Draft to be used for public consultations purposes

Second Sindh Education Reform Program (SERP-II)

Environmental Impact Assessment (EA-II)

and

Environmental and Social Management Framework (ESMF-II)

DRAFT FOR PUBLIC CONSULTATION PURPOSE

Reform Support Unit

Education and Literacy Department

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Government of Sindh

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Executive Summary

The Sindh government has embarked on the design and implementation of the Second Sindh Education Sector Reform Program (SERP-II). The government has drawn lessons from SERP-I[1] implementation and under SERP-II will carry forward some of the successful governance and accountability interventions under SERP-I, and add in complementary governance and accountability interventions, that will ensure positive results at the school level.

The World Bank (WB) is planning to support SERP-II with an US$ 300 million loan, to be disbursed over a four-year period (FY2012-13 to 2015-17), subjected to the achievement of annual performance benchmarks called Disbursement Linked Indicators.

As part of the Implementation Completion Report for SERP-I, and to evaluate and identify lessons learned during the ESMF-I implementation of the World Bank commissioned two field surveys covering a sample of schools (public and private) that were built or renovated under SERP-I. The first survey, on a sample of 47 randomly selected public schools in 11 districts, was carried out in June 2012, and the second on a sample of 28 private schools (SEF schools) in November 2012. A summary of the findings of both surveys are included and discussed in section 4.3 of this document.

In line with the WB safeguard policies and national regulations, an environmental assessment (EA-II) of the proposed program has been carried out and an Environmental and Social Management Framework (ESMF-II) prepared. This document presents the process and outcome of the environmental assessment of SERP II.

The EA-II and ESMF-II are based on lessons learned from the implementation from 2009 to 2012 of the original EA and ESMF prepared for SERP I. The revised and enhanced version of the environmental assessment and the environmental and social management framework are herein referred as EA-II, and ESMF-II.

Environmental Laws and Regulations

The Pakistan Environmental Protection Act of 1997 is the apex environmental legislation in the country which created the institutional framework for all subsequent regulations regarding environmental management, including the provincial guidelines for EIA preparation. . Given the constitutional changes, the Federal Ministry of Environment (MoE) has been renamed as Ministry of Climate Change (MoCC).

[1] In order to help the reader to differentiate the two Projects, SERP will be referred in this document as SERP-I. The same nomenclature will be applied to the original EA and ESMF, which will be referred as EA-I, and ESMF-I.

The Sindh Environmental Protection Agency (SEPA) is the environmental authority in the province. For the environmental management of infrastructure projects, SEPA adopted the same requirements issued by the Pakistan Environmental Protection Agency "*Review of IEE and EIA Regulations, 2000*." The regulations cover the scope, contents and applicable procedural steps for the environmental assessments that are required for this type of projects. To facilitate their application, the Pak-EPA 2000 regulations included two Schedules in which several types of projects were specified. Projects listed in Schedule I are required to prepare only an initial environmental examination (IEE), while projects listed in Schedule II must prepare a full-fledged EIA, carry out public consultations, and apply for an environmental permit. Education sector projects involving the construction and/or renovation of schools are not included in any of the two Schedules. Therefore, there are no national/provincial environmental requirements to be complied with by SERP-II sponsors (ELD/RSU). The present EA has been carried out to comply with the World Bank environmental safeguard policies that are described in section 3.2.

Environmental Assessment (EA-II) and Environmental and Social Management Framework (ESMF-II)

The environmental assessment (EA-II) of the proposed program has been carried out using a screening matrix, which was tailor-made addressing the particular nature of the program´s impact-generating activities. The EA-II did not identify significant environmental impacts associated with the implementation of SERP-II. Based on the findings of the environmental assessment, an Environmental and Social Management Framework (ESMF-II) has been prepared to provide the actions required to minimize or avoid the potential negative impacts, maximize the positive ones and to address other important issues to the sustainability of the SERP-II.

Going beyond compliance, the project includes a number of environmental interventions aimed at enhancing the benefits to the target population. To ensure the project's environmental sustainability, it includes interventions to: (i) minimize the vulnerabilities to natural disasters[2] (both in new and rehabilitated schools); (ii) improve the quality of drinking water, and the sanitation facilities at schools; (iii) educate children in personal hygiene habits, and in safety procedures during emergencies; (iv) implement low-cost renewable power systems in schools located in off-grid areas to address inadequate learning environment for children (excessive heat and poor lightning); and (v) implement low-cost water pollution control technologies, and management of liquid and solid wastes generated during school construction and operation.

As it occurred in SERP-I, the subprogram of school construction, renovation and/or consolidation will be implemented in the settled areas in which the schools are currently located. Since no schools will be constructed in disputed or forested areas, as defined in World Bank policies, neither OP 7.60 (Disputed Areas), nor OP 4.36 (Forested Areas), will be triggered.

Similarly, since the program does not include the use of any pesticides, the OP 4.09 (Pest Management) will not be triggered.

[2] Mainly due to earthquakes, floods and landslides.

As mentioned before, all construction activities will be carried out in lands belonging to the existing schools, which are located in settled areas. They are not expected to affect any of Sindh´s natural habitats -- one national park, thirty-three wildlife sanctuaries and sixteen game reserves. Therefore, OP 4.04 is not triggered. However, as a precaution, the ESMF-II includes guidelines to help to avoid eventual problems in natural habitats.

The school construction activities might uncover places of archeological, historical, or religious significance in the province. There are over 60 such sites in Sindh. As a precaution, ESMF-II includes guidelines on how to proceed in case any such site is discovered during school construction. Therefore, OP-11 (Cultural Property) is triggered.

The project will not trigger the World Bank social safeguard policies. Two components are expected to have civil works that might require lands. However, SERP II will not finance investments that potentially could trigger the Government Land Acquisition Act, or the World Bank OP 4.12 on Involuntary Resettlement[3].

Operational experiences and extensive planning work indicates that there are no indigenous peoples as defined under the World Bank policy in the project areas. Therefore, the World Bank OP 4.10 on Indigenous People will not be triggered.

The Project is going beyond safeguards compliance and will carry out a comprehensive social assessment. It will be combined with the rigorous social monitoring and evaluation system designed for the project. The social assessment will be focus on facilitating stakeholder participation during implementation, continuing exploring the various social factors underpinning quality to education, developing a gender dimension of various component programs and further screening component interventions for social safeguard impacts.

Though potential negative impacts are not significant, mitigation measures have been proposed in the present EA-II and an environmental and social management framework (ESMF-II) has been developed to further reduce the probability and magnitude of the potential negative impacts. ESMF-II will also improve the overall environmental performance of the program. The framework proposes a two-tier organizational structure with the overall environmental management responsibility assigned to the Government of Sindh (GoS) Education and Literacy Department (ELD), and its Reform Support Unit (RSU). Direct implementation responsibilities are assigned to the District Governments and their executing agencies (Implementation Partners - IPs), supported by specialized consulting firms. The ELD will provide also capacity building support to the partners to create awareness and help achieve the environment management objectives.

The present EA-II has confirmed that the program will not result in any significant and/or lasting environmental impacts. It is also concluded that the present assessment is sufficient, and no

[3] The new public schools to be built will replace shelterless schools which already have the necessary land, and are not occupied by low-income settlers. The public-private partnerships funded by the SERP II to establish new schools to be run by the private sector will use existing buildings to minimize the need of sizeable upfront investments.

further EA action is needed, in accordance with the applicable World Bank´s requirements (OP 4.01 on Environmental Assessment).

The ESMF summarizes the actions proposed to address the identified impacts and concerns, and comprises sections on: (i) the roles and responsibilities of all major stakeholders involved in the environmental management aspects of SERP-II, as well as the documentation and reporting mechanisms; (ii) environmental construction and operation guidelines; and (iii) a social management framework addressing the social issues. Three annexes are included in the ESMF-II: (i) Assessment of ESMF-I Implementation; (ii) Sindh Active Faults and Arsenic Concentrations; and (iii) Implementation Strategy for the Environmental, Safety and Safeguards Aspects.

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Acronyms

DG	District Government
DLI	Disbursement Linked Indicator
DPC	Development Policy Credit
EA	Environmental Assessment
EC	European Commission
EEP	Eligible Expenditure Program
EIA	Environmental Impact Assessment
ELD	Education and Literacy Department
ESMF	Environmental and Social Management Framework
GoP	Government of Pakistan
GoS	Government of Sindh
Ha	Hectare
IDA	International Development Association
IEE	Initial Environmental Examination
IP	Implementation Partner
OP	Operational Policy
PPP	Public Private Partnership
RSU	Reform Support Unit
SEF	Sindh Education Foundation
SEMIS	Sindh Education Management Information System
SEPA	Sindh Environmental Protection Agency
SERP	Sindh Education Reform Program
SIL	Specific Investment Loan
SMC	School Management Committee
SRP	School Rehabilitation Program
SWAp	Sector Wide Approach
TA	Technical Assistance
TOP	Terms of Partnership
TOR	Terms of Reference
WB	World Bank

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1 Project Description

1.1 Background.

The Sindh Education Sector Reform Program. In the period 2007/08, the Sindh government initiated a major, multifaceted, medium-term sector reform program for primary and secondary education called the Sindh Education Sector Reform Program (SERP). Reflecting an important shift from previous education development efforts by the Sindh government which aimed to increase expenditures, inputs, and benefits, SERP aimed to maximize the gains from any given level of expenditures, inputs, and benefits principally by strengthening governance and accountability. The World Bank provided financial support to SERP between FY2006/07–FY2011/12 through the Sindh Education Sector Development Policy Credit (SEDPC) approved in June 2007, the Sindh Education Sector Project (SEP) approved in June 2009, and the Additional Financing to the Sindh Education Sector Project (SEP AF) approved in March 2011.

The Project Development Objective (PDO) for SEP was to support SERP I. The objectives of SERP were to increase school participation, reduce gender and rural-urban disparities, increase progression, and improve the measurement of student learning. Success in meeting SERP I objectives was measured by using the following outcome indicators and targets:

Outcome indicator	Latest available baseline	Target, 2011/12
Primary NER (%)	50.0 (2006/07)	55.6
Female-male ratio NER, primary, rural (%)	61.2 (2006/07)	64.6
Class 5-6 transition rate, rural, girls, public school (%)	51.2 (2007/08)	63.4
Learning levels monitored through diagnostic learning assessments		

SEP was a results-based project, with 98% of its credit amount of US$300 million conditioned on the Sindh government satisfactorily complying with the credit covenants and meeting Disbursement Linked Indicators (DLIs), which were program implementation performance and progress targets agreed with the Sindh government. SEP Additional Financing was also a results-based project, with 100% of its credit amount of US$50 million conditioned on DLIs. The Sindh government complied with credit covenants and satisfactorily met the agreed DLIs under SEP and SEP AF.

1.2 The Second Sindh Education Sector Reform Program (SERP-II)

The Sindh government has embarked on the design and early implementation of the Second Sindh Education Sector Reform Program (SERP II). The Project Development Objective

(PDO) is to support the Second Sindh Education Sector Reform Program (SERP II). SERP II aims to raise school participation, by improving the quality of service delivery, and measure student achievement. Success in the project in meeting the PDO will be measured by the following indicators:

1. Primary school participation: Net Enrollment Rate (NER), primary, 6–10 years;
2. Middle school participation, NER, middle, 11–13, years;
3. High school participation, NER, matriculate, 14–15 years; and
4. Measurement of student achievement: Annual administration of the Student Achievement Test in grades 5 and 8 in government schools.

The project is a US$300 million Specific Investment Credit (SIC), which supports the implementation of SERP II over the period 2013–17. The project comprises of two main components: (i) a results-based component—Component 1—which finances SERP II, amounting to US$295 million (roughly 98% of the total Credit); and (ii) a Technical Assistance (TA) component—Component 2—which finances essential advisory, technical, capacity-building, and monitoring and evaluation support for SERP II, amounting to US$5 million (2% of the total Credit).

Component 1. Under the results-based component, the event and amount of project disbursements will be contingent on the satisfactory achievement of DLIs. For each subprogram, the activity promoted by a stream of annual DLIs over the project period is summarized below.

