Environmental Assessment and Preparation of Environmental Management Framework for Rashtriya Madhyamik Shiksha Abhiyan (RMSA)

Prepared for

Government of India
Ministry of Human Resource Development
Department of School Education & Literacy

Prepared by

SENES Consultants India Pvt. Ltd.

Table of Contents

List of Tables

List of Figures

1 INTRODUCTION

1.1 BACKGROUND TO RMSA

The Government of India (GoI) has made a commitment to expand and improve secondary education in the country. To help achieve this it has formulated the Rashtriya Madhyamik Shiksha Abhiyan (RMSA) a national scheme for universalisation of access and improvement in quality of secondary education. The scheme was officially launched in March 2009 covering all states of the country and is the first national level programme for reforming and improving secondary education in the country. Universalisation of secondary education will build on universalisation of elementary education being pursued through the Sarva Shiksha Abhiyan (SSA).

The key goal and objectives of the RMSA are – (i) to make good quality secondary education available, accessible and affordable to all young persons, (ii) to remove gender, socio-economic and disability norms, (iii) to ensure that all secondary schools conform to prescribed norms, (iv) to achieve a GER of 75% in secondary education by 2014, (v) to achieve universal access to secondary education by 2017 and (vi) to achieve universal retention by 2020.

These goals and objectives are to be achieved through provision of additional physical infrastructure and hiring of additional teachers. Financing is also specified for school grants, in-service teacher training and for purchase of books, equipments and consumables.

1.2 SETTING UP OF NATIONAL MISSION ON RMSA

The National Policy on Education (NPE), 1986 and its Programme of Action 1992 inter alia states that access to secondary education will be widened with emphasis on the enrolment of girls, SCs and STs, particularly in science, commerce and vocational streams. Following the constitutional mandate to universalize elementary education and the success of Sarva Shiksha Abhiyan it became essential to push this vision forward to move towards universalisation of secondary education.

The Committee on 'Universalisation of Secondary Education' constituted by the Central Advisory Board of Education (CABE) in its report (June 2005) had suggested urgently taking up a programme on secondary education based on laid down norms and parameters. The Mid-Term Appraisal of the 10th Five Year Plan (June 2005) of the Planning Commission had also suggested a new mission for secondary education on the lines of SSA (Sarva Shiksha Abhiyan) pursuant to the success of SSA .

While education is a concurrent subject and secondary education primarily remains the responsibility of the State Governments, the Ministry of HRD has set its vision on making secondary education of good quality available, accessible and affordable to all young persons in the age group of 15-16 years. Accordingly the Government of India has launched a

centrally sponsored scheme to universalize access to and improve quality of education at secondary stage, called the Rashtriya Madhyamik Shiksha Abhiyan (RMSA)

1.3 VISION, GOALS AND OBJECTIVE OF RMSA

Therefore with this backdrop the Government of India through the Ministry of HRD set its vision on making secondary education of good quality available, accessible and affordable to all young persons in the age group of 15-16 years and accordingly and launched a centrally sponsored scheme called the Rashtriya Madhyamik Shiksha Abhiyan (RMSA)

1.3.1 Vision

The vision for secondary education is to make good quality education available, accessible and affordable to all young persons in the age group of 14-18 years. With this vision in mind, the following is to be achieved:

- To provide a secondary school within a reasonable distance of any habitation, which should be 5 Km for secondary schools and 7 -10 Km for higher secondary schools.
- Ensure universal access of secondary education by 2017 (GER of 100%), and
- Universal retention by 2020,
- Providing access to secondary education with special references to economically weaker sections of the society, the educationally backward, the girls and the disabled children residing in rural areas and other marginalized categories like SC, ST, OBC and Educationally Backward Minorities (EBM)

1.3.2 Goals

In order to meet the challenge of Universalisation of Secondary Education (USE), there is a need for a paradigm shift in the conceptual design of secondary education. The guiding principles in this regard are; Universal Access, Equality and Social Justice, Relevance and Development and Curricular and Structural Aspects. Universalisation of Secondary Education gives opportunity, to move towards equity. The concept of 'common school' will be encouraged. If these values are to be established in the system, all types of schools, including unaided private schools will also contribute towards Universalisation of Secondary Education (USE) by ensuring adequate enrolments for the children from under privileged society and the children Below Poverty Line (BPL) families.

1.4 OBJECTIVES

The above goal translates into the following main objectives:

- To ensure that all secondary schools have physical facilities, staffs and supplies at least according to the prescribed standards through financial support in case of Government/ Local Body and Government aided schools, and appropriate regulatory mechanism in the case of other schools.

- To improve access to secondary schooling to all young person according to norms – through proximate location (say, Secondary Schools within 5 Km, and Higher Secondary Schools within 7-10 Km) / efficient and safe transport arrangements/residential facilities, depending on local circumstances including open schooling. However in hilly and difficult areas, these norms can be relaxed. Preferably residential schools may be set up in such areas.
- To ensure that no child is deprived of secondary education of satisfactory quality due to gender, socio-economic, disability and other barriers.
- To improve quality of secondary education resulting in enhanced intellectual, social and cultural learning.
- To ensure that all students pursuing secondary education receive education of good quality
- Achievement of the above objectives would also, inter-alia, signify substantial progress in the direction of the Common School System.

1.5 ENVIRONMENTAL MANAGEMENT IN RMSA

The RMSA as it currently stands, particularly in terms of what is specified for financing, is primarily designed for expanding 'access' to secondary school education. The program gives priority to creation and strengthening of physical infrastructure. As per current estimates, this involves expansion, repair and renovation of nearly 60,000 existing government secondary schools, upgrading approximately 44,000 upper primary schools into secondary schools and opening of about 11,200 new secondary and senior secondary schools. These new and renovated schools are mainly in underserved areas based on school mapping exercises and data from Secondary Education Management Information System (SEMIS).

While the RMSA framework seeks to bridge the current gap in infrastructure requirements, presently there is not much emphasis on the need and ways to create and maintain a sustainable/ environment friendly school campus.

In order to develop and strengthen environment, health and safety practices in planning, design, construction and operation of secondary schools, the Ministry of Human Resource Development (MHRD) envisaged that an environmental assessment study is to be carried out for RMSA that will enable in over-corning existing gaps/deficiencies in the schools and will enable comprehensive and holistic planning in case of new schools.

The Environmental Assessment is intended towards facilitating MHRD in overcoming the deficiencies with regard to environment, health and safety aspects in secondary schools and to help in developing an environmental management framework (EMF), to help in mainstreaming environmental dimensions in the development and operation of secondary schools. It is therefore intended to help the MHRD in introducing/implementing the concept of ‘green schools’.

1.6 ENVIRONMENT ASSESSMENT FRAMEWORK FOR RMSA

MHRD has retained the services of SENES Consultants India Pvt. Ltd. (SENES) and awarded them an assignment to conduct the Environmental Assessment and Formulate the Environmental Management Framework for RMSA.

1.6.1 Purpose and Objectives

As has been stated in the earlier section an environmental assessment study will be carried out for RMSA in order to develop and strengthen environment, health and safety practices in planning, design, construction and operation of secondary schools, that will enable in over-corning existing gaps/deficiencies in the schools and will enable comprehensive and holistic planning in case of new schools.

Therefore, the objectives of this consultancy services would be to:

- establish an environment assessment methodology/procedure keeping in mind the objective and scope of services (detailed out in the subsequent section);
- review the nature and extent up to which the compliance is being achieved in the existing system in line with the various regulatory requirements;
- Identify strengths and deficiencies of the existing system and develop a framework, which will help in mainstreaming environmental dimensions in the development and operation of secondary schools.

Accordingly, the activities under this consultancy package will include:

- Study and review the various acts, rules and regulations of Govt. of India (including those of MHRD) and some State Governments regarding environment, health and safety provisions/aspects that are required to be followed by the schools.
- Detailed review of the nature and extent of compliance of environment, health and safety aspects in schools (covering both existing secondary schools and those that are proposed for upgrading from upper primary to secondary level).
- Identification of good practices, strengths, deficiencies and gaps in the existing system/s with regard to planning, implementation, enforcement and monitoring of environment, health and safety aspects in schools.
- Preparation of an Environment Management Framework (EMF) that provides/ recommends a comprehensive set of measures to ensure that school buildings and the over-all campus, covering both new and existing construction, are environment-friendly / sustainable.
- Development of a detailed capacity building plan for sensitizing and training various stakeholders, particularly the state directorates to guide them on the implementation of the Environment Management Framework.

1.6.2 Scope of Services

The key tasks of the present consultancy assignment are as follows:

- **Task A**: Review Existing Provisions and Establish Detailed Methodology / Procedure for Conducting Environmental Assessment (EA)
    - Review and understand the various acts, rules and regulations of Govt. of India (including those of MHRD) and State Governments regarding environment, health and safety provisions/aspects that are required to be followed by the secondary schools.
    - Review the existing systems (institutional, financial and human) of the secondary education sector at National, State, District and Block level regarding environmental management and health and safety in secondary schools. This will include review of planning, delivery, monitoring, and reporting systems through collection and assessment of primary (small representative sample including government, govt. aided and private schools in advance and lagging States, in rural and urban locations) and secondary data/information.
    - Identify and provide an evidence-based explanation of the critical issues and risks that need to be assessed in detail and establish an EA procedure, satisfactory to MHRD and the Development Partners. The critical issues and risks should be presented in order of priority.
- **Task B:** Conduct Environment Assessment (EA)
    - Carry out a detailed environment assessment of secondary schools in line with the identified issues/risks and agreed methodology. This review and assessment to be carried out for a representative sample must include, but may not be limited, to the following aspects pertaining to:
        - Siting/ location of the school
        - Planning and Lay-out of the campus (including orientation of buildings: internal circulation arrangements)
        - Structural safety aspects (application and adherence to building codes; condition of buildings)
        - Building Design (building lay-out; space for various activities; materials used)
        - Class room design (space availability; natural fight and ventilation; display arrangements)
        - Library and laboratory design (space availability; natural light and ventilation; display arrangements)
        - Measures for Disaster Risk Management
        - Facilities for Physically Challenged
        - Water management in the school (drinking water arrangements its usage for other purposes, water supply sources and quality)
        - Drinking water arrangements

- Drainage arrangements
- Sanitation arrangements and its condition
- Energy use and management
- Waste management (collection and disposal)
- Exposure to pollution particularly dust, toxic fumes, contaminated water and noise.
- Fire and Electrical Safety Practices
- Storage, handling and use of various toxic/hazardous materials (such as chemicals used in laboratories).
- Specific safety measures/precautions in the laboratories
- First aid and emergency response arrangements
- Over-all operation and maintenance aspects (housekeeping; cleanliness and hygiene)

  - Assess the capacity for complying with current environment health and safety requirements at various levels including students, teachers and staff from school management and state directorate.
  - Identify and make a comprehensive list of items/aspects and areas/sections where gaps/deficiencies exist.
  - Identify the good practices that are being followed/adopted, which can be used as dissemination and potential scaling-up.

- **Task C:** Preparation of Environment Management Framework
  - Review norms, experience and implementation mechanisms to identify global best practices with regard to environmental management in schools.
  - Recommend specific actions, and specify, associated Financial and management costs (e.g. technical capacity), that are required to overcome deficiencies and to strengthen/improve environment, health and safety conditions in schools focusing on planning, design, construction and maintenance elements. The required measures will be separately identified for new buildings and retro-fitting/improving existing structures.
  - Prepare an Environment Management Framework that can serve as a comprehensive and systematic guide towards making secondary schools (both new and existing ones) environment friendly/sustainable.
- **Task D:** Training and Capacity Building
  - Develop a detailed capacity building plan for improving awareness and knowledge on environment, health and safety requirements at various levels.
  - Organize workshops/sessions to build capacity by sensitizing and training various stakeholders, particularly the staff of state directorates, to guide them on the implementation of the environment management framework.

1.7 THE PROJECT AREA

The Rashtriya Madhyamik Shiksha Abhiyan (RMSA) has been launched by the Government of India as a centrally sponsored scheme for all states and union territories across the country. However for the purpose of conducting the Environmental Assessment for the RMSA it was decided to select 5 different states across the different regions of the country. The states selected would not only represent the different geographic domains of the country but at the same time bring out unique natural, environmental and socio-economic conditions that prevail across the various regions of the country and thereby help in formulation of an Environmental Management Framework (EMF) that can be made applicable to the overall country as a whole.

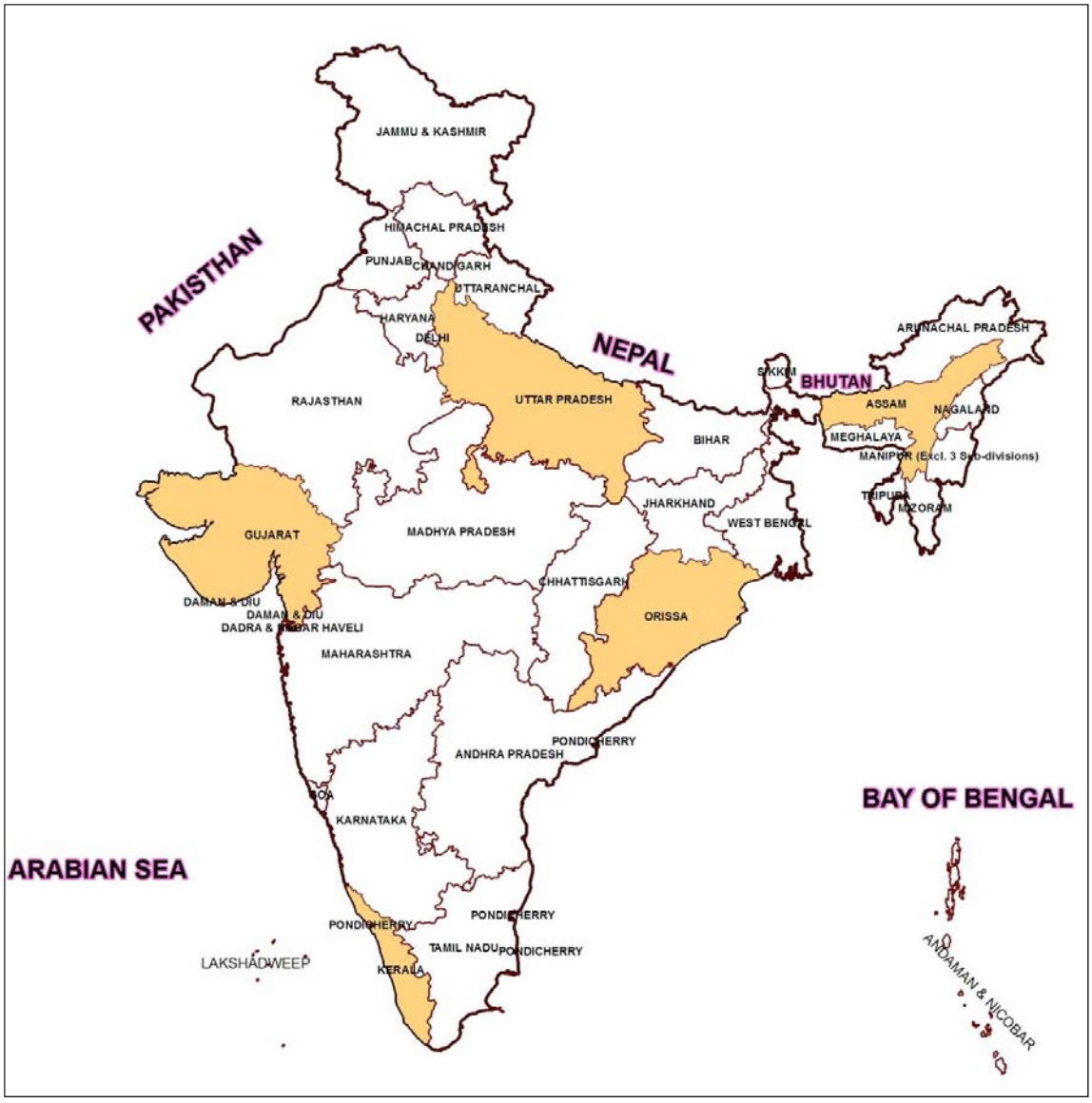
The 5 states selected include Uttar Pradesh (North) Kerala (South), Orissa (East) Gujarat (West) and Assam (North-East). 15 secondary schools (with a mix of government, government aided and private schools) will be studied per state from both urban and rural locations (at least 10 schools should from rural areas).

1.8 THE PRESENT REPORT

A framework for short listing of districts and also schools was developed in consultation with MHRD, the State Directorate and the World Bank which is presented in the subsequent chapter. The state of Orissa was used as for testing this framework developed. The school visits in Orissa were conducted in November 2011 after finalization of 18 schools from RMSA State Directorate and its approval for these schools.

This report presents an Environmental Assessment of schools in Orissa based on the outcome of the facility visits conducted in the 18 schools in the state.

FIGURE 1-1: STATES SELECTED FOR ENVIRONMENTAL ASSESSMENT OF RMSA



2 ENVIRONMENT ASSESSMENT METHODOLOGY

The environmental assessment is carried out with intent to assess the environmental, health and safety performance of the schools included under RMSA by comparing them against certain benchmarks or standards. For the purpose a systematic assessment methodology has been developed whereby schools are ranked according to their environmental performance and environmental issues are highlighted. The methodology for assessment is described in details below.

2.1 REVIEW OF EXISTING DOCUMENTATION

A number of guidelines have been drafted to ensure safe and conducive environment for students in educational institutions across the country. These guidelines have been reviewed to identify the benchmarks which educational institutions are required to adhere.

2.1.1 Review of Policy, Legislation & Guidelines

A review of existing legislation, policy and guidelines/codes relevant to the environmental issues associated with schools were carried out. In addition to these judicial interventions pertaining environmental health and safety aspects of educational institutions were also reviewed.

2.1.2 Review of Project Documents

A desk review of the relevant documents prepared under various education program of the government e.g. Sarva Siksha Abhiyan and Rashtriya Madhyamik Siksha Abhiyan was carried out to obtain background about the relevant issue related to environmental assessment.

2.2 ANALYSIS OF SEMIS DATABASE

A **Decentralized Secondary Education Management Information System (SEMIS)** has been developed and is being maintained by **National University of Educational Planning and Administration (NUEPA).** The SEMIS contains information on a wide range of parameters including location, management, funding, enrolment, infrastructure, health and hygiene, curium etc for all the recognized secondary and higher secondary schools across the country. The data for the period 2008- 2009 was provided by MHRD which has been used for the analysis presented later in the report.

2.3 CRITERIA FOR SELECTING SCHOOLS FOR ENVIRONMENTAL ASSESSMENT

MHRD intends to overcome the deficiencies with regard to environment, health and safety aspects in secondary schools and introduce/implement the concept of ‘green schools’. To get and understanding of the present scenario related to environmental health and safety performance of the schools this environmental assessment of the schools across the country was necessitated. We carried out a stratified random sampling from the SEMEIS database to

select schools which would best represent different schools located in different physiographic and socio cultural settings.

2.3.1 The Selected States

MHRD had identified 5 states across the country for the purpose of the assessment. These states represent different physiographic and climatic regions with an intent to broaden the base of the assessment The natural, environmental and socio-economic conditions prevailing in these 5 states are highlighted in the ***Table 2-1***.

TABLE 2-1: STATES SELECTED FOR ENVIRONMENTAL ASSESSMENT OF RMSA

Sl. No	State	Geographic Region	Environmental Setting
1	Uttar Pradesh	North	• Distinct Physiographic Zones (Northern Himalayas & Siwalik Foothills, Western Plain and Eastern Gangetic Plans & Vindhiyan Plateau) • Number of Archaeological Locations, Heritage Sites and Religious Places • Fertile Land with Agricultural Dependency • Natural Hazard (Flood)
2	Kerala	South	• District Physiographic Zones (Highlands-Western Ghats, Midland-Plans and Lowland-Coastal Areas) • Rich Biodiversity and Number of Protected Habitats and Wildlife • Natural Hazard (Landslide and Flood) • Well known for its Scenic Beauty, but the land is relatively poor in natural resources
3	Orissa	East	• Distinct Physiographic Zones (Northern Plateau, Eastern Ghats, Coastal Areas and Flood Plains) • Natural Hazard (Cyclone, Flood, Storm Surge, Earthquake, Drought) • Environmental Vulnerability (Industrial Area, Mining Areas, etc.) • Large Forest Area with Wildlife Habitat, especially Elephant, Tiger, Olive Ridley Turtles and migratory bird habitat at Chilika. Presence of Mangrove Vegetation. • Socio-economic Backwardness
4	Gujarat	West	• One of most Industrialized States in India • Distinct physiographic zones (Alluvial Plains, Eastern Highlands, Peninsular Region and Arid Zone) • Sensitive Ecological Habitat • Natural Hazard (Earthquake, Drought)

Sl. No	State	Geographic Region	Environmental Setting
5	Assam	North-East	• Distinct Physiographic Zones (Brahmaputra and Barak Valley and Hilly Regions) • Rich Biodiversity with Sensitive Ecological Habitat for number of Endangered Species • Rich Natural Resources (Petroleum, Natural Gas, Coal, Limestone and Other Minor Minerals) • Natural Hazard Prone (Flood, Earthquake)

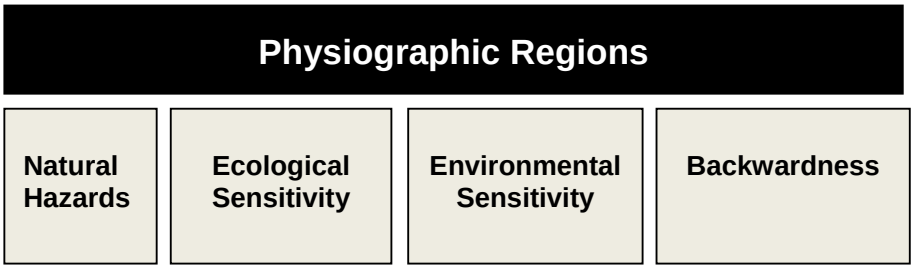
2.3.2 Methodology for Short listing Districts

A stratified sampling procedure was adopted to identify representative districts of these states. A two layered stratification namely physiographic regions (representing different terrains and the climates) and socio-environmental parameters was employed for identifying the districts. The socio-environmental parameters included and combination of the following criterion:

- Natural Hazards
- Ecological Sensitivity (forest, wildlife corridor etc)
- Environmental vulnerability (industrial activity, mining etc)
- Backwardness

The generic framework for short listing of districts is presented in ***Figure 2 1***.

FIGURE 2-1: CLASSIFICATION OF DISTRICTS IN EACH STATE



2.3.3 Methodology for short listing Schools

Schools were randomly short listed within the selected districts based on the combination of the following criteria:

- Sub district (Rural 10 schools Urban 5 schools)
- Government & Government Aided
- Type of Schools : Boys Girls Co education (1 each from each group)
- Facilities Available in the school (Library, laboratory, Kitchen, Hostel Playground).

For each selected district one urban sub-district and two rural sub-districts are selected. The district headquarters or major urban area would be selected as an urban sub district. In each

of the sub-district a combination of government and government aided schools would be selected depending on the total sample size.

2.4 FRAMEWORK FOR ASSESSING ENVIRONMENTAL IMPACTS

In keeping with the RMSA objectives of developing "Green Schools" the selected schools were assessed for their environmental performance considering the environmental impacts of the schools activity on the surroundings and also the impacts the natural environment on the school. In addition we appreciate that an education institution has an influence on the formative period of a child. Therefore, stress has been laid as to how the school imbibes conservation practices in the students and also equips them with necessary skills for tackling environmental issues.

2.4.1 Identification of Key Environment, Health and Safety Aspects in Schools

The preliminary identification of the key environment, health and safety aspects in schools has been carried out based on the understanding of the project gained through document review and during school visits, consultation with representatives from MHRD, the World Bank and the State RMSA Directorate and professional judgment of the SENES team. The aspects were further refined in course of the study.

A child spends most of his time in the school outside his/her family's domain. Thus it becomes imperative for the schools to set exemplary standards which would have influence on the both physiologically and psychologically. Both the built environment as well as the cognitive surroundings has to be designed to have an impact on the child. Apart from the physical built environment i.e. school building etc environment, health and safety aspects also need to be stressed to ensure that the school provides a conducive environment. To integrate environmental health and safety aspects into the school

The environment, health and safety aspects that need to be addressed for a high performance environmentally friendly school can be clubbed under five key elements which are as follows have been identified.

- **The School Environment:** This deals with the built environment in a school and would include not only the physical design aspects and immediate surroundings but also access to facilities so that the school provides a conducive environment for children to attend school
- **Potential Environmental Impacts:** The school also has potential to adversely impact the environment unless the activities of the school are managed efficiently. Schools capacity to manage its adverse environmental impacts has thus been considered in the assessment.
- **Conservation of Resource:** Cognitive learning process would be an effective method for imparting environmental education. Stressing on conservation practices would help child practicing conservation. Thus the schools effort in this regard has been considered as a key element.

- **Reinforcing the Learning Environment:** It is necessary to create consciousness in the child about the environment issues The learning environment should equip children with the requisite knowledge and necessary skills for appreciating environmental issues and managing them appropriately
- **Resilience of the School**: Appreciating that the school should be a safe place due importance has been given to the schools capacity to withstand risks both from inside as well as from external sources. Both natural as well as anthropogenic elements have been considered.

The significant environmental health and safety issues for each of the key elements has been carried out based on the understanding of the project gained through document review and during school visits, consultation with representatives from MHRD, the World Bank and the State RMSA Directorate and professional judgment of the SENES team has been addressed through analysis of certain important aspects relating to environment, health and safety. The aspects were further refined in course of the study. The entire framework of key elements and associated environment, health and safety aspects has been represented in ***Table 2-2***.

TABLE 2-2: KEY ENVIRONMENT, HEALTH AND SAFETY ASPECTS IN SCHOOLS

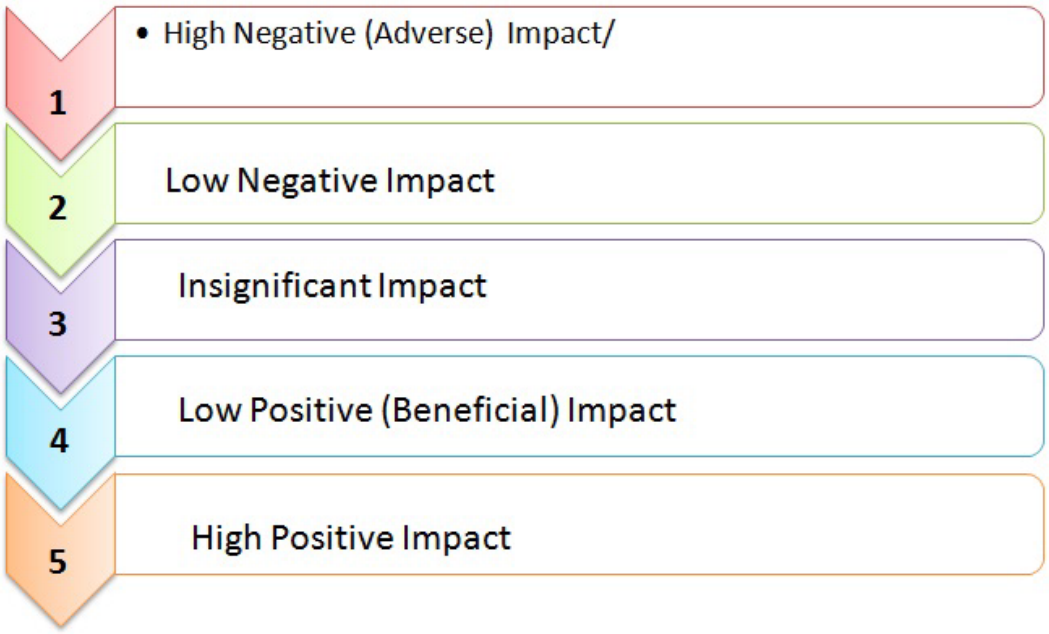
Sl. No.	Key Elements	Sl. No.	Environment, Health and Safety Aspects
I	**The School Environment**	1	Location of School
		2	Building Design
		3	Natural Light & Ventilation
		4	Artificial Lighting & Air Circulation
		5	Seating & Display Arrangements in Class Rooms
		6	Library Design
		7	Laboratory Design
		8	Kitchen Design
		9	Facilities for Physically Challenged
		10	Drinking Water Facility
		11	Sanitation Facility
		12	Drainage System
II	**Potential Environmental Impact**	1	Drainage
		2	Waste water treatment & discharge
		3	Disposal of Solid waste
		4	Air & Noise Emission
III	**Conservation of Resource**	1	Water conservation
		2	Energy Conservation
		3	Renewable Energy
IV	**Reinforcing the Learning Environment**	1	School Curriculum and Activities Related to Environment
		2	Celebration of Events Related to Environment
		3	Awareness & Campaigns / Program

Sl. No.	Key Elements	Sl. No.	Environment, Health and Safety Aspects
V	**Resilience of the School**	1	Safety aspect of Building Design
		2	Laboratory safety
		3	Kitchen Safety
		4	Fire Safety
		5	Electrical Safety
		6	Transport Safety
		7	Disaster Preparedness

2.5 TOOLS USED FOR ENVIRONMENTAL ASSESSMENT OF SCHOOLS

After having identified the key elements and the aspects related to the elements, indicators were categorized for each aspect. These indicators were ranked according to different levels of impacts and benchmarks for activities or infrastructure in the schools.

The indicators have been assessed using a Likert scale which has been developed based on the respective benchmarks which are applicable to educational institutions. The scores for the Likert scale is defined as presented.



A semi-structured questionnaire was used to collect the information on the indicators from each of the selected schools. This primarily involved ranking of the indicators and the scores were subsequently used for the environmental health and safety assessment of the schools.

The criteria for ranking of indicators are presented in **Annex 1**.

2.5.1 Environmental Score of Schools

After ranking of indicators based on expected impact levels an attempt was made to integrate all key elements, their respective environment-health-safety aspects and the corresponding indicators and their ranks into a single environmental score for each school which would at a glance be representative of the overall status of environment, health and safety in the school.

Each school was assessed out of a maximum achievable environmental score of 100. Higher environmental score of schools indicated relatively improved status of environment, health and safety aspects in the schools and vice-versa.

Each key element was assigned a maximum score ranging between 15 and 25 based on the relative importance of that element in respect of the overall environment, health and safety management framework for the school. The maximum score of each key element was thereafter distributed among corresponding aspects wherein each aspect was assigned a maximum score ranging between 2 and 5 again based on the relative importance of that aspect in respect of managing that key element.

