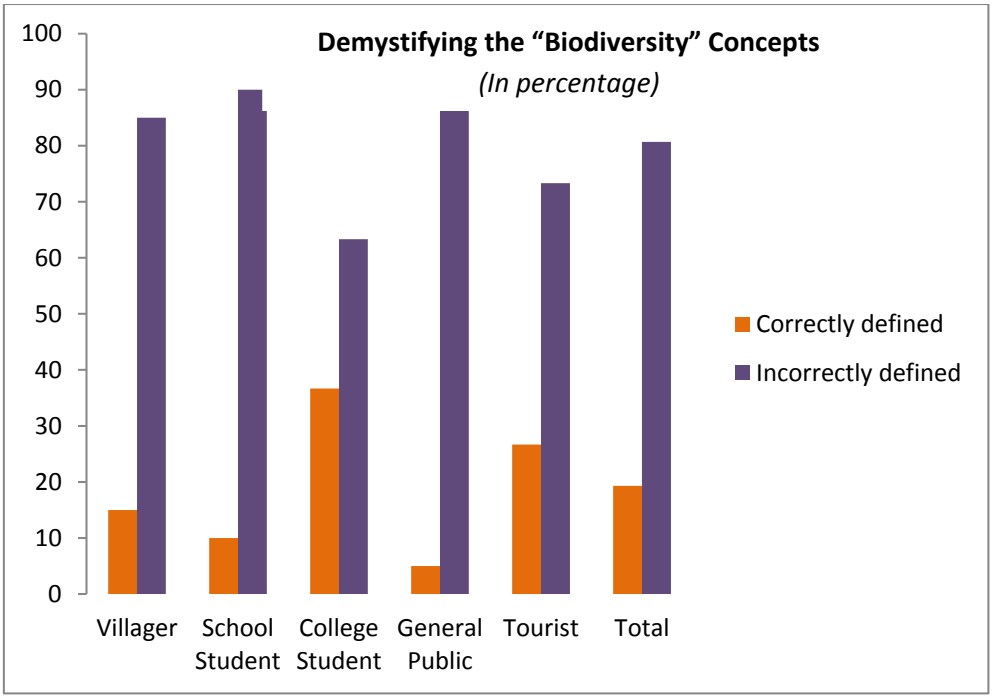
4.2 Awareness Level on Environment and Biodiversity Issues

Once the profile of the respondents was established, the survey moved on to the next step: understanding the awareness levels of the respondent groups on biodiversity. At the outset, it must be stated that the understanding of the respondent group in Jamnagar on biodiversity concepts and concerns has been higher than the respondent group in Porbandar. Pollution, climate change, global warming, deforestation were concepts that most villagers, along with students, teachers, the general public, tourists were equally familiar with. When asked specifically whether biodiversity meant a variety of plant, animal, crops and minerals on Earth, the villagers, general public and tourists all agreed with the option while the highest response to this option came from college students. There was an almost equal understanding among the same respondent group that biodiversity loss meant fewer resources, with the students also emphasising that biodiversity loss meant fewer numbers of certain types of birds, animals and plants. Teachers and tourists' best understood the concept of ecological imbalance while villagers also displayed a good understanding.

Table 4: Demystifying the "Biodiversity" Concepts

(in percentage)

Response	Villagers	School Students	College Students	General Public	Tourists	Total
Correctly Understood	15	10	37	5	27	19
Incorrectly Understood	85	90	63	95	73	81



College students, teachers and tourists showed an average understanding of "wetlands" as being "low lying areas saturated with water", with only 33% having knowledge of the concept. Tourists were the most aware respondent group followed by the public and the students. Villagers have shown an awareness of the role of wetlands in recharging groundwater and acting as a flood control, which is heartening. The more educated segment evidently displayed a good understanding of the role of wetlands in the former ways while understanding its role in providing a habitat for flora and fauna, filtering and purifying air, and capturing waste carbon dioxide.

Table 5: Understanding of Wetlands

(In percentage)

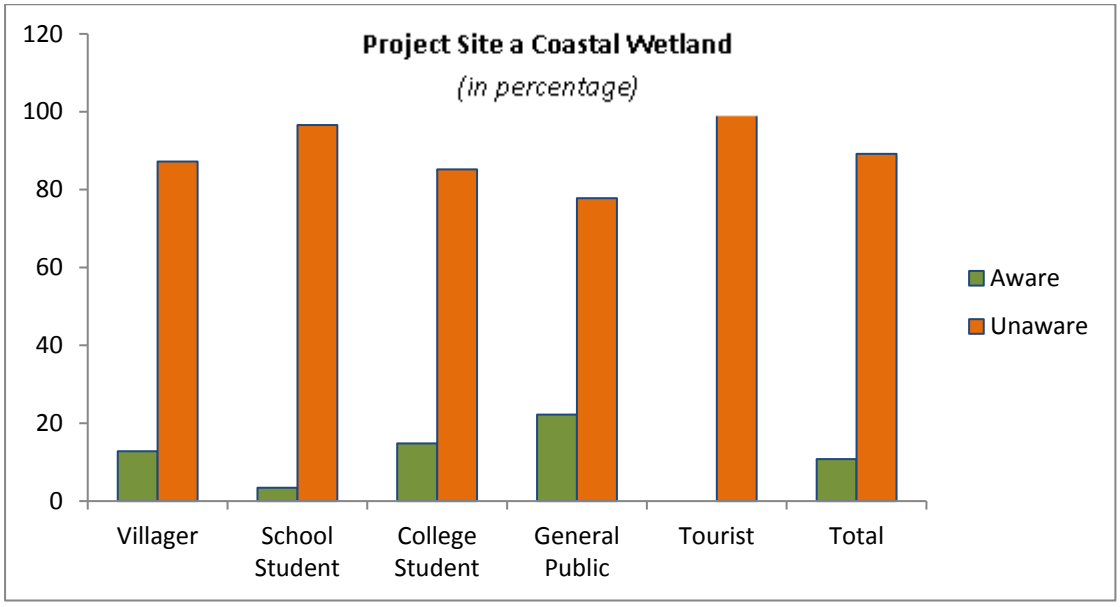
Response	Villagers	School Students	College Students	General Public	Tourists	Total
Have knowledge	15	30	33	30	37	**33**
No knowledge	85	70	67	70	63	**67**

Most of the respondents have shown a very good understanding, including villagers, of the fact that a coastal wetland is an area where rivers meet the sea and water changes from fresh to salt, which can offer an extremely rich mix of biodiversity. The highest response on this understanding has come from teachers and college students.

Table 6: Interpretation of "Coastal Wetlands"

(In percentage)

Response	Villagers	School Students	College Students	General Public	Tourists	Total
Correct Interpretation	8	7	0	0	13	**5**
Wrong Interpretation	93	93	100	100	87	**96**

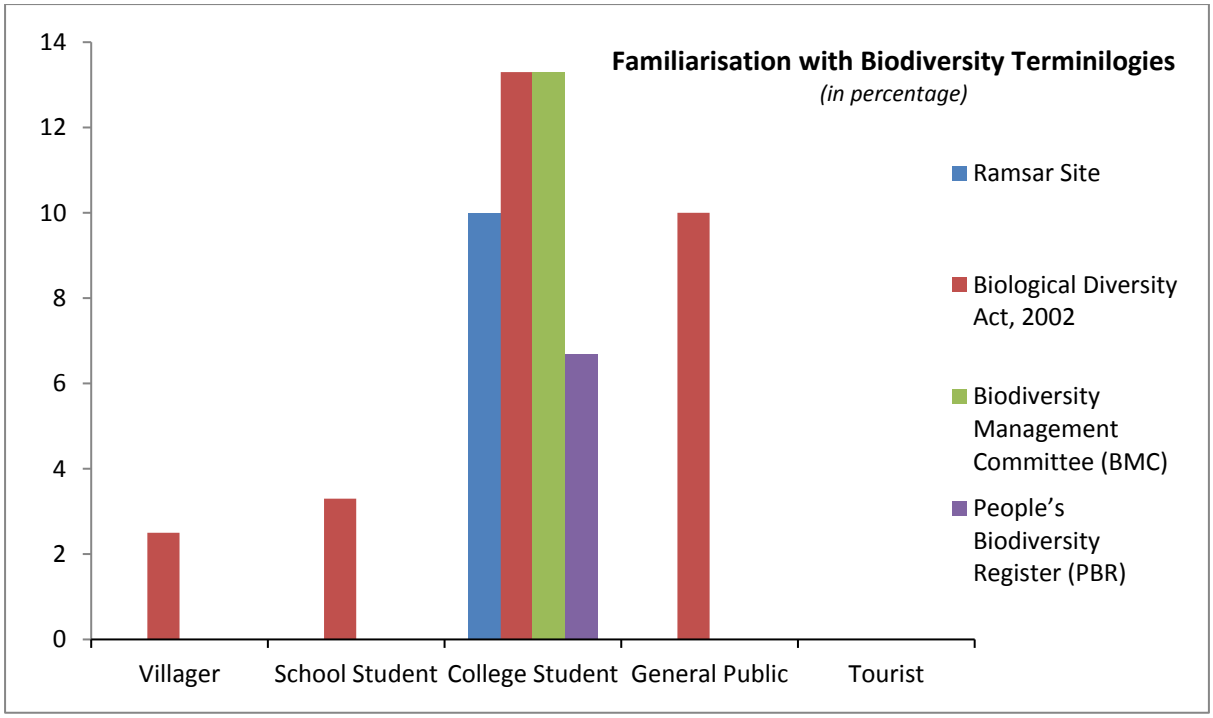


Familiarity with the biodiversity concepts has been quite low with the highest levels of familiarity being seen in students, specifically college students, with only a small percentage of villagers — 3% — having heard about the Biological Diversity Act, 2002. The public at 10% showed a better level of understanding of the Biological Diversity Act, 2002. Apart from the students, the concepts Biodiversity Management Committee and People's Biodiversity Register drew a blank from all respondents.

Table 7: Familiarisation with the Biodiversity Terminologies

(In percentage)

Terms	Villagers	School Students	College Students	General Public	Tourists
Ramsar Site	0	0	10	0	0
Biological Diversity Act, 2002	3	3	13	10	0
Biodiversity Management Committee (BMC)	0	0	13	0	0
People's Biodiversity Register (PBR)	0	0	7	0	0



Site-specific Knowledge of Conservation Issues

A high number of respondents have visited the project site with villagers leading the numbers and followed by teachers, students and the general public. Villagers, students, the general public, teachers, and tourists knows the status of the site as a protected area with fair understanding of the site as a coastal wetland, with a high level of comprehension of the site being a flourishing habitat for birds in general and migratory birds specifically.

Table 8: Acquaintance with the Project Site

(In percentage)

Response	Villagers	School Students	College Students	General Public	Tourists	Total
Visited this area	78	67	57	75	13	**53**
Heard about this area	23	33	37	20	43	**29**
Have knowledge about the area	3	3	10	20	0	**6**
Never heard about the area	3	3	0	10	40	**10**
Never visited this area	0	0	10	0	3	**3**

Table 9: Conservation Issues Flagged by Respondents

(in percentage)

Conservation Issues	Villagers	School Students	College Students	General Publics	Tourists	Total
No water in this area	88	77	47	45	30	**44**
Less no of birds visit this area	8	7	43	5	10	**11**
Less fish/ food for birds	3	0	10	25	7	**5**
Poaching of birds	3	23	37	15	3	**11**
Water is used for agriculture	3	3	7	15	0	**3**
Excessive use of fertilizers and pesticides	0	3	17	0	0	**3**
Fishing is prevalent	0	7	20	5	0	**4**
Sewage or water discharged in this area	0	0	7	15	0	**3**
Don't know	8	7	7	20	67	**15**

The visits by villagers, weekly and fortnightly, have largely been for bird watching and farming while other respondent groups such as students, teachers and the general public have been there for picnics.

Table 10: Purpose of Visit to Project Site

(in percentage)

Purpose	Villagers	School Students	College Students	General Public	Tourists	Total
Bird Watching	45	35	24	47	75	**33**
Picnic	23	40	47	47	0	**29**
Study Tour	10	25	24	0	0	**11**
Nature Camp	3	15	6	0	0	**5**
Others	3	0	0	7	0	**2**
Farming	35	0	6	0	0	**11**
As a Tourist	0	5	29	0	50	**8**
Fishing	3	0	0	0	0	**1**

Table 11: Frequency of Visit to Project Site

(In percentage)

Frequency	Villagers	School Students	College Students	General Public	Tourists	Total
Only once	6	40	53	47	25	**31**
Weekly	61	25	6	7	0	**30**
Fortnightly	19	15	0	0	25	**12**
Yearly	13	20	41	47	50	**28**

When asked about the floral species at the project site and their importance, villagers have responded largely saying that it yields mostly fuel wood. Response to the other options such as medicinal values, invasive species, good for nesting have drawn few responses.

Changes in the landscape coming from the construction of infrastructure, buildings and facilities has been cited as the biggest threat to the conservation of the site by a large number of respondents with salination being picked as the second biggest conservation threat, echoing a similar concern at the Gosa Bara Wetland Complex, Porbandar.

Table 12: Threats to the Conservation of Project site

(In percentage)

Threats	Villagers	School Students	College Students	General Public	Tourists	Total
Salination	20	23	17	35	13	**14**
Industrial waste	8	10	37	40	7	**12**
Pesticide Pollution	13	33	43	15	20	**16**
Changes in the landscape coming from the construction of infrastructure, buildings and facilities	35	23	37	20	7	**17**
Tourism	18	10	23	5	10	**9**
Invasive species	10	3	10	0	0	**4**
Noise Pollution	8	0	0	5	0	**2**
Encroachment	3	0	7	0	10	**3**
Mobile Towers	5	13	10	5	7	**5**
Over Fishing	3	10	10			**3**
City's sewage			13	10	3	**3**
All	3		3			**1**
Don't know	13	10	10	10	50	**12**

The various biodiversity conservation initiatives being undertaken in the area are cleanliness drive, nature camps, study tours for students, documentation of the flora and fauna species by wildlife students, restriction on the entry of large vehicles, increase in entry fee, check on waste pollution, restriction on use of water for irrigation, tree plantation. Schools are engaged in sparrow conservation efforts and are helping make nests for the sparrows. Plantation of mangroves is being done to check the salinity, which has been diminishing the fertility of the land.

With an above average site-specific knowledge, respondents are keen to recommend a visit to the project site for friends and family.

Table 13: Recommending Others to Visit Project Site

(In percentage)

Response	Villagers	School Students	College Students	General Public	Tourists	Total
Recommend	88	90	90	75	50	**79**
Don't Recommend	13	10	10	25	50	**21**

According to them, forest officials play the biggest role in the conservation of the site. In addition, respondents feel that villagers, forest officials and guides have greater levels of awareness about the area as they live or work in that area and have vast knowledge about the species, its behaviour and habitat.

Table14: Role Model for Conserving the Project Site

(In percentage)

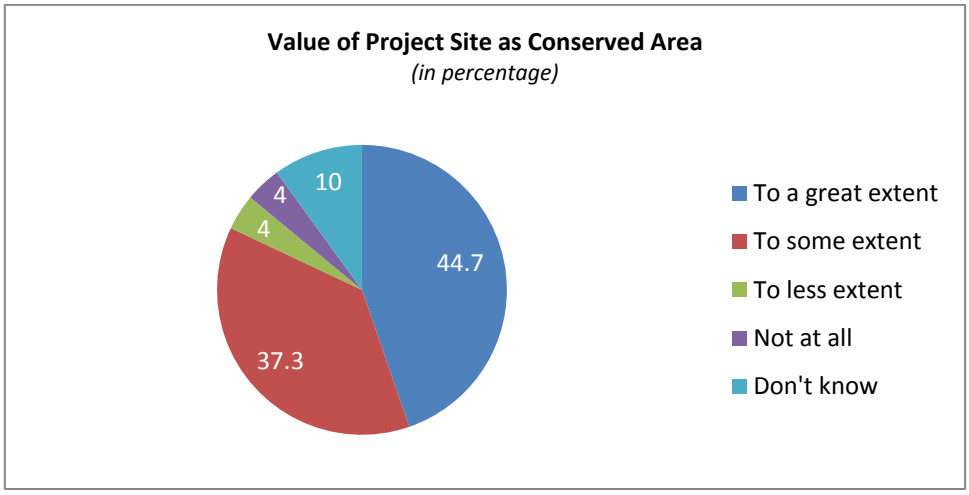
Role Model	Villagers	School Students	College Students	General Public	Tourists	Total
Forest officials	35	37	50	55	27	**24**
Villagers	58	37	43	30	53	**28**
Government	35	37	27	20	27	**19**
NGOs	13	7	23	10	10	**8**
Eco Guides	0	3	20	15	7	**5**
School	0	13	13	0	0	**3**
Ecotour Operators	0	0	0	0	7	**1**
Salt Pan Workers	5	3	0	0	0	**1**
Fishermen	0	0	0	15	0	**1**
All of the above	0	3	10	15	0	**3**
Don't know	10	0	7	10	27	**7**

It is also felt that since, villagers, guides depend primarily on the project site for resources and their livelihood, their stake in the project site, and their responsibility towards its conservation is higher. Among the respondents, 45% value the site largely, while 37% value it to some extent.