1. DLIs for subprogram 1 on **budget and expenditure management** promote budget preparation and execution following an agreed customized calendar for SERP-II initiatives and streamlined release procedures.
2. DLIs for subprogram 2 on the **Annual School Census** promote the regular administration of the ASC activity accompanied by strengthened administrative arrangements, procedures, and practices.
3. DLIs for subprogram 3 on the **Student Achievement Test** promote the regular administration of the SAT accompanied by an external review of the activity and the incorporation of recommendations to strengthen the sustainability and robustness of the activity, the reliability and validity of the test results, and the responsible use and dissemination of test results.
4. DLIs under subprogram 4 on **school budgets** promote the preparation, approval, and release of school budgets, both salary and nonsalary components, following transparent, objective, and needs-based criteria; the refinement and customization of the criteria to better account for school needs; district and school compliance with fiduciary guidelines for managing the use of nonsalary school budgets, and field-based, third-party support to the districts for managing and monitoring school budgets.

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5. DLIs under subprogram 5 on **school infrastructure development** promote school rehabilitation following a whole school development approach and school upgradation in compliance with transparent, objective screening criteria; construction quality, school design, and environment management conditions; and third-party supervision of civil works activities.

6. DLIs under subprogram 6 on **school system consolidation** promote the merging of such types of schools into single schools and organizing and strengthening them to function as single schools.

7. DLIs under subprogram 7 on **school management committees** promote stronger due diligence and financial management controls; improved communication of expectations, roles, responsibilities, and redressal avenues to key parties associated with the SMC initiative; and more extensive and intensive support to and monitoring of SMCS by the districts.

8. DLIs under subprogram 8 on **incentive- and accountability-based public financing of the private provision of schooling** promote the incremental expansion of the program accompanied by strengthened administrative and monitoring systems and the design and enforcement of incentive and accountability conditions to improve school performance.

9. DLIs under subprogram 9 on **headteachers** promote the introduction of headmasters in qualifying, relevant schools following agreed transparent, objective, merit-based recruitment and promotion criteria and rigorous mechanisms; headmaster contracts which include a well-specified job description and performance measurement criteria; and training and the provision of materials and tools to help headmasters perform their job.

10. DLIs under subprogram 10 on **teacher management** promote strengthened merit- and needs-based teacher recruitment arrangements, procedures, and practices; teacher contracts with include a well-specified job description and performance measurement criteria; the integration of teacher performance management within the government's standard performance evaluation system; and training and provision of materials and tools to help recruited teachers perform their job.

Component 2. Under the Technical Assistance component, funds will finance important technical, advisory, and capacity-building support to strengthen fiduciary, environmental management, administrative, and monitoring and evaluation activities. The selected activities would aid program implementation progress and performance including, importantly, the achievement of DLIs.

1.3 Project´s Potential Impact-Causing Actions

From the environmental management point of view, subprogram 5 (**school infrastructure development**), is the only one that might generate negative social and environmental impacts.

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It is estimated that around 4,000 schools in 23 districts will be rehabilitated, constructed, or added missing facilities under SERP II. The construction and rehabilitation of schools are in general small civil works projects with minor environmental impacts. In order to ensure a good quality final product, the construction activities are monitored by inspectors who are required at the end of construction to certify that everything was done according to the designs and accepted local construction standards.

In general, the following actions are carried out in the construction of schools:

1. Site clearing and vegetation removal (if any);
2. Site leveling with small earth-moving equipment;
3. Minor excavations for the building´s foundations;
4. Installation of a temporary toilet for the construction workers;
5. Stocking of construction materials (cement, bricks, sand, steel rebars, water, etc.);
6. Preparation of concrete forms using locally available wood;
7. Rebar preparation (steel cutting & bending);
8. Construction of a water well and installation of a manual pump (if none exists). In case the available water is inadequate for concrete-preparation, water will have to be brought from the nearest place;
9. Preparation of concrete for the building´s framed structure (i.e., pillars, beams, and slabs in reinforced concrete);
10. Brick-laying using locally prepared mortar;
11. Roofing and flooring;
12. Installation of windows and doors;
13. Construction and installation of underground and overhead water tanks where missing or with insufficient capacities, along with the treatment facility for safe drinking water (if any);
14. Minor excavations for sewage treatment facilities (i.e., septic tank and its final disposal);
15. Plumbing for the sanitation facilities;
16. Electrical wiring;
17. Wall plastering;
18. Wall painting;
19. Construction of boundary walls;
20. Construction wastes removal from the site;
21. Final construction inspection and building acceptance (filling of a punch list by the construction inspector).

1.4 Project Location Characteristics

SERP-II will be implemented throughout the twenty-three districts of the Sindh province. Sindh is the second largest province of Pakistan. The neighboring regions are Balochistan to the west and northwest, Punjab in the north, Rajasthan (India) to the east and the Arabian Sea and Gujarat (India) to the south. **Exhibit 1.1** presents a map of the Province. The

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province forms the lower Indus basin and lies between 23º and 28º North latitudes and 66º and 71º East longitudes. It is about 579 km in length from north to south and nearly 442 km in its extreme breadth (281 km average). It covers an area of 140,914 km^2.

The overall literacy of Sindh is 45.29 percent (1998 census data). The urban literacy is 63.72 percent which is substantially higher than the rural literacy which is 25.75 percent. At about 24 percent, the overall educational enrolment in the entire Sindh province is also quite dismal.

There exist a large number of sites of archeological, cultural, historical and religious significance in Sindh. The major ones include the archeological remains at Moen-Jo-Daro, which is one of the most important Indus Civilization sites, and the Makli Hills graveyard in the Thatta district. In addition, a large numbers of shrines exist in almost all parts of the project area. A list of these places located in the project area districts is provided in **Exhibit 1.2**.

The entire area of Sindh is located in the Indus Basin, which essentially forms the western extension of Indo-Gangetic Plain, and has been made up of the silt brought by the Indus and its numerous tributaries, such as Jhelum, Chenab, Ravi and Sutlej on the east bank, and Kabul, Kurram, Tochi, and others on the west bank. The Indus Plain is known for its agricultural fertility and cultural development throughout history.

The left bank tributaries of the Indus River all meet at Panjnad and flow as one large stream for about 75 km before joining the Indus at Mithankot, and south of it, the Indus flows almost alone up to the Arabian Sea without receiving any noticeable tributary.

The average annual discharge of the Indus – 92 million acre feet (MAF) at Attock Khurd – is much higher than the combined discharge of its tributaries. There is a great fluctuation in their seasonal discharge, especially in the hot summer and rainy season. Almost all of its tributaries and the Indus itself have their sources in snow and glaciated areas of Himalayan, Karakoram and Hindukush mountain systems.

On the basis of hydrology and land geomorphology, the Indus Plain can be divided into the Upper and Lower Indus Plains. The Upper Indus Plain differs from the Lower Indus Plain (the Sindh Province) primarily because of the major tributaries (Jhelum, Chenab, Ravi and Sutlej) divide the land surface into several interfluves or '*doabs*'. The two plains are separated by a narrow corridor near Mithankot where the Sulaiman range approaches the Indus River. The Lower Indus Plain (Sindh Province) is very flat, generally sloping to the south with an average gradient of 95 mm per km (6 inches per mile). Sindh can be divided in five distinct micro-relief land forms: active flood plain; meander flood plain; cover flood plain; scalloped interfluves; and the Indus delta. In the northeast, the meander flood plain is more extensive, while in the central and lower Indus Plain, the cover flood plain is more prominent. Topographically, Sindh can be divided into four distinct parts with the dry and barren Kirthar Range in the west, a central alluvial plain bisected by the Indus River, a desert belt in the east, and the Indus delta in the south.

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As the catastrophic floods that occurred in 2010 showed, the large discharge (flow) variability of the Indus River and its tributaries, coupled with the geomorphological characteristics (very flat) of the Lower Indus Plain, makes thousands of schools located in Sindh´s flood plains at high risk of floods. The severe school damages inflicted by the 2010 flood highlighted the vulnerability of the schools located in or near flood plains. Their rehabilitation/reconstruction is consuming significant amounts of the already scarce resources available for the Sindh public education system.

Pakistan geologically overlaps both with the Indian and the Eurasian tectonic plates where the Sindh and Punjab provinces lie on the north-western corner of the Indian plate while Balochistan and most of the Khyber-Pakhtunkhwa lie within the Eurasian plate, which mainly comprises the Iranian plateau, some parts of the Middle East and Central Asia. This explains the high seismic activity observed in the country. Since earthquakes cannot be prevented, and many Sindh schools are located in earthquake prone areas, any school construction program needs to pay attention to their potential vulnerabilities to such extreme events. Regarding the hydrogeological characteristics, some areas in Sindh are prone to natural water contamination (surface and groundwater) by trace elements with significant impact on public health such as arsenic and fluorides.

There are one national park, thirty-three wildlife sanctuaries and sixteen game reserves in the Sindh province. A list of these protected areas is provided in **Exhibit 1.3**.

2 Document Structure

Chapter 3 describes the Pakistan's regulatory and legal framework, and World Bank's safeguard policies for environmental management relevant to the proposed program.

Chapter 4 presents the environmental assessment methodology adopted during the EA exercise; identifies the key environmental impacts and concerns associated with the proposed program; and presents the findings and recommendations of the two surveys conducted in 2012, to assess the effectiveness of the actions proposed in the ESMF-I for SERP-I, as well as an assessment of the reasons of the identified compliance problems. This assessment includes also a discussion on the risks posed by the existing adverse hydrological, hydro-geological and geological characteristics of the Sindh province on the implementation of SERP-II. These aspects, if not properly addressed, might result in serious harm to both teachers and students.

Chapter 5 presents the proposed Environmental and Social Management Framework, which is essentially a mechanism for the implementation of the environmental management measures. This new framework (ESMF-II) is an updated and improved version of the original one, and reflects the lessons learned during SERP-I implementation.

Chapter 6 presents the social aspects related to SERP-II.

Chapter 7 presents the conclusion of the studies carried out.
Annex 1 presents an assessment on ESMF-I implementation