TABLE 2-3: ENVIRONMENTAL SCORE OF SCHOOLS

Key Elements		Environment, Health and Safety Aspects		Max Score	
I	**The School Environment**			**25**	
		1	Location of School		2
		2	Building Design		2
		3	Natural Light & Ventilation		2
		4	Artificial Lighting & Air Circulation		2
		5	Seating & Display Arrangements in Class Rooms		2
	`	6	Library Design		2
		7	Laboratory Design		2
		8	Kitchen Design		2
		9	Facilities for Physically Challenged		2
		10	Drinking Water Facility		2.5
		11	Sanitation Facility		2.5
		12	Drainage System		2
II	**Potential Environmental Impact**			**20**	
		1	Drainage		5
		2	Waste water treatment & discharge		5
		3	Disposal of Solid waste		5
		4	Air & Noise Emission		5
III	**Conservation of Resource**			**15**	
		1	Water Conservation		5
		2	Energy Conservation		5
		3	Renewable Energy		5
IV	**Reinforcing the Learning Environment**			**15**	
		1	Curriculum & Activities Related to Environment		5
		2	Celebration of Events Related to Environment		5
		3	Awareness & Campaigns / Program		5

Key Elements		Environment, Health and Safety Aspects		Max Score	
V	**Resilience of the School**			**25**	
		1	Safety aspect of Building Design		5
		2	Laboratory safety		3
		3	Kitchen Safety		3
		4	Fire Safety		3
		5	Electrical Safety		3
		6	Transport Safety		3
		7	Disaster Preparedness		5
VI	**Total Environmental Score**				**100**

As stated in the earlier section all indicators collectively representing individual aspects were ranked according to the expected impact levels. Thereafter the assigned ranking of indicators for an aspect was utilized to determine the environmental score for that aspect using the following formula:

$$\textbf{\textit{Environmental Score of an Aspect}} = \frac{\textit{Total of the Assigned Ranking (Based on Assessed Impact Level) for all Indicators Corresponding to that Aspect}}{\textit{Total of the Highest Ranking for all Indicators Corresponding to that Aspect}} \; X \; \textit{Maximum Achievable Environmental Score for that Aspect}$$

Once the environmental scores were determined for all aspects they were summed across corresponding key elements to arrive at the environmental score for each key element. The environmental score for individual elements were then totaled to arrive at the final Environmental Score of the School. The Environmental Score of the school would be representative of the overall status of environment, health and safety in the school.

3 REVIEW OF EXISTING DOCUMENTS POLICIES & LEGISLATIONS

A review of existing legislation, policy and guidelines/codes relevant to the environmental issues associated with schools has been carried out. In addition to these judicial interventions pertaining environmental health and safety aspects of educational institutions were also reviewed. Summarized details have been presented in subsequent sections.

3.1 REVIEW OF STANDARDS AND GUIDELINES

3.1.1 IS: 8827 – 1978 recommendations for basic requirements of schools buildings (reaffirmed in 2006)

This standard covers spatial, functional and environmental requirements of school buildings. Relevant sections of this standard in reference to Secondary Schools are described hereunder.

Essential Elements of Class Room Design

- Classroom in secondary schools should be designed for 40 student places
- Area of classroom should be calculated considering a requirement of 1.26 m2 /student place
- Height of the classroom should not be less than 3 m. Minimum head room shall be 2.6 m
- Proportion of Breadth (Min) to Length (Max) should not be more than 1: 1.5
- Min aggregate area of openings (excluding doors) shall not be less than
    - 20% of floor area if openings are in a single wall
    - 15% of floor area if openings are on both side walls at same sill level
- Min clear distance between the chalkboard and first row of desks shall be 2.2 m

Functional Requirements

- Illumination Levels for classroom and libraries should be 150-300 lux ; for laboratories it should be 200-300 lux and in toilets it should be 150 lux
- Area of the chalk board should be 1.2 m X 2.4 m and base should be 0.8 m above platform/floor level. In order to minimise glare, the board should be on the wall adjacent to the window wall and placed such that the mid-vertical line of the board lies between ½ and ⅔ of the depth of the room
- Max acceptable noise in classroom/teaching spaces due to external sources should be 40 dB(A)
- Level of ventilation in classroom/teaching spaces shall be 6 air changes per hour
- Orientation of buildings should conform to IS: 7662 (Part I) - 1974

Area of the School

- Built-up Area (on all floors) per student place is
    - For secondary + higher secondary school having 4 sections per class – 3.4m2
    - For secondary + higher secondary school having 2 sections per class – 4.6m2
- Plot Area other than playfield - 2 to 3 the built-up area (on all floors)
- Playfield for secondary / higher secondary school – 15000m2

Exit Requirements

- All exits shall be free of obstructions
- Exits shall be clearly visible and all the routes to reach the exits shall be clearly marked and signs posted to guide the students to the floor concerned
- All exits shall be properly illuminated
- Exits shall be so arranged that they may be reached without passing through another occupied unit
- Exits shall be so located that the distance from the exit to the most remote point on the floor area served by them measured along the line of travel shall in no case be greater than 30 m except that where sprinklers are installed throughout a building the maximum distance of travel to an exit may be increased by 50%
- The capacity of exits (doors and stairways) indicating the number of persons that could be safely evacuated through an unit exit width of 50 cm shall be:
    - Stairway – 25 Numbers
    - Doors – 75 Numbers
- There shall be minimum two staircases and one of them shall be an enclosed stairway and the other shall be on the external walls of the building and shall open directly to the exteriors, interior open space or an open space of safety
- Notwithstanding the detailed provisions for exits as specified above the minimum with of stairways shall be 2 m.
- No exit doorway shall be less than 100 cm in width. Doorways shall not be less than 200 cm in height. Doorways for bathrooms, water closet shall not be less than 75 cm wide.

Stairways

- Interior stairs shall be constructed of non-combustible material throughout
- Interior staircase shall be constructed as self contained unit with at least one side adjacent to an external wall and shall be completely enclosed
- The minimum tread shall be 30 cm, constructed and maintained in a manner to prevent slipping

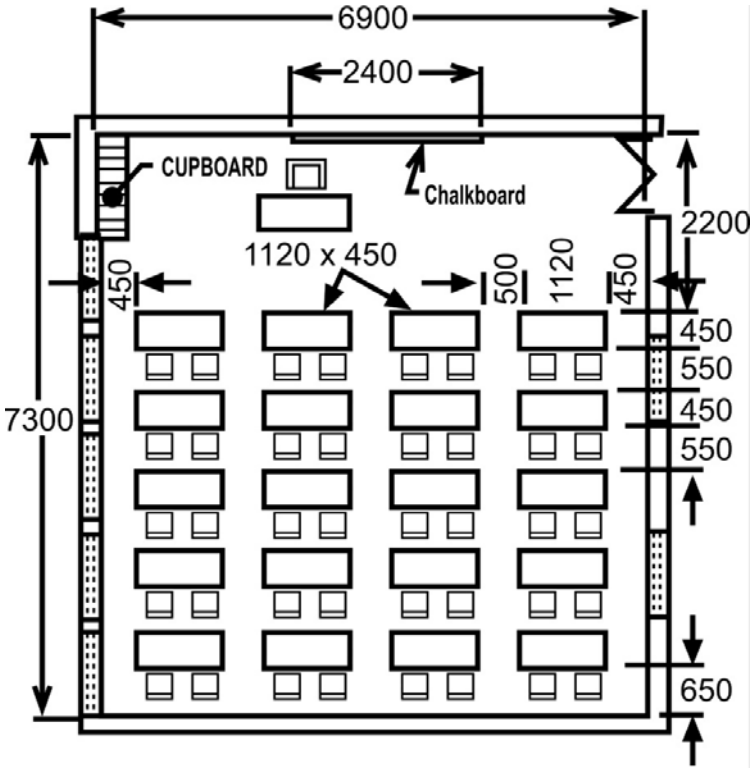
- The maximum height of riser shall be 15 cm and limited to 12 per flight
- Handrails shall be provided with a minimum height of 90 cm from centre of tread
- Minimum headroom in a passage under the landing of a staircase and under the staircase shall be 2.2m

Water Supply and Sanitary Requirements

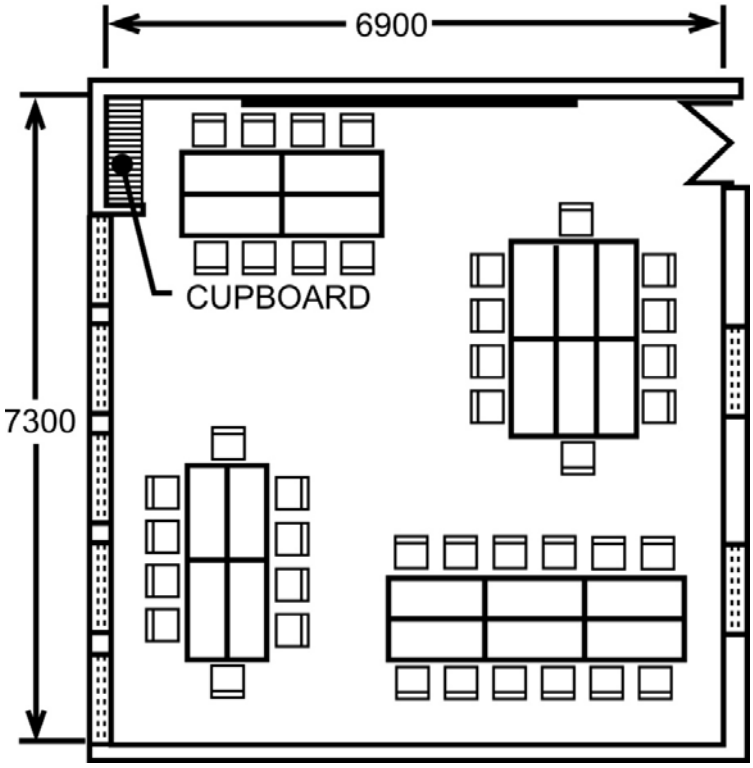
- Arrangements shall be made to supply 45 litres of water per head per day in a school building apart from the requirements of fire fighting. Laying and distribution of water supply system shall be in accordance with provisions in IS:2065 – 1972 (Codes of Practice for Water Supply in Buildings)
- The requirement for fittings for drainage and sanitation in schools shall be as follows:

Sl. No	Fittings	For Boys	For Girls
1	Water Closets	1 per 40 pupils	1 per 40 pupils
		1 per 30 members of staff	
2	Ablution Taps	1 in each Water Closet	1 in each Water Closet
		1 water tap with draining arrangements shall be provided for 50 pupils in the vicinity of water closets and urinals	
3	Urinals	1 per 20 pupils	Squatting Plate Urinals 1 per 20 pupils
		1 per 30 members of staff	
4	Wash Basins	1 per 40 pupils	1 per 40 pupils
		1 per 30 members of staff	
5	Drinking Water Fountain	1 per 50 pupils	
6	Cleaner's Sink	1 per floor, minimum	

FIGURE 3-1: TYPICAL ILLUSTRATION OF A SECONDARY / HIGHER SECONDARY CLASS ROOM



Typical Illustration of a Secondary / Higher Secondary Class Room



Selection of Site

While selecting the site of the school the following points should be kept in mind:

- Easy accessibility from residential areas
- Site away from heavy traffic roads, rivers, ponds, railway tracks, etc.
- Site should be away from high tension lines
- The land should not be of made up ground unless precautions have been taken for stabilisation
- Site should ensure a good natural drainage
- The site should be at a quiet place away from places generating noise and pollution such as cinemas, factories and shopping centres.

Effect of Landscape Elements

- While planning the school building the importance of landscape elements such as open areas, to increase the comfort condition inside the building and also in the surrounding environment, should be kept in mind
- Plants, hedges and shrubs planed immediately outside the classroom window, where such windows are principal source of natural light and ventilation, should not protrude beyond sill level
- The row of tall and shady trees should be at right angles to the source of light to the building in order to avoid glare in the rooms. At the same time tall and shady trees, walls or any other obstruction in front of the classroom windows should be at a distance to ensure adequate amount of light and ventilation. The distance may be taken equal to the height of the building.

3.1.2 IS: 2440 – 1975 Guide For Day Lighting Of Buildings (Reaffirmed In 2004)

- The main aim of day lighting design is how to admit enough light for good visibility without setting up uncomfortable glare
- Level of lighting determined analytically must be translated into levels of daylight and then into size of window openings using the code
- One of the many important factors involved in the translation is the lightness of the room surface. The illumination level in a given room with a finite window will be higher when the walls are light coloured than when these are dark coloured. Lighting is not merely a matter of window openings and quite half the eventual level of lighting may be dependent on decoration in the room. Whatever colour is used it is most desirable to maintain proper values of reflectance factors for ceiling, walls and floors so that the level of daylight illumination is maintained.

Day Light Factor

- It is a measure of the total daylight illumination at a point on a given plane expressed as the ratio (or percentage) which the illumination at the point on the given plane bears to the simultaneous illumination on a horizontal plane due to clear design sky at an exterior point open to the whole sky vault, direct sunlight excluded.

Recommended Day Light Factor for Schools

- Day Light Factor in Class-room – 1.9%
- Day Light Factor in Study Hall (Library) – 2.0 to 2.5 %
- Day Light Factor in Laboratory – 1.9 to 3.8 %

Principles of Window Design to Afford Good Day Lighting

- In schools broader window may be more efficient provided their sils are raised by 30 – 60 cm above the working plane.
- Windows on two opposite side would give greater uniformity to the internal daylight illumination.
- Cross lighting with windows on adjacent walls tend to increase the diffused lighting within the room.
- Windows in deep tend to reduce glare.
- Broad and low windows are much easier in to shade against sunlight entry.

Sitting Of Building

Planning and layout of the building can appreciably influence the day lighting. The buildings should be disposed such that the obstruction does not occur. The relative availability of the daylight in multi-storied block of different orientation is dependent on the distance separating the blocks, length of the block, height.

3.1.3 IS: 14435 – 1997 Fire Safety in Educational Institution – Codes Of Practice.

For the purpose of this code any school building up to higher secondary level with more than 20 students or more are considered.

Type of Construction

- All educational building should have external shell, floor and load bearing elements with 4 h fire resistance. Internal and non load bearing walls shall have 2 h fire resistance rating.
- Basement constructed should not be used for classrooms, laboratories/libraries and assembly hall.

- Temporary structures such as tents or thatched construction should not be used for housing educational institution.

Arrangement of Exits

- There should be at least two emergency exits in each floor and that it should be 22.5 m from any point in the floor.
- Every room with capacity of 45 students should have 45 person shall have at least two doorways.
- Elevators and lifts should not be counted as exits

Corridor and Passageways

- Exit corridors shall not have widths less than the aggregate required width of the exit doorway
- Height of the passageways and corridor shall not be less than 2.4 m
- Passageways, corridors and lobbies shall be adequately ventilated.

Doorways

- Exit doorways shall be more than 1 M wide except for assembly hall which shall be 2 m wide. The height of the door shall be more than 2 m
- The doors shall open outwardly
- Overhead and sliding doors shall not be installed.
- The door should not open immediately to a staircase.

Staircase

- Any building having more than 500 m2 in each floor and 15 or more in height shall have minimum of two stair case of enclosed type. One of the stair cases shall be on the external wall and shall directly open to the exterior or any safe place.

Internal Staircase

Internal staircase shall not be:

- Constructed from any combustible material
- Shall not be organized around the shaft of the lift.
- No gas piping shall be laid on the stairway.
- Minimum width of tread shall not be less than 300 mm and the maximum height of riser shall not exceed 150mm
- Height of railing shall be more than 1 m gaps between verticals shall not exceed 200 mm. The gaps should be reduced to 150 mm when small children use them.

- The parameters for design of internal stairways are:
    - Minimum headroom for passage & landing is 2.2m
    - The stair should be 1 h fire resistant.
    - External exit door of staircase shall open directly to open spaces
    - No electrical shaft/ AC duct or gas pipe line shall pass through the staircase
    - Exit sign with row indicating escape shall be marked.
    - Individual floors shall be prominently indicated on the wall facing the staircase.

External Staircase

- All external stairs shall be directly connected to the ground and shall be separate and remote from the internal stair.
- The stair can be constructed from non combustible material
- The external stair shall be free from encumbrance
- External staircase shall not be less than 1m wide with minimum 200 mm tread and riser not less than 190mm. The number of riser shall be limited to 15 per flight.
- Handrail shall be at a height not less than 1 m and not exceeding 1.2m.

Air Conditioning

- In case of room air-conditioning no extra precaution is required.
- In case of central air conditioning in laboratories and auditorium the measures laid down in IS 1642 shall apply

Restriction on Spread of Fire

- Vertical shafts /ducts meant for electrical wiring shall be effectively sealed at all floors
- Laboratories having highly combustible material should be located in a separate block.
- Hazardous Chemicals shall be stored separately.
- Adequate precautions shall be taken for storage of gas in form of bullet, tanks, battery or cylinder and shall be governed as per respective laws.

Equipment & Safety

- Transformers , HT and LT control panel which have in aggregate more than 2000 l of oil should be located in separate building 6 m away and should be properly fenced
- Staircase and corridor lighting should have separate circuits
- Miniature Circuit Breakers shall be provided in the circuits

Fires Safety Measures

- For building less than 15 m high. The measures to be adhered are :

- hose reel to be provided for building more than 2 storey high and area exceeding 1000 m2
- Automatic Sprinkler to be provided

Clearances & Certificates:

Every School shall have a mandatory fire safety inspection by the Fire and Rescue Services Department followed by issuance of a `no objection certificate' to the School as a mandatory requirement for granting permission for establishing or continuation of a School.

3.1.4 IS: 7662 (Part I) – 1974 Recommendation For Orientation Of Buildings Part I: Non Industrial

The primary emphasis of the orientation of Building is to provide physically and psychologically comfortable living inside the building by creating conditions inside the building conducive for the living of working. Climatological factors are the factors which are the most important which would primarily help in deciding the orientation of the building.

The climatological factors which need to be considered are as follows:

- Solar Radiation
- Cloud and Rain
- Humidity
- Prevailing Winds

Solar Radiation

Since the school building is used only during the daytime the effects of solar radiation during the day has only been considered for the review. The temperature inside the building is dependent on the solar radiation which can happen either by a) directly by the penetration of the sun b) indirectly by absorption of the radiation of heat on walls. Both these factors are considered to ensure comfort of the building. The easiest method of protection against solar radiation is reorientation of the building. The different facade of building has different characteristics:

- **South Face:** For opening on the south wall a small overhang can reduce the solar radiation during summer but can allow sunlight during winter.
- **North Face:** In case of buildings north of 23ON vertical louvers can cut of the direct morning and late evening sun. For places south of 23ON small overhangs on the top can reduce the solar radiation.
- **East and West Faces:** The solar radiation on the eastern and western walls is same but since they receive the radiation at different time of the day when climatic conditions are different during the time of the day. So the heat from the western walls may be reduced by providing thermal insulation on the exterior or by shading this facade by verandah, creeper or plants. Eastern face may have glass windows so that the solar radiation can

come in. As the temperature during this time of the day is low so the rise in temperature due to the entry of solar radiation is bearable.

In order to assess whether to take advantage of the solar radiation the broad classification of mean maximum temperature ranges were defined:

- Cold (Below 15^{o}C) & Cool (15 – 20^{o}C): Building in such region should take advantage of the south facade.
- Temperate (20oC – 30^{o}C): Such places the orientation of the building would be influenced not by the solar radiation but by factors e.g. humidity glare, prevailing winds etc.
- Hot (30^{o}C to 35^{o}C) & Very Hot (above 35^{o}C): High temperatures occur during the April- June and between 2.00 – 5.00 PM. The exact location of the sun would be between W and WSW in latitudes higher than 20^{o} and WNW to W in latitudes lesser than 20^{o}. Since the altitude of the sun is also low during this time of the day it would not be easy to protect the western wall with simple measures e.g. louvers. In Northern India the south wall receives lesser solar radiation and most of the discomfort is due to the reflected solar radiation from the ground. So non-reflective and absorptive surface e.g. grassy lawns should be used
- Diurnal Range of Temperature: In case the diurnal difference is greater than 8 ^{o}C and the maximum is greater than 30 ^{o}C in such cases the protection of opening against direct incidence is essential and also evaporative cooling is recommended. Concurrently if the diurnal range is less than 8^{o}C and maximum temperature exceeds 30^{o}C. In such hot humid climate maximum relief is obtained by profuse ventilators through large openings in opposite walls facing prevailing wind direction

Humidity

Humidity causes discomfort and can be improved by movement of the air around you. This can either be achieved through electric fans or mechanical ventilation. This would however result in increase in cost.

For areas with different humidity levels require different strategies. These are as follows:

- Very dry (<25%) and dry (25- 50%): In such cases the advantage of evaporative cooling can take place.
- Humid (50-75%) and Very Humid (75-100%): Regulate the rate of air movement either artificially with aid of electric fan or with help of prevailing wind.

For assuring comfort in humid regions the temperature within the building should be kept as near as possible to shade temperature by use of:

a) Fans and forced ventilation with air movements up to 0-100 cm/s

b) Adopting light weight construction material of low thermal capacity

c) Using material externally with low absorption capacity

d) Minimizing effect of solar radiation

Prevailing Winds

The prevailing wind can be used for natural ventilation in a building and provide comfort during periods of high humidity but the orientation of the building has to be judiciously used to ensure that that the right wind in a particular period of time is used for ventilation.

In areas of extreme heat in summer cutting of the heat and glare is necessary. It would thus be advantageous to orient the building to face the winds of the humid months rather than the prevailing winds.

Rows of buildings produce field of eddies in which case the prevailing wind become weak and are not effective for ventilation

The buildings need not face directly into the prevailing wind because their velocity is not reduced even if the building is rotated even up to 30o.

Special consideration has to be given to hot & cold winds and also the designs of the building would entirely not be dependent only on the prevailing wind but on the wind during the particular part of the day when the ventilation would be most required.

Climatic Zones & Their Problems

For the purpose of orientation of building it would be convenient to divide the country into three board zone i.e.

- Hot and Arid
- Hot/Warm and Humid
- Cold
    - Hot and Arid Areas: In hot & arid areas it is necessary to keep out the day time heat or solar radiation. Thick walls, more height of the room's verandah on east or west are not very effective the most effective method would be the right orientation of the building. In single or double storied development a courtyard provides both physical and psychological advantage if it is shaded during the day or is landscaped or cooled by sprinkling water. In multi-storied development staggered balcony or terraces provide some comfort. To reduce the thermal capacity of the surface and roof which receives sunlight these walls should have adequate thermal capacity & Time lag. It is also necessary that terraces, open verandah, staggered balconies should have light construction material which give up heat quickly for comfortable sleep.
    - Hot/Warm and humid areas: In these areas it is necessary to maximum ventilation to reduce discomfort of humidity and also maintain the indoor temperature as near as possible to the ambient or shade temperature. The best method is to make maximum use of prevailing winds for the ventilation. The screen and jallies are more effective as they not only keep off the suns glare but

also allow breeze to flow. Efforts should also be made to reduce the indoor temperature as possible to ambient or shade temperature. Walls, roof if possible should e of light weight construction material having low thermal capacity. The external surface should absorb as little solar radiation and internal wall should emit as little solar radiation. The movement of air should be up to 50- 100 cm/s.

- Cold Zone: In cold zone i.e. hills the roof should be heavy weight with high thermal capacity for absorbing and storing heat during the day and to heat the interior of building during night. In case heavy material is not possible it should be ensured that the material does not loose heat during the night. Air movement and ventilation should be restricted to minimum. Regular flues or devices for minimal permanent ventilation at night should be provided to avoid concentration of carbon monoxides when open fires are burnt inside rooms.

Layout and Road Systems

In city and towns where the road system is predetermined the orientation of the building is handicapped. This is aggravated when building bye laws mandate certain offset distance. In such conditions the approach road one side of the building would help in the orientation of the building.

In case of building line at an offset from the road the building faces should be at an appropriate angle to take the advantage of orientation instead of having parallel to the road approach.

In case the rows of the building face directly against the wind they block the wind flow to the other block. If the blocks are obliquely oriented to the wind direction and if gaps are provided within them obstruction of the wind can be lessened.

Planning of trees in street and open spaces should take into consideration that it does not block the flow of wind but at the same time provides shade and reduces the glare. Trees which shed leaves in winter and have heavy foliage during summer should be advantageous where the southern and westerns exposure is concerned.

3.1.5 IS 4963-1987: Recommendation For Building And Facilities For Physically Handicapped

The construction and maintenance in all categories of buildings and facilities used by the public should be accessible functional for, physically disabled persons. This guideline is intended to make buildings more convenient for elderly persons and persons suffering from any kind of physical ailments. The main purpose is to provide safer, easier environment for the physically disabled which would help in integrating disabled and elderly persons into the social mainstream.

The standards provide for the design guidelines on a number of aspects.

Site Development: The accessibility of buildings to physically challenged can be improved by undertaking site development. Some of the key features are:

- Walks and Pathways
    - Walks should be smooth, hard level surface suitable for walking and wheeling. Irregular surface as cobble stones, coarsely exposed aggregate concrete, bricks, etc, often cause bumpy rides.
    - The minimum walkway width would be 1200 mm and for moderate two way traffic it should be 1650 mm-1800 mm.
    - Longitudinal walk gradient should be 3 to 5% (30 mm-50 mm in 1 metre)
    - When walks exceed 60 metre in length it is desirable to provide rest area adjacent to the walk at convenient intervals with space for bench seats. For comfort the seat should be between 350 mm-425 mm high but not over 450 mm.
    - Texture change in walkways adjacent to seating will be desirable for blind persons.
    - Avoid grates and manholes in walks. If grates cannot be avoid then bearing bar should be perpendicular to the travel path and no opening between bearing bars should be greater than 12 mm in width.
- Parking Spaces

  For parking of vehicles of disabled people the following provisions shall be made:
    - Surface parking for two care spaces shall be provided near the entrance for physically handicapped persons with maximum travel distance of 30 m from building entrance.
    - The width of parking bay shall be minimum 3.60 metre.
    - The information stating that the space is reserved for wheelchair users shall be conspicuously displayed.
    - Guiding floor materials shall be provided or a device which guides visually impaired persons with audible signals or other devices which serves the same purpose shall be provided.
- Entrance Ramps and Doorways
    - Persons restricted on wheelchairs should use the facilities within the built environment alone without a helper's assistance.
    - A wheelchair may be operated by the user alone or with a helper's assistance. However, wheelchair design must assume that the user should be able to operate the wheelchair without help.
    - The width and length of the wheelchair, its control and the diameter of the casters decide the following:
    - Width of entrances and exits (clear 900 mm)
    - Width of the passage/corridor (min. 900mm)
    - Slope of the climbing (min. ramp slope 1:12)

- Passing over different levels and grooves (Grating with narrow slots in the direction of movement and level difference to limit to 2 cm or less)
- Transferring from wheel chair (adequate space is required to transfer from wheelchair to toilet seat and bed.
- Width of passage for crutch users (min. 900 mm).
- Finishes of floor surface with non slip floor material.
- Installation of handrail to support the body weight at critical places, for example staircase, toilet, ramp, passage with a change of level (800-850 mm).
- Extension of handrail on the flat landing at the top and bottom of the stairs (300 mm).
- To prevent a cane or crutch tip from slipping off the side of the stairs or ramp, install a 20 mm high lip on the exposed edge.

- Controls
  - Locking and opening controls for window and doors should not be more than 1400mm from the finished floor usable by one hand.
  - Switches for electric light and power as well as door handles and other fixtures and fittings should be between 900 mm-1200 mm from finished floor.
  - Power point for general purpose should be fixed between 400-500 mm from the finished floor.
  - A wheelchair has a footplate and leg rest attached in front of the seat. (The footplate extends about 350 mm in front of the knee). The footplate may prevent a wheelchair user from getting close enough to an object.
  - Manually operated equipment must be designed to be easily accessible from a wheelchair.
  - The coin slots of vending machines, etc, are located no higher than 1200 mm.
  - A space at least 350 mm deep and 700 mm high under a counter stands, etc.
- Floor
  - Floor shall have non-slip surface
  - Floors on a given story should have a common level
- Sanitary Facilities
  - Sanitary facilities shall have space to allow movement of individuals in wheelchairs
  - Sanitary facilities should have at least one water closet for ambulant disabled which is 900m wide, at least 1500 mm preferable 1600mm deep, has a door shutter that is 800 mm wide and swings out

- Has handrails on each side 780 mm high and parallel to the floor 40 mm clearance between handrail and wall
- Has a water closet seat with seat 500 mm from ground.

3.2 A GUIDE TO DESIGN FOR BETTER LEARNING ENVIRONMENT: DISTRICT PRIMARY EDUCATION PROJECT

The District Primary Education Project (DPEP) is a program launched by Government of India to promote primary education. Since the school is probably the first built environment that a child interacts with individually, outside her I his family's domain thus it is important to develop a comfortable and friendly atmosphere as possible. Educational institutions thus influence the children both physiologically and psychologically and would ensure that students come forward and continue to remain in the education system. The guidelines deal on four principle elements i.e.

- Design of Elements
- Design of Spaces
- Site Selection

3.2.1 Design of Elements

It contains various functional and psychological elements required for primary school. These include:

Storage: The storages should be planned taking into consideration the functional requirements and the requirement of children

Display: At least two chalk boards are required in each class for multigrade teaching. Chalkboards required for outdoor classes should be light and mobile and which can be easily transported. To ensure chalk boards are used by children it should be provided at a lower level.

Floor: The floor should be made of material to conform to safety of children and of maintenance. Hence, smooth finish for classroom floor is recommended. Also one should consider aspects e.g. colour texture and patterns as they influence subconsciously on the children

3.2.2 Design of Spaces

The school should be functional comfortable and attractive, so that both teachers and students find it interesting. In order to attain such environment, guidelines regarding the following spaces may be considered while designing primary schools.

- Classroom
- Verandah
- Teachers' room

- School building
- Services
- Dalwadi

3.2.3 Site Planning

In order to design a successful and workable institution, the functional relationship among the various buildings and the open spaces has to be satisfied. Guidelines for site planning have been described under the following heads:

- Layout: general
- school building
- services
- Balwadi
- open space
- Landscape
- Boundary
- Miscellaneous

3.2.4 Site Selection

A suitable site has to be selected before planning the layout arid designing the school. This ensures, among other things, an easy access to the school and the safety of the childiren.

A number of factors determining the suitability of a site are:

- Location
- 5izc
- Shape
- Topography
- 5ub-soil
- Services
- Noise
- Safety

3.3 SUPREME COURT JUDGMENT

3.3.1 Safety in Schools

Case Comment on Avinash Mehrotra v. Union of India & Others (2009) 6 SCC 398

The judgment of the court was delivered by Dalveer Bhandari J. and Lokeshwar Singh Panta J. The Court observed that in view of the importance of Article 21A, it is imperative that the

education which is provided to children in the primary schools should be in the environment of safety. It has become imperative that each school must follow the bare minimum safety standards, in addition to the compliance of the National Building Code of India, 2005, in particular Part IV - Fire & Life Safety and the Code of Practice of Fire Safety in Educational Institutions (IS 14435:1997) of the Bureau of Indian Standards.

3.3.2 Provision of Drinking water and Toilets

Environmental and Consumer Protection Foundation V/S Delhi Administration and others

"By order dated: 29 &rib 2011, this Court dictated that basic facility of potable drinking water be made available to all the schools. It directed all states and union territories to build toilets, particularly for girls, in all government schools.

4 SELECTION OF SCHOOLS FOR ENVIRONMENTAL ASSESSMENT - ORISSA

The state of Orissa was used as for testing this framework developed. In this regard the following approach was adopted.

