E4820

Madhya Pradesh

Higher Education Quality Improvement Project

(Proposed for World Bank Funding)

Environment Management Framework

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Department of Higher Education
Government of Madhya Pradesh

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Abbreviations

AWP&B	Annual Work Plan and Budget
BoQ	Bill of Quantities
BRC	Block Resource Centre
CSS	Centrally Sponsored Scheme
CWSN	Children with Special Needs
DEO	District Education Office
DFID	Department for International Development (UK)
DIET	District Institute for Education and Training
DISE	District Information System for Education
DPs	Development Partners
DPC	District Program Coordinator
DPO	District Project Office
DPR	Detailed Project Report
DPEP	District Primary Education Program
DSEL	Department of School Education and Literacy
EFA	Education for All
GER	Gross Enrolment Ratio
GIA	Grant in Aid
GoI	Government of India
ICR	Implementation Completion Report
IDA	International Development Association
IFB	Invitation for Bid
IGNOU	Indira Gandhi National Open University
IS	Indian Standards
JRM	Joint Review Mission
M&E	Monitoring and Evaluation
MDGs	Millennium Development Goals
MHRD	Ministry of Human Resource Development
MoU	Memorandum of Understanding
NAS	National Assessment Survey
NCERT	National Council for Educational Research and Training

NCF	National Curriculum Framework
NCTE	National Council for Teacher Education
NER	Net Enrolment Ratio
NGO	Non-Governmental Organization
NIOS	National Institute for Open Schooling
NOC	No-Objection Certificate
NUEPA	National University for Educational Planning and Administration
NSS	National Sample Survey
O&M	Operations and Maintenance
PAB	Project Approval Board
PDO	Project Development Objective
PRI	Panchayati Raj Institutions (local government institutions)
PTA	Parents-Teachers Association
PTR	Pupil Teacher Ratio
PWD	Public Works Department
RI	Regional Institutions
RMSA	Rashtriya Madhyamik Shiksha Abhiyan
SC	Scheduled Caste
SCERT	State Council of Education Research and Training
SEMIS	Secondary Education Management Information System
SFG	Special Focus Group
SIEMAT	State Institute of Educational Management and Training
SIS	State Implementation Society
SMDC	School Management Development Committee
SPO	State Project Office
SSA	Sarva Shiksha Abhiyan
ST	Scheduled Tribe
SWAp	Sector-wide Approach
TA	Technical Assistance
TSG	Technical Support Group
UT	Union Territories
WB	The World Bank

Chapter 1

Project Background

1.1 Introduction

India is a lower middle-income country with a Gross Domestic Product (GDP per capita of US$1,499 (2013 US$). It has made considerable progress in economic growth and poverty reduction over the past ten years. The country experienced high economic growth during 2001-11, with an average Gross Domestic Product (GDP) growth of 7.9% per annum. From 2005-10, 53 million people were brought out of poverty. Human development outcomes also improved during this period, with under-5 year mortality decreasing from 88.1 to 58.6 per 1000 live births; and primary school net enrolment increasing from 85.7% to 98.9%. Yet, a number of challenges exist, notably, a deceleration of economic growth following the global financial crisis and high levels of inequality.

Economic growth slowed in the recent past, decelerating from 9.6% in 2010 to 5% in 2013, but is expected to recover, reaching 6.4% in 2015 and 7% in 2016. The forecast for inequality is less optimistic, with economic inequality and differences in human development outcomes remaining stark, especially across regions, caste and gender. A child belonging to the richest income quintile has an under-five year mortality rate that is 3.3 times lower than one born into the poorest quintile, and a person from the richest quintile has 2.5 times more years of education than one from the poorest quintile. Importantly, nearly 50% of India lives in 14 low income/special category states with poverty rates close to 40% — and faces the reality of poor development outcomes.

India's 12th Five Year Plan (2012-17), based on the pillars of faster, sustainable, and inclusive growth, emphasizes increasing the supply of highly-skilled workers to drive the economy, as well as helping low-income states catch up with their more advanced neighbours.

Madhya Pradesh (MP), with a State GDP of US$728, is a low-income state, with a population of 73 million, of which 75% live in rural areas. While average human development indicators in MP resemble the national average, rural areas, women, and Scheduled Caste/Scheduled Tribe (SC/ST) groups face significant disadvantages. For example, the percentage of people with education above the primary level is 36% (national average is 44%); in urban areas, over 47% of the population has completed at least primary school; in rural areas, less than 29% has. Within rural areas, attainment is particularly poor for disadvantaged groups: only 19% of STs and 20% of women have education levels beyond the primary level. Infant mortality rate and Under-5 year mortality rate differ by 5-7 extra deaths per 1000 live births for girls compared to boys, and more than 20 extra deaths per 1000 live births for STs. Madhya Pradesh has nearly 15% of the country's ST population.

In its Vision 2018 document (December, 2013), Madhya Pradesh has outlined forward-looking plans for the state's development. In higher education it has

identified reforms include performance based funding of higher education institutions (HEIs), HEIs pursuing self-determined reforms, and ICT enabled education.

1.2 Sectoral Context

Higher education in India has been expanding rapidly, with enrolment doubling from 8.4 million students to 17 million students from 2001-11. These students are enrolled in 665 universities and 24120 colleges. Universities, whether government or private, are established by an Act of Parliament or of the State Legislative Assembly. With the exception of private universities, the respective government, central or state, is the primary funder of key categories of expenses — salaries, buildings and equipment. Universities must follow the guidelines and notifications issued by the University Grants Commission (UGC) to be eligible for central government funds. This apart, universities are autonomous, in that they have relative freedom to determine the academic, financial and administrative aspects of their functioning. The exact degree of freedom is specified in their respective Acts. Colleges in India, whether government or private, are categorized into the following types: constituent colleges, affiliated colleges and autonomous colleges. Constituent colleges are established as part of a university. Affiliated colleges are expected to follow the curricular and examination guidelines of their affiliating universities. Autonomous colleges, in theory, have freedom over curriculum and examination decisions. Colleges are granted autonomy based upon the recommendation of the UGC in consultation with the respective government and the university concerned.

Nearly 10% of all students in higher education in India are enrolled in university/colleges in MP. These 1.6 million students attend 36 universities and 1316 colleges in the state.[1] In 2012-13, MP's Gross Enrolment Ratio (GER) in higher education was 19.5%, close to the national average of 21.1%. However, in the age group 18 to 23 years, only 13.1% of SC students and 7.5% of ST students were enrolled in higher education. Enrolment rates for women students in MP are especially low, with only 36% of enrolments comprising women students, relative to a national average of 45%. Moreover, there are major concerns over quality and relevance. A recent Bank study, 'Making Engineering Graduates in India Employable (2015)' finds that employers are most likely to reject newly graduated engineers for poor technical skills. Across India (except MP), 74.5 % employers stated that weak technical skills was the most important reason for rejecting a job applicant; in MP the 77.5% employers stated the same.

In 2012, the Bank carried out a major review of the higher education sector in MP, resulting in the report 'Madhya Pradesh Higher Education Reforms: Policy Options'. In addition to the two core challenges discussed above — access and equity — the report identifies low quality as a fundamental concern. Only about half of an

[1] Out of the 36 universities, 17 are state public universities, 9 are state private universities, 3 are institutes of national importance, 3 are deemed government universities and 2 are central universities. Additionally, there is a central open university and a state open university.

incoming cohort of students graduate at the end of three years, and an even smaller percent finding employment. Transition rates of students from one year to the next, especially those from disadvantaged backgrounds, are low, with the drop-out rate being the highest between the first and the second years of study. Finally, the tendency to open colleges without a careful analysis of costs and benefits has meant that institutions are small in size, with average enrolment at 609 students (all-India average is 707). This puts a fundamental constraint on quality improvement since most institutions do not have a critical mass of students (and therefore budget) or qualified faculty to offer quality education and other student services, and carry out research. The report and project preparation work have identified the following critical issues in the higher education sector in MP:

- Limited autonomy: The importance of autonomy in academic, financial and administrative issues has been emphasized in universities and colleges across the country repeatedly since the First Education Commission (1964-66). Actual practice in Madhya Pradesh — as in other states — shows that colleges have little autonomy in any of the matters noted above, and thereby, little control over key decisions regarding quality improvement (even when they are labelled as autonomous). Often, universities too have limited autonomy from their respective government in these matters. At the college-level, the problem has been compounded by the system of affiliation, whereby every college must be affiliated to a university. Such top-down control constrains the ability of colleges to design labor-market relevant curricula and conduct examinations in a timely manner. Importantly, the need to seek permission from a higher entity at every stage limits faculty motivation and innovation.
- Inadequate resources and inefficient systems/practices: MP's higher education system suffers from a shortage of human resources as well as financial resources. Government colleges in MP suffer from high faculty vacancy rates; nearly 30% of the 8,000 posts sanctioned by the state government were vacant in 2012. In terms of financial resources, although the total budget on higher and technical education has more than doubled between 2009 and 2014 from $151.12 million to $313.4 million and average utilization has exceeded 100 percent over the period, project preparatory work suggests that funding will both need to increase as well as be better managed if MP is to meet its goals in higher education.[2] Importantly, there are no clear funding mechanisms/performance-based criteria regarding central and state funding. Further, there are key shortcomings in audit systems, inadequate computerization of internal FM systems and large vacancies of non-teaching staff, as a result of which much of the administrative work gets assigned to already over-burdened teaching staff.
- Poor governance, leadership and accountability: As in most states in India, the higher education system in MP is characterized by a series of governance

[2] The INR amount was INR 767.76 crore in 2009 and INR 1989.14 crore in 2014. Exchange rates of INR 50.804 per USD was used for 2009 and INR 63.469 per USD was used for 2014.

challenges. First, limited autonomy means that a university vice-chancellor or college principal has little flexibility in making key management decisions or in choosing his/her own administrative or teaching staff. Second, the affiliation system has reduced the relationship between universities and affiliating colleges to a minimalistic administrative one. One consequence is that a single university with nearly a hundred colleges affiliated to it imposes the same curriculum and examinations on all; individual colleges cannot adapt curricula to the needs and interests of their students. Third, there is little coordination between different state higher education entities and the Department of Higher Education (DHE), between the UGC and the All India Council for Technical Education (AICTE), and between colleges and universities. Fourth, quality assurance procedures are weak or non-existent. At present, less than 5 percent of colleges in the state are accredited by NAAC[3] despite a major push in recent years. Finally, the system is characterized by rampant politicization, with appointments of vice-chancellors, faculty and non-teaching staff open to political influence, weakening the ability of the system to function on a merit-based transparent manner.

The private HE is fairly substantial in Madhya Pradesh. As of 2012-13, 54% of colleges and over a third of higher education students in MP study at private unaided institutions which receive no financial support from the GOMP. Both the government and private HE sectors have grown rapidly in recent years; however, the core issues of quality and relevance remain concerns for both parts of the sector.

1.3 Project Over-view

The **Madhya Pradesh Higher Education Quality Improvement Project (MPHEQIP)** will support the implementation of the Government of Madhya Pradesh's vision for the higher education sector as articulated in the Vision 2018 Document and the State Higher Education Plan 2014. The project is consistent with India's 12th Five Year Plan, based on the pillars of faster, sustainable, and inclusive growth, which emphasizes increasing the supply of highly-skilled workers to drive the economy, as well as helping low-income states catch up with their more advanced neighbors.

The Project in alignment with the Government's vision focuses on the following thematic areas in higher education:

(a) **Excellence** and **employability** through better quality of education services offered, improved teaching-learning resources, and research

(b) Expanding **equity and access**, and

(c) Strengthened sector and institutional **governance and financing**, and management (including better monitoring and evaluation in the sector).

[3] The National Assessment and Accreditation Council (NAAC) is a national statutory body that provides accreditation to HEIs and programs offered by them. Currently, only 32 HEIs in the state have an active NAAC accreditation.

MPHEQIP is designed around the fact that the HE sector in Madhya Pradesh is currently at an emergent level with regards to capacity of higher education institutions (HEIs) to achieve quality outputs, internal and external quality assurance, and robust governance, management and data systems. The GOMP foresees a significant period of reform in the HE sector initiated by their Vision 2018 document, their participation in the RUSA scheme, and new state level initiatives.

The MPHEQIP is designed to help the GoMP begin its long-term reform process. International evidence suggests that when embarking on a major reform, it is essential to identify a relatively small number of complementary and mutually-supporting activities which can be completed successfully so as to build momentum for further reform. In this way also, the system's capacity to plan, implement, monitor and adjust its reform path is augmented – making the next phase of reforms more likely to be successful. While the expected outcomes from a first phase (i.e., from the MPHEQIP) may be relatively modest, the initial set of activities should lay the foundation of capacity and processes for further reforms.

1.4 Project Development Objectives

The development objective of the proposed project is to improve student outcomes in selected higher education institutions and to increase the effectiveness of the higher education system in Madhya Pradesh.

1.5 Project Components

The MPHEQIP has three components: (i) Component 1: Grants support to HEIs for improving institutional performance along the following dimensions - excellence, equity, employability, access, and governance, (ii) Component 2: State Level Initiatives to strengthen sector governance, and (iii) Component 3: Improving System Management. The first two components ($285m IDA) cover the result-based financing part of the Credit and will finance key expenditure items of the higher education budget, using disbursements tied to pre-specified results. The third component ($15m IDA) will provide technical assistance and capacity building for smooth implementation of activities under the first two components.

Disbursements under Components 1 and 2 will be made against a set of Eligible Expenditure Programs (EEPs) selected from higher education budget, and will be linked to the achievement of a set of Disbursement Linked Indicators (DLIs). Each DLI will have its own price. The Bank's guidelines on Financial Management, Procurement, and Social and Environmental safeguards will be applicable to the EEPs.

Component 1 – Grants Support to HEIs

The main thrust of project will be Institutional Grants to eligible government colleges and universities through two windows: (a) Window 1: Institutional Development Grants support to HEIs, and (b) Window 2: Establishment of Centers of Excellence. The Institutional Development Grants (Window 1) will provide financing to enable colleges and universities to pursue the goals set out in their respective Strategic Plans which will be prepared by all government colleges and

university departments under the project. It is expected that through these Plans institutions will improve institutional performance around quality in higher education, equitable access and better capacity utilization, strengthened quality assurance including activities aimed at making students more employable, skills development, and strengthened institutional mechanisms for governance and management. Centers of Excellence support (Window 2) will provide financing to a limited number of colleges and university departments that satisfy a set of minimum conditions for excellence for establishing best practice teaching-learning and research in a focus area. Component 1 will constitute the major bulk of funding under the project. Overall, Component 1 will constitute the major bulk of funding under the project. A limit of 25% of total project costs may be used for civil works. An HEI can, in principle, receive support under both windows. Reimbursement for Component 1 will use a results-based-finance modality based on achievement of a set of DLIs.

The grants provided under this component will also reinforce the system reforms under the project, e.g., (i) increased autonomy and accountability, and will help re-define the relationship between DHE and government colleges; and, (ii) pursuing NAAC accreditation to benchmark quality and give access to additional resources for quality improvement from national and state governments.

Window 1 -- Institutional Development Grants to HEIs

Institutional Strategic Plans: All government colleges and university departments in the state will prepare an institutional strategic plan with a 10 year horizon, setting out their goals (including measureable targets) and a set of actions necessary to achieve those goals. The HEIs can use their plans to propose, *inter-alia*, training of faculty, upgradation of equipment, and teaching-learning resources, refurbishment of existing infrastructure, construction of new infrastructure (college buildings and hostels) up to a ceiling[4], ICT services (including libraries and e-resources), quality

[4] For the purposes of this note, 'new infrastructure' means new stand-alone buildings. In this project, the new infrastructure will be limited to: (a) hostels, especially to attract girls and ST populations to higher education; and (b) new buildings for established colleges which currently have no buildings. In addition to new infrastructure, higher education institutions will be able to use funds from the project for civil works upgrading, such as (but not limited to): renovating existing buildings, repair and maintenance, improving energy efficiency and greening buildings, provision of water supply and waste disposal, purchasing equipment (specialist laboratory equipment, furniture, etc.) and extension of existing buildings. In no cases (i.e., neither for new infrastructure nor for civil works upgrading) will any new land be acquired from project financing nor will any site be used where resettlement would be needed (including voluntary resettlement). In addition, in all cases, the social and environmental management frameworks agreed for use under the Bank-financed project will be used. Funding for new infrastructure in colleges with no buildings at present will be subject to: in ST dominated areas, minimum number of undergraduate students (500) and faculties (at least 2), 75% of faculty positions are filled with permanent appointments, permanent principal in

assurance, support for disadvantaged students (by enhancing their student support services, remedial classes, pedagogical training, hostel facilities, etc.), greening of campuses, wifi-campuses and smart classrooms, sports and cultural activities, additional technical support staff, and additional faculty members hired on contract for the project period.

It is expected that the average grants size to an institution will likely be $2 million (10 crore rupees; actual grants size may be less or more), and a maximum of 200 government HEIs will be supported through this sub-component.

The process for developing these Plans[5] is expected to galvanize the various stakeholders in institutions (faculty, non-teaching staff, students, members of the Governing Body, local employers) around plans to improve their institution. It is expected that these Plans would also help institutions prepare for NAAC accreditation (either for the first time or for re-accreditation). These Plans would form the basis for the Government to prioritize the allocation of resources from MPHEQIP, and the RUSA scheme as well as be the platform from which institutions apply for other funding (from UGC, Department of Science and Technology, alumni, employers, etc.). The Strategic Plan is a significant undertaking, the need for these plans to be developed in a consultative way, and the fact that most institutions do not have experience of preparing such plans, institutions will need significant training and capacity building support to do this properly. The Plans once prepared would be finally approved by the Governing Body of the institution.

Selection of colleges and university departments for Institutional Grants support*:* Broadly, the selection process will be a three stage process consisting of (a) identification of eligible institutions, (b) preparation of strategic plans by eligible institutions with technical support, and (c) review of plans for final selection. The eligibility criteria for HEIs to receive institutional grants would be a set of objective indicators: having a minimum number of students, a minimum percentage of faculty positions filled, having an active quality assurance committee, have completed all required audit reports, and be at least of a certain age. The final minimum values of these criteria as determined by the Department of Higher Education (DHE) and agreed with the World Bank will be described in the Project Implementation Plan

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place, financial audit completed for last 5 years, necessary social and environmental clearances, and no land acquisition or involuntary resettlement.

[5] Steps in the development of the strategic plans will include: (a) development of a Plan template, (b) establishment of a process for plan development, (c) consultation with institutions and finalization the process, and (d) development of a timetable for institutions to complete their strategic plans in a phased manner, and (e) preparation of the plans based on the agreed process. The Project Directorate will prepare Terms of Reference for the necessary capacity building (technical assistance, workshops) of the HEIs to prepare these plans, and will contract with government and private institutions which are able and willing to provide needed capacity building.

(PIP). All eligible colleges and university departments will need to complete their Strategic Plans, and HEIs that are selected for grants support will need to submit annual work-plans and budgets, annual targets to be achieved and a financial sustainability plan covering five years after project closing, and agree to the monitoring and reporting requirements of the project. DHE will use review committees to assess Plans and recommend any changes or approve them. All Plans will be consistent with NAAC requirements, and will include quality, equity, efficiency and governance and management target outcomes for the KPIs and the intermediate outcome indicators in the Results Framework. All supported institutions will also ensure that there is regular internal quality assurance through their quality assurance committees and through labor market tracking of students.

Performance management and Quality Assurance: Each institution receiving an Institutional Grant will receive an initial allocation (20 percent of the grant) to begin activities. Each institution will also agree with DHE on a set of performance standards which will have to be met in order to receive further tranches of funding. Some of these performance standards will be common across all institutions (such as adherence to the FMP Manual, on-time preparation of the financial audit, on-time completion of data entry for the management information system/AISHE, publication of an annual report, etc.) while others will be related to specific goals and objectives of the different institutions.

Strategic Plan support to institutions is aimed at strengthening systems and mechanisms so that institutions can make continuous improvement in the delivery of education services. All colleges in Madhya Pradesh have an Internal Quality Assurance Cell (IQAC) which will be strengthened through Strategic Plan support, and which will take the lead in helping institutions achieve NAAC accreditation, in preparation of the institution's annual report, and other quality related issues in the institution. As NAAC accreditation, preparation of annual reports, and quality management are data intensive processes, the HEIs will use the financial support provided for their strategic plans to hire dedicated data management personnel. All institutions selected for Plan support will have to establish functional placement and career cells, and introduce labor market tracking of students, through a system of their choice (such as making use of mobile phones and e-mails). These placement cells would have dedicated personnel who will have the skills-set that allow the HEI to establish strong linkages with employers within and outside the state, arrange for soft-skills development of their students, and manage and update the institutional data associated with placement and labor-market tracking.

Window 2 – Establishment of Centres of Excellence in existing colleges and university departments

This window will support the establishment of Centres of Excellence (COEs) in different subject areas in existing government colleges and university departments. The objectives of the COEs will be to develop specialized facilities in particular subject areas, and undertake research in areas that have been deemed to be of importance for academic, commercial and research reasons. The COEs will be awarded using a sequence of steps beginning with inviting proposals from interested government colleges and university departments. It is expected that

there will be a total of 30 COEs by the end of the project; with average allocations of $2m.

Centre of Excellence Proposal, review and selection process: Interested colleges and university departments will have to submit a detailed proposal for the establishment of COEs. The proposal will describe the institution's vision and objectives for establishment of the COEs, self-assessment of their strengths, weaknesses, and the opportunities they foresee for themselves, activities and targets to be achieved over the project period and annually, and against which they will report, and a budget/cost section. The Departments can use their proposals, *inter-alia*, for training of faculty, equipment, teaching-learning resources, refurbishment, ICT services, fellowships, quality assurance such as NAAC fees, and support for signing MOUs with industries, additional technical support staff, and additional faculty members hired on contract for the project period. Only those colleges and university departments that fulfil a set of minimum conditions for excellence will be eligible for support through this window. The process of reviewing and final selection of proposals will include teams of two independent experts who would review each proposal and make a recommendation to the PD. The objective of the evaluation will be two-fold. The first objective will be to make a recommendation to the PD regarding funding for the proposal; the second objective will be to provide guidance to the applicants on how to strengthen their proposals.[6]

Performance management: In a similar way to Institutional Grants, institutions receiving funds for COEs will be required to meet certain performance benchmarks in order to receive funds beyond the initial allocation.

For this component, release of IDA funds will be linked to achievements of the following DLIs: DLI 1 (Increase in UG enrolment), DLI 2 (Performance based grants to selected HEIs), DLI 4 (Institutional support for improving employability), and DLI 6 (Fiduciary strengthening of HEIs).

Component 2: State Level Initiatives

The main objective of Component 2 is to support state level initiatives for enhanced equity, improving the quality of teaching, learning and research, and the quality and relevance of system outputs in the form of better skilled graduates and research desirable by employers, and companies in the private sector. The Component supports strategic interventions to be undertaken by the state to (a) provide financial support through scholarships to disadvantaged and meritorious students, (b) upgrade qualifications and skills of new and existing faculty members, (b) establish a state institute of higher education training and research, (c) extend technical assistance for NAAC to all government HEIs, and (d) strengthen teaching-learning resources in colleges through library and e-resources grants.

[6] The two independent experts who will evaluate the proposals will preferably be from outside of Madhya Pradesh (including outside of India). The experts will be independent: i.e., they will not have any ongoing collaboration in teaching or research with the Department which is submitting the proposal, nor will they have received a higher degree (MA or PhD) from that institution. The experts will remain anonymous; their identity will be known only to the Department of Higher Education and the Project Directorate.