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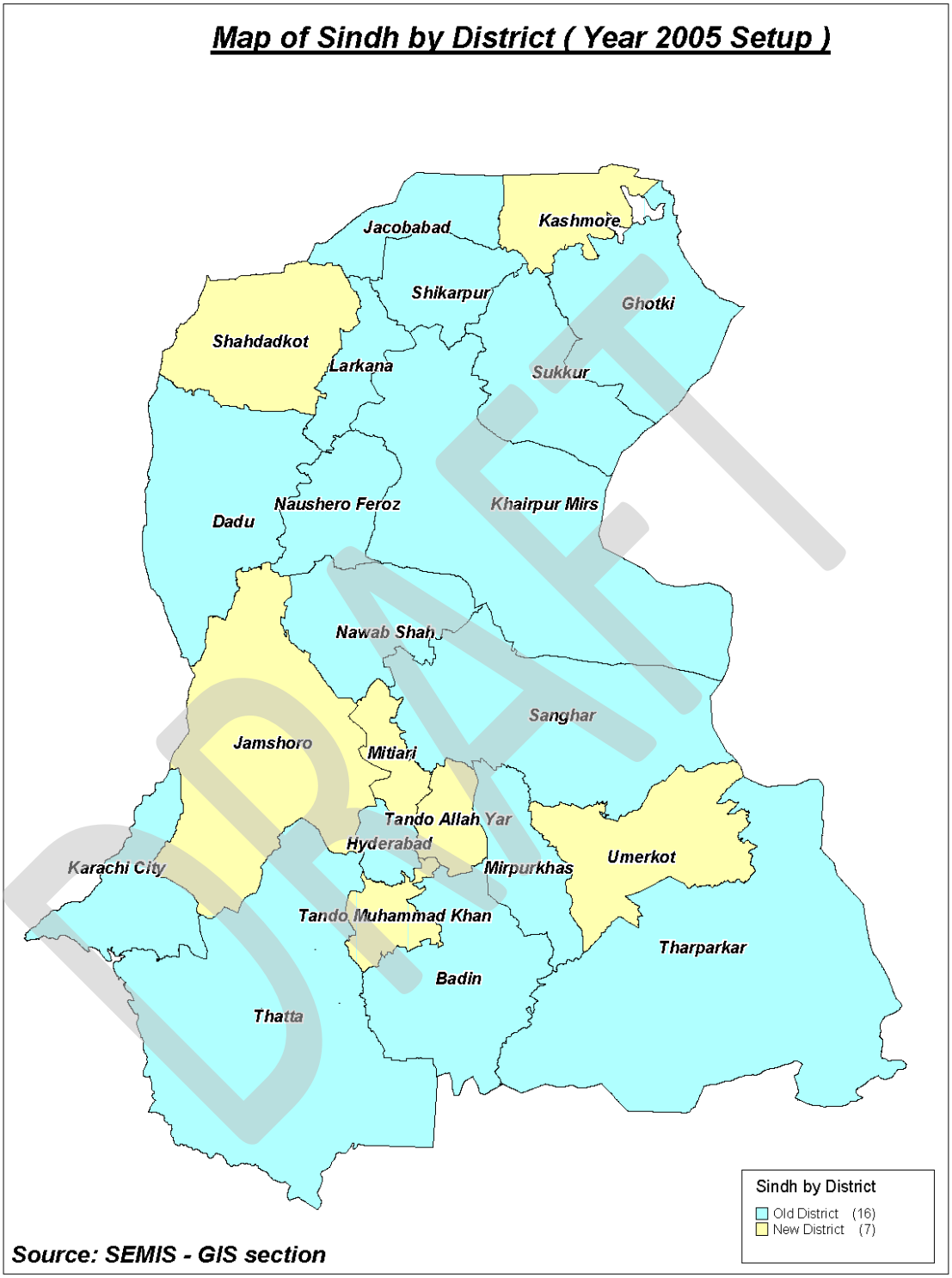
Exhibit 1.1: Map of Sindh



Annex 2 presents an example of the results of the analytical work being done by World Bank consultants (Sindh Active Faults and Arsenic Concentrations).

Finally, **Annex 3** presents a detailed description of the recommended environmental management programs and actions, as well as an Implementation Strategy including a timetable for their execution.

Exhibit 1.2: Places of Archeological, Historical or Religious Significance Falling in Sindh Province

Badin District

1. Ruins of old city at Badin.

Hyderabad District

2. Tomb of Ghulam Shah Kalhora, Hyderabad.
3. Boundary Wall of Pucca Fort, Hyderabad.
4. Old office of Mirs, Hyderabad Fort, Hyderabad.
5. Tajar (Treasury) of Mirs, Hyderabad Fort, Hyderabad.
6. Tomb of Ghulam Nabi Khan Kalhora, Hyderabad.
7. Buddhist Stupa, (Guja) a few miles from Tando Muhammad Khan, Hyderabad.
8. Haram of Talpur Mirs, Hyderabad.
9. Enclosure containing Tombs of Talpur Mirs, Hyderabad.
10. Tower (Now used as water tank), Hyderabad Fort, Hyderabad.
11. Two Mosques and a Tomb, Tando Fazal, Hyderabad.
12. Tomb of Sarfaraz Khan Kalhora, Hyderabad.
13. Nasar-ji- Mosque, Mohalla Jhambhas, Nasarpur, Hyderabad.
14. Kiraiji Masjid, Mohalla Misri, Nasarpur, Hyderabad.
15. Mai Khairiji Masjid, Mohalla Memon, Hyderabad.
16. Mosque of Mirs, Hyderabad, ward “E”, Hyderabad.
17. Enclosure containing Tombs of Talpur Mirs, Hyderabad.

Larkana District

18. Jhukar mound, Mithadaro, Larkana.
19. Moenjodaro, Buddhist monastery and prehistoric remains around Moenjodaro, Larkana.
20. Moenjodaro, Buddhist Stupa and prehistoric remains underneath, Moenjodaro, Larkana.
21. Tajjar Building, Jinnah Bagh, Larkana.
22. Tomb of Shah Baharo, Larkana.
23. Square Tower, near Dhamrao, Larkana.
24. Dhamrao Dero (three groups), Deh Dhamrao, Deh 67 Nasrat, Larkana.

Sanghar District

25. Brahmanabad (Mansura) locally known as Dalo Raja-ji-Nagri, Jamara, Tehsil Sinjhoro. Deh Dalore, Sanghar.
26. Mound Thulh, Deh Kot Bujar, Sanghar.
27. Graveyard, Tehsil Shahdadpur, Sanghar.

Thatta District

28. Brick dome to the north-east of tomb of Mubarak Khan (tomb of Fateh Khan's sister), Makli Hill - Thatta.
29. Tomb of Mubarak Khan son of Jam Nizamuddin, Makli Hill, Thatta.
30. Tomb and compound wall of yellow stone to the south of Jam Nizamuddin, Makli Hill, and Thatta.
31. Tomb and enclosure to the south-west of S. No. 92. Makli Hill, Thatta.
32. Tomb and enclosure to the west of the above tomb S. No. 93, Makli Hill, Thatta.
33. Brick dome to the south of the tomb S. No 94, above Makli Hill, Thatta.
34. Sultan Ibrahim and other tombs also but wrongly known as Amir Khalil Khan's tomb, Makli Hill, Thatta.
35. Tomb and compound wall of yellow stone to the south of Mirza Muhammad Baqi Tarkhan tomb (wrongly called Mirza Isa Khan's tomb), Makli Hill, Thatta.
36. Brick enclosure of Mirza Baqi Baig Uzbak's tomb, south of the tomb of Nawab Isa Khan the younger, Makli Hill, Thatta.
37. Dabgir Masjid, Makli Hill, Thatta.
38. Graveyard, Makli Hill, Thatta.
39. Goth Raja Malik graveyard known as Maqam Qadar Shah, Deh Raja Malik, Thatta.
40. Sonda graveyard, village Sonda, Thatta.
41. Jam Nizmuddin's tomb, Makli Hill, Thatta.
42. Baradari, Makli Hill, Thatta.
43. Tomb of Amir Sultan Muhammad son of Amir Hajika, Makli hill, Thatta.
44. Tomb of Nawab Isa Khan, the younger Makli Hill, Thatta.
45. Mirza Tughral Baig's tomb, Makli Hill, Thatta.
46. Tomb of Mirza Jani and Mirza Ghazi Baig, Makli Hill, Thatta.
47. Stone enclosure containing tombs of Nawab Isa Khan, Makli Hill, Thatta.
48. Mirza Muhammad Baqi Tarkhan's tomb (wrongly called Mirza Isa Khan's tomb) Makli Hill, Thatta.
49. Stone tomb with a dome on stone pillars by the side Mirza Jani Baig's tomb, Makli Hill Thatta.
50. Brick masjid and enclosure near Nawab Shurfa Khan's tomb (supposed to be the tomb of Sayyed Amir Khan), Makli Hill, Thatta.
51. Stone tomb with enclosure to the south of tomb of Mirza Muhammad Baqi Tarkhan, Makli Hill, Thatta.
52. Tomb of Mirza Muhammad Isa Turkhan I, Makli Hill, Thatta.
53. Brick tomb near the tomb of Qulia pir, Makli Hill, Thatta.
54. Tomb with superstructure on stone pillars to the north of tomb of Jam Nizamuddin, Makli Hill, Thatta.
55. Brick structure to the north of tomb of Jam Nizamuddin, Makli Hill, Thatta.

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56. Two pavilions on stone pillars over the tombs to the southwest of tomb of Jam Nizamuddin. One is the tomb of Jam Sikandar Shah, Makli Hill, Thatta.
57. Kalan Kot, Makli Hill, Thatta.
58. Nawab Amir Khan's mosque, Makli Hill, Thatta.
59. Building with two domes near the Civil Hospital, Thatta, Makli Hill, Thatta.
60. Jama Masjid, Makli Hill, Thatta.
61. Sasian-Jo-Takar (Mirpur Sakro, Thatta.
62. Jama Masjid, Thatta.

WORLD HERITAGE MONUMENTS ON UNESCO LIST.

1. Mohenjodaro, District Larkana.
2. Makli Hill, Thatta.

Source: Guidelines for Sensitive and Critical Areas. Government of Pakistan. 1997.

Note: None of the above areas are located at or in the immediate vicinity of the proposed project components.

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Exhibit 1.3: Wildlife Protected Areas in Sindh

Protected Area Name	Area (ha)	Classification	Coordinates
1. Bijoro Chach	121	Wildlife Sanctuary	Not Recorded
2. Cut Munarki Chach	405	Wildlife Sanctuary	Not Recorded
3. Deh Akro/Nara Canal	20,000	Wildlife Sanctuary	27/42 N. 68/52 E.
4. Deh Jangisar	314	Game Reserve	Not Recorded
5. Deh Khalifa	429	Game Reserve	Not Recorded
6. Deh Sahib Saman	349	Game Reserve	Not Recorded
7. Dhoung Block	2,098	Wildlife Sanctuary	Not Recorded
8. Dograyon Lake	648	Wildlife Sanctuary	Not Recorded
9. Dosu Forest	2,312	Game Reserve	Not Recorded
10. Drigh Lake	164	Wildlife Sanctuary	Not Recorded
11. Ghamot	27,283	Game Reserve	Not Recorded
12. Ghondak Dhoro	31	Wildlife Sanctuary	Not Recorded
13. Gullel Khon	40	Wildlife Sanctuary	Not Recorded
14. Gulsher Dhand	24	Wildlife Sanctuary	Not Recorded
15. Hadero Lake	1,321	Wildlife Sanctuary	24/50 N. 67/53 E.
16. Hala	954	Game Reserve	25/48 N. 68/25 E.
17. Haleji Lake	1,704	Wildlife Sanctuary	24/49 N. 67/44 E.
18. Hilaya	324	Wildlife Sanctuary	Not Recorded
19. Indus River	44,200	Game Reserve	28/24 N. 69/45 E.
20. Keti Bunder South	8,948	Wildlife Sanctuary	24/08 N. 67/27 E.
21. Keti Bunder North	23,040	Wildlife Sanctuary	24/08 N. 67/27 E.
22. Khadi	81	Wildlife Sanctuary	Not Recorded
23. Khairpur Game Reserve	Not Recorded	Unclassified	27/32N. 68/47 E.
24. Khanpur	Not Recorded	Unclassified	Not Recorded
25. Khat Dhoro	11	Wildlife Sanctuary	Not Recorded
26. Khipro	3,885	Game Reserve	25/49 N. 69/21 E.

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Protected Area Name	Area (ha)	Classification	Coordinates
27. Kinjhar (Kain) Lake	13,468	Wildlife Sanctuary	29/54 N. 70/57 E.
28. Kirthar	308,733	National Park	25/44 - 27/15 N. 67/10 E.
29. Kot Dinghano	30	Wildlife Sanctuary	Not Recorded
30. Lakht	101	Wildlife Sanctuary	26/36 N. 67/53 E.
31. Langh (Lungh) Lake	19	Wildlife Sanctuary	27/30 N. 68/03 E.
32. Mahal Kohistan	70,577	Wildlife Sanctuary	Not Recorded
33. Mejiran	24	Wildlife Sanctuary	Not Recorded
34. Mando Dero	1,234	Game Reserve	Not Recorded
35. Marho Kohn	162	Wildlife Sanctuary	Not Recorded
36. Miani Dhand	57	Wildlife Sanctuary	25/27 N. 68/23 E.
37. Mirpur Sakro	777	Game Reserve	24/32 N. 67/38 E.
38. Mubahat Dero	16	Wildlife Sanctuary	Not Recorded
39. Munarki	12	Wildlife Sanctuary	Not Recorded
40. Nara	109,966	Game Reserve	27/42 N. 68/52 E.
41. Nara Desert	223,590	Wildlife Sanctuary	Not Recorded
42. Norang	243	Wildlife Sanctuary	Not Recorded
43. Pai	1,969	Game Reserve	Not Recorded
44. Pir Mahfooz Game Reserve	Not Recorded	Unclassified	Not Recorded
45. Pir Pagara Game Reserve	Not Recorded	Unclassified	Not Recorded
46. Runn of Kutch	320,463	Wildlife Sanctuary	Not Recorded
47. Sadnani	84	Wildlife Sanctuary	Not Recorded
48. Samno Dhand	23	Wildlife Sanctuary	Not Recorded
49. Shah Lanko	61	Wildlife Sanctuary	Not Recorded
50. Surjan, Sumbak, Eri and Hothiano	40,632	Game Reserve	25/25 N. 67/55 E.
51. Takkar	43,513	Wildlife Sanctuary	27/15 N. 68/49 E.
52. Tando Matha Khan	5,343	Game Reserve	Not Recorded

Source: Guidelines for Sensitive and Critical Areas. Government of Pakistan. 1997.