The following approach has been followed in short listing of the schools in Orissa:

4.1 SELECTION OF DISTRICT

Orissa has four distinct physiographic regions namely:

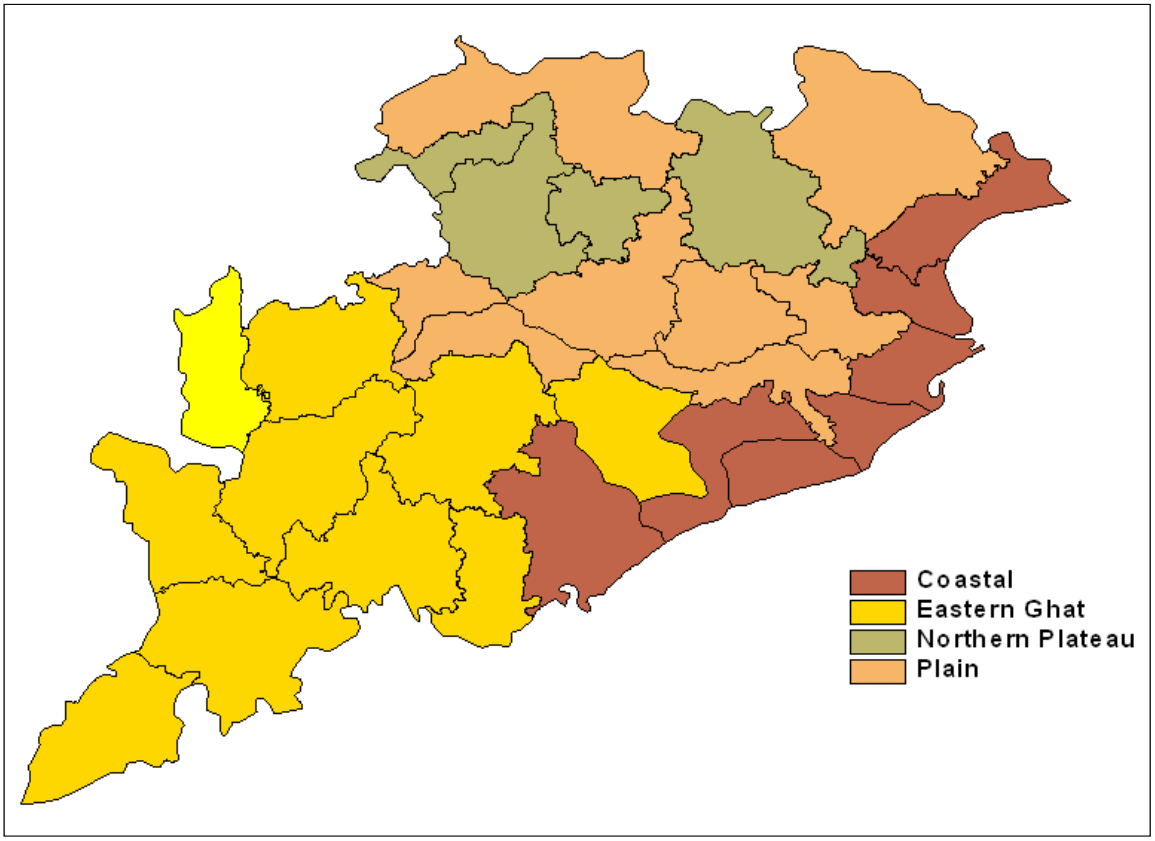
- **Coastal Plain**: This region stretches along the coast of Bay of Bengal. This region is the combination of several deltas, formed by the major rivers of Orissa.
- **Eastern Ghats**: This region covers about three-fourths of the entire State. This region comprises the hills and mountains of the Eastern Ghats which rise abruptly and steeply in the east and slope gently to a dissected plateau in the west running from north-east (Mayurbhanj) to north-west (Malkangiri). The average height of this region is about 900 meters above the mean sea level.
- **Northern Plateau**: The northern plateaus are mostly eroded plateaus forming the western slopes of the Eastern Ghats with elevation varying from 305-610 meters.
- **Major Flood Plains**: These are lower in elevation than the central plateaus having heights varying from 153 meters to 305 meters.

The 30 districts in the state can be classified into the four physiographic regions as follows:

TABLE 4-1: DISTRICTS IN THE FOUR PHYSIOGRAPHIC REGIONS IN ORISSA

Physiographic Region	Districts
Coastal Plains	Balasore, Bhadrak, Ganjam, Jagatsinghpur, Kendrapara, Khurdha, Puri
Eastern Ghats	Bolangir, Gajapati, Kalahandi, Kandhamal, Koraput, Malkangiri , Nabarangpur, Nuapada, Rayagada
Northern Plateau	Deogarh, Jharsuguda, Keonjhar, Sundergarh
Flood Plain	Angul, Bargarh, Boudh, Cuttack, Dhenkanal, Jajpur, Mayurbhanja, Nayagarh, Sambalpur, Sonepur

FIGURE 4-1: PHYSIOGRAPHIC REGIONS IN ORISSA



Each of the districts was further classified on the basis of the Ecological Sensitivity, Natural Hazards and Environmental Sensitivity. Backwardness was also taken as a criterion considering the guidelines issued by the Planning Commission, Government of India.

TABLE 4-2: SELECTION MATRIX FOR THE DISTRICTS IN ORISSA

Physiography	Name of District	Backward District	Natural Disasters	Eco Vulnerability	Environmental Vulnerability	District Selected
Coastal Plain	Balasore	-	Cyclone	Kuldhia Wildlife Sanctuary	-	
	Bhadrak	-	Cyclone	-	-	
	Ganjam	Backward	Cyclone	Chilika Lake & Breeding Site for Olive Ridley Turtle; Lakhari Valley Wildlife Sanctuary	Industry	Selected
	Jagatsinghpur	-	Cyclone	-	Port & Industry	
	Kendrapara	-	Cyclone	Bhitar Kanika National Park; Gahirmata Beach & Marine Sanctuary (Breeding Site for Olive Ridley Turtle)	-	
	Khurdha	-	-	Nandankanan National Park & Chandaka Elephant Reserve	-	
	Puri	-	Cyclone	Chilika Lake & Wildlife Sanctuary; Balukhand-Konarak Wildlife Sanctuary	-	
Eastern Ghat	Bolangir	Backward	Drought	-	-	
	Gajapati	Backward	-	-	-	
	Kalahandi	Backward	Drought	Karlapat Wildlife Sanctuary	-	
	Kandhamal	Backward	Drought	Kotgarh Wildlife Sanctuary & Elephant Corridor	-	Selected
	Koraput	Backward	-	-	-	
	Malkangiri	Backward	-	-	-	
	Nabarangpur	Backward	-	-	-	
	Nuapada	Backward	-	Sunbeda Wildlife Sanctuary	-	
	Rayagada	Backward	-	-	-	

Physiography	Name of District	Backward District	Natural Disasters	Eco Vulnerability	Environmental Vulnerability	District Selected
Northern Plateau	Deogarh	Backward	-	-	-	
	Jharsuguda	Backward	-	-	Mines	
	Keonjhar	Backward	-	Hadgarh Wildlife Sanctuary, Elephant Reserve & Corridor	Industry & Mines	
	Sundergarh	Backward	-	Elephant Reserve & Corridor	Industry & Mines	Selected
Flood Plain	**Angul**	-	-	Satkoshia Gorge Wildlife Sanctuary	Industry	Selected
	Bargarh	-	-	Debrigarh Wildlife Sanctuary	-	
	Boudh	Backward	-		-	
	Cuttack	-	Cyclone	-	-	Selected
	Dhenkanal	Backward	-	-	Mines	
	Jajpur		-	-	Mines	
	Mayurbhanj	Backward	-	Simlipal National Park; Kuldhia Wildlife Sanctuary, Tiger Reserve, Elephant Reserve & Corridor	-	
	Nayagarh		-	Baisipali Wildlife Sanctuary	-	
	Sambalpur	Backward	-	Badrama & Khalasuni Wildlife Sanctuaries, Elephant Reserve & Corridor	-	
	Sonapur	Backward	-	-	-	

FIGURE 4-2: BACKWARD DISTRICTS IN ORISSA

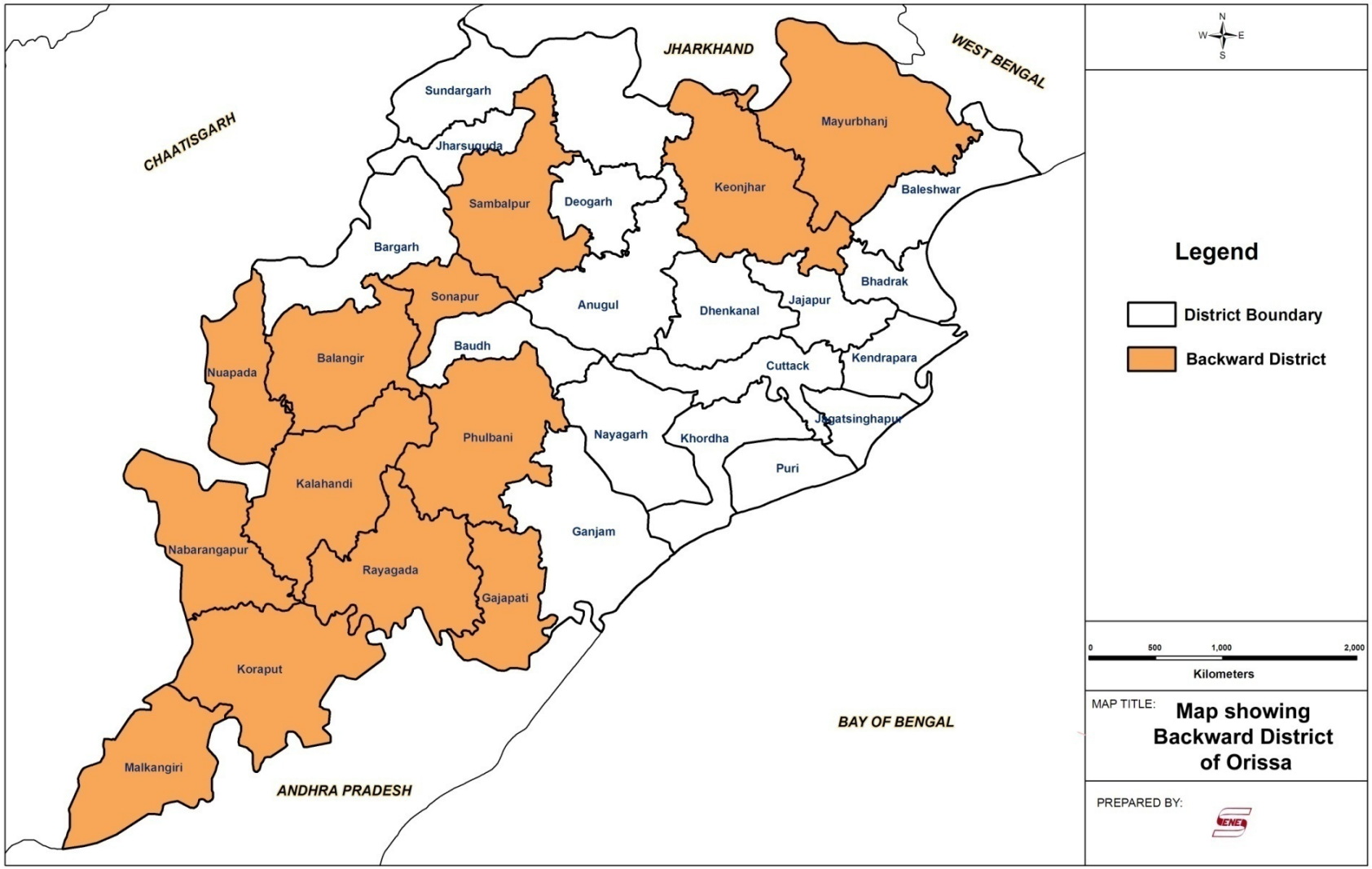


FIGURE 4-3: NATURAL DISASTER PRONE DISTRICTS IN ORISSA

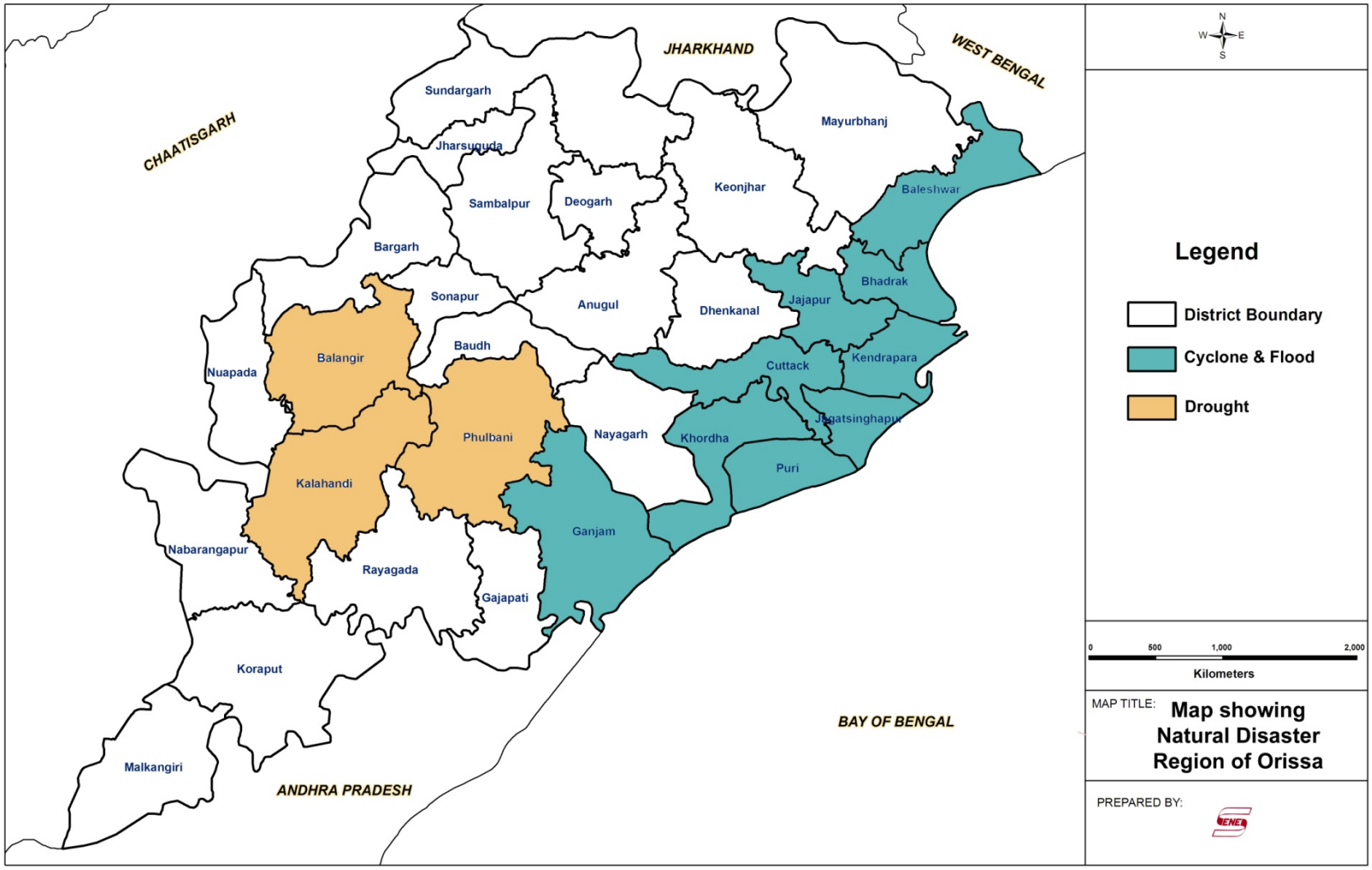


FIGURE 4-4: ECOLOGICALLY VULNERABLE DISTRICTS OF ORISSA

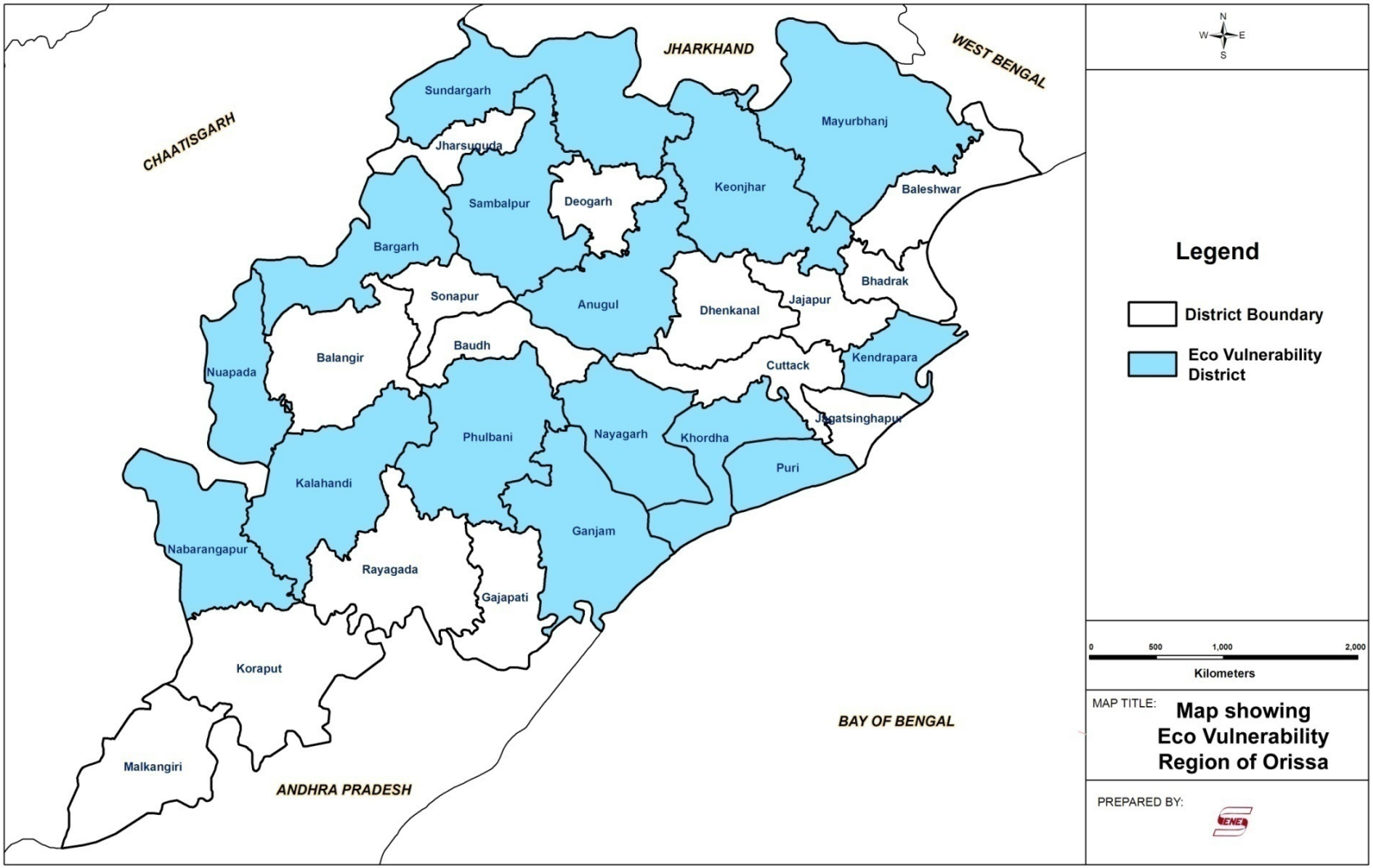
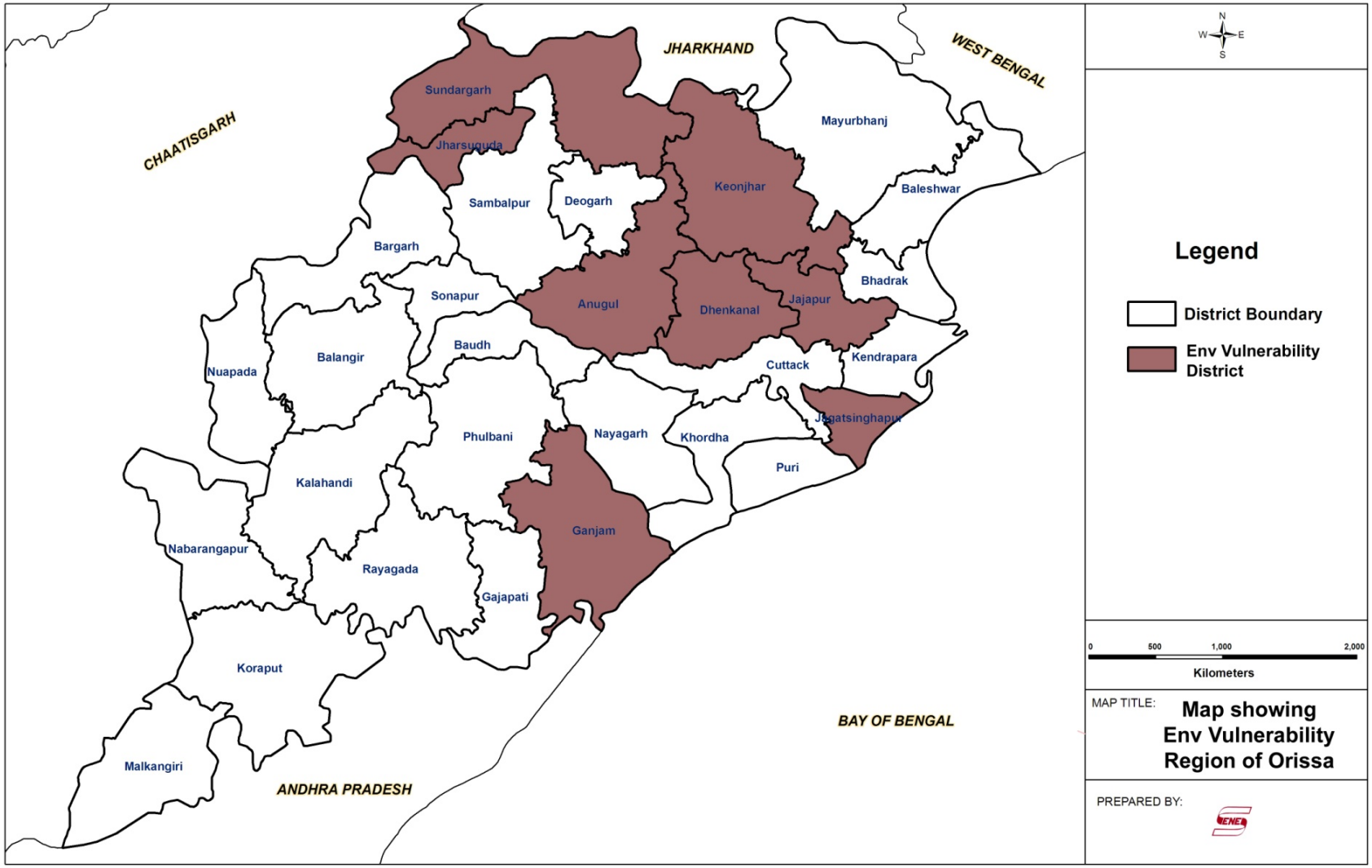


FIGURE 4-5: ENVIRONMENTALLY VULNERABLE DISTRICTS OF ORISSA



Considering the selection matrix in ***Table 4-2*** the district which best represents all of them in each physiographic category was shortlisted for the sampling. Thus the following districts were identified in the four physiographic regions:

- Coastal Plains: Ganjam
- Eastern Ghats: Kandhamal
- Northern Plateau :Sundergarh
- **Flood Plains:** Angul and Cuttack
- The districts selected in Orissa are shown in ***Figure 4.6.***

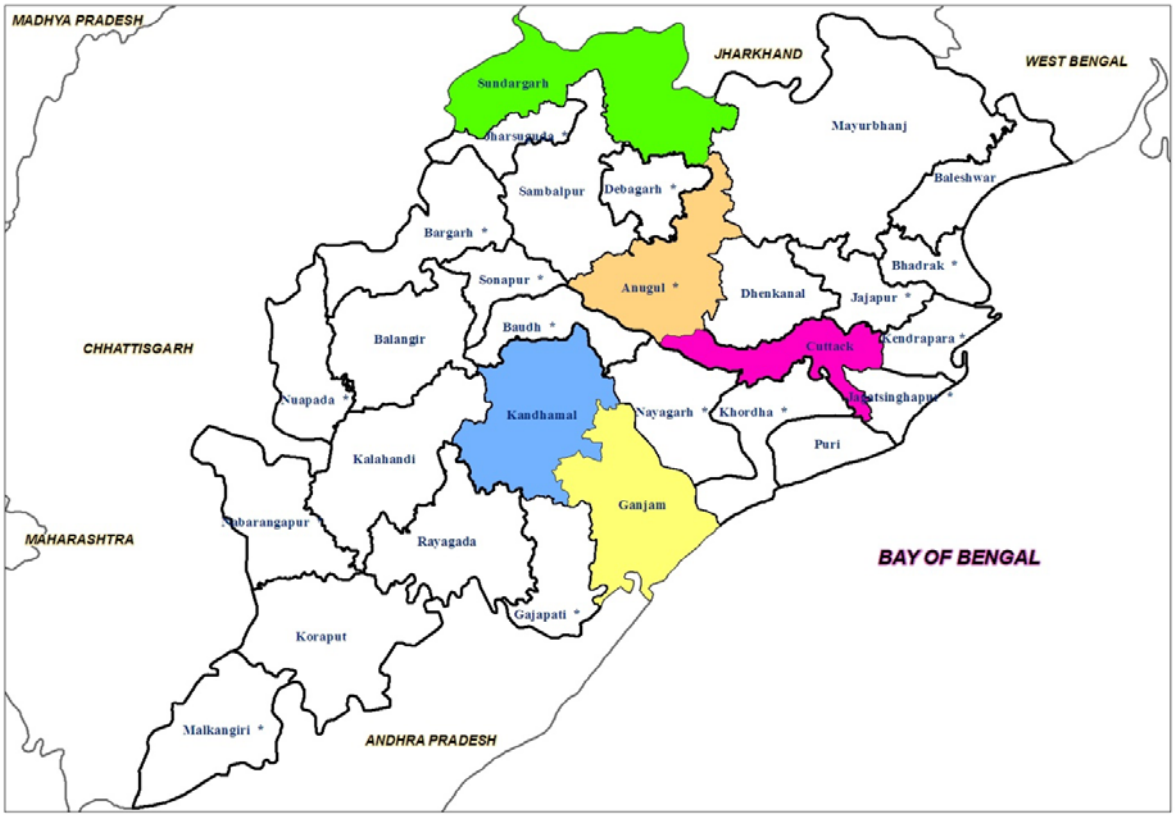
4.2 SELECTION OF THE SUB DISTRICTS

From these five district sub-districts were selected which would best be representative of the rural and urban areas. As a general principle it was decided to consider the district headquarters or the main settlement in each district as an urban area and two other sub-districts in district as rural areas. Further districts which have particular environmental or ecological sensitivity (for which a district has been selected), the sub-district which best represents this has been selected. Considering this principle the following sub-districts in each of the districts were identified which is presented in ***Table 4-3***.

TABLE 4-3: SELECTED SUB-DISTRICT IN REPRESENTATIVE DISTRICTS OF ORISSA

Physiographic Region	District	Block	Urban / Rural
Coastal Plains	Ganjam	Khallikote	Rural
		Ganjam NAC	Urban
		Chatrapur	Rural
		Rambha NAC	Rural
Eastern Ghats	Kandhamal	Phulbani NAC	Urban
		Phulbani	Rural
		Khajuripada	Rural
Northern Plateau	Sundergarh	Rourkela MPL	Urban
		Rajgangpur	Rural
		Kuarmunda	Rural
Flood Plains	Angul	Talcher	Rural
		Angul NAC	Urban
		Kishorenagar	Rural
	Cuttack	Banki	Rural
		Cuttack Sadar	Urban
		Salipur	Rural

FIGURE 4-6: DISTRICTS SELECTED IN ORISSA



4.3 SELECTION OF THE SCHOOLS

Considering the guidelines in the ToR for the assignment that in each state 15 schools would be selected of which 10 would be in rural areas and five in urban areas, one school in each block was selected. However, for selection of schools both government and government aided schools were taken. Representative samples were also taken from boys, girls and co-education schools. Additionally, the representative sample was selected in such a way that the following facilities in education system were represented in the sample:

- Playground
- Laboratory
- Library
- Kitchen
- Hostel

Considering these criteria above the schools were identified using the SEMIS data base. The list of shortlisted schools was circulated to the State Project Office for RMSA in Orissa. The final list of schools was drawn up based on the recommendations from the state level.

The schools selected are presented in ***Table 4-4.***

TABLE 4-4: SCHOOLS SELECTED IN ORISSA FOR THE RMSA ENVIRONMENTAL FRAMEWORK

District	Block	Sl. No.	School
Anugul	Anugul NAC	1	Anugul Govt. High School
	Talcher	2	Colliery High School
	Kishorenagar	3	R.D. High School
		4	Maa Maheswari High School
Ganjam	Chattarpur	5	Mahananda P.U.P.S
	Ganjam NAC	6	Bharati Bidyapith
	Khallikote	7	R.C.M. High School
	Rambha NAC	8	Gopal Krishna High School
Kandhamal	Phulbani NAC	9	A.J.O. H.S.
		10	Govt Girls High School
	Phulbani	11	Jawahar Navodaya Vidyalaya
	Khajuripada	12	Govt. Girls High School
Sundergarh	Kuarmunda	13	Kuarmunda Girls High School
	Rourkela MPL	14	Govt. High School, Uditnagar
	Rajgangpur	15	Kichinda Nodal UPS
Cuttack	Banki	16	Sadhab Samaj Bidya Niketan
	Cuttack Sadar	17	Sankhatras Govt. H.S.
	Salipur	18	Gopabandhu Girls H.S.

4.4 FIELD TESTING OF THE SURVEY FRAMEWORK PROPOSED IN ORISSA

Before canvassing the questionnaire to the different schools, a pilot field visit was being done to test the framework of the study.

BOX 4-1: FIELD TESTING OF SURVEY FRAMEWORK

A Kickoff Meeting with Directorate of RMSA, Orissa was organized in Bhubaneswar on 3rd November 2011 in presence of representative from the World Bank (Ms. Neha Vyas, Environmental Specialist). From the State, the State Project Director – Mr. B. C. Pattanaik and his entire team were present. SENES was represented in the meeting by a six member team lead by Dr. A.K. Ghosh (Team Leader). The methodology and approach of the study for selection of four districts (Sundegarh, Anagul, Ganjam, Kandamal) for Orissa, sub districts and schools were discussed. The Director of RMSA suggested including Cuttack district for this study as a district representative for flood prone areas.

Thereafter the SENES team along with World Bank's Environmental Specialist and RMSA Officials visited two schools in Ganjam district on 4th November, 2011 for field testing the methodology and approach adopted for the school surveys. During the School Visits the District Inspector of Education was also present.

The fieldwork for the environmental assessment was completed in Orissa during 21st Nov., 2011 to 27th Nov., 2011. During this time 18 schools were visited in the 5 districts identified in the state. The 18 schools were selected after discussion with the State Directorate, RMSA Orissa.

5 ENVIRONMENTAL SETTING OF SCHOOLS IN ORISSA – ANALYSIS OF SEMIS DATABASE

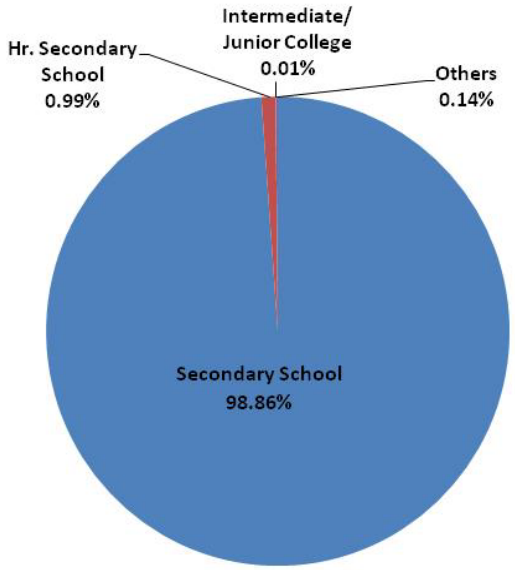
The Secondary Education Management Information System (SEMIS) aims at creating a comprehensive database on secondary and higher secondary education for facilitating planning, monitoring and related secondary education management activities under the RMSA. The SEMIS cover all recognized institutions in the State/UT imparting secondary and higher secondary education. It envisages collecting relevant data relating to profile of the institution, enrolment, repeaters, pass outs, teacher provisions, infrastructure and teaching-learning facilities, and school level income and expenditures. Data thus collected using the DCF under the SEMIS is being processed and stored both at the district and state levels. Accordingly, necessary arrangements are being made at the district level to institutionalize SEMIS under the RMSA.