Reimbursement for Component 2 will also use a results-based-finance modality based on achievement of a set of DLIs.

Scholarship support for disadvantaged students:

Under this sub-component, the GOMP will commission a review of existing scholarship schemes for their impacts, including the ease with which scholarships can be accessed by students, continued student attendance and retention, course completion, and adequacy of support. The review will also make recommendations on mechanisms for supporting meritorious students from disadvantaged backgrounds, and for increasing the participation of students from these groups into more science based courses. Based on the findings of the review, the design of some of the existing schemes may be revised as necessary, and the number and types of scholarships offered scaled up. Consultations will be held with targeted beneficiaries before the revised set of schemes are finalized. Information on all scholarship schemes offered by the DHE will be made available on the Scholarship Portal which is a repository of information on scholarships for HE from all sources in the state. In the fourth year of project implementation, GOMP will commission a feasibility study for the sustainability of interventions introduced under this activity.

Establishment of the State Institute of Higher Education, Training and Research (SIHETR): There is a need for a dedicated institutional or organizational mechanism with the mandate for the focused development of human resources for higher education, and which includes in its scope training (including needs analysis, implementation plans, calendars etc.), research and development, consultancy, and other activities). Members of the SIHETR can include faculty from the parent institution, faculty from other HEIs, experts, academics and scholars, and industry representatives. The SIHETR will also offer residential and non-residential fellowships to scholars in India and abroad. It is envisaged that the SIHETR will *inter alia* carry out the following functions:

a. Carry out training needs analysis (TNA) periodically for faculty, management, heads of institutions and other stakeholders in the sector.

b. Coordinate training activities that are on offer from various institutions in the state, and create a single-window for applicants to get information on these training. In particular, conduct training of trainers.

c. Create linkages with institutions that are located within the country and abroad for conduct of training and joint research in higher education domain areas and areas identified in the TNA.

d. Promote research and analysis in the area of higher education pedagogy, assessment, curriculum revision and development, students' need assessment, policy making and M & E. In particular, provide advice to the State Higher Education Council, the DHE and the State Governments as needed, for example, over norms for establishing colleges and the introduction of the choice based credit system in institutions.

e. Conduct specialized training to faculty on research methods, sources of support for carrying out research, and the various media for publication of good research (as working papers or in peer reviewed journals).

f. Develop specialized state-level facilities for audio-visual lab, to connect with other institutions and pilot innovative curriculum ideas

g. Have a dedicated website that will make available in the public domain: research, work in progress, and information on upcoming events.

The Project Directorate will invite applications from interested institutions in the state for the establishment of the SIHETR within their existing campus. The project will provide support for the refurbishment of premises, equipment and facilities support, fellowships, recurrent costs, and hiring of extra personnel required to run and manage the SIHETR.

Upgrading Qualifications and Skills of New and Existing Faculty Members: The project will provide financial support to all government HEIs for upgrading their academic qualifications (Masters, Doctorate etc.). Institutions which receive in Institutional Grant would be expected to use that Grant to meet these costs. For other colleges, direct provision of financial support for upgraded qualifications will be provided. The project will also provide research grants to faculty members and researchers to conduct original research, and for publication fees. Research grants will be awarded through a rigorous peer review process, including experts from outside Madhya Pradesh, and in priority areas.

Enhancing the Quality and Relevance of Programs delivered by HEIs: Curriculum development and revision for affiliated colleges in Madhya Pradesh are currently the responsibility of the Board of Studies of affiliating Universities. In most colleges, faculty and students express their dissatisfaction with the relevance of curricula used in the various programs, though there is no functional mechanism in the state to take cognizance of their views. In principle, faculty members in colleges have the freedom to adapt twenty percent of the syllabus to align with needs as they deem fit. In practice, faculty members usually do not exercise this flexibility as their perception is that the twenty percent needs to be appended to the syllabus and not be used to substitute the same.

All the six affiliating state universities in Madhya Pradesh will establish Curriculum Revision Committees (CRC) that will coordinate with their Boards of Studies for the various programs, and the affiliating colleges to ensure that curricula for all programs currently offered are revised, and new curricula developed for colleges wishing to introduce such programs. The CRC will include experts, scholars, industry representatives, teachers and students, and research organizations. Digitization of all curricula will be done (as video lectures, power-point presentations, e-books etc.), and made available for all colleges in the state.

Extending NAAC related support to all government and aided colleges: Government and aided colleges in Madhya Pradesh that are not selected for Institutional Grants support will be able to use the aegis of the project towards applying for NAAC accreditation. This will include financial support for (a) participation in NAAC workshops organized by the Project Directorate, (b) preparation of their NAAC applications which can include hiring of consultants and experts in this area, and (c) NAAC fees.

For this component, release of IDA funds will be linked to achievements of the following DLIs: DLI 2 (Performance based grants to selected HEIs), DLI 3 (Support to disadvantaged students) and DLI 5 (Improving sector-wide governance and management).

Component 3 – Improving System Management

The main objective of this component is to assist DHE, SHEC, the PD and the HEIs to strengthen their implementation capacity and sector governance and management. Funds under this component will be disbursed based on Interim Unaudited Financial Reports (IUFRs) prepared and presented quarterly. This component has two main sub-components – Sub-Component 3.1: Improving Sector Governance and Management, and Sub-Component 3.2: Capacity Building which includes technical assistance, project management and monitoring and evaluation activities. This component requires the preparation of an annual procurement plan according to guidelines agreed between the DHE and the World Bank (and as described in a Procurement Manual).

Sub-component 3.1 – Improving Sector Governance and Management

The objective of this sub-component is to strengthen governance, management and accountability structures and practices at the state and institution levels. The main activities supported under this activity will include: (a) helping a larger number of institutions attain autonomous status that goes beyond the UGC definition of autonomy, (b) all government HEIs to prepare an annual report on performance, (c) reconstitution of the Board of Governors of HEIs with clear mandates with respect to governance and accountability, and (d) fiduciary strengthening of government colleges.

Institutional Autonomy*:* The UGC formally grants to colleges' academic autonomy that meets certain conditions; this autonomy relates to curriculum, conduct of examinations, assessment and declaration of results. Such colleges are also entitled to certain grants from UGC. Colleges wishes to apply for autonomy have to meet certain conditions, including having permanent affiliation and NAAC accreditation. The Institutional Grants therefore are an important mechanism for helping institutions acquire this academic autonomy.

Beyond this academic autonomy however, evidence from around the world, including India, shows that a key reform that promotes more effective institutional performance (of both universities and colleges) is greater autonomy across financial, managerial and administrative aspects as well. This will require new guidelines and regulations to be developed by the DHE, to be followed by significant capacity building of institutions in order that they may exercise this greater autonomy effectively. These guidelines and regulations will also need to address how institutions with greater autonomy will also be subject to robust accountability. The intention is that more colleges would acquire this autonomy during the project.

In order to effectively implement actions towards their strategic plans, institutions need effective autonomy. Autonomous colleges should be given the powers over academic issues as prescribed by the UGC. Specifically:

- Freedom to decide on the structure and modalities for the end term examination
- Freedom to decide the syllabus for undergraduate programs, subject to approval by their own board of studies. Currently, colleges are constrained by university regulations. (Autonomous colleges already have freedom over the syllabus with respect to postgraduate programs).

Beyond the delegated power of the principal, the Governing Body of the institution should have final authority over expenditures of the institution. Provided colleges and universities use the prescribed financial management and procurement manual, they should have freedom to incur expenses if funds are available to them, without any further approvals from the DHE.

Jan Bhagidari Samitis/Boards of Governors: Having an effective Board of Governors is also essential in order for colleges to effectively utilize their autonomy by setting and fulfilling strategic objectives. Capacity building of members of the Boards of Governors will be undertaken over the course of the whole project.

By the end of the project, it is agreed that all colleges should have governing bodies, which are constituted such that (a) the Chair is an academic; (b) the government representatives and nominees are in the minority; and (c) at least one third of the members will be independent (i.e., independent of and external to the institution).

The Department of Higher Education will get the relevant approvals to change the composition of governing bodies by 31st October 2015.

The main responsibilities of governing bodies will be:

- To approve the mission, strategic plan and annual budget of the institution
- To ensure the establishment and monitoring of proper, effective and efficient systems of control and accountability
- To monitor institutional performance and quality assurance arrangements
- To put in place suitable arrangements for monitoring the performance of the head of the institution

Governing bodies will seek to operate in a transparent and open manner. This includes

- Publishing an annual report as per the format prescribed by DHE
- Advance notice and Minutes of the meetings of the governing body will be posted on the institution's website
- Setting out the expectations of members of the governing body in terms of attendance at governing body meetings and other college events, and maintaining a register of interests of members of the governing body.

However, this will be implemented in a phased manner as follows:

- Existing autonomous colleges. By 31st March 2016 all governing bodies of existing autonomous colleges will have been reconstituted and have had their first meeting.
- Additional autonomous colleges: Any new colleges which become autonomous will have governing bodies established along the revised lines from the beginning of acquiring autonomous status.
- NAAC accredited colleges. All colleges are currently accredited by NAAC with a grade A, B or C will be required, by 31st March 2016, to establish a governing body and have held the first meeting.
- Additional colleges which become accredited by NAAC. Colleges which become accredited during the course of the project will have established a governing body and have held the first meeting within 6 months of acquiring NAAC accreditation.
- The remaining government colleges will acquire governing bodies over the course of the project. The DHE and the World Bank will agree the criteria which will be used to phase institutions. It is expected that the main criteria will be: number of students and percentage of faculty in place.
- DHE/PD will organize appropriate training and other events for members of the governing bodies to understand and carry out their roles and responsibilities effectively.

Institutions Annual Reports: All government colleges will prepare and publish an annual report, which will provide information on a standard set of indicators collected in a consistent way. These annual reports will (a) provide reliable information on the nature and performance of the HE sector in Madhya Pradesh, (b) act as benchmarks for the HEIs assessment of their own performance, (c) source of evidence to inform policy developments, and (d) contribute to public accountability of the HE sector. The PD and the DHE will develop a set of indicators and a template for the annual report in the first year of the project.

Faculty and Principal Transfers and Appointment of Guest Faculty: It is important that there is some stability for faculty and principals of colleges, so that they can contribute effectively to the development of their institutions. This needs to be balanced against the needs of the system to ensure an equitable distribution of faculty and principals across government colleges – though new faculty appointments rather than transfers are the most effective way to do this. The DHE will publish its policy about faculty transfers. This policy will make clear: (a) that the normal expectation is that faculty and principals will be able to remain in post for at least five years; (b) faculty and principals would only be moved before five years under exceptional circumstances. The policy would set out what these circumstances are and the process by which the DHE will be implement these circumstances and give the opportunity for concerned faculty to object. (c) all transfers will take place during the main breaks between semesters; (d) transfers would not be used a disciplinary action. However, faculty may request to be transferred to an existing open position at any time.

The DHE will amend the current policy/guidelines to increase the compensation given to guest faculty, up to the equivalent of associate professor daily rates. Colleges and universities would be able to enter into contracts with guest faculty for at least 10 months. However, colleges would only be hire guest faculty if they have the resources available in their approved budget.

Fiduciary strengthening: Fiduciary strengthening of government colleges and state universities: Under this sub-component, the DHE and government colleges will be supported to strengthen their fiduciary systems through (a) shifting to electronic systems for financial management, and (b) financial support for hiring a Chartered Accountant for clearing past audit observations and conducting regular audits. The PD will designate an officer (who can be a consultant hired for the purpose) to consolidate all the audit responses received and prepare a institution-wise report that will be used to follow up on compliance, and to provide appropriate support to HEIs as necessary on an annual basis.

Sub-component 3.2: Capacity Building

1. This sub-component will support capacity building activities to help SHEC, the PD, and the HEIs carry out the implementation of the project in a smooth manner. It will include technical assistance support project management, monitoring and evaluation, and funds for for surveys, studies, assessments and any due diligence deemed necessary for policy and practice. Activities under this sub-component can include *inter-alia*:

- Fully staffed Project Directorate: the Project Directorate can use project funds to hire consultants in different expertise areas (domain areas such as pedagogy, scholarships, M & E, and management areas such as procurement, financial management, M & E) for the entire project period or for a short duration as deemed necessary.
- DLI verification: Hiring of agencies to verify the achievement of the DLI according to agreed protocols and to agreed standards.
- Performance assessment and verification of reports submitted by supported HEIs (colleges and university departments) against their annual targets.
- Faculty and Student Satisfaction Surveys: The Project Directorate will commission surveys of faculty and student satisfaction and of employer perceptions at least twice during the project period, and use the findings towards actions that can help improve the academic experience of faculty and students subsequently.
- Policy or Assessment studies on the affiliation system, the credit system, norms for establishing government and private colleges and universities, etc.
- Hiring of dedicated personnel for managing the inputs and outputs (reports and summaries) of the project M & E system.
- Capacity building of SHEC and the Project Directorate, through provision of long-term consultants in the areas of monitoring, statistics, policy analysis financial management and procurement. Short-term consultants in other areas

as required such as program evaluation, regulatory reforms, and communications and outreach can also be hired by the Project Directorate.

- Technical assistance to HEIs to prepare their Institutional Strategic Plans and in the areas of strategic planning, budgeting and financial planning, governance, use of the MIS and M &E.
- Technical assistance on the NAAC accreditation process
- Establishment of an IT Portal/Management Information System (MIS) for the HE sector as a whole and training of HEIs in the use of the MIS.

1.6 Project Financing

The MPHEQIP will support a portion of the Government of Madhya Pradesh's Program for the higher education sector. The proposed project will primarily focus on the implementation of the Program's quality improvement initiatives, and has an estimated funding of US$430 million. This includes a commitment of $130 million from GOMP and proposed Bank support of US$ 300 million.

Project Components	Project cost (US$ millions)	IDA Financing (US$ millions)	% Financing
1. Grant support to higher education institutions	387.0	270.0	70
2. State level initiatives	21.5	15.0	70
3. Improving system management	21.5	15.0	70
Total Costs	**430.0**	**300.0**	**70**
Total Project Costs	430.0		
Total Financing Required	300.0		
GoMP Funding	130.0		

The project will use an Investment Project Financing (IPF) lending instrument using a Results Based Financing (RBF) modality. Components 1 and 2 will be results-based and project funds would be disbursed against Eligible Expenditures (up to capped amounts and upon achievement of agreed Disbursement Linked Indicators or DLIs) under selected line items in GOMP's Department of Higher Education annual budget. Component 3 would use a traditional investment project approach with direct reimbursement of project expenditures.

1.7 Project Beneficiaries

Project interventions will benefit all higher education students enrolled in Universities and Colleges that are overseen by the Department of Higher Education (DHE), their faculty, administrators and the officers of the DHE, the State Higher Education Council (SHEC), the RUSA Project Directorate which will be the main implementing agency of the project, members of Governing Bodies in Colleges and Universities, and other relevant key bodies in the higher education sector. It is expected that approximately 1 million students, 10,000 academic staff, and 1400 administrators and officers in nearly 200 government colleges and university departments and key state entities will benefit directly from project interventions. Indirect beneficiaries will include employers (both within and outside the state) who will have a more skilled higher education graduates' pool to choose from, households who can expect higher income streams in the future due to the earnings of more productive graduates, and investors who can benefit from the greater presence of higher quality human capital and research output in the state. The MPHEQIP will also contribute to filling public goods gaps in the state by strengthening the information and coordination networks between higher education institutions, potential and current students, administrators and employers and investors. Improving opportunities for access to good quality education, the MPHEQIP will contribute to more equitable distribution of higher education resources to students belonging to disadvantaged groups.

Chapter 2

Need for Environmental Management Framework and Methodology Used for Limited EA

2.1 Limited EA / Diagnostic Review

A Diagnostic Review or Limited Environment Assessment (EA) study was conducted and completed in February 2015. This exercise was intended towards facilitating GoMP in overcoming some of the challenges/deficiencies with regard to environment, health and safety aspects in Higher Education Institutes in an incremental manner (building on efforts from TEQIP, also a World Bank Funded Project supporting HE at the national level and currently the second project is under implementation) and in introducing/implementing the concept of 'greener HE institutes'.

This section describes the approach and methodology used for carrying out the Diagnostic Review (also referred to as the Limited Environment Assessment) for MPHEQIP:

2.1.1 Approach Used

The Diagnostic Review/limited EA and the recommendations to strengthen the environmental performance of MPHEQIP as a program were solely driven by the objective of creating and maintaining safe, clean and sustainable surroundings in colleges, which has been recognized as a basic pre-requisite for creating an appropriate learning environment.

Accordingly, the methodology to achieve this goal involved the following:

(a) Study and review of secondary data/information related to environment, health and safety provisions/aspects.

(b) Review of the nature and extent of compliance of requirements/norms related to environment, health and safety aspects in HE institutes.

(c) 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 HE institutes.

(d) Providing recommendations to help improve/strengthen the environmental performance of the programme.

2.1.2 Parameters Assessed

The review and assessment included, but was not limited to the following aspects:

a. Siting/location

b. Planning and Lay-out of the campus (including orientation of building/s; internal circulation arrangements)

c. Structural safety aspects (application and adherence to building codes; condition of buildings)

d. Building Design (building plan; space for various activities; materials used)

e. Class room design (space availability; natural light and ventilation; display arrangements)

f. Measures for Disaster Risk Management

g. Facilities for Physically Challenged

h. Water management (source)

i. Drinking water arrangements

j. Drainage arrangements

k. Sanitation arrangements and its condition

l. Energy (availability, usage and efficiency measures, if any)

m. Waste management (collection and disposal arrangements)

n. Exposure to pollution particularly dust, contaminated water and noise.

o. Fire and Electrical Safety Practices

p. Over-all operation and maintenance aspects (housekeeping; cleanliness and hygiene in the campus)

2.1.3 Methodology Adopted

1. Review of Secondary Data/Information

a. At National Level

The environment, health and safety related information has been collated from available/provided by the Ministry of Human Resource Development. The review provided necessary insights on various environmental management measures that have been ingrained under the program to provide a safe, healthy and environmentally sustainable institute.

The findings from the documentation review provided the foundation for diagnostic assessment study. Attempts have been made to cover the various stages associated with planning, design, construction and maintenance of HE institutes. It covered review of contents and mechanisms adopted for compliance with RUSA Framework requirements.

The key documents reviewed include the following:

- RUSA Framework
- All India Status of Higher Education Report - 2014
- Minutes of the Joint Review Mission Meetings – TEQIP II
- Other Guidelines/Manuals (including manuals for civil works developed for TEQIP II program)

While documents such as RUSA Framework gave information on the program requirements to make a college environmentally sustainable and make it contribute towards the overall learning experience of the children, other documents such JRM minutes provided insights into the achievement and challenges that the states have faced during implementation, particularly with regard to infrastructure gaps, construction and operation of institutes.

b. At State Level

The aim was to review the state's approach to address the program requirements set forth in RUSA Framework, particularly with a focus on the environmental management requirements. Some documents were reviewed as part of this exercise. These included:

- Mapping of HE Institutions
- Civil Work - Planning and Implementation Process and Procedures
- Building plan drawing(s)

The review focused mainly on how effectively environmental management has been integrated in the over-all program and sub-project level execution. It also tried to identify good practices and challenges faced within the State in implementing the EHS requirements of the program.

2. Meetings with Key Stakeholders

Discussions with key stakeholders were held at the State, District, Block and College level. The discussions were mainly aimed to seek feedback and assess the implementation issues in terms of site selection, building design, execution, quality of work, institutional support and other such issues faced by the different stakeholders.

The discussion at the district level provided a better sense on the implementation challenges of the program at District and Block level. On the other hand, discussions with students and faculty helped in understanding their perception of the over-all program and in assessing their understanding of specific roles and responsibilities with regard to safety, health and hygiene maintenance in colleges.

3. Site Visits to Selected Colleges/Institutes

On the basis of information collected and reviewed both at national and state level, specific aspects were reviewed on the ground. For this, site visits to selected institutes were made. The specific parameters that were reviewed include:

- Type of program intervention/s (i.e. new school, major repair, additional room construction, construction of other facilities etc.)
- Overall school campus planning
- Building plan and design

- Site Selection
- Condition of the building/s (based on visual observations only)
- Use of cost effectiveness technologies/construction materials
- Overall finishing and detailing (in case of completed building)
- Provisions for CWSN
- Drinking water facility
- Sanitation facility
- Hygiene (in/around drinking water source, kitchen, grain storage room and sanitation facilities)
- Safety (boundary walls; railing/s, where needed)
- Electricity (connection, availability)
- O&M practices (including budget/fund availability)
- Monitoring mechanism/s

The above parameters helped in identification of key environmental concerns that can/need to be addressed in a school to create a good environment that will be inviting, appealing to children and community and help avoid/reduce exposure to health and safety issues.

4. Information supplemented by Other Studies carried out in the past

In addition to the assessment mentioned above, the review built-on on the assessments conducted earlier for TEQIP I and TEQIP II.

2.2 Need for an Environment Management Framework

The very achievement of the programme/project objectives, particularly indicators related to access and equity, depends directly on the provision of safe, clean and sustainable surroundings in education institutes to create conducive learning and teaching environment.

It is envisaged that there will be gradation/modernization/refurbishment of facilities of the educational institutions/colleges, as part of **Component 1** activities, under the project. The Planning, development and management for the up-gradation /modernization/refurbishment of educational institutions/colleges will involve fulfilment of some important environmental obligations and requirements.

Good environmental management practices are essential and integral elements of sound project preparation and implementation and therefore, an Environment Management tool would be needed for preventing or overcoming environmental issues encountered during the various stages of project – from planning, design, construction and operation. Such a tool should be prepared with an intention to strengthen the intended outcomes from the proposed project.

2.2.1 Objectives of EMF

The key objectives of the EMF are to:

- Provide a framework for integration of environmental aspects at all stages of project planning, design, execution and operation.
- Enhance positive environmental impacts of the project and avoid/minimize potential adverse impacts.
- Make environment information available to stakeholders and the public to foster consensus and project ownership or collective responsibility for environmental actions.