Table 15: Value of Project Site as a Conserved Area

(In percentage)

Value Level	Villagers	School Students	College Student	General Public	Tourists	Total
To a great extent	45	53	53	35	33	**45**
To some extent	38	40	27	50	37	**37**
To less extent	8	3	3	5	0	**4**
Not at all	10	0	7	0	0	**4**
Don’t know	0	3	10	10	30	**10**



Benefits from Site-Specific Ecological Services

There is a healthy understanding on both the tangible and intangible benefits, which the project site yields. Villagers, as seen in the earlier responses too, have shown the highest levels of awareness on this parameter too, picking tourism (88%) and fuel wood (83%) as the major tangible benefits coming from the site. The next highest responses on the same parameters have come from school students, teachers and the general public, respectively. Respondents have also cited medicinal plants and fresh water as valuable resources, which the site yields.

Table 16: Knowledge on the Tangible Benefits

(In percentage)

Benefits Derived	Villagers	School Students	College Students	General Public	Tourists
Food	70	40	20	65	17
Fodder	85	63	40	80	20
Fuel Wood	83	57	57	55	17
Fresh Water	63	47	53	65	13
Tourism	88	73	77	90	30
Medicinal Plants	43	37	40	55	13
Other Benefits	13	7	0	40	7

Among the intangible benefits, clean and pure air with the site being the pride of place were picked as the top benefits by villagers, followed closely by teachers and students.

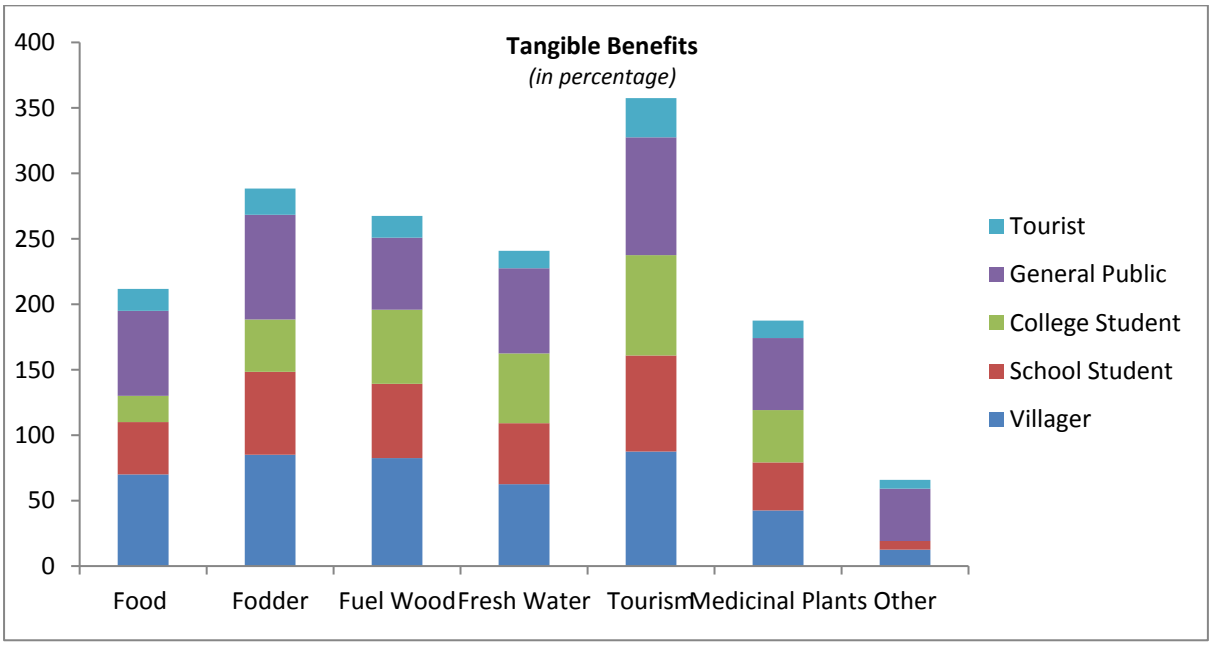


Table 17: Knowledge on the Intangible Benefits

(In percentage)

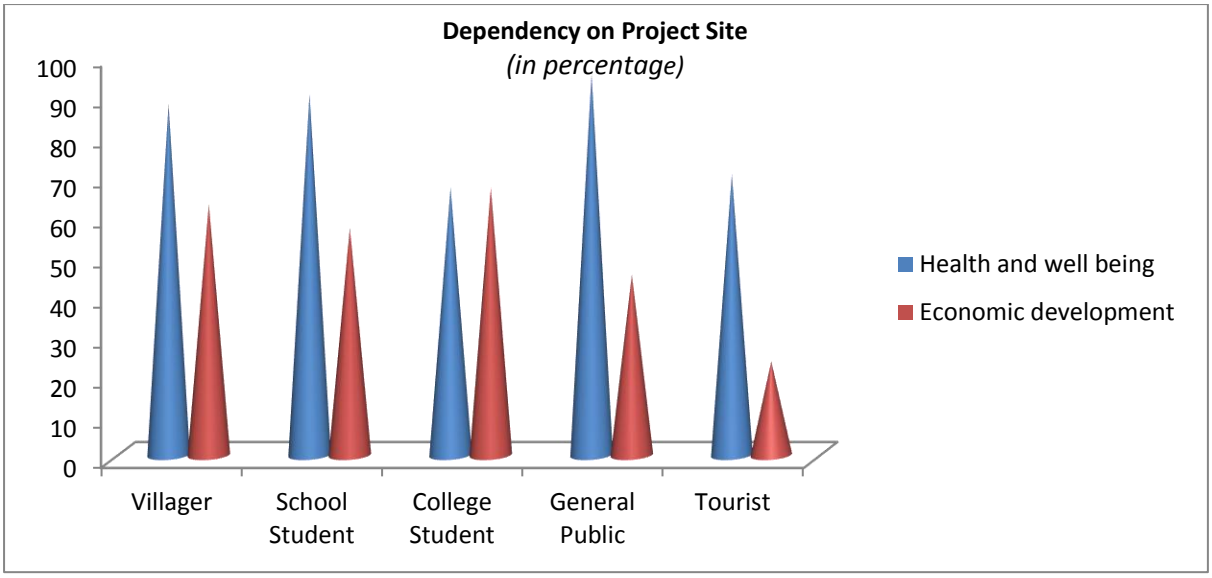
Benefits Derived	Villagers	School Students	College Students	General Public	Tourists	Total
Clean and pure air	83	77	73	95	43	**39**
Pride of the area	58	60	57	40	23	**26**
Habitat for species	10	13	20	15	7	**7**
Health and wellbeing	8	3	20	25	3	**6**
Aesthetic value	8	20	17	0	3	**5**
Waste water treatment	5	3	10	30	0	**4**
Maintenance of genetic diversity	0	0	10	0	0	**1**
Recreational opportunities	3	0	0	10	3	**1**
All	0	3	10	0	0	**1**
Captures wasted Carbon Dioxide	3	3	3	0	0	**1**
Pollination	0	0	3	0	0	**0**
Pest control	0	0	3	0	0	**0**
Erosion prevention and maintenance of soil fertility	0	0	0	0	0	**0**
Don't know	8	13	0	0	50	**8**

The site was rated very highly as yielding health benefits to the respondents with a response of 88% from villagers and 95% from the general public while its economic benefits was rated lower, standing at 63%, as rated by the villagers, 67% by the college students, and only 45% by the general public.

Table18: Dependency on Project Site

(In percentage)

Dependency for	Villagers	School Students	College Students	General Public	Tourists
Health and well being	88	90	67	95	70
Economic development	63	57	67	45	23

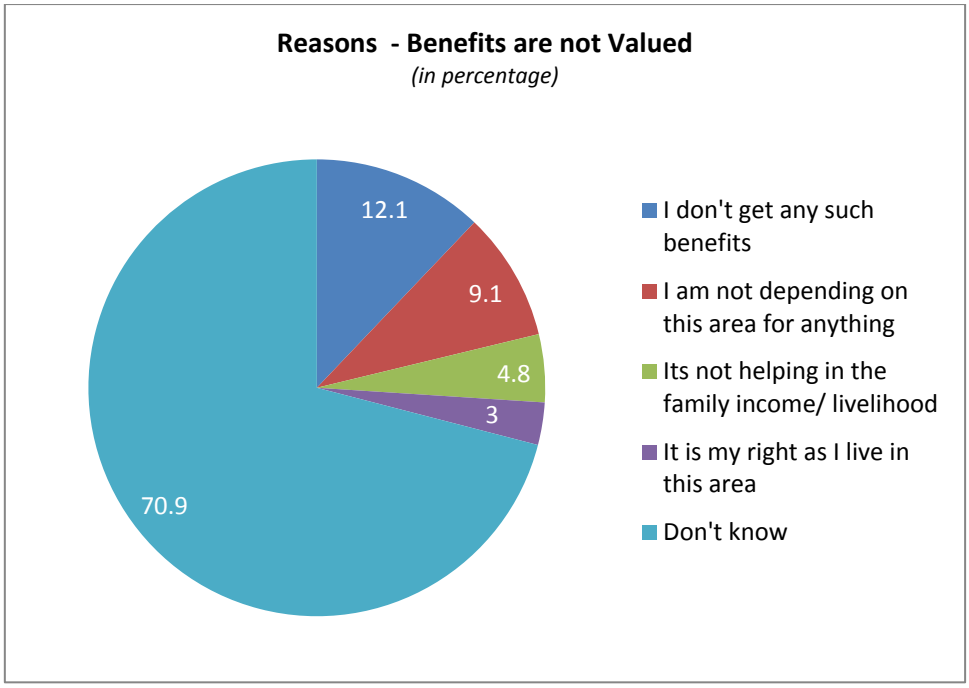


Very few respondents felt that the site did not yield any benefits with the response largely inclined towards the many benefits it yielded. As high as 40% felt that the site was of great value.

Table 19: Value of Benefits

(In percentage)

Value Level	Villagers	School Students	College Students	General Public	Tourists	Total
To a great extent	40	50	60	25	20	**40**
To some extent	30	33	27	25	37	**31**
To less extent	10	3	10	5	7	**7**
Not at all	13	10	0	25	0	**9**
Don't know	8	3	3	20	37	**13**



With the fuel wood, tourism, medicinal value from plants being picked as the highest tangible benefits, it seems like a natural corollary that the two top reasons for conserving the site should be to preserve the flora and fauna (63%) and to promote tourism (40%). Other reasons to preserve the site were to maintain ecological balance and promote livelihood.

Table 20: Why Project Site should be Protected?

(In percentage)

Reasons Cited	Villagers	School Students	College Students	General Public	Tourists	Total
To preserve the floral and faunal diversity	63	50	73	30	43	**31**
To promote tourism	40	50	37	60	43	**25**
To maintain ecological balance	20	30	60	45	13	**18**
To support livelihood	23	17	27	30	17	**13**
Because it has aesthetic beauty	20	10	30	15	13	**10**
Don't know	3	0	0	0	17	**2**
All	3	0	3	0	0	**1**

Significantly, many villagers also feel, on similar lines as seen at the Gosa Bara Wetland Complex in Porbandar, that land should not be protected as it diminishes the value of the land. Respondents have largely shown an above average understanding of the site.

Willingness for Conserving the Coastal Environment

Respondents find the conservation efforts not very satisfactory with more than 50% saying as much and feel that the government should step up its efforts to conserve the site more intensively. To some extent, respondents would also like to be engaged in the conservation efforts and display an average willingness to change behaviours towards conservation.

Table 21: Interest Level in Conservation of Project Site

(In percentage)

Interest Level	Villagers	School Students	College Students	General Public	Tourists	Total
To a great extent	23	37	43	0	30	**28**
To some extent	38	50	40	60	47	**45**
Not at all	23	10	3	30	0	**13**
Don't know	18	3	13	10	23	**14**

Villagers would like to be engaged in cleaning the coastal areas and protecting the birds' species. The general public is keener on cleaning the project sites along with the NGOs and planting trees. Schoolteachers and students would like to educate the villagers and engage in regular visits to the project site. Schools have already been engaged in promoting sparrow nesting and their plantation drives are a positive step towards creating natural habitats for the birds by increasing the green cover of the site. Touching upon an important aspect, college teachers would like to educate the youth on environment laws. They would like students to develop an understanding on industrial pollution and the law dealing with coastal area conservation besides teaching them biodiversity conservation. More oriented towards call-to-action, college students have expressed a desire to associate with NGOs and nature clubs in awareness activities and conduct plantation activities.

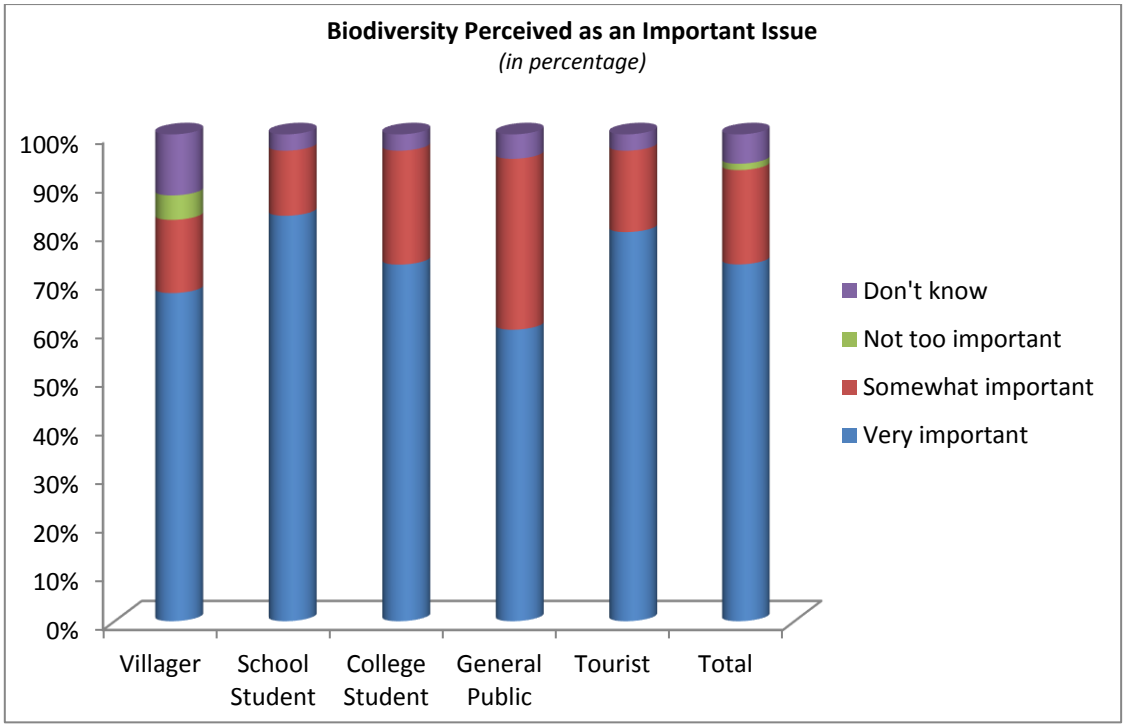
Vision of the Future State of the Environment

In an encouraging development, all respondents view biodiversity as a very important issue in the future.

Table 22: Biodiversity Perceived as an Important Issue in Future

(In percentage)

Importance Level	Villagers	School Students	College Students	General Public	Tourists	Total
Very important	68	83	73	60	80	**73**
Somewhat important	15	13	23	35	17	**19**
Not too important	5	0	0	0	0	**1**
Don't know	13	3	3	5	3	**6**



A good average of 35% would like to see the site "very rich in floral and faunal diversity", 19% would like to see it more protected and 14% would like to see it conserved with sufficient amount of water available. Respondents have shown a high level of awareness about the future state of the environment at the project site.

Table 23: Future Perception of Project Site

(In percentage)

Perception	Villagers	School Students	College Students	General Public	Tourists	Total
Very rich in floral and faunal diversity	60	87	67	65	70	**35**
More protected and conserved	30	27	47	50	40	**19**
Recognised as an area of international conservation importance	18	17	30	45	20	**12**
Should have good amount of water	30	37	27	20	23	**14**
Recognised as an economic hub	18	20	7	0	17	**7**
Developed with all the modern amenities	15	0	13	15	3	**5**
All	3	7	20	5	3	**4**
Don't know	13	3	3	5	13	**4**
Remain in same status	5	0	0	10	0	**1**

Communication Needs

One of the most important aspects towards gauging the level of understanding of the respondent group on biodiversity issues is to understand how they get their information, the communication modes available, accessible and preferred by the respondents.