The current SEMIS Database for Orissa for the academic year 2009-2010 has been analyzed particularly in reference to issues concerned with health, safety and environment to draw up a picture of the concerned issues across the state of Orissa.

5.1 THE SCHOOL PROFILE

5.1.1 Category of the Schools

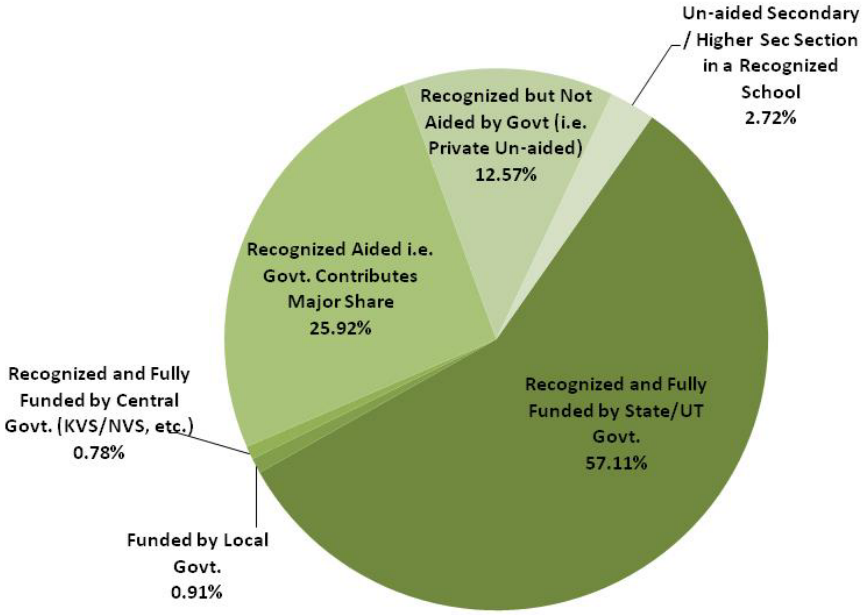
Most of the schools included in the SEMIS Data base are ***Secondary Schools*** (> 98%). The remaining few are ***Higher Secondary Schools, Intermediate / Junior Colleges or Other Category of Schools.***



Category of Schools

5.1.2 Source of Funding

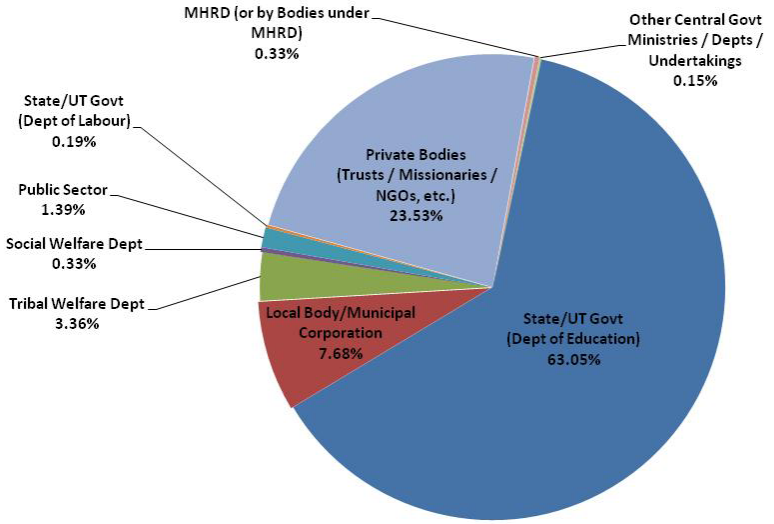
The primary source of funding for the schools is from State / UT Governments (57.11%) for the recognized Government Schools. The Government Aided Schools (i.e. recognized schools where Government contributes more than 50% of the school's budget) occupies the next category and around 25% of the schools fall in this category.



Source of Funding

5.1.3 Management of Schools

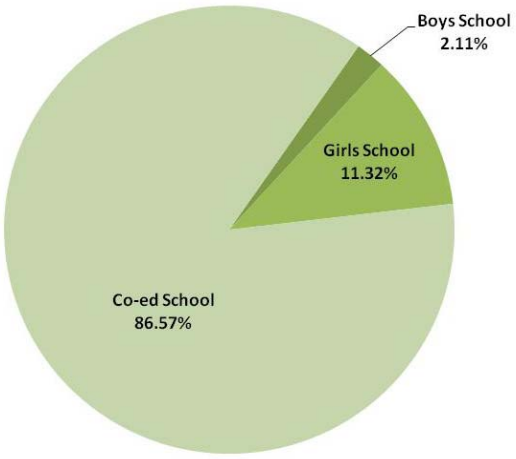
Schools are managed mostly by the State / UT Governments (approx 63% of the total schools).Private bodies such as trusts, NGOs, missionaries, etc run 23.5% of the schools while the urban local bodies are managing about 8% of the schools.



Management of Schools

5.1.4 Type of Schools

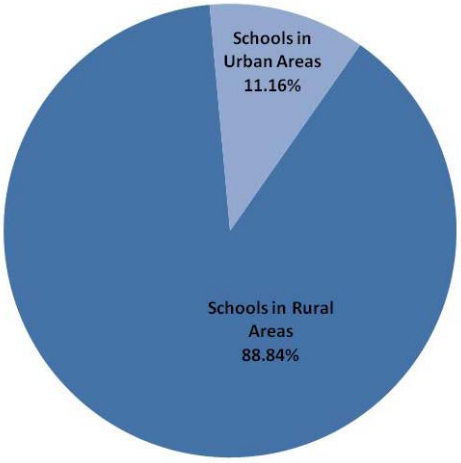
Most of the schools included in the SEMIS Data base are C***o-ed Schools*** (> 86%). The number of Girls Schools (11.3%) are found to be higher than the Boys Schools (<3%).



Type of Schools

5.1.5 Urban / Rural Schools

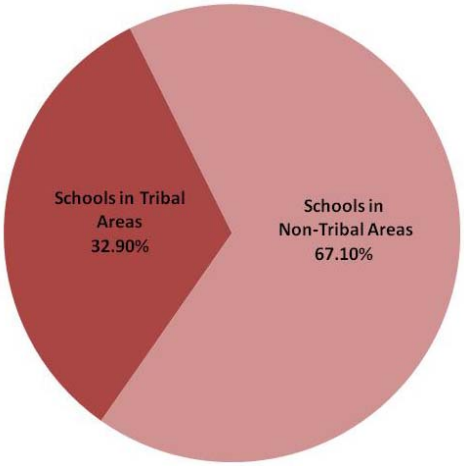
Schools in the SEMIS database have been categorized on the basis of their location in urban or rural areas. Out of close to 8000 schools covered under the SEMIS data base, most of the schools are located in rural areas (>88%). The schools in urban areas are just around 11% of the total schools. The total number of schools located in rural areas is 7034 whereas only 884 schools are located in the urban areas.



Urban / Rural Schools

5.1.6 Tribal Schools

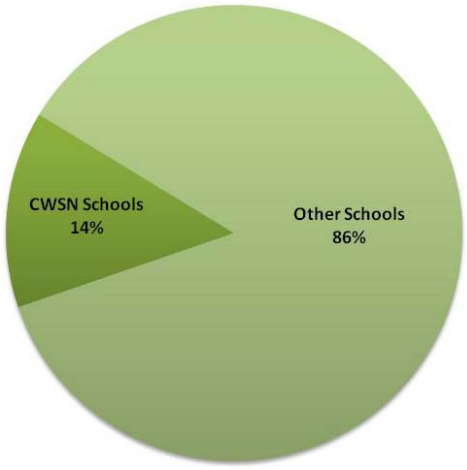
Orissa is a state with high tribal population. It is observed that out of close to 8000 schools covered under the SEMIS data base around 33% of the schools are located in tribal areas which implies that around 2605 schools in Orissa under RMSA are in tribal dominated areas.



Tribal Schools

5.1.7 Schools for Children with Special Needs (CWSN)

Schools exclusively for children with special needs (CWSN) occupy around 14% of the total schools in the SEMIS Database. Out of close to 8000 schools covered under the SEMIS data base, 1108 schools are exclusively for children with special needs.

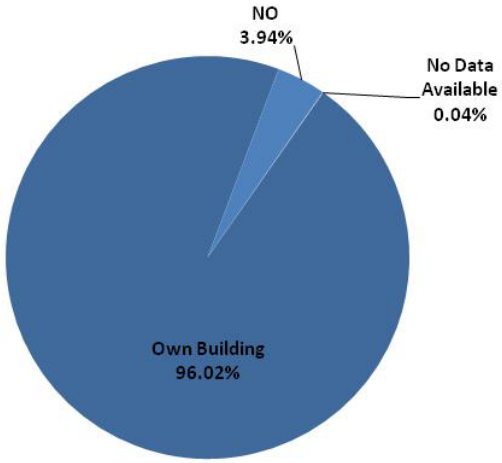


CWSN Schools

5.2 SCHOOL BUILDING AND CLASSROOMS

5.2.1 Ownership of School Building

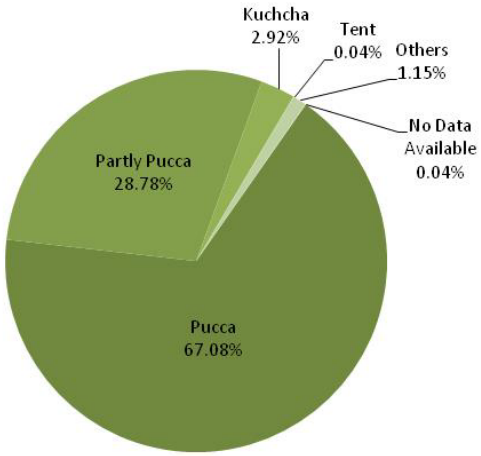
Analysis of the SEMIS database reveals that most of the schools own the school building/s. It is observed that 96% of the schools have their own building. Only around 4% of the schools operate out of rented establishments / community buildings, etc.



Ownership of School Building

5.2.2 Type of School Building

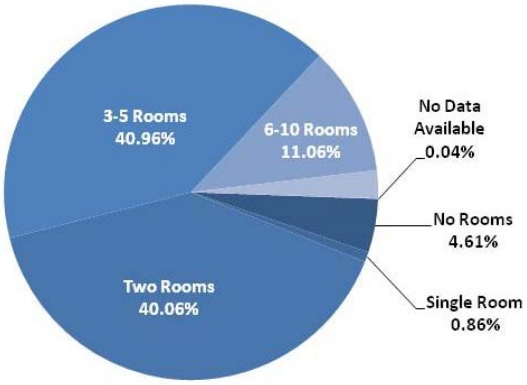
Analysis of the SEMIS database reveals that 67% of the school buildings are pucca in nature while 29% are partly pucca. It is observed that around 3% of the school buildings are kutcha.



Type of School Building

5.2.3 Classrooms for Class IX-X

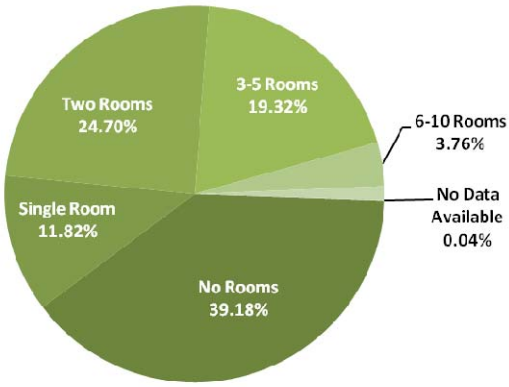
Analysis of the SEMIS Database reveals that in 40% of the school, two rooms are available for use of Class IX-X. In another 40% of the schools, 3-5 rooms are in use for Class IX and X. In < 1% of the schools only a single room is available for Classes IX and X whereas in around 4% of the schools, no rooms in useable condition are available for Class IX and X.



Classrooms for Class IX – X

5.2.4 Classrooms for Class IX-X – In Good Condition

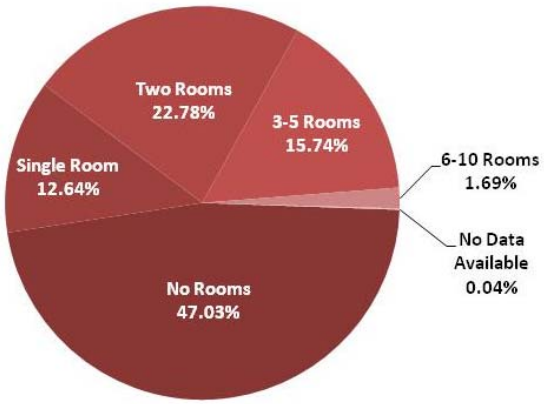
Analysis of the SEMIS database reveals that in 39% of the school, none of the classrooms presently used for Class IX and X are in good condition. In 12% of the schools, a single room (used for Class IX and X) is in good condition. In 25% of the schools 'two rooms' whereas in 20% of the schools '3-5 rooms' are available for Classes IX and X which are in good condition.



Classrooms for Class IX–X
(In Good Condition)

5.2.5 Classrooms for Class IX-X – Requiring Major Repairs

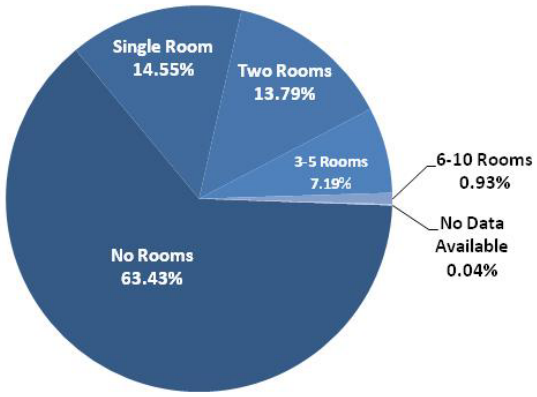
Analysis of the SEMIS database reveals that in 47% of the schools, the classrooms presently used for Class IX and X do not require any major repairs. In 12% of the schools, a single room (among class rooms for Class IX and X) requires major repair while in 23% of the schools two rooms require major repairs. In about 15% of the schools '3-5 rooms' presently used for Class IX and X require major repairs.



Classrooms for Class IX–X
(Requiring Major Repairs)

5.2.6 Classrooms for Class IX-X – Requiring Minor Repairs

Analysis of the SEMIS database reveals that in 63% of the schools, the classrooms presently used for Class IX and X do not require any kind of repairs (including minor repairs). In 14% of the schools, a single room (among class rooms for Class IX and X) requires minor repair while in another 14% of the schools two rooms require minor repairs. In about 7% of the schools '3-5 rooms' presently used for Class IX and X require minor repairs.

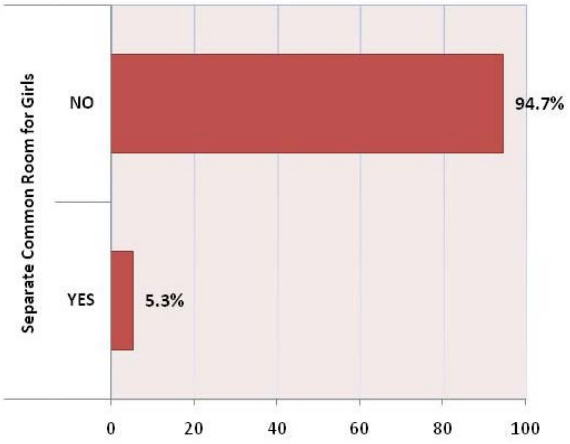


Classrooms for Class IX–X (Requiring Minor Repairs)

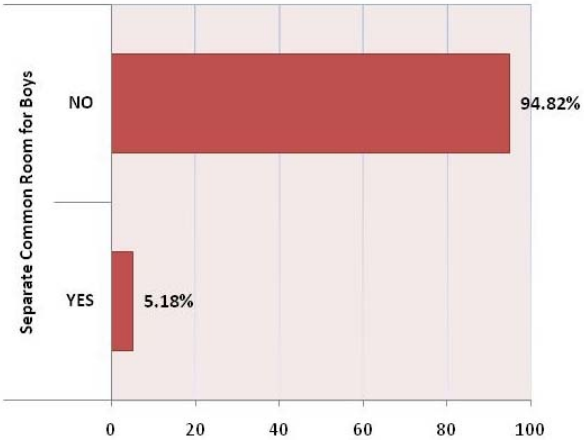
5.3 SCHOOL INFRASTRUCTURE AND FACILITIES

5.3.1 Common Rooms for Students

Analysis of the SEMIS database reveals that in most of the schools, separate common rooms for boys/girls are not available. In case of girls schools only 5.3% of the schools have separate common room for girls. A similar scenario is visible in case of boy's schools also. Only 5.2% of the boy's schools have separate common room facilities for boys.



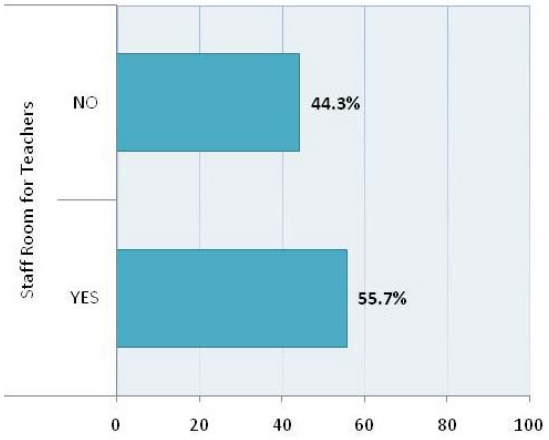
Separate Common Room for Girls



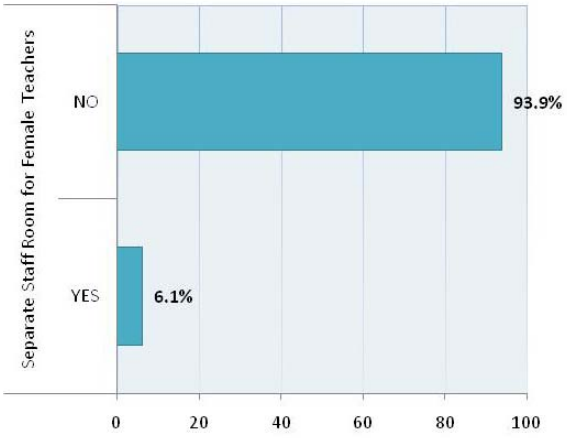
Separate Common Room for Boys

5.3.2 Staff Rooms for Teachers

Analysis of the SEMIS database reveals that in 44% of the schools, separate staff rooms for teachers are available. However over 55% of the schools are without any dedicated staff room for teachers. In case of separate staff room facilities for female teachers the picture is further dismal – only 6% of the schools have separate staff room facilities for female teachers.



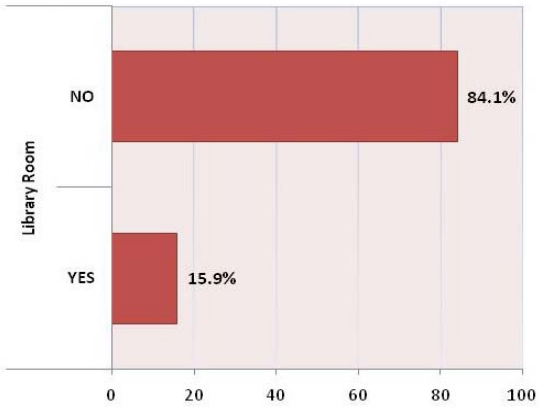
Staff Room for Teachers



Separate Staff Room for Female Teachers

5.3.3 Library

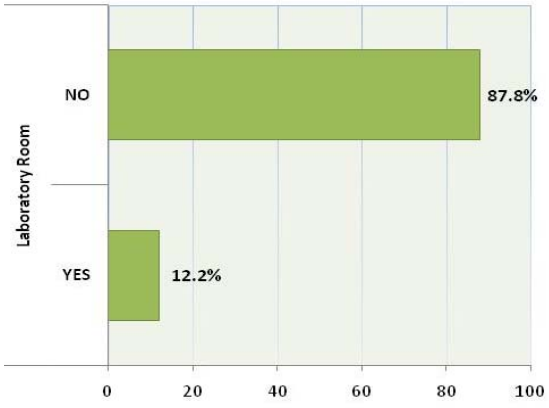
Analysis of the SEMIS database reveals that in 84% of the schools, separate library room is not available. Only around 16% of the schools have dedicated library facilities.



Library Room

5.3.4 Laboratory

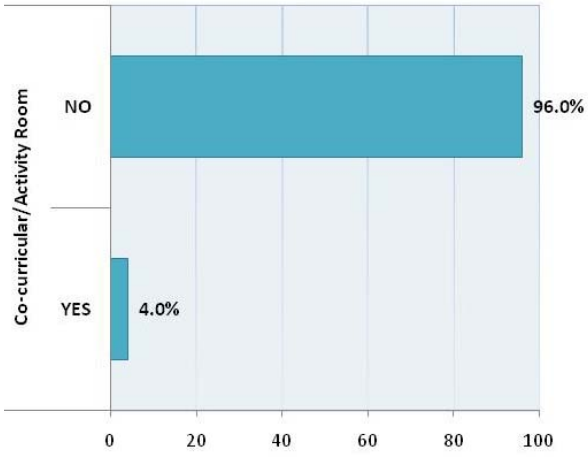
Analysis of the SEMIS database reveals that in 88% of the schools, separate laboratory room is not available. Only around 12% of the schools have laboratory facilities.



Laboratory Room

5.3.5 Co-curricular / Activity Room

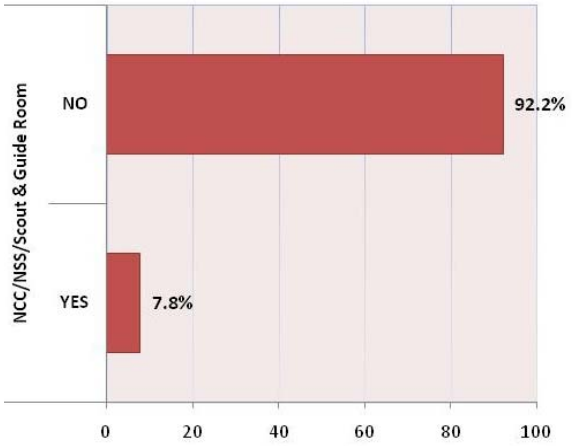
Analysis of the SEMIS database reveals that in 96% of the schools, co-curricular / activity rooms are not available. Only in 4% of the schools a separate room is available for co-curricular activities (indicative of the school's interest in promoting co-curricular activities).



Co-curricular / Activity Room

5.3.6 NCC/NSS/Scout & Guide Room

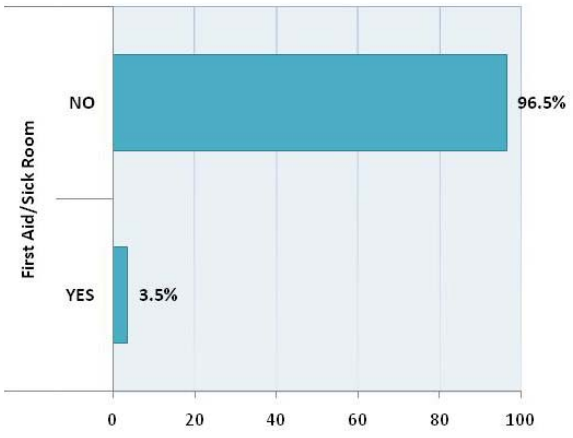
Analysis of the SEMIS database reveals that in 92% of the schools, separate NCC/NSS/Scout and Guide room is not available. Only in 8% of the schools, a separate room is available for NCC/NSS/Scout activities (indicative of the school's interest in promoting such activities).



NCC/NSS/Scout & Guide Room

5.3.7 First Aid / Sick Room

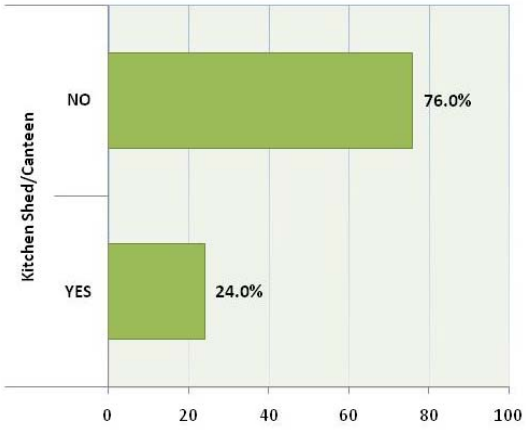
Analysis of the SEMIS database reveals that in 96.5% of the schools, separate First Aid/Sick room is not available. Only in 3.5% of the schools, a separate First Aid/Sick room is available.



First Aid / Sick Room

5.3.8 Kitchen Shed / Canteen

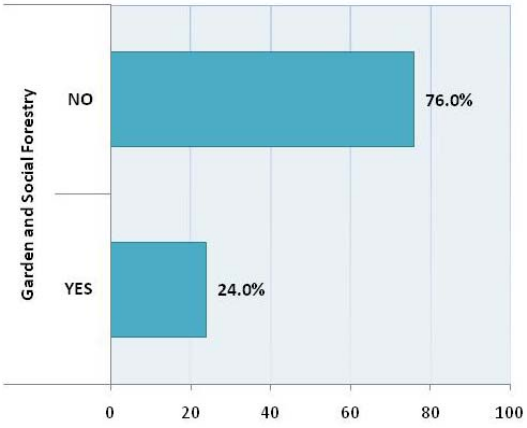
Analysis of the SEMIS database reveals that in 76% of the schools, separate kitchen sheds/canteens are not available. Only 24% of the schools have kitchen shed / canteen facilities.



Kitchen Shed / Canteen

5.3.9 Garden & Social Forestry

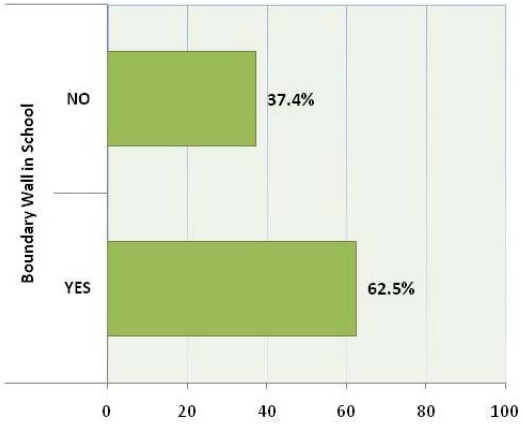
Analysis of the SEMIS database reveals that in 76% of the schools, garden or any kind of social forestry/plantations are not available. Only 24% of the schools have gardens or social forestry.



Garden / Social Forestry

5.3.10 Boundary Wall in School

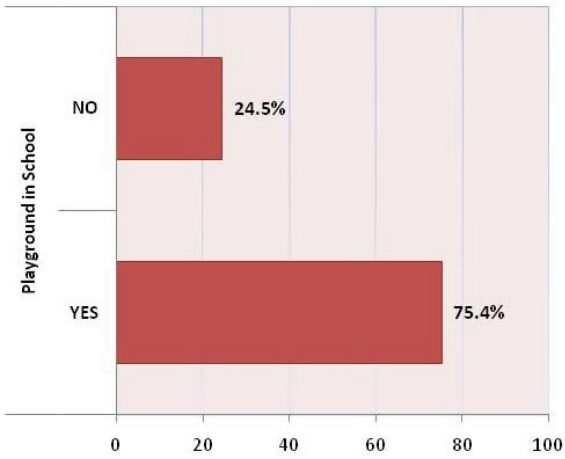
Analysis of the SEMIS database reveals that around 63% of the schools do have a boundary wall around the school. However in 37% of the schools the boundary wall is missing (has not been constructed / has completed broken down)



Boundary Wall in School

5.3.11 Playground in School

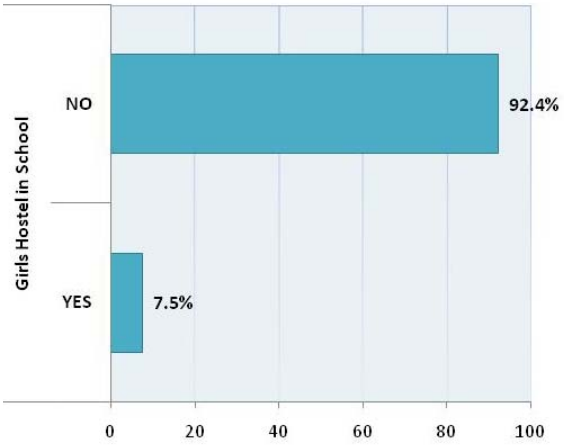
Analysis of the SEMIS database reveals that over 75% of the schools have a playground for children within the school. However in 25% of the schools no such playgrounds for the children are available.



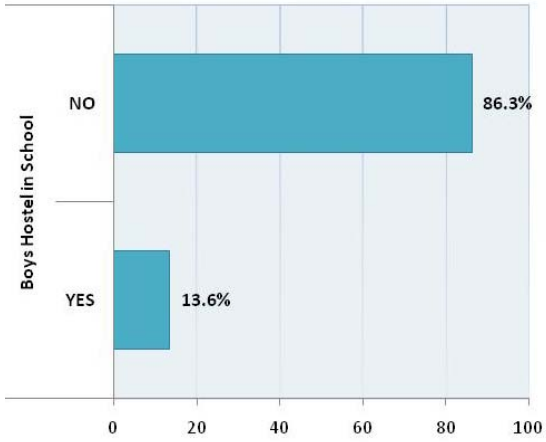
Playground in School

5.3.12 Hostel Facilities

Most of the schools are non-residential and meant for only day boarders. Hostel facilities are available only in about 20% of the schools. Hostel facilities for boys are available in 14% of the schools while hostels for girls are limited to only 7.5% of the schools.



Hostels for Girls



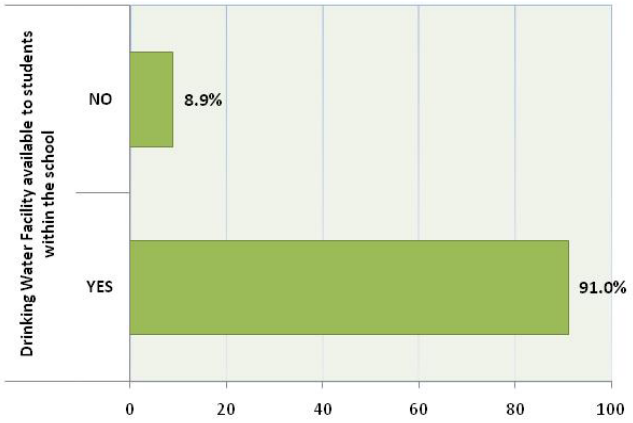
Hostels for Boys

5.1 WATER, SANITATION, POWER, SAFETY & OTHER SPECIAL PROVISIONS IN THE SCHOOL

5.1.1 Water Supply

Availability of Drinking Water Facilities within School

Analysis of the SEMIS database reveals that in 91% of the schools, drinking water facilities are available within the school. However around 9% of the schools have no drinking water facility within the school.