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3 Regulatory and Policy Review

This Chapter briefly describes the legislative and policy framework relevant to the proposed program.

3.1 National Legislation, Regulations and Policies

The cornerstone of environmental legislation in the country is the Pakistan Environmental Protection Act of 1997 (PEPA), which superseded the Pakistan Environmental Protection Ordinance of 1983. The Act establishes the general conditions, prohibitions, and enforcement for the prevention and control of pollution, and the promotion of sustainable development. The Act also establishes and delineates the powers and functions of the Pakistan Environmental Protection Council (PEPC), Pakistan Environmental Protection Agency (Pak-EPA), provincial Environmental Protection Agencies (EPAs), and Environmental Tribunals. In particular, the Act creates the authority for delegation of environmental management functions to the provincial EPAs. Nothing in the Act prohibits provincial governments from adopting more stringent standards or regulations.

Under the PEPA, the Federal government has the authority to delegate any of its environmental management functions and powers to provincial governments, government agencies, or local authorities. Provincial governments in turn may delegate powers to any lower-tiered government agency. This provision establishes a framework for environmental federalism within which environmental management responsibilities are shared among federal, provincial and local governments. Environmental federalism is built on the belief that governance is strongest when implemented at the level closest to the beneficiary, and is further promoted in Pakistan by the Local Government Ordinance of 2001, which introduced a new system of local government aimed at promoting responsibility at the local level. According to this Ordinance, rural and urban local councils are responsible for "the prevention of pollution of water or land from such sources and in such manner as the by-laws may provide."

According to PEPA, no development program can be undertaken unless an initial environmental examination (IEE) or an environmental impact assessment (EIA) is conducted, and approval is received from the federal or relevant provincial EPA. The categories of programs, for which an EIA or IEE has to be carried out, are defined in the Pakistan Environmental Protection Agency "*Review of IEE and EIA Regulations, 2000*". In Sindh, the guidelines for the preparation of IEEs and EIAs are the same general guidelines that were issued by Pak-EPA in 1997, and updated in 2000.

The approval in April 2010, of the "Constitution (Eighteenth Amendment) Act of 2010", which among other things abolished the so-called "Concurrent Legislative List" that allowed the federal government to legislate on a concurrent basis with the provinces on matters such as the environment and natural resources management, has greatly enhanced the jurisdiction and authority of the provincial and local governments in such areas, while the powers of the federal government have been significantly curtailed. Given the constitutional changes, the Federal Ministry of Environment (MoE) has been renamed as Ministry of Climate Change (MoCC). As with most major constitutional changes, the precise extend of the changes are still being debated by legal scholars and will only be clarified by complementary legislation and the interpretation by the courts, in a process that will likely take several years to play out.

The Sindh Environmental Protection Agency (SEPA) is the environmental authority in the province. As mentioned before, SEPA adopted the same requirements issued by the Pakistan Environmental Protection Agency "*Review of IEE and EIA Regulations, 2000*." The regulations cover the scope, contents and applicable procedural steps for the environmental assessments that might be required for infrastructure projects. To facilitate their application, the Pak-EPA 2000 regulations included two Schedules in which several types of projects were specified. Projects listed in Schedule I are required to prepare only an initial environmental examination (IEE), while projects listed in Schedule II must prepare a full-fledged EIA, carry out public consultations, and apply for an environmental permit. Education sector projects involving the construction and/or renovation of schools are not included in any of the two Schedules. Therefore, there are no national/provincial environmental requirements to be complied with by SERP-II sponsors (ELD/RSU). The present EA has been carried out to comply with the World Bank environmental safeguard policies that are described below in section 3.2.

3.2 World Bank Safeguard Policies

The program was also analyzed against the WB safeguard policies: OP 4.01 (Environmental Assessment); OP 4.04 (Natural Habitats); OP 4.36 (Forestry); OP 4.09 (Pest Management); OP 4.11 (Cultural Property); OP 4.37 (Safety of Dams); OP 7.50 (Projects in International Waters); and OP 7.60 (Projects in Disputed Areas).

The above-mentioned OPs and their applicability to the present program are discussed in the following table:

OP 4.01	Environmental Assessment	This OP requires environmental assessment (EA) of projects proposed for Bank financing to help ensure that they are environmentally sound and sustainable. This OP also categorizes the projects on the basis of the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts. SERP-II has been classified as Category B, and the present assessment has been developed in response to this OP.
OP 4.04	Natural Habitats	There are one national park, thirty-three wildlife sanctuaries and sixteen game reserves located all over the province. The conservation of natural habitats, like other measures that protect and enhance the environment, is essential for long-term sustainable development. Through this OP, the WB therefore supports the protection, maintenance, and rehabilitation of natural habitats and their functions. The program includes limited amount of construction work related to expansion of existing school buildings, provision of missing facilities in the existing schools and construction of buildings for the existing shelter-less schools. None of these activities are expected to affect any of the natural habitats. As a precaution, the ESMF-II includes guidelines to ensure that the project does not exert any negative impacts on natural habitats. Therefore, OP-04 is not triggered.
OP 4.36	Forestry	The objective of this Policy is to assist the WB's borrowers to harness the potential of forests to reduce poverty in a sustainable manner, integrate forests effectively into sustainable economic development, and protect the vital local and global environmental services and values of forests. As mentioned above, the physical works during the proposed program will be carried out at the existing facilities which are in settled areas. Hence no forest area is likely to be affected, and therefore, this OP is not triggered.
OP 4.09	Pest Management	Through this OP, the WB supports a strategy that promotes the use of biological or environmental control methods and reduces reliance on synthetic chemical pesticides. This OP is not applicable since the proposed program does not involve any activities relating to the use of pesticides or other chemical inputs.
OP 4.11	Cultural Property	The World Bank's general policy regarding cultural properties is to assist in their preservation, and to seek to avoid their elimination. As discussed above, the program involves civil works at the existing school locations which are located in settled areas. There are over 60 sites of archeological, cultural, historical and religious significance distributed all over the province, as precaution, the ESMF-II includes guidelines on how to proceed in (the very low probability) case any such site is discovered during school construction. Therefore, OP-11 is triggered.
	Safety of	The Policy seeks to ensure that appropriate measures are taken and

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OP 4.37	Dams	sufficient resources provided for the safety of dams the WB finances. This OP is not applicable since program does not involve any work relating to dam construction.
OP 7.50	Projects in International Waters	This OP defines the procedure to be followed for projects the WB finances that are located on any water body that forms a boundary between, or flows through two or more states. This OP is not applicable since the program does not involve any works on or near international waters.
OP 7.60	Projects in disputed areas	Projects in disputed areas may raise a number of delicate problems affecting relations not only between the Bank and its member countries, but also between the borrower and one or more neighboring countries. In order not to prejudice the position of either the Bank or the countries concerned, any dispute over an area in which a proposed project is located is dealt with at the earliest possible stage. This OP is not applicable as no disputed areas as defined in the policy, exist in the Sindh province.

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4 Environmental Assessment

This Chapter assesses the potential negative impacts of the proposed program on various aspects of the environment. At the end of each section is included a new section with a discussion of issues related to the potential risks resulting from a combination of three adverse conditions: (i) the province´s hydrological and geological characteristics that make it prone to natural disasters; (ii) the province´s hydrogeological characteristics that creates areas with high water (ground and surface) contamination with toxic compounds such as arsenic and fluorides; and (iii) the vulnerability of existing schools to natural disasters.

4.1 Methodology

The present environmental assessment was carried out using a standard methodology, in line with the national regulations and World Bank safeguards described above. The assessment was initiated with a review of the program information, particularly the identification the actions with the potential of causing environmental and social impacts. Discussions were held with school management personnel and teachers. In addition, meetings were held with some key stakeholders, including the Sindh Environmental Protection Agency (SEPA), Sindh Education Foundation (SEF), Works & Services Department, and NED University of Engineering & Technology, Karachi.

After the literature review, interviews, fieldwork and visits, an environmental assessment of the proposed program was carried out employing a screening matrix, which was tailor-made according to the specific needs of the program. The screening exercise was complemented with a comprehensive analysis of other important issues such as school vulnerability to natural hazards, sanitation, personal hygiene and public health that are particularly relevant in Sindh. This approach allowed the consideration of not only the impacts of the program actions on the environment, but more importantly the potential impacts of the province´s environmental characteristics on the program.

The screening matrix examined the interaction of program activities with various components of the environment. These activities included construction of additional classrooms, provision of missing facilities, and construction of new buildings in existing shelterless schools, whereas the environmental parameters were broadly classified as physical, biological and social, and then each of these broad categories further divided into different aspects. The potential impacts thus predicted were characterized as follows:

1. High negative (adverse) impact,
2. Low negative impact,
3. Insignificant impact,
4. High positive (beneficial) impact,

5. Low positive impact, and
6. No impact.
7. The screening matrix for the proposed program is provided in **Exhibit 3.1**.

4.2 Findings of the Environmental Assessment

This section discusses the findings of the environmental assessment carried out for the proposed program. The potential environmental impacts are organized in three sections related to the main phases of project implementation: (i) design; (ii) construction; and (iii) operation. Given the similarities between SERP-I and SERP-II, most findings of the original EA-I are still valid and applicable to SERP-II. At the end of each section is included a new section with a discussion of the concerns related to risks posed by Sindh´s hydrological, geological and geomorphological characteristics on SERP-II implementation.

4.2.1 Impacts Related to School Design

The potential impacts related to the school design activity are listed below:

1. Risk of surface and groundwater contamination caused by improper design of sewage disposal facilities;
2. Risk of impacts on the public health caused by improper sewage disposal;
3. Gender issues associated with the lack of provision of separate and adequate toilets for boys and girls in schools.

All these impacts have been determined to be relatively small and can be avoided or minimized with standard and well-know mitigatory measures such as well-designed sewage treatment and final disposal facilities; and properly designed sanitation facilities taking into account the applicable national technical specifications. The ESMF-II includes guidelines to address these problems as well as the TORs for the execution of analytical work to develop a blue print for their implementation.

4.2.2 Concerns Related to School Design

Analytical work carried out under SERP-I in 2009, indicated that there are areas in Sindh that are prone to natural disasters such as earthquakes, floods, landslides, tidal surges, and water contamination by toxic compounds (e.g., arsenic and fluorides). The devastating floods that occurred in Sindh in the summer of 2010 highlighted the vulnerability of schools located in flood plains. In some areas, those risks are in the range of moderate to high, thus demanding special attention. The key environmental concerns associated with school design relate to the following aspects:

1. Lack of adequate school siting guidelines based on GIS-based information about areas with high risk of natural hazards (earthquakes, floods, etc.), and high levels of water contamination (arsenic, fluorides, etc.).
2. Lack of sources of safe drinking water (surface and groundwater) due to contamination with pollutants such as arsenic, fluorides, fecal coliforms, etc.).
3. Safety risks associated to natural disasters (such as earthquakes and severe floods) due to inadequate structural designs and the absence of enforceable building codes.
4. Energy efficiency issues caused by inadequate school designs not taking full advantage of the natural lighting and ventilation conditions, thus requiring the use of electricity, which in many cases is not available either because the school is off-grid, or there are no funds available to pay the bills.

