



Mumbai Metropolitan Region Environment Improvement Society



STRENGTHENING ENVIRONMENT EDUCATION THROUGH PROJECT BASED - LEARNING AND ACTION IN JUNIOR COLLEGES OF PANVEL

CEE

Centre for Environment Education

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Strengthening Environment Education through Project based- learning and Action in Junior Colleges of Panvel

BACKGROUND STUDY

The purpose of this report is to identify local specific challenges faced by city and design activities to define, understand and find the possible solution through action project. In the process of identifying local specific challenges, CEE held consultations with local stakeholders like parents, teacher, citizens, local non-government organizations, citizen's representatives and students. One of the purposes of this report was to help in preparation of source materials for EE. The ESR report and CSP report of Panvel provide a holistic view towards the design of such materials.

A metropolitan area is a region consisting of a densely populated urban core and its less-populated surrounding territories, sharing industry, infrastructure, and housing. Through real life projects and good local specific understanding of environment and challenges students of standard XI and XII, can get an opportunity to learn more effectively.

The objective of the study is to help strengthen, motivate and guide students through their high school experience by making an effort to connect the classroom to the real working world. Sometimes learning could come from sources beyond the classroom and this is one such effort to change their perception of education.

INTERVIEW OF STAKEHOLDER

Sr.no.	Stakeholder	Name	Contact No.
1	KESKV KanyaVidyalaya	MrWaghmare Sir (Vice Principal)	9082277908
2	C. K. T School	MrPrashant More	27458458
3	Bhathia School	MrD L Shivrame	9004982004
4	Gokhale Education Society	MrsReshamaPatil	9167434725
5	Residential	MrAkashPuri	9833771848
6	YuvaOrganisation	MrsShantaKhot	9594834807
7	YuvaOrganisation	Mr Anil Ingle	9322894328
8	PreranaNavnihal Org.	MrsMadhuriShinde	9619178355
9	Residential	Mrs Anjali Inamdar	9619276107
10	Asst. Commissioner, PMC	MrsTejaswiniGalande	9421666767
11	Sudhagad Education Society	Mr A. D. Shailar	8097282259

REPORT LITERATURE

- City Sanitation Plan of Panvel Municipal Council – 2014.
- Environment Status Report of Panvel Municipal Council 2014-15.
- Textbook analysis of class XI (In Process).
- “KaseKaruyaParyavaranHirave” text book
- Green School Programme Manual

Video literature

- Dr. Sudhakar Shinde (Commissioner of PMC), Sanvad with Kharghar residents.

Media

- Panvel specific news from Ramprahar newspaper.
- Panvel specific news from Panvel Today, Sakal newspaper.

LOCAL SPECIFIC CHALLENGES AND TEXT BOOK REFERENCE

Sr. No.	Local Issues and challenges	Text book Reference
1	Safe, hygienic, affordable sanitation facilities with proper O&M of all sanitary installations.	Class XI 1.6 Environment and Health Class XII 5. Environment Information for Human well being
2	Scope to improve drinking water coverage with proper distribution in water supply schemes. Safe potable drinking water.	Class XI: 2.2 Impact of economic growth on environment Class XII 1 Geosphere and Biosphere 1.5 Local, Regional and Global Impact on increased consumption.
3	The level of COD and BOD is very high in the river near Wadgher and near the highway. (Source: CSP report of Panvel) Scope to improve effective, efficient management and proper disposal of liquid waste water.	Class XI 3. Legal and Culture Institution and the Environment Environment Impact assessment Step in the EIA process Environmental Audit Environment Management System
4	Need to improve and increase the level of segregation, coverage of waste collection, efficiency and effectiveness of waste collection & transportation along with proper disposal of waste as per SWM Rule 2016.	Class XI 1.6 Environment and Health Class XII 5. Environment Information for Human Well Being
5	The 'city as a Whole' approach missing.	Class XI Unit 1: System Perspective of Environment Interconnections System and its characteristics Environment as system System Thinking System - A Bicycle is a system - The part of bicycle separated out is not a system.
6	Lack of technology use in basic service provided by PMC. Service measurement tools for basic service provided by PMC.	Class XII 5. Environment Information for Human well being
7	Need more clarity on roles and responsibilities. (between CIDCO & PMC).	Class XI 3. Legal and Culture Institution and the Environment Environment Impact assessment Step in the EIA process Environmental Audit Environment Management System