Availability of Drinking Water Facilities within School

Source of Drinking Water Facilities within School

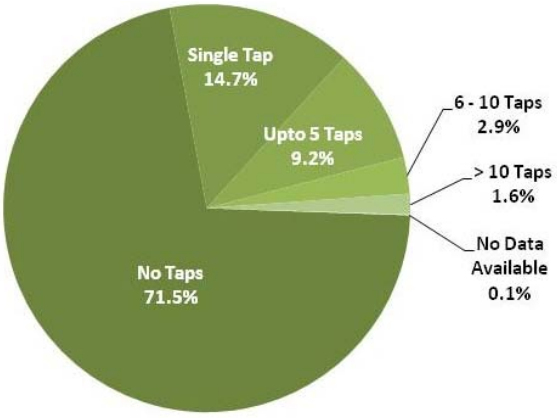
The major source of drinking water supply in schools has been indicated as taps, hand pumps and wells. The database also lists static vessels (such as pitchers, pots and buckets) as source of drinking water supply for schools in which the other water sources are not available.

Review of the SEMIS database reveals that in respect of taps as the source of water supply, 72% of the schools do not have taps. Around 15% of the schools have a single tap while 10% of the schools presently have up to 5 taps in the school. Only about 5% of the schools have more than 5 taps within the school.

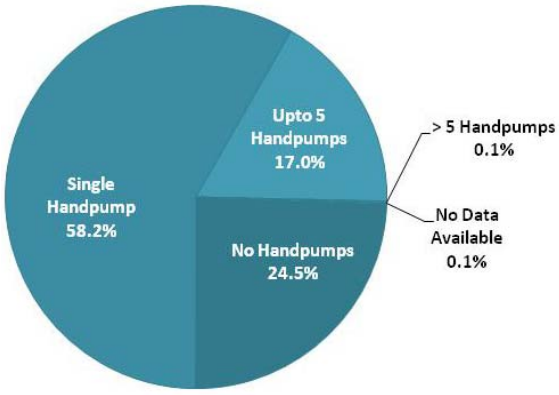
Similarly in respect of hand pumps, 25% of the schools do not have any hand pump. Around 58% of the schools have a single hand pump within the school while around 17% of the schools have more than one hand pump.

In respect of wells, 75% of the schools do not have any wells within the school premises. Around 23% of the schools have a single well within the school premises whereas only 2% of the schools have more than one well within the school premises.

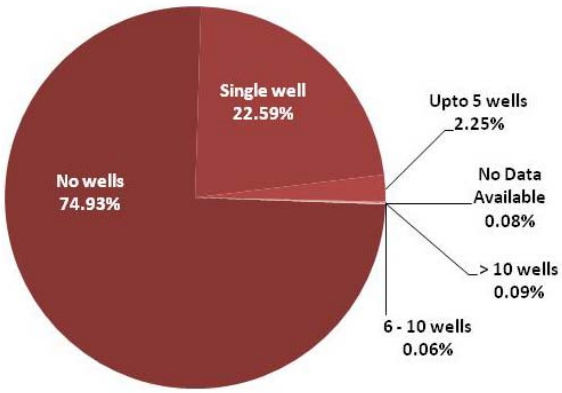
In case of vessels for storing water such as buckets, pitchers and pots, 65% of the schools do not have such vessels. Remaining 35% of the schools have some form of the vessels and in varying numbers.



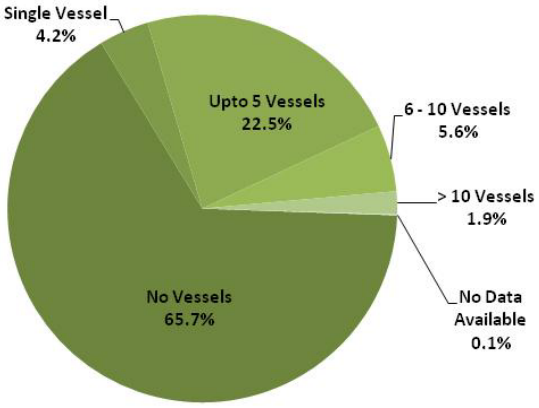
Taps



Hand pumps



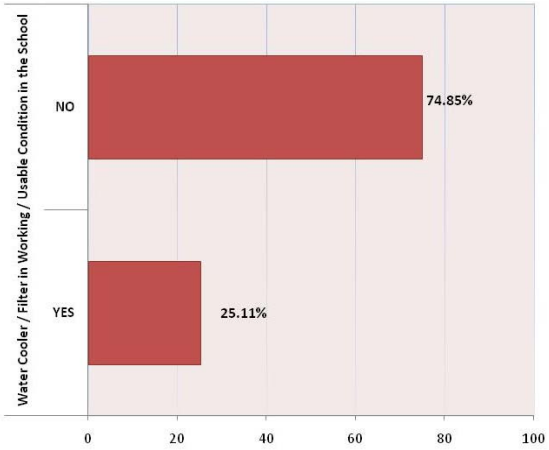
Wells



Vessels

Water Cooler/ Filter in Usable Condition within School

Analysis of the SEMIS database reveals that in 75% of the schools, water filter / water cooler facilities are available in the school. Around 25% of the schools however have facilities such as water cooler / water filter in usable condition.

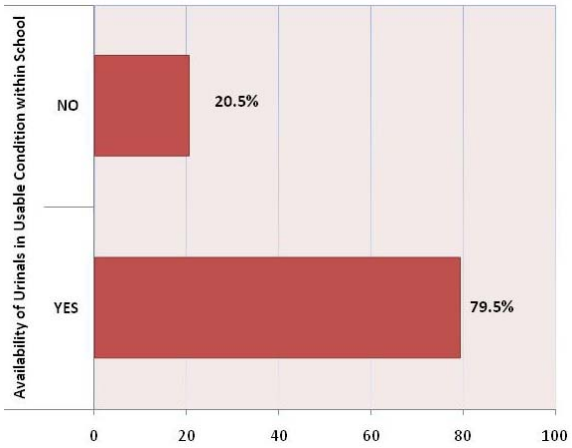


Availability of Water Cooler/ Filter in Usable Condition within School

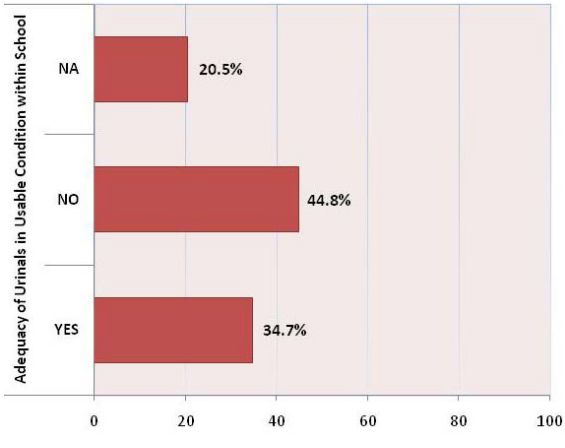
5.1.2 Sanitation

Urinals within School

Analysis of the SEMIS database reveals that in 80% of the schools, urinals in useable condition are available in the school. However in around 20% of the schools urinals in usable condition are not available. Among the schools which do have urinals (80%), it is only in about 35 % of the schools that the number of urinals is adequate whereas in the remaining 45% of the schools the number of urinals is inadequate.



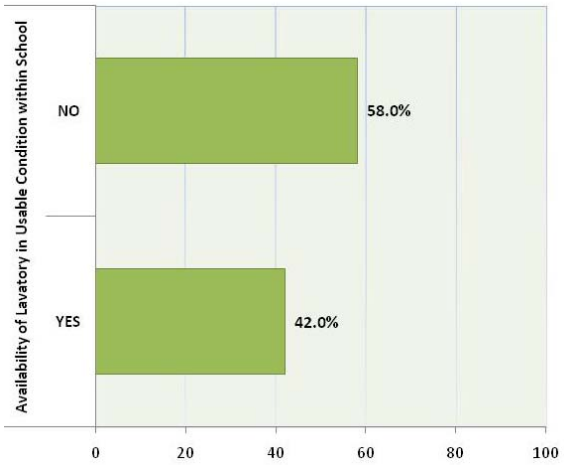
Availability of Urinals in Usable Condition within School



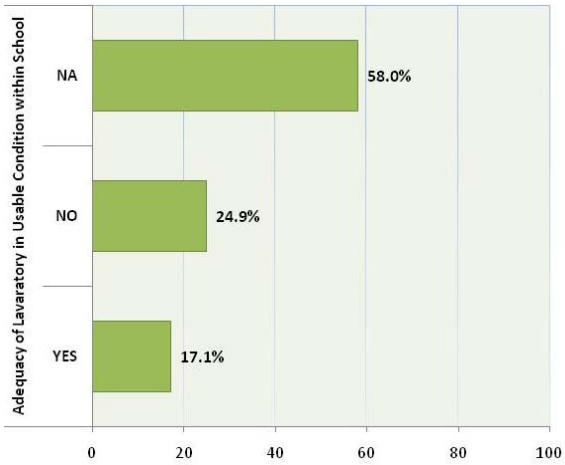
Adequacy of Urinals in Usable Condition within School

Lavatory within School

Analysis of the SEMIS database reveals that in 42% of the schools, lavatories in useable condition are available in the school. However in around 58% of the schools lavatories in useable condition are not available. Among the schools which do have lavatories (42%), it is only in about 17 % of the schools that the number of lavatories is adequate whereas in the remaining 25% of the schools the number of lavatories is inadequate.



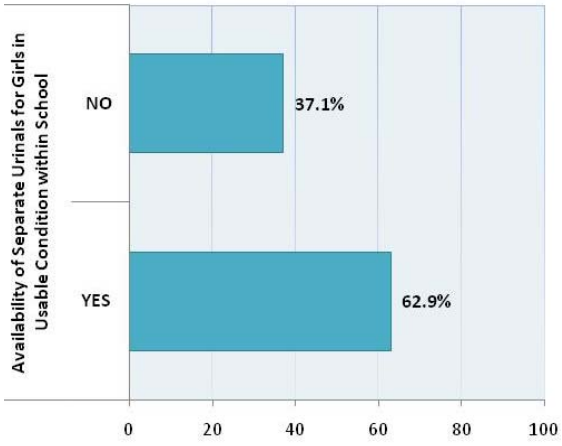
Availability of Lavatory in Usable Condition within School



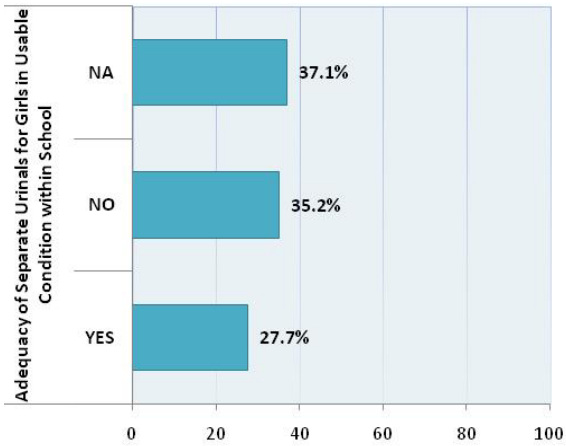
Adequacy of Lavatory in Usable Condition within School

Separate Urinals for Girls within School

Analysis of the SEMIS database reveals that in 63% of the schools, separate urinals for girls in useable condition are available in the school. However in around 37% of the schools separate urinals for girls in useable condition are not available. Among the schools which do have urinals (63%), in about 28 % of the schools, that the number of separate urinals for girls in useable condition is adequate whereas in the remaining 35% of the schools the number is inadequate.



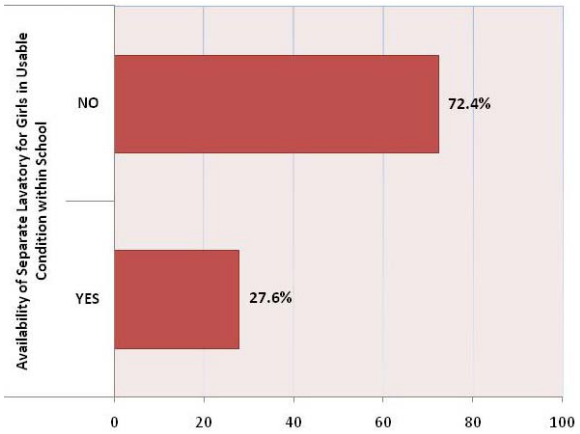
Availability of Separate Urinals for Girls in Usable Condition within School



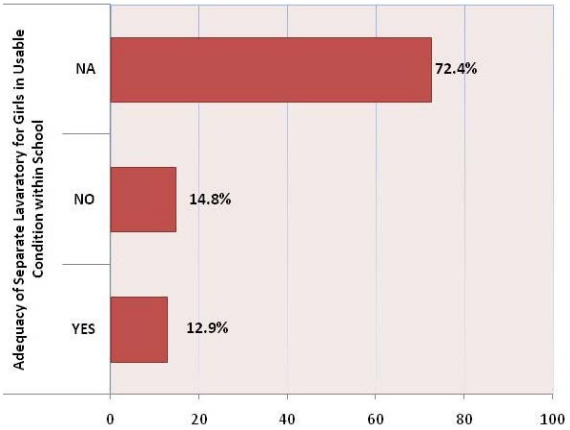
Adequacy of Separate Urinals for Girls in Usable Condition within School

Separate Lavatory for Girls within School

Analysis of the SEMIS database reveals that in 28% of the schools, separate lavatories for girls in useable condition are available in the school. However in around 72% of the schools, separate lavatories for girls in useable condition are not available. Among the schools which do have lavatories (28%), in about 13 % of the schools, the number of separate lavatories for girls is adequate, whereas in the remaining 15% of schools the number is inadequate.



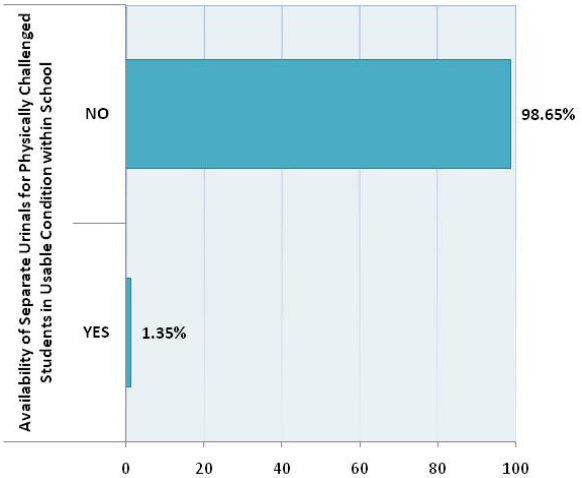
Availability of Separate Lavatory for Girls in Usable Condition within School



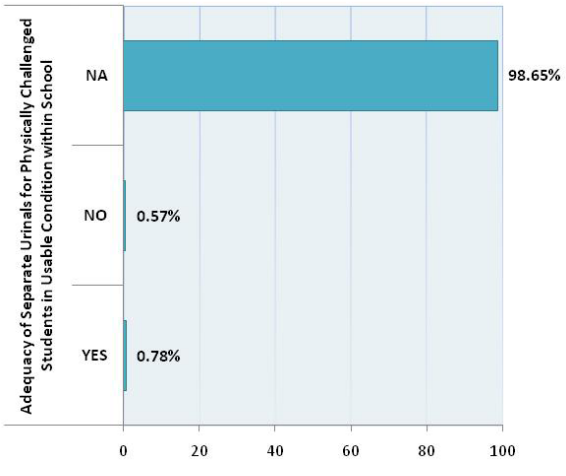
Adequacy of Separate Lavatory for Girls in Usable Condition within School

Separate Urinal for Physically Challenged Students within School

In 98.6% of the schools, separate urinals for physically challenged students in useable condition are not available. Among schools which do have separate urinals for the physically challenged students (1.4%), in about 0.8 % of the schools, that the number of urinals is adequate whereas in the remaining 0.6% of the schools, the number is inadequate.



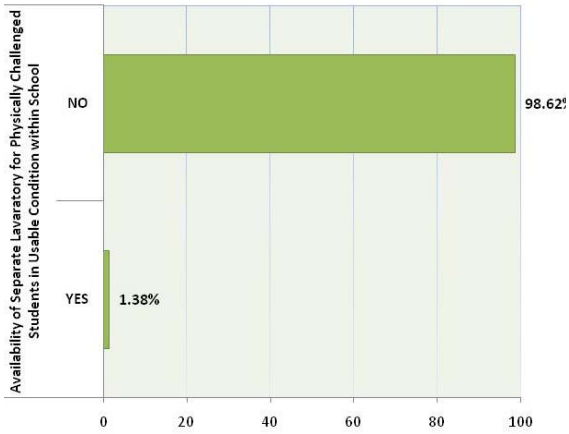
Availability of Separate Urinal for Physically Challenged Students in Usable Condition within School



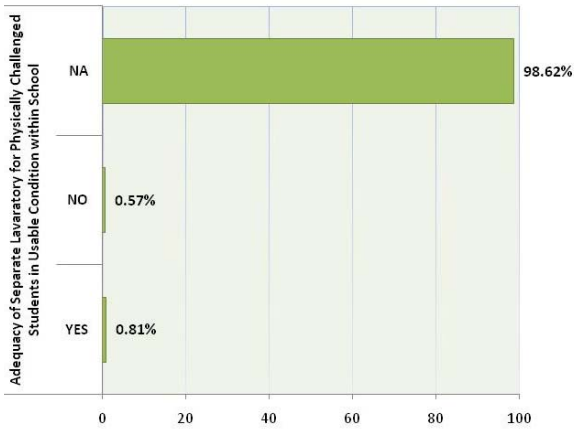
Adequacy of Separate Urinal for Physically Challenged Students in Usable Condition within School

Separate Lavatory for Physically Challenged Students within School

In 98.6% of the schools, separate lavatory for physically challenged students in useable condition is not available. Among schools which do have separate lavatory for the physically challenged students (1.4%), in about 0.8 % of the schools, that the number of urinals is adequate whereas in the remaining 0.6% of the schools, the number is inadequate.



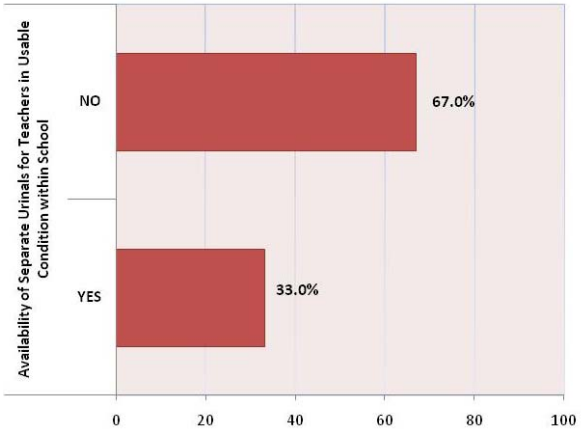
Availability of Separate Lavatory for Physically Challenged Students in Usable Condition within School



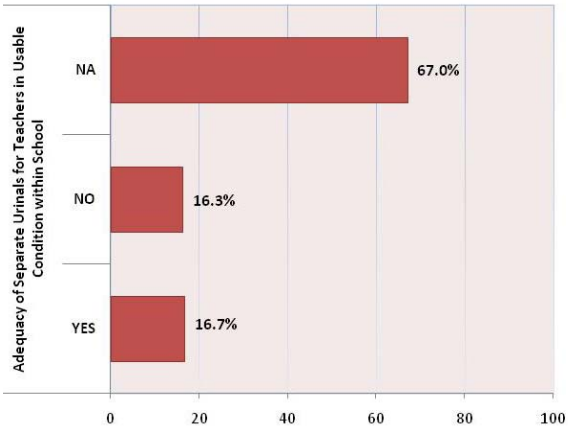
Adequacy of Separate Lavatory for Physically Challenged Students in Usable Condition within School

Separate Urinal for Teachers within School

In 33% of the schools, separate urinals for teachers in useable condition are available in the school. However in around 67% of the schools separate urinals for teachers in useable condition are not available. Among the schools which do have separate urinals for teachers (33%), in about 17 % of the schools, the numbers are adequate whereas in the remaining 16% of the schools the numbers are inadequate.



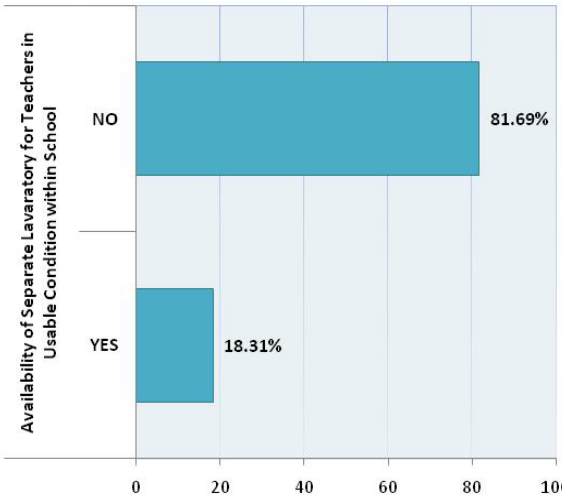
Availability of Separate Urinals for Teachers in Usable Condition within School



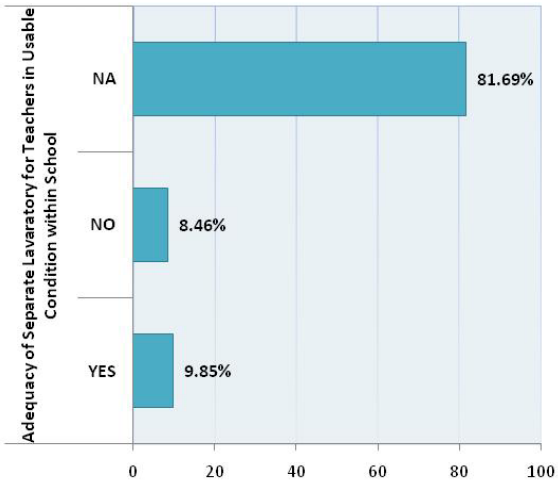
Adequacy of Separate Urinals for Teachers in Usable Condition within School

Separate Lavatory for Teachers within School

In 18% of the schools, separate lavatory for teachers in useable condition is available in the school. However in around 81% of the schools separate lavatory for teachers in useable condition are not available. Among the schools which do have separate lavatory for teachers (18%), in about 10 % of the schools, the numbers are adequate whereas in the remaining 8% of the schools, the numbers are inadequate.



Availability of Separate Lavatory for Teachers in Usable Condition within School

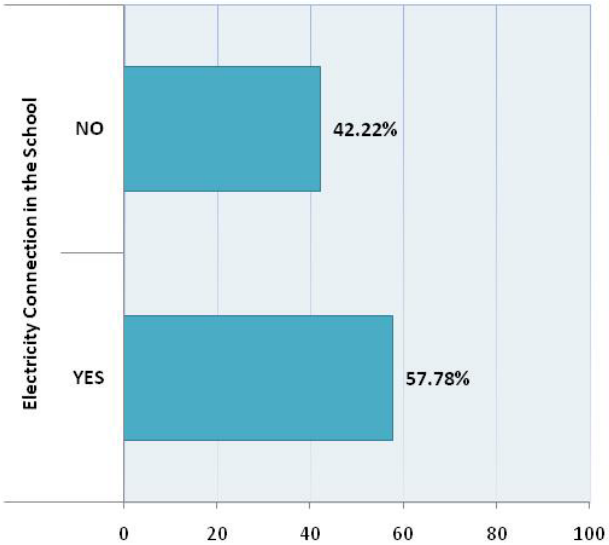


Adequacy of Separate Lavatory for Teachers in Usable Condition within School

5.1.3 Power Supply

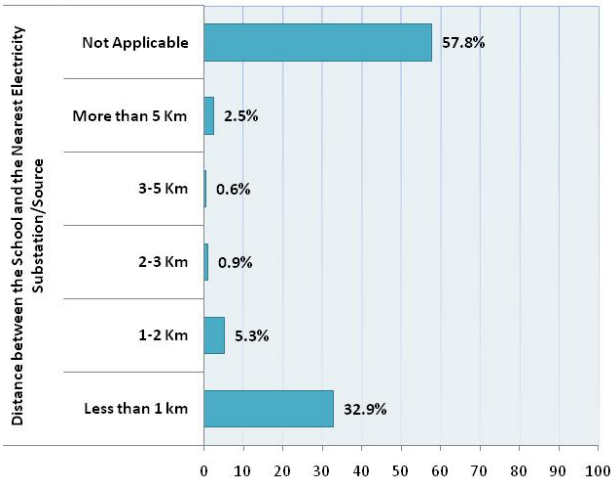
Analysis of the SEMIS database reveals that 58% of the schools have electricity connection. Among 42% of the schools that have no access to electricity, 33% of the schools are located within a distance of 1 Km of an electrical sub-station / source whereas around 5.3% of the schools are located within a distance of 1-2 Km from an electric sub-station / source.

Among 42% of the schools with no access to electricity, around 2.5% of the schools are located at a distance more than 5 Km from an electrical sub-station / source.

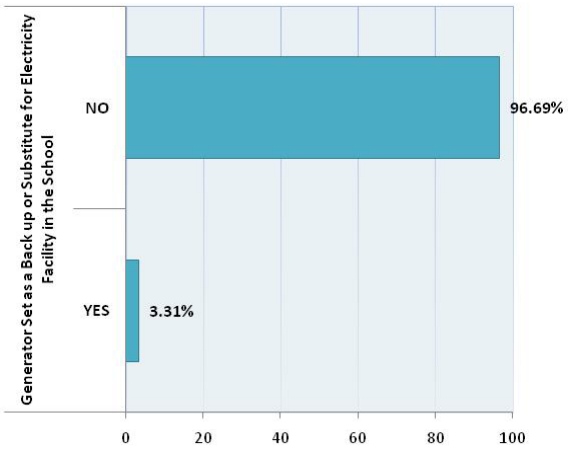


Electricity Connection in School

In terms of DG sets as back up arrangements or as a substitute electric facility in school, only about 3.3% of the schools have the required facilities.



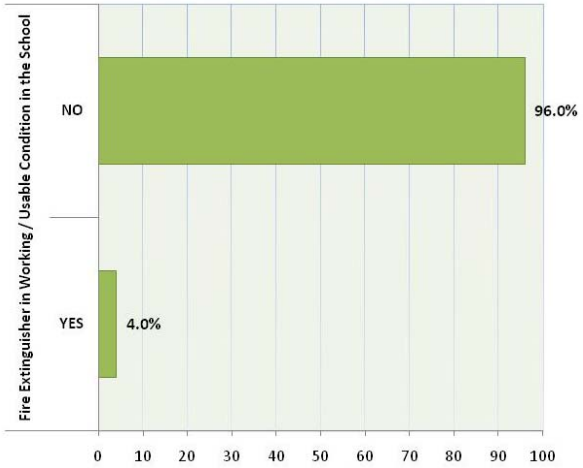
Distance between the School and the Nearest Electricity Substation/Source



DG Set in School

5.1.4 Fire Safety Arrangements

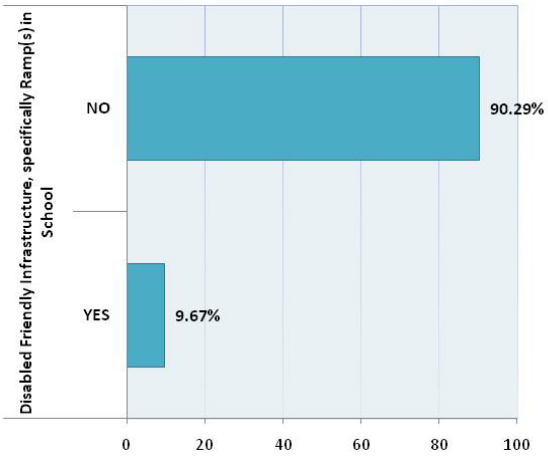
Analysis of the SEMIS database reveals that 96% of the schools do not have a fire extinguisher in working / useable condition within the school. Only in case of 4% of the schools, fire extinguishers in working condition are available.



Fire Extinguishers in Working / Usable Condition in School

5.1.5 Special Arrangements for Physically Challenged Students

Analysis of the SEMIS database reveals that 90% of the schools do not have any special arrangements for physically challenged students within the school. Only in case of around 10% of the schools, special arrangements for physically challenged students specifically ramps are available.



Special Arrangements for Physically Challenged Students in School

6 ENVIRONMENTAL ASSESSMENT OF THE SCHOOLS IN ORISSA

Environmental Assessment (of schools) helps to identify the key environmental concerns which have negative impacts upon the school environment. This would lead to the proposed environmental management framework which would essentially indicate a mechanism for the implementation of the environmental management measures. This chapter tries to capture the environmental impacts of different schools based on the ***five*** key elements categorized earlier, namely, *the school environment*, *potential environmental impact*, *conservation of resource*, *reinforcing the learning environment* and the *resilience of the school*. As have already been mentioned in the previous chapter, several aspects under the key elements have been classified to analyze the present situation of the schools. We therefore discuss each 'key element' with reference to the different aspects in the following sections and sub-sections of this chapter.

6.1 INDICATORS FOR ENVIRONMENTAL ASSESSMENT

Based on the review of guidelines, manual and documents benchmarks and best practices were identified. As mentioned earlier the indicators were ranked based on these benchmarks and best practices. The rationale to selection of these indicators for each of the five key elements and the aspects thereof are presented in ***Table 6-1***, ***Table 6-2***, ***Table 6-3***, ***Table 6-4*** and ***Table 6-5*** respectively.