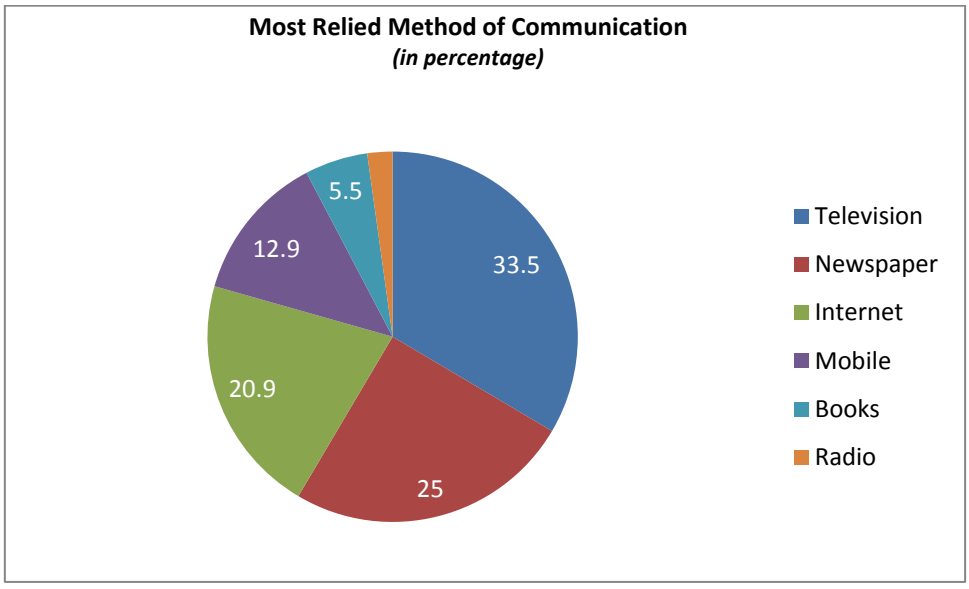
Sandesh, Gujarat Samachar, Divya Bhaskar are the newspapers which are read by all stakeholders including villagers. Besides these, the general public, school and college teachers, school and college students, bird watchers, guides, tourists and tour operators read Times of India, Nobat, Bhagya, Hindustan Times, Indian Express and Economic Times.

Television closely followed by the newspaper is the most preferred mode of communication while the use of social media is very low. The various channels being watched by the stakeholders are Aaj Tak, ABP News, Animal Planet, Anjali, BBC News, Chanel V, Colours, DD Girnar, DD News, Discovery, ETV, Gujarat News, History TV, India TV, Jamnagar89, Life OK, N B News, NatGeo Wild, National Geographic, NDTV, News Channel, Romedy Now, SAB TV, Sandesh News, Sony, Star Gold, Star Plus, Star Utsav, TV9, UTV, ZEE Cinema, ZEE TV. It has been observed that school students, teachers and general public watch all the entertainment and news channels. College teachers view news channels and bird watchers watch environment and wildlife channels.

Table 24: Preferred and Reliable Method of Communication

(In percentage)

Preferred Method	Villagers	School Students	College Students	General Public	Tourists	Total
Television	80	73	73	90	93	**34**
Newspaper	53	53	70	70	63	**25**
Internet	23	57	57	75	60	**21**
Mobile	18	20	40	50	40	**13**
Books	8	17	30	5	7	**6**
Radio	3	0	3	15	10	**2**



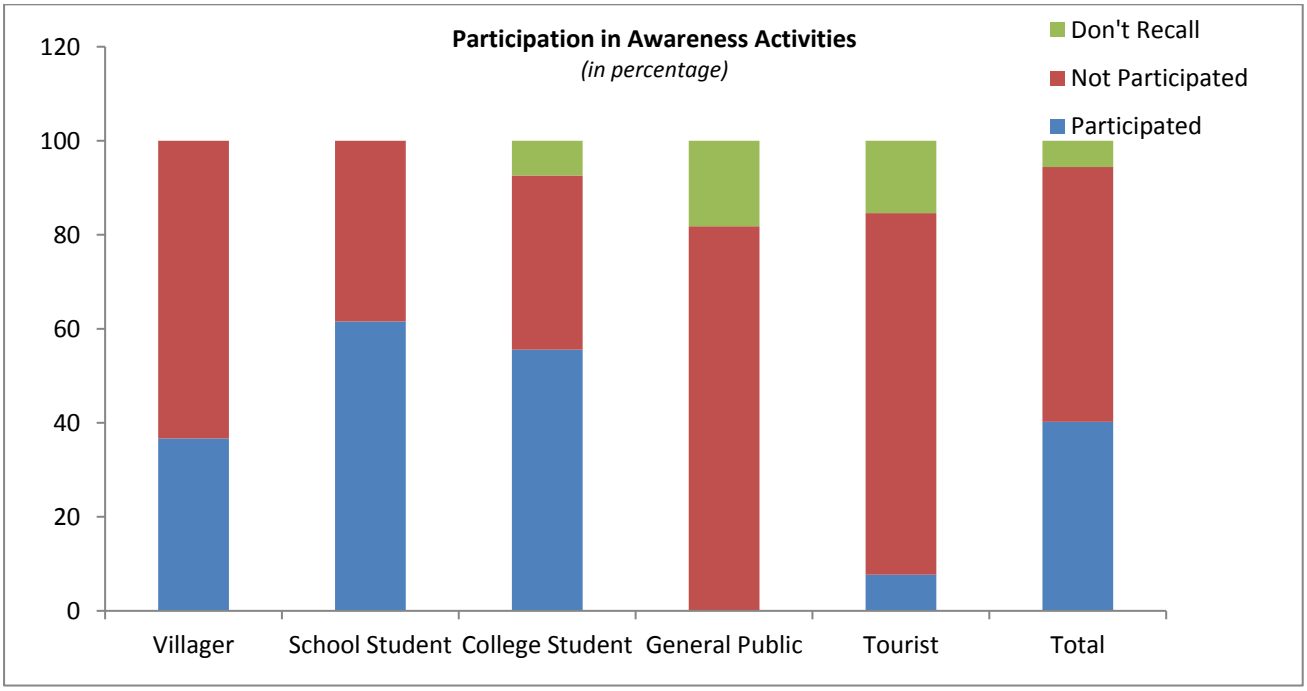
Apart from the television and newspaper as preferred and reliable modes of seeking information, the respondents also seek out relevant and reliable information on environment in general and biodiversity specifically from their peer groups, teachers, eco-clubs and the Panchayat. Students, teachers, tourists and the general public have also cited books, nature education camps and government documents, environment-related NGOs and Eco Club committees as an important source of information on environment.

Nature camps followed by film screenings and then workshops have been perceived as being the most organized activities organized on environment at the project site with an average level of participation in these activities, standing at 40% and the non-participation at 54%.

Table 25: Participation in Awareness Activities

(In percentage)

Response	Villagers	School Students	College Students	General Public	Tourists	Total
Participated	37	62	56	0	8	**40**
Not Participated	63	38	37	82	77	**54**
Don't Recall	0	0	7	18	15	**6**



The key messages identified from organized activities have been birds, in general, migratory birds and biodiversity conservation of the area with a significant percentage of 52% considering such activities to be very useful and 33% useful to some extent.

Table 26: Impact of Awareness Activities

(In percentage)

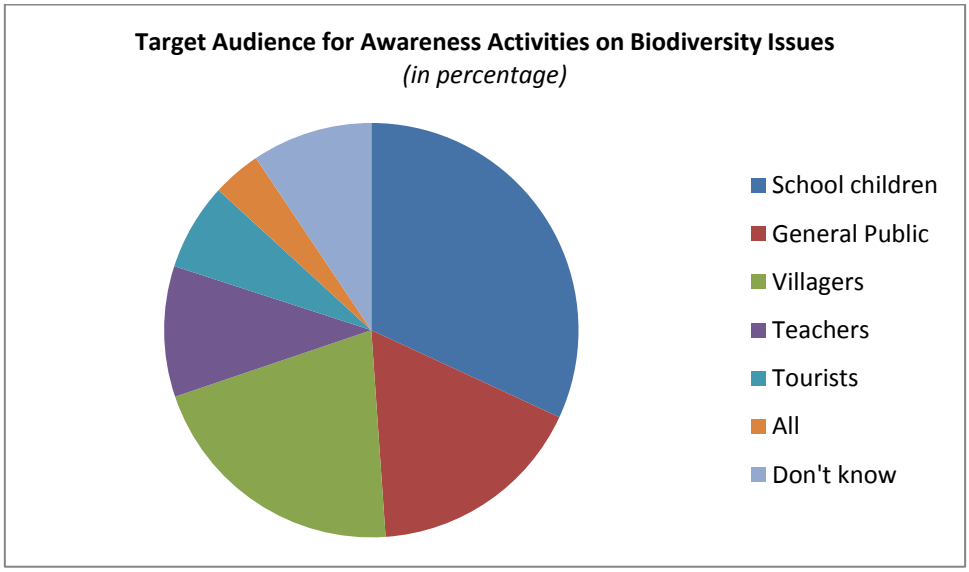
Impact	Villagers	School Students	College Students	General Public	Tourists	Total
Very useful	35	70	63	45	50	**52**
Useful to some extent	45	20	33	50	17	**33**
Not much useful	0	0	0	0	3	**1**
Not at all useful	0	0	0	0	0	**0**
Don't know	20	10	3	5	30	**15**

Such activities were primarily perceived as being targeted towards students and have been seen to be very effective and important in creating awareness and motivating people to conserve the rich biodiversity of the project site, across respondent groups.

Table 27: Target Audience for Awareness Activities on Biodiversity Issues

(In percentage)

Target Audience	Villagers	School Students	College Students	General Public	Tourists	Total
School children	50	53	47	55	47	**32**
General Public	18	20	33	30	37	**17**
Villagers	45	37	13	20	40	**21**
Teachers	13	10	30	15	13	**10**
Tourists	13	3	13	10	13	**7**
All	13	13	3	20	27	**4**
Don't know	0	0	23	0	7	**9**



A crucial aspect is the general lack of awareness as well as willingness to be involved in biodiversity conservation activities. One reason is the low levels of literacy in the project site. However, an important and recurring response has been that designating the site as a protected area and too many conservation activities will mean that the natural resources have been “taken away from them” and a “loss of livelihood” to the stakeholders.

Table 28: Key Barriers in Creating Awareness for Behavioural Change

(In percentage)

Barriers	Villagers	School Students	College Students	General Public	Tourists	Total
Lack of interest in the issue	48	50	47	50	40	**22**
Lack of knowledge about the subject	35	43	53	45	40	**21**
Language	30	13	23	30	37	**13**
Have other priorities	25	27	10	25	30	**11**
Lack of time	35	20	23	30	17	**12**
Use of technical language	18	10	20	15	17	**8**
Lack of resources	3	3	30	30	10	**6**
Family's disapproval	5	10	10	10	10	**4**
Don't know	3	0	0	5	20	**3**

Alternative livelihood options are not available and hence, site conservation is not high on the priority list neither is it much desired. Regular and sustained interventions by NGOs and clubs such as the Lions Club and the Rotary Club, free awareness camps, a Nagar Palika Award, and regular media coverage of positive environment conservation efforts, rallies, and regular advertisement s on conservation issues related to the project site in newspapers and on preferred television channels have been suggested as impactful methods to raise awareness and get more people involved in conserving the biodiversity of the Khijadiya Bird Sanctuary, Jamnagar.

Table 29: Motivational Tools to Conserve Biodiversity

(In percentage)

Tools	Villagers	School Students	College Students	General Public	Tourists	Total
Reinforce conservation messages through different activities	45	70	60	85	60	40
Frequent Campaigns	25	40	47	60	37	26
Felicitate the champions with Green ambassador awards	23	33	43	10	20	17
Provide economic incentives	5	13	37	0	7	8
Don't know	20	0	0	10	23	7
All	3	0	3	5	0	1

Table 30: Role Model for Communicating Biodiversity Communication Messages

(In percentage)

Role Model	Villagers	School Students	College Students	General Public	Tourists	Total
Teachers	55	63	67	60	57	**40**
Celebrities	25	33	47	40	57	**26**
Religious Leaders	15	7	30	40	3	**12**
Community Leaders	10	3	30	10	3	**8**
Politicians	8	20	7	15	17	**8**
Panchayat heads	20	7	0	0	0	**4**
Talati cum Mantri	0	3	0	10	3	**2**

Teachers, celebrities, Panchayat, and religious leaders have an important role to play in motivating people towards conservation, according to the respondents. Sports personalities, bird watchers, and well-known environmentalists were identified as another important group of stakeholders who could help to motivate people in conserving the wetland.

CONCLUSION AND RECOMMENDATIONS

The study "Baseline Research on the Awareness on Biodiversity in Selected Marine and Coastal Areas" was for establishing a benchmark on the information and awareness levels of relevant stakeholders in respect to the importance of conserving marine and coastal biodiversity in areas they are directly concerned with.

The benchmark indicators comprise:

- Individual level of general awareness on environmental issues.
- Site-specific knowledge of conservation issues.
- Knowledge about benefits derived from site-specific ecological services.
- Level of willingness to change personal behaviour (or income generating activities) in order to conserve the coastal environment.
- Perception of the future in respect to the state of the environment.
- Communication Needs

Overall, the level of understanding on issues related to the biodiversity and conservation concerns of the Sanctuary is good standing at 34%. Where technical expressions are introduced such as the Ramsar Site, Biodiversity Act, 2002, or the BMC and the PBR, the responses have been vague. However, when specific options have been cited on the indicators, which they have been likely to experience in their daily lives, the responses have been more forthcoming.

Table 31: Awareness Level on Biodiversity Issues

(In percentage)

Level	Villagers	School Students	College Students	General Public	Tourists	Total
Excellent	0	3	0	0	3	**1**
Very Good	8	3	20	35	27	**17**
Good	30	40	30	30	40	**34**
Fair	50	33	37	30	23	**36**
Poor	13	20	13	5	7	**12**

Knowledge specifically about the site has been good at 57% showing knowledge of the site as a protected area and its benefits to their lives.

Table 32: Level of Site-specific Knowledge

(In percentage)

Knowledge Level	Villagers	School Students	College Students	General Public	Tourists	Total
Excellent	3	0	0	10	0	**2**
Very Good	10	10	47	5	7	**16**
Good	68	63	27	70	57	**57**
Fair	20	23	27	15	13	**20**
Poor	0	3	0	0	23	**5**

Significantly, a major concern, which has emerged from the baseline research, has been a general level of unwillingness to engage in conservation activity. On the surface while, this is the story, there is an underlying concern on declaring the site as a protected area or stepping up conservation activities, which is worrying the respondents — once the project site is declared as protected, they will no longer be able to derive their sustenance from it such as fish, fuel wood, and medicines. The lack of alternative livelihood options and the cordoning off the site, as a protected will affect them negatively, which is why they are not too keen to engage in conservation activities.

Where organised activities, technical concepts and the digital media come in, the response has been higher from teachers, students and tourists. Where the impacts are visible on the ground and the grass roots changes influence their daily activities, the villagers have been more forthcoming.

With reference to the tangible benefits, the wetland yields irrigation to 14 villages while fishing is an important source of livelihood. The site also yields many intangible benefits to the people. It provides a good site for bird watching and photography; preserving the aesthetic value of the site will not only attract tourists but also prove to be a draw for the local population and the students while providing a thriving hhabitat for a variety of birds and fish.

Table 33: Knowledge Level with regards to Site-specific Benefits

(In percentage)

Level	Villagers	School Students	College Students	General Public	Tourists	Total
Excellent	0	0	3	10	0	**2**
Very Good	10	3	37	30	23	**19**
Good	65	67	50	55	57	**59**
Fair	25	30	7	5	17	**18**
Poor	0	0	3	0	3	**1**

With internet accessibility limited among the respondents owing to the low levels of literacy and awareness of the digital domain, television is the most preferred source of information followed by the newspaper. A regular, sustained intervention by the government, NGOs, and forest officers, though, is being seen as an impactful method to raise awareness levels on the biodiversity issues of the project site and get more people involved.

The perception level of stakeholders about the future vision of the site and its conservation is average at 50% though what is significant is that 39% have a high level of perception of the site as being important to their future and that its conservation in the future is of tremendous relevance as their lives are inter-linked with the project site.

Table 34: Perception Level of the Stakeholders

(In percentage)

Level	Villagers	School Students	College Students	General Public	Tourists	Total
Very high	3	0	7	10	3	**4**
High	38	50	43	25	37	**39**
Average	50	50	47	50	53	**50**
Low	3	0	0	10	7	**3**
Very low	8	0	3	5	0	**3**

Providing people with alternative sources of livelihood is also seen as an important input, which will help to mould behaviours, and attitudes positively towards conservations as the livelihood concern will be then adequately met. When the daily struggle is to be able to earn a decent livelihood, conserving biodiversity might seem like an onerous task, though, the good health of the biodiversity is what will sustain the local population, in the end.

Table 35: Willingness Level to Change Personal Behaviours for Conserving the Coastal Environment

(In percentage)

Level	Villagers	School Students	College Students	General Public	Tourists	Total
Very high	0	0	3	0	0	**1**
High	13	17	43	35	30	**26**
Average	80	63	50	50	70	**65**
Low	8	20	0	15	0	**8**
Very low	0	0	3	0	0	**1**

Hence, regular awareness raising activities, workshops, fairs, government intervention, and raising the levels of education need to be intensively focused upon to establish the linkage between flourishing biodiversity health and flourishing local lifestyles.

Important Issues Affecting Biodiversity of Project Site

Birds

- Shikari (Hunter) community near Khijadiya indulges in poaching of birds. They catch birds by creating a loud noise and using kites and nets, which causes injury to the birds.
- Farmers create a din and noise to scare away wild animals in the process causing disturbance to the birds.
- More of commercial crops are grown, thus less birds visit the area as they do not get enough food.
- Decreasing rainfall has led to decline in the number of bird visits.