		Class XI 1.6 Environment and Health
8	Scope to improve Health & Medical Facilities.	Class XII 5. Environment Information for Human Well Being
9	The population projection of Panvel shows there will be lots of pressure on urban service and facility is going to increase day by day in the future. Proper, planned storm water drainage and preventing floods through the removal of rainwater. Urban service level measurement, evaluation, assessment and reporting method followed by further action on them has not been institutionalized. Identification of flooding spots and fixing with best possible and suitable solution.	Class: XI , Unit 2 1. People & Environment Growth in Human Numbers over Historical Times Migration of People Factors of Migration Study of Migration Future scenario of Migration
10	Maharashtra Industrial Development Corporation (MIDC) has direct and indirect effects on infrastructure and services of Panvel Municipal Corporation during last few years.	Class XI: 2.2 Impact of economic growth on environment
11	The inward migration on rise in Panvel.	Class XI Migration of People Factors of Migration Study of Migration Future scenario of Migration
12	lack of urban facilities in the slum of Panvel.	Class XI 2.3 Inequitable Economic Growth, Poverty and Environment
13	To avoid contamination and comply with receiving water body standards as per the MPCB as well as WHO norms.	Class XI 3. Legal and Culture Institution and the Environment Environment Impact assessment Step in the EIA process Environmental Audit Environment Management System
14	Scope to utilize open spaces and ponds in and around Panvel properly .	Class XII 2.6 Evolution of Environment concerns in different societies over the course of history. 2.7 India`s manifold traditions of conservation & sustainable use.
15	Scope to improve toilet coverage and need of planned and managed toilets wherever necessary.	Class XI 2.3 Inequitable Economic Growth, Poverty and Environment

16	Lack of awareness and poor concentration to promote Reduce, Recycle and Reuse concept.	Class XII Environment Information for Human Well Being
17	Lack of awareness and poor concentration about inherent linkage with public health.	Class XII Environment Information for Human Well Being
18	Need to improve promotional effort for tourist places around Panvel.	Class XII 2.6 Evolution of Environment concerns in different societies over the course of history. 2.7 India`s manifold traditions of conservation & sustainable use.
19	Lack of urban services and facilities	What Went Wrong:- In traditional economic thinking, the goal was always economic growth, in the belief that an increase in economic growth necessarily implied an increase in human well-being. But now we understand that economic growth is only one part of development.

EXAMPLES OF HYPOTHESES FROM CLASS XI TEXT BOOK

Examples of Hypotheses from Class XI text book

A list of hypothesis is provided below. Students can choose any of these for investigation, but are encouraged to develop their own hypothesis based on their interest.

Sr. No	Particular	Thematic
1	Mosquito densities are significantly correlated with tree densities	Biodiversity
2	Stray dogs exhibit a less variety of colors than pet dogs.	Biodiversity
3	Indigenous species show a significantly higher level of leaf damage than exotic species.	Biodiversity
4	Natural habitats have more irregular shapes than man-made habitats.	Rural-Urban
5	Proportion of raw materials from more natural/near-natural sources (e.g. bamboo) used in house construction decreases with the size of the house.	Biodiversity
6	Over time, paper mills have been bringing in forest based raw material from greater and greater distance.	Biodiversity
7	Over time, paper and polyfibre mills have switched from use of forest based to farm produces raw material.	Biodiversity
8	Over time, proportion of paper produced from imported pulp has been increasing.	Biodiversity
9	The number of distinctive uses of bamboo that a person can name increases with age.	Biodiversity
10	The ratio of price of paper to the royalty paid to the Forest Department has decreased over time.	Biodiversity
11	Bamboo densities are inversely proportional to cattle densities as assessed from cattle dung densities	Biodiversity
12	Fish diversity is greater upstream as compared to downstream of release of paper mill effluent.	Biodiversity
13	Bamboo densities are higher in reserved as compared to protected forest.	Biodiversity
14	A comparison of the species that have declined over the last five years with those that have increased reveals that more xerophytic species are on the increase.	Biodiversity
15	The greater the population of a village/town/city, greater the technological inputs in its drinking water supply.	Water
16	Females rank, scarcity of drinking water as a more serious environment concern than males do	Water
17	The greater the population of a villages / town /city, greater the distance to its drinking water source.	Water
18	The amount of drinking water supplied to a town/city has increased at a slower rate than its population.	Water
19	The lake receives more water from sewage than natural water flow.	Water
20	The proportion of paper collected from domestic garbage by rag pickers increase with per capita number of cars for residents of the locality.	Waste