TABLE 6-1: THE SCHOOL ENVIRONMENT – CRITERIA AND RANKING

No.	Aspect	Indicators	Rationale
1	Location of School	Location of School in respect of Ecologically Protected Areas	Selection of site for a school should look into aspects like natural risk (floods, earthquakes landslides etc) The natural environment in which it is located should not be an impediment for the development of the child. **(IS: 8827 – 1978)**
		Location of School in respect of Natural Disaster Prone Areas (Flood, Earthquake, Erosion, Landslide, Cyclone, Storm & Drought)	
		Location of School in respect of Polluted Industrial / Mining Areas	
		Location of School in respect of Ground Water Contaminated Areas	
		Location of School in respect of Congested Areas & Busy Road	
2	Building Design	Type of Building	The physical condition of the building should provide a comfortable atmosphere to the children Landscaping would play an important role to increase the comfort condition inside the
		Physical Condition of Building	
		Material Used for Roof	
		Material Used for Windows	
		Landscaping & Natural Shade	

No.	Aspect	Indicators	Rationale
		Colour of the Building and Class Room	building and also in the surrounding environment External condition of schools acts as stimulant for the child to attend school
3	Natural Light & Ventilation	Cross Ventilation	Ventilation especially in certain climatic conditions would be important for improving comfort of the classroom (IS: 7662 (PART I) – 1974) Location and sufficiency of openings would be crucial for the natural ventilation (IS: 8827 – 1978) Nature and sufficiency of light has to be maintained. However day light would be most preferred (IS: 2440 – 1975)
		Sufficiency of Door & Window Width	
		Sufficiency of Natural Light	
4	Artificial Lighting & Air Circulation	Lighting Facility in the Class Room	Artificial air circulation have to be maintained within class rooms to maintain comfort of the classroom (IS: 7662 (PART I) – 1974
		Arrangement for Air Circulation	
		Cooling / Heating Arrangement	
5	Seating & Display Arrangements in Class Rooms	Sufficiency of Space	Space for class room should cater for 40 students. Ergonomics of the learning environment (IS 4837) Blackboard orientation should ensure it is visibility from all sides. (IS: 8827 – 1978) Arrangements required for physically challenged (IS 4963)
		Height of Benches / Tables / Desks	
		Special Sitting Arrangement for Physically Challenged Students	
		Visibility of Black Board	
6	Library Design	Free Movement Space	Design guidelines for libraries (IS 8338)
		Adequate Numbers for Sitting	
		Adequate Light & Ventilation	
		Regular Pest Control	
7	Laboratory Design	Adequate Space for All Subjects	Lighting and Ventilation of Laboratories Availability of daylight in laboratories (IS: 2440 – 1975)
		Proper Height of Laboratory Table	
		Cross ventilation and Exhaust Fan	
		Availability of Clear Daylight	
		Artificial Lighting Facility	
		Running Water and Hand/Eye Washing Facility	

No.	Aspect	Indicators	Rationale
8	Kitchen Design	Provision of Separate Kitchen	Provisions of Kitchen National Building Codes 2005 Part 2 Section 12.3) Part IV - Fire & Life Safety and the Code of Practice of Fire Safety in Educational Institutions (IS 14435:1997)
		Location of Kitchen in Proximity to Class Rooms	
		Availability of Exhaust Fan / Chimney	
9	Facilities for Physically Challenged	Ramp for Physically Challenged Student	Provisions for Physically Challenged persons (IS 4963-1987)
		Availability of Benches of Different Heights	
10	Water Supply	Drinking Water Source	Basic facilities for school buildings (1 IS: 8827 – n pro1978) Supreme Court order on providing drinking water, toilet and electricity in schools
		Water Storage Facility	
		Water Availability	
		Sufficiency of Drinking Water Facilities	
		Water Treatment Facilities	
		Testing of Drinking Water Quality	
		Condition of Drinking Water Facilities & their Maintenance	
		Location of UG Reservoir with respect to any Source of Contamination	
11	Sanitation Facility	Sufficiency of Urinal / Lavatory	Basic facilities for school buildings (1 IS: 8827 –1978) Supreme Court order on providing drinking water, toilet and electricity in schools
		Separate Toilets for Boys and Girls	
		Separate Toilets for Teachers and Students	
		Safety of Girl's Toilet	
		Provisions in Toilets for Physically Challenged Students	
		Availability of Water Connection in Toilets	
		Structural Condition of Toilets	
		Hygienic Condition of Toilets	
12	Drainage System	Availability of Drainage Facility	Basic facilities for school buildings (1 IS: 8827 –1978)
		Type of Drains	
		Structural Condition of Drains	
		Cleaning of Drains	
		Water Logging or Overflow of Drains	

TABLE 6-2: ENVIRONMENTAL IMPACTS – CRITERIA AND RANKING

No.	Aspect	Indicators	Rationale
1	Drainage	Outfall of Drain	Severity of Impacts of discharge would be dependent on receiving water body
2	Waste Water Treatment & Discharge	Waste Water Treatment & Discharge Arrangement	Quality of discharge would be dependent on the treatment facility.
		Type of Latrines and Associated Treatment Facility	
3	Disposal of Solid waste	Waste Collection Facility in the School	Availability of Collection treatment and disposal systems of solid waste would determine the level of impacts
		Separate Collection for Segregated Waste	
		Condition of Bins	
		Disposal of Waste	
		Frequency of Disposal	
		Treatment of Waste	
4	Air & Noise Emission	Condition of DG Stack and Acoustic Enclosure	Sources of noise not natural to the school can be a source of discomfort to the school or adjoining locality

TABLE 6-3: CONSERVATION OF RESOURCE – CRITERIA AND RANKING

No.	Aspect	Indicators	Rationale
1	Water Conservation	Water Conservation	Efforts undertaken to promote conservation of water
		Rain Water Harvesting	
		Preventive Maintenance of Facilities	
2	Energy Conservation	Type of Lighting Facility	Efforts undertaken to conserve energy
3	Use of Renewable Energy	Use of Renewable Energy	Efforts undertaken Promotion of renewable energy
		Awareness in School	

TABLE 6-4: REINFORCING THE LEARNING ENVIRONMENT – CRITERIA AND RANKING

No.	Aspect	Indicators	Rationale
1	School Curriculum and Activities Related to Environment	Curricular and Extra-Curricular Activities in School related to Environment	Awareness about environmental issues Effectiveness of environmental education efforts
		Environment Awareness Camp	
		Eco-Clubs / Environmental Clubs	
2	Celebration Events related to Environment	Forestry Week / World Environment Day / Other Similar Events Observed in School	Involvement of school in awareness generation events

No.	Aspect	Indicators	Rationale
3	Awareness & Campaigns / Program	Safety Campaign & Awareness Activities	Program undertaken to raise awareness.
		School Campus Cleaning Program	
		Nature Study Camp	
		Awareness about Waste Management	
		Awareness about Energy Conservation	
		Awareness about Water Conservation	

TABLE 6-5: RESILIENCE OF THE SCHOOL – CRITERIA AND RANKING

No.	Aspect	Indicators	Rationale
1	Safety Aspect of Building Design	Physical Condition of the Building	Provision of fire safety in educational institution (IS: 14435 – 1997)
		Special Structural Facility to Cope with Natural Hazard	Cyclonic resistance of low rise houses and other
		Condition of Stair Case	buildings/structures (IS 15498:2004)
2	Laboratory Safety	Labelling of Chemicals	Earthquake Resistant Design and Construction of Buildings (IS 4326:1993)
		Availability of Fire Extinguishers	
		Availability of PPEs	
		Awareness Regarding Use of PPEs	

The Environmental score of the schools are presented in Annex 2. Each of these aspects have been analyzed and presented in the section below.

6.2 THE SCHOOL ENVIRONMENT

To assess the school environment the physical design aspects of school building, physical environment surrounding the school and the facilities available in the school were assessed as these together would create an environment conducive for education.

6.2.1 Location of the School

Impact on the school environment due to its specific location is said to be significant if it is located in any of the following sites - an ecologically sensitive area, natural disaster prone areas, industrially polluted area, groundwater contaminated area and congested areas or busy roads. Prior to the school visit schools were selected from different sensitive areas to identify the impact of the school location on the school environment. The schools adjacent to the highways or arterial road within the town are prone to accidents, e.g . AJO High School, Phulbani and Ma Maheswari High School, Angul Govt High School, Angul are adjacent to the main road in Phulbani Town and National Highway 55. In both these schools the entrance of

the school opens directly onto the highway and the safety of the children is a cause of concern. In Phulbani it was observed that the school authorities have taken initiative to post peons and staff on duty to manage traffic during the morning and evening.

Other than anthropogenic development natural habitats can also have influence on the school. The Kichainda Nodal UPS,Sundergah district is located in the Northern Plateaus Region of the state. This region has a number of reserve forest which are natural habitat for the elephants. It was reported that wild elephants strayed into the school premises some 2-3 years and had caused some minor damage to the buildings. Even though there is no defined wildlife corridor in the region the area is prone to such straying by some wild animals.

6.2.2 Building Design

For assessing the building design, indicators like type of building, physical condition of the building, material used for roof and windows, landscaping and natural shade within the school premises and colour of school building and classroom were considered. The schools in the rural and semi-urban areas scored below than the urban schools mainly because these schools were semi-pucca in nature and poor building condition (with cracks, damps and fissures). The maintenance of the assets created is very poor. Cracks in the walls, holes in the roof and seepages on the walls were observed in a number of occasions. The lack of maintenance of school building resulted in deterioration of the built environment in the school as is illustrated below.

BOX 6-1: MAINTENANCE OF BUILDING & OTHER INFRASTRUCTURE IN SCHOOLS

Out of the eighteen schools visited the lack of initiative in maintenance was observed in number of schools both governmant , government aided , Co-ed and boys or girls schools. Damps on walls can be seen as one of the primary signs of lack of maintenance as was observed in case of Jawaharlal Navodaya Vidyalaya, Tudipaju. Even though the schools performed satisfactorly in a number of parameters seepage was noticed at a few places and it was also observed to affect the the electrical wiring especially at the drinking water and toilet areas is illustrated in the picture below.

In some cases cracks were also observed in the walls, holes in the roofs of building

The above pictures damps affecting electrical wiring at Jawahar Navodaya Vidyalaya and cracks hostel building of Government Girls High School (Girls), Dutipada respectively

6.2.3 Natural and artificial lighting and ventilation

To assess the natural lighting and ventilation of the schools the criterion considered were cross ventilation, sufficiency of width of doors and windows in the classrooms and natural light within the classrooms. In any school if natural lighting is sufficient, artificial lighting is not very necessary. However, considering the hot and humid summer months of Orissa, even if there is natural ventilation within the classrooms, artificial provision of air circulation for proper ventilation is a necessity. In most of the rural and the semi-urban schools visited, the team observed that artificial air circulation was almost absent and students and teachers rely on natural ventilation. In most of these schools although artificial lighting was present, lights were inappropriately placed. This is of particular relevance where natural lighting was poor. Thus, the rural and semi urban schools had lower scores than their urban counterparts in terms of artificial air circulation and lighting.

6.2.4 Seating and display arrangements in the classrooms

Spacious classrooms with proper seating and display arrangements in classrooms are a prerequisite for providing good learning environment or the students. The parameters considered while assessing the seating and display arrangements were sufficiency of space to move around the school, height of desk, benches and table, special seating arrangements for physically challenged students and visibility of blackboard. None of the schools visited were found to have special seating arrangements for physically challenged students in the classrooms. Some of the schools had been provided by desks and benches through the Thirteenth Finance Commission. These benches however do not have a provision to cater to the different heights of the students. Especially in rural schools student of junior classes were found to be seating on the floor. This again impairs the proper visibility of the blackboard. Also in most of the schools blackboards were placed in the corners of the classrooms which impair the visibility from the entire classroom. In some schools the blackboards were in poor condition and hence it was not properly visible even from the middle of the classroom. Cumulative consideration of these aspects shows poor scoring of most of the rural schools.

6.2.5 Library and laboratory facilities within the schools

A library and a laboratory are essential components of a good school. A laboratory is required for students of the middle and higher schools for doing their practical experiments as per the course curriculum. Within a laboratory space for movement, natural and artificial lighting along with proper ventilation and provision of running water (especially for chemistry laboratories) are necessary. Similarly, a library is required so that students can get reference books and enhance their knowledge on the subject matter.

About fifty percent of the schools visited did not have a dedicated library. The books were usually stored in almirahs in the headmaster's office or in a room without seating provision and insufficient natural or artificial lighting and ventilation. Similarly, none of the school visited were found to have dedicated laboratories for different subjects. Government funded schools although had the provision of laboratory facility, the laboratory usually was used only to

demonstrate the experiments to the students and store the teaching aids (like charts and models) used for science subjects and students were not allowed to do experiments on their own.

BOX 6-2: LIBRARY AND LABORATORY FACILITIES IN SCHOOLS

Out of the eighteen schools visited only two schools (*Jawahar Navodaya Vidyalaya* and *Sankhatras Govt. High School*) were found to have a dedicated library as well as a dedicated laboratory with proper facilities. In both these schools, libraries had proper seating arrangements with natural and articial lighting. Similarly, laboratories in these schools had the provisions for their students to conduct their own experiments, along with facilities of proper lighting and ventilation anf running water.

The above pictures shows proper library facilities at Sankhatras Government High School and Jawahar Navodaya Vidyalaya respectively

The children are thus deprived of gaining practical exposure in their learning process.

6.2.6 Kitchen Design

Mid-day meals for students up to class eight have been introduced under *Sarva Siksha Abhiyan*. This has necessitated construction of kitchen facilities in the school premises. However, sometimes it has also been observed that schools have outsourced the cooking activities to the NGOs/SHGs nearby and hence cooking is restricted outside the school premises. In the schools visited, mid-day meals were being cooked within the school. Kitchen design was an important aspect that was considered to have an impact on the environment of the school particularly when there are no separate facilities for kitchen or it is located close to the classes and without proper ventilating systems. Majority of the schools were without separate kitchen or have some makeshift arrangements for kitchen. This is in deviation to the standard prescribed. The schools with separate kitchens were observed to be either void of exhausts or kitchens were situated close to the classrooms. Even open kitchens void of sheds were observed in some of the semi-urban areas. In majority of the schools it was observed that firewood was used as fuel in the kitchen. This is a concern particularly when kitchens are situated adjacent to the classrooms.

BOX 6-3: SCHOOL KITCHENS

In one of the schools in the rural area (*Sahadab Samaj Bidyaniketan*), three kitchens were being located within the school premises. The three kitchens were meant for the ICDS school, primary section and the middle section. All the three kitchens were separate kichens with appropiate shed and stores, all of them were stored just adjacent to the classroom and were void of exhausts. The drains from the kitchen were led to the school premises.

The picture at the left shows dedicated kitchen with proper shade, while the picture at the right shows open kitcen facilities in the school

4.1.7 Arrangements for physically challenged students

Physically challenged students require additional facilities within the school, like specially constructed desks and benches, hand-rails in the lavatory and ramps alongside stairs. The provisions which are required in public institutions have been described earlier in the document. None of the schools visited reported that they had separate provisions for the physically challenged students. Although, schools were provided with the ramps, it was reported that since the schools serve as polling booths these ramps were constructed from the grants from the Election Commission. However, while assessing the schools we have considered that provisions of these ramps would facilitate the physically challenged students in the schools and hence the schools were given higher scores having number of ramps in different parts of the school building. Even though the ramps have been constructed other infrastructure modification required e.g. toilets to facilitate physically challenged person were not observed during the site visits.

4.1.8 Drinking water supply

Drinking water is an important aspect for the schools particularly when schools are situated in drier parts of the state and in the rural areas. Usually urban and semi-urban schools are provided with piped water supply from the municipalities or have bore-well facilities and proper storages and students usually carry their own drinking water. To assess the drinking water facilities existing within the schools the following parameters were considered – drinking water source, water storage facility, water availability, and sufficiency of drinking water facilities, water treatment facilities, testing of drinking water quality, condition of drinking water facilities & their maintenance, location of underground reservoir with respect to

any source of contamination. The drinking water sources observed in the schools were piped water supply from the municipalities or the nearby industry (which provides water to the townships), bore-well and tube well facilities within school or in the vicinity of the school. The schools having alternate drinking water facilities scored better since they could meet the sufficiency requirement of water at the same time. Most of the schools visited did not have water treatment facilities, and therefore schools provided water from municipalities or the industries were considered to be better than the other schools adjudging the external treatment facilities. Regarding the storage facilities, almost of the schools had overhead tanks or tanks with exception for some schools where tube wells were the source of drinking water. Given this fact it was observed that in most of the schools visited, there was a lack of testing of drinking water facilities or proper maintenance of the drinking water facilities and only 60 percent of the schools could be ranked above average in terms of drinking water facilities and these schools were situated in urban or semi-urban areas. Thus even though drinking water was available in all schools visited the quality of the drinking water was found to be neglected and the condition of drinking water facilities were found to be poorly maintained.

4.1.9 Sanitation facility

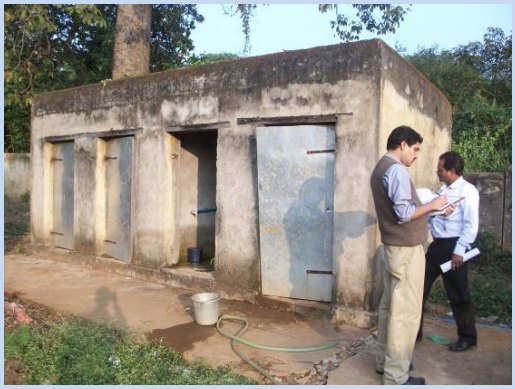
A proper sanitation facility in the schools is yet another important aspect for the students to provide a congenial atmosphere for education. It is in the school a student learns about proper means of health and hygiene, thus it becomes quite imperative for schools to provide and maintain proper sanitation facility to the students. The first important parameter considered was sufficiency of urinal / lavatory in the schools and whether separate toilets for boys and girls were provided. This is particularly important for co-education schools. The other parameters considered while assessing the sanitation facilities were separate toilets for teachers and students, safety of girl's toilet, availability of water connection in toilets, structural condition of toilets, hygienic condition of toilets and provisions in toilets for physically challenged students.

The sanitation facilities of the government schools in the urban areas fared better than the new government schools of the semi-urban and rural areas. Two important concern related to the urinals in the schools was absence of water connection in the toilets which again led to the poor hygienic condition of the toilets and the poor structural condition of the toilets. As have been mentioned earlier none of the schools were found to have provisions for physically challenged students.

BOX 6-4: SANITATION FACILITIES IN SCHOOLS

In almost all the schools visited, the school authority reported that there are no funds being provided for maintaining the proper hygeinic condition of the schools. In the schools sweepers or janitors are not regularly employed to clean the toilets and lavoratories. This had resulted in the poor conditions of the toilets. Out of the four girls' schools visited, in two schools sanitation facilities with respct to adequacy of toilets, privacy and hygiene conditions were above average, while in the other two schools this is of serious concern. In the co-ed schools visited usually girl students were found to have a separate facility. It was also observed that in some schools the girls students share these toilets with the female teachers which is a good practice, but in one school it was found that male teahers have their urinal and lavatory just adjacent to the girls toilet without a separator. This is a privacy concern among the girls students.






The scoring of sanitation facilities was done looking into the structural condition, hygiene, water connection, separate facility for girl students and for teachers. The above two picture shows good sanitation facilitiesin terms of structural condition and hygiene which were taken as benchmark. The two pictures below average and poor structural conditional respectively.

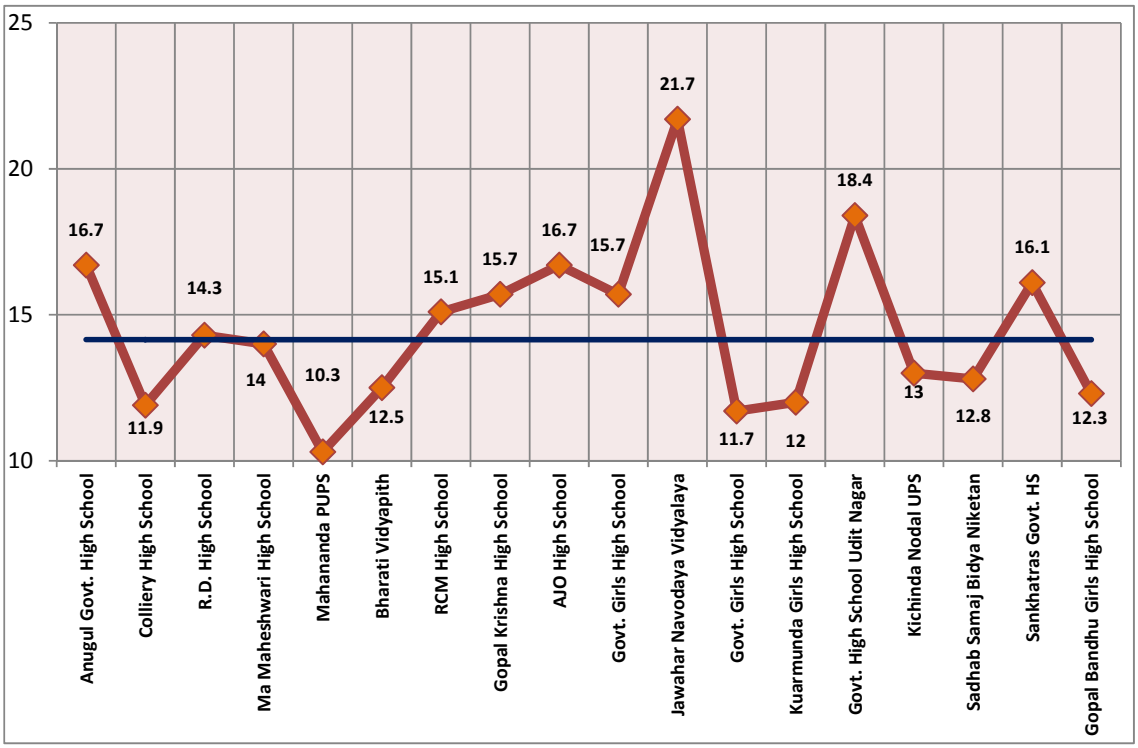
4.1.10 Drainage system

The schools were adjudged based on the availability of drainage facility, type of drains, and structural condition of drains, cleaning of drains, water logging or overflow of drains. Drainage facility was absent in almost all the schools excepting the government schools in the urban areas. Rural schools had open kutcha drains which had outlet within the school premises leading to an unhygienic condition.

This paragraph summaries the assessment done on the Key element of school environment. It shows a particular trend that the government schools in the urban and old government schools in rural areas are better poised than the other rural and semi-urban schools. It is to be noted

here that the student strength in these government schools are also higher compared to the other rural and semi-urban schools. One important fact that comes out from the analysis of the scores is that girl's schools have comparatively poor infrastructure than the other schools. The programme needs to address this issue to ensure that there is no deprivation of education at secondary level on the basis of socio-economic or gender considerations. The ***Figure 6-1*** shows the composite scores of all the eighteen schools obtained by assessing the school environment. The highs that are observed in the graph are those of government schools in urban areas (Angul Govt High School, Uditnagar Govt High School) and old government school in rural areas e.g. Shanktaras Govt High School, AJO High School.

FIGURE 6-1: ASSESSMENT OF SCHOOL ENVIRONMENT



6.3 POTENTIAL ENVIRONMENTAL IMPACTS

To assess the potential environmental impacts a school has on its surroundings the parameters that were considered were drainage, waste water treatment and discharge, disposal of solid waste and air and noise emission. These parameters were assessed based on the different criterion mentioned earlier.

6.3.1 Drainage

As have already been mentioned most of the schools did not have proper drains and about 40 percent of these schools had outlets within the school premises. Urban schools had drains leading to the municipality drains while most of the rural schools disposed the waste water to barren fields or nearby ponds.

6.3.2 Waste water treatment and discharge

The two key issues considered while assessing the waste water drainage and discharge were the existing arrangements for waste water disposal and types of latrines and associated treatment facilities. The prominent waste water disposal arrangement present in most of the schools was single pit septic tank without soak-pits leading out from the urinals and the lavatories. Absence of soak pits along with the septic tanks would result in the addition of untreated sewage which is a potential pollutant. About 60 percent of the schools thus had just an average score with respect to this parameter.

4.1.1 Disposal of solid waste

The solid wastes generated within the school are mainly waste papers, wastes from the food, dried leaves and twigs etc. The parameters considered in assessing the schools were – waste collection facility, separation and segregation of waste, condition of the bins, disposal of the waste, frequency of the disposal and the treatment of the waste. In all the rural schools visited irrespective of the fact whether they are government schools or not, the school authority reported that the students take part in the cleaning of the classrooms regularly. The school authority of urban government schools reported that the wastes collected from the classrooms are usually being collected by the municipalities as and when requisition are been given, but as such there is no regular collection. Out of the eighteen schools visited, only two schools could cite the utility of a compost pit but none of the schools were found to have compost pits for disposal of solid waste. In some of the rural and semi-urban schools it was observed that the students are of the habit of disposing of solid waste in the backyards of their classrooms through the windows of their classrooms. This shows that the awareness level among the students to be quite low in terms of proper disposal of the solid waste.

BOX 6-5: DISPOSAL OF SOLID WASTE

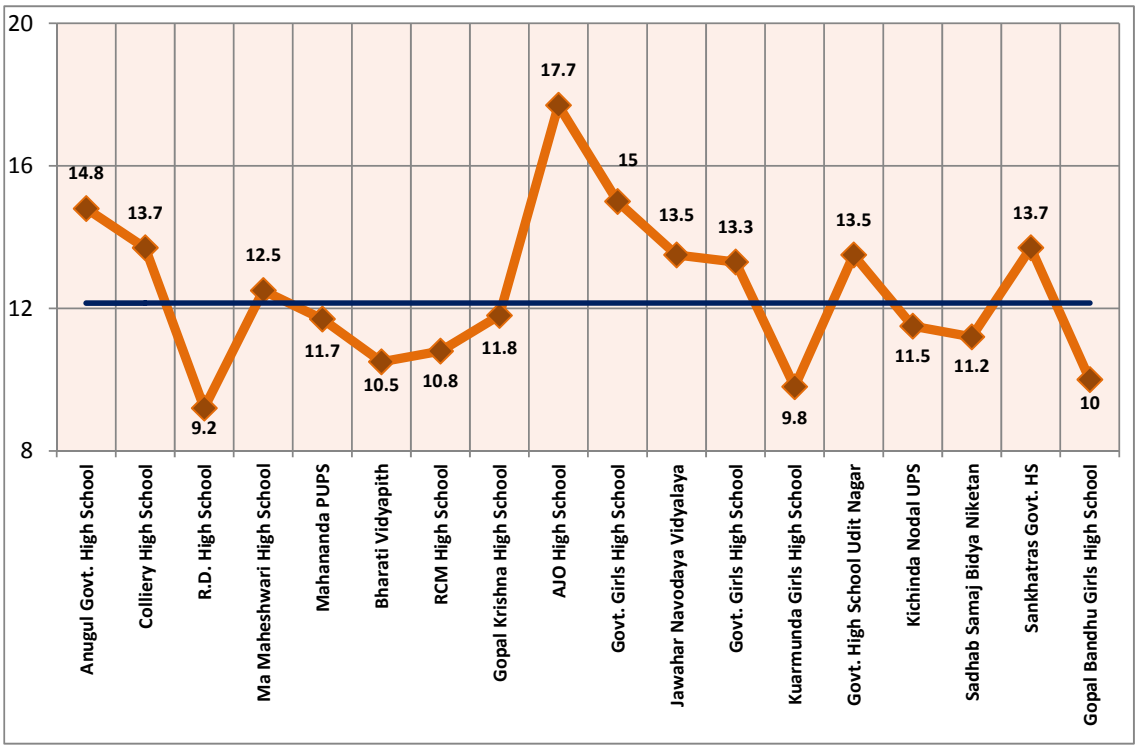
A common practice in the schools of Orissa is to collect the solid waste and burn them. Sometimes the litter is being burned near to the classrooms which is ought to have a high impact on the students. Thus, separation and segregation of solid waste is not a common practice and there is no treatment of waste.

Burning of waste in the schools of the Orissa

6.3.3 Air and noise emission

To assess whether there is potential impact on air and noise emission through any activities undertaken by the school, the school authority was probed regarding the presence of DG set and the acoustic enclave. Only one of the schools was found to have a DG set with a proper acoustic enclosure, the other schools did not have a DG set and thus the potential environmental impact was deemed to be low in comparison to the other impacts.

FIGURE 6-2: ASSESSMENT OF POTENTIAL ENVIRONMENTAL IMPACTS



The above ***Figure 6-2*** shows that urban schools e.g. (Angul Govt High School, Uditnagar Govt High School) delivers lower impact upon the surrounding environment while most of the rural and semi-urban schools render environmental impacts upon the surrounding particularly with respect to drainage of waste water directly to ponds, agricultural fields or discharge of untreated sewage to the environment.

6.4 CONSERVATION OF RESOURCES

One of the important components of sustainability is resource conservation. The schools adoption of conservation practices would definitely help in influencing a child's cognitive learning process and hence stress has been laid on the school's adoption of such practices.

4.3.1 Water conservation

The school authorities and the teachers were asked as to whether they were aware about the water conservation issues. Only 30 percent of the schools visited, reported to be aware of the water conservation measures. In these schools, even though water pipelines were properly maintained however leaks were observed in different areas e.g. storage, taps etc. It was also

observed that in some schools awareness levels among students about water conservation is low and initiative taken by the school were also lagging. This problem is particularly prominent in rural schools. However rainwater harvesting structures were absent in all the schools that were visited.

4.3.2 Energy conservation and use of renewable energy

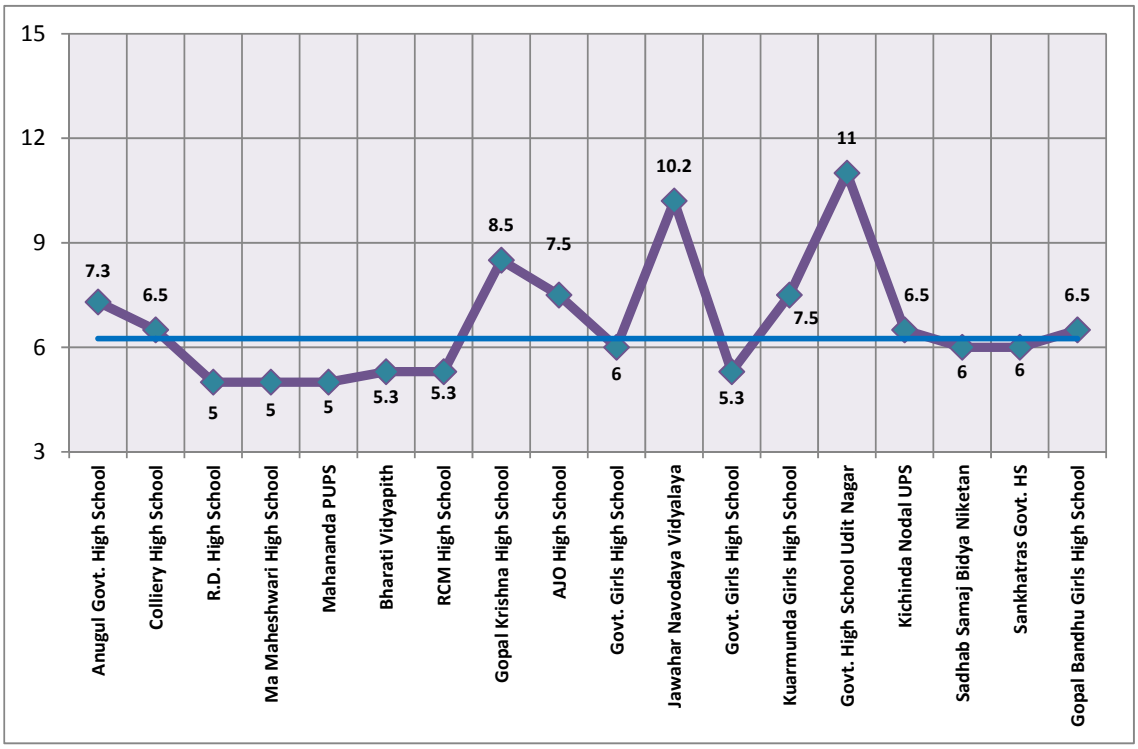
Although most of the schools visited were found to use CFL bulbs which are said to conserve energy, most of the school authorities were unaware about the use of renewable energy in the schools. The school teachers who said that they are aware about solar energy, mentioned that such proposition is viable only of government funds are being provided.

BOX 6-6: USE OF RENEWABLE ENERGY IN SCHOOLS

Only one school was found to have an inclination in utilising renewable energy from their own – *Jawahar Navodaya Vidyalaya.* At *Kichinda UPS*, solar panels were found to be installed within the school premises but it was found to be installed under the – Rural Electrification Scheme. Even though the construction of the facility is complete it is yet to be comissioned. This has increased the awareness of renewable energy among the teachers and students of the school.

Installation of solar panels under Rural electrification Scheme at Kichinda UPS

FIGURE 6-3: ASSESSMENT OF CONSERVATION OF RESOURCES



The analysis of the conservation aspects in the schools presented in

Figure 6-3 indicate that some Government schools e.g. (Gopal Krishna High School, Uditnagar Govt High School, Jawahar Navodaya Vidyalaya) have undertaken some efforts in conservation but other schools across all the categories have fared badly.

6.5 REINFORCING LEARNING ENVIRONMENT

During the visit to the schools, an attempt was made to understand whether the school undertakes activities related to environmental awareness. The school authority and the students were investigated on the following issues - awareness campaigns undertaken, celebration of events (like World Environment Day, Forestry week etc.) and whether the school curriculum includes aspects related to the environment.