2.2.2 Structure of Environmental Management Framework

The EMF addresses environmental concerns through the appropriate application of process requirements, allocation of resources, assignment of responsibility and continuous evaluation of practices/procedures to facilitate continual improvement of the system. The framework describes the principles, objectives and approach to be followed for selecting, avoiding, minimizing and/or mitigating the adverse environmental impacts that are likely to arise due to the project. It outlines the indicative management measures required to effectively address or deal with the key issues that have been identified. The framework also details out the various policies, guidelines and procedures that need to be integrated during the planning, design and implementation cycle of the Bank-funded project. The contents of the report have been structured into the following chapters:

Chapter 1: Project Background

Chapter 2: Need for Environmental Management Framework and Methodology Used for Limited EA

Chapter 3: Environmental Setting and Existing Conditions

Chapter 4: Policy, Legal and Regulatory Framework

Chapter 5: Potential Environmental Impacts

Chapter 6: Environment Management - Approach

Chapter 7: Environment Management Measures

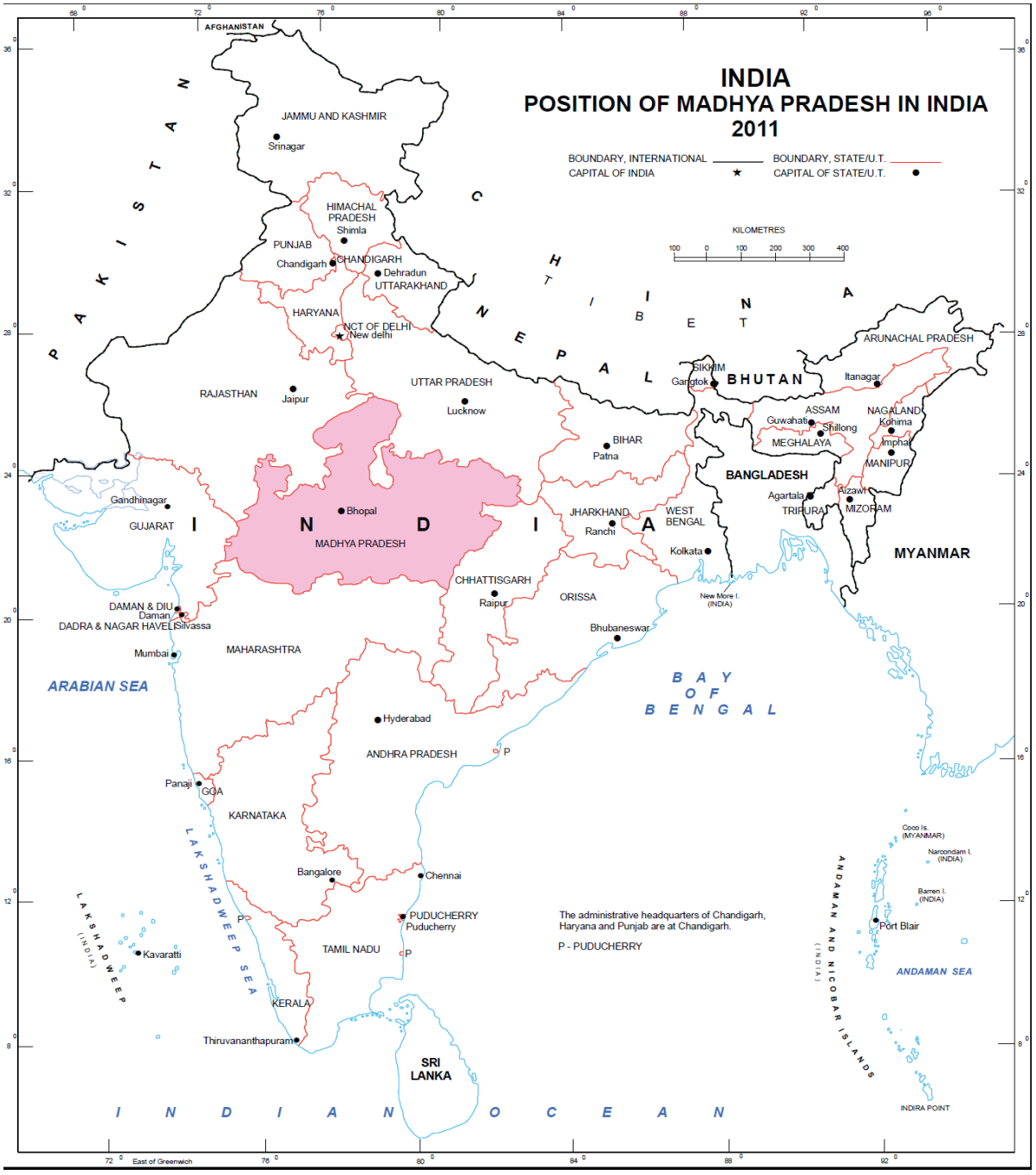
Chapter 8: Consultations with Stakeholders

Chapter 9: Implementation/Institutional Arrangements

Chapter 3

Environmental Setting and Existing Conditions

The state of Madhya Pradesh, is located in central part of India, between latitude 21.2°N-26.87°N and longitude 74°02'-82°49' E. The state is bordered on the west by Gujarat, on the northwest by Rajasthan, on the northeast by Uttar Pradesh, on the east by Chhattisgarh, and on the south by Maharashtra. The state capital is Bhopal, and the largest city is Indore. Madhya Pradesh is the second largest state in



the country by area (3, 08, 000 sq.km.) and has 51 districts. The institutions of

higher education are concentrated in the more advance districts like Indore, Bhopal, Gwalior and Jabalpur. The proposed project covers all 51 districts of Madhya Pradesh.

3.1 Topography

Madhya Pradesh, with an area of 3, 08, 000 sq.km. is the second largest state in India after Rajasthan. It is a part of peninsular plateau of India lying in north central part, whose boundary can be classified in the north by the plains of Ganga-Yamuna, in the west by the Aravali, east by the Chhattisgarh plain and in the south by the Tapti valley and the plateau of Maharashtra.

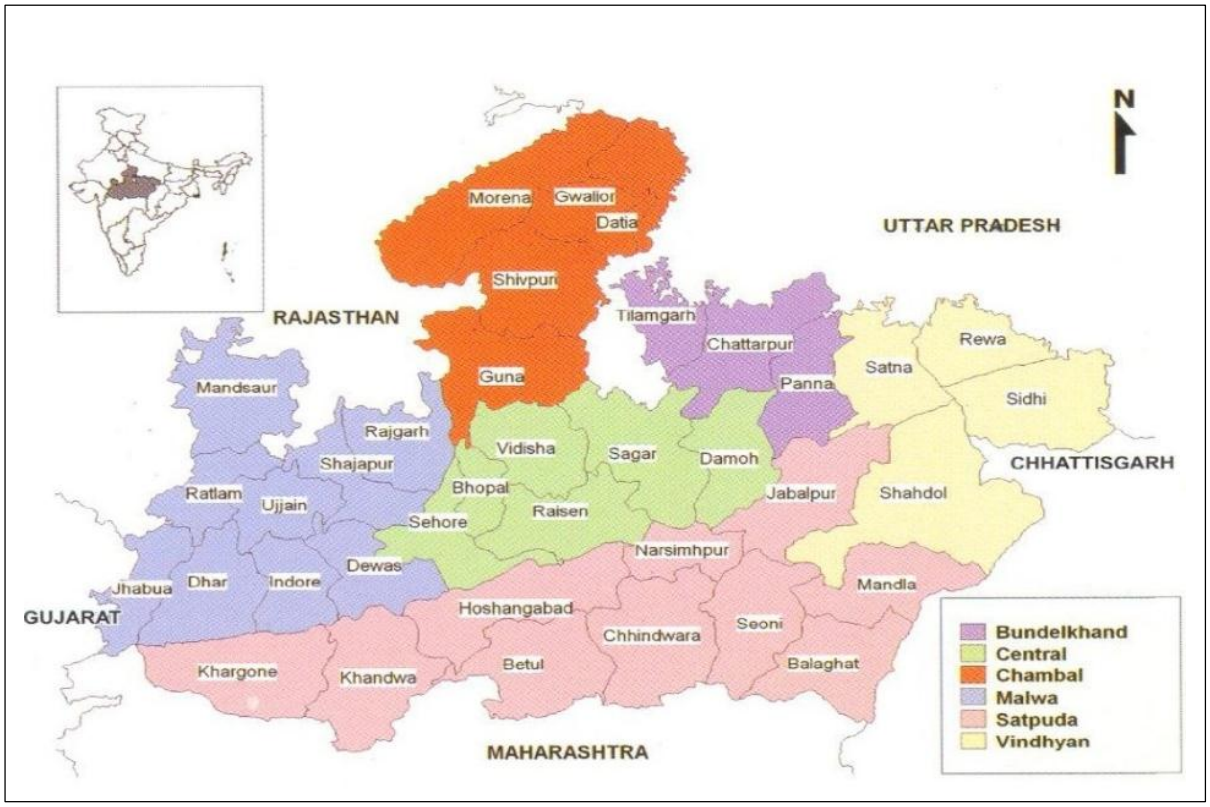
The topography of Madhya Pradesh is defined by the Narmada Sone Valley. It is a narrow and long valley extending through almost the whole of the state from east to west. Sone valley forms the upper part; Shahdol and Sidhi districts lie in this valley. The lower part forms the Narmada valley. It has an average elevation of 300 m above MSL and is covered with alluvial soil. Jabalpur, Mandla, Narsinghpur, Hoshangabad, Raisen, Khandwa, Khargone and Barwani districts lie in this region. The Sone valley is narrower than Narmada valley and alluvial deposit is also comparatively poor and thin, therefore Narmada valley is more important than Sone valley for agricultural activities. To the north of this valley lie the Central Highlands, to the south the Satpura-Maikal ranges and to the south-east, the eastern plateau. These three form the natural physiographic regions-into which the state is divided. The Central Highlands are spread between the Narmada-Sone valley and the Aravali ranges to the west in a triangular form. The highlands slope towards the north and drain into the Yamuna. The central highlands region in the state includes the following four uplands:

The Rewa-Panna plateau is one, also known as the Vindhyan plateau, lies in the north- eastern part of the central highlands. The main rivers flowing in the area are Ken, Sonar, Barna and Tons. Rewa, Panna, Satna, Damoh and Sagar districts lie in this region.The other is Bundelkhand plateau located to the north-west of the Rewa-Panna plateau. Datia, Chhatarpur, Panna, Tikamgarh and parts of Guna and Shivpuri districts forming the northern part of the state lie in this region. The plateau is bounded in north-east by Vindhyan escarp lands or Rewa-Panna plateau. The average height of the region is 350-450 m above MSL and general slope is towards north. The main rivers flowing in the area are Betwa, Dhasan and Jamner which finally join Yamuna.

Central India plateau is the third that lies to west of Bundelkhand plateau. Shivpuri, Morena and Gwalior districts exist in this region. This plateau has an average elevation of 450 m on highlands and 150-450 m above MSL in valleys. Chambal, Kali Sindh and Parvati are the main rivers flowing in this area. The fourth Malwa plateau covers almost the entire western Madhya Pradesh. The plateau is bounded in the north by Chambal and in south by the Narmada. The average elevation ranges between 300-500 m above MSL. Shajapur, Dewas, Indore, Ujjain, Dhar, Ratlam and parts of Sehore and Jhabua districts lie in this region. Bhopal is situated at the eastern edge of the Malwa plateau. Shipra, Parvati, Kali Sindh, Gambhir and Chambal rivers flow through the Malwa plateau. It also forms the water divide

between the Ganga and the Narmada basin. The soil in the area is black cotton as a result of weathering of basalts.

Satpura-Maikal ranges lie to the south and the eastern plateau regions to the north-east of the Narmada - Sone valley. Chhindwara, Betul, Seoni, Balaghat, Mandla and parts of Khandwa and Khargone districts lie in the Satpura-Maikal ranges. Average height of these ranges is 300 mt ; but there are several high peaks; the highest peak of the state, Dhoopgarh that rises to 1360 m above msl lies in these ranges. The slope is sharp in south face and gentle on northern side. The eastern part, the Satpuras, is wider than the western part which stretches in the form of a semi-circle and is known as the Maikal ranges. The Maikal ranges include the Amarkantak plateau, which is origin of both Narmada and Sone rivers. The other rivers in the area are Johila, Macherwa, Denwa and Choti Tawa which join the Narmada. The eastern plateau region comprises Baghelkhand Plateau lying between Maikal ranges and Chhattisgarh plain area with an elevation of 1033 m above MSL.



3.2 Climate

Like other parts of India, Madhya Pradesh also has three major seasons - Summer Monsoon and Winter. During summer (March-June), the temperature in the entire state ranges above 29.4°C. In general, the eastern parts of Madhya Pradesh are hotter than the western parts. The regions like Gwalior, Morena and Datia record temperature of over 42°C in the month of May. The humidity is relatively very low and the region usually experiences frequent mild dust storms. The south-west

Monsoon usually breaks out in mid June and the entire state receive a major share of its rainfall between June and September. The south and south-east regions tend to experience a higher rainfall whereas the parts of north-west receive less. Mandla, Balaghat, Sidhi, Jabalpur and other extreme eastern parts receive more than 150 cm rainfall. The districts of western Madhya Pradesh receive less than 80 cm rainfall. The winter season starts from the month of November. The temperature remains low in the northern parts of the state in comparison to the southern parts. The daily maximum temperature in most of the northern part in the month of January remains between 15 and 18°C. The climate is generally dry and pleasant with a clear sky.

3.3 Demographic Characteristics

The population of Madhya Pradesh according to the 2011 census stands at about 72 million which is not as huge as compared to some of the other big states in the country. The state has a growth rate of about 20 percent which is above the national average of about 17 and thus the population of the state is rising considerably given the progress in the state.

More than 75% of the population resides in villages whose main occupation is agriculture, while the rest of the population lives in towns. The majority population is Hindu with Muslims making up the largest minority community.

Literacy Rate - 2011: Literacy rate in Madhya Pradesh has seen upward trend and is 69.32 percent as per 2011 population census. Of that, male literacy stands at 78.73 percent while female literacy is at 54.49 percent. In 2001, literacy rate in Madhya Pradesh stood at 63.74 percent of which male and female were 75.35 percent and 54.61 percent literate respectively. In actual numbers, total literates in Madhya Pradesh stands at 42,851,169 of which males were 25,174,328 and females were 17,676,841.

Population Density 2011: Total area of Madhya Pradesh is 308,252 sq. km. Density of Madhya Pradesh is 236 per sq km which is lower than national average 382 per sq km. In 2001, density of Madhya Pradesh was 196 per sq km, while nation average in 2001 was 324 per Sq.km.

Urban Population: The largest city in the state of Madhya Pradesh is Bhopal while Indore is the capital city of the Madhya Pradesh. The languages spoken in the Madhya Pradesh state includes Hindi. In total Madhya Pradesh (MP) state comprises 50 districts. Out of total population of Madhya Pradesh, 27.63% people live in urban regions. The total figure of population living in urban areas is 20,069,405 of which 10,462,918 are males and while remaining 9,606,487 are females. The urban population in the last 10 years has increased by 27.63 percent.

Sex Ratio in urban regions of Madhya Pradesh was 918 females per 1000 males. For child (0-6) sex ratio the figure for urban region stood at 901 girls per 1000 boys. Total children (0-6 age) living in urban areas of Madhya Pradesh were 2,483,664. Of total population in urban region, 12.38 % were children (0-6). Average Literacy rate in Madhya Pradesh for Urban regions was 82.85 percent in which males were 88.67% literate while female literacy stood at 69.46%. Total literates in urban region of Madhya Pradesh were 14,569,183.

Rural Population - 2011: Of the total population of Madhya Pradesh state, around 72.37 percent live in the villages of rural areas. In actual numbers, males and females were 27,149,388 and 25,408,016 respectively. Total population of rural areas of Madhya Pradesh state was 52,557,404. The population growth rate recorded for this decade (2001-2011) was 72.37%.

In rural regions of Madhya Pradesh state, female sex ratio per 1000 males was 936 while same for the child (0-6 age) was 923 girls per 1000 boys. In Madhya Pradesh, 8,325,731 children (0-6) live in rural areas. Child population forms 15.84 percent of total rural population. In rural areas of Madhya Pradesh, literacy rate for males and female stood at 74.74 % and 48.49 %. Average literacy rate in Madhya Pradesh for rural areas was 63.94 percent. Child population forms 15.84 percent of total rural population. In rural areas of Madhya Pradesh, literacy rate for males and female stood at 74.74 % and 48.49 %. Average literacy rate in Madhya Pradesh for rural areas was 63.94 percent.

Description	**2011**
Population	72,597,565
• Male	37,612,920
• Female	34,984,645
Decadal Population Growth (2001-2011)	20.3%
Sex Ratio	930
Density of Population (per sq. km.)	236
Total Child Population (0-6 Age)	1,05,48,295
Male Population (0-6 Age)	55,16,957
Female Population (0-6 Age)	50,31,338
Literacy Rate	70.6%
• Male Literacy Rate	80.5%
• Female Literacy Rate	60.0%

Tribes: The tribes of Madhya Pradesh constitute over 20 % of the state's population and are mainly concentrated in southern south-western and eastern parts of the state. The social customs prevalent among different tribes and castes vary more due to variation in their habitat and surrounding geographical conditions. For earnings they depend upon agriculture, forest produce and local craft. With improved communication and growth in the economy, the tribal's way of living is changing.

Gond is the best known tribe and forms the largest group in Madhya Pradesh. They mainly inhabit areas on both sides of Narmada in Mandla, Chhindwara, Betul and Seoni regions and the hilly terrains of Vindhya and Satpura regions. Agaria, Pradhan, Ojhan, Solahas are the descendant tribal groups originating from Gonds, with two sub-castes - Rajgond and Datoliya.

Baigas believe themselves to be descendants of Dravid and this tribe is found in Mandla, Balaghat, Shahdol and Sidhi districts. Saharia inhabit north-west area mainly in the districts of Gwalior, Shivpuri, Bhind, Morena, Sheopur, Vidisha and Raisen. Most Saharias are cultivators. Bharia tribe has major concentration in Jabalpur and Chhindwara districts of Madhya Pradesh. The place Patalkot in Chhindwara has almost 90% population of Bharias. They work as agriculture labourers and work upon bamboo to create beautiful baskets and other items.

Bhil, the second largest tribe, is largely concentrated in areas around Jhabua, Khargone, Dhar and Ratlam. They are regarded as warrior with fine inherited guerrilla tactics and archery skills. Korku tribal community is administered by the head of a panchayat called Sarpanch and they are found in Hoshangabad, Betul, Chhindwara, Harda and Khandwa districts of Madhya Pradesh. Santia is a tribe of Malwa, who believe themselves to be originally a martial Rajput tribe. They prefer to remain nomadic. Mainly of labour class, Kols are found in Rewa, Sidhi, Satna, Shahdol and Jabalpur districts. This caste finds mention even in ancient puranas and the famous epics of Ramayana and Mahabharata and they are highly religious minded and staunch believer of Hindu mythology. Lesser known tribes like Dhanuk, Panika, Saur still form an important group.

3.4 Economic Characteristics

Madhya Pradesh, India's second largest state, which occupies 9.38% of the country's area, is also the second richest state in terms of its mineral resources. Primarily, it has an agricultural and pastoral economy. Industrial development is primarily concentrated in the more advance districts like Indore, Bhopal, Gwalior and Jabalpur.

A large part of the mineral production of India is contributed by Madhya Pradesh. Big reserves of Manganese are found in Balaghat and Chhindwara districts. The state also produces about 45% of Bauxite in India with Jabalpur, Mandla, Shahdol, Satna and Rewa being the important Bauxite producing centers. Iron ore deposits are found in Balaghat, Jabalpur and Mandla districts. The State of Madhya Pradesh also has rich reserves of coal in the northeastern and Satpura regions. The state has the distinction of being the only diamonds producing state in India, with production in Panna and Chhatishgarh districts.

Over 30% of the State's total area is enveloped by the forest. The eastern districts of Balaghat, Mandla, Shahdol, Sidhi have dense forest cover. The abundantly found trees include Teak, Sal, Bamboo and Tendu. Agriculture is the main occupation of villagers, Wheat, Soybean and Jowar (Sorghum) are the main Crops. Paddy and Coarse Millets are also sown in large parts. Pulses, Cereals and Groundnut are also grown. Important among the cash crops are Cotton, Sugarcane and Oil Seeds. Mandsaur is the largest opium producing district in the country.

The irrigation of land is mostly dependent on major rivers like Narmada, Chambal, Tapti, Betwa, Sone, Shipra, Kali Sindh and Tava. The Chambal valley and the Narmada valley offer good potential for hydroelectric power generation. Besides Thermal and Hydro power generation, numerous other conventional and non-conventional power projects are in place or in the stages of progress. Road density is increasing continuously with present road length being over 80 thousand kms. Communications are well developed.

Rail route connecting different parts of India passes through Madhya Pradesh. Major Airports link all major cities like Delhi, Mumbai, Varanasi, Nagpur, Bengaluru, Hyderabad, Chennai etc. Telephone and cellular service provider BSNL and other private operators are operational; internet access is easy across the state. The big industries are mostly in districts of Indore, Bhopal, Gwalior and Jabalpur. Cement, sugar, paper, textile, steel, soya, vehicles and medicine are the major industries today. BHEL in Bhopal, Government Ordnance Factory Jabalpur, Currency Printing Press at Dewas, Alkaloid Factory at Neemuch, Rail Coach Factory Bhopal are notable Central Government managed organisations. Mineral development, industries based on agricultural and forest produce continue to be the mainstay of industrial production in the state.

Madhya Pradesh has enormous potential and resources to become a major tourism destination. Numerous monuments of historical, archaeological, architectural and pilgrimage importance dot the state. The forests are teeming with all kinds of wildlife. Because of its central location and easy accessibility, tourism is becoming a major attraction.

3.5 Administrative Divisions

The state of Madhya Pradesh has 51 districts grouped into ten divisions:

- **Bhopal Division**
  - Bhopal District
  - Raisen District
  - Rajgarh District
  - Sehore District
  - Vidisha District
- **Chambal Division**
  - Morena District
  - Sheopur District
  - Bhind District
- **Gwalior Division**
  - Ashoknagar District (split from Guna in 2003)
  - Shivpuri District
  - Datia District

    - Guna District
    - Gwalior District
- **Indore Division**
    - Alirajpur District (split from Jhabua District on 17 May 2008[1])
    - Barwani District
    - Burhanpur District (split from East Nimar on 15 August 2003)
    - Dhar District
    - Indore District
    - Jhabua District
    - Khandwa District (East Nimar)
    - Khargone District (West Nimar)
- **Jabalpur Division**
    - Balaghat District
    - Chhindwara District
    - Jabalpur District
    - Katni District
    - Mandla District
    - Narsinghpur District
    - Seoni District
- **Narmadapuram Division** (created on 27 Aug 2008 from districts of Bhopal Division[2])
    - Betul District
    - Harda District
    - Hoshangabad District
- **Rewa Division**
    - Rewa District
    - Satna District
    - Sidhi District
    - Singrauli District (split from Sidhi District on 24 May 2008[3])
- **Sagar Division**
    - Chhatarpur District
    - Damoh District
    - Panna District
    - Sagar District

- Tikamgarh District

- **Shahdol Division** (created on 14 June 2008[4])
  - Anuppur District (previously in Rewa Division)
  - Shahdol District (previously in Rewa Division)
  - Umaria District (previously in Rewa Division)
  - Dindori District (previously in Jabalpur Division)
- **Ujjain Division**
  - Agar Malwa District
  - Dewas District
  - Mandsaur District
  - Neemuch District
  - Ratlam District
  - Shajapur District
  - Ujjain District

3.5 Higher Education Infrastructure in the State

The Madhya Pradesh State Higher Education Council (SHEC), created in October 2014, has overall responsibility for policy making in higher education in Madhya Pradesh. The Council is headed by the State Minister for Higher and Technical Education. The main implementing agency will be the Project Directorate which serves as the executive arm of the SHEC, and is responsible also for managing the State's RUSA funds.

The state has around 431 government colleges, 75 government aided colleges, 789 private unaided colleges and 5 government institutes[7] catering to students from the 51 districts. There are six state universities established under the Madhya Pradesh Vishwavidyalaya Adhiniyam, 1973 (MP Universities Act, 1973), which also act as affiliating bodies for all government and private colleges in the state. Three universities and 32 of the 431 government colleges have active National Assessment and Accreditation Council (NAAC) accreditation as of 3rd March 2015.[8] Eight government colleges have been granted autonomous status by the University Grant Commission (UGC). As per UGC[9], there are, 2 central universities and 19 state universities in Madhya Pradesh. The list of UGC approved central and state universities are as follows:

[7] (http://highereducation.mp.gov.in/index.htm)

[8] Source: www.naac.gov.in. An additional XX institutions have been accredited at some point in the past but that accreditation has lapsed.