Tourism

- Excessive, unregulated tourism is a threat.
- More visits by people leads to noise pollution and leads to decline in the birds visit in the area.
- City-dwellers go to Khijadiya for leisurely picnics and end up dumping plastic at the site, which affects the growth of planktons.

Livelihoods

- No economic activity is being carried out as it is a protected area. Only environment-friendly activity can be done.

Salt pans

- Water salinity is too high.
- Salt pan has affected the agriculture land and it has become unfertile; underground water is not being recharged.
- Salt pan workers burn wood for fuel purpose causing pollution.

Invasive species

- Invasive species such as gandobaval do not let other plants grow and destroy the fertility of the region. Government has disallowed cutting down of gandobaval as it controls floods.

Initiatives taken for conservation

- **Pakshi Bachao Abhiyan (Save the birds campaign)** – NGOs have been distributing nests (cardboard or clay made) to people to encourage bird nesting.
- **Religious linkages have been established to save biodiversity** by using the terminology “Ram ki chidiya, Ram ka khet i.e. keeping a row for keeping grains for birds in farms to encourage conservation of biodiversity.
- Government has been organizing nature camps to raise awareness levels on biodiversity and conservation issues and encourage people to engage in conservation activities.

Recommendations

- **In Jamnagar trees are scarce**. A greater variety of indigenous species of trees should be planted to provide habitat for various kinds of birds and to provide a pure & clean environment.

- **Unregulated tourism is becoming a menace.** Proper guidelines for tourists in the project area need to be formulated and implemented to promote regulated eco-tourism.

- **Regular, sustained interventions** in the form of nature camps, workshops, fairs, one-to-one interaction points by the government, NGOs and forest officers will help to make information on biodiversity more accessible while providing a platform to clear doubts and apprehensions.

- **To engage greater numbers of stakeholders in conserving the coastal biodiversity** greater suppport needs to be provided by the NGOs and Government.

- **Efforts to raise education levels** will help to people undestand how the well-being of the site positively impacts their social and economic well-being.

- **Provision of alternative livelihoods** will help reduce dependance on the site and halt overfishing.

- Once it has been clearly established that stakeholders have a **direct dependance on the project site** there will be a greater level of willingness to change personal behaviour. This specific linkage must be established with the help of appropriate IEC strategy.

- **Providing alternative livelihood options to the people** needs to be looked at actively so that they turn their attention to the conservation of the site and not look at it merely as a source of earning their livelihoods.

- **Methods to address the salinity of the land** must be activley explored as it is depleting the fertility of the land.

- **Most preferred role models** for communicating biodiversity conservation messages are community leaders and teachers, and their role in raising awareness needs to be expanded by intensifying their engagement via workshops.

Section 2: Gosabara Wetland Complex

List of Tables

LIST OF ACRONYMS

BCC: Biodiversity Communication Centre

BMC: Biodiversity Management Committee

BMUB: German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety

CBD: Convention on Biological Diversity

CEC: Centre for Environment Communication

CEPA: Communication, Education & Public Awareness

CMPA: Coastal and Marine Protected Areas

DD: Doordarshan

ETV: Eenadu Television

GIZ: Deutsche Gesellschaft für Internationale Zusammenarbeit

ICE: Information, Communication and Education

ICZM: Integrated Coastal Zone Management

MoEF&CC: Ministry of Environment, Forests and Climate Change

NGO: Non-governmental Organisation

PBR: People's Biodiversity Register

UTV: United Television

BACKGROUND

Indo-German Cooperation on Biodiversity

Recognising the importance of conserving and sustainably using coastal and marine biodiversity, the Governments of India and Germany have fostered a partnership for the implementation of dedicated programmes aimed at enhanced conservation of India's biodiversity, in line with the objectives of the Convention on Biological Diversity (CBD). Protecting the environment takes centre stage, in unison with the principle of sustainable development and enhancement of human well-being.

The CMPA Project

The Conservation and Sustainable Management of Existing and Potential Coastal and Marine Protected Areas (CMPA) project is one of the flagship projects of the Indo-German technical cooperation supporting the CBD's Aichi targets. The Project is funded by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) and implemented by the Ministry of Environment, Forests and Climate Change (MoEF&CC), Government of India, and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) on behalf of BMUB.

The current project on the Biodiversity in Marine & Coastal Areas, Inland-Wetland Ecosystem and Forest Ecosystems for selected Marine and Coastal Areas in India addresses the status of conservation measures and what more needs to be done at the following project sites: **Goa** - Dr Salim Ali Bird Sanctuary (Chorao) **Gujarat** - Gosa Bara Wetland and Madhavpur Turtle Area (Porbandar), Khijadiya Wildlife Sanctuary (Jamnagar) **Maharashtra** - Thane Creek (Mumbai), Velas Coast (Ratnagiri), and Ansure Creek (Ratnagiri).

The project aims at facilitating measures that result in the following outputs:

- Participatory processes for the management of areas identified for conservation of biodiversity have been implemented;
- A capacity development system for the sustainable management of coastal and marine protected areas has been made available in Gujarat;
- Relevant stakeholders are aware of – and sensitised for – the importance of conserving biodiversity in coastal and marine areas.

PROJECT OVERVIEW

The study "Baseline Research on the Awareness on Biodiversity in Selected Marine and Coastal Areas" is for establishing benchmark on the information and awareness levels of relevant stakeholders in respect to the importance of conserving marine and coastal biodiversity in areas they are directly concerned with. The scope of work also includes analysing the results of the benchmark and contributes in the recommendations for impact-oriented information, education and communication (IEC) strategies for the concerned project sites in Gujarat.

With the mission, 'Communicating for Creating Sustainable Societies', Centre for Environment Communication (CEC) is committed to raising awareness among children, youth, and adults proactively on environmental issues and promoting action to concretise the awareness. Under the aegis of its thematic Biodiversity Communication Centre (BCC), CEC is working towards mainstreaming biodiversity conservation among the people, at large, and the youth, specifically. CEC has been entrusted to undertake this study with the below mentioned objectives and scope of work.

This report presents the outputs of the Baseline Research on the Awareness on Biodiversity in Selected Marine and Coastal Areas" for the Gosa Bara Wetland and Madhavpur Turtle Area (Porbandar).

Objectives and Scope of Work

Objectives of the work are three-fold:

(d) Establish a benchmark on the information and awareness levels of relevant stakeholders in respect to the importance of conserving marine and coastal biodiversity in areas they are directly concerned with. The benchmark indicators will be based on statistically supported results obtained during field surveys, the indicators could comprise (but are not limited to):

- Individual level of general awareness on environmental issues.
- Site-specific knowledge of conservation issues.
- Knowledge about benefits derived from site-specific ecological services.
- Level of willingness to change personal behaviour (or income generating activities) in order to conserve the coastal environment.
- Perception of the future in respect to the state of the environment.

(e) Analyse the results of the benchmark and recommend impact-oriented information, education and communication strategies at the concerned project sites i.e. Gosa Bara Wetland Complex, Porbandar and Khijadiya Bird Sanctuary, Jamnagar.

(f) Organise a two-day film festival on one of the project sites to engage the stakeholders in celebrating and appreciating the coastal biodiversity.

About CEC

Centre for Environment Communication (CEC) is committed to raising awareness among children, youth, and adults proactively on environmental issues and promoting action to concretise the awareness. Through consistent and sustained call for awareness and action, CEC aims to gradually engender behaviour change, at large, towards environment and make its conservation a part of our daily concerns towards creating a good life. CEC has collaborated with UNICEF, UNESCO, GIZ, PLAN INDIA, DELHI GOVERNMENT and UNITED NATIONS FOUNDATION for its various projects. www.cecin.org

Mission: Communicating for Creating Sustainable Societies

APPROACH AND METHODOLOGY

Desk Review and Background Paper

CEC developed a detailed background paper for the expected results, possible stakeholders, duration and timeline based on the initial field visit undertaken in December first week. The detail note included a methodology for the implementation of the baseline survey, stakeholders' selection, sample size, contents of questionnaires, and methods of analysis. Detailed discussions were held with the GIZ staff and other organisations involved in the research studies as per the objectives of the assignment. Some documents were also referred for deeper understanding of the project, stakeholders and the communication gaps and needs i.e.

- 12th Meeting of the Conference of the Parties to the Convention on Wetlands (Ramsar, Iran, 1971): Resolution XII.9
- Handbook 6: Wetland CEPA
- ICZM Report of World Bank on communication assessment of Marine National Park

Based on the above discussions, field visits and referred documents, CEC identified the need for information in terms of covering all stakeholders to create a universe of stakeholders truly representative of the project sites and according to the priority of the project.

Overview of Project Sites

Gosa Bara Wetland – Madhavpur: The Gosabara creek forms a part of the Mokarsagar-Gosabara wetland complex. Waterbird census records provided by local birdwatchers indicate presence of over 100 waterbird species. Recently fishing within the wetland complex has been banned by the Forest Department to reduce anthropogenic stress on migrating waterbirds. Discharge of untreated waste from Porbandar City and industrial areas is a major threat to the site. Post monsoon, the exposed beds of Mokarsagar are subject to extensive grazing altering natural soil profiles and damaging bird-nesting site. Around 40 villages dot the margins of the wetland complex. The closest settlements are village Mokar, Gosa, Tukda Gosa and Madhavpur. Mokar and Tukda Gosa are the upstream and downstream villages selected for the baseline research. Educational institutions comprise a larger percentage of the universe followed by NGOs and government departments. The stakeholders comprise photographers, birdwatchers, guides, NGOs, and government departments.

Field Visits

Meeting and Field-visit to Finalise Methodology and Framework of Baseline Studies: TheCEC team undertook field missions along with the GIZ team and other partner organisations to the site in Gujarat from Dec 02 – 04, 2015. During the field missions, discussions were held on the methodology and key questions to create synergies between the various research studies. The team also had intense discussions on the catchment area of the project sites. The universe and the sample size of the awareness baseline were also reviewed and the forest department of both the sites provided strategic inputs.

Preliminary Visit: TheCEC senior researchers visited both the project site from Jan 06 – 12, 2016 to finalise the sample size and to carry out a concept pretesting of the tools for understanding the knowledge level of the NGOs, bird watchers, tourist, government officials, photographers, tourists, villagers and general public on the indicators of the study. The tools and sample size was accordingly finalised.

Review Meeting: The CEC Team Leader attended the Midterm review meeting on 7 March 2016 at the CCF MNP office, Jamnagar. During this meeting an overview, methodology, and the baseline research key findings in the form of graphs and tables were presented.

Sample Size and Respondents

Table 1: Gosa Bara Wetland – Madhavpur (Porbandar), Gujarat

S No	Stakeholders	Total No (Universe)	Sample Size	Total Respondents
1.	Villages[5]	4	2	40
2.	Colleges & University	7	2	30
3.	Schools	10	3	45
4.	Tourists	67	20	20
5.	General Public	60	20	20
6.	Wildlife Photographers and Bird Watchers	10	3	3
7.	Guides and Tour Operators	3-4	4	4
8.	NGOs [6]	9	9	9
9.	Govt Departments[7]	6	6	6
	Total			**177**

Research Tools

The baseline research was conducted through a mix of quantitative (interview schedule for Villagers, school and college students, teachers, guides, tour operators, photographers, bird watchers, tourists and general public) and qualitative research (discussion guidelines for Government officials, NGOs and Corporates).

Gosa Bara Wetland – Madhavpur (Porbandar), Gujarat

1. Villages: Mokar, Gosa, Tukda Gosa and Madhavpur

6 NGOs:Mokar Sagar Wetland Conservation Committee, Next Gen Nature Club, Green Wildlife Conservation Society(GWCS) Nature Club, Prakriti The Youth Society, Nature Club Porbandar, Fishermen Association, Bird Conservation Society, Sakhi Mandal, Lohana Maha Parishad

7 Govt Departments:, Irrigation Department, Salinity Control Division, Director of Fisheries,Gujarat Maritime Board, District Collector's Office, District Development Officer

Analysis

The data gathered during the field visits in January and February 2016 were scrutinized and coded in the field by the interviewers and later in the office for consistency. The data entry and analysis has also been done. The results are disaggregated by project sites and by gender, occupation, age, and target groups.

The individual level of general awareness of all stakeholders in terms of their understanding and awareness of the biodiversity and environment issues has been assessed. Analysis was done on the knowledge level on some of floral and faunal species found in the project sites; benefits both tangible and intangible derived by the stakeholders; threats & solutions for the project sites; stakeholder's connectedness with the project sites; and their communication needs. Information was taken on what kind of communication mediums were preferred by stakeholders in their daily life. Respondents' future perception of the project sites was also taken. Suggestions were also taken from the respondents on the communication activities that can be conducted for increasing the awareness level of the stakeholders on the project sites.

Timeline and Deliverables

Table 2: Baseline Research Timeline and Deliverables

S No	Tasks and Deliverables	Timeline
9.	Assignment started	November 16, 2015
10.	Draft methodology and plan for baseline study is submitted	December 01, 2015
11.	Draft methodology and plan for baseline study is presented at a meeting in Gandhinagar, Porbandar and Jamnagar	December 02 - 04, 2015
12.	Final methodology and plan for baseline study is submitted	December 18, 2015
13.	Interim report submitted	January 05, 2016
14.	Conducting baseline research	January 06 – 12 and Feb 07 - 17, 2016
15.	Submission of draft report	February 29, 2016
16.	Midterm review meeting	March 07, 2016

BASELINE RESEARCH ANALYSIS AND KEY FINDINGS

Baselines are the "point zero" from where to measure the change from an intervention. A baseline is used to measure and observe progress from a starting point. Hence, its purpose is instrumental to facilitating reflection and reporting of change.*(IUCN: Monitoring and Evaluation in Livelihoods and Landscapes).*

The "Baseline Research on the Awareness on Biodiversity in Selected Marine and Coastal Areas" resulted from various sources. It comprised drawing up a questionnaire for each stakeholder group, a situation analysis "of the state and condition of people and ecosystem (including identification of trends and pressures), identification of major issues related to people and ecosystems that require attention, an analysis of key stakeholders – groups of people and institutions with a right, mandate and/or interest in resources and their management in the geographic area of the potential project". *(IUCN: Situation Analysis – An Approach and Method for Analyzing the Context of Projects and Programme)*, and collection of data from various stakeholders to be able to establish a benchmark on the awareness on biodiversity in selected marine and coastal areas at the project site, Gosa Bara Wetland Complex, Porbandar and recommend impact-oriented information, education and communication strategies through a mix of quantitative and qualitative research. This section will present the inferences from the baseline research analysis conducted under several parameters and put forth the key findings of the study.

The target audience at the project site was surveyed on a range of parameters to arrive at a holistic picture on their levels of awareness on the biodiversity in their region and critical issues related to it, which influenced their lifestyles. The parameters spanned their awareness levels on general environmental & conservation issues and specifically related to the site; the benefits they derive from site-specific ecological resources; their levels of willingness to change behaviours towards conserving the coastal environment; how they perceive the future with respect to the state of the environment, and finally, their communication needs – how do they best access information and knowledge related to their natural environment and what it means to them. A detailed analysis of these parameters helped CEC to arrive at key findings for the Gosa Bara Wetland Complex, Porbandar.

Respondent Information

The baseline in Porbandar started out with the first step: understanding the profile of the respondents, which would significantly determine their response on issues related to the biodiversity of the region and its linkages with their lives. While conducting the survey, villagers returned the highest number of response, followed by the teachers, tourists, public and the students. Most of the villagers had not studied beyond class 10 while many were illiterate. Higher levels of education, comprising largely graduates, was found among the tourists, public, teachers, and the students, respectively. Villagers were found to be engaged primarily in farming, with the maximum number of respondents across the categories of public, teachers, and tourists holding private jobs. Monthly income across categories largely did not exceed Rs 50,000/-.

Table 3: Respondent's Occupation

(in percentage)

Occupation	Villagers	School Students	College Students	General Public	Tourist	Teachers	Wildlife Photographers	Guides
Govt service	3	-	-	20	15	56	0	25
Private job	0	-	-	10	25	36	0	25
Unemployed	10	-	-	10	5	0	0	0
Farming	63	-	-	0	0	0	0	0
Fishing	0	-	-	5	0	0	0	0
Daily wage labour	5	-	-	0	0	0	0	0
Business	5	-	-	25	25		100	50
Housewife	13	-	-	15	15	8	0	0
Retired	0	-	-	10		0	0	0
Not Applicable	3	100	95	0	5	0	0	0
Others	0	0	5	5	10	0	0	0

Awareness Level on Environment and Biodiversity Issues

Equipped thus with an understanding of the demographic, social and economic profile of the region, the survey sought to focus on the key topic: understanding awareness levels on biodiversity. Not many people had a clear understanding on what exactly the term biodiversity meant with 86% defining it incorrectly.