While more than 80 percent of the schools had Eco Clubs, only about 50 percent of the school authorities were found to be aware about the environmental issues and have celebrated the special occasions. In the other schools, students have joined the Eco-clubs but they have not been introduced to different activities. Regarding safety campaign and awareness activities, the schools activities were restricted mostly to celebration of the 'hand-wash' day.

BOX 6-7: REINFORCING THE LEARNING ENVIRONMENT IN SCHOOLS

Department of Science and Technology (DST) , Government of India (GoI) has initiated a project ***Participation of Youth in Real Time and Field Observation of Benefit Education (PROBE)*** to elicit interest among the students of secondary school (IX & X classes) in meterological sciences. Under the ambit of this project meterological laboratory has been set up in different schools of each districts. The science teacher of the school is incharge of this laboratory and the students observe and collect weather related data pertaining to maximum and mimum temperature, humidity, wind speed and direction, rainfall, sunshine and evaporation. Out of the eighteen schools visited, five schools were foud to have such meterological stations where the students participate in collection of the weather data from the different instruments.

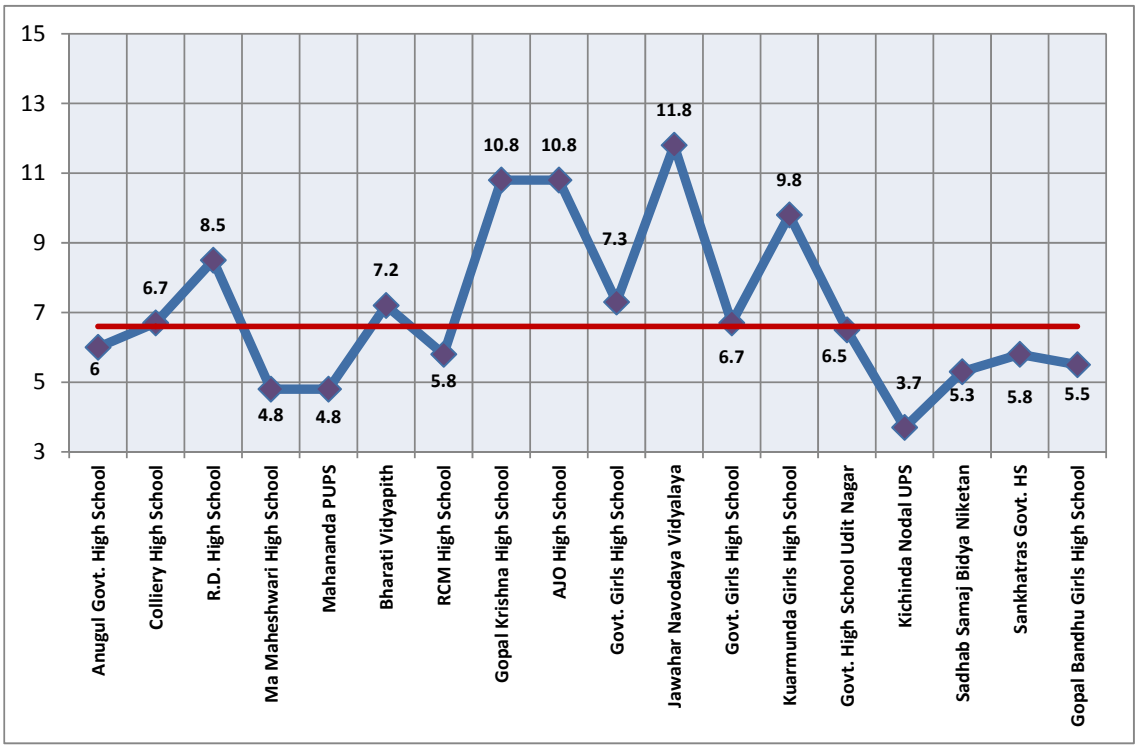
The school authority of *Government High School, Uditnagar* had initiated an innovative idea for maintaining the cleanliness and beautification within the school campus. The school campus had been divided into small areas and each class has been assigned the responsibility to maintain a particular plot in the school campus. The students thus maintains the gardens and also clear of the litter in that particular plot.

Eco-club activities that were found to be very prominent in *Gopal Krishna High School*. The school has received Prakruti Mitra Award 2009 from the Department of Environment and Forest and of their students received the Prakruti Bandhu Award. Their acitivities included the cleaning up the banks of Rushikulya. The Eco-Club of the school actively participates in the Celebration od Wetand day and with World Environment day and Forest Week.

The above two pictures shows Meterological Station at Talcher High School and Kuarmunda Girls High School.

The pictures below shows the demarcation of the school area under different classes at Uditnagar Government High School

FIGURE 6-4: ASSESSMENT OF REINFORCING LEARNING ENVIRONMENT



The above figure (***Figure 6-4***) shows that awareness among the students with relation to environment pertaining to course curriculum and different extra-curricular activities is limited only to some old government schools in the rural areas, followed by the semi-urban schools. The government schools of the urban areas have comparatively scored lower in this aspect. The reason behind such trend is due to the fact that the meteorological stations are located in rural and semi urban areas and the students in such schools actively participate in such program.

6.6 RESILIENCE OF THE SCHOOL

The resilience of the school was assessed considering the safety aspects of the building design, laboratory, kitchen, electrical and fire and also transport. In addition, the students and the teachers were probed about their awareness regarding emergency and their preparedness for any disaster. The safety aspect of the building design considered the physical condition of the building, special structural facility to cope with the natural hazard and condition of the stair case.

BOX 6-8: RESILIENCE OF SCHOOLS

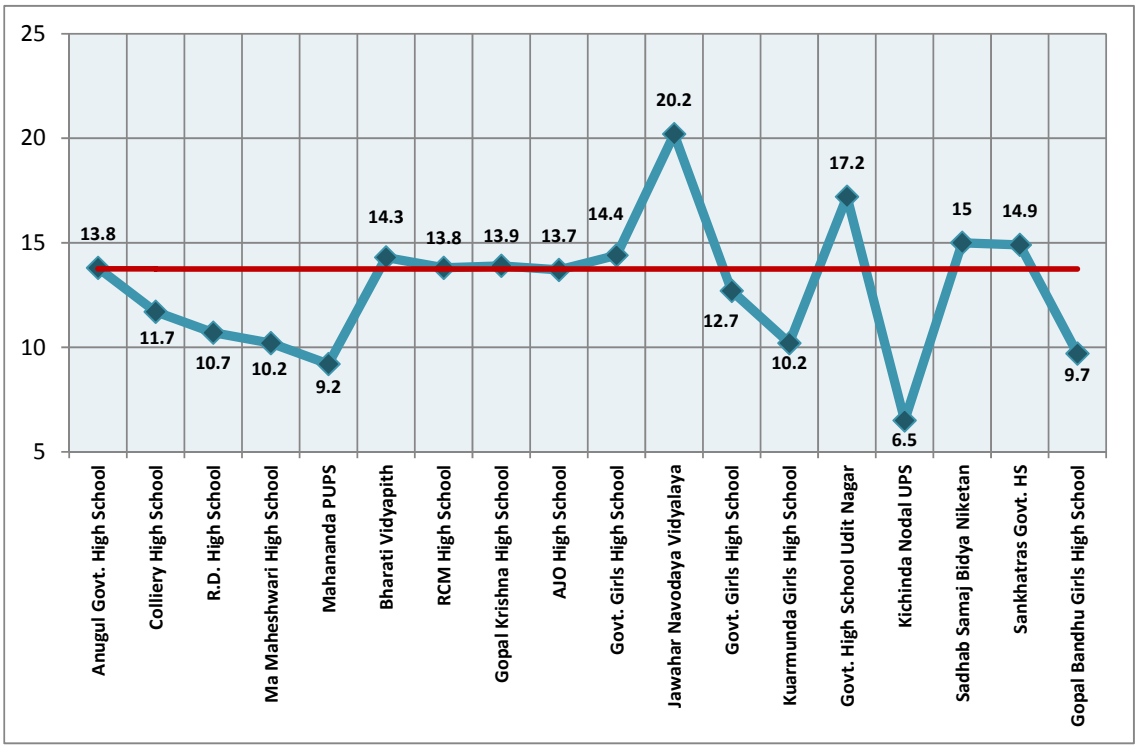
Three of the schools visited were found to have been constructed by the government after 1999 cyclone in the coastal district of Orissa. In these schools one of the buildings was constructed in such a manner which could act as a cyclone shelter in future. The resilence of such school buildings (at east partly) is important for the students and the community as a whole. In contrast to this some rural schools were found to be unsafe in aspects like ceiling plaster breaking off in certain classrooms.

Cyclone shelter in one of the schools in the coastal districts

In general the resilience of the urban schools was found to better compared to the rural schools and semi-urban areas. One of the striking features that were observed in the school visit is the low level of awareness towards safety issues with respect to laboratory, kitchen and fire. In some schools electrical safety is a concern otherwise condition of switches wiring and location of electrical fittings were found to be appropriate. A composite score of the safety issues shows an average performance of the schools in the rural areas and semi-urban areas. None of schools visited were found to have disaster preparedness and or awareness about emergency plans. Even schools with the cyclone shelters have not done any mock drills for disaster preparedness. Only one school *Angul Government High School* could show us the vacating points and that they have done mock drills to generate awareness among students about the emergency. However, they did not have an emergency plan.

The ***Figure 6-5*** corroborates the discussion above. The schools with the cyclone shelters have scored averagely since the awareness about disaster preparedness and emergency is low. On the other hand urban government schools scored just above average primarily because the construction of the building is good but safety issues related to laboratory or kitchen is poor. Most of the rural schools and the semi-urban schools visited scored less than average following either the weak building resilience or other safety issues.

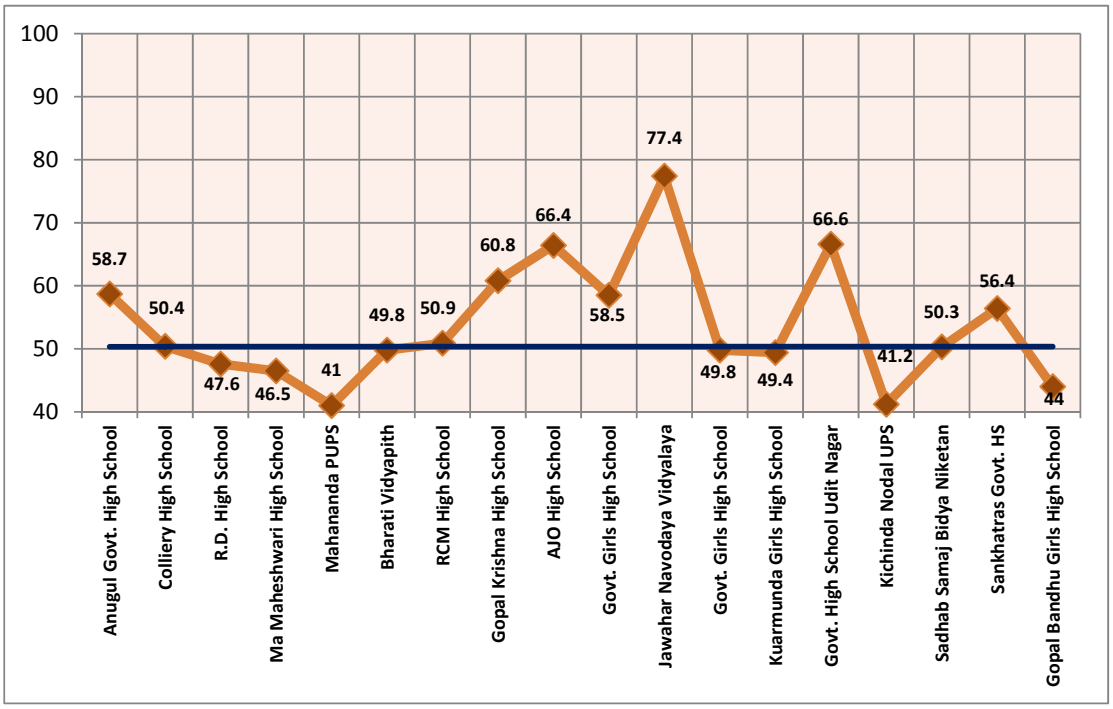
FIGURE 6-5: ASSESSMENT OF RESILIENCE OF SCHOOLS



6.7 ENVIRONMENTAL HEALTH & SAFETY PERFORMANCE OF SCHOOLS

The environmental health & safety performance of schools were derived by compositing the scores in all the five key elements without any bias. The composite score of all the key elements are presented in ***Figure 6-6***. Analysis shows that two schools *Jawahar Navodaya Vidyalaya* and *Uditnagar Government High School* scored over average consistently over all the key elements. In the following section we take up a case study of *Jawahar Navodaya Vidyalaya* to identify the good practices of the school.

FIGURE 6-6: COMPOSITE SCORES OF THE KEY ELEMENTS OF THE SCHOOLS



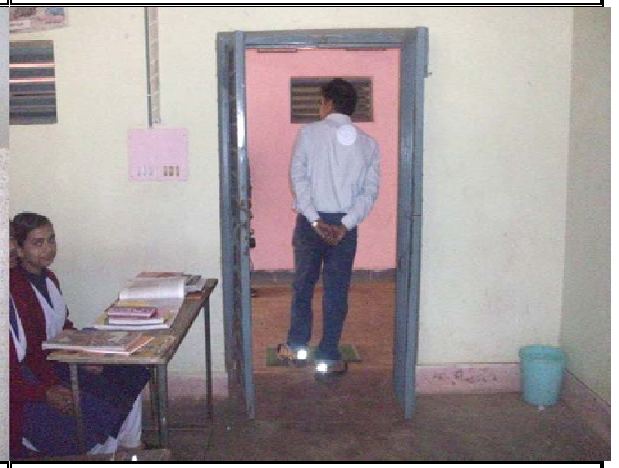
BOX 6-9: CASE STUDY OF JAWAHAR NAVODAYA VIDYALAYA

The National policy on Education (NEP) 1986, Govt. of India envisages establishment of one Jawahar Noavodaya Vidyalaya (JNV) in each district of the country as a model school. Its significance lies in the selection of talented rural children as the target group and the attempt to provide them with quality education comparable to the best in a residential school system. These schools are governed by the the Jawahar Vidyalaya Samiti under Ministry of Human Resource Development, Govt. of India and follow a common code of practice for the evelopment and management of the school. In Odisha there are 31 such JNV Schools covering all the 30 districts.

Considering the factors of providing the Jawahar Noavodaya Vidyalaya, TudipajuPhulbani District was selected. The five key elements were studied in thse school and it was observed that Jawahar Noavodaya Vidyalaya, Tudipaju faired much better than any other schools in all the areas.

The good practices that have been observed in the school are enumerated below:-

- *Water purification system (aquaguard) is present at drinking water points with separate dedicated indoor tank*
- *Green Board in every class room aiding visibility from all the corners of the school*
- *Waste Collection Bins provided for every classroom*
- *Separate arrangements of lavatory for teachers (separately for male & female) & students (separately for girls & boys)*
- *Planned drainainage network for both waste water as well as surface run off till the dischrge point*
- *Sufficiently large volume underground reservoir and overhead tank (both 1000 ltr.)*
- *Existence of well-equipped laboratory facilities for each subjects*
- *Well organized library with seating arrangements of 40 students*
- *Pesto-flash provided within the kitchens and dining*
- *Existence of green DG set with acoustic sound enclosure*
- *Bins being provided for sanitary napkins in the girl's hostel*
- *Exclusive Medical Unit and facilities available with a dedicated doctor who visits the school campus twice a week and on emergencies*

		
Green Board visible from all corner of the classroom	*Ventilators for cross ventilation at the classroom*	*Sufficient sitting arrangement with sufficient lighting and air circulation inside Library*
		
Adequate drinking water taps with a dedicated indoor tank and water treatment facilities at each floor	*Gents toilet block with lighting and exhaust fan*	*Waste Bins at individual classrooms*

		
Laboratory with running water facilities, proper height tables and sufficient movement space	*Computer room with sufficient space , screen, white & green board*	*Fire extinguisher outside LPG store room*
		
Green Generator with acoustic sound enclosure	*Pesto flash at the dining hall*	*Main switch at very low height behind the staircase*

Annex 1: Criteria for Ranking of Indicators

The School Environment – Criteria and Ranking

No.	Aspect	Indicators	Criteria	Ranking
1	Location of School	Location of School in respect of Ecologically Protected Areas	Within the Ecologically Protected Areas	1
			Immediately adjacent to the Ecologically Protected Areas	2
			Within 200 m of the Ecologically Protected Areas	3
			Within 500 m of the Ecologically Protected Areas	4
			Not applicable	5
		Location of School in respect of Natural Disaster Prone Areas (Flood, Earthquake, Erosion, Landslide, Cyclone, Storm & Drought)	Within the zone of high intensity & high probability	1
			Within the zone of either high intensity or high probability	2
			Within the zone of moderate intensity and/or moderate probability	3
			Within the zone of low intensity and/or low probability	4
			Not applicable	5
		Location of School in respect of Polluted Industrial / Mining Areas	Within Polluted Industrial Area / Mining Area	1
			Within 100 m of Polluted Industrial Area / Mining Area	2
			Within 500 m of Polluted Industrial Area / Mining Area	3
			Within 1000 m of Polluted Industrial Area / Mining Area	4
			Not applicable	5
		Location of School in respect of Ground Water Contaminated Areas	Within well established Arsenic / Fluoride contaminated region	1
			Some cases of Arsenic / Fluoride contamination have been established (tested)	2
			Some cases of Arsenic / Fluoride contamination have been reported	3
			Arsenic / Fluoride Contamination is not reported but high iron content in water	4
			Not applicable	5
		Location of School in respect of Congested Areas & Busy Road	Within Congested Urban Areas / Markets and immediately adjacent to a busy road	1
			Within either Congested Urban Areas / Markets or immediately adjacent to a busy road	2
			Within 50 m of either Congested Urban Areas / Markets /busy road	3
			Within 100 m of either Congested Urban Areas / Markets /busy road	4
			Not applicable	5
2	Building Design	Type of Building	Kutcha	1
			Mix of Semi-Pucca & Kutcha	2
			Semi-Pucca	3
			Mix of Pucca & Semi Pucca	4

No.	Aspect	Indicators	Criteria	Ranking
			Pucca	5
		Physical Condition of Building	Cracks, Damps, Seepages & Damaged Plaster - All Present	1
			Combination of Three Conditions - Cracks / Damaged Plaster/ Damps / Seepage	2
			Combination of Two Conditions - Cracks / Damaged Plaster/ Damps / Seepage	3
			Either of any One Condition - Cracks / Damaged Plaster/Damps / Seepage	4
			Neither Condition is Present	5
		Material Used for Roof	Combination of Asbestos & Tin	1
			Either of Asbestos / Tin	2
			RCC with Combination of either Asbestos / Tin	3
			RCC with Combination of Tiles	4
			RCC	5
		Material Used for Windows	Iron	1
			Glass - Windows West Facing	2
			Glass - Windows North / South Facing	3
			Wood	4
			Combination of Glass & Wood	5
		Landscaping & Natural Shade	No Green Belt	1
			Scattered trees	2
			Only gardens (without Trees)	3
			Green Belt across the periphery	4
			Green Belt across the periphery & well maintained gardens	5
		Colour of the Building and Class Room	Not painted	1
			School Building painted in patches	2
			School Building painted but not properly maintained	3
			School Building painted but not aesthetically / not as per State Code	4
			Entire school painted aesthetically / as per state colour code	5
3	Natural Light & Ventilation	Cross Ventilation	No windows / openings	1
			Neither of any doors / windows are across each other	2
			Windows / Doors on opposite walls	3
			Windows / Doors on opposite walls along with ventilators (But on single wall / blocked)	4
			Windows / Doors on opposite walls along with ventilators	5
		Sufficiency of Door & Window Width	Doors and windows are both of insufficient width	1
			Windows are of sufficient width but some are blocked/ jammed (hence cannot be opened) and door width is insufficient	2

No.	Aspect	Indicators	Criteria	Ranking
			Windows are of sufficient width but door width is insufficient	3
			Doors are of sufficient width but window width is insufficient	4
			Doors and windows are both of sufficient width	5
		Sufficiency of Natural Light	Artificial lighting required daily throughout the day	1
			Artificial lighting required daily at some part of the day	2
			Artificial lighting required most part of the year	3
			Artificial lighting required only during monsoons	4
			No artificial lighting required throughout the year	5
4	Artificial Lighting & Air Circulation	Lighting Facility in the Class Room	Artificial Lighting facility not available	1
			Artificial Lighting facility with ordinary bulbs not adequate in number	2
			Artificial Lighting facility with ordinary bulbs adequate in number	3
			Artificial Lighting facility with ordinary bulbs & tube light	4
			Artificial Lighting facility with tube light / CFL	5
		Arrangement for Air Circulation	No means of air circulation	1
			Inadequate number of fans	2
			Adequate number of fans but all not operative	3
			Adequate number of fans but not in appropriate position	4
			Adequate number of fans provided all operative in appropriate position	5
		Cooling / Heating Arrangement	Required but not available	1
			Cooling / heating arrangements available but insufficient	2
			Cooling / heating arrangements available but not operative	3
			Cooling / heating arrangements available but operated with faulty practices	4
			Not required and hence not available OR Required and appropriate arrangement available	5
5	Seating & Display Arrangements in Class Rooms	Sufficiency of Space	Insufficient space for seating and movement within class room	1
			Insufficient space for seating but with adequate space for movement within classroom	2
			Sufficiency of space for seating but with no space for movement within classroom	3
			Sufficiency of space for seating but with limited space for movement within classroom	4
			Sufficiency of space for seating and movement within class room	5
		Height of Benches / Tables / Desks	No benches / tables / desk (Students sitting on floor)	1
			Proper height of benches / tables / desk available only for selected classes	2
			Proper height of benches / tables / desk available for most of the classes	3
			Proper height of benches / tables / desk in entire school but without differential height	4
			Proper and differential height of benches / tables / desk in entire school	5

No.	Aspect	Indicators	Criteria	Ranking
		Special Sitting Arrangement for Physically Challenged Students	No special seating arrangement for physically handicapped students	1
			Special seating arrangements present for physically handicapped students in specified classes	2
			Special seating arrangements present for physically handicapped students in some of the classes	3
			Special seating arrangements present for physically handicapped students in most of the classes	4
			Special seating arrangements present for physically handicapped students in all the classes	5
		Visibility of Black Board	No blackboard present	1
			Blackboards present but in a bad condition (resulting in bad visibility)	2
			Blackboards are visible from a particular corner of the classroom	3
			Blackboards are visible from all corners of the classroom	4
			Special boards which are visible from all the corners of the classroom	5
6	Library Design	Free Movement Space	No dedicated library	1
			Dedicated library (without seating) but access to the shelves is not possible	2
			Dedicated library (without seating) and access to the shelves is possible	3
			Dedicated library (with seating) but access to the shelves is not possible	4
			Dedicated library (with seating) and access to the shelves is possible	5
		Adequate Numbers for Sitting	No dedicated library	1
			Dedicated library with no seating arrangement	2
			Dedicated library with seating arrangement for at least 10 students	3
			Dedicated library with seating arrangement for at least 20 students (50% of a section)	4
			Dedicated library with seating arrangement for at least 40 students (Considered as a full section)	5
		Adequate Light & Ventilation	No dedicated library	1
			Natural Lighting, Artificial Lighting and Ventilation all insufficient	2
			Natural Lighting and Ventilation sufficient but no artificial lighting	3
			Natural Lighting and Ventilation sufficient but with insufficient artificial lighting	4
			Natural Lighting, Artificial Lighting and Ventilation all sufficient	5
		Regular Pest Control	No dedicated library	1
			No pest control at all	2
			Pest Control not as per any schedule	3
			Pest control annually	4
			Pest control during vacations	5
7	Laboratory Design	Adequate Space for All Subjects	No laboratory in school	1
			Common laboratory for all subjects	2
			Separate laboratory for one subject but common laboratory for other subjects	3

No.	Aspect	Indicators	Criteria	Ranking
			Separate laboratories with inadequate space	4
			Separate laboratories with adequate space	5
		Proper Height of Laboratory Table	No laboratory in school	1
			Laboratory without any laboratory tables (make shift arrangements)	2
			Laboratory tables are of inappropriate heights	3
			Laboratory tables with appropriate heights are present but not used	4
			Laboratory tables with appropriate heights are present and being used	5
		Cross ventilation and Exhaust Fan	No laboratory in school	1
			Laboratory without any cross ventilation and exhaust	2
			Laboratory with either cross ventilation or exhaust	3
			Laboratory with cross ventilation and inadequate/non-functional exhausts	4
			Laboratory with proper cross ventilation and adequate exhausts	5
		Availability of Clear Daylight	No laboratory in school	1
			Natural lighting is not sufficient within the laboratory throughout the day	2
			Natural lighting is not sufficient within the laboratory for some part of the day	3
			Natural lighting is sufficient but not uniform within the laboratory	4
			Uniform and Sufficient natural lighting within the laboratory	5
		Artificial Lighting Facility	No laboratory in school	1
			Artificial Lighting facility with ordinary bulbs not adequate in number	2
			Artificial Lighting facility with ordinary bulbs adequate in number	3
			Artificial Lighting facility with ordinary bulbs & tube light	4
			Artificial Lighting facility with tube light / CFL	5
		Running Water and Hand/Eye Washing Facility	No laboratory in school	1
			Laboratory present but without wash facility and running water	2
			Laboratory with wash facility but no running water	3
			Laboratory with wash facility and running water but inadequate in number	4
			Laboratory with wash facility and running water and adequate in number	5
8	Kitchen Design	Provision of Separate Kitchen	No kitchen in the school and no provision of MDM/arranged through SHGs/NGOs	1
			Open kitchen without any shed	2
			Open kitchen with a shed	3
			Separate kitchen available with insufficient space	4
			Separate kitchen available with sufficient space	5
		Location of Kitchen in	No kitchen in the school and no provision of MDM/ MDM arranged through SHGs/NGOs	1

No.	Aspect	Indicators	Criteria	Ranking
		Proximity to Class Rooms	Open kitchen immediately adjacent to the classroom	2
			Separate kitchen but immediately adjacent to the classroom	3
			Separate kitchen away from the classrooms but the kitchen store is right next to a classroom	4
			Dedicated kitchen and store both away from the classrooms	5
		Availability of Exhaust Fan / Chimney	No kitchen in the school and no provision of MDM/arranged through SHGs/NGOs	1
			Open kitchen and hence no exhaust	2
			Separate kitchen without any exhaust	3
			Separate kitchen with an exhaust but non-functional	4
			Separate kitchen with an exhaust	5
9	Facilities for Physically Challenged	Ramp for Physically Challenged Student	No ramps in the school	1
			Ramps provided in some buildings within the school	2
			Ramps provided but without appropriate slope and width	3
			Ramps in every building with appropriate slope and width but without hand rails	4
			Ramps in every buildings with appropriate slope, width and hand rails	5
		Availability of Benches of Different Heights	No special seating arrangement for physically handicapped students	1
			Special seating arrangements present for physically handicapped students in specified classes	2
			Special seating arrangements present for physically handicapped students in some of the classes	3
			Special seating arrangements present for physically handicapped students in most of the classes	4
			Special seating arrangements present for physically handicapped students in all the classes	5
10	Water Supply	Drinking Water Source	No permanent drinking water source	1
			Ground water source with potential contamination (visible / reported)	2
			Separate and safe ground water source available to the school	3
			Piped supply available to the school	4
			Both piped supply along with alternate safe ground water source available to the school	5
		Water Storage Facility	No water storage facility in the school	1
			Water storage in open tanks	2
			Water storage in closed tanks (overhead / underground)	3
			Water storage in underground reservoir and overhead tanks but poorly maintained	4
			Water storage in properly maintained underground reservoir and overhead tanks	5
		Water Availability	Water scarcity throughout the year	1
			Water scarcity during the dry season every year	2
			Water scarcity during lean years	3
			Sufficient water available throughout the year but not of proper quality	4

No.	Aspect	Indicators	Criteria	Ranking
			Sufficient water of proper quality available throughout the year	5
		Sufficiency of Drinking Water Facilities	No drinking water facility	1
			Inadequate number of drinking water facilities and some are non-functional	2
			Inadequate number of drinking water facilities and all are functional	3
			Adequate number of drinking water facilities but some are non-functional	4
			Adequate number of drinking water facilities and all functional	5
		Water Treatment Facilities	No Water Treatment Facility	1
			Water treatment facility present but non- functional	2
			Water treatment facility only for teachers restricted for students	3
			Water treatment facility only for teachers available for some students	4
			Water treatment facility for the entire school	5
		Testing of Drinking Water Quality	No awareness about testing of drinking water facility	1
			Aware but no testing of drinking water facility	2
			Testing of drinking water was carried out long back	3
			Testing of drinking water is carried out without any schedule	4
			Testing of drinking water is carried out periodically following a schedule	5
		Condition of Drinking Water Facilities & their Maintenance	No drinking water facility	1
			Maintenance and condition of the drinking water facilities is poor	2
			Cleaned and maintained only against complaints	3
			Cleaned and maintained without any schedule	4
			Drinking water facility is cleaned and maintained regularly	5
		Location of UG Reservoir with respect to any Source of Contamination	UG Reservoir not present	1
			UG reservoirs in close proximity to kutcha drains/leaking septic tanks	2
			UG reservoirs in close proximity to drains/septic tanks	3
			UG Reservoir located at a safe distance from drains/septic tanks	4
			UG Reservoir located at a safe distance from drains/septic tanks within a covered area	5
11	Sanitation Facility	Sufficiency of Urinal / Lavatory	No urinal / lavatory in school	1
			Insufficient number of urinal / lavatory and in unhygienic condition	2
			Insufficient number of urinal / lavatory and in hygienic condition	3
			Sufficient number of urinal / lavatory and in unhygienic condition	4
			Sufficient number of urinal / lavatory and in hygienic condition	5
		Separate Toilets for Boys and Girls	Girls / Boys School so not applicable	1
			No separate toilet blocks for boys and girls	2

No.	Aspect	Indicators	Criteria	Ranking
			Toilet block only for girls in a Co-ed School	3
			Separate toilet block for boys and girls but adjacent to each other	4
			Separate toilet block for both boys and girls and distant apart	5
		Separate Toilets for Teachers and Students	Girls / Boys School - No separate toilets for teachers and students	1
			Girls/Boys School-Separate toilets for teachers & students but sharing of toilets due to unhygienic conditions in some toilets	2
			Girls / Boys School- Separate toilets for teachers & students but sharing of toilets as some toilets reserved for use only during special events	3
			Separate toilets for male teachers and students but female teachers and students share the same toilet and vice versa	4
			Separate toilet for teachers and students (separately for males and females)	5
		Safety of Girl's Toilet	Boys School so not applicable	1
			No separate toilet blocks for girls (located immediately adjacent to toilet block for boys / male teachers)	2
			Separate toilet block for girls in safe location but not ensuring privacy	3
			Separate toilet block for girls in an unsafe location but ensuring privacy	4
			Separate toilet block for girls in safe location and ensuring privacy	5
		Provisions in Toilets for Physically Challenged Students	No dedicated toilets for physically challenged students	1
			Special provisions for physically challenged students in common toilets	2
			Dedicated toilets for physically challenged students but unhygienic (hence not being used)	3
			Dedicated toilets for physically challenged students but without special provisions	4
			Dedicated toilets for physically challenged students and with special provisions	5
		Availability of Water Connection in Toilets	No running water connection in toilets	1
			No running water connection in toilets and water is stored in tanks / vessels	2
			No separate water outlets for individual urinals / latrines	3
			Running water connection in all individual urinals / latrines but all are not functional	4
			Functional running water connection in all individual urinals / latrines	5
		Structural Condition of Toilets	Dilapidated structural condition of toilets (entire toilet unsafe for use)	1
			Sections of the toilet block necessitating immediate repairs (parts of the toilet unsafe for use)	2
			Moderate structural condition of toilets but not plastered	3
			Moderate structural condition of toilets and requiring minor alterations	4
			Good structural condition of toilets and properly plastered	5
		Hygienic Condition of Toilets	Poor hygienic condition in the toilets	1
			Leaking faucets/sewers/pipes OR clogged drains and outlets	2
			Broken sanitary fittings within the toilets resulting in unhygienic conditions (no proper cleaning possible)	3
			Moderately maintained hygienic conditions in the toilets	4
			High hygienic standards maintained in the toilets	5