[9] Source: www.ugc.ac.in

S.No.	University	Location	Specialization	Central / State University
1	Dr. Hari Singh Gour University	Sagar	General	Central University
2	Indira Gandhi National Tribal University	Amarkantak	General	Central University
3	Atal Bihari Vajpayee Hindi Vishwavidyalaya	Rewa	General	State University
4	Awadhesh Pratap Singh University	Rewa	General	State University
5	Barkatullah University	Bhopal	General	State University
6	Devi Ahilya University	Indore	General	State University
7	Jawaharlal Nehru Krishi Vishwavidyalaya	Jabalpur	Agriculture	State University
8	Jiwaji University	Gwalior	General	State University
9	M.G.Gramodaya Vishwavidyalaya	Chitrakoot	General	State University
10	Madhya Pradesh Bhoj Open University	Bhopal	Distance education	State University
11	Madhya Pradesh Pashu Chikitsa Vigyan Vishwa Vidyalaya	Jabalpur	Veterinary	State University
12	Maharishi Mahesh Yogi Vedic Vishwavidyalaya	Katni	General	State University
13	Maharshi Panini Sanskrit University	Ujjain	Sanskrit	State University
14	Makhanlal Chaturvedi National University of Journalism and Communication	Bhopal	Computer Science, Journalism and communication	State University
15	National Law Institute University	Bhopal	Law	State University
16	Raja Mansingh Tomar Music & Arts University	Gwalior	Arts &Music	State University

S.No.	University	Location	Specialization	Central / State University
18	Rajiv Gandhi Technical University	Bhopal	Engineering	State University
19	Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya	Gwalior	Agriculture	State University
20	Rani Durgavati University	Jabalpur	General	State University
21	Vikram University	Ujjain	General	State University

There are 14 private universities in the state, which have either been approved or undergoing UGC approval process. The list of the private universities is provided in Table below:

S.No	University Name
1	A.K.S. University
2	AISECT University
3	Amity University
4	ITM University
5	Jagran Lakecity University
6	Jaypee University of Engineering & Technology
7	Maharishi Mahesh Yogi Vedic Vishwavidyalaya
8	Oriental University
9	People's University
10	RKDF University
11	Sarvepalli Radhakrishnan University
12	Sri Satya Sai University of Technology & Medical Sciences
13	Swami Vivekananda University
14	Techno Global University

There are no IITs in the state. Key institutions in the state

1. Dr. Hari Singh Gour Sagar University

2. Indira Gandhi National Tribal University

3. National Law University, Bhopal

4. IISER - Bhopal

5. IIM Indore

6. Maulana Azad NIT, Bhopal

7. Jai Prakash Narayan National Centre for Excellence in Humanities (to be set up).

MP with 2172 colleges has a share of 6.23% of all colleges in India and ranks 7 on total number of colleges in any state in India. In terms of access, MP has 25 colleges per lakh population as same as the all India average of 25 colleges per lakh population. In terms of average enrolment per college, MP (551) is lesser than all India average of 703. Total enrolment of students in regular mode in higher education institutes in MP is around 14.01 lakhs.

Out of the total colleges in the state, 67% are affiliated to universities, and the remaining is constituent/university colleges, PG/off campus or recognized centres by the universities. In terms of management, MP colleges are dominated by the Private Unaided colleges, forming 53.2% of all colleges in the state, followed by 36% owned by Government and 10.8% that are private aided.

Stand-alone Institutions are those that are outside the purview of the university & college and they require recognition from one or other statutory bodies. These include Polytechnics, PGDM, Nursing, Teacher Training, CA, CS etc. In MP, there are 386 such stand-alone institutions and the total enrolment in these is estimated to be around 0.88 lakhs.

Student Enrolment

By Level: The state-wise Enrolment through Regular Mode at various levels is 14.01 lakhs. Break-up across various levels and split by gender is given in the figure / table below. As can be inferred, the highest share of enrolment (77.1%) is at under-graduate level, followed by post-graduate (11.6%) and Diploma (5.5%), with all other levels forming only 5.7%. As can be seen from table above, maximum enrolment share (56.5%) is in Government colleges in the state.

By Gender: In terms of gender, enrolment is skewed as 63.2% comprises males, while only 36.8% of the enrolment is females, indicating significant gender disparity. The GER for males (22) is higher than GER for females (14.6), resulting in a gender parity index of 0.67 (which is lower compared to 0.88 at all-India level).

By Social Group: The GER of SCs (12.4) and STs (7.1) is lower than the state GER of 18.5. Further, there is disparity within the social groups between male and female GER. The gender parity index for SC is 0.79, but it is lower in case of STs (0.69). As can be seen from table below on Gender and Social representation, the share of student enrolment across all backward groups in MP is lesser than their proportionate share in population.

Faculty

The PTR of colleges in MP at 11.9 students per teacher is better than the all India average of 13.1. Total number of teaching staff and non-teaching staff in all

colleges in MP is estimated to be 1.01 lakhs and 0.49 lakhs respectively (extrapolating data available for 57.5% colleges in state). However, given the large number of colleges in the state, the number of teachers per college (46.5) and non-teaching staff per college (22.3) are lesser than the corresponding all–India levels as shown in the adjoining table.

In terms of the post-wise share of teaching staff, the figure alongside provides the break-up in the state. 73% of the teaching posts are at level of Lecturer/ Assistant professor with there being almost equal numbers of Readers/ Associate Professors and Professors. Around 4% of the staff is Demonstrator/tutor and 3% temporary.

In terms of representation of various social groups and gender in the teaching and non-teaching staff, the table below provides the relative comparison with the state population. It reveals that females are significantly under-represented among the faculty and staff in higher education institutes as compared to males. In case of social groups also, all the groups shown in the table show a deficit in terms of representation in both faculty and staff in higher educational institutions as compared to their share of population in the state. When compared to all-India levels of representation, MP has fared much better in terms of Female and ST but lags behind in SC, OBC and Muslim and other minority representation among faculty and non-teaching staff.

Chapter 4

Policy and Regulatory Framework

The Chapter provides a reminder that all activities under the proposed project must be consistent with all applicable laws, regulations, notifications that are relevant in the context of the proposed project interventions. It is the responsibility of the Project Implementing Agency to ensure that proposed activities are consistent with the regulatory/legal framework, whether international, national, state or municipal/local. Additionally, it is also to be ensured that activities are consistent with World Bank's operational policies and guidelines. This section is not a legal opinion on the applicability of the law but serves as guidance in the application of the law to the current project context.

4.1 National Policy and Regulatory Framework applicable to the Project

The Environment (Protection) Act, 1986 serves as the umbrella environment legislation in India and entrusts joint ensure effective implementation of the environment legislation and regulations. The MoEF and the pollution control boards (CPCB i.e. Central Pollution Control Board and SPCBs i.e. State Pollution Control Boards /SPCCs i.e. State Pollution control Committee's) together form the regulatory and administrative core of the sector.

Two specific legislations (popularly called the Air Act and the Water Act) empower the central and state pollution control authorities to enforce emission and effluent standards for industries discharging pollutants into air and water.

In addition, the Supreme Court of India and some High Courts of the states have led the way in the enforcement of environmental laws through citizen-led public interest litigation (PIL) that has its legal basis in the constitutional right to a healthy environment. A summary of key environmental legislations applicable to the proposed project is given below:

Assessment of Key Environmental Legislations with regard to its Applicability to the Proposed Project

Act and/or rules	Summary	Applicability
Environment Protection Act, 1986 (to be read with The Environment Protection Rules, 1986)	The Act applies to all areas where the hazardous substances are handled.	Yes
The Air (Prevention and Control of Pollution) Act, 1981 (to be read with Air (Prevention and Control of Pollution) Rules, 1983)	The Act applies to any building, structure or property used for industrial or trade purposes where pollution occurs or emitting any air pollutant into the atmosphere takes place.	Yes

Act and/or rules	Summary	Applicability
The Water (Prevention and Control of Pollution) Act, 1974 (amended 1988)	The Act applies to every outlet that includes any conduit pipe or channel, open or closed, carrying sewage or trade effluent or any other holding arrangement which causes or is likely to cause, pollution.	Yes
The Water (Prevention and Control of Pollution) Cess (Amendment) Act, 2003	The Act applies to every industry which includes any operation or process, or treatment and disposal system, which consumes water or gives rise to sewage effluent or trade effluent, but does not include any hydel power unit.	Yes
Noise Pollution (Regulation & Control) Rules 2000	The rule applies to: 1) Industrial area 2) Commercial area 3) Residential area 4) Silence zone (where an area comprising not less than 100 metres around hospitals, educational institutions and Courts may be declared as silence area/zone for the purpose of these rules).	Yes
EIA notification on Environment Clearances, 2009	It mandates that certain projects envisaged to be polluting for the environment have to seek prior approval from the Ministry of Environment and Forests to set-up the project. A list of projects along with the procedure required to be undertaken to sought the approval from Government is clearly delineated under the law.	No (Screening will eliminate any such possibility)
Forest (Conservation) Act, 1980	The Act is applicable to any project which requires forest land for construction. Depending on the size of the tract to be cleared, clearances are required.	No (Screening will eliminate any such possibility)

Act and/or rules	Summary	Applicability
Biological Diversity Act, 2002	The Ministry of Environment and Forests has enacted the Biological Diversity Act, 2002, following the Convention on Biological Diversity signed at Rio de Janeiro in 1992, of which India is a party. This Act is meant to "provide for the conservation of biological diversity, sustainable use of its components, and fair and equitable sharing of the benefits arising out of the use of biological resources, knowledge and for matters connected therewith or incidental thereto."	No (Screening will eliminate any such possibility)
The Scheduled Tribes & Other Traditional Forest Dwellers (Recognition of Forest Rights), 2006	The Act recognizes and vests the forest rights and occupation in forest land in forest dwelling Scheduled Tribes and other traditional forest dwellers who have been residing in such forests for generations but whose rights could not be recorded, and provides for a framework for recording the forest rights so vested and the nature of evidence required for such recognition and vesting in respect of forest land. The Act may be applicable in case of forest land used for TC or in the immediate vicinity.	No (Screening will eliminate any such possibility)
Batteries (Management and handling) Rules, 2001	The Rule applies to every manufacturer, importer, re-conditioner, assembler, dealer, recycler, auctioneer, consumer and bulk consumer involved in manufacture, processing, sale, purchase and use of batteries or components.	Yes

Act and/or rules	Summary	Applicability
E-waste (Management and Handling) Rules, 2011	The Rules applies to every producer, consumer or bulk consumer involved in the manufacture, sale, purchase and processing of electrical and electronic equipment or components as specified in Schedule-I, collection centre, dismantler and recycler of e-waste.	Yes
Gas Cylinder Rules, 2004	The Act applies to every person who intends to fills any cylinder with compressed gas or possess, import or transport any cylinder filled with any compressed gases or any person desiring to manufacture cylinders, valves, LPG regulators attached to self-closing valves, multi-function valves and other fitting and also every person in charge of/using gas cylinders.	Yes
The Ancient Monuments and Archaeological Sites and Remains Act, 1958 & Its amendments till 1992	Under sub-rule 32 of the ancient monuments and archaeological sites and remain rules, 1959 and notification issued in 1992, area up to 100 m from the protected limits and further beyond it up to 200 m near and adjoining protected monument have been declared to be protected and regulated areas, respectively, for purpose of both mining operation and construction. Any repair, addition or alternation and construction/reconstruction within these areas need prior approval of the Archaeological Survey of India	Yes
Payment of Wages Act, 1936	The Act applies to every establishment and lays down as to by what date the wages are to be paid, when it will' be paid and what deductions can be made from the wages of the workers.	Yes

Act and/or rules	Summary	Applicability
Minimum Wages Act, 1948	The Act applies to every establishment and mandates that the employer is supposed to pay not less than the Minimum Wages fixed by the State Government.	Yes
The Public Liability Insurance Act and Rules, 1991	The Act mandates companies to take public insurance for its employees	Yes
Workmen's Compensation Act, 1923	The Act applies to every establishment and provides for compensation in case of injury by accident arising out of and during the course of employment.	Yes
Contact Labour (Regulation and Abolition) Act, 1970	The Act applies to every establishment and contractor who employs on any day of the preceding twelve months twenty or more workmen and the work performed by the workers shall be for more than one hundred and twenty days in the preceding twelve months and if work is of a seasonal character it is performed for more than sixty days in a year.	Yes
Equal Remuneration Act, 1979	The Act applies to every establishment and mandates that equal payment of wages shall be made for work of equal nature to male and female workers and not for making discrimination against female employees	Yes
Child Labour (Prohibition and Regulation) Act, 1986	The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of child labour is prohibited in building and construction industry	Yes

4.2 State Level Policy and Regulatory Framework applicable to the Project

Madhya Pradesh State Environment Policy: The Madhya Pradesh State Environment Policy 1982 (revised 1999) is the state's key environmental policy. The State Environment Policy seeks to lay down guidelines that will facilitate development while ensuring environmental conservation yet without hampering the present and future development imperatives.

4.3 Rashtriya Uchchatar Shiksha Abhiyan (RUSA)

The 12th Five Year Plan proposed a holistic plan for the development of higher education in the country by ensuring access, equity and quality. The Plan, which recommended strategic utilization of central funds to ensure comprehensive planning at the State level recommended a new Centrally Sponsored Scheme (CSS) "Rashtriya Uchchatar Shiksha Abhiyan" (RUSA). The vision of RUSA is to attain higher levels of access, equity and excellence in the State higher education system with greater efficiency, transparency, accountability and responsiveness. The salient objectives of RUSA are as follows:

- Improve the overall quality of state institutions by ensuring conformity to prescribed norms and standards and adopt accreditation as a mandatory quality assurance framework.
- Usher transformative reforms in the state higher education system by creating a facilitating institutional structure for planning and monitoring at the state level, promoting autonomy in State Universities and improving governance in institutions.
- Ensure reforms in the affiliation, academic and examination systems.
- Ensure adequate availability of quality faculty in all higher educational institutions and ensure capacity building at all levels of employment.
- Create an enabling atmosphere in the higher educational institutions to devote themselves to research and innovations.
- Expand the institutional base by creating additional capacity in existing institutions and establishing new institutions, in order to achieve enrolment targets.
- Correct regional imbalances in access to higher education by setting up institutions in un-served & underserved areas.
- Improve equity in higher education by providing adequate opportunities of higher education to SC/STs and socially and educationally backward classes; promote inclusion of women, minorities, and differently abled persons.

RUSA would be spread over the 12th and 13th Plan period for funding the State universities and colleges to achieve its objectives. The allocation of funds under RUSA would be based on well-defined norms and linked to certain key academic, administrative and governance reforms in the state's higher education system, which currently enrols over 96% of the students. The scheme will be implemented through the Ministry of Human Resource Development (MHRD) with matching

contributions from the State governments and Union Territories (UTs). The central funding under the scheme (in the ratio of 65:35 for general category States and 90:10 for special category states) would be norm based and outcome dependent. The funding would flow from the central ministry through the state governments/union territories to the State Higher Education Councils before reaching the identified institutions. The funding to the states would be made on the basis of critical appraisal of State Higher Education Plans, which would describe each state's strategy to address issues of equity, access and excellence in higher education.

Relevance to the project: The project will support the implementation of the Government of Madhya Pradesh's vision for the higher education sector as articulated in the Vision 2018 Document, the State Higher Education Plan 2014 and increase participation in the RUSA scheme, via various sub-components of the project.

RUSA - Analysis of the goals/salient features from an EHS Perspective

S. No.	Description	EHS Relevance
1.	Improve the overall quality of existing state institutions by ensuring that all institutions conform to prescribed norms and standards and adopt accreditation as a mandatory quality assurance framework.	Yes. Mandatory NAAC accreditation for colleges/institutions participating in RUSA scheme at state level.
2.	Usher transformative reforms in the state higher education system by creating a facilitating institutional structure for planning and monitoring at the state level, promoting autonomy in State Universities and improving governance in institutions.	-
3.	Ensure academic and examination reforms in the higher educational institutions.	Yes. Training & capacity building with focus on courses/training programs in sustainability/ EHS.
4.	Enable conversion of some of the universities into research universities at par with the best in the world.	-
5.	Create opportunities for states to undertake reforms in the affiliation system in order to ensure that the reforms and resource requirements of affiliated colleges are adequately met.	Yes

S. No.	Description	EHS Relevance
6.	Ensure adequate availability of quality faculty in all higher educational institutions and ensure capacity building at all levels of employment.	-
7.	Create an enabling atmosphere in the higher educational institutions to devote themselves to research and innovations	-
8.	Expand the institutional base by creating additional capacity in existing institutions and establishing new institutions, in order to achieve enrolment targets.	Yes. Planning and Design of new infrastructure (college buildings/educational centres) with focus on environmentally sustainable designs. Repair & Refurbishment of existing campuses/institutional buildings, including retrofitting existing buildings (drinking & sanitation facilities, hostels, playgrounds, boundary wall/fencing, etc.) towards hazard resistant design.
9.	Correct regional imbalances in access to higher education by facilitating access to high quality institutions in urban & semi-urban areas, creating opportunities for students from rural areas to get access to better quality institutions and setting up institutions in un-served & underserved areas.	Yes
10.	Improve equity in higher education by providing adequate opportunities of higher education to SC/STs and socially and educationally backward classes; promote inclusion of women, minorities, and differently abled persons.	Yes. Barrier Free Access in educational institutions/colleges/ campuses. Provision of proper toilets/sanitation, facilities for women & differently abled persons.

4.3 World Bank Policy

The World Bank's 10 environmental and social safeguard policies are a cornerstone of its support to sustainable poverty reduction. The objective of these policies is to prevent and mitigate undue harm to people and the environment in the development process. These policies provide guidelines for the identification, preparation, and implementation of programs and projects.

The operational policy discussion pertaining to social safeguards has been described in the Social Management Framework, a standalone document that has been prepared to guide the management of social issues of the project, including those pertaining to resettlement and issues of indigenous communities. The following paragraphs describe the Bank's operational policies and their applicability from an environmental viewpoint.

Safeguard Policies Triggered	Yes	No	TBD
Environmental Assessment (OP 4.01)	✓		
The project interventions by and large are not likely to cause significant or serious damage to natural and physical environment. However, specific interventions (under Component 1) envisaged under the project such as construction of new buildings/blocks and/or refurbishment/repair of existing buildings/laboratories may have some potential adverse environmental impacts in the local context. Even though it is expected that the new buildings/blocks would be located within existing college campuses and/or on available government land, planning, construction and operation of buildings would require appropriate consideration and integration of environment, health and safety measures to ensure that adverse environmental impacts are minimized and properly managed. OP 4.01 has been triggered to ensure that project/program interventions are planned and designed to be environmentally sound by integrating appropriate principles and approaches into the over-all decision making process.			
Natural Habitats (OP 4.04)		✓	
No physical interventions proposed under the project are expected to affect natural habitats. No civil works will be financed under the project in designated protected areas/wilderness areas/critical natural habitats. The environment screening tool will be used to ensure compliance in this regard. Therefore, OP 4.04 is not being triggered for the project.			
Forests (OP 4.36)		✓	
OP 4.36 is not being triggered for this project as no interventions are envisaged in forest areas and therefore no conversion/degradation of this natural resource would occur.			

Safeguard Policies Triggered	Yes	No	TBD
Pest Management (OP 4.09)		✓	
OP 4.09 is not being triggered for this project as biological/environmental control methods or reliance on synthetic chemical pesticides is not envisaged. In case such a need arises, the requirement is likely to be very limited and in such a scenario, the requirements under the pest management policy of the Bank will be built-in as part of the over-all Campus Environment Management Plan to be developed for the institute in question.			
Physical Cultural Resources (OP 4.11)	✓		
By and large, implementation of the project/program is not likely to affect religious structures of local significance or other heritage/protected structures. However, since some civil works are involved, 'chance finds' at work sites is a likely impact that cannot be ruled out and will have to be managed by incorporating appropriate provisions in the bidding/contract documents.			
Safety of Dams (OP 4.37)		✓	
OP 4.37 is not being triggered for this project as there is no construction of new dams or activities that are concerned with safe functioning of existing dams.			
Projects on International Waterways (OP 7.50)		✓	
OP 7.50 will not be triggered for this project as there are no interventions planned/proposed over or around an international waterway that could cause a potential conflict. There are also no activities that may affect the use or pollute such a waterway.			
Projects in Disputed Areas (OP 7.60)		✓	
OP 7.60 is not being triggered as the project is not proposed in any disputed area.			

Consultation and Disclosure Requirements (OP 17.50)

The policy requires the borrower to consult key stakeholders, including Project Affected People and local NGOs through the various phases of the project. It requires that groups being consulted be provided on-time, comprehensible and easily accessible information before consultations. The policy also requires that the borrower to make the EA summary available in the state (in a local language) and a public places to all the stakeholders prior to appraisal.

Applicability:

For each sub-component under the project, comprehensive consultations will be required during the design, planning and implementation stages: to determine specific issues; locally viable mitigation measures for addressing environmental impacts and consensus on engineering designs especially where up gradation of colleges/institutions will be undertaken.

Chapter 5

Potential Environmental Impacts

While the project interventions, overall, will have a positive impact on the higher education sector of Madhya Pradesh, specific interventions (under Component 1) envisaged under the project such as construction of new buildings/blocks and/or refurbishment/retrofitting/major repair works of existing academic blocks/laboratories/libraries/hostels may have some potential adverse environmental impacts in the local context. Therefore, these activities are central to the approach and design from an environmental management and safeguards perspective for the project.

5.1 Potential Environmental Impacts/Issues

The components of the current project primarily deal with improving the access to and the quality of higher education imparted in the Indian state of Madhya Pradesh. While most of the work done under the components would deal with improving quality of education by provision of better management and training for the existing resources and faculty, the primary component where one can expect some short-term environmental impacts will emerge from the component on improving access. Investments under this category would involve the construction of new buildings and the refurbishment of existing facilities. The associated impacts because of the construction activity will be short-term in nature and its adverse impacts can be mitigated for.

Based on the results from the assessment, following are some of the environmental issues that need to be addressed in the project. While on the whole, the nature of activities proposed under the project does not pose significant environmental risks, there are some environmental concerns associated with activities such as civil works (new construction/expansion/repair of buildings) and pressure on already stressed facilities within the existing campus with introduction of new building blocks. In addition, issues pertaining to health and safety also need attention and are directly related to creation and maintenance of a clean and safe learning and teaching environment, which is ultimately linked to the achievement of the objectives of the project. The key issues have been categorized into the following categories:

1. Location/site selection related issues

Location is not a primary concern in this project, since it is expected that all the construction activities that would be taken up as a part of the project will be a within the existing campus. However, one needs to acknowledge that some of the college campuses might be near (or in some cases might even have them within the periphery of the campus itself) sensitive and ecologically valuable ecosystems, such as wetlands, and endangered species habitats; areas with archaeological and/or historic sites and areas where the groundwater is recognized to be contaminated. This category also includes issues related to individual institutes, including siting of institutes on or near areas susceptible to health or other hazards – such as institutes located on the banks of a river, along watercourses used for human

consumption, near industrial waste disposal sites, municipal landfills, hospital waste disposal sites, slaughter houses, hospitals without systematic bio-medical waste disposal mechanism, cattle-sheds, or any other probable source of infectious diseases.

2. Design related impacts

These issues pertaining to site planning/lay-out and building designs. These include aspects such as proper and adequate drainage, providing safe site slope, safe excavation, removal of trees; indoor air quality in classrooms/ventilation; daylight factor within the classrooms, laboratories and workshops; provision of safe potable water, particularly in the areas where arsenic and fluoride levels are high/unsafe; sanitation facilities and waste management, provision of toilets, hygiene in the campus and around; non-use of unsafe building materials such as asbestos and low cost chemical (lead) paints.

In case of existing buildings that require refurbishment, it is important to assess the existing condition of the building. Interventions to improve the condition of the superstructure, should be adequately assessed and addressed. Moreover, significant emphasis should be put on improving the existing conditions of the buildings to address issues of lighting, ventilation and heating/cooling. These interventions will have a direct impact on the health of the users of the facility.