Table 4: Understanding Biodiversity Concepts

(in percentage)

Response	Villagers	School Students	College Students	General Public	Tourists	Total
Yes	**3**	**10**	**50**	**0**	**20**	**14**
No	**98**	**90**	**50**	**100**	**80**	**86**

From the villagers, to the school and college students to the general public, what the term biodiversity encompassed was not clearly understood. When asked specifically whether biodiversity meant a variety of plant, animal, crops and minerals on Earth, the maximum number of responses in the affirmative came from teachers, college students, and tourists. While the least understanding of the term biodiversity, even when specific options were clearly given, was seen among the villagers, conversely, when asked if biodiversity loss meant fewer resources, the highest response in the affirmative came from them. This pattern points to the fact that while specific technical terms might not be understood by them, the villagers do feel the impacts of the loss of biodiversity in their lives and hence, were able to point out that natural resources were dwindling. The concept of ecological imbalance was best understood by the educated segment of the target audience comprising teachers, school and college students. On the reasons for the loss in biodiversity, the highest comprehension on the reasons for the losses listed – pollution, deforestation, increase in human population, indiscriminate use of natural resources and habitat destruction – could be seen in the students. Apart from the students, the general public agreed to a huge extent that factors listed were responsible for the loss of biodiversity.

Teachers felt that biodiversity loss was leading to a diminishing of natural beauty, which act as natural stress soothers and constitute a major tourist attraction. The weather had "changed", people were not as connected to nature as was seen in the older days, and industrial waste was polluting natural resources.

Extinction of animal and bird species, climate change, loss of forest cover and scarcity of water has emerged as the best understood impacts of loss of biodiversity. Respondents have not been able to link the rise in infectious diseases with the loss of biodiversity. It has been very heartening to note that very few people have not felt the impacts of loss of biodiversity, with the majority feeling the impact of the loss in some way or the other. Villagers dependant on agriculture for their livelihood feel that rainfall is not as abundant as before due to the loss of biodiversity and the salt pan work has reduced the fertility of the land has decreased. A ban on the saltpan work was also suggested to prevent degradation of the land. When people are questioned on a broad term such as "What are the impacts of biodiversity loss", the response seen is mostly an "I do not know" but when presented with specific options such as loss of natural cover, change in climate, scarcity of water, the term has been better understood and the response more forthcoming. Following the three R's – Reduce, reuse, recycle and halting deforestation have emerged as the best solutions to conserve biodiversity while other suggestions have been stopping saltpan work. Educated segments of students, teachers and the tourists have suggested raising awareness via seminars, peoples participating, ban on dumping waste in water bodies, strict conservation laws, banning kite flying to prevent injuries to the birds, as impactful ways to conserve biodiversity.

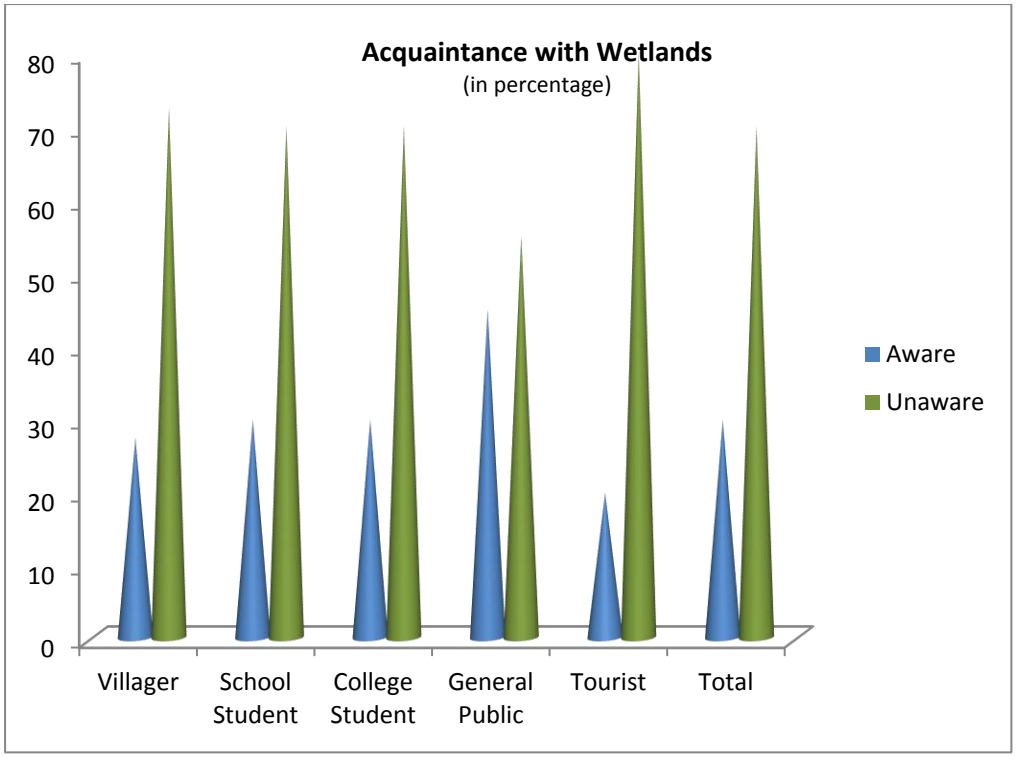
While villagers have some understanding (30%) on what wetlands are and their role in recharging groundwater, protecting from floods, and purifying water, they are not sure of its role in stabilizing climate conditions and controlling pests. In general, these two aspects are not well understood by villagers or the general public. Largely, students and teachers are aware of these two benefits of wetlands. Teachers have said that wetlands help biodiversity flourish by providing food and habitat for birds. Pollution and dumping of waste is considered the biggest threat to wetlands by more than 50% of the respondents. Excessive tourism and development are also perceived as major threats to the wetlands.

Table 5: Acquaintance with Wetlands

(in percentage)

Response	**Villagers**	**School Students**	**College Students**	**General Public**	**Tourists**	**Total**
Aware	28	30	30	45	20	**30**
Unaware	73	70	70	55	80	**70**

What then should be the solutions to conserve wetlands? Proper land use planning has been suggested by the majority as an important way to conserve wetlands. Efforts to prevent dumping and raising awareness among people on the benefits of wetlands in recharging groundwater and acting as natural flood controls while providing a flourishing habitat for birds is also perceived to be an important solution to conserving wetlands. An important suggestion from tour guides in the region has been to provide alternative livelihood options to the village youth.



Understanding of the term "coastal wetlands" is very low, standing at 8% only with college students showing the highest level of understanding. More than 50% of the cases surveyed in the project site have never heard about the terms Ramsar Site, Biological Diversity Act, 2002, Biodiversity Management Committee, or the People's Biodiversity Register. Overall, an above average level of awareness is observed among the respondents at the Gosa Bara Wetland Complex on general environmental and biodiversity issues related to the site.

Table 6: Understanding of Coastal Wetlands

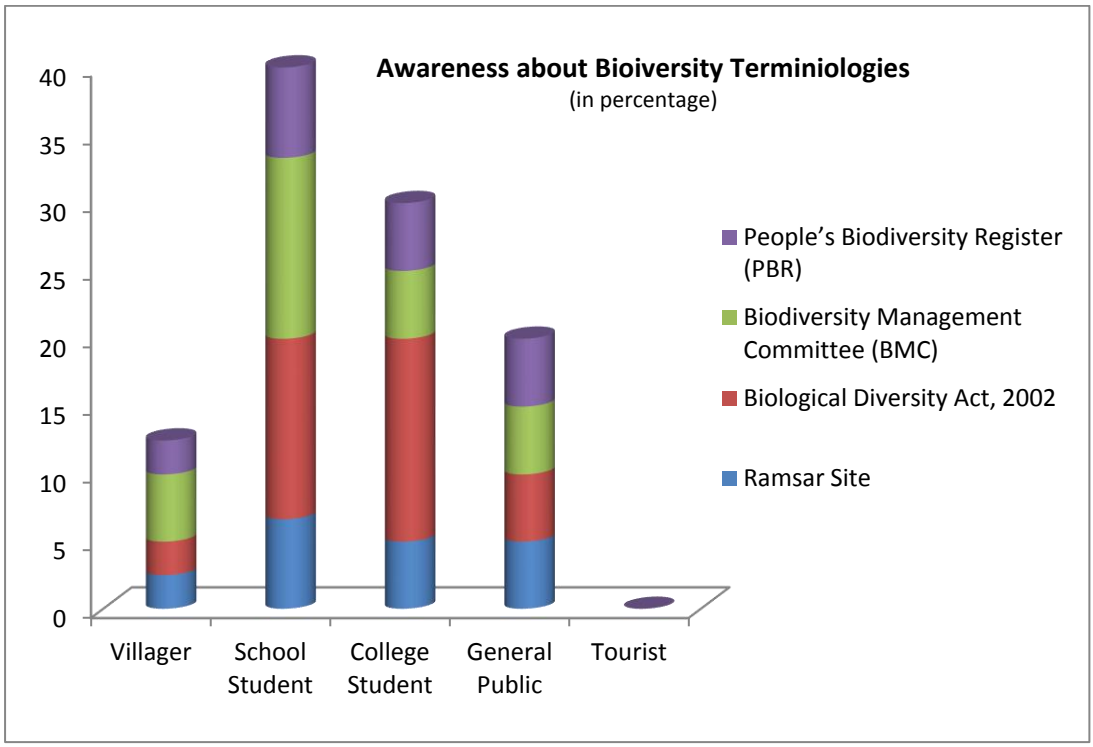
(in percentage)

Response	**Villagers**	**School Students**	**College Students**	**General Public**	**Tourists**	**Total**
Have knowledge	3	20	10	0	5	**8**
No knowledge	98	80	90	100	95	**92**

Table 7: Awareness about Biodiversity Terminologies

(in percentage)

Biodiversity Terminologies	Villagers	School Students	College Students	General Public	Tourists
Ramsar Site	3	7	5	5	0
Biological Diversity Act, 2002	3	13	15	5	0
Biodiversity Management Committee (BMC)	5	13	5	5	0
People's Biodiversity Register (PBR)	3	7	5	5	0



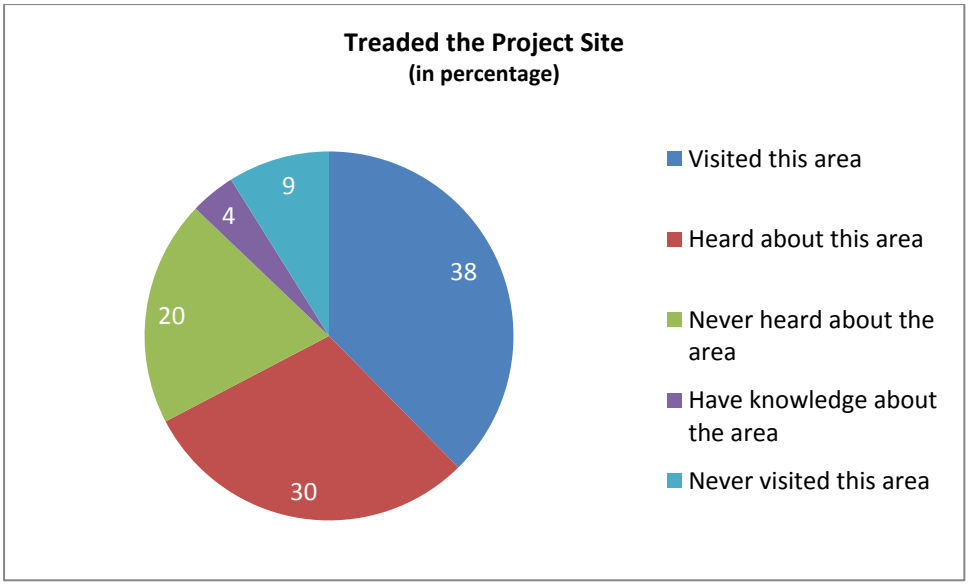
Site-specific Knowledge of Conservation Issues

Villagers, students and teachers, and the general public comprise the biggest numbers of visitors to the project site. Close to 38% have visited the area with around 30% having heard about it.

Table 8: Treaded the Project Site

(in percentage)

Response	Villagers	School Students	College Students	General Public	Tourists	Total
Visited this area	78	23	15	40	10	**38**
Heard about this area	15	43	50	50	10	**30**
Never heard about the area	3	27	30	10	50	**20**
Have knowledge about the area		3		10	10	**4**
Never visited this area	5	3	5	20	20	**9**

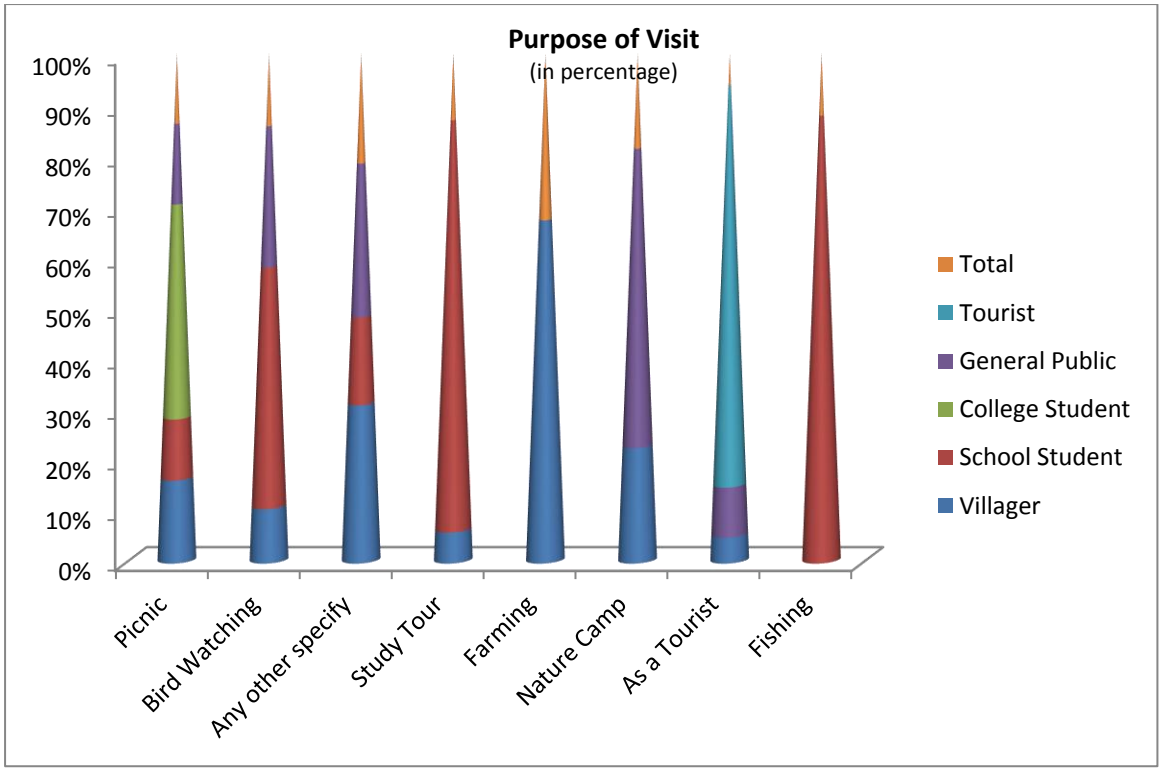


A leisurely trip as a picnic has taken almost 33% respondents there while for specialist groups such as wildlife photographers or tourist guides, the Gosa Bara Wetland Complex has been a birdwatchers delight, with weekly or fortnightly visits being the norm.

Table 9: Purpose of Visit

(in percentage)

Purpose	Villagers	School Students	College Students	General Public	Tourists	Total
Picnic	39	29	100	38	0	**33**
Bird Watching	10	43	0	25	0	**13**
Any other specify	26	14	0	25	0	**18**
Study Tour	3	43	0	0	0	**7**
Farming	23	0	0	0	0	**11**
Nature Camp	10	0	0	25	0	**8**
As a Tourist	6	0	0	13	100	**8**
Fishing	0	14	0	0	0	**2**



Respondents consider the importance of the site more as a wetland (36%) than specifically as a coastal wetland (19%) while a significant percentage (22%) do not know much about the importance of the site.

Table 10: Importance of Project Site

(in percentage)

Significance	**Villagers**	**School Students**	**College Students**	**General Public**	**Tourists**	**Total**
Coastal wetland	5	10	23	57	33	**19**
Wetland	57	29	23	14	17	**36**
Island	3	5	0	0	0	**2**
Protected area	0	10	15	0	33	**7**
Its biodiversity	3	29	15	14	0	**12**
No significance	0	5	0	7	0	**2**
Don't know	32	14	23	7	17	**22**

Having seen many birds at the wetland during their visit, 45% the respondents know that this area is known for birds while the 25% understand that these birds are specifically migratory birds.

Table 11: Linkage of Project Site

(in percentage)

Linkage with	Villagers	School Students	College Students	General Public	Tourists	Total
Birds	85	60	55	70	35	**45**
Migratory birds	43	50	35	30	5	**25**
Animals	8	3	0	35	0	**6**
Salt Pan	3	3	0	15	0	**3**
Medicinal plants and herbs	0	0	10	15	0	**3**
Mangroves	0	3	0	0	5	**1**
All	0	3	0	5	10	**2**
Don't know	10	27	30	5	50	**16**

When questioned with specific issues related to the conservation of this important wetland, a large number of respondents identified poaching of birds (16%), fishing (14%), decreasing water in the area (11%) and diminishing numbers of birds (10%) as the major conservation issues in the project site.