21	Organic farms exhibit a significantly greater diversity of crops than non-organic farms	Biodiversity
22	Organic farms exhibit a significantly lower (or higher) per hectare yields of any given crop than non-organic farms	Biodiversity
23	Insect/disease damage to crop is significantly higher in monoculture than in mixed crops	Biodiversity
24	damage to crops is significantly higher in fields closer to forest patches.	Biodiversity
25	Urban birds include a significantly higher proportion of species from forest than grassland habitats.	Biodiversity
26	Fish species diversity is significantly lower in reservoirs than in rivers.	Biodiversity & Water
27	As reported by experience bird watcher, there has been a decline in the population of insectivores	Biodiversity
28	There is a significantly greater proportion of larger sized fish amongst species reported to have gone locally extinct by knowledgeable fishermen.	Biodiversity
29	Amongst urban student personal observation is a significantly less important source of knowledge about living organisms that they can name than information gathered from books, magazine or TV.	Biodiversity
30	Organic farms exhibits significantly lower expenditure per kilogram of farm produce than non-organic farms.	Biodiversity
31	Organic farms exhibit significantly higher inputs of labour per kilogram of farm produce than non-organic farms.	Biodiversity
32	In cities, shops selling organic produce are situated in economically more affluent areas as indicated by shop rents.	Biodiversity
33	Communal roosting sites are significantly commoner around human habitations than in farms/orchards.	Biodiversity
34	Densities of barnacles on rock are inversely correlated with phosphorus content of sea water.	Biodiversity & Water
35	Insect/disease damage to crops is significantly higher in fields with higher levels of fertilizer application.	Biodiversity
36	Lichen species diversity is significantly higher in wetter habitats.	Biodiversity
37	Lichen species diversity is significantly higher in cooler habitats	Biodiversity
38	Mollusk species diversity of fresh water bodies declines with increasing opacity of water	Biodiversity & Water
39	Diversity of insect caught in light traps declines significantly following forest/grassland fire	Biodiversity
40	Urban birds include a significantly higher proportion of species using a wider range of habitats than birds from rural habitats.	Biodiversity
41	Medicinal plants include a significantly higher proportion of species belonging to wet tropical forest habitats.	Biodiversity
42	Plant species used for basket/mat weaving includes a significantly higher proportion of monocot species.	Biodiversity

43	Species whose wood is used for carving includes a higher proportion of species from wet tropical forest.	Biodiversity
44	Cultivated plants include a significantly higher proportion of successions/pioneer species.	Biodiversity
45	Cultivated plants include a significantly higher proportion of species belonging to grassland habitats	Biodiversity
46	Under similar level of pesticides applications, traditional cultivars show significantly lower levels of leaf damage as compared with HYCs.	Biodiversity
47	Educational Institutional have a lower density of trees per unit open space than housing societies.	Biodiversity
48	Proportion of households consuming self caught fish declines with size of agriculture landholding.	Biodiversity
49	Proportion of people consuming wild roots and tubers at home has declined over time.	Biodiversity

EXAMPLES OF HYPOTHESIS FROM CLASS XII TEXT BOOK

Chapter 1: Our Changing World – Geosphere and Biosphere

Sr. No	Particular
1	Over time, there has been a change in the size and shape of the boundary of the villages / town you stay in.
2	The area under natural ecosystems like grasslands and forests has reduced because of their conversion to agriculture.
3	Ecosystems in villages / city have been modified over the last two generations into farming or human habitation and are degraded.
4	The groundwater levels have gone down due to increase in use of water by people.
5	There is a reduction in the diversity of fish locally due to changes in the practices of fishing / fish harvesting.
6	A number of species have become locally extinct due to excessive disturbance of the natural environment by humans.
7	The quantum of solid waste produced in homes and restaurants has increased over time.
8	The number of incidents of wildlife straying into human habitation has gone up, with the decrease in their natural habitat.
9	The previous generation of people in villages / town had greater dependence on local ecosystem services as compared to the present generation.
10	There are new patterns of disease and pest attacks with changes in rainfall patterns.
11	New challenges have emerged locally for agriculture as a result of changes in rainfall patterns.

Chapter 2: Sustainable Human Well-being and Environment Sustainability

Sr. No.	Particular
1.	People value several factors other than income in their perception of a good quality of life.
2.	People value 'green surroundings' as an important part of their well-being.
3.	People believe that 'sustainable' and 'development' are opposing concepts.
4.	The quality of water and soil affects the cost of farming and water and soil pollution is borne by individual farmers even though the cause of the pollution may lie elsewhere.

Chapter 3: Biodiversity Conservation and Sustainable Use

Sr. No.	Particular
1.	People have a respect for biodiversity and believe that all species have their own right to life.
2.	Pollution is less due to organic agriculture as compared to chemical intensive agriculture.
3.	Farm biodiversity increases and the cost of pest control reduces with the use of Integrated Pest Management techniques.
4.	Deforestation decreases with enhanced awareness about forest conservation.
5.	It is possible to reduce river pollution by the use of sewage water for irrigation.