3. Issues related to Disaster Preparedness

For areas of high vulnerability to natural hazards (landslide, cyclones, floods, earthquake); safe design and construction practices and emergency evacuation should be adopted.

4. Safety Issues

Fire and electrical safety and emergency response arrangements, including use fire resistant building materials and evacuation/assembly areas.

5. Issues related to Special Purpose Designs

These include provision of facilities for the physically disadvantaged, provision of rainwater harvesting, possible use of solar power.

6. Construction related impacts

These are issues that could be addressed effectively by good construction management, and include generation of dust and noise; generation and management of construction wastes; maintaining proper cut slopes and work site safety practices. An example of this could be the occurrence of soil erosion resulting from the clearing of land before initiating the construction activity. This can easily be mitigated for by better planning and ensuring that the construction activity starts as soon as the land is cleared.

7. Issues related to Provision and Maintenance of Facilities

These arise due to the provision, or lack of provision of the required facilities - drinking water facilities, prevention of infections, site cleanliness, health and hygiene, maintenance of site and off-site drainage, and preventing exposure to chemicals/pesticides.

Even though it is expected that the new buildings/blocks would be located within existing college campuses and/or on available government land, planning, construction and operation of higher education facilities, including buildings and supporting infrastructure would require appropriate consideration and integration of environment, health and safety measures to ensure that adverse environmental impacts are minimized and properly managed.

Even when no major new construction is involved, the largely poor state of existing infrastructure requires that environment management dimensions are specifically introduced and enhanced within the higher education institutes of the state. Impacts pertaining to: (a) location (environmental features of the site and surrounding land-uses); (b) design (sanitation, water supply, drainage, solid waste arrangements, waste water management, ventilation, access, energy efficiency, material usage, fire safety, storage facility and natural disaster dimension); (c) construction and worksite safety management, including occupational health and safety of construction workers, public safety issues, dust and noise, management of materials, their sources and debris/waste material; and; (d) operation/maintenance aspects of physical assets such as buildings, laboratories (such as sanitation, waste management, e-waste handling, landscaping, creation/maintenance of activity/sitting spaces, and cleanliness/hygiene in the campus and its various facilities) would require attention. Also, any refurbishment/repair/retrofitting works may require specific student and worker safety measures during construction if it involves removal of asbestos (which can be identified only when the civil works assessment is initiated).

Some specific long-term environmental impacts are associated with the operation and management of the higher education institutes itself. Appropriate water and sanitation facilities, disposal of wastes, including management of e-wastes, energy use/efficiency, disaster preparedness and dealing with issues where institutes are exposed to noise or other sources of pollution require regular attention. However, such adverse impacts are not likely to be large-scale or irreversible in nature. These can be avoided/minimized to a great extent and the positive outcomes from the project and higher education program in the state of Madhya Pradesh can be enhanced substantially by putting appropriate institutional mechanisms, procedures and capacity in place.

Beyond the regular environment, health and safety dimensions, the project also offers an opportunity to improve the over-all environmental footprint by creating 'green buildings' or 'greener facilities' by adopting practices of water efficiency, energy conservation, wastewater recycling and reuse. Considerations of environment, health and safety dimensions in operation and maintenance cycle of higher education institutions would help in ensuring the soundness and sustainability of the project/program from an environmental perspective.

5.2 Conclusion

Largely, significant long-term environmental impacts are not envisaged due to the implementation of the current project. However, it is expected that there will be short-term environmental impacts that would emerge due to the refurbishment works or due to the construction of new facilities. These may include issues that

may arise due to improper site selection or inadequate design measures, both of which can be avoided with good planning. Issues arising during construction can be mitigated for by providing better supervision, and improved planning.

In fact, the environment management framework provides an opportunity to the State Department of Higher education and the concerned institutions to move towards 'greener-buildings' that are resource efficient, well planned and have the least footprint on the environment.

The framework approach used for the project approaches the issue of environment management in a broad manner. While it is expected that the framework identifies all possible issues that may arise due to the implementation of this project, it is expected that an environment management plan will be made for each site that is taken up for implementation of works. The management plan so prepared should always be available at the site for reference, when executing works, as it will ensure sustainable delivery of the project objectives.

In view of the project's potential impacts on the environment, the Bank's OP 4.01 on Environmental Assessment and OP 4.11 on Physical Cultural Resources have been triggered, and the project is designated as Category B. On the whole, with proper management, the project interventions are not likely to cause large scale, significant or irreversible damage to natural, physical or social environment.

Chapter 6

Environmental Management – Approach and Key Steps to be Followed

Environment management should be an integral part of the implementation and operation of an institute. This chapter details out the key requirements that should be adhered to for ensuring appropriate environmental management in each college/HE institute that will be supported through the project. However, specific requirements may vary depending on needs and context of proposed interventions and therefore these guidelines will be treated/used accordingly.

6.1 Key Requirements

Each institute should have the following measures in place so as to ensure good environment, health and safety practices in place thereby minimizing the EHS impact:

1. ***EHS Policy:*** Each college should define an EHS policy and have its own CAMPUS Environmental Plan. This serves as a mission document for the envisaged EHS practices and performance in the future. The policy should be communicated to all in order to ensure all are on the same page and the culture of minimizing EHS impact runs throughout the system;
2. ***EHS professional:*** Each college/institute should identify/appoint an EHS officer to look after the EHS performance. He should be entrusted with the responsibility of:
   a) Imparting EHS training to all;
   b) Keep a track of all the applicable legislation and ensure that all the applicable license/approvals required for the operations of building is in place;
   c) Conduct internal audit and take plant rounds once in a week/month to ensure that there is no deviation from the defined procedures/plans.

6.2 Key steps to be followed

6.2.1 Existing Institutes/Buildings

In case of expansion planned for the existing building, it is essential that a step wise approach may be adopted to minimize its environment impact. A focused approach to identify potential environmental issues shall be adopted at each and every stage of the expansion process from site selection to the stage of operation. This section deals with the expansion at the same site within existing college/institute.

6.2.1.1 Detailed Site Assessment

A detailed site assessment shall be carried out before deciding on the magnitude of expansion to understand the environment feasibility. This may involve gauging the

availability of natural resources, raw material, impact on nearby biodiversity due to increased capacity, legislation requirement, etc. A checklist that was used to carry out the assessment is provided in Annexure.

6.2.1.2 Campus Layout/plan

Campus layout is also important for successful performance of a institute. The better and more efficient a design for the internal functions the better the performance.

In the campus at least 30% green area should be maintained and landscaping should be done to improve aesthetics of the surrounding while maintaining habitats conductive to natural fauna. Few initiatives that can be taken up are:

- **Trees:** Effort should be made to plant more trees and their regular upkeep should be done to enhance natural shade within the campus. Cutting of existing trees for expansion should be avoided to the extent possible and 10 trees should be planted for every one tree cut in the process.
- **Heat island effect:** Work may be done at site to mitigate the heat island effect (Thermal gradient difference between developed and undeveloped areas) by following measures:
  a. At least 40% of the non-roof impervious surfaces on the site (including parking lots and walkways) should be shaded
  b. Pavements and walkways should be painted in light colour (solar reflectance index > 0.5)
- **Boundary:** The campus should be provided with wall boundary in all the directions to avoid encroachment, theft and safety issues for the employees and students.

6.2.1.3 Detailed building plan preparation

The building design is also crucial to the sustainable performance of the institute. Initiatives like use of energy efficient products, increasing natural light and ventilation, insulating, etc. may be adopted to enhance positive environment impact of the operations. Also, aspects related to safety like, resistant to earthquakes, proper evacuations, etc., may be planned to ensure successful operations of the institute.

The building design for the expansion should be responsive to the local climate. The buildings that are in hot and dry climatic region should be designed to be passive to heat gains and cardinally oriented so as to reduce the heat gain and direct heat ingress into the building though the walls and openings, a lot of shading elements on the west wall may also be adopted. Similarly, the buildings in a colder climate should be designed to increase the heat gain and also insulate it against heat losses. Emphasis should be given to ensure that development of new building should not block the natural light of the existing infrastructure.

New infrastructure in earthquake prone zones should be designed with proper attention to earthquake safety, safety codes and also escape routes in case of emergency. In case of cyclonic zones it must be taken into account for the roofs and the anchoring of the roofs against the cyclone and rainfall.

Also, efforts should be to use local materials for the construction of the expansion facility to the extent possible. Most of the locations have local sand stone or other stones and these can be easily used for the construction purposes.

Apart from this, certain points that may be adopted during the building plan preparations are:

- Efforts should be made to utilize natural light to the maximum possible extent and provision should be made for natural ventilation;
- Green building codes may be adopted while designing the expansion so as to ensure following environmental safeguards:
    a. Renewable energy in terms of solar water heater, solar panels, solar street light may be used;
    b. LED/CFL lights should be used within the premises to reduce the energy consumption;
    c. Water treatment and recycling facility to reduce fresh water consumption;
    d. Rain water harvesting arrangement so as to recharge the ground water and/or reduce dependency on ground water;
    e. Proper waste management including practices to minimize waste generation, etc.
- Criteria mentioned in the National Building Code should be followed so as to ensure that all the safety precaution like escape routes/emergency exits, setting of machinery providing appropriate working space, etc. is maintained;
- Hazardous material like asbestos sheets should not be used in any part of the structure;
- Substitutes to natural resources should be encouraged in appropriate ratio so as to decrease natural resource consumption while maintaining the required strength (example: Fly ash may be used in small percentage instead of cement for construction, composite material may be used construction of doors instead of wood, etc.;
- Provision of toilets for both men and women shall be made in appropriate number so as to ensure comfortable and hygienic working conditions;
- Energy efficient products like 5 star rated Air conditioners, refrigerators, etc should be used in the institutes.

6.2.1.4 Construction management

Construction at the site involves a number of activities. These activities may lead to certain EHS impacts on the existing natural settings and therefore, appropriate

mitigation measures are required to be put in place so as to minimize or avoid these EHS impacts. A snapshot of the issues to be kept in mind along with mitigation measures are provided below for ready reference:

S. No.	Likely Issues	3.1. Mitigation measures
1	Generation of noise during construction	➢ The construction activities involving generation of noise should be carried out in the daytime only and should be avoided in the night; ➢ Acoustic barriers may be used in case residential area is in the immediate vicinity or classes are disturbed in the existing facility
2	Loss of top soil	➢ Top soil excavated from the site should be carefully handled. It should be collected separately and stored as a heap which is appropriately covered. The heap should not be put in the direction of wind to avoid dust generation; ➢ Maximum effort should be made to utilize the top soil for landscaping within the site;
3	Air pollution due to digging and levelling activities	➢ Water sprinkling shall be practiced; ➢ Construction machinery shall be properly maintained to minimize exhaust emissions of CO, SPM and Hydrocarbons; ➢ These activities shall be avoided in very high wind and cover should be provided for loose construction material
4	Water contamination and health risks associated with setting labour camp for construction	➢ Toilet shall be earmarked for both men and women contractual workers; ➢ Adequate drinking facilities shall be provided at the construction site; ➢ Temporary crèche facility may be provided in case of migrant labourers children residing in the camps to ensure safety
5	Air pollution due to movement of vehicles	➢ All the vehicles entering the site to be asked to have updated PUC (Pollution under control) certificate; ➢ Sprinkling of water shall be practiced at the site

S. No.	Likely Issues	3.1. Mitigation measures
6	Land and water contamination due to vehicle movement	➢ Proper maintenance of vehicle shall be ensured out to avoid any leakage of oil or grease.
7	Safety issues due to vehicle movement at the site	➢ Vehicle speed is to be restricted to 15km/hour at site; ➢ Provision of adequate personal protective equipment like safety helmets, face masks, safety shoes, safety goggles etc. for the safety of workers
8	Air pollution due to use of D.G set	➢ D.G set to be optimally used with proper orientation and adequate stack height; ➢ Stack monitoring carried out on regular basis; ➢ Proper maintenance of the DG Set should be carried out on regular basis; ➢ Acoustic enclosures are to be provided with the D.G sets to minimize the noise levels
9	Land and water contamination due to waste generated at site	➢ Waste shall be stored at designated place after segregation on the basis of category (hazardous and non-hazardous); ➢ Hazardous waste shall be disposed of to the authorized vendors only.
10	Issues like child labour during construction at site	➢ Provision of clause in contractor's agreement that bans child labour and forced labour at project site. ➢ Adequate procedures to avoid or prevent hiring/entry of child labour at the project site

6.2.1.5 Operation and Maintenance Plan preparation

In case safe operating procedure are already defined for the existing operations, the same may be used in the expanded operations if found appropriate and are not affected by the size of operation. The possible impacts from operations are defined in next chapter. The same shall be assessed and appropriate measures should be adopted to minimize or eliminate the impact.

6.2.2 Establishment/setting-up of Colleges/Buildings

6.2.2.1 Screening

Screening is the process by which the appropriate level and type of EA is determined for a given project on the basis of its likely environmental impacts. The two main objectives of environmental and social screening are to:

1. Enhance the environmental and social sustainability of a proposed project. This aspect of screening focuses on the environmental and social *benefits* of a project.
2. Identify and manage environmental and social risks that could be associated with a proposed project. This aspect of screening focuses on the possible environmental and social costs of an intervention and may point to the need for environmental and social review and management.

The screening process aims to quickly identify those projects where no potential environmental and social issues exist, so that only those with potential environmental and social implications will undergo a more detailed screening process. As a consequence, the outcome of the screening process will be a categorization of the project into one or more of the following categories:

Category 1: No further action is needed, either because no significant environmental impacts and risks were identified, or because sufficient environmental review has already been conducted and environmental management recommendations have been incorporated into the project;

Category 2: Environmental sustainability elements need to be integrated into project design because there are possible environmental and social benefits, impacts, and/or risks associated with the project (or a project component) but these are limited in nature, predominantly indirect or very long-term and so extremely difficult or impossible to directly identify and assess.

Category 3: Further environmental and social review and management is needed because potential environmental and social impacts or risks are associated with the project (or a project component) and it is possible to identify these with a reasonable degree of certainty. In some cases, determining the significance of these impacts or risks will require environmental and social assessment which, in turn, will lead to the identification of specific environmental and social management measures that need to be incorporated into the project.

The methodology for screening includes Desk study, site visit and study of available literature.

- ✓ ***Desk study*** involves collection and review of the secondary data available in the public domain. This may involve the seismic activity of the area where new TC is proposed, soil type, land use pattern, etc. This will enable one to decide the methodology and level of Environment assessment and distributing the responsibility amongst the team members.
- ✓ **Site visit/s** is/are conducted to collect first hand data/information about the new site. This enables a cross check of the secondary data available during

the desk review and assessing the likely environmental aspects and health and safety hazards. Also, this involves interaction with different stakeholder in the region to gauge any possibility of conflict related to TC.

- ✓ Also, **publically available literature** review on the issues in the envisaged industrial sectors should be kept in mind. This may further help in a robust screening of the possible EHS impacts of upcoming TC and may provide opportunity to MSME to have measures in place to mitigate the same.

A checklist to conduct screening exercise is enclosed for reference as Annexure 3. The same must be used before finalizing the site for development of new TC.

6.2.2.2 Use of screening results for site selection

Based on the results of the screening exercise decision must be taken on the site selection of the new tool room. In case, the EHS impacts observed from the envisaged TC on the site and its nearby areas is high following actions shall be adopted:

- First preference shall be given to look for an alternative and feasible option to setup the institute;
- In case of non-availability of alternate site location, appropriate measures shall be identified and delineated in the Environment Management Plan for the institute.

6.2.2.3 Detailed Site Assessment

A detailed site assessment shall be carried out before deciding on the magnitude of expansion to understand the environment feasibility. This may involve gauging the availability of natural resources, raw material, impact on nearby biodiversity due to the establishment of tool room, legislation requirement, etc.

The output of the detailed site assessment shall provide a holistic view of the existing environment settings and the mitigation/preventive measures required to be adopted so as to minimize the EHS impact of the tool room.

6.2.2.4 Campus Layout/Plan

Campus layout is also important crucial for successful performance of a tool room. The better and more efficient a design for the internal functions the better the performance.

In the campus at least 30% green area should be maintained and landscaping should be done to improve aesthetics of the surrounding while maintaining habitats conductive to natural fauna. Also, efforts should be made to conserved existing vegetation and other rich biodiversity in the premises as well as vicinity.

Apart from this, a number of points shall be kept in mind while planning the campus layout. Some of the key aspects are given below:

- **Trees:** Maximum effort should be made to retain the existing trees in the available area. The campus should be designed in such a way that there is no

need of cutting any tree in the area. In case, a tree is cut at the site appropriate approvals shall be taken from the authorities and about 10 trees shall be planted within the campus to compensate the loss. Also, a continuous monitoring should be done to ensure maximum survival rate of the planted trees;

- **Site drainage:** Existing drainage pattern of the available site should be studied and the drainage system required for the TC should be constructed in line with the same. The storm water drain should be constructed separately so as avoid mixing of the fresh and the waste water;
- **Heat island effect:** Site need to be planned properly to mitigate the heat island effect (Thermal gradient difference between developed and undeveloped areas) by following measures:
  - At least 40% of the non-roof impervious surfaces on the site (including parking lots and walkways) should be shaded
  - 50% of parking area can be provided underground
  - Pavements and walkways should be painted in light colour (solar reflectance index > 0.5)
- **Boundary:** The campus should be provided with a wall boundary in all the directions to avoid encroachment, theft and also to provide safety to the employees and students.

6.2.2.5 Detailed building plan preparation

The building design is also crucial to the sustainable performance of the TCs. A number of factors including energy efficiency, materials of construction, natural light and ventilation, insulating, etc. should be kept in mind in order to maintain eco-friendly operations. Also, aspects related to safety like, resistant to earthquakes, proper evacuations, etc., ensure successful operations of the TC.

The building design should be responsive to the local climate. The buildings that are in hot and dry climatic should be designed to be passive to heat gains and cardinally oriented so as to reduce the heat gain and direct heat ingress into the building though the walls and openings, a lot of shading elements on the west wall may also be adopted. Similarly, the buildings in a colder climate should be designed to increase the heat gain and also insulate it against heat losses. The other buildings that are in earthquake zones should be designed with proper attention to earthquake safety, safety codes and also escape routes in case of emergency. In case of cyclonic zones it must be taken into account for the roofs and the anchoring of the roofs against the cyclone.

Also, efforts should be to use local materials for the construction of the facility to the extent possible. Most of the locations have local sand stone or other stones and these can be easily used for the construction purposes.

Apart from this, certain points that may be adopted during the building plan preparations are:

- Trees should be planted in large numbers to provide natural shade in the open areas. This also helps to reduce the temperature in the campus in comparison to the vicinity;
- Efforts should be made to utilize natural light to the maximum possible extent and provision should be made for natural ventilation;
- Green building codes may be adopted while designing the building layout so as to ensure following environmental safeguards:

    - Renewable energy in terms of solar water heater, solar panels, solar street light may be used;
    - LED/CFL lights should be used within the premises to reduce the energy consumption;
    - Water treatment and recycling facility to reduce water consumption;
    - Water harvesting arrangement so as to recharge the ground water and/or reduce dependency on ground water;
    - Proper waste management including practices to minimize waste generation, etc.
- Criteria mentioned in the National building code should be followed so as to ensure that all the safety precaution like escape routes/emergency exits, setting of machinery providing appropriate working space, etc. is maintained;
- Hazardous material like asbestos sheets should not be used in any part of the structure;
- Substitutes to natural resources should be encouraged in appropriate ratio so as to decrease natural resource consumption while maintaining the required strength (example: Fly ash may be used in small percentage instead of cement for construction, composite material may be used construction of doors instead of wood, etc.;
- Provision of toilets for both men and women shall be made in appropriate number so as to ensure comfortable and hygienic working conditions;
- Energy efficient products like 5 star rated air conditioner; refrigerator, energy efficient motors, etc. should be used in the institute.

6.2.2.6 Construction Management

Construction at the site involves a number of activities. These activities may lead to certain EHS impacts on the existing natural settings and therefore, appropriate mitigation measures are required to be put in place so as to minimize or avoid these EHS impacts. A snapshot of the issues with the basic principles that should be kept in mind during the construction activity is as follows:

S.No	Likely Issues	3.2. Mitigation measures
1	Generation of noise during construction	➢ The construction activities involving generation of noise should be carried out in the daytime only and should be avoided in the night; ➢ Acoustic barriers may be used in case residential area is in the immediate vicinity
2	Loss of top soil	➢ Top soil excavated from the site should be carefully handled. It should be collected separately and stored as a heap which is appropriately covered. The heap should not be put in the direction of wind to avoid dust generation; ➢ Maximum effort should be made to utilize the top soil for landscaping within the site; ➢ For larger sites, sedimentation basin and contour trenching should be provided so as to avoid loss of top soil
3	Air pollution due to digging and levelling activities	➢ Water sprinkling shall be practiced; ➢ Construction machinery shall be properly maintained to minimize exhaust emissions of CO, SPM and Hydrocarbons; ➢ These activities shall be avoided in very high wind and cover should be provided for loose construction material
4	Water contamination and health risks associated with setting labour camp for construction	➢ Provision of separate mobile toilet facilities for men and women shall be made; ➢ The domestic effluent shall be properly disposed of in soak pits; ➢ Garbage bins shall be provided to all workers' accommodation for dumping wastes regularly in a hygienic manner; ➢ Awareness programmes to be conducted regularly for workers on AIDS, and other health related issues; ➢ Adequate drinking facilities shall be provided at the construction site; ➢ Temporary crèche facility may be provided in case of migrant labour children residing in the camps to ensure safety

S.No	Likely Issues	3.2. Mitigation measures
5	Air pollution due to movement of vehicles	➢ All the vehicles entering the site to be asked to have updated PUC (Pollution Under Control) certificate; ➢ Maintenance of vehicles shall be carried out regularly ➢ Sprinkling of water shall be practiced at the site
6	Land and water contamination due to vehicle movement	➢ Proper maintenance of vehicle shall be carried out to avoid any leakage of oil or grease.
7	Safety issues due to vehicle movement at the site	➢ Vehicle speed is to be restricted to 15km/hour at site; ➢ Necessary safety trainings shall be provided to the drivers of construction vehicles for speed restrictions and do's and don'ts to be followed during movement of construction vehicles; ➢ Provision of adequate personal protective equipment like safety helmets, face masks, safety shoes, safety goggles etc. for the safety of workers
8	Air pollution due to use of D.G set	➢ D.G set to be optimally used with proper orientation and adequate stack height; ➢ Stack monitoring carried out on regular basis; ➢ Proper maintenance of the D.G set should be carried out on regular basis; ➢ Acoustic enclosures are to be provided with the D.G sets to minimize the noise levels
9	Land and water contamination and safety risks due to use and storage of diesel at site	➢ A covered area shall be defined for storage of HSD with concrete flooring; ➢ The diesel storage area shall not be proximity of the labour camps; ➢ Inflammable substance shall not be allowed at the project site.
10	Land and water contamination due to waste generated at	➢ Waste shall be stored at designated place after segregation on the basis of category (hazardous and non-hazardous); ➢ Hazardous waste shall be disposed of to the

S.No	Likely Issues	3.2. Mitigation measures
	site	authorized vendors only; ➢ A waste management plan shall be chalked out to properly dispose the debris generated from the site.
11	Issues like child labour during construction at site	➢ Provision of clause in contractor's agreement that bans child labour and forced labour at project site. ➢ Adequate procedures to avoid or prevent hiring/entry of child labour at the project site

6.2.2.7 Operation and Maintenance Plan preparation

The success of the expansion activities and new developments may be attributed to vigorous and continuous monitoring of all the activities including environment and social management. The monitoring of environment parameters must be undertaken on monthly basis and a copy of the consolidated performance should be sent to MSME for their records and recommendations. Annexure 5 provides a monitoring and reporting template that can be adopted by the T.C's

For environmental and social components of a project, environmental and social monitoring plan is developed, based on baseline data and impacts predicted during the environmental and social assessment process.