Table 12: Concerns Related to Project Site

(in percentage)

Conservation Issues	Villagers	School Students	College Students	General Public	Tourists	Total
Poaching of birds	18	27	25	35	15	**16**
Fishing is prevalent	23	10	20	35	15	**14**
No water in this area	25	7	0	30	15	**11**
Less no of birds visit this area	8	13	20	35	5	**10**
Water is used for agriculture	18	10	0	25	5	**8**
Excessive use of fertilizers and pesticides	0	3	15	10	10	**4**
Less fish/ food for birds	0	10	0	0	0	**2**
Sewage or water discharged in this area	3	0	25	15	10	**6**
All	3	7	5	10	5	**4**
Don't know	38	40	30	15	60	**25**

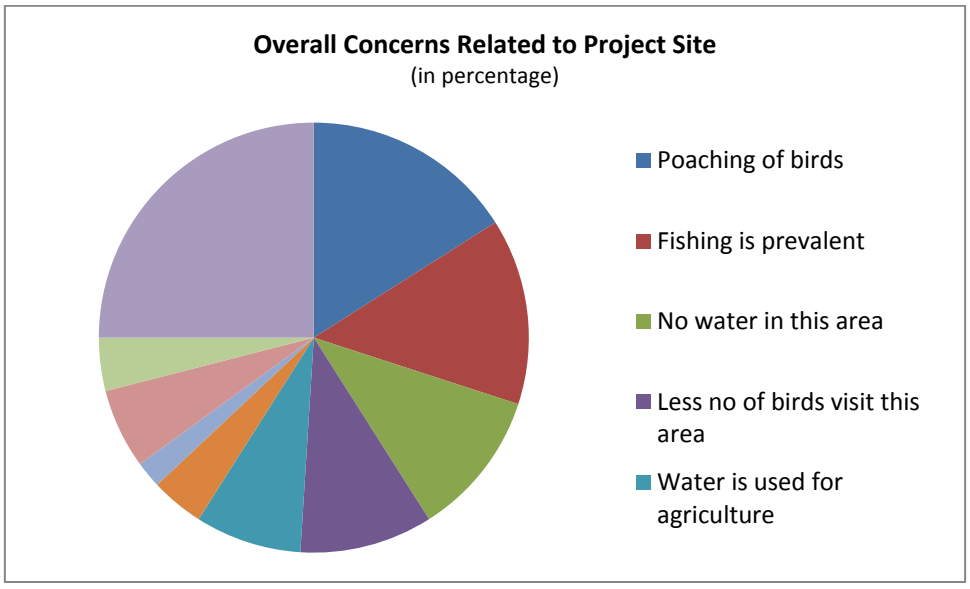
The issue of salination diminishing the fertility of the land is a recurring response and is a matter of concern to most respondents. Three major issues affecting the site negatively were identified as overfishing (14%), pesticide pollution (13%), and industrial waste (12%).

Table 13: Threats Impacting the Project Site

(in percentage)

Threats	Villagers	School Students	College Students	General Public	Tourists	Total
Over Fishing	35	20	5	30	15	**14**
Industrial waste	13	13	30	50		**12**
Pesticide Pollution	15	27	20	35	10	**13**
Changes in the landscape coming from the construction	5	7	20	35	15	**8**
Tourism	10	10	5	35	20	**9**
Encroachment	8	7	5	30	0	**6**
Salination	8	3	5	20	0	**4**
Mobile Towers	0	0	10	25	0	**3**
City's sewage	5	7	10	5	0	**3**
Invasive species	3	0	15	5	0	**2**
All	3	13	0	5	20	**5**
Don't know	33	33	40	10	55	**21**

There is not much knowledge of the different types of floral species that inhabit the wetland. The species is mainly used for fuel wood and to some extent for medicinal purposes. While most of the respondents consider overfishing, pesticide pollution and industrial pollution as the biggest threats to the conservation of the wetland, villagers have especially identified the three as being the biggest culprits threatening the conservation of the wetland.



As high as 73% are eager to recommend the site to their friends and family; most respondents feel that the villagers have a big role to play in maintaining the good health of the wetland and deriving its benefits.

Table 14: Recommendation to Visit the Project Site

(in percentage)

Response	Villagers	School Students	College Students	General Public	Tourists	Total
Recommend	78	67	75	75	70	**73**
Do not recommend	23	33	25	25	30	**27**

Role models who have a major role to play in the conservation of the wetland were identified as first the villagers as they are intrinsically connected with the land (27%), the government (19%), forest officials (13%), and the NGOs (13%).

Table 15: Role Model in Conservation of Project Site

(in percentage)

Role Model	Villager	School Student	College Student	General Public	Tourist	Total
Villagers	58	30	30	65	40	**27**
Government	20	53	35	35	15	**19**
Forest officials	23	23	5	35	20	**13**
NGOs	8	23	40	25	25	**13**
School	0	13	15	20	10	**6**
Fishermen	8	13	0	15	10	**6**
Eco Guides	0	7	5	5	0	**2**
Salt Pan Workers	0	3	0	5	0	**1**
All of the above	0	3	5	25	30	**6**
Don't know	25	10	5	0	5	**7**

Even though the understanding on the specifics and technicalities of the wetland, and biodiversity terms was not very high but its relevance in sustaining them was understood and hence, the wetland was valued largely by most of the respondents, resulting in an above average understanding of the site-specific issues among the target audience. A significant 38% valued the site to a great extent while 34% valued it to some extent.

Table 16: Value Assigned with Project Site as Conserved Area

(in percentage)

Value	Villagers	School Students	College Students	General Public	Tourists	Total
To a great extent	23	50	45	60	25	**38**
To some extent	35	37	25	25	45	**34**
To less extent	15	3	5	10	5	**8**
Not at all	13	0	0	0	5	**5**
Don't know	15	10	25	5	20	**15**

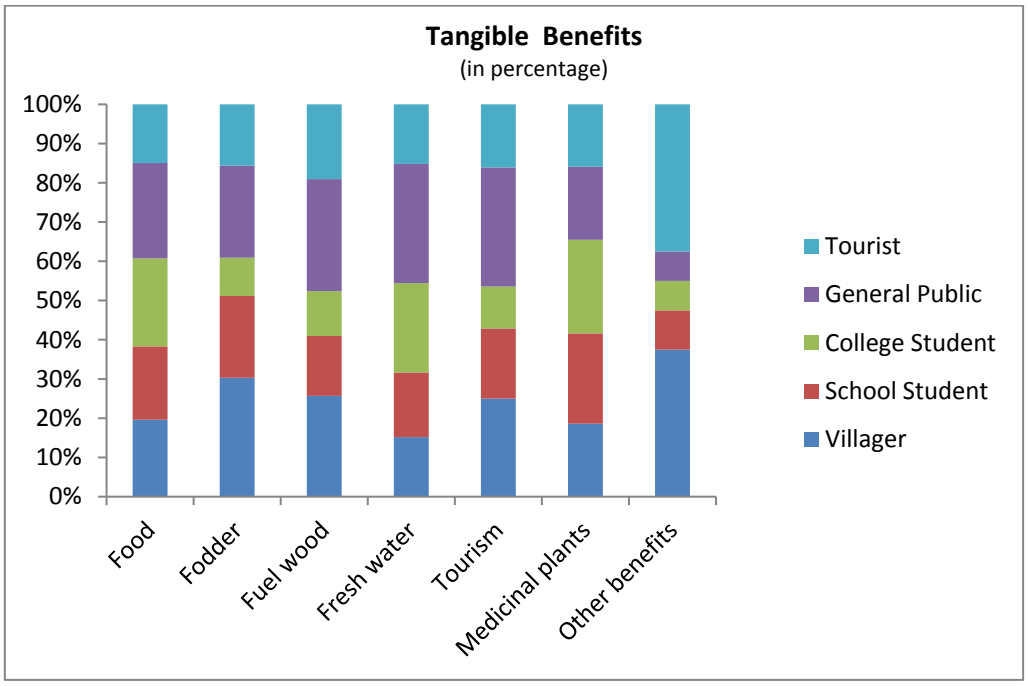
Benefits from Site-Specific Ecological Services

Respondents are largely aware that they get tangible benefits such as food (40%), fodder (40%), fuel wood (50%) and fresh water (40%) from the site. While there is awareness on the medicinal uses of the plants that the site yields, the understanding is comparatively lower compared to its uses for fodder, fuel wood and fresh water.

Table 17: Tangible Benefits

(in percentage)

Benefits	Villagers	School Students	College Students	General Public	Tourists
Food	53	50	60	65	40
Fodder	78	53	25	60	40
Fuel wood	68	40	30	75	50
Fresh water	40	43	60	80	40
Tourism	70	50	30	85	45
Medicinal plants	35	43	45	35	30
Other benefits	25	7	5	5	25



The site draws large numbers of tourists, which boosts the economy of the region, and this aspect iswell understood by the respondents.

The number of respondents who understand the intangible benefits, which the site yields, is comparatively lower than the understanding on the tangible benefits from the site. The response on intangible benefits which the site yields such as clean and pure air (30%), pride of the area (16%), erosion prevention and soil maintenance, capturing of waste carbon, pest control, pollination, maintenance of genetic diversity has been quite low.

Table 18: Intangible Benefits

(in percentage)

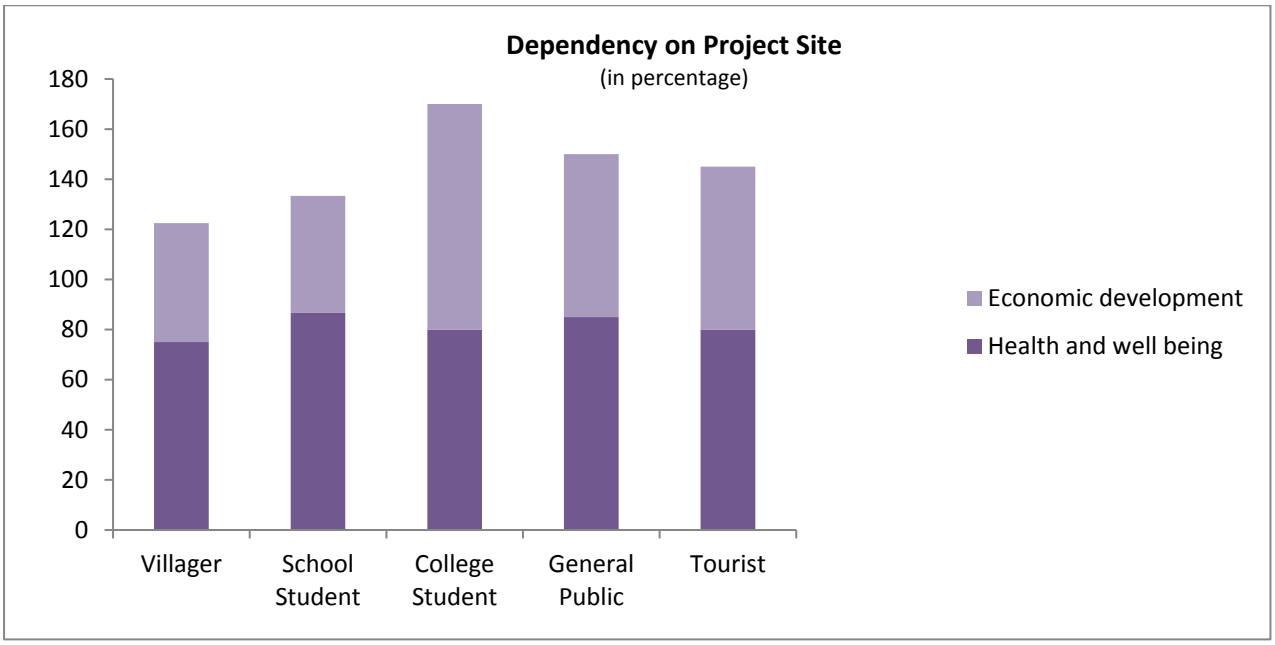
Benefits	Villagers	School Students	College Students	General Public	Tourists	Total
Clean and pure air	60	57	80	55	40	**30**
Pride of the area	30	33	15	40	40	**16**
Habitat for species	20	17	0	30	5	**8**
Health and wellbeing	5	20	0	30	30	**8**
Waste water treatment	13	23	15	15	30	**10**
Erosion prevention and maintenance of soil fertility	3	13	20	10	5	**5**
Aesthetic value	3	7	0	5	5	**2**
Recreational opportunities	0	3	10	15	5	**3**
Captures waste carbon dioxide	0	3	10	10		**2**
Pest control	0	0	0	20	15	**3**
Pollination	3	0	0	5	10	**2**
Maintenance of genetic diversity	0	7	0	0	0	**1**
All	3	7	0	10	0	**2**
Don't know	23	23	10	5	25	**10**

The response to the question that is their health and well-being dependant on the site has been a very confident “yes”, standing at 80% with students returning the most assertive response and villagers following close behind. The link between the health of the site and economic development is understood to a lesser extent at 65%. Perhaps the benefits are taken as something which should come to them naturally and are taken as granted and hence, they are valued only “to some extent” by a majority of the respondents.

Table 19: Dependency on Project Site

(in percentage)

Value	Villagers	School Students	College Students	General Public	Tourists
Health and well being	75	87	80	85	80
Economic development	48	47	90	65	65

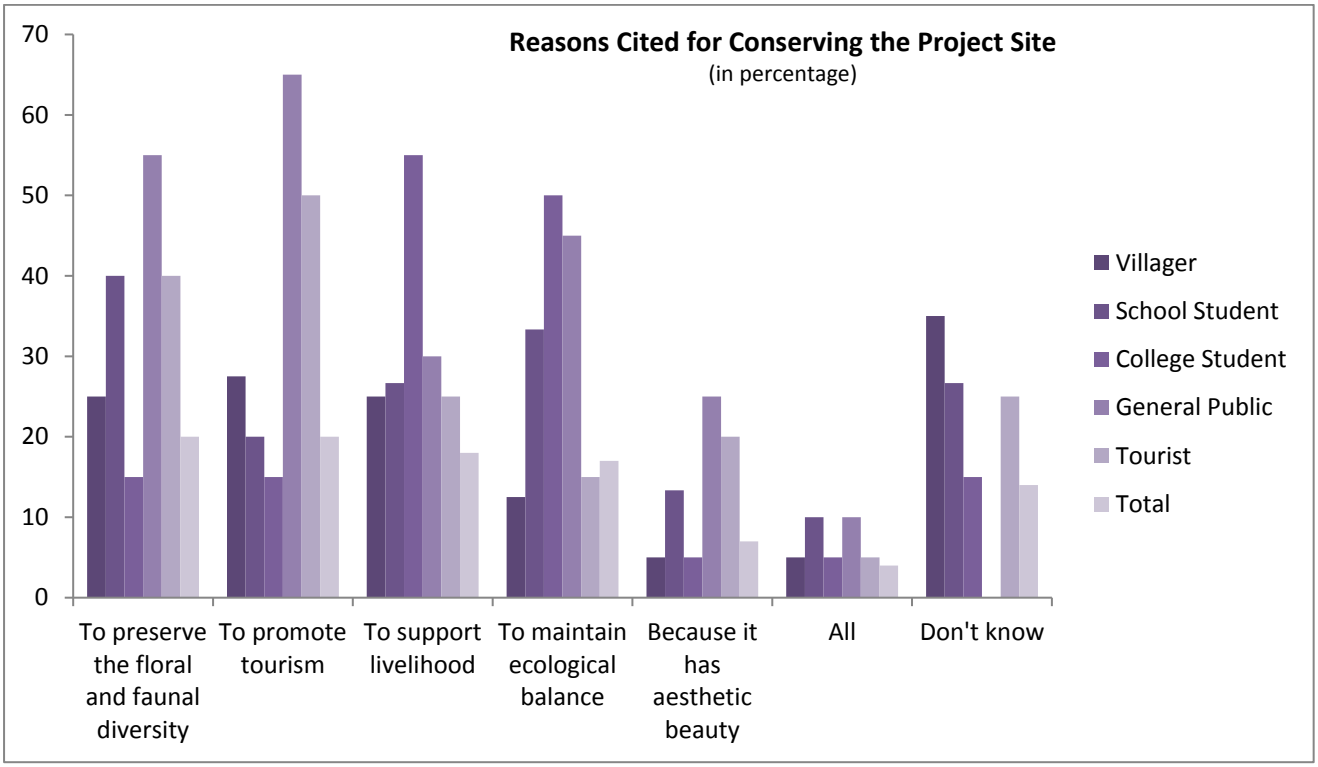


The response has been moderate towardsthe query on preservation of the site for floral and faunal beauty (20%), tourism (20%), livelihood (18%), and promoting ecological balance (17%). On the contrary, many villagers feel the land should not be protected as it diminishes the value of the land.