No.	Aspect	Indicators	Criteria	Ranking
12	Drainage System	Availability of Drainage Facility	No drainage facility within the school	1
			Temporary drainage facility in some part of the school	2
			Permanent drainage facility in some part of the school	3
			Permanent drainage facility throughout the school without proper outfall	4
			Permanent drainage facility throughout the school with proper outfall	5
		Type of Drains	No drainage facility within the school OR Kutcha and open drains	1
			Kutcha and Pucca mixed open drains	2
			Pucca open drains	3
			Pucca closed drains	4
			Underground drains in the entire school	5
		Structural Condition of Drains	No drainage system in the school	1
			Poor structural condition of the drains in the entire school	2
			Poor structural condition of the drains in most part of the school	3
			Poor structural condition of the drains in some part of the school	4
			Good structural condition of drains in the school	5
		Cleaning of Drains	No drainage system in the school	1
			No cleaning of drains in the school (blocked/clogged drains)	2
			Drains being cleaned annually once only before the monsoons	3
			Periodic cleaning of drains at least twice in a year	4
			Regular monthly cleaning of the drains	5
		Water Logging or Overflow of Drains	No drainage system in the school	1
			Drains overflow throughout the year in most parts of the school	2
			Drains overflow throughout the year in some parts of the school	3
			Drains overflow only during monsoons in some parts of the school	4
			No overflow of drains throughout the year in the entire school	5

Potential Environmental Impacts – Criteria and Ranking

No.	Aspect	Indicators	Criteria	Ranking
1	Drainage	Outfall of Drain	No drainage system in the school	1
			Outfall into the nearby pond/canal/river	2
			Outfall into the agricultural field	3
			Outfall into the barren lands	4
			Outfall into the municipal drains	5
2	Waste Water Treatment & Discharge	Waste Water Treatment & Discharge Arrangement	No waste water treatment system and discharged within school premises	1
			Discharged into ponds/rivers/canals / open fields	2
			Discharged into municipal drains	3
			Discharged into the septic tank	4
			Discharged into the septic tank with soak pit	5
		Type of Latrines and Associated Treatment Facility	No treatment facility and discharged within school premises	1
			Single pit septic tank	2
			Double / twin pit septic tank	3
			Single pit septic tank attached to a soak pit	4
			Twin pit septic tank attached to a soak pit	5
3	Disposal of Solid waste	Waste Collection Facility in the School	No solid waste collection facility in the school	1
			No bins available at individual classrooms and waste is collected at a central point of the school	2
			Single Bin for three-four classes cumulatively	3
			Waste Collection Bins available in individual classrooms	4
			Separate waste collection bins available for segregation in individual classrooms and practiced	5
		Separate Collection for Segregated Waste	No solid waste collection facility in the school	1
			No bins available and waste is collected at a central point of the school without being segregated	2
			Bins available but no segregation in individual classrooms	3
			Separate waste collection bins available for segregation in individual classrooms and not practised	4
			Separate waste collection bins available for segregation in individual classrooms and practised	5
		Condition of Bins	No solid waste collection facility in the school/ Paper boxes are used as bins	1
			Most of the bins are found to be in broken condition	2
			Some of the bins are found to be in broken condition	3
			Waste collection bins are in good condition but not covered	4
			Waste collection bins are in good condition and covered	5
		Disposal of Waste	No solid waste collection facility in the school	1
			Waste collected and burnt and ash /residues disposed within school premises	2

No.	Aspect	Indicators	Criteria	Ranking
			Waste collected and disposed into surrounding lands	3
			Waste is disposed in designated areas within school premises and collected by local bodies	4
			Waste disposed into municipal collection points	5
		Frequency of Disposal	No solid waste collection facility in the school	1
			Waste collected and burnt and ash /residues disposed within school premises	2
			Waste collected and disposed into surrounding lands	3
			Waste is disposed in designated areas within school premises and collected by local bodies	4
			Waste disposed into municipal collection points	5
		Treatment of Waste	No solid waste collection facility in the school	1
			No facility for treatment of waste	2
			School has planned to adopt composting but no actions taken yet	3
			School has initiated / prepared the compost but the same is not being used	4
			School is practising back yard / garden composting	5
4	Air & Noise Emission	Condition of DG Stack and Acoustic Enclosure	DG Set without any enclosure and without any stack and installed close to the school building	1
			DG Set without any enclosure and without any stack but installed at isolated location of school	2
			DG Set with proper enclosure and stack	3
			Silent DG Sets	4
			No DG Set	5

Conservation of Resource – Criteria and Ranking

No.	Aspect	Indicators	Criteria	Ranking
1	Water Conservation	Water Conservation	No awareness about water conservation	1
			Conservation plans not available and neither any stand alone measures have adopted in this regard	2
			Conservation plans not available but some stand alone measures have adopted in this regard	3
			Conservation plans available but overall plan has not been implemented; however some specific measures adopted	4
			Conservation Plans available and overall plan has been implemented	5
		Rain Water Harvesting	No awareness about rain water harvesting / Faulty practices of implementation related to ground water recharge	1
			Aware about rain water harvesting but no action has been initiated due lack of technical knowhow and/or lack of funds	2
			Rain water harvesting plan is available but it has not been implemented due to lack of funds	3
			No rain water harvesting plan but use of traditional knowledge has been used to harvest rain water	4
			Rain water harvesting plan is available and has been properly implemented	5
		Preventive Maintenance of Facilities	Inadequate infrastructure (reservoir/conduit capacities), low maintenance and inefficiency in operations	1
			Adequate infrastructure but inefficient operations	2
			Inadequate infrastructure but highly efficient operations	3
			Adequate infrastructure and efficient operations but poor regular maintenance	4
			Adequate infrastructure with regular maintenance and high efficiency in operations	5
2	Energy Conservation	Type of Lighting Facility	Artificial Lighting facility not available	1
			Artificial Lighting facility with ordinary bulbs	2
			Artificial Lighting facility with ordinary bulbs & tube light	3
			Artificial Lighting facility with tube light / CFL	4
			Artificial Lighting facility with CFL	5
3	Use of Renewable Energy	Use of Renewable Energy	No awareness about renewable energy	1
			Aware about renewable energy but no action has been initiated due lack of technical knowhow and/or lack of funds	2
			Plan for utilising renewal energy is available but it has not been implemented due to lack of funds	3
			School has been inducted within the ambit of govt. sponsored / promoted electrification schemes using renewable energy	4
			School has implemented measures for utilisation of renewable energy on its own	5
		Awareness in School	No awareness on use of renewable energy among the school authority	1
			School authority is aware of renewable energy but have no intentions of implementing the same	2
			School authority is aware of renewable energy but can only implement if Govt. funds for the same are available	3
			School authority is aware of renewable energy and have already requisitioned to the Govt. for providing them with financial assistance in this regard	4
			School authority is aware of renewable energy and is interested to implement the same on its own	5

Reinforcing the Learning Environment – Criteria and Ranking

No.	Aspect	Indicators	Criteria	Ranking
1	School Curriculum and Activities Related to Environment	Curricular and Extra-Curricular Activities in School related to Environment	No such activities take place	1
			School has environment related activities in its regular routine but it is not followed	2
			School has environment related activities in its regular routine but it is seldom followed	3
			School has environment related activities in its regular routine and mostly it is adhered to	4
			School has environment related activities in its regular routine and it is followed accordingly	5
		Environment Awareness Camp	No such camps organised	1
			Environmental Camp was planned but was not conducted due to lack of funds	2
			Environmental Camp organised long back	3
			Annual excursions were undertaken but Environmental Camp was not the sole motive	4
			Environmental Camps organised annually	5
		Eco-Clubs / Environmental Clubs	No Eco-Club / Environmental Club is present in the school	1
			Eco-Club / Environmental Club present without a planned schedule and students have not opted for membership	2
			Eco-Club / Environmental Club present and a few students are member but the supervising teacher is not active	3
			Active Eco-Club / Environmental Club with planned schedule (but only some students are members)	4
			Active Eco-Club / Environmental Club with planned schedule and most of the students are member	5
2	Celebration Events related to Environment	Forestry Week / World Environment Day / Other Similar Events Observed in School	School authority is not aware of such events and hence no events are being celebrated	1
			School authority is aware of such events but they are not being celebrated	2
			School authority is aware and celebrates such events but without proper preparations	3
			School authority is aware and has set up a particular committee to celebrate such events with allocation of funds	4
			School authority is aware and sets up event based committee to celebrate such events with specific allocation of funds	5
3	Awareness & Campaigns / Program	Safety Campaign & Awareness Activities	School authority is unaware hence no such events are being organised	1
			School authority is aware of such activities but no such events are being organised	2
			School authority is aware and have plans for such activities but they have not been implemented yet	3
			School authority carries out mock drills & safety campaigns but participation / frequency limited	4
			School authority regularly carries out mock drills & safety campaigns with full participation of school	5
		School Campus Cleaning Program	No such activities take place	1
			School campus/ Classroom cleaning drive is being carried out by students only once in a year	2
			School campus/ Classroom cleaning drive is being carried out by students to observe special occasions only	3
			School campus/ Classroom cleaning is being carried out by students at least once per month	4
			School campus/ Classroom cleaning is being regularly carried out by students on rotation	5
		Nature Study Camp	School authority is not aware and hence no such activities take place	1

No.	Aspect	Indicators	Criteria	Ranking
			School authority is aware of such activities but Nature Study Camp has never been organised	2
			School authority is aware of such activities but Nature Study Camp was organised long back	3
			Nature Study Camps organised annually	4
			Nature Study Camps organised at least once in a year	5
		Awareness about Waste Management	No awareness on solid waste management among the school authority	1
			School authority is aware on solid waste management but don't have any plans for implementation	2
			School authority is aware and have plans on solid waste management but doesn't practice it	3
			School authority has planned waste management system & Collection Bins available in individual classrooms	4
			Waste is regularly segregated and disposed by students themselves under the supervision of teachers	5
		Awareness about Energy Conservation	No awareness on energy conservation among the school authority	1
			School authority is aware on energy conservation but don't have any plans for implementation	2
			School authority is not perfectly aware but have participated in such campaigns organised by some other institutes	3
			School authority is aware and organise sensitization programmes without following any planned schedule	4
			School authority is aware and organise sensitization classes/ programmes following any planned schedule	5
		Awareness about Water Conservation	No awareness on water conservation among the school authority	1
			School authority is aware of the need for water conservation but don't have any plans for implementation	2
			School authority is not perfectly aware but have participated in such campaigns organised by some other institutes	3
			School authority is aware and organise sensitization programmes without following any planned schedule	4
			School authority is aware and organise sensitization classes/ programmes following a planned schedule	5

Resilience of the School – Criteria and Ranking

No.	Aspect	Indicators	Criteria	Ranking
1	Safety Aspect of Building Design	Physical Condition of the Building	Major part of the school building is in a dilapidated condition	1
			Apprehensions among teachers and students about the physical condition of the building which is clearly visible	2
			Some part of the school building is properly maintained and the physical condition is good	3
			Most part of the school building is properly maintained and the physical condition is good	4
			The physical condition of the entire school building is excellent and properly maintained	5
		Special Structural Facility to Cope with Natural Hazard	Located in a hazard prone area, school has not developed any plans to cope with natural hazards	1
			Located in a hazard prone area, school has developed the necessary plans but is yet to implement the same	2
			One of the school buildings is designed to cope with natural hazard	3
			Most part of the school is designed to cope with natural hazard	4
			The entire school is designed to cope with natural hazard / School not in hazard prone zone - hence not applicable	5
		Condition of Stair Case	Most of steps in the stair case are broken	1
			Stairs are well maintained but the design/construction is not appropriate (width of the steps are very narrow/ height of the steps are too steep/ steps are slippery)	2
			Well maintained stairs of appropriate width and height but without sufficiently high hand rails/guard walls	3
			Well maintained stairs of appropriate width and height with sufficiently high hand rails/guard walls but without proper lighting	4
			Well maintained stairs of appropriate width and height and have sufficiently high hand rails/guard walls with proper lighting / Single storied building so not applicable	5
2	Laboratory Safety	Labelling of Chemicals	No Laboratory available	1
			Chemicals are kept without proper labelling	2
			Labels are being provided but are illegible	3
			Most of the chemicals with proper labelling	4
			All the chemicals with proper labelling	5
		Availability of Fire Extinguishers	No Laboratory available	1
			No Fire Extinguisher available	2
			The school has only one Fire extinguisher and kept away from the laboratory	3
			The school has only one Fire extinguisher but kept near the laboratory	4
			The laboratory has dedicated fire extinguisher	5
		Availability of PPEs	No Laboratory available/ No PPE available	1
			PPE available but not sufficient to meet the need of a single class & most are in poor condition	2
			PPE available but not sufficient to meet the need of a single class & some are in poor condition	3
			PPE sufficiently available to meet the need of a single class & some are in poor condition	4

No.	Aspect	Indicators	Criteria	Ranking
			PPE sufficiently available to meet the need of at least a single class & all are in good condition	5
		Awareness Regarding Use of PPEs	No Laboratory available / No awareness about PPEs and PPEs not available	1
			PPEs available but no awareness about using the PPEs	2
			PPEs available but not used by most of the students	3
			PPEs available and most of the students use them	4
			School have reinforced the rule that PPEs have to be worn before entering the laboratory	5
		Display of Safety Information	No laboratory available / No awareness about display of safety information	1
			School authority is aware of the need to display safety information but information is not displayed	2
			School authority is aware and have planned to display the safety information	3
			Safety information is displayed but it is either incomplete/illegible/located in an obscure place which is not visible properly	4
			Safety information is displayed and highlighted in an appropriate location	5
3	Kitchen Safety	Availability of Fire Extinguishers	No dedicated kitchen available	1
			No Fire Extinguisher available in the school	2
			The school has Fire extinguisher but kept away from the kitchen	3
			The school has Fire extinguisher but kept near the kitchen	4
			The kitchen has a dedicated fire extinguisher	5
		LPG Storage Area	No dedicated kitchen available/LPG not used for cooking hence not applicable	1
			LPG stacked within the kitchen close to the cooking area	2
			LPG stacked in a separate store adjacent to the kitchen	3
			LPG stacked in a dedicated store away from the kitchen but close to the classrooms	4
			LPG stored in a dedicated and safe storage area	5
4	Fire Safety	Availability of Fire Extinguishers	School does not recognise the fire safety concern and does not have any fire extinguishers	1
			School recognises the fire safety concern but fire extinguishers are not available	2
			School has fire extinguishers but are not functional	3
			School has fire extinguishers but not in the appropriate places	4
			School has fire extinguishers which are functional and in appropriate places	5
		Posting of Fire Exit Sign	School authority is unaware of the fire exit signs and signs are not displayed	1
			School authority is aware of the fire exit signs but signs are not displayed	2
			School authority is aware and have planned to post the fire exit signs	3
			Fire exit sign is displayed but it is either not in the appropriate location or incomplete/illegible/ not visible properly	4
			Fire exit signs are posted and highlighted in an appropriate location which is clearly visible	5

No.	Aspect	Indicators	Criteria	Ranking
5	Electrical Safety	Condition of Switches / Fittings	No electrification in the school and hence not applicable	1
			Switches and fittings are old and needs immediate repair/replacement	2
			Most of the switches and fittings are not in good condition/not appropriately installed	3
			Some of the switches and fittings are not in good condition/not appropriately installed	4
			All switches and fittings are safely and appropriately installed	5
		Condition of Wiring / Insulation	No electrification in the school and hence not applicable	1
			Naked live wires/bare ends	2
			Hanging wires without any casing/pipes	3
			Wires are fixed to ceilings/walls but are exposed in some areas	4
			Wires are concealed/through appropriately installed insulated casings (or pipes)	5
		Location of Switches / Fittings	No electrification in the school and hence not applicable	1
			Switches, plugs and mains are within reach of students and do not have covers/closers	2
			Switches, plugs and mains and within reach of students but have covers/closers	3
			Most of the Switches, plugs and mains are outside reach of students and have covers/closers	4
			All Switches, plugs and mains are outside reach of students and have covers/closers	5
6	Transport Safety	Inspection of School Buses	No transportation facilities provided by the school	1
			Buses are not checked or maintained by the school authority	2
			Buses are checked only when there are complaints	3
			Buses are checked regularly but not properly maintained by the school authority	4
			Buses are checked regularly and properly maintained by the school authority / Transportation facility not required (Residential Schools)	5
		Training of Drivers	No transportation facilities provided by the school	1
			Transportation facilities are available through arrangements between parents and private operators and school has no link with the process	2
			Transportation facilities are provided by the school but arranged through private operators and school has no control on drivers employed	3
			Transportation facilities are provided by the school and drivers are also appointed by the school but no training is imparted	4
			Only trained and licensed drivers are assigned for school buses / Transportation facility is not required (Residential Schools)	5
7	Disaster Preparedness	Alternative Exit Gate	No alternative exit gate for the school	1
			Only one alternative exit and the exit does not lead to a safe location	2
			Only one alternative exit and the exit but it leads to a safe location	3
			More than one alternative exits but some exits does not lead to a safe location	4
			More than one alternative exits through which students and teachers can exit safely	5
		Alternative	No alternative exit gate/points for any building	1

No.	Aspect	Indicators	Criteria	Ranking
		Building Exit	Only one alternative exit for the school buildings and the exit does not lead to a safe location	2
			Only one alternative exit for the school buildings but it leads to a safe location	3
			More than one alternative exits for most of the school buildings through which students and teachers can exit safely	4
			More than one alternative exits for all the school buildings through which students and teachers can exit safely	5
		Outdoor Assembly Point	No assembly points available in the school or outside the school	1
			Assembly point not available in the school and in exigencies students and teachers have to assemble outside the school	2
			Only one assembly point available in the school and assembly outside the school is also not possible	3
			More than one assembly points available in the school but it is not sufficient according to the number of students and teachers	4
			Sufficient number of outdoor assembly points inside and outside the school which are safe	5
		Display of Emergency Numbers	School does not recognise the safety concern and have not displayed the emergency numbers	1
			School recognises the safety concerns but have not displayed the emergency numbers	2
			School authority is aware and have planned to display the emergency numbers	3
			Emergency numbers are displayed but it is either incomplete/illegible/located in an obscure place which is not visible properly	4
			Emergency numbers are displayed and highlighted in an appropriate location which is visible and legible to all	5
		Emergency Plan	School does not recognise the safety concern and hence have no emergency plans	1
			School have recognised the safety concern but is yet to formulate an emergency plan	2
			School have an emergency plan but cumbersome to implement	3
			School have an emergency plan which is easy to implement in certain respects but not exhaustive	4
			School have a well designed and exhaustive emergency plan which is simple to implement	5
		Awareness on Emergency Plan & Conduct of Safety Drills	School does not recognise the safety concern and hence no emergency plans in place and nether has conducted any safety drills	1
			School does recognise the safety concerns but no emergency plans in place and nether has conducted any safety drills yet	2
			School has emergency plans and has conducted safety drills but long back/last year	3
			School organise safety drills as per the emergency plan every year	4
			School organise safety drills as per the emergency plan with help of trained personnel every year	5
		First Aid Facility	No first aid kit available	1
			First aid kit available but with mostly expired and/or insufficient medicines	2
			First aid kit available which is more or less equipped	3
			Properly equipped first aid box available with the respective teacher but some medicines have expired	4
			Properly equipped first aid box containing sufficient medicines within expiry date available with the respective teacher	5

Annex 2: Environmental Score of Schools in Orissa

District	Angul	Angul	Angul	Angul	Ganjam	Ganjam	Ganjam	Ganjam	Kandamal	Kandamal	Kandamal	Kandamal	Sundergarh	Sundergarh	Sundergarh	Cuttack	Cuttack	Cuttack	Max Score
Block	Angul NAC	Talcher	Kishore Nagar	Kishore Nagar	Chhatarpur	Ganjam NAC	Khallikhote	Rambha NAC	Phulbani NAC	Phulbani NAC	Phulbani	Khajuripada	Kuarmunda	Rourkela MPL	Rajgangpur	Banki	Cuttack Sadar	Salipur	
Landuse	Urban	Semi-Urban	Rural	Rural	Rural	Semi-Urban	Rural	Urban	Urban	Urban	Rural	Rural	Semi-Urban	Urban	Rural	Rural	Rural	Rural	
Type	Co-ed	Co-ed	Co-ed	Co-ed	Co-ed	Boys	Co-ed	Co-ed	Co-ed	Girls	Co-ed	Girls	Girls	Co-ed	Co-ed	Co-ed	Co-ed	Girls	
Funding	Govt.	Govt.	Govt.	Govt.	Govt.	Govt. Aided	Govt.	Govt.	Govt.	Govt.	Govt.	Govt.	Govt. Aided	Govt.	Govt.	Govt.	Govt.	Govt.	
Students	1200	508	373	213	206	428	606	362	817	676	555	166	166	1275	170	216	399	150	
School Name	Anugul Govt. High School	Colliery High School	R.D. High School	Ma Maheshwari High School	Mahananda PUPS	Bharati Vidyapith	RCM High School	Gopal Krishna High School	AJO High School	Govt. Girls High School	Jawahar Navodaya Vidyalaya	Govt. Girls High School	Kuarmunda Girls High School	Govt. High School Udit Nagar	Kichinda Nodal UPS	Sadhab Samaj Bidya Niketan	Sankhatras Govt. HS	Gopal Bandhu Girls High School	
(I) School Environment																			
(1) Location of School	1.7	1.8	1.9	1.8	2.0	1.8	2.0	1.8	1.7	2.0	1.8	1.8	1.8	1.6	1.7	2.0	1.9	2.0	**2**
(2) Building Design	1.8	1.1	1.6	1.3	1.1	1.1	1.5	1.5	1.7	1.7	1.7	1.3	1.4	2.0	1.7	0.9	1.2	1.3	**2**
(3) Natural Light & Ventilation	1.7	1.5	1.7	1.9	0.9	1.7	1.3	1.3	1.7	1.9	1.9	1.6	1.6	2.0	2.0	1.6	1.7	1.6	**2**
(4) Artificial Lighting & Air Circulation	1.7	0.7	1.7	1.7	1.5	1.1	1.7	1.7	1.3	1.3	2.0	0.8	1.6	2.0	0.4	1.6	1.6	0.8	**2**
(5) Seating & Display Arrangements in Class Rooms	1.4	1.3	1.5	1.4	0.9	1.3	0.9	1.4	1.3	1.5	1.5	1.3	0.8	1.4	1.6	1.0	0.9	0.9	**2**
(6) Library Design	0.8	0.4	0.4	0.4	0.4	0.8	1.1	1.7	0.9	1.1	2.0	0.4	0.4	1.0	0.4	0.4	1.8	0.4	**2**
(7) Laboratory Design	1.3	0.4	0.4	0.4	0.4	0.8	1.2	1.3	1.6	0.8	2.0	0.4	0.4	0.8	0.4	0.4	1.2	0.4	**2**
(8) Kitchen Design	1.6	1.1	1.5	1.1	0.4	1.2	1.7	1.5	0.9	0.4	2.0	0.4	1.1	1.1	1.2	1.3	1.7	1.5	**2**
(9) Facilities for Physically Challenged	0.4	0.4	0.4	0.4	0.6	0.4	0.4	0.4	0.4	0.6	0.4	0.0	0.4	1.2	1.2	0.6	1.2	0.4	**2**
(10) Drinking Water Facility	1.1	1.3	1.2	1.6	0.9	1.4	1.2	1.4	1.6	1.6	2.4	1.1	1.3	2.0	1.3	0.9	1.1	1.2	**2.5**
(11) Sanitation Facility	1.7	1.0	1.4	1.6	0.8	0.5	1.6	1.1	2.1	1.4	2.3	1.4	0.8	1.8	0.8	1.7	1.3	1.5	**2.5**
(12) Drainage System	1.4	1.0	0.6	0.4	0.4	0.4	0.4	0.5	1.4	1.3	1.8	1.2	0.4	1.6	0.4	0.4	0.4	0.4	**2**
TOTAL	**16.7**	**11.9**	**14.3**	**14.0**	**10.3**	**12.5**	**15.1**	**15.7**	**16.7**	**15.7**	**21.7**	**11.7**	**12.0**	**18.4**	**13.0**	**12.8**	**16.1**	**12.3**	**25**
(II) Potential Environmental Impacts																			
(1) Drainage	5.0	5.0	1.0	4.0	1.0	1.0	1.0	3.0	5.0	4.0	2.0	3.0	1.0	2.0	4.0	1.0	3.0	1.0	5
(2) Waste water Treatment & Discharge	3.0	1.5	1.5	2.0	3.0	3.5	3.0	2.0	4.0	3.0	5.0	3.5	1.0	3.0	1.5	3.0	3.0	1.0	5
(3) Disposal of Solid waste	1.8	2.2	1.7	1.5	2.7	1.0	1.8	1.8	3.7	3.0	3.5	1.8	2.8	3.5	1.0	2.2	2.7	3.0	5
(4) Air & Noise Emission	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5
TOTAL	**14.8**	**13.7**	**9.2**	**12.5**	**11.7**	**10.5**	**10.8**	**11.8**	**17.7**	**15.0**	**13.5**	**13.3**	**9.8**	**13.5**	**11.5**	**11.2**	**13.7**	**10.0**	**20**
(III) Conservation of Resource																			
(1) Water conservation	2.3	2.0	1.0	1.0	1.0	2.3	1.3	3.0	2.0	1.0	3.7	1.3	3.0	3.0	1.0	1.0	2.0	1.0	5
(2) Energy Conservation	3.0	2.0	2.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	5.0	1.0	3.0	3.0	4.0	5
(3) Renewable Energy	2.0	2.5	2.0	1.0	1.0	1.0	1.0	2.5	2.5	2.0	3.5	1.0	2.5	3.0	4.5	2.0	1.0	1.5	5
TOTAL	**7.3**	**6.5**	**5.0**	**5.0**	**5.0**	**5.3**	**5.3**	**8.5**	**7.5**	**6.0**	**10.2**	**5.3**	**7.5**	**11.0**	**6.5**	**6.0**	**6.0**	**6.5**	**15**

District	Angul	Angul	Angul	Angul	Ganjam	Ganjam	Ganjam	Ganjam	Kandamal	Kandamal	Kandamal	Kandamal	Sundergarh	Sundergarh	Sundergarh	Cuttack	Cuttack	Cuttack	Max Score
Block	Angul NAC	Talcher	Kishore Nagar	Kishore Nagar	Chhatarpur	Ganjam NAC	Khallikhote	Rambha NAC	Phulbani NAC	Phulbani NAC	Phulbani	Khajuripada	Kuarmunda	Rourkela MPL	Rajgangpur	Banki	Cuttack Sadar	Salipur	
Landuse	Urban	Semi-Urban	Rural	Rural	Rural	Semi-Urban	Rural	Urban	Urban	Urban	Rural	Rural	Semi-Urban	Urban	Rural	Rural	Rural	Rural	
Type	Co-ed	Co-ed	Co-ed	Co-ed	Co-ed	Boys	Co-ed	Co-ed	Co-ed	Girls	Co-ed	Girls	Girls	Co-ed	Co-ed	Co-ed	Co-ed	Girls	
Funding	Govt.	Govt.	Govt.	Govt.	Govt.	Govt. Aided	Govt.	Govt.	Govt.	Govt.	Govt.	Govt.	Govt. Aided	Govt.	Govt.	Govt.	Govt.	Govt.	
Students	1200	508	373	213	206	428	606	362	817	676	555	166	166	1275	170	216	399	150	
School Name	Anugul Govt. High School	Colliery High School	R.D. High School	Ma Maheshwari High School	Mahananda PUPS	Bharati Vidyapith	RCM High School	Gopal Krishna High School	AJO High School	Govt. Girls High School	Jawahar Navodaya Vidyalaya	Govt. Girls High School	Kuarmunda Girls High School	Govt. High School Udit Nagar	Kichinda Nodal UPS	Sadhab Samaj Bidya Niketan	Sankhatras Govt. HS	Gopal Bandhu Girls High School	
(IV) Reinforcing the Learning Environment																			
(1) School Curriculum and Activities Related to Environment	2.7	3.0	2.0	1.7	1.0	2.0	1.0	3.7	4.0	2.3	4.3	1.7	3.3	3.0	1.3	2.0	3.0	2.7	5
(2) Celebration of Events Related to Environment	1.0	1.0	4.0	1.0	2.0	3.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0	1.0	1.0	1.0	1.0	1.0	5
(3) Awareness & Campaigns / Program	2.3	2.7	2.5	2.2	1.8	2.2	1.8	3.2	2.8	2.0	3.5	2.0	2.5	2.5	1.3	2.3	1.8	1.8	5
TOTAL	**6.0**	**6.7**	**8.5**	**4.8**	**4.8**	**7.2**	**5.8**	**10.8**	**10.8**	**7.3**	**11.8**	**6.7**	**9.8**	**6.5**	**3.7**	**5.3**	**5.8**	**5.5**	**15**
(V) Resilience of the School																			
(1) Safety aspect of Building Design	3.3	3.3	3.3	3.3	3.0	4.3	4.0	3.7	4.7	4.7	5.0	4.7	2.0	5.0	1.3	4.7	3.3	3.0	5
(2) Laboratory safety	1.1	0.6	0.6	0.6	0.6	0.8	0.8	1.3	1.1	1.1	2.8	0.6	0.6	1.0	0.6	0.6	1.2	0.6	3
(3) Kitchen Safety	1.2	0.9	0.6	0.6	0.6	1.2	1.2	1.5	1.2	0.6	2.4	0.6	0.9	1.2	0.6	1.2	1.2	0.6	3
(4) Fire Safety	1.2	0.6	0.6	0.6	0.6	1.8	1.8	1.8	1.8	2.1	2.7	1.2	1.2	1.5	0.6	1.2	1.5	0.6	3
(5) Electrical Safety	2.0	2.4	2.8	2.2	1.8	2.0	2.4	2.2	2.4	2.4	2.6	2.2	1.8	2.8	0.6	1.6	2.2	2.0	3
(6) Transport Safety	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	3.0	0.6	3.0	3.0	0.6	3
(7) Disaster Preparedness	3.0	3.3	2.1	2.3	2.0	3.6	3.0	2.9	2.0	3.0	4.1	2.9	3.1	2.7	2.1	2.7	2.4	2.3	5
TOTAL	**12.4**	**11.7**	**10.7**	**10.2**	**9.2**	**14.3**	**13.8**	**13.9**	**13.7**	**14.4**	**20.2**	**12.7**	**10.2**	**17.2**	**6.5**	**15.0**	**14.9**	**9.7**	**25**
Total Score	**57.3**	**50.4**	**47.6**	**46.5**	**41.0**	**49.8**	**50.9**	**60.8**	**66.4**	**58.5**	**77.4**	**49.8**	**49.4**	**66.6**	**41.2**	**50.3**	**56.4**	**44.0**	**100**