Operation and maintenance in the tool rooms may have a number of EHS impacts based on the type of industries. The possible aspects are delineated in the section 5.3 of the report.

Chapter 7

Environmental Management - Mitigation Measures

This chapter enumerates the various elements/aspects/measures that are critical for building and ensuring a safe and sustainable environment on campus while implementing the proposed investment. Compliance with the proposed measures shall also help the institute in improving the NAAC accreditation scores.

7.1 Types of Civil Works Envisaged under the Project

a. New Buildings: These will generally be an independent new building/s constructed with in the existing campus.

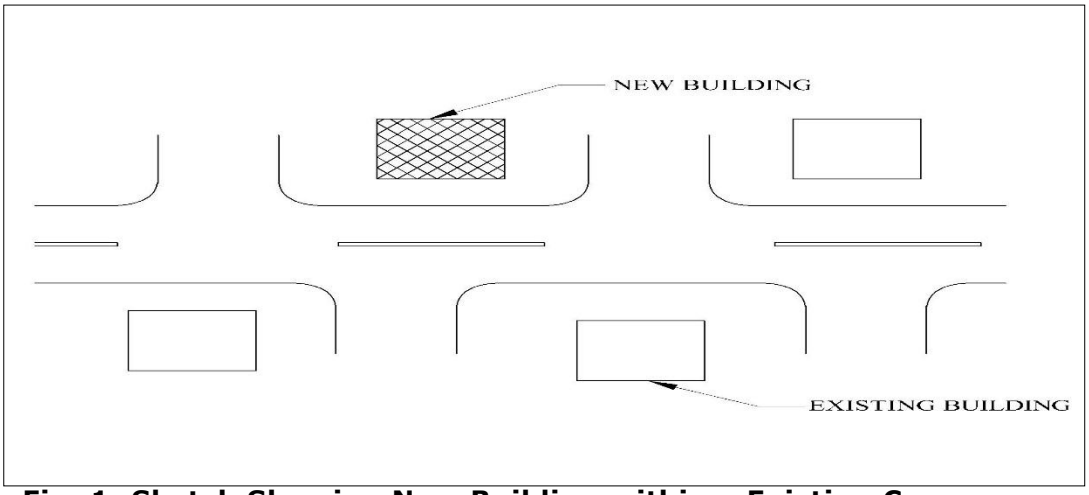
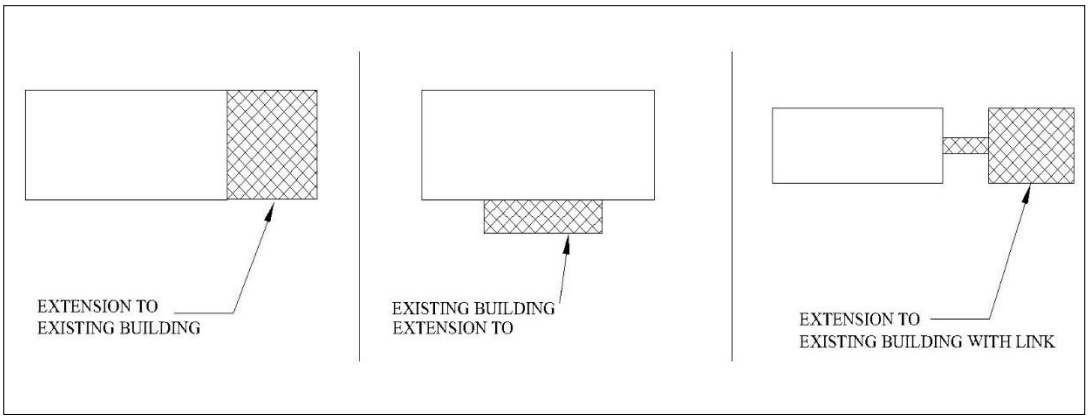


Fig. 1: Sketch Showing New Building within a Existing Campus

b. Extension to Existing Buildings: Under this category, an additional area will be constructed in continuation of an existing building, both physically and functionally.



Sketches Showing Possible Extensions to Existing Building

c. Repair works: These are the works associated with repair of dilapidated and / or non-functional components of the existing building. These may include

replacement of leaking pipes or broken toilet fittings and repair of damaged flooring or plaster.

d. Refurbishment works: Under this category, the works that are usually executed relate to changing the existing function of a room / space to a new proposed function. For example: Provision of electrical, water supply and/or waste disposal arrangements in an existing room which is proposed to be used as a laboratory.

7.2 Environment Management

The section here lists out the various elements/aspects/measures that will help in creating and maintaining good and safer campus environment. The list provided under the various sub-heads is a comprehensive one to ensure that various possibilities that often exist in a national level project can be addressed effectively.

Pre-Construction Activities

The project will permit new buildings and extensions to existing buildings only on land that is owned and fully in the possession of the Institution, the State Government or the Central Government. Further, this land must not be occupied by any person/s, including squatters or encroachers, who may be using it for residential, commercial/livelihood or any other purposes. The availability of land free from any encroachers and/or squatters must be ensured before a site a selected for construction.

The Land Site Assessment process needs to be completed as per Annexure 1 and a Certificate must be prepared following the format given in Annexure 2. Documentation on the process followed and the certificate prepared need to be archived and made available to Joint Review Missions, comprising of World Bank and NPIU officials. It must be ensured that the ownership of the land is clearly with the Institute on which the civil works are proposed.

As far as possible, the selected sites should be free from encumbrances. However, any encumbrances on the selected site/land such as trees, electrical and water utilities, hand pumps, water taps, parking sheds and temples/shrines (or any other) will be clearly identified and documented using the format provided in Annexure 3. The documentation will cover details of type, number, size/area of the impacted structure, species (in case of trees), as applicable. Relocation/replacement of such structures and utilities needs to be planned and executed prior to initiation of civil works. The cost estimates for such pre-construction activities will be shown under a separate head in the civil works estimates.

Building Design and Related Aspects

During the design of the building/s or extension of existing blocks, ensure the following:

- Water Supply arrangement/s, as per applicable norms

- Sanitation arrangement/s, as per applicable norms including separate arrangements for men, women and physically challenged
- Waste water discharge or disposal arrangement/s
- Adequate storm water discharge arrangement
- Floor height and window area, as per NBC norms.
- Promote wood substitutes and use of materials like fly ash and unleaded paint.
- Adoption of relevant construction code/s, applicable for earthquake, cyclone, flood and/or landslides.

Clear and comprehensive drawings for various utility services such as wiring, water supply, waste collection and disposal, plumbing, drainage and sewage disposal diagrams will be made (as explained in Section 8).

Additionally, the following should be considered and provided in the design:

- Building or block orientation, keeping in mind the solar and wind direction and also the existing lay-out (as explained in the earlier sections to the extent possible).
- Natural Light and Ventilation in Classrooms, Laboratories, Canteen and Toilets
- Barrier free access for the physically challenged.
- Appropriate shading devices (*chajjas* and louvers)
- Signage inside and outside the building
- Display/notice boards for display of information in the classrooms and at other required locations.
- Fire and electrical safety arrangements
- Provision of alarms or hooters to alert building occupiers in case of emergency.
- Clear demarcation of escape routes and assembly points for emergency situations.
- Provision of parking (segregated for two and four wheelers)
- Preserve existing trees, to the extent possible.

Many of these measures can be given effect even when there is no new construction involved.

Campus Maintenance and Related Aspects

All institutes participating in the project (even in cases where no new construction is proposed) need to ensure over-all cleanliness and hygiene in the campus. This includes:

- Adequate provision of waste collection bins including arrangements for segregation of solid wastes and their regular disposal.
- Separate collection and disposal of toxic, inflammable wastes, specifically from laboratories.
- Hygiene in kitchen, mess, canteen and toilets
- Proper storage of materials (whether in kitchen/mess, workshops and stores)
- Provision and maintenance of first aid boxes.
- Posters with safety and cleanliness messages, as applicable.

Environment Augmentative Measures

The following environment augmentative measures should be encouraged in the institutes:

- Rain water harvesting.
- Promotion of energy efficient lighting.
- Provision of acoustic measures.
- Use of heat reflecting glass.
- Promotion of water conservation measures.
- Promoting use of solar energy.
- Minimization of paved area: Eg: Loose aggregate and paving stones can be used for pedestrian movement areas in place of a hard concrete surface.
- Appropriate use of colors for buildings and walkways. Eg: Colors that absorb less heat can be chosen.
- Vermi-composting for bio-degradable waste.
- Landscaping (such as of roads, parking areas, water bodies, entry and exit gates, boundary walls, open spaces and footpaths)
- Tree plantation (including use of drip irrigation system to reduce wastage of water)
- Use of locally available materials, as possible.

Environment and Safety Management Measures for the Construction Stage

The institute will ensure that the implementing agency (such as CPWD or State PWD) and/or its contractor fully abide by the required legal requirements, including adherence to labour laws. Some key environment and safety requirements that need to be enforced and monitored include the following:

- Provision and enforcement of Personal Protective Equipment (PPE), as relevant to the needs of the work.

- Ensuring proper safety precautions during erection, use and dismantling of temporary structures such as scaffoldings.
- Ensuring proper barricading and delineation of worksites.
- Ensuring that the required electrical, fire and mechanical safety practices are followed during various construction operations.
- Ensuring provision of safe access and working platforms for workers and supervisors.
- Display of information on Minimum Wages.
- Provision of accommodation for workers as per norms.
- Provision of proper potable water supply arrangements for workers.
- Provision of sanitation arrangements (toilets, urinals, bathrooms) for workers (including separate ones for women workers, as required).
- Provision of first aid and emergency response arrangement.
- Minimization of wastage including reuse and recycle of materials, as possible.
- Proper stacking and disposal of waste materials (including proper segregation, storage and disposal of any toxic and hazardous wastes).
- Use of acoustic generators for construction work.
- Ensure proper and safe storing/stacking of construction material.
- Provide for silt control measures, if there are any streams/water bodies in the vicinity.
- Proper planning and sequencing of construction activities to reduce/minimize disturbance to students.

Integration of Environment Management Aspects

The key steps that will guide the integration of environment management measures into civil works are as follows:

- Step 1: A reference to the environment management elements/measures (planning or design stage related) listed in the section above needs to be made. Then, a clear list of elements that will 'apply' to the particular civil work being proposed, needs to be identified/made.
- Step 2: The identified environment management elements/measures need to be clearly reflected/marked in the Detailed Project Reports including Design Drawings.
- Step 3: The construction stage environment management requirements need to be integrated into Bidding Documents.

The civil works cum environment coordinators both at the institute and the state level will cross-check and ascertain the integration of environment management

aspects into civil works. Format provided in Annexure 4 should be used for this purpose.

Chapter 8

Consultation with Key Stakeholders

Consultations play a major role in identifying the potential impacts of any project. Organized with the associated stakeholders, consultations play an important role in identifying the gaps in the present arrangements, discussing various components of the proposed project and also in the getting a buy in of all the associated players. A participative approach is followed during this process.

8.1 Objectives

Stakeholder consultation to support the EMF and the resettlement process, if any, specifically aims to achieve the following objectives:

- To provide information about the project and its potential impacts to those interested in or affected by the project, and solicit their opinion in that regard
- To manage expectations and streamline misconceptions regarding the project
- To ensure participation and acceptance of the project by the communities/project proponents/stakeholders.
- Information obtained during consultations can be used to make an inventory of existing infrastructure and to collect information on expectations of the communities/project proponents/stakeholders.

8.2 Methodology

The first step in this process was:

I. Identification of key stakeholders:

- The current program is managed by the Higher Education Department of the state of Madhya Pradesh. The Madhya Pradesh State Higher Education Department is responsible the entire process of planning and implementation for higher education in the state.
- Management representatives from technical colleges such as Principals/Administrative staff associated with Planning/Construction/Maintenance of Buildings. These are important stakeholders owing to their knowledge of the local area and surrounding. Their influence on the program further increases during the operation phase since the entire responsibility of maintenance and upkeep of the institution is managed by them
- Academics from the departments of Civil Engineering/Architecture/Planning (from colleges in or around Bhopal), including those from Maulana Azad National Institute of Technology. The project envisages moving to 'greener' and more sustainable designs for construction. The aforementioned departments will play a crucial role in this process.

- Student Representatives. These include representatives from the various student associations, welfare bodies (including women, youth and/or physically challenged). Probably the most important stakeholder in the process since they are directly impacted by the outcomes of the project.
- Government Agencies responsible for implementing, and monitoring the environmental policies set forth by the stat/national government. These include representatives from the Environmental Planning & Coordination Organization of the state, representatives from the State Pollution Control Board and representatives from the state Environmental Impact Assessment Authority. These representatives can view the proposed framework from the legal standpoint and also give important inputs on the efficacy of it implementation.
- Representative from CEE Madhya Pradesh State Office and other NGOs working on education sector programs/projects. These stakeholders understand the sector well and will be able to provide useful inputs on the existing gaps that need to addressed in higher education in the state

Subsequent to identification of the stakeholders, a consultation plan was drawn up. The consultation plan was based on the preliminary understanding of the issues and concerns which need to be discussed with the stakeholders identified. The stakeholder were informed about the outline of the project and also given an understanding of the purpose of consultations.

After the identification of the stakeholders, the consultations for the project have been carried out in two phases, namely:

1. **The Assessment Phase:** The consultations at this phase were more focused on understanding the present work processes. The consultation during this phase was intended to assess whether the process involved in the program can identify, assess and mitigate the potential E&S risks.
2. **The Development Phase:** During this phase of the consultation the Environmental framework that has been drafted was discussed with all stakeholders. The specific provision in the guidelines, proposed work procedures etc. were discussed in a workshop attended by all stakeholders to get their feedback on the proposed system.

General concerns associated with the process primarily revolve around the quality of the process. The consultation process needs to be carried out in a fair and transparent manner to ensure that all stakeholders have a voice on the table and such that their views can be captured. This would help improve the design of the proposed project and make it more robust towards unforeseen issues in the future.

8.3 Key Findings - Stakeholder Consultation at Bhopal

Public Consultations on 31st March, 2015

Presentation by Commissioner, Higher Education Department - The commissioner, Higher Education Department of Madhya Pradesh, presented the state's vision for higher education/project implementation plan (PIP). The key points made in the presentation are: - (i) The existing number of colleges in the state is inadequate and around 80 tehsils do not have colleges within 10 km radius. (ii) The PIP interventions has been designed at 3 levels: - (i) State Level DLI Based, (ii) State Level TA based (iii) Institute level DLI based (further sub-categorized into strategic plan support & centers of excellence).

Comments & Discussions by participants/stakeholders

Dr. Arun Joshi (CEO, ASADS) pointed out that, currently there is total disconnect of higher education and employment opportunities in the context of rural areas & its youth population. There is total lack of quality and meaningful education for rural youth. The rural youth population, in order to access colleges, travel long distances (upto 50-60 kms). However, these youth do not find suitable employment in the rural sector, after passing out of colleges, as their degrees/courses/certificates are not oriented for rural livelihoods. Hence, there is need for establishment of facilities & re-orientation of syllabus with emphasis on appropriate skills set development for rural youth.

Mr. Rohit Trivedi & Mr. Anil Mudgal (from ARUSHI) emphasized that there is need to develop proper barrier free infrastructure & associated facilities for differently abled students, in order to increase enrollment in colleges. The space & other constraints in the college campus/buildings should be considered while designing barrier free

access and relevant design options should be incorporated. Further, different types of disabilities require diverse types of facilities and all these should be taken into account while designing college/institutional infrastructure. In terms of providing braille books in colleges, it would not be feasible due to space issues. There are alternatives available to braille books (like e-books & electronic brain display software facilities) which may be explored for college libraries.

Mr. Sachin Sinha (Commissioner, MPHED) mentioned that, as per 2011 census there are around 15 lakh disabled persons in Madhya Pradesh. This is a 10% increase over 2001. Further, around 8.5 lakhs differently abled persons fall in the category of over 40% disability (i.e. having medical certificate of disability). Hence, there is a huge requirement for improvement of facilities in higher education institutions to adequately cater to differently abled students special needs.

Ms. Gita Kanitha (Joint Director, Department of Social Justice) explained that there is 6% reservation for differently abled persons in state government services/jobs (which is in ratio of 2:2:2 for hearing impaired, visually challenged & physically challenged) and 3% reservation in college admissions. In order to increase awareness and social inclusion about differently abled in the society, they have appointed celebrities as brand ambassadors. She mentioned that social inclusion of differently abled girls/women is a cause for concern and there is need to improve

Dr. Neeraj Agnihotri (Professor of English) emphasized that training of teachers is essential and it should conducted on a compulsory basis in all colleges, at least once in a year. This exercise would be a key step in enhancing skill sets of the teachers/faculty.

Dr. A.K. Pathak (Professor of Mathematics, IEHE) was earlier posted in colleges in the rural area and provided an insight on the issues in colleges in rural areas. He explained there is need for re-orientation of syllabus and introduction of courses, that would more appropriate to cater to the skills set development for rural youth; the rural youth should be able to find suitable employment opportunities in the rural sector, after passing out with such degrees/courses. In terms of infrastructure facilities, there is huge need to improve the physical infrastructure, especially classrooms, libraries, toilets, & drinking water facilities. Presently, the hygiene conditions of the rural colleges is generally poor. Further, the college campuses are located some distance away from the villages, which creates both safety & time issues with regards to transportation. The girl students, in particular, face difficulties in attending colleges due to poor toilet facilities and remote location of the colleges. Therefore, enhancement of physical infrastructure and facilitation of easier transportation for the students are an urgent requirement in rural areas.

Comments & Discussions by participants/stakeholders

Dr. Sudha Singh (Professor, Hamidiya PG Boys College) pointed out that there is poor attendance of students, from rural areas (especially girl students) due to transportation problems. The yatayat yojna (scholarship of Rs.5/- per day for travel) for facilitating students' travel to colleges has had an overwhelming response from students, as they now have some financial support available for transport. However, this yatayat yojna is able to cover only 1/4th (approx.) of the actual cost of students' travel.

Dr. Deepti Srivastava & Dr. Anita Puri Singh (Faculty, Govt. MLB Girls PG Autonomous College Bhopal) reiterated that there is poor attendance due to transportation problems faced by girl students. Majority of students in MLB College are from the outskirts of the city and they face problems in travel to & from college (both financial & logistical). The dropout rate of girl students is more in UG courses compared to PG courses. However, it was also observed that there has been some improvement in attendance rates after introduction of transport scholarship (i.e. yatayat yojna).

Mr. Rohit Trivedi (from ARUSHI) suggested that the option for introducing special bus services for students may be explored.

Mr. Sachin Sinha (Commissioner, MPHED) suggested alternatives to ease the transportation problem for students, such as: - (i) Hostels, especially for girl students (ii) Establishing colleges in new areas (e.g. areas which do not have any educational institutions within 10 km radius).

Dr. Arun Joshi (CEO, ASADS) suggested the following, with regards to the need of rural youth in the areas of education and employment:- (i) Higher education for rural youth should be relevant to the local/rural context, (ii) Sustained livelihood for the rural youth after obtaining higher education (iii) Development of hard & soft skills development in the rural context, (iv) Corporate Social Responsibility (CSR) component now being an integral part of private sector's activities, there is huge opportunity for corporate firms to work and provide employment in the rural sector, and (v) Community College model for rural youth is a viable and relevant option, which may be explored further.

Dr. Vibha Shukla (Principal, Government College Benazir, Bhopal) had the following comments & suggestions: - (i) Provision of hostel facilities/residential campuses for students to improve the attendance rates, (ii) Provide transportation facilities (e.g. special bus services) to students, instead of monetary support, and (iv) In addition to scholarship schemes for SC/ST & differently disabled, there should be some form of scholarships provided to other economically disadvantaged students.

Presentation on Environment Management Framework - Presentation on draft Environment Management Framework was made, which highlighted the issues on Environment, Health and Safety with regards to the existing physical infrastructure and proposed interventions, including green campuses, energy efficient measures, barrier free access, adequate sanitation & potable water facilities, water conservation measures (like rain water harvesting), etc.

Dr. Deepti Srivastava (Faculty, Govt. MLB Girls PG Autonomous College Bhopal) pointed out that majority of colleges (both in urban & rural areas) face shortage of both physical infrastructure (e.g. classrooms, libraries, computer rooms) and human resources (Both academic and non-academic staff especially Class IV staff) . She mentioned that in MLB College, garbage collection and sanitation services have been outsourced to private agency, which has resulted in improvement in hygiene and overall cleanliness within the campus. Likewise, many colleges in Bhopal have also outsourced garbage collection, sanitation & security services to private agencies. However, use of clean energy initiatives (like LED, solar energy) has only been taken up on individual basis by specific colleges. She suggested that the idea

of 'Green Campuses' may be initiated at the state level and as showcase , some model college campuses can be developed.

Faculty members of IEHE had the following comments/observations:- (i) Water shortage is a major problem faced by almost all colleges in Madhya Pradesh, (ii) AICTE norms provide a good benchmark for technical colleges and similar norms may be developed for other higher education (i.e. non-technical) institutions, (iii) Presently Madhya Pradesh does not have edusat and provision of the same may be explored, as it is a good medium to achieve the goals of access & equity, and (iv) Flagship colleges for SC/ST youth, especially in the backward areas of the state.

Dr. Arun Joshi (CEO, ASADS) made the following comments/observations:- (i) Presently, colleges in rural areas have huge inadequacies with regards to physical infrastructure, EHS and curriculum development, (ii) There is potential to develop green campuses/green architecture in rural areas, due to land/space availability.

Chapter 9

Implementation Arrangements

The main implementing agency will be the Project Directorate (PD) which serves as the executive arm of the Madhya Pradesh State Higher Education Council (SHEC) and is responsible also for managing the *Rashtriya Ucchatar Siksha Abhiyan* (National Higher Education Program) (RUSA) funds coming to the state. The Directorate is a Society under the Indian Societies Act, 1860 and has required institutional autonomy to administer funds and recruit contractual staff. The Directorate was established in October 2014 and has 18 sanctioned posts. The PD is headed by the Commissioner (Higher Education) as its Project Director, supported by an Additional Project Director (APD), and a team of professionals (either on deputation or hired as consultants).

The SHEC, created in October 2014, has overall responsibility for policy making in higher education in Madhya Pradesh. The Council is headed by the State Minister for Higher and Technical Education. SHEC will be the Steering Committee for the Project and will be responsible for approving the project's annual work plan and budget, reviewing project implementation progress and achievement of the PDO, and endorsing Higher Education Institutes selected for support under the project.

The bulk of the activities under the proposed project will be implemented by colleges and universities. They will receive funds from the PD and will be responsible for managing the procurement and financial management arrangements for these funds. Institutions currently receive and manage funds from the state government (as well as revenues mainly generated from tuition fees). The TA component of the project will be used to provide targeted capacity building support for smooth implementation to both the PD and colleges and universities participating in the project.

On the whole, the management and oversight structure for implementation includes a Steering Committee at the top and the PMU to manage design, coordination and implementation monitoring. Lead Colleges at the district level will technically support and monitor the activities of colleges and will function as intermediate level monitoring agencies. At the field implementation level, colleges/institutes will be the key players.