Table 20: Reasons Cited for Conserving the Project Site

(in percentage)

Reasons	Villagers	School Students	College Students	General Public	Tourists	Total
To preserve the floral and faunal diversity	25	40	15	55	40	**20**
To promote tourism	28	20	15	65	50	**20**
To support livelihood	25	27	55	30	25	**18**
To maintain ecological balance	13	33	50	45	15	**17**
Because it has aesthetic beauty	5	13	5	25	20	**7**
All	5	10	5	10	5	**4**
Don't know	35	27	15	0	25	**14**



Traditional knowledge and practices existing in the region also contribute in the conservation of the project site. People generally take care of the food and water needs of the birds around the villages and fields. They feed the birds and provide water. Local efforts have also been towards saving Porbandar and its surrounding villages from flooding.

An average level of understanding has been seen in the respondents on the site-specific benefits. There is a greater understanding on the tangible benefits, and these are perceived to be more as what should be accruing to them naturally and not too much as things they should be seriously looking to conserve or protect. Close to 32% understand the value of benefits to a great extent and 42% value it to some extent.

Table 21: Value of Benefits

(in percentage)

Value	Villagers	School Students	College Students	General Public	Tourists	Total
To a great extent	10	23	45	65	40	**32**
To some extent	38	53	50	25	40	**42**
To less extent	18	0	0	5	5	**7**
Not at all	18	3	0	0	5	**7**
Don't know	18	20	5	5	10	**13**

Livelihood concerns are also a major reason on why they feel the site should not be protected as it will curtail the benefits of fuel-wood etc, which they derive from the site. 10% feel they get no benefits from the site while 6% take the benefits for granted and as their natural right.

Table 22: Why Benefits are not Valued

(in percentage)

Reasons	Villagers	School Students	College Students	General Public	Tourist	Total
I don't get any such benefits	18	13	0	0	10	**10**
It is my right as I live in this area	8	7	5	0	10	**6**
Its not helping in the family income/ livelihood	3	7	0	0	0	**2**
I am not depending on this area for anything	0	7	0	0	5	**2**
Don't know	78	77	95	100	75	**80**

Initiatives and Willingness for Conserving the Coastal Environment

Conservation efforts to protect the site have not been satisfactory, feel most of the respondents, and while not completely, 45% would like to be involved to "some extent" in activities to conserve the site.

Table 23: Perception of Engagement in Conservation Efforts

(in percentage)

Perception	Villagers	School Students	College Students	General Public	Tourists	Total
To a great extent	20	40	15	35	20	**26**
To some extent	40	40	80	60	15	**45**
Not at all	15	0	0	5	25	**9**
Don't know	25	20	5	0	40	**19**

According to them, even though they would like to, they have not been actively involved in the conserving the coastal environment as they are not sure what they should do and how should they go about engaging in conservation activities. There is a tentative willingness to change attitudes and behviours towards conservation. The hesitation to throw oneself completely into it stems largely from the lack of awareness on how it could affect them, on concerns that it could reduce livelihood opportunities. On conservation efforts, 62% are somewhat satisfied with the efforts which shows that there is expectation to do more towards site conservation.

Table 24: Satisfaction Level with Conservation Efforts

(in percentage)

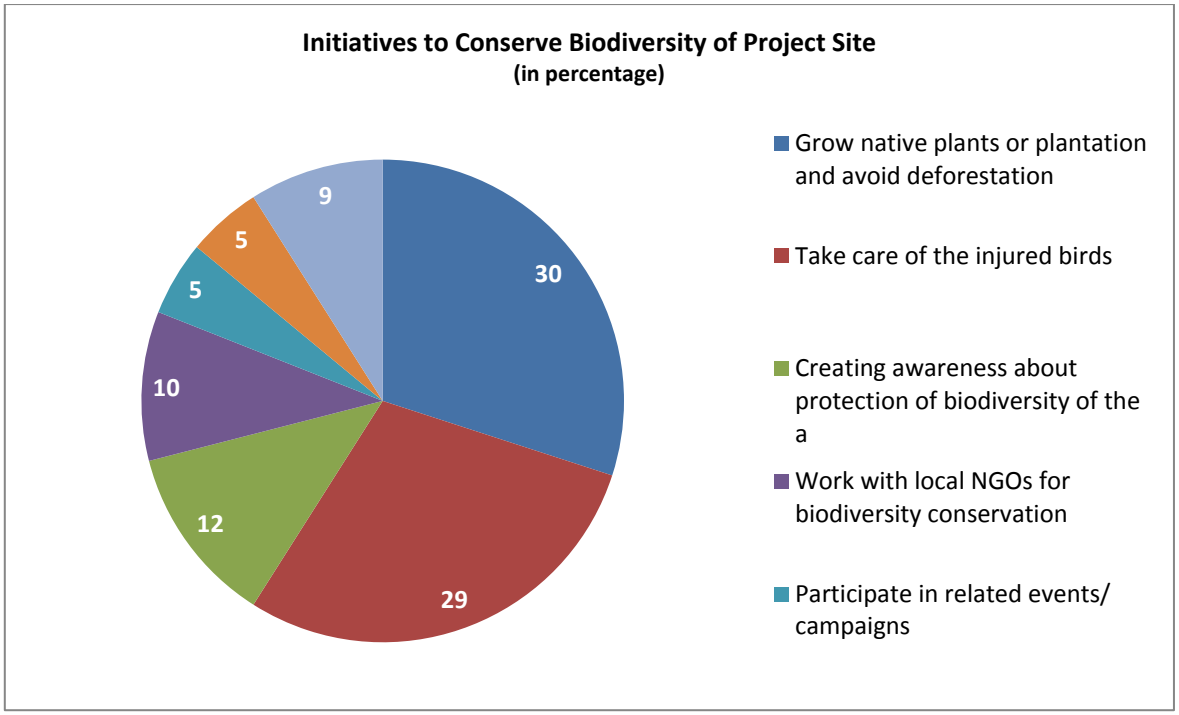
Level	Villagers	School Students	College Students	General Public	Tourists	Total
Very satisfied	33	23	30	45	20	**30**
Somewhat satisfied	60	67	70	45	70	**62**
Not satisfied	8	10	0	10	10	**8**

Villagers and the general public are generally willing to help in conservation but with the help of NGOs or the Government; they would like to take care of the injured birds; prevent pollution; engage in native tree plantation; use organic products, and attend awareness programmes. Teachers would like to contribute by organising awareness programmes in their schools and colleges; specialist groups such as tour guides would like to join in the conservation efforts by creating awareness among visitors about the wetland, keeping the project site clean and noise free, and also informing the visitors about the various flora and fauna present at the project site. Another specialist group, the bird watchers, would like to encourage bird nesting and very interestingly, distribute bird nests as return gifts on birthdays. All the stakeholders displayed a willingness to engage in activities that would create awareness on keeping the project site clean and pollution free.

Table 25: Initiatives to Conserve Biodiversity of Project Site

(in percentage)

Initiatives	Villagers	School Students	College Students	General Public	Tourists	Total
Grow native plants or plantation and avoid deforestation	63	80	50	50	65	**30**
Take care of the injured birds	63	57	65	75	45	**29**
Creating awareness about protection of biodiversity of the a	23	40	25	20	15	**12**
Work with local NGOs for biodiversity conservation	5	23	50	25	15	**10**
Participate in related events/ campaigns	3	13	20	25	5	**5**
Report any wildlife crime to the concerned authority	13	13	15	15	0	**5**
Don't know	25	7	5	25	25	**9**



Vision of the Future State of the Environment

Biodiversity is seen as "very important" to their future by 59% respondents who would like to see the site rich in floral and faunal diversity, attracting more tourists and as an area of international importance, though understanding on the future state of the environment has been seen to be "average".

Table 26: Perception of Biodiversity as an Important Issue

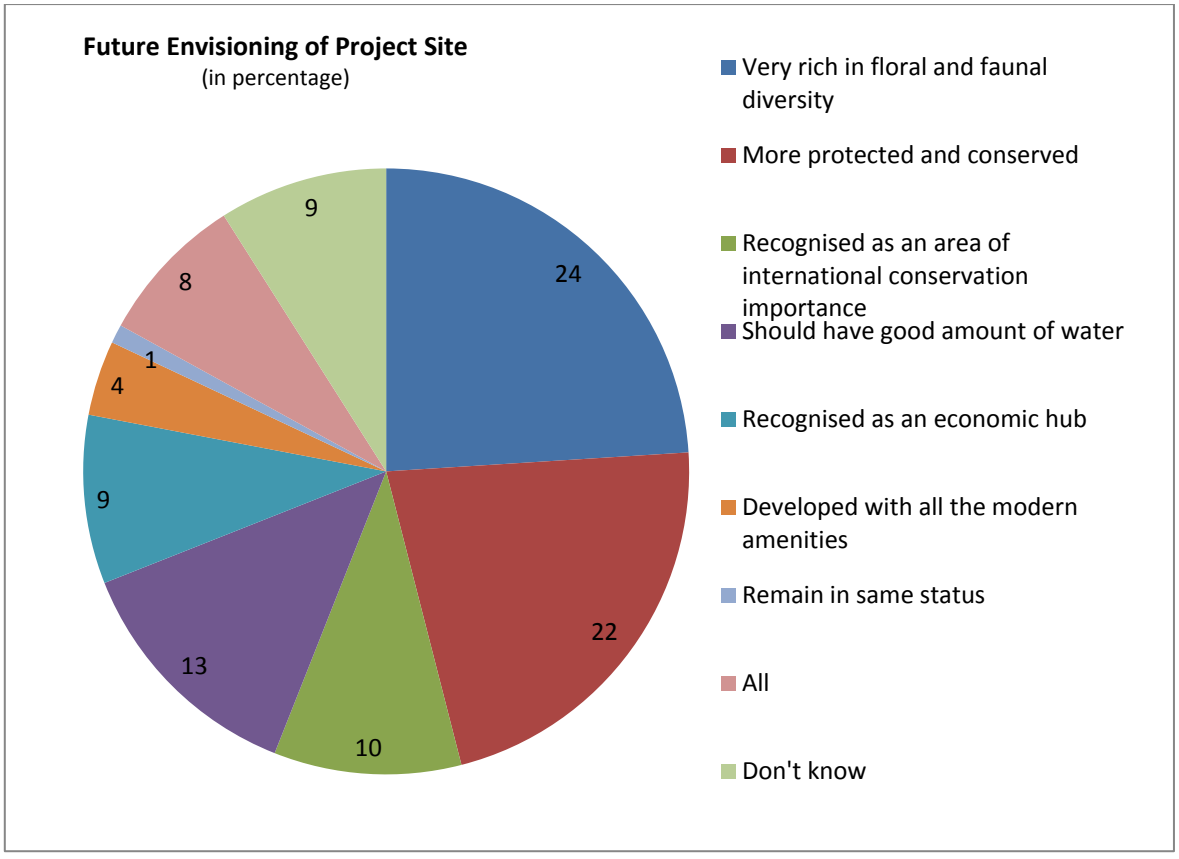
(in percentage)

Perception	Villagers	School Students	College Students	General Public	Tourists	Total
Very important	43	70	65	65	65	**59**
Somewhat important	23	20	35	30	30	**26**
Not too important	5	0	0	0	0	**2**
Not a problem	0	0	0	0	0	**1**
Don't know	30	10	0	0	5	**12**

Table 27: Future Envisioning of Project Site

(in percentage)

Response	Villagers	School Students	College Students	General Public	Tourists	Total
Very rich in floral and faunal diversity	30	60	30	45	40	**24**
More protected and conserved	18	40	70	35	40	**22**
Recognised as an area of international conservation importance	8	13	30	30	15	**10**
Should have good amount of water	10	23	25	40	20	**13**
Recognised as an economic hub	3	10	20	35	25	**9**
Developed with all the modern amenities	0	7	0	20	15	**4**
Remain in same status	5	0	0	0	5	**1**
All	13	20	0	20	10	**8**
Don't know	33	13	0	0	10	**9**



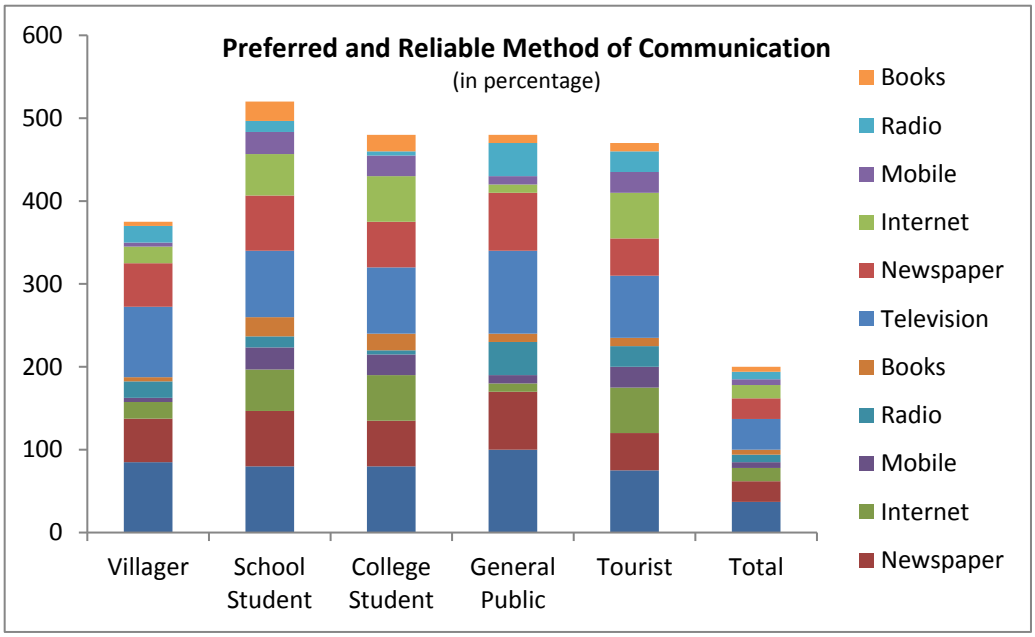
Communication Needs

One of the most important aspects towards gauging the level of understanding of the respondent group on biodiversity issues is to understand how they get their information, the communication modes available, accessible and preferred by the respondents. Villagers, general public and guides mostly read regional newspapers such as Sandesh, Gujarat Samachar, Jai Hind, Ful Chab, Divya Bhaskar. Teachers, bird watchers, tourists and students read both regional and national newspapers i.e. Times of India, Indian Express, Telegraph and The Hindu.As a mode of obtaining information, television is preferred more (37%) than the newspaper (25%) while accessing the internet as a mode of information is seen more in students, tourists and teachers rather than the villagers and the general public. The television and newspaper are the preferred sources of information over other communication modes as these are seen to be more reliable and easily available.

Table 28: Preferred and Reliable Method of Communication

(in percentage)

Communication Methods	Villagers	School Students	College Students	General Public	Tourists	Total
Television	85	80	80	100	75	**37**
Newspaper	53	67	55	70	45	**25**
Internet	20	50	55	10	55	**16**
Mobile	5	27	25	10	25	**7**
Radio	20	13	5	40	25	**9**
Books	5	23	20	10	10	**6**



News on environment and science are the two top issues respondents are most interested in. Apart from the television and newspaper as preferred and reliable modes of seeking information, the respondents also seek out relevant and reliable information on environment in general and biodiversity specifically from their peer groups, teachers, eco-clubs and the Panchayat. Students, teachers, tourists and the general public have also cited books, nature education camps and government documents as an important source of information.

Around 47% have participated in awareness activities while almost a similar percentage, 49%, has not participated in any awareness activity.

Table 29: Participation in Awareness Activities

(in percentage)

Response	Villagers	School Students	College Students	General Public	Tourists	Total
Participated	43	59	60	44	26	**47**
Didn't participate	54	38	40	50	63	**49**
Don't remember	3	3		6	11	**4**

Those that have participated have found the activities to be very useful in raising awareness (46%) while 33% have found it useful to some extent.

Table 30: Positive Impact of Awareness Activities

(in percentage)

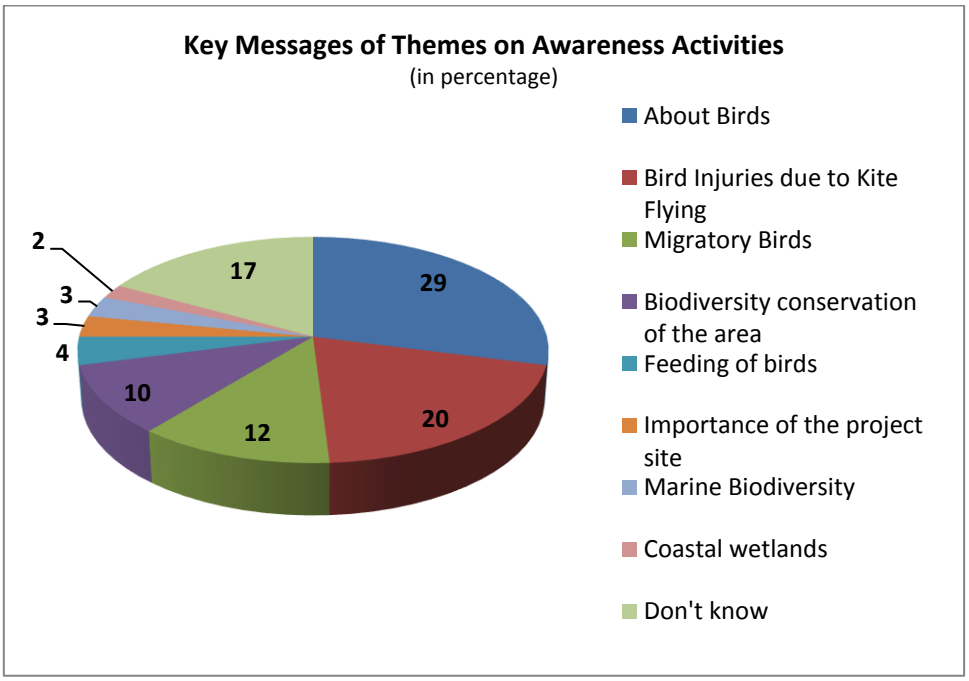
Impact	Villager	School Student	College Student	General Public	Tourist	Total
Very useful	35	67	55	40	35	**46**
Useful to some extent	33	23	40	50	25	**33**
Not much useful	3	0	0	0	0	**1**
Not at all useful	3	0	0	0	5	**2**
Don't know	28	10	5	10	35	**18**

The key messages identified from organized activities such as fairs, workshops and camps activities identified by respondents have largely been about birds (29%), in general, and injuries to birds due to kite-flying (20) and about migratory birds (12%).