The above problems are complex in nature and might pose significant risks to the wellbeing of thousands of children and teachers, and continue to be challenges that needed to be addressed in a comprehensive manner to minimize/eliminate these risks.

In addition to serious drinking water quality problems, the majority of the schools in Sindh don't have adequate sanitation facilities, either because they do not exist, have been poorly designed and built, are insufficient for the number of students, or are in such a state of disrepair (due to lack of maintenance), that no children can use them. The existence of fully operational sanitation facilities is particularly important in the case of girls, and their absence may discourage parents to enroll their daughters in the schools, thus contributing to defeat one of the main objectives of SERP-II.

Seismic events in Pakistan and China that occurred in the last decade, which resulted in high children fatality in schools, demonstrate the seriousness of the problem. The 2010 massive floods (plus ones of lesser magnitude in 2011), resulting in a large number of damaged schools, underscores the importance of measures to reduce school vulnerability to nature's extreme events. Moreover, it is likely that in the future, the frequency and magnitude of floods and other extreme hydrological events will be higher due to climate change. Although a significant amount of data is available in Pakistan regarding the location of areas prone to natural disasters, as well as locally developed research results concerning low-cost methods to reinforce existing small structures and to improve the design of the new ones, the knowledge of this vital information is still compartmented and restricted to a few people directly involved in the data collection and/or research activities. It is very important the implementation of measures to disseminate the available information to a wider audience, including top officials of the GoS. It should be noted however, that most available natural hazard maps for Pakistan cover the whole country, and are in a scale (1:1,000,000) that cannot be used to properly assess the safety of public and private schools in the province (and other high-importance infrastructure

like hospitals, fire stations, etc.). Analytical work being carried out by World Bank consultants are preparing GIS-based natural hazard maps for Sindh (and Punjab) in a scale (1:10,000) that could be used by the GoS for that purpose. **Annex 2** shows an example of the products resulting from work being done by Bank consultants (Sindh´s Active Faults and Arsenic Concentrations). The GIS-based mapping will be an important input in the preparation of reliable school siting guidelines that would allow planners to avoid areas where the risks are too high. As mentioned before, under SERP-I an important goal was accomplished: the use of unframed structures was abandoned, and replaced by reinforced cement concrete structures (RCC), that has no load-bearing walls and therefore are less vulnerable to natural disasters.

The preparation of a detailed implementation plan for gradually addressing issues related to inadequate sources of drinking water, poorly designed & built sanitation facilities, buildings vulnerability to natural disasters, and for improving school design, construction, and maintenance standards, as well as renewable power supply for off-grid schools, is an integral part of SERP-II´s design (**Annex 3 – Implementation Strategy),** and will be supported (by DLI4s and Technical assistance) under the project.

4.2.3 Impacts Associated with School Construction

A low level of negative environmental impacts is expected to be experienced during the construction phase of the schools. These include:

1. Potential temporary increase in water scarcity during construction activities (in water-scarce areas),
2. Possible contamination of water because of improper disposal of construction wastes, and associated public health concerns;
3. Safety hazards for the students, school staff and the community associated with the construction activities in existing schools;
4. Loss of natural vegetation and/or loss of agriculture as a result of the construction activities.

Many of the above effects are temporary in nature and will disappear as soon as the building construction ends. Furthermore, due to the smallness of the individual school buildings, the magnitude of most expected impacts will be small. Hence most of these impacts have been characterized as 'low negative impacts' in **Exhibit 3.1**.

The probability and magnitude of these impacts will further be decreased by employing basic and well known impact mitigation measures – such as waste collection and appropriate disposal, avoiding areas of significant natural vegetation and prime

[4] Disbursement Linked Indicators.

cultivation/orchard lands, as well as the work of a third party construction supervision firm that has been hired to ensure that all buildings are properly designed and built.

The environmental guidelines to address the above concerns have been developed and provided in the **Chapter 5** (**Environmental and Social Management Framework-II)**. Contractors will be required to follow these guidelines when carrying out the construction activities.

4.2.4 Concerns Associated to School Construction

The main concerns related to the school construction phase are listed below.

1. Poor concrete quality resulting from the use of water with high salinity levels that is available in some areas of the province.
2. Inadequate level of construction supervision, resulting in buildings with poor structural quality and with incomplete facilities (e.g., sanitation facilities without plumbing).

Analytical work carried under SERP-I (2009), showed that in several areas of the province the surface and groundwater have high levels of salinity. Water with high salinity levels is inadequate for concrete making. The excess salt levels provoke the premature corrosion of the steel rebars, thus weakening the whole RCC structure. In order to prevent this from occurring, contractors must be required to bring water from nearby sources (not contaminated), and store it at the construction site.

Experience has indicated that inadequate levels of construction supervision result in poor quality buildings and/or incomplete sanitation facilities. To eliminate the problem, the construction inspection systems need to be strengthened, and a more detailed reporting system implemented. A more detailed reporting mechanism should be used to prevent the firm leaving the construction site (and receiving the last payment) without demonstrating that it had complied in full with all construction requirements.

4.2.5 Impacts Associated with School Operation

The following types of environmental impacts can potentially arise during various phases of school operation (both the government as well as PPP schools):

1. Health impacts associated with missing/non-functioning facilities of safe drinking water;
2. Health impacts associated with missing/non-functioning sanitation facilities;
3. Surface and ground water contamination caused by improper waste disposal (missing/non-functioning sewage treatment and disposal systems);
4. Risk of communicable diseases such as Hepatitis B, Typhoid, and Cholera.

The lack of access to safe drinking water, and adequate sanitation facilities at the schools can pose a health risk to the students, teachers and the nearby community. No schools should be built or renovated without having these facilities. Construction of appropriate

toilet facilities and their proper functioning, as well as raising awareness of the teachers and students in matters such as personal hygiene will help to minimize these impacts. Another aspect that must be taken very seriously is the adequate operation of sewage treatment and effluent disposal facilities (e.g., septic tanks, seepage ditches, etc.). Without adequate operation, even the best designed & built systems would be ineffective in a couple of years, and will increase the surface and/or groundwater contamination levels at or near the schools. Through SERP-II, these important issues will continue to be addressed, as appropriate sanitation facilities will be required in the design of the school buildings (as discussed in **Section 4.2.1** above), and during the school construction´s inspections carried out by the construction supervision firm. As mentioned before, no construction would be formally accepted (and the last payment released), unless these facilities are in proper working condition and fully operational. These aspects are also included in the TORs for the third party construction supervision firm that was hired under SERP-I. It should be noted that the provision of safe drinking water in all built/renovated schools is a more complex issue that can be expensive in areas in which both the surface and groundwater sources are highly contaminated by arsenic (cumulative poisoning) and/or fluorides (bone-deforming disease). SERP-II will finance the design and implementation of a pilot program in at least 15 (fifteen) schools located in the worst affected areas aimed at studying commonly used low-cost water treatment alternatives to select the one(s) that is(are) the most cost-effective(s) for Sindh. The next step would be to scale-up the pilot program to cover the schools in the worst affected areas.

The risks of other communicable diseases can be reduced through the implementation of the government's occasional vaccination drives. Raising awareness level and disseminating information among the administrators, teachers and students on precautionary measures and healthy personal hygiene habits will also greatly reduce if this risk. These capacity building/awareness raising aspects are also included in the design of the proposed program.

4.2.6 Concerns Associated with School Operation

The main concerns associated with school operation are:

1. Lack of training on injury and fatality prevention during the occurrence of natural disasters.
2. Lack of training on healthy personal hygiene habits.

Since the construction of buildings capable to withstand earthquakes or floods of any magnitude would be enormously expensive, and thus impractical for the realities of Pakistan, it is imperative that all schools in the province receive training on injury and fatality prevention during such emergencies. A group of teachers and headteachers would be trained first, and then transformed in "master trainers" with the responsibility to

disseminate the information to all teachers and students. The one-day training must be repeated every year to cover all new students.

In some rural areas in the province, the habit to use toilets is still not widespread. In these areas, the construction of separated sanitation facilities for boys and girls are not sufficient to improve the health conditions of school children. It is necessary therefore to have a training program on healthy personal hygiene habits in all schools. As in the training on injury prevention, a group of teachers and headteachers would be trained first, and then transformed in "master trainers" with the responsibility to disseminate the information to all teachers and students. The one-day training must be repeated every year to cover all new students.

4.3 General Assessment of the ESMF-I implementation

As seen in **Annex 1**, the implementation of many environmental management actions recommended in ESMF-I was not carried by the Reform Support Unit (RSU) with the desired efficacy. In spite its attempts, for several administrative and political reasons, the agency was not able in the last three years to hire a qualified environmental specialist to act as its Environmental Coordinator. This staffing problem, and the problems in procurement process to hire a consulting firm with expertise in environmental management were the main reasons for the agency's problems in the implementation of the ESMF-I. During project preparation phase, the RSU conducted an analysis on the reasons for the problems encountered in the past three years with the objective to incorporate the lessons learned in SERP-II design.

In order to implement the ESMF-II in a proper and timely fashion, the consulting firm being hired would have to carry out the following tasks:

1. Provide detailed designs for the recommended actions, which would then be used as a "blue print" for their implementation in the field.
2. Prepare detailed TORs, timetables and budget estimates for hiring specialized firms to install and operate for at least six months the: (i) pilot programs on drinking water treatment technologies; and (ii) on low-cost renewable power systems.
3. Develop model architectural and structural designs appropriate for schools located in in each of the four main regions of Sindh, with particular attention to areas with moderate--to--high risks of natural disasters.
4. Prepare a manual on school siting with detailed guidelines aimed at preventing their construction/renovation in areas with high risk of natural disasters, and the precautions to be taken in schools located in areas with moderate--to--low risks
5. Develop training programs on injury/fatality prevention during natural disasters and other emergencies.
6. Develop training programs on healthy habits on personal hygiene.

7. Prepare detailed designs to upscale the pilot programs on drinking water treatment to schools included in a priority list based on the degree of contamination of their water sources.

Originally the GIS-based mapping on natural hazards was included in the scope of the work to be carried out by the consulting firm with expertise in environmental management. However, considering that the natural hazards mapping for Sindh is an important pre-requisite for many other ESMF-II actions, the World Bank hired in October 2012 four local senior consultants (two GIS experts, one Geologist, and one Hydrologist) to prepare GIS-based natural hazard maps including the location of all public schools in Sindh. This will allow the identification of the schools located in areas with moderate and high risk of natural hazards such as earthquakes, floods, tsunamis, etc. In addition to the natural hazards mapping, the GIS system will allow the mapping of any other important parameters such as arsenic water contamination, roads network, school locations, etc. The expected date for the work completion is February 15th, 2013. **Annex 2** presents two examples of the work being developed by the World Bank consultants.

The next chapters and **Annex 3** include more details on the proposed measures to overcome the identified shortcomings, and also a revised Implementation Schedule for the ESMF-I (which is an integral part of ESMF-II).

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Exhibit 4.1: Screening Matrix

	Physical					Biological		Social and Socioeconomic														
	Soil Erosion / Contamination	*Air Quality*	*Surface Water Quality*	*Groundwater Quality*	*Water Availability and Consumption*	*Natural Vegetation*	*Wildlife*	*Blocked Access Routes*	*Noise and Vibration*	*Agriculture*	*Use of Agro Chemicals*	*Livestock Grazing*	*Compensation Issues*	*Safety Hazards (e.g. floods and earthquakes)*	*Employment/Earning Opportunities*	*Public Infrastructure*	*Public Health (hygiene and sanitation)*	*Aesthetic Value*	*Conflicts and Cultural Issues*	*Gender Issues*	*Sites of Archeological, Historical or Cultural Significance*	*Impacts on Indigenous People*
TOP Schools																						
School Design	N	N	-2	-2	N	N	N	N	N	N	N	N	N	-2	N	N	-2	-1	N	-2	N	N
Construction Activities (SHE, ACR, MF)	-1	0	-1	-1	-1	0	N	0	-1	-1	N	0	N	-2	+2	0	-2	0	0	0	0	N
School Operation	-1	N	-2	-2	-1	N	N	N	N	N	N	N	N	N	+1	N	-2	N	N	-1	N	N
PPP-SEF Schools																						
School Operation	-1	N	-2	-2	-1	N	N	N	N	N	N	N	N	N	+1	N	-2	N	N	-1	N	N

Key: -2: High negative impact; -1: Low negative impact; 0: insignificant/negligible impact; +1: low positive impact; +2: High positive impact, N: no impact.