Chapter 4: Sustainable Energy and Material Flow

Sr. No.	Particular
1.	The Household expenses on fuel is reduced by the adoption of biogas.
2.	By collecting and composting (or vermicomposting) organic waste at home, the plants around the house can get organic fertilizer.
3.	By using public transport, it is possible to reduce the expenses on transportation and purchase of fuel.
4.	It is possible to reduce the use of electricity by using more efficient appliances.
5.	It is possible to reduce the use of grid connected electricity by using solar or wind energy.

Chapter 5: Environment Information for Human well being

Sr. No.	Particular
1.	People in my locality are aware of the changes taking place in the local environment due to climate change and the impact on the people in my villages/town.
2.	People have observed a change in the onset of flowering of trees in different seasons over the past decade.
3.	Livelihood / employment / Income generation activities suitable for environment and natural resources conservation are taken up by using environment related information under the MNREGA.
4.	The annual budget plan of the municipal authorities is prepared by taking into consideration the Environment Status Report
5.	People purchase environment – friendly products by seeing the advertisement of such products.
6.	Environment related information is shared and discussed at weekly markets, animal fairs, jatras etc. that takes place in the locality or region.
7.	People in my neighborhood / students in my institute are aware of the dangers and health impact of tobacco consumption.
8.	Advertisements about the dangers to human health smoking or chewing tobacco are effective and lead to people giving up the consumption of tobacco.

QUESTIONNAIRE

Strengthening Environment Education through Project based-learning and Action in Junior Colleges of Panvel

Baseline Information of Principals

_____ *Date:* _____

Name of the college:

Address:
.....

Respondent: Principal Sir

1) Name of the Principal:

Contact details:

2) Are XI & XII Standard classes held regularly?

- (a) Regular (b) Irregular

3) Student strength and Teacher strength

Particular	No. Division	No. Students	Total Teacher	No. EVS Teacher
XI				
XII				

4) The status of Environment Education.

- (a) Very dissatisfied (b) Dissatisfied (c) Satisfied (d) Very satisfied

Please Elaborate:

5) What types of support would be most useful for you?

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Baseline Information of Teachers

1. Name of the EVS Teacher:
Contact details:

2. Which faculty and subject do you teach?
1) Faculty: 2) Subject:

3. Are you aware of separate textbooks for Environment subject? Yes/ No/ Can't say
^{3.1} If yes, then are you using those for teaching XI & XII Standards? Yes/ No/ Can't say

4. How much time is allotted for teaching environment subject per division? 1/ 2 /3/4 session per week

5. What types of teaching methodologies are used for teaching environment subject?
Explanation:Tools & technique used so far if any.....

6. Can you talk a little about your past experiences in environmental education?
(any background training, any other environmental education programem you may have done in your classroom or with outside groups?)
.....
.....

7. The status of Environment Education.
(1) Very dissatisfied (2) Dissatisfied (3) Satisfied (4) Very satisfied
Explanation:

8. The student's participation in Environment Education?
(1) Very dissatisfied (2) Dissatisfied (3) Satisfied (4) Very satisfied
Explanation:

Challenges in project base learning activities

1. What challenges you face in teaching content in the textbook?
.....
.....

2. What challenges do students face in understanding textbooks?
.....
.....

3. What types of support would be most useful for you as teachers? (Teacher Fellowship, Training workshop, Facilitator's kit)

.....
.....

4. What types of support would be most useful for students?

.....
.....

5. Do you know any local NGOs, environmentalists working in your area? Please share their work and contact details with us.

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ACKNOWLEDGEMENT AND CREDITS

- City Sanitation Plan of Panvel Municipal Council – 2014.
- Environment Status Report of Panvel Municipal Council 2014-15.
- All Textbooks analysis of class XI and XII.
- “KaseKaruyaParyavaranHirave” text book.
- Dr. Sudhakar Shinde (Commissioner of PMC), Sanvad with Kharghar residents.
- Panvel specific news from Ramprahar newspaper.
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- Mr. Waghmare (Vice Principal), KESKV KanyaVidyalaya.
- Mr. Prashant More, C. K. T School.
- Mr. D L Shivrame, Bhathia School.
- Mrs. Reshama Patil, Gokhale Education Society.
- Mr. Akash Puri, Resident.
- Mrs. Shanta Khot, Yuva Organisation.
- Mr. Anil Ingle, Yuva Organisation.
- Mrs. Madhuri Shinde, Prerana Navnihal Org.
- Mrs. Anjali Inamdar, Resident.
- Mr. A. D. Shailar, Sudhagad Education Society.
- Mrs. Tejaswini Galande, Asst. Commissioner, Panvel Municipal Corporation.
- ee-success report.
- ee-efs survey report.
- Image Source :- Website of WQM.
- Source :- STOP Medway Peaker Project.
- Source :Elets Techno media.
- GSP manual by CSE

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