9.1 Project Institutional and Implementation Arrangements

Project Directorate: The main implementing agency for the project will be the RUSA Project Directorate (PD), established in October 2014, which serves as the executive arm of the SHEC, and is also responsible for managing the State's RUSA funds. The Commissioner of Higher Education (Department of Higher Education, GOMP) is the head of the Project Directorate as its Director. He/She is supported by an Additional Project Director (APD) who is responsible for the day-to-day activities of the PD. The Directorate itself is a Society under the Societies Act and so has autonomy to administer funds and recruit contractual staff. Currently, the PD has 18 sanctioned posts, 5 of which are filled as funds from RUSA are only now starting

to flow. For the smooth implementation of the project, the PD staff will be supported by a team of consultants with expertise in different domain areas, namely, procurement, financial management, higher education sector issues, capacity building and training, and monitoring and evaluation. These consultants can be hired using agreed processes for long and short-durations, as necessary.

The PD will be responsible for overall project implementation, and for activities financed by the project that are state-wide in coverage, for example, for the State Institute for Higher Education Training and Research, capacity building activities on governance, Tally software and the IT Portal, including the financial management and procurement arrangements for these activities. The PD will also be fully responsible for implementing the Technical Assistance (TA) component of the project. The Project Implementation Plan will set out the functions of the PD in detail, including its delegated authority.

At the institutional level, the **Higher Education Institutions** (HEIs), namely the University Departments and Colleges, will implement project supported Institutional Strategic Plans. The Plans will be approved by the Jan Bhagidari Samitis/Board of Governors of the HEIs. The HEIs will receive funds from the PD to be utilized by them according to processes described in the agreed financial management and procurement manuals for the project. The **Internal Quality Assurance Cell (IQAC)** in each supported HEI will be the locus of quality monitoring within the institution for the institution as a whole, for programs offered by the institution, student academic and employment outcomes, and institutional performance vis-à-vis strategic plans. The IQACs will also be responsible for overseeing the preparation of the institutional annual reports. Presence of a functioning IQAC in HEIs will be a condition for receiving project support.

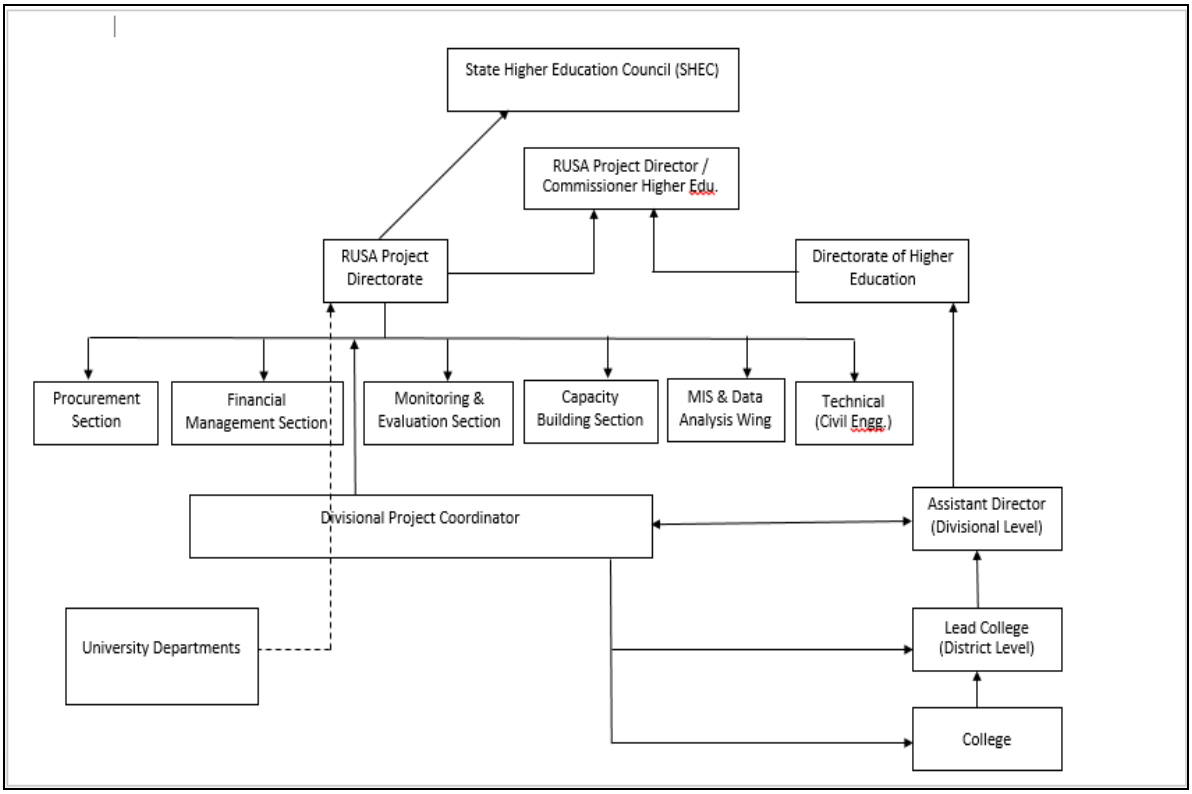
Jan Bhagidari Samitis/Board of Governors in HEIs: Each HEI is required to have an overall policy making body, which makes decisions for the institution within the delegated powers set out in the relevant legislation, regulations and/or statutes. Overtime, the project will increase the level of delegation power to these bodies, within a clear framework of accountability, as described in the Project Implementation Plan (PIP).

Division level Monitoring/Role of Lead Colleges: The DHE has established a 'lead college' in each district, which is responsible for administrative coordination between the government colleges in that district and the Department. These Lead Colleges will continue to have this function under the Project, including raising awareness about project activities amongst its colleges and collecting information and project progress reports to forward to the PD.

The State Higher Education Council: The Madhya Pradesh State Higher Education Council (SHEC), created in October 2014, has overall responsibility for policy-making in higher education in the state. The Council is headed by the State Minister for Higher and Technical Education, with the Principal Secretary and Commissioner of the Department of Higher Education as members of the Council. SHEC also has members from institutions and other state government departments. The PD will present to the SHEC periodic project progress reviews, and seek guidance on project implementation, as necessary. The SHEC can use

recommendations and findings emerging from the project, and any sector studies/surveys/reviews carried out as inputs into its larger policy-making, sector oversight and coordination, and guidance role.

Program Management Structure of MPHEQIP



Staffing for Environment Management

In the light of the above, the institutional arrangements for implementing the project will integrate capacity and professional expertise to plan and implement actions towards fulfilling the requirements set forth in the SMF and the EMF. The DoHE/PMU will enhance its implementation capacity with hiring consultants to technically support, coordinate, monitor and report SMF and EMF implementation, both at the state and at the district level. The PMU will have professional consultants to manage social and environmental management issues. This team will include a civil engineer and an architect/planner to support the EMF implementation, including the green building/campus initiatives. The PMU may hire NGOs for supporting field-level implementation of specific social activities. Specific capacity building will be required for staff involved in building design, construction and maintenance at the district and institute level to ensure that the vision of creating clean, safe and green campuses is actually realized on the ground.

9.3 Monitoring and Evaluation

At the state level, the RUSA Project Directorate (PD) will be responsible for carrying out project M & E activities. These activities will include: (a) periodic

sector and project progress reviews, (b) preparing and disseminating project progress reports (including reporting on the fiduciary and safeguards requirements of the project), (c) reporting on DLI achievements, and (d) feasibility studies, evaluations and other reports as necessary. The PD will be responsible for consolidating the M & E information according to the agreed Results Framework from all implementing agencies such as the supported HEIs and HE service providers, and the activities carried out by them.

At the institutional level, the Heads of the Institutions (Principals of Colleges, University Department Heads under the aegis of their Vice Chancellors) will be responsible for carrying out the M &E activities agreed. They will be supported by the institutions' Internal Quality Assurance Cells who will maintain data records in standardized formats that will be used for reporting on progress on Strategic Plan activities and for preparing Institutional Annual Reports.

The M &E requirements and responsibilities of the implementing agencies will be described in detail in a Project Implementation Plan. These will include reporting on DLI achievements, and the verification protocols to be followed thereof.

The Project through Component 3 (Technical Assistance) will support the establishment of a sector MIS in Madhya Pradesh. The MIS will include data from both supported and non-supported government and non-government HEIs. The frequency with which different types of data will be collected will be specified in an MIS manual. Capacity building on M & E activities and the MIS for the RUSA PD and HEIs will also be undertaken through this component.

Monitoring of EMF

Safeguards Monitoring will be an integral part of the implementation and monitoring system of the project. Regular performance monitoring of EMF and SMF implementation will be carried out by the internal oversight mechanisms of the project spelt out above. The Lead Collages will play a key role in flagging campus environment and GESI issues including those relating to the TDP before the PMU. Annual SMF and EMF implementation review shall be carried out in addition to mid-term and end-term evaluations for recording lessons and ensure implementation quality with necessary capacity building measures as necessary

Additionally, at the state level, there shall be an Advisory Committee on "Social Inclusion" and "Campus Environment Management", comprising reputed representatives from the civil society having experience and expertise in gender, social inclusion, education, environment, health and safety and building design (specifically green buildings) issues.

The Committee will meet one in a quarter and shall discuss the key issues in the state's higher education sector and advise the PD regarding actions on subjects brought to its notice. The Independent Quality Audit consultants will have expertise in social and environment aspects. The monitoring indicators shall be informed by social and environment considerations.

9.4 Reporting Requirements

Review Missions: Combined teams of GOMP and the World Bank will undertake joint review missions to assess project progress every six months during the project implementation period. The PD will report on project progress as per the results agreement framework and the DLI matrix, and ensure the collection of complete and credible data from all implementing agencies and participating centers. Each progress report will document the extent to which the project is on track in achieving the PDO, progress on agreed actions, identify key implementation issues and challenges, and make recommendations for future actions. The progress report will also provide evidence underlying the achievements, document implementation progress, and report on fiduciary and safeguards aspects of the project. Based on their findings, the review missions will agree on next steps to be undertaken by the PD to improve project implementation in the ensuing six months. Thematic area experts may be invited by the GOMP, SHEC and the PD, and the World Bank to participate in the review missions as necessary.

Implementation Progress Reports (IPRs): The PD will produce periodic IPRs showing the sources and uses of funds, procurement management and output monitoring.

Base-line data and Standard Reporting Formats: The collection of any outstanding baseline data will be completed by the PD within 6 months of the project becoming effective. Till such time the MIS for the sector and project is established, the PD will make adequate alternative arrangements for the collection, storage and analysis of this data. The PD will also develop reporting formats for each project component and ensure that data reporting by implementing agencies, and participating institutions such as training providers, is standardized.

Mid-Term Review: A Mid-Term review of the project will be carried out, along the lines of the joint review missions, roughly half-way through the project implementation period.

Reporting and verification of DLI achievements: The PD will establish robust reporting and verification mechanisms using third-party monitors for the Disbursement Linked Indicators under Component 1. These reports must be shared with the World Bank as per the agreed disbursement cycle, and the findings from the verification reports, subject to the satisfaction of the World Bank will be used as the evidence basis for re-imbursement claims under this Component.

Other Policy Studies and Reports: As part of Component 3, the SHEC and the PD may commission through experts/consultants policy and thematic area studies and surveys, formative assessments and impact evaluations of policy, practice and new interventions in the HE sector.

Sources of Data for Monitoring Outcomes and Outputs

Project Monitoring: The PD will regularly monitor and document implementation of all project components as part of standard project monitoring. The PD will also establish a system for tracking project expenditures at the level of all

implementing agencies, and will generate quarterly financial management reports. The Heads of HEIs supported by the IQACs will be responsible for monitoring and documenting implementation progress in their institutions.

Project MIS: Through support from the project, the PD will establish a Sector MIS for project management and monitoring. The Project MIS will be used to maintain all project related inputs, outputs and outcomes information generated from all project components, and will be updated timely and regularly in a manner pre-specified in an MIS users' manual.

Institutional data: A wide range of institutional data needed for planning is collected annual through the AISHE survey. This will form the basis of data collection from institutions.

Third Party Validation: The PD will commission as and when agreed studies carried out by external/third party agencies on project performance and implementation assessments. These studies by external agencies will complement internal monitoring.

Annexures

Annexure 1

Format to Certify Land Ownership and Status

CERTIFICATE

This is to certify that the land at _____ (Address of plot) measuring _____ (Area of plot) on which the _____

(Name of facility, e.g., laboratory building of XXX College of ------- at ----- YYY (name of place, etc.) will be constructed under the World Bank-assisted MPHEIProject is registered in the name of _____ (Name of Institution or Government Department, if relevant) and is fully in its possession and control.

It does not have any claimants, nor is it the subject of any judicial proceedings.

It is not occupied by any person(s), tenants, encroachers or squatters for residential or livelihood/work/business purposes.

It is not being used for any public purpose which would be denied by construction of the facility, nor does it have any encumbrances whose removal would cause inconvenience to anyone.

Signed by Appropriate Authority

Annexure 2

Format for Site Assessment – Documentation of Encumbrances

- Name of the Institute:
- Name of the Work:

Note

Information in form of number/units and whether it will be relocated/reconstructed or shifted or compensated or any other information relevant should be provided in the remarks column.

S. No.	Type of Encumbrance	Remarks
a.		
b.		
c.		
d.		
e.		

Annexure 3
Environment Management Measures
Checklists for Design, Construction and Operation Stages

CHECKLIST FOR DESIGN STAGE

1. Building/Block Design and Related Aspects

S. No.	Aspect	Yes/No	Remarks
f.	Have the relevant construction code/s, applicable for earthquake, cyclone, flood and/or landslides, been adopted during building/ block design?		
g.	Have adequate fire safety measures been put into place?		
h.	Has the water supply arrangement been made as per norms?		
i.	Is the provision of potable water arrangement sufficient?		
j.	Has the sanitation arrangement been made as per norms?		
k.	Are there specific arrangements for the physically challenged in the toilets/urinals?		
l.	Does the building/block provide for barrier free access for the physically challenged?		
m.	Is there any unhygienic area within the campus? Eg: Open clogged drains carrying waste water		
n.	Is there any water logging in the campus?		
o.	Have adequate numbers of dust bins/garbage collection facilities been provided?		
p.	Were any trees cut for the construction of new building/block?		

S. No.	Aspect	Yes/No	Remarks
q.	Has signage (internal as well as external) been provided?		
r.	Have sufficient number of display/notice boards been provided?		
s.	Is there any provision for alarm/s or hooter/s ?		
t.	Is there a proper and sufficient provision for parking?		
u.	Is there any proposal to undertake tree plantation?		
v.	Is there any landscaping proposal?		

2. Environment Augmentative Measures

S. No.	Aspect	Yes/No	Remarks
a.	Are wood substitutes being proposed?		
b.	Is the use of fly ash (brick, block or in any other form) being proposed?		
c.	Is rain water harvesting arrangement proposed?		
d.	Is energy efficient lighting being provided?		
e.	Is there any requirement to provide for acoustic measures?		
	If yes, have such provisions been made in the design?		
f.	Are there any provision/measures to support water conservation?		

S. No.	Aspect	Yes/No	Remarks
g.	Does the proposed colour scheme take into account heat absorption factor?		
h.	Is there any initiative on vermi-composting?		
i.	Is there any proposition to use locally available material?		

CHECKLIST FOR CONSTRUCTION STAGE

S. No.	Aspect	Yes/No	Remarks
a.	Is the required Personal Protective Equipment (PPE) (as relevant to the needs of the work) being provided to the workers?		
	Is the PPE being used by engineers and supervisors?		
	Is the PPE being used by the labour?		
b.	Have any enforcement mechanism/s been put into place towards ensuring use of PPE provide?		
c.	Are proper safety precautions/practices being taken during erection and use of temporary structures such as scaffoldings?		
d.	Are proper safety precautions/practices in place for working platforms and ladders?		
e.	Does the worksite have restricted access?		
f.	Is/are the worksite/s barricading properly?		
g.	Have proper precautions been taken to ensure fire safety during construction?		
h.	Are the required measures in place to ensure electrical safety during construction?		

S. No.	Aspect	Yes/No	Remarks
i.	Is there a mechanism in place to check the safety of various mechanical equipment and machinery that is being used for construction?		
j.	Has the information on Minimum Wages been displayed in the local language?		
k.	Is the worker accommodation in line with legal provisions?		
l.	Is there a proper potable water supply arrangement for workers?		
m.	Has proper sanitation arrangement (toilets, urinals, bathrooms) for workers (including separate ones for women workers, as required) been made?		
n.	Has the contractor made first aid and emergency response arrangement on the worksite?		
o.	Has the storage/stacking of materials been appropriately (safely) done?		
p.	Are there adequate and proper waste collection and disposal arrangements on the worksite?		
q.	Are acoustic generators being used for construction?		
r.	Is the construction work causing any inconvenience to any of the campus residents/users?		
s.	Has the worksite been cleared off all debris, wastes and left over materials?		
t.	Has the worksite or area used temporarily during construction been restored?		

CHECKLIST FOR POST-CONSTRUCTION/OPERATION STAGE

S. No.	Aspect	Yes/No	Remarks
a.	Are the required numbers of first aid boxes available?		
	Is the provision in the first aid boxes as per the norms?		
b.	Are the following utilities/services/facilities functioning properly and are these being maintained properly?		
	Water Supply Arrangements		
	Potable Water Arrangement		
	Sanitation Arrangements		
	Solid Waste Collection and Disposal Arrangements		
	Waste water collection and disposal system		
	Storm water collection and disposal system		
c.	Are the landscaping works being maintained properly?		
d.	Is the survival rate of plantation more than 80 percent?		
e.	Is there a clear demarcation of escape routes and assembly points for emergency situations?		
f.	Are the fire safety arrangements being regularly checked regularly?		
g.	Is the follow-up action (such as refilling of fire extinguishers) action on fire safety issues being taken in time?		
h.	Are the hooters/alarms in working order?		
i.	Does the institute conduct/arrange safety drills from time to time?		

Note

Information in form of number/units, norms/standards used, reasons, remarks on applicability (for example, one can say 'not applicable' in situations where acoustic measures are not required or in a case where already a rain water harvesting system is in place, one could say 'it already exists')) or any other information relevant should be provided in the remarks column.

Annexure 4

Guidelines for Environment Friendly Colleges/Institutes

The following guidance is being provided to help create safe and sustainable school buildings and enhance environmental friendliness of school buildings:

a. Sustainable College/institute Design

Innovative Design is strongly committed to designing college/institutes that not only embrace the concept of sustainability but are, in themselves, teaching tools for sustainability. Studies have shown that college/institutes incorporating passive solar features, such as daylighting, use less energy, student grades have improved, and attendance is higher.

The college/institute should incorporate environmentally friendly design principles, including:

- Building orientation to increase day lighting and reduce fluorescent lighting
- High-efficiency electric lighting
- Light and motion detectors to monitor energy usage (if viable)
- Solar panels to heat water for the college/institute
- Minimize impervious surface in the landscape
- Rainwater collection to water college/institute lawns
- Native landscaping to reduce water use
- Eco-garden to demonstrate water conservation and aquatic plants and animals (if viable)
- Outdoor teaching spaces
- Use of regionally produced products
- Low-toxic or non-toxic building materials
- Weather station to demonstrate energy and water conservation systems
- Minimized construction waste, and recycling of construction materials, and
- Restoring waterways and vegetation in and around site.

b. Site Selection and Preservation

It is appreciated that from a design perspective, designers are not commonly presented with a choice of sites for a new building to be constructed upon. However, in those situations where a choice is offered it is necessary to consider, again at the earliest possible stage, the wider issues in design terms.

The site may be vulnerable due to possibility of flooding, pollution or vehicular accidents. To ensure safety of students, the following guidance may be of help:

- The site should be at least 5 ft above the 100 years High Flood Level of the nearest water body.

- The site should not be located within 1 km from any industrial estate or any major hazard category industry as per Ministry of Environment and Forest classification.
- The site should not be within 1 km at the downwind side of any red category industry as per the Central Pollution Control Board classification. Wind direction should be taken as annual average wind direction provided by nearest weather station.
- The site should not be abutting National Highways. If unavoidable, then the access to the site should not be directly from the highway.
- The site should not be on or within a distance of 500 m from a municipal/ hazardous waste dumping ground.
- The site should not be on or within a distance of 500 m from a contaminated area declared by State of Central Pollution Control Board.

It is preferable to choose site which is near to:

- Bus stops
- Developed area with where local governmental body is providing water supply, sewage and solid waste facility

c. Use of site features/site planning and landscape design

The design must make use of existing site features. The site features can be appreciated in the form of existing trees, slope, boulders, water body/channel or even presence of good view of natural landscape. As far as possible, such features should be preserved and used as part of design.

- Develop the site in an environmentally sensitive manner.
- Understand and maximize natural site conditions.
- Design the site for easy pedestrian, bicycle, mass transit, and handicap accessibility.
- Provide site protection during construction.

d. Energy Efficient Building Envelope

- Design shall address all radiant energy flows as well as conductive heat gain and loss.
- Select the optimum glazing for each location on the building.
- Provide proper window treatments to maximize winter solar gain and minimize summer overheating.

e. Construction Material

Major amount of energy is consumed by building construction material in manufacturing and transportation.

Use of Recycled Material: Recycling construction material or use of material with recycled content will reduce demand for new material. Maximum use of fly ash can be a major environmental achievement. As per the Fly Ash Notification September

1999 and amended as on August 23rd 2003 fly ash should be used as building construction material, if the project is located with 100km of Thermal Power Station. This can be achieved through following measures:

- RC (reinforced concrete) (including ready-mix concrete) to make use of fly ash by using PPC (Portland pozzolona cement) containing fly ash. A minimum of 15 percent replacement of cement with fly ash in PPC (by weight of the cement used) in the over-all RC for meeting the equivalent strength requirements.
- Use fly ash in Plaster/masonry mortar by employing PPC. Use plaster and/or masonry mortar, which utilizes a minimum 30 percent of fly ash in PPC, in 100 percent wall/ceiling finishes and wall construction, meeting the required structural properties.

Other recycled material can be incorporated in the building by adopting the following measures:

- Use of recycled steel for reinforcement.
- Use of construction waste generated during construction for levelling and land filling instead of soil or murom.
- Use of furnace slag in concrete.
- Use of rejected or thrown away furniture.

In case of retrofitting existing building, emphasis should be on preserving all the structural members in their original form and use the shell of the building, as far as possible, to house the new activities.

Local Material: To reduce the energy consumption in material transport, use of local material is essential. Any material, which is processed within 500 km from the construction site should be considered as local material. As mentioned earlier if there is conflict between relatively maintenance free material to be procured from distance against high maintenance required material available locally, the decision maker should choose material with less maintenance requirement. Use of precast beams, slabs and panels greatly reduces construction waste and hence demand for new material.

Wood: Use of material obtained from rapidly growing trees and shrubs will also reduce pressure on new material. Trees or shrubs that complete their life cycle within 10 years should be considered as rapidly renewable material. Example of such building material is composite panel doors with wheat or cork core.

Wood whenever used in the building must have certificate from Forest Department. The wood should be directly procured from Auction conducted by Forest Department or the chain of custody should be ensured to ascertain that the wood is coming from officially cut wood provided by Forest Department.

f. Indoor Air Quality / VOC free materials

Volatile Organic Compound (VOC) Emissions caused by paints, varnishes, sealants are harmful for occupiers. The building must use paints that emit low or zero VOC. The VOC limits are specified in the table below.