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5 Environmental and Social Management Framework for SERP-II

This Chapter provides the environmental and social management framework for SERP II (ESMF-II), which has been developed to address the environmental concerns and issues discussed in **Chapter 4** above.

5.1 Objective

The objective of the ESMF-II is to provide a framework to manage the social and environmental issues that may arise during SERP-II implementation, particularly the design, construction, renovation, and operation of schools. The ESMF-II defines the roles and responsibilities of various stakeholders and also provides guidelines to be followed during the program implementation both by the TOP-based School Rehabilitation Program (SRP) and the Promoting Private Schooling in Rural Sindh initiative (PPRS) under the Second Sindh Education Reform Program (SERP-II). As discussed above, due to the similarities of SERP-I and SERP-II (from the environmental point of view), this ESMF-II is an updated and expanded version of the ESMF-I.

5.2 Management Approach

The overall responsibility for the ESMF-II implementation and for the environmental performance of the program will rest with the Government of Sindh´s Education & Literacy Department and its Reform Support Unit (RSU). The ELD/RSU has hired an Environmental Coordinator (EC) who will be the focal point for all matters relating to the environmental issues during the program execution. The actual implementation of the ESMF-II will be carried out by the Implementation Partners (IPs)/TOP Partner Districts and the Sindh Education Foundation (for PPRS schools), who would in coordination and under the supervision of the EC, ensure compliance with the environmental guidelines presented later in the document.

5.3 Roles and Responsibilities

RSU/ELD Environmental Coordinator (EC): The EC will be overall responsible for the environmental performance of SERP-II, and will facilitate compliance to the ESMF-II and the environmental guidelines presented in this document. The EC will coordinate with the Implementation Partners/TOP Districts, third-party construction supervision firm, civil works contractors, SEF, environmental management consulting firm, and the community for the implementation of the ESMF-II and other environmental management

activities. The EC will also coordinate with other stakeholders, such as the Education and Literacy Department, Sindh EPA (SEPA), or any NGO, as and when required.

TOP District Governments: Implementation Partners (i.e., District Governments) will be responsible for the on-site implementation of the ESMF-II related measures and the guidelines provided in it. The IP´s site engineers, District's EDO Works, and the engineers from the third-party construction supervision firm will supervise the school construction/rehabilitation activities, and will ensure that the environmental issues are adequately addressed.

Sindh Education Foundation: SEF will be responsible for the on-site implementation of the ESMF-II related measures to PPRS schools. The engineers from the third-party construction supervision firm will supervise the school construction/renovation activities (if any), and will ensure that the environmental issues are adequately addressed

The roles and responsibilities are tabulated in **Exhibit 5.1**.

5.4 Environmental Construction Guidelines

The construction guidelines are one of the key components of the ESMF-II. These guidelines, which should not be confused with the school siting guidelines[5], list the potential effects of each activity of the program and their associated mitigation measures. These guidelines should be followed during the design, construction and operation of the schools. The guidelines are presented in **Exhibits 4.2** to **4.4**.

5.5 Environmental Education, Safety, Public Health and Personal Hygiene Trainings

Environmental, public health and personal hygiene trainings will help enhance the awareness level of the IP/SEF staff, district/provincial governments, School Management Committees (SMC), and the community on all matters relating to the environment. These trainings will ensure that the requirements of the EMSF-II are clearly understood and followed by the ELD/RSU, IPs/TOP Districts, SEF and community throughout the program period. The key stakeholders listed above (i.e., IP/SEF staff, district/provincial governments), will attend one of the training sessions organized by the consulting firm for the master trainers; all others will attend the sessions organized at the district level by the master trainers.

The primary responsibility for providing trainings to all program personnel will be that of the ELD/RSU and SEF. As detailed in **Annex 3**, the environmental training programs

[5] The school siting guidelines will be prepared by the consulting firm being hired by the GoS, using among other inputs, the GIS-based natural hazards maps in scale of 1:10,000, being developed by World Bank consultants.

will be designed and executed by a consulting firm with expertise in environmental management that is being hired by the RSU. The firm will provide training for at least 50 "master trainers" (teachers and headteachers), who will be responsible for the dissemination of the trainings to the children at every the school. After being trained, these teachers would return to their districts and organize new training sessions at the Taluka level. The training sessions at the Taluka level should prioritize schools located in areas with high and moderate risks of natural disasters.

The scope of the trainings will cover: (i) general environmental awareness; (ii) disaster preparedness and casualty prevention; (iii) public health and personal hygiene habits; (iv) waste disposal and effective house-keeping during construction activities, in order to minimize the negative environmental effects of the program and enhance the positive ones. The training materials will be prepared and conducted in English, Sindhi and Urdu.

5.6 Documentation and Reporting Mechanism

RSU/ELD and SEF will be responsible for developing reporting mechanism for ascertaining compliance to the requirements of the ESMF-II.

The RSU/ELD will have the prime responsibility for generating various documents and maintaining the records. ELD/RSU will develop easy-to-fill checklists and other performance related documents, on the basis of the environmental guidelines discussed in this chapter. The site engineer (EDO - Works) in each IP in the case of TOP districts, and visiting monitoring/authorized officer in the case of SEF, will fill in the checklist during his/her site visit to the schools.

The resident engineers (AREs) from the third-party construction supervision firm will be required to fill out the checklists and other performance reports and provide a copy to the supervisory site engineer from Education Works, who will maintain a complete record of these filled documents and any follow-up action required/taken on them. In the case of the PPP Schools, SEF will be responsible for maintenance of all such records as well as follow up action.

RSU/ELD will also maintain a complete record of the training modules developed, training programs conducted, places & duration, and the attendees of these trainings.

Exhibit 5.1: Major Roles and Responsibilities

Organization	*Responsibility*
RSU/ELD (through the Environmental Coordinator-EC)	Overall responsible for the implementation of the ESMF-II and the environmental performance of the program.
	Supervise all the work being done by the consulting firm specialized in environmental management during ESMF-II implementation.
	Supervise the preparation of the environmental, public health, safety and hygiene training modules and periodically organize these trainings for the IPs, PPP-SEF staff, teachers, children, and the SMC/community. Maintain a complete record of the trainings (training modules developed, trainings conducted, places and attendees)
	Supervise the preparation of checklists & performance related documents on the basis of the environmental guidelines (**Exhibits 5.2** to **5.4**)
	Ensure that the concerned AREs, District and IPs officials properly fill out the checklists for each construction or rehabilitation works on a regular basis.
	Ensure that the third-party/site engineer, authorized person or any monitoring officer fills out the checklists and determines and/or report any corrective action, if required.
	Ensure that the IPs (education-works/schools/third party and SEF) maintain a record of all the filled checklists, and the corrective actions planned/undertaken either themselves or through the third-party engineering consultant firm.
	Review the filled checklists and other performance related documents, and determine any corrective action, if required.
	Maintain a record of all the filled checklists, and the corrective actions planned/undertaken.
	Periodically visit the schools/construction sites, in coordination with the third-party construction supervision firm in order to monitor the reliability of filled checklists, and to determine their effectiveness.
	Maintain a complete and written record of the above mentioned field visits.
	Ensure through the third-party engineering consultant firm/site engineer (education works) that the environmental considerations for the school building design are adequately adhered (**Exhibit 4.2**).
	Coordinate with any other stakeholder, such as the Education

Organization	*Responsibility*
	Department, Sindh EPA, or any NGO or any other organization interested to know the environmental performance of the program.
IPs/TOP Districts/SMCs and PPRS - School Head Masters / Entrepreneurs	Participate in the environmental trainings conducted by RSU/ELD, and in the their dissemination at the school level.
	Implement the environmental construction guidelines in the field, during the construction phase and/or operation of the schools.
	Fill the environmental checklists and other performance related documents on regular/periodic basis, and provide copy to the RSU/ELD EC and PPP-SEF Project Director.
	Provide feedback to RSU/ELD and SEF on the effectiveness of the checklists and other performance related documents.
	Contribute to increase the environmental awareness among the community/SMCs.

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Exhibit 5.2: Environmental Guidelines for the Design Phase[6]

1. Design of the school buildings must adhere to all existing standard technical requirements.
2. The design should consider the earthquake classification of the area, as well as, the flood risks. In particular, school siting should avoid known seismic fault lines and flood plains, as indicated in the GIS-based Natural Hazard Maps prepared with support from the World Bank (see the example in **Annex 2**).
3. The design should consider the existing cultural sites and avoid the construction of schools near them (see **Exhibit 1.2**).
4. The design should consider the wildlife protected areas in Sindh and avoid the construction of schools near them (see **Exhibit 1.3**).
5. The design should include provision of safe water supply and adequate sanitation facilities. Sites with high water (surface and ground) contamination should be avoided.
6. The new school designs should consider the local climate conditions (insulation, predominant wind direction and intensity, temperature, etc.), to maximize the energy efficiency of school buildings in order to reduce the need of energy for artificial ventilation and illumination.
7. The building should have separate toilets for males and females in a number that is adequate to school enrollment. Toilet design should address the needs of the children (particularly teenager girls) and teachers, and be water efficient.
8. When feasible and cost-effective, the use of the local materials should be maximized.
9. The design should take into account, the available skills of the community, in order to maximize local employment.
10. In the design of new schools and rehabilitation of existing schools located in off-grid areas, the designer should investigate the feasibility of the installation of low-cost renewable power systems.
11. In case of the girls' schools, the boundary walls should be of appropriate height, in line with the local customs and values.

[6] These guidelines should be considered preliminary and temporary, and will be reviewed and complemented by the work that will be carried out by consulting firm being hired by the GoS.

Exhibit 5.3: Environmental Guidelines for the Construction Phase[7]

School Location

1. The school construction site should be selected with the full consent of the community.
2. The school building should not be constructed over any disputed land, known seismic fault lines, flood plain, or areas with poor soil support capacity. The GIS-based Natural Hazard Maps must be used to assess the natural hazard risks.
3. Before starting construction, the RSU/EC should check if the school site is too close to protected areas (the wildlife protected areas), as well as the notified areas of archeological, cultural or historical significance (see **Exhibits 1.2 and 1.3** for these areas in the Province). If a potential conflict is identified, the EC should notify the competent authorities and ask their advice on how to proceed.
4. School construction should be avoided in areas having any significant natural vegetation or over cultivated land. When this is inevitable, adequate measures should be taken to minimize the area that needs to be cleared for the building.
5. Water is an important element in construction but people still ignore quality-related aspects of this element. The water is required for preparation of mortar, mixing of cement concrete and for curing work etc., during construction work. In order to prevent poor-quality concrete, brackish water shall not be used for any construction activities like concreting, curing, etc. As a general rule, water with a concentration higher than 2,000 ppm (0.2%) of total dissolved solids should not be used for concrete-making purposes. If the local water is not suitable, water from elsewhere should be used.

Construction Safety Aspects (Natural Disaster Vulnerability)

1. The construction of all new school buildings or additional classroom must use framed structures with reinforced cement concrete (i.e., RCC structures) particularly those located in areas prone to natural disasters (low to moderate risks). No schools should be built in high risk areas. In case of justified necessity, buildings located in high risk areas must use extra strong foundations & framed structures, and the RSU/EC must be informed about the risks involved.
2. No new schools should be located in flood plains. In case of existing schools located in flood plains appropriate measures must be taken during school renovation and/or addition of new classrooms (e.g., stronger foundations, floors raised to at least 30 centimeters above the maximum flood levels recorded in the

[7] These guidelines should be considered preliminary and temporary, and will be reviewed and complemented by the consulting firm being hired by the GoS.

area. The GIS-based Natural Hazard Map must be used for flood risk assessment purposes.