Table 31: Key Messages or Themes of Awareness Activities

(in percentage)

Messages/ Themes	Villagers	School Students	College Students	General Public	Tourists	Total
About Birds	50	47	20	55	60	**29**
Bird Injuries due to Kite Flying	15	33	60	45	30	**20**
Migratory Birds	15	23	25	35	5	**12**
Biodiversity conservation of the area	3	23	15	35	15	**10**
Feeding of birds	3	7	5	10	10	**4**
Importance of the project site	3	7	15	5		**3**
Marine Biodiversity	0	7	5	0	15	**3**
Coastal wetlands	5	0	5	0	10	**2**
Don't know	43	20	15	25	25	**17**



Such activities were primarily perceived as being targeted towards students and the general public; these have been seen to be very effective and important in creating awareness and motivating people to conserve the rich biodiversity of the project site, across respondent groups.

Table 32: Target Audience for Awareness Activities

(in percentage)

Target Audience	Villagers	School Students	College Students	General Public	Tourists	Total
School children	25	47	55	65	30	**27**
General Public	25	20	40	40	25	**19**
Teachers	8	10	30	30	35	**13**
Villagers	38	7	35	30	5	**16**
Don't know	35	27	5	10	20	**15**
All	5	13	15	20	25	**9**
Tourists	0	7	5	5	10	**3**

A crucial aspect is the general lack of time (21%), lack of interest (19%) and language barrier in understanding conservation issues. One reason is the low levels of literacy at the project site. However, an important and recurring response has been that designating the site as a protected area and too many conservation activities will mean that the natural resources have been "taken away from them" and a "loss of livelihood" to the stakeholders. Alternative livelihood options are not available and hence, site conservation is not high on the priority list neither is it much desired.

Table 33: Key Barriers in Creating Awareness for Behavioural Change

(in percentage)

Barriers	Villagers	School Students	College Students	General Public	Tourists	Total
Lack of interest in the issue	28	43	45	65	55	**19**
Lack of time	35	43	60	60	60	**21**
Language	33	23	25	35	45	**14**
Have other priorities	18	13	45	25	35	**11**
Lack of knowledge about the subject	15	13	20	40	10	**8**
Lack of resources	10	23	25	20	25	**8**
Use of technical language	23	23	10	10	10	**7**
Family's disapproval	8	33	15	25	0	**7**
Don't know	13	10	0	5	5	**3**

Regular and sustained interventions by NGOs and clubs such as the Lions Club and the Rotary Club, free awareness camps, a Nagar Palika Award, and regular media coverage of positive environment conservation efforts, rallies, and regular advertisement s on conservation issues related to the project site in newspapers and on preferred television channels have been suggested as impactful methods to raise awareness and get more people involved in conserving the biodiversity of the Gosa Bara Wetland Complex.

Table 34: Motivational Tools to Conserve Biodiversity

(in percentage)

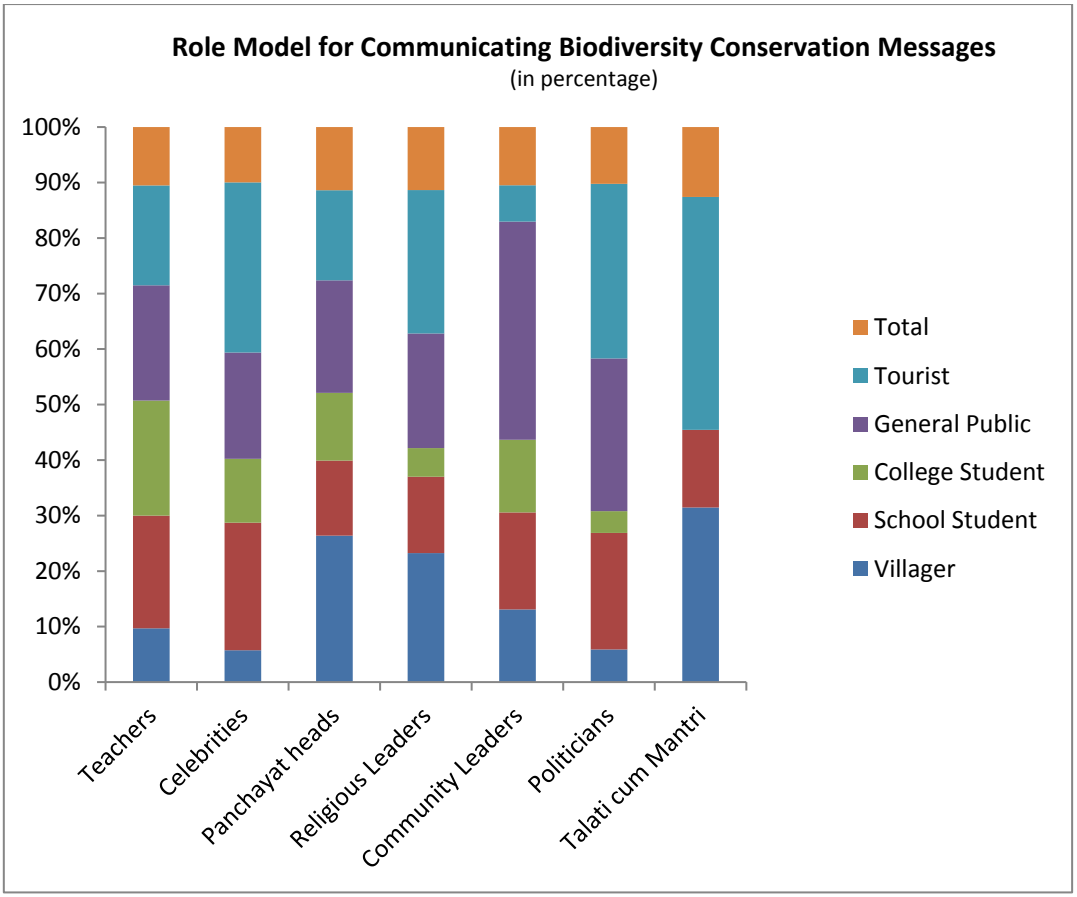
Tools	Villagers	School Students	College Students	General Public	Tourists	Total
Reinforce conservation messages through different activities	50	50	50	45	45	**35**
Frequent Campaigns	13	33	20	65	40	**22**
Felicitate the champions with Green ambassador awards	10	10	25	45	20	**14**
Provide economic incentives	8	23	20	35	30	**15**
All	5	7	0	10	10	**4**
Don't know	28	7	15	0	15	**10**

Teachers (38%), celebrities (14%), Panchayat heads (14%), and religious leaders (11%) have an important role to play in motivating people towards conservation, according to the respondents. Sports personalities, bird watchers, and well-known environmentalists were identified as another important group of stakeholders who could help to motivate people in conserving the wetland.

Table 35: Role Model for Communicating Biodiversity Conservation Messages

(in percentage)

Role Model	Villagers	School Students	College Students	General Public	Tourists	Total
Teachers	35	73	75	75	65	**38**
Celebrities	8	30	15	25	40	**13**
Panchayat heads	33	17	15	25	20	**14**
Religious Leaders	23	13	5	20	25	**11**
Community Leaders	10	13	10	30	5	**8**
Politicians	8	27	5	35	40	**13**
Talati cum Mantri	8	3	0	0	10	**3**


Role Model for Communicating Biodiversity Conservation Messages
(in percentage)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Teachers
Celebrities
Panchayat heads
Religious Leaders
Community Leaders
Politicians
Talati cum Mantri
Total
Tourist
General Public
College Student
School Student
Villager

CONCLUSION AND RECOMMENDATIONS

The study "Baseline Research on the Awareness on Biodiversity in Selected Marine and Coastal Areas" was for establishing a benchmark on the information and awareness levels of relevant stakeholders in respect to the importance of conserving marine and coastal biodiversity in areas they are directly concerned with.

The benchmark indicators comprise:

- Individual level of general awareness on biodiversity issues.
- Site-specific knowledge of conservation issues.
- Knowledge about benefits derived from site-specific ecological services.
- Level of willingness to change personal behaviour (or income generating activities) in order to conserve the coastal environment.
- Perception of the future in respect to the state of the environment.
- Communication Needs

Overall, the level of understanding on issues related to the biodiversity and conservation concerns of the Gosa Bara Wetland Complex is above average, standing at 31%. College students have shown the highest levels of awareness followed by villagers, the general public and tourists. Where technical terms are introduced such as the Ramsar Site, Biodiversity Act 2002, or the BMC and the PBR, the responses have been vague.

Table 36: Biodiversity Awareness Level of the Affected Population

(in percentage)

Awareness	Villagers	School Students	College Students	General Public	Tourists	Total
Excellent	0	7	0	15	5	**5**
Very Good	3	20	0	15	20	**11**
Good	33	23	40	30	30	**31**
Fair	43	40	55	35	30	**41**
Poor	23	10	5	5	15	**13**

However, when specific options have been cited on the indicators, which they have been likely to experience in their daily lives, the responses have been more forthcoming, standing at an overall level of 42% with college students showing the highest awareness followed by villagers.

Table 37: Site-specific Knowledge Level

(in percentage)

Level	Villagers	School Students	College Students	General Public	Tourists	Total
Excellent	3	3	0	15	10	**5**
Very Good	8	27	15	25	10	**16**
Good	43	37	65	35	30	**42**
Fair	25	17	15	15	20	**19**
Poor	23	17	5	10	30	**18**

The overall knowledge level of respondents has been good at 44% which is good news for the project site as awareness goes a long way in inculcating positive behaviours towards environment conservation. Also hearteningly, villagers at 45% have shown a good level of knowledge on conservation issues, while college students due to higher levels of education have shown 65% understanding of issues.

Table 38: Knowledge Level of the Affected Population about Benefits Derived from Site-Specific Ecological Services

(in percentage)

Assessment	Villagers	School Students	College Students	General Public	Tourists	Total
Excellent	3	3		5	20	**5**
Very Good	8	20	15	35	10	**16**
Good	45	50	65	30	25	**44**
Fair	23	20	15	10	25	**19**
Poor	23	7	5	20	20	**15**

Significantly, a major concern, which has emerged from the baseline research, has been a general level of unwillingness to engage in conservation activity with only 40% willing to change personal behaviour towards conservation.

Table 39: Willingness Level to Change Personal Behaviour

(in percentage)

Willingness	Villagers	School Students	College Students	General Public	Tourists	Total
Very high	8	10	20	15	15	**12**
High	8	27	15	40	10	**18**
Average	40	43	55	35	25	**40**
Low	25	17	10	10	35	**20**
Very low	20	3	0	0	15	**9**

On the surface while, this is the story, there is an underlying concern on declaring the site as a protected area or stepping up conservation activities, which is worrying the respondents — once the project site is declared as protected, they will no longer be able to derive their sustenance from it such as fish, fuel wood, and medicines. The lack of alternative livelihood options and the cordoning off the site, as a protected will affect them negatively, which is why they are not too keen to engage in conservation activities.

Where organized activities, technical terms and the digital media come in, the response has been higher from teachers, students and tourists. Where the impacts are visible on the ground and the grass roots changes influencetheir daily activities, the villagers have been more forthcoming.

In terms of tangible benefits, the wetland yields irrigation to 14 villages while fishing is an important source of livelihood. The site also yields many intangible benefits to the people. It provides a good site for bird watching and photography; preserving the aesthetic value of the site will not only attract tourists but also prove to be a draw for the local population and the students while providing a thriving habitat for a variety of birds and fish.

With internet accessibility limited among the respondents owing to the low levels of literacy and awareness of the digital domain, television is the most preferred source of information followed by the newspaper. A regular, sustained intervention by the government, NGOs, and forest officers, though, is being seen as an impactful method to raise awareness levels on the biodiversity issues of the project site and get more people involved.

The perception levels with regards to the future state of the environment has been average at 45% with college students at 55% showing the highest future perception levels and villagers standing at 43%.

Table 40: Perception Level with Regards to Future State of Environment

(in percentage)

Perception	Villager	School Student	College Student	General Public	Tourist	Total
Very high	5	10	0	25	25	**12**
High	13	30	40	35	15	**25**
Average	43	53	55	35	40	**45**
Low	25	3	5	5	5	**11**
Very low	15	3	0	0	15	**8**

Providing people with alternative sources of livelihood is also seen as an important input, which will help to mould behaviours, and attitudes positively towards conservations as the livelihood concern will be then adequately met. When the daily struggle is to be able to earn a decent livelihood, conserving biodiversity might seem like an onerous task, though, the good health of the biodiversity is what will sustain the local population, in the end. Hence, regular awareness raising activities, workshops, fairs, government intervention, and raising the levels of education need to be intensively focused upon to establish the linkage between flourishing biodiversity health and flourishing local lifestyles.

Important Issues affecting Biodiversity of Project Site

Birds

- Poaching of birds.
- Windmills come in the route of migratory birds and kill them.

Mining

- Birds get killed after eating groundnuts and cumin seeds (jeera) which is full of pesticide.
- Chemical fertilizeris drained in the rainy season and affects the birds and fishes.

Overfishing

- Fishing nets is seen to be a major concern. Besides small fish, birds and snakes also are caught in Gosa Bara.
- Turtles get caught in the nets while fishing
- Labourers indulge in illegal fishing.

Initiatives taken for conservation by organisations

- Creating awareness among fishermen to release turtles and birds stuck in their nets and give free nets
- Banning heavy vehicles
- Prohibiting motor fishing
- Ban on fishing

Recommendations

- **Awareness activities** are making an impact. It has been reinformced that Govt should also provide alternate livelihood opportunities to fishermen to motivate them.
- **Lack of interest in the issue, lack of knowledge in the subject and lack of time are key barriers** for engendering behaviour change on biodiversity conservation.
- **Stakeholders are willing to be engaged in conserving the coastal biodiversity** provided they get the support from NGOs and Government.
- **Sustained intervention by NGOs, Govt and forest officers** in raising awareness on how conserving the biodiveristy of the site is directly linked to their economic and social well-being.
- **Willingness to change personal behaviour for conservation is directly related to dependance on project site.**

  Providing alternative livelihood options to the peopleneeds to be looked at actively so that they turn their attention to the conservation of the site and not look at it merely as a source of earning their livelihood.
- **Raising the education levels of the people** will go a long way in enabling their access to more information about why they should conserve biodiversity while opening their minds to biodiversity and its symbiotic importance in their lives.
- **Majority concerns on the salinity** declining the fertility of the land need to be addressed.
- **Most preferred role models** for communicating biodiversity conservation messages are community leaders and teachers, and their role in raising awareness needs to be expanded by intensifying their engagement via workshops.
- **Some of the stakeholders have not been able to correlate economic development with biodiversity** and the value of the benefits derived from the project site.Greater intervention by government, NGOs and experts needs to establish the seminal linkage.
- **More innovative suggestions** such as the one given by bird watchers on giving away birds's nests as return gifts on birthdays need to be explored.

About the Study

The "Baseline study on the Biodiversity awareness in Selected Marine and Coastal Areas in Gujarat" establishes a benchmark on the current information, awareness and appreciation levels of key stakeholders towards coastal and marine biodiversity. The study focused on analyzing the results of the field surveys to make recommendations for impact oriented information, education and communication (IEC) strategies for the coastal wetlands in Gujarat.

The CMPA Project

The Project "Conservation and Sustainable Management of Coastal and Marine Protected Areas" (CMPA) is a project of the Indo-German technical cooperation. It is funded by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) and implemented by the Ministry of Environment, Forests and Climate Change (MoEFCC), Government of India, and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of BMUB.

Established to support the achievement of the Aichi targets of the Convention on Biological Diversity, the Project's overall goal is to contribute to conservation and sustainable use of biodiversity in selected areas along the coast of India. Taking into consideration the economic importance of the coastal zone for large segments of the population, the Project's approach is people-centered, thus ensuring the support for conservation by those depending on coastal ecosystems.

CMPA Technical Report Series

29

Baseline study on the Biodiversity Awareness in Selected Marine and Coastal Areas in Gujarat

November 2016

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

On behalf of:

Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety

of the Federal Republic of Germany

Indo-German Biodiversity Programme
Conservation and Sustainable Management of Coastal and Marine Protected Areas