Material and VOC Limits

Type of Material	VOC Limit
Paints	
Non Flat Paints	150 gram/litre
Flat (Mat) Paints	50 gram/litre
Anti Corrosive/ Anti Rust Paint	250 gram/litre
Varnish	350 gram/litre
Adhesives	
Wood Flooring Adhesives	100 gram/litre
Tile Adhesives	65 gram/litre
Wood Adhesives	30 gram/litre

- Consider physical, biological, and chemical sources of potentially harmful contaminants and select environmentally friendly alternatives.
- Consider material placement, encapsulation, and the incorporation of barriers as means to insure good indoor air quality.
- Incorporate standards for air ventilation strategies.
- Implement pollutant sensors and air quality monitoring equipment that controls fresh air make-up.
- Use natural ventilation strategies where practical.

g. Lighting

Sufficient lighting is essential in every college/institute building for tasks like reading, writing, art and crafts etc. Insufficient lighting may increase stress on eyes and irritation. The lighting can be divided as Natural Lighting and Artificial Lighting according to its source.

Natural Lighting: In a college/institute building, lighting is most important aspect of design. Use of natural light is most preferable as it is free and provides better colour recognition. At least 75% of the floor area of each classroom should achieve at least 2% day light factor.

Day light factor can be calculated using various free software that can simulate the natural lighting. For manual calculation following method should be adopted.

$$\text{Daylight Factor} = \frac{\text{Window Area [SF]}}{\text{Floor Area [SF]}} \times \text{Window Geometry} \times \frac{\text{Actual Visible transmittance}}{\text{Minimum Visible transmittance}} \times \text{Height Factor}$$

- Window Area: Area of glass in the window
- Floor Area: Carpet area of the room

- Actual Visible transmittance: Transmittance of glass used for window

For other factors see the following figure. Other considerations include the following:

- Incorporate day lighting as a significant lighting strategy for all main teaching and learning spaces.
- Orient buildings to maximize southern exposure and minimize east-west walls.
- Reduce cost by integrating day lighting components into overall design.
- Account for benefits of day lighting by reducing cooling equipment and electrical lighting.
- In general, the internal colour should by a light shade which will reflect available light

Energy Benefits of Day Lighting

- Drastically reduces energy costs by up to 64%
- Saves on the up-front expense of cooling and electrical equipment, thereby keeping costs within budget
- Cuts the expenses associated with long-term mechanical and lighting equipment maintenance
- Produces superior lighting conditions; and
- Improves health and increases attendance.

Artificial Lighting / Energy Efficient Lighting and Electrical Systems: Artificial lighting should be mostly used as support to natural lighting at day hours in most of the classrooms. Artificial lighting will be absolutely necessary in case of laboratories, library, stores and function halls. While selecting lighting bulbs, the following factors should be considered:

- The lighting should be designed using software that can simulate indoor lighting conditions using manufacturer's data about luminaries. Such software is freely available on internet.
- Compact Fluorescent Lamps are easily available and provide great efficiency in lighting small spaces. These lamps or T5 tube lights should be used in class rooms.
- To light large areas like play ground or function halls, high pressure sodium vapour lamps should be used. These lamps are the most energy efficient lamps and have long working life.
- Lighting grid should match the working platform grid in laboratories.
- Employ lighting systems that are compatible with the day lighting strategy and use full-spectrum lighting in well-utilized, non-day lit spaces.
- Utilize controls that reduce lighting levels in stages according to the amount of natural daylight in each space.

- Use high-efficiency products that require low maintenance.
- Control key components of lighting, mechanical, and electrical systems with energy management system.

h. Ventilation

Indoor air quality is adversely affected by presence of indoor air pollutants and air changes. In a college/institute building, indoor air pollution can come from following sources: paints, varnishes, solvents that emit volatile organic compounds and carbon dioxide from human breathing. Generally used cleaning agents and cooking also contributes to indoor air pollution. To eliminate the threat of indoor air pollution, good ventilation is essential.

To ensure good ventilation following points should be considered:

- In most of the college/institute building the class rooms are built along a corridor in a row. This arrangement minimizes use of space but eliminates the possibility of cross ventilation. If the college/institute design is single storied then following arrangement can be used to achieve cross ventilation without compromising the use of single corridor by two rows of classrooms. See figure given here.
- At least 3 m. distance should be there between two external surfaces (say, walls) which are facing each other.
- Preferably, the room should have openings on two different walls to ensure cross ventilation.
- After the building construction is complete, including internal colouring and furniture work, the building should not be used for 10 days. During this time, all the doors and windows should be kept open so that all accumulated indoor pollution during construction can be flushed out.
- Laboratories must achieve desired ventilation through exhaust fans.
- If the college/institute building is single storey, wherever possible wall mounted fans should be used instead of ceiling fans. The ceiling of a single storied building absorbs heat of sun radiation and the ceiling fan circulates hot air into the room. A wall mounted fan circulates comparatively cooler air and adds to the comfort of the user.
- Employ energy efficient mechanical system.
- Avoid over sizing equipment.
- Utilize waste heat wherever possible.
- Use energy efficient strategies to insure good indoor air quality.

i. Water

Water conservation in a college/institute building can be achieved by adopting the following measures:

- Providing water efficient landscape.

- Trees that do not require water after first two years should be preferred in the college/institute premises.
- Minimize water consumption for irrigation through the use of native plants and xeriscape principles.
- Design landscapes with drought-resistant, native plants and grasses, and that support integrated pest management (IPM).
- The garden or trees should be irrigated with drip irrigation system
- Avoid unnecessary water waste by incorporating low-flow and water conserving fixtures.
- Use low-flow fixtures. Water efficient taps (discharging less than 12 litres/minute under 5 bar pressure) should be installed.
- The taps should be of self closing type.
- Water efficient duel flushing system should be used in all water closets.
- Harvest rainwater from the building roof and site for irrigation and toilet flushing. Rainwater harvesting can be efficient way of reducing fresh water demand.

Rain water harvesting system should be installed in the college/institute building. The system should include water collecting pipes from the roof top, valves to direct the down coming water, storage tank and ground water recharge pit/ well. The storage tank should be able store at least two days rain water in it. The capacity of the tank can be calculated in the following manner.

Max Rain Fall (as per IMD) occurred in a day in last 10 years for the regions expressed in meters X roof area in squire meters X 0.9 X 2	= Storage Capacity of tank in Cubic Meters

The system should allow for the first rainfall water to be directed to storm water drain and then subsequently should be directed into the storage tank. The overflow of the storage tank should be connected to rainwater harvesting pit or well. The overflow of the recharge pit or well should be connected to storm water drainage.

j. Energy

Reducing the electrical consumption without compromising the users comfort level is the goal of a sustainable building. The energy consumption in a college/institute building would be for lighting and mechanical ventilation. If the day-lighting and ventilation aspects are taken care of, the majority of electrical consumption requirements would be reduced. To enhance energy savings, the following measures should be implemented.

- Consider the wide range of viable passive energy technologies and integrate them into over-all design for maximum effect.
- Could use Energy modelling and simulation softwares as a decision making tool regards to the Energy Conservation Measures (ECMs) that can be implemented and are also economically viable.

- Use of electrical ballast for all lighting fixtures
- Use of China Mosaic or White Cement Tiles on the roof to reflect the heat radiated by sun.
- Use of energy efficient fans.
- Installation and use of at least 1 kW capacity hybrid system (Solar and Wind) for artificial lighting.
- Dove tailing with other GoI initiatives such as the Solar Mission.

k. Solid Waste

Solid waste generated in the college/institute building is considered as Municipal Solid Waste which is largely non-hazardous. Such waste would comprise of biodegradable material, recyclable material and inert material. Segregation at source would be essential to manage the waste efficiently. The biodegradable part of the waste should be composted within the college/institute premises. Various composting techniques are available and can be used as per the requirement of the particular case. Composting would be most suitable technique for rural college/institutes as it requires large areas but can be treated without any cost.

Vermi-composting, on the other hand requires smaller space and requires some maintenance at regular intervals. Organic Waste Converter requires least space but is costliest to maintain. Thus, technique should be selected according to space availability and cost constraints.

The recyclable waste can be sold to authorised vendors and inert waste should be handed over to the local governing body.

Some part of waste generated by college/institute may be hazardous waste also. Especially waste coming from laboratories and non-functional electrical bulbs would prove dangerous, if not handled properly. Waste coming from laboratories may contain harmful chemicals and the issue with Compact Florescent Lamps are the sharp glass pieces and mercury. The designer should provide a secluded storage space for such waste which is not easily accessible to any student.

l. Barrier free Environment

The States need to create a barrier free physical environment in the college/institute on following lines:

Children with loco-motor impairment: Includes children with non ambulatory and semi ambulatory disabilities.

- Gates, approach road and steps to allow for smooth movement.
- Ramps with handrails to be provided.
- No major level differences within building.
- Toilets to be provided with adjustable seat, grab rail and ramp.

Children with visual impairment: Includes children with low vision and total blindness.

- Plan of the building should be simple.

- Design of windows and illumination levels to eliminate glare
- Reduce distance between the child and the chalk board
- Use of contrasting colours and textures to aid identification of levels, ramps, passageways, steps, doors etc.
- Minimize risk of injuries - avoid projections, sharp edges etc.
- Provision of embossed eye charts on walls

Children with hearing impairment: Children with hearing deficiency or have difficulty in comprehending words and sounds in noisy environments.

- Reduce distance between teacher and child
- Insulate walls – provision of low cost mats and panels, soft board, charts etc.
- Provision of supplementary visual information – ideograms

Children with intellectual impairment: Children with uncommon social behavior or hyperactive

- Provide for open space and greenery
- Create / in built personal space for the child
- Use of bright colours
- Provision of in built play elements

m. Safety

Safety of the pupil and teaching staff is foremost important issue, which can be addressed through some design interventions as mentioned below:

- Providing sufficient high boundary wall – open access not just to the college/institute grounds but to areas around the buildings will be a safety concern as college/institutes in rural areas may be constructed outside developed areas.
- Providing strong and good quality doors, windows, frames and locking devices;
- Making roofs difficult to access
- Providing sufficient firebreaks in wall, ceiling and roof voids;
- Improper or easily accessible storage of waste could be harmful to pupil
- Providing sufficient and proper storage. Lack of this generally results in piling of equipments, furniture or records in corridor which will hamper movement especially in the case of emergency.

n. Other Environmentally Sensitive Building Products and Systems

- Consider the life-cycle energy and environmental impacts of products, materials, and processes - prefer local, recycled, non-polluting materials.
- Use products that are made from recycled materials.
- Prefer local products, materials, and services.

- Use products/materials that do not pollute
- Use alternative fuel and solar electric service vehicles and buses.
- Discourage single car travel by providing convenient connections to mass transit, safe bicycle paths and pedestrian friendly walkways.
- Develop and implement an effective commissioning process that will help ensure proper operation of mechanical and electrical systems.
- Through the design of the building, send a clear message that sustainability matters - design the college/institute as a teaching tool for sustainability.

Annexure 5

Environment Screening Form

Annexure 6

Generic EMP for Building Construction

S.No.	Activity	Measures to be Implemented by the Contractor
1.	Work Plan for EMP implementation	The Contractor's Project Manager shall be responsible for implementation of EMP provisions and will coordinate the over-all implementation of the said plan. Along with the Work Programme, the Contractor shall submit a plan including method statement and timeline about specific actions that will be taken by him to implement the provisions laid out in the EMP.
2.	Construction/ Labour camp – location	• Construction camps shall not be proposed within 500 m from the nearest settlements to avoid conflicts and stress over the infrastructure facilities with the local community. • Camp site shall not be located within 250 m from a water body including village pond. • A distance of at least 500 m shall be maintained from designated/protected natural habitats (such as National Parks, Sanctuaries, Biosphere Reserves, Reserve Forests and Ramsar Sites, if any) and Coastal Regulation Zone.
3.	Labour Camp Management	**Accommodation:** The Contractor shall follow all relevant provisions of the Factories Act, 1948 and the Building and the other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 for construction and maintenance of labour camp. **Potable water:** The Contractor shall: a) Supply of sufficient quantity of potable water (at least 40 lpcd) in labour camp at suitable and easily accessible places and regular maintenance of such facilities. b) If any water storage tank is provided, the bottom of the tank shall be kept at least 1mt. above the surrounding ground level. **Fuel for Cooking:** The Contractor will be responsible

S.No.	Activity	Measures to be Implemented by the Contractor
		for providing LPG Cylinder/Kerosene in labour camp to avoid cutting of trees for fuel wood from the adjoining areas. **Sanitation and sewage system:** The Contractor shall ensure that: • The sewage system for the camp shall be designed, built and operated in such a fashion that it should not pollute the ground water or nearby surface water. • Separate toilets/bathrooms, shall be arranged for men and women • Adequate water supply is to be provided in all toilets and urinals • All toilets in workplaces are with dry-earth system (receptacles) which are to be cleaned and kept in a strict sanitary condition • Night soil (human excreta) is to be disposed off by putting layer of it at the bottom of a permanent tank prepared for the purpose and covered with 15 cm. layer of waste or refuse and then covered with a layer of earth for a fortnight. **Waste disposal:** The Contractor shall provide garbage bins in the camps and ensure that these are regularly emptied and disposed off in a hygienic manner. **Fire Safety:** Adequate fire safety precautions shall be taken and required fire safety equipment (such as fire extinguishers) shall be provided by the Contractor.
4.	First aid	The Contractor shall arrange for – • A readily available first aid unit including adequate supply of sterilized dressing materials and appliances as per the Factories Rules in work zone • Availability of suitable transport at all times to take injured or sick person(s) to the nearest hospital
5.	Labour's Safety	The Contractor shall provide: • Protective footwear and protective goggles to all workers employed on mixing cement, concrete etc. • Protective goggles and clothing to workers engaged in stone breaking activities

S.No.	Activity	Measures to be Implemented by the Contractor
		• Earplugs to workers exposed to loud noise, and workers working in concrete mixing operation. • Adequate safety measures for workers during handling of materials at site. The Contractor shall comply with all the precautions as required for ensuring the safety of the workmen as per the International Labour Organization (ILO) Convention No. 62 as far as those are applicable to this contract. The Contractor shall make sure that during the construction work all relevant provisions of the Factories Act, 1948 and the Building and other Construction Workers (regulation of Employment and Conditions of Services) Act, 1996 are adhered to. The Contractor shall not employ any person below the age of **14 years** for any work and no woman shall be employed on the work of painting with products containing lead in any form. The Contractor shall also ensure that no paint containing lead or lead products is used except in the form of paste or readymade paint. He shall provide facemasks for use to the workers when paint is applied in the form of spray or a surface having lead paint is rubbed and scraped. The Contractor shall mark 'no smoking' in high risk areas. These shall be reflected in the Construction Safety Plan to be prepared by the Contractor during mobilization and shall be approved by competent authority.
6.	Labour requirements	Local people shall be given preference for unskilled and other jobs created during construction phase of the project. The contractor would notify requirement of unskilled labours in nearby/surrounding villages. In case local labours are not interested/available then a certificate/letter shall be issued by the Panchayat officials to the Contractors in this regard.
7.	Site Clearance	Only ground cover/shrubs that impinge directly on the permanent works or necessary temporary works shall be removed with prior approval from competent authority.. The Contractor, under any circumstances shall not cut or damage trees. Trees identified under the project shall be cut only after receiving clearance

S.No.	Activity	Measures to be Implemented by the Contractor
		from the State Forest Department or after the receipt of written permission from competent authority.
9.	Preservation of top soil	The topsoil from all areas of cutting and all areas to be permanently covered shall be stripped to a specified depth of 15 cm and stored in stockpiles. A portion of the temporarily acquired area shall be earmarked for storing topsoil. The following precautionary measures shall be taken to preserve them till they are used: (a) Stockpile shall be designed such that the slope does not exceed 1:2 (vertical to horizontal), and height of the pile is restricted to 2 m. To retain soil and to allow percolation of water, the edges of the pile shall be protected by silt fencing (b) Stockpiles shall not be surcharged or otherwise loaded and multiple handling shall be kept to a minimum to ensure that no compaction shall occur. The top soil shall be reinstated in the cyclone shelter compound after the construction is over. Residual topsoil, if there is any shall be utilized for the plantation.
10	Construction vehicles, equipment and machinery	All vehicles, equipment and machinery to be procured and brought to site for construction shall confirm to the relevant Bureau of India Standard (BIS) norms and the manufacturer's specifications. The discharge standards promulgated under the Environment Protection Act, 1986 shall be strictly adhered to. Noise limits for construction equipment to be procured shall not exceed the value specified in the Environment (Protection) Rules, 1986. The equipment proposed to be used for construction and installed close to waterway/streams, must be checked and certified fit, especially with respect to the potential leakage of oil and grease. The inspection should verify that: • Equipment is clean (free of mud, dirt and oil) • Equipment is in good working order. • A drip pan is available for equipment that shall be stored on site. • Contractor has a spill kit

S.No.	Activity	Measures to be Implemented by the Contractor
		• Operator is trained on the re-fuelling, maintenance and emergency spill procedures. • Adequate inspections shall be conducted during the construction period.
12.	Construction water	Water for construction and for use at construction camps (including labour camps) is to be extracted with prior written permission of (a) the individual owner, in case the source is private well/tube well; (b) Gram Panchayat in case the source belongs to community; and (c) Irrigation Department in case the source is an irrigation canal or a river. The Contractor shall take all precaution to minimize the wastage of water in the construction process.
13.	Air pollution	• The Contractor shall take every precaution (water sprinkling etc.) to reduce the level of fugitive dust generating from construction site. • Water shall be sprinkled at least twice during dry day on haulage roads passing through or near settlements (including at least 100 m before the settlement). • Wind barriers or screens shall be provided in the downwind direction at air pollution causing sources like plant sites and fine material storage stock yards. • Truck carrying construction materials will be duly covered to avoid spilling. • The Contractor shall ensure that all vehicles, equipments and machineries used for construction are regularly maintained and confirm that pollution emission levels comply with the relevant requirements of State Pollution Control Board (SPCB). • The Contractor shall submit PUC certificates for all vehicles/ equipment/machinery used for the project and maintains a record of the same during the contract period.

S.No.	Activity	Measures to be Implemented by the Contractor
14.	Noise Pollution	The Contractor shall confirm the following: • All plants and equipment used in construction shall strictly conform to the CPCB noise standards. • All vehicles and equipment used in construction shall be fitted with exhaust silencers. • Servicing of all construction vehicles and machinery shall be done regularly and during routine servicing operations, the effectiveness of exhaust silencers shall be checked and if found defective shall be replaced. • At the construction sites within 150 m of the nearest habitation, noisy construction work shall be stopped during the night time between 9.00 pm to 6.00 am.
15.	Water Pollution	***Water pollution from construction wastes*** The Contractor will take all precautionary measures to prevent the wastewater generated during construction from entering into streams, water bodies or the irrigation system. He will avoid construction works close to streams or water bodies during monsoon. All measures (including provision of temporary silt fencing to control sediment run-off) required for avoiding adverse impacts to water bodies (such as ponds, streams, canals and rivers), water sources (such as hand pumps and wells) and adjacent farmland shall be undertaken by the Contractor. ***Water pollution from fuel and lubricants*** • The Contractor will ensure that all construction vehicle parking location, fuel/lubricants storage sites, vehicle, machinery and equipment maintenance sites are located at least 100 m away from any water body. The Contractor will also ensure that spillage of fuels and lubricants do not contaminate the ground. • If fuel storage and re-fuelling areas are located on agricultural land or areas supporting vegetation, the top soil will be stripped, stockpiled and returned after cessation of such activities. • Storage of materials like fuel, chemicals and

S.No.	Activity	Measures to be Implemented by the Contractor
		cement shall be done in a manner (with impervious layer on bottom and a covered shed on top) that does not contaminate land and ground/surface water.
16.	Solid Waste	Solid waste from the project during construction will be mainly domestic scraps & wastes from the construction camp and construction spoils from construction sites. • The small amount of construction debris will be disposed of in suitable preidentified or existing dumping areas in tune with the local condition to avoid land degradation & water logging due to indiscriminate dumping. • Dumping areas will be biologically reclaimed through top soil cover. • Regular inspection of haul roads, construction site & camp will be carried out to ensure regular and timely removal of construction debris to the dumping sites.
17.	Restoration and Rehabilitation of Sites	All work sites and areas under temporary use (including construction and labour camps, plant sites, haul roads and borrow areas) shall be restored/ rehabilitated to a better condition (if not at least to its original condition) and to the satisfaction of land owner upon completion of construction work by the Contractor. Completion of work will also include completion of rehabilitation and clean-up of the work sites including camps, plants, in and around the construction site; disposal of debris/construction wastes at pre-approved locations and; restoration of borrow areas and other sites/locations used for material sourcing.
18.	Liabilities	Any liability arising out of Contractor's agreement with landowners/ local people/gram panchayat (including those related to temporary use of land, water extraction and disposal of debris) shall be settled by the Contractor.

Annexure 7

Construction Camps and Basic Amenities for Labour

Foreseeing the involvement of women, both direct and indirect in the construction activities, IA shall ensure certain measures that are required to be taken by the construction contractor towards welfare and wellbeing of women and children during the construction phase such as:

(a) **Temporary Housing:** During the construction the families of labourers/workers should be provided with residential accommodation suitable to nuclear families.

(b) **Health Centre:** Health problems of the workers should be taken care of by providing basic health care facilities through health centres temporarily set up for the construction camp. The health centre should have at least a doctor, nurses, General Duty staff, medicines and minimum medical facilities to tackle first-aid requirements or minor accidental cases, linkage with nearest higher order hospital to refer patients of major illnesses or critical cases. The health centre should have MCW (Mother and Child Welfare) units for treating mothers and children in the camp. Apart from this, the health centre should provide with regular vaccinations required for children.

(c) **Day Crèche Facilities:** It is expected that among the women workers there will be mothers with infants and small children. Provision of a day crèche may solve the problems of such women, who can leave behind their children in such a crèche and work for the day in the construction activities. If the construction work involves women in its day-night schedules, the provision of such a crèche should be made available on a 24-hour basis.

The crèche should be provided with at least a trained ICDS (Integrated Child Development Scheme) worker with '*Ayahs*' to look after the children. The ICDS worker, preferably women, may take care of the children in a better way and can manage to provide nutritional food (as prescribed in ICDS and provided free of cost by the government) to them. In cases of emergency, a trained ICDS worker can tackle the health problems of the children much more efficiently and effectively and can organise treatment linking the nearest health centre.

(d) **Proper Scheduling of Construction Works:** Owing to the demand of a fast construction work, it is expected that a 24 hours-long work-schedule would be in operation. Women, especially the mothers with infants, should to be exempted from night shifts as far as possible. If unavoidable, crèche facilities in the construction camps must be extended to them in the night shifts too.

(e) **Education Facilities:** The construction workers are mainly mobile groups of people. They are found to move from one place to another taking along their families with them. Thus, there is a need for educating their children at the place of their work. Wherever feasible, day crèche facilities may be extended with primary educational facilities or some kind of informal education facilities

could be created at the construction camp.

(f) **Control on Child Labour**: Minors, i.e. persons below the age of 14 years, should be restricted from getting involved in the constructional activities. It will be the responsibility of IA and social and environmental experts of DPIUs to ensure that no child labourer is engaged in the activities. Exploitation of women is very common in such camps. IA shall keep strong vigilance to ensure cessation of such exploitation.

(g) **Special Measures for Controlling STD, AIDS:** Solitary adult males usually dominate the labour force of construction camps. They play a significant role in spreading sexually transmitted diseases. In the construction camps as well as in the neighbouring areas, they are found to indulge in high-risk behaviour giving rise to STDs and AIDS.

While it is difficult to stop such activities, it is wiser to make provisions for means of controlling the spread of such diseases. IA shall conduct awareness camps for the target people, both in the construction camp and neighbouring villages as well. IA shall have to tie up SACS for awareness and IEC materials, and supply of condoms at concessional rate (or free) to the male workers may help to a large extent in this respect.