Land Acquisition Aspects

1. In the case of public schools, the title of the land should be regularized (registered by the Land Registrar), and formally transferred to the concerned District.
2. Sites that might require involuntary land acquisition, or resettlement of low-income persons should be avoided.
3. Required documentation should be completed for the land acquisition. These would include preparation of a transfer deed on court papers (*Stamp Paper*) which should be signed by the owner(s) of the land and endorsed by the *Patwari* (land record clerk). The transfer deed should then be registered by the Registrar. Involvement of the District Government is also recommended in this process. Section 5.1.3 and 5.1.4 below present a more detailed discussion on the land acquisition aspects.

Waste Disposal

1. Appropriate waste disposal measures should be adopted during the construction phase. The construction waste must be disposed in a manner that does not contaminate the soils or water resources (surface/groundwater).
2. Civil works contractors may utilize the demolition waste as a backfilling material for the construction of other schools in Deh, Taluka or District.
3. The recyclable waste should be sold to the recycling contractors; the biodegradable waste should be buried at an appropriate site; the left-over construction materials should be sold to other users; and the remaining waste should be burnt at a place at a safe distance from any human settlements.

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Exhibit 5.4: Guidelines for the Operation Phase[8]

Health and Safety Concerns

1. The water supply at the schools should be properly treated to ensure its safety for human consumption. A water quality monitoring program should be implemented to ensure long term quality of the water supply system. **Annex 3** provides more details on this subject.
2. The toilets should be kept clean and functional all the time.
3. Sewage treatment and disposal facilities should be properly operated and maintained in order to prevent diseases and contamination. Septic tanks should be emptied every three years.
4. Appropriate arrangement for final disposal of treated effluent (sewage) shall be developed; either the final effluent may be discharged into the public sewerage system or in properly designed soak ways. If such arrangement is not available then other possible arrangement according to the prevailing conditions of area may be adopted like soak pit, disposal of treated sewage into agriculture land, and any other water body used for irrigation purposes.
5. Solid waste should be collected and properly disposed.
6. Awareness level should be raised among the students, teachers and other school staff regarding personal hygiene, water contamination, communicable diseases and the associated precautionary measures.
7. Awareness level should be raised among the students, teachers and other school staff about precautionary measures that must be taken during the occurrence of natural disasters and other emergencies. The GIS-based Natural Hazard Maps must be used in determining the priority areas for receiving this training.

Gender Issues

1. Separate toilets should be available all times for boys and girls.
2. Awareness level should be developed on gender issues among the teachers, students and other staff of the school.

General Issues

1. Environmental awareness should be enhanced among the students, teachers and other staff through various means, including trainings, instructional materials and wall charts.
2. Attempts should be made to raise the environmental awareness of the community in general, particularly on issues such as waste disposal. This could be done by allowing members of the school management committees (SMC) to participle in the

[8] These guidelines should be considered preliminary and temporary, and will be reviewed and complemented by the consulting firm being hired by the GoS.

training programs carried at the school on sanitation, healthy personal hygiene habits, safety, etc.

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6 Social Management Framework

6.1 Social Safeguards

6.1.1 Program Background.

Despite being the province with the highest per capita income in Pakistan, urban rural and gender inequalities in social indicators (particularly in rural areas) are among the highest in Sindh. Improving education outcomes in Sindh is essential for poverty reduction and human development outcomes. The Pakistan National Education Policy prioritizes achievement Education for All (EFA) goals of universal primary enrollment; SERP-II assists the provincial and federal governments in their efforts to accelerate progress towards the achievement of its MDG for universal primary education, including removing urban-rural and gender imbalances, as well as enhancing the quality of education and student learning at all levels. SERP-II seeks to improve access, equity and quality in education by improving governance and institutionalizing accountability in education service delivery. It combines interventions in the education sector with broader fiscal, financial management and governance reform. The focus is on improving educational outcomes especially among the most vulnerable segments of the population (rural areas, girls) to ensure that growth is inclusive and contributes to poverty reduction.

6.1.2 Program's Civil Works Component

As occurred with SERP-I, SERP-II has components that might involve civil works. One is the Terms of Partnership (TOP) with the Districts, and the other is the Private Public Partnership Program (PPRS). The TOP, which will include the majority of construction-related activities, is an on-going government program that will continue to be supported under the project, providing each district with resources to provide new classrooms for shelterless schools, expanding classroom space where necessary and putting in missing facilities in local schools. The PPRS program (SEF schools) would provide stipends on agreed terms for new schools to be established and operated by private entrepreneurs. This type of program is also on-going in Sindh and other provinces.

6.1.3 Possible Land Needs and Approach to Address Them

The land needs if necessary for new schools or classrooms would be very small and would not be obtained through mandatory acquisition under the Land Acquisition Act. The new structures would be built on existing campus or public lands.

Under the PPRS program, the voluntary participating entrepreneurs will be responsible for the establishment and operation of the schools. They will locate the sites of the new

schools, and if applicable, they will make the necessary improvements. Public consultations and experiences from existing operations under SERP-I show that new PPRS schools, mostly of small size, are established through using self-owned or renting existing structures. Where new schools need to be built, they are mostly constructed on public and community lands as agreed with local communities, or leased lands from local people. Land purchasing in the market seldom happens for this purpose. But in case it becomes necessary, it would be conducted through pure market transactions on a willing-buyer-willing-seller basis. The program is not anticipating triggering of the Land Acquisition Act, or the World Bank OP-4.12 on Involuntary Resettlements.

The experience gained in the last three years during SERP-I implementation, when thousands of schools were built, or renovated in Sindh, without causing any problems related to land acquisition or involuntary resettlement, confirms the validity of the above assessment.

6.1.4 Monitoring of possible land needs

As justified above, the project will not trigger World Bank OP 4.12 on Involuntary Resettlement or the Land Acquisition Act in Pakistan. However, the monitoring and evaluation system to be established under the project would monitor the progress of the proposed civil works and the related land issues. The monitoring and evaluation reports will also cover these aspects.

6.1.5 Indigenous peoples

It is indicated through operational experiences and extensive planning exercises that there are no indigenous groups as defined under the World Bank Policy OP 4.10. This is also confirmed through public consultations and field visits. Therefore the project as designed is not triggering World Bank Policy 4.10 on Indigenous Peoples. However, screening should continue of project interventions during implementation. In the eventuality that such groups are identified, an Indigenous Peoples Development Plan should be developed to include actions to mitigate possible impacts and ensure culturally appropriate benefits to these people.

6.2 Social Assessment

SERP-II design was developed on a good understanding of the education sector status in Sindh Province, the challenges, various barriers and factors impacting access to quality education. This understanding comes from years of planning and operational experiences gained during SERP-I implementation as well as academic studies, professional researches and broad feedback from the public. Two major public consultation workshops were held as part of the project preparation to brainstorm over the above issues and design a way forward to address them. A programmatic social assessment was

carried out under SERP-I and will be updated in SERP-II along the annual programming and implementation of various components. It would focus on the following:

1. Facilitating continuous stakeholder consultations through component programming and implementation, particularly with local communities, students and teachers over their respective difficulties and needs in access to better education, and their prioritization in terms of education facilities and services. These would feed back into the project component design and implementation.
2. Assessing how various constraining factors relating to education (social, political, cultural, economic etc.,) are evolving under the project interventions under all components and whether the designed interventions are effective in addressing these factors and improving access to quality education. A better gauging of these would help improve project interventions.
3. Particular attention will be given to gender dimensions to all component programs. These will cover measures to improve access to and quality education for girls, such as the stipends programs under PPRS, and component programs targeting female teachers. The social assessment will also reflect gender perspectives in all project programs.
4. Screening of possible social safeguard issues. Review of possible land needs for interventions under the PPRS and TOP programs and making sure that the ESMF-II recommendations are followed in situations of such needs. All project interventions should be screened for possible impacts on indigenous peoples.

The project has designed an elaborate and vigorous social M&E system for timely and reliable information on the performance of the SERP-II components. It will employ both qualitative and quantitative process evaluations, which will be used to both inform and assess modifications in SERP-II design and implementation. This system consists of many initiatives aligned with component programs and is supported DLI EEP and TA. The M&E will be conducted by the RSU and independent research organizations.

The updated programmatic social assessment for SERP-II is designed to continue throughout project implementation. This process will be built into the elaborate monitoring and evaluation systems that have been planned along various component initiatives. The TORs and designs have been developed for the component M&E initiatives. The social analysis will be integrated, reflecting largely in the scope of work and methodologies. Each component M&E may vary in terms of its coverage, depth of analysis and methodology for social analysis due to its program focus and design. The following are the generic focus areas across all components.

1. The updated social assessment will facilitate continuation of stakeholder analysis and their participation in the project implementation. The project design is anchored on identification of key stakeholders and a good understanding of their

respective roles in the reform agenda. Main stakeholders include government institutions, non-governmental organizations, research institutions and other social groups/beneficiaries at all levels of intervention. Their participation is structured into the design of the project programs. The social assessment will monitor and evaluate their participation and roles they play in all project components. It would also facilitate their participation through the M&E exercise and provide recommendations for improvement. Special attention will be given vulnerable and disadvantaged groups.

2. The social analysis will monitor and explore various factors underpinning educational outcomes. It will maintain a focus on factors that continue to impact on access to education, with special attention to the most vulnerable, disadvantaged groups and the most lagging areas. Since the updated M&E will be tailored on a component program basis, each M&E exercise may have different sets of social factors to be analyzed due to its program focus. These factors will be assessed under the program interventions for their evolving impacts on education and the effectiveness of project interventions to harness their impacts.
3. The gender analysis will be an important dimension of the social M&E in all component programs. First, it will assess the performance of the stipend programs for girls, including before and after project comparisons as well as project and non-project school performance comparisons with respect to enrolment and completion rates of female students. Secondly, all analytical data to be collected should be disaggregated by gender to enable a gender dimension of the analysis and bring out the viewpoints of social groups, particularly women.
4. The social assessment will include a social safeguard analysis. Though these potential impacts such as land acquisition and impacts on indigenous groups are not unanticipated under the program as designed, it will be necessary to continue screening of project interventions, particularly under the TOP and PPRS programs. In the eventually of such unanticipated impacts, the social assessment will recommend follow-up actions to address them in line with relevant local laws and World Bank policies.

The RSU will assume the responsibility for M&E under SERP-II. It will develop the TORs, design the social M&E for component programs and establish the M&E teams. It will recruit dedicated teams under the SERP-II component. The teams could be established within the government or outsourced. There would be also independent researchers joining the M&E programs.

The updated social assessment will use a range of tools for data collection and analysis. The project will establish a series of surveys as process monitoring, to monitor and evaluate the project implementation progress. As it was done in SERP-I, these tools will

be complement and blend into the M&E design as appropriate. The RSU will regularly gather information and report on the implementation of SERP-II components. The information will be regularly collected and maintained in a database. Additionally the social assessment will also use questionnaire surveys, focus group discussions and interviews of key informants. Where possible, participatory rural appraisal tools should be designed into the M&E initiatives such as social group mapping in conjunction with access to education, ranking of problems regarding access and quality of education. These should enable a combination of both qualitative and quantitative analysis.

Choice of social assessment tools will depend on the component activity needs. As part of the design of the component program, RSU will also develop the TOR for the planned social M&E and recruit qualified candidate for this assignment. The TOR will incorporate the social analysis into the M&E design. The World Bank will also review the TORs and provide its input.

As occurred with SERP-I, the project is expected to generate a significant amount of useful data during implementation. These will be summarized and submitted to the relevant parties mostly in the form of progress monitoring reports for both project output and outcome.

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Exhibit 6.1: Guidelines on Cultural Property

Guidelines on Archaeological "Chance Find" Procedures

These procedures were developed in accordance with the World Policy OP 4.11 on Cultural Property (Physical Cultural Resources), and should be included as standard provisions in construction contracts to ensure the protection of cultural heritage.

Specifically, a clause for "Protection of Archaeological and Historical Sites' should be added to all bidding documents for the school works contract which explains the steps to follow whenever new archaeological remains, antiquity or any other object of cultural or archaeological importance are encountered during construction.

Protection of Archaeological and Historical Sites Guidelines

1. Excavation near or in sites of known archaeological interest should be avoided. Where this is unavoidable, prior discussions must be held with the Ministry of Culture´s Department of Archaeology and Museums (DOAM) in order to undertake pre-construction excavation or assign an archaeologist to log discoveries as construction proceeds. Where historical remains, antiquity or any other object of cultural or archaeological importance are unexpectedly discovered during construction in an area not previously known for its archaeological interest, the following procedures should be applied:
   a. Stop all construction activities.
   b. Delineate the discovered site area.
   c. Secure the site to prevent any damage or loss of removable objects. In case of removable antiquities or sensitive remains, a night guard should be present until the responsible authority takes over.
   d. Notify the responsible foreman/archaeologist. Who in turn should notify the responsible authorities, the Department of Archaeology and Museums and local authorities (within less than 24 hours).
   e. Responsible authorities would be in charge of protecting and preserving the site before deciding on the proper procedures to be carried out.
   f. An evaluation of the finding will be performed by the DOAM. The significance and importance of the findings will be assessed according to various criteria relevant to cultural heritage including aesthetic, historic, scientific or research, social and economic values.
   g. Decision on how to handle the finding will be reached based on the above assessment and could include changes in the project layout (in case of finding an irrevocable remain of cultural or archaeological importance), conservation, preservation, restoration or salvage.
   h. Implementation of the authority´s decision concerning the management of the finding.

i. Construction work could resume only when permission is given from the DOAM after the decision concerning the safeguard of the heritage is fully executed.

In case of delay incurred in direct relation to cultural/archeological findings not stipulated in the contract (and affecting the overall schedule of works), the contractor may apply for an extension of time. However, the contractor will not be entitled for any kind of compensation or claim other than what is directly related to the execution of the archeological findings works and protections

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7 Conclusions

SERP-II's school rehabilitation component involves the construction/renovation of about 4,000 schools during its tenure. Each year the program is expected to fund the school building construction/renovation in all 23 districts of Sindh province of Pakistan. The proposed school locations are spread all over the province, and the magnitude of the individual construction works for addition/expansion of existing school building or provision of new ones, have been determined to be quite small, thus causing minimal of the environmental impacts, and even these impacts will be mostly temporary in nature.

In order to assess the identified impacts, an environmental assessment of SERP-II was carried out which confirmed that the program would not result in any significant and lasting environmental impacts. It was also concluded that the present assessment, which is an updated and expanded version of the one prepared for SERP-I, was sufficient, and no further EA action would be needed, in accordance with the requirements of the World Bank OP 4.01 on Environmental Assessment.

In order to address the potentially adverse impacts of the program, particularly during the school construction, an environmental and social management framework (ESMF-II), has been developed, which will further improve the environmental performance of the program in Sindh.

Going beyond safeguards compliance, the environmental assessment addressed important issues that in some cases might be better characterized as impacts from natural environment on the program. To facilitate their characterization, they are referred in this document as environmental concerns rather than environmental impacts. It is important to note that they are likely to affect the long-term development effectiveness and sustainability of the whole program. Examples of such issues are:

1. The existing contamination of the drinking water sources (surface and ground) by toxic compounds such as arsenic and fluorides, in a significant number of schools;
2. The vulnerability of school buildings to natural disasters, the absence of reliable maps indicating the location of areas with the highest risks, and insufficient awareness at the top levels of the GoS regarding the risks and potential consequences of natural disasters;
3. The absence of training programs on injury/fatality prevention in case of emergencies, and on public health and personal hygiene habits.
4. Energy efficiency aspects in the design of new schools; and
5. Feasibility of the installation of low-cost renewable power systems in schools located in off-grid areas.

ANNEX 1 - Assessment of ESMF-I Implementation

To verify the degree of compliance with the ESMF-I recommended actions and their appropriateness and effectiveness; two field surveys were conducted in a sample of public and private schools in Sindh. The next two sections provide a description of the issues identified during the two surveys, and recommendations on how to address them.

In the third section a broader discussion is presented about the problems that occurred in the last three years during ESMF-I implementation, particularly those not covered by the two mentioned surveys.

1. Findings from the Survey on Public Schools (TOP-II and III)

The purpose of the survey was to collect data about the quality of construction, and the degree of compliance with the recommendations of the ESMF-I agreed with the Bank in 2009. It covered a total of 47 randomly selected schools located in 11 districts. All selected schools were either built or renovated under the Terms of Partnership (TOP), rounds II and III.

ESMF-I recommendations included among others, the following actions: (i) design and implementation of a pilot program aimed at providing safe drinking water in schools; (ii) provision of adequate sanitation facilities for boys and girls; (iii) adoption of architectural and structural designs that resulted in better and safer schools, particularly those located in areas prone to natural disasters; (iv) design and installation of a pilot program on low-cost renewable power systems in schools not connected to the power grid; and (v) execution of training programs on healthy personal hygiene habits, and on minimization of injuries and fatalities during natural disasters (earthquakes, floods, tidal surges, tsunamis, etc.).

The survey collected also data on the effectiveness of the construction supervision activities provided by a construction supervision firm (CSF) hired by the GoS to supervise all civil works related to SERP-I. To perform this task the CSF assigned an assistant resident engineer (ARE) to each of the 23 Districts in the province. These professionals were tasked with the monitoring of all construction activities to ensure that they complied in full with the approved designs, and the quality of materials used met pertinent national standards.

The survey's findings were consolidated and summarized in a final Report that provided several recommendations that were incorporated in the design of SERP-II. The following

paragraphs present a summary of the survey's main findings and recommendations to be included in ESMF-II.

1.1 Construction Safety Quality

As recommended in the ESMF-I, new schools buildings, additional classrooms (ACRs), toilets and boundary walls were designed as conventional RCC structures (reinforced concrete structure). As a result, the visited new schools or additional classrooms are: (i) stronger than the old school buildings, thus better prepared to withstand natural disasters; (ii) with larger windows in order to make them well lighted, without the use of electric energy; and (iii) less hot during the summer months. However, the quality of the work was not uniform from contractor to contractor and it also depends on how effective was the construction supervision by the local Assistant Resident Engineer (ARE). This indicates that the level of construction supervision provided by the construction supervision firm (CSF) need to be strengthened so to avoid buildings with an uneven quality and different degrees of completeness.

Overall, in the opinion of the teachers/headmasters, the quality of work now is much better when compared to the schools built by the Education Works department (EWD) before SERP-I, which were unframed, and had load-bearing walls that are highly vulnerable to natural disasters.

1.2 Sanitation Facilities

ESMF-I required that toilets be built connected to a septic tank, with a drainage system and running water. Since the use of toilets is still not a widespread practice in small villages in Sindh, local contractors may see the sanitation facilities as a mere formality which wouldn't be used by children anyway. This type of problem shows that the supervision work carried out by the AREs from the CSF needs to be improved. In order to enhance the construction supervision efficacy, the AREs would be required to certify the quality and completeness of the work, and that all components are fully operational. Finally, the culture of going to the fields should be changed through education on healthy hygiene habits, as recommended in the ESMF-I.

1.3 Public Health

To create a healthy and safe environment in Sindh schools, the quality of drinking water must be ensured. The ESMF-I recommended the design and implementation of a water treatment Pilot Program in 15 schools located in the areas with the highest levels of contamination, to select the most cost-effective treatment technology(ies) for the local conditions (e.g., type and concentration of pollutants, availability of materials, etc.). The pilot program would then be scaled up to provide drinking water treatment facilities in the schools located in areas with the worst contamination levels of arsenic, fluoride, pathogens, etc. A permanent water quality testing and monitoring program was also one

of the main ESMF-I recommendations to ensure long-term quality of the water supply system in problematic areas. However, since procurement problems prevented the hiring of the RSU´s environmental coordinator and the consulting firm responsible for the ESMF-I implementation, the pilot program was not implemented as intended. This scenario has recently changed with the hiring of the environmental coordinator, who started working at the RSU on December 02, 2012, and also the advanced stage of the procurement process for a consulting firm specialized in environmental management.

1.4 Low-Cost Renewable Power Systems

Regarding the installation of low-cost renewable power systems, due to the same procurement problems mentioned above, the pilot program to select the most cost-effective technology for Sindh was not implemented as envisioned.

Unlike other areas, in the Tharparkar district all visited schools were without any type of electrical connection. In this district, the general public was aware of the solar systems as NGOs have provided them in many places for pumping the underground water. These small solar panels costs between Rs 3,000.00 and 4,000.00 (US$ 31.00 – 42.00), depending on the size, and are being used commercially in Nagarparkar to recharge cell phones. For these reasons, Tharparkar district seems to be a good location to receive one of the Pilot low-cost renewable power system recommended in the ESMF-I. As mentioned above, the procurement situation has changed for the better, and it is expected that the consulting firm will be hired before March 31, 2013.

1.5 Training on Healthy Habits on Personal Hygiene

No ESMF-I recommended training was carried out in any of the visited schools. A few years ago, NGOs have provided in a few schools training to teachers/children on matters related to healthy habits on personal hygiene. However, even in those schools, refresher courses are required to inculcate healthy habits in children, particularly the use of toilets, and washing hands after its use. It is important that for a successful training program on personal hygiene, the sanitation facilities at the schools must be completed and fully operational, otherwise the training will be purely theoretical, and less effective.

1.6 Training on Casualty Prevention

Interviews with head teachers indicated that except in a couple of schools, no training was provided to teachers and children on how to minimize the fatalities and injuries in the event of a natural disaster. As recommended in the ESMF-I, an extensive, structured, and formal training program is required to educate students and teachers on the preparedness to natural disasters like earthquakes, floods, tsunamis, and other emergencies. If properly done, this training might save many lives during such extreme events. The preparation of a multilanguage presentation and the training of 50 “master

trainers" (two from each district, and four from the SEF), will be the responsibility of consulting firm being hired to implement ESMF-II.

2. Survey on private schools built/renovated by the PPRS under SEF

This survey was carried out in November 2012 in a sample of 28 schools in 6 Districts. Although during SERP-I implementation the ESMF-I recommendations were not specifically required to the PPRS schools, during ESMF-II preparation it was decided that gathering field data on them was important to help understanding their specific realities, and problems.

Unlike TOP public schools, most PPRS private schools are located in rented houses and depending on the locality the type of construction varies from load-bearing walls to mud house with wood-straw roof/bamboo and even a hut. Therefore, no environmentally significant construction activities were carried out in those schools, which are in general located in the poorest areas of the province, and have to operate under very limited budgets (government subsidies). Moreover, since the property does not belong to the entrepreneur, he has very little incentive in making any significant investments in it.

The main problems encountered in the PPRS schools were quite similar to the ones found in most public schools, and cover issues such as building conditions, safe supply of drinking water, sanitation facilities, trainings on personal hygiene and disaster preparedness.

The survey results indicated that, in general, the PPRS schools installations are in worse conditions than the public ones (TOP).

It should be noted that the construction of safer school buildings or the structural reinforcement of the existing ones involve significant investments and contractual implications in the existing leasing contracts, that can only be addressed with changes in the rules under which these schools operate. Given this reality, the following recommendations include only simple measures that did not involve large outlays of capital. As one example, the poor lighting conditions in the most surveyed classrooms can be significantly improved if the dark color of the walls is replaced by a white one.

Water quality is a very important aspect for the health of children. No school in the survey of PPRS schools was found to have any kind of water filtering arrangement. During the visits it was informed that a survey of the schools was carried out and soon water filters will be supplied with support from the World Bank. However, the filters that are being supplied will only be reduce the microbial contamination, which is much more widespread in the province than the other types, which affect only some specific areas. Other serious contaminants like arsenic and fluorides will not be reduced by these filters.

Although the filters would be a significant improvement in the current conditions, because coliform contamination is a much more frequent problem in Sindh, they might give a false impression that the water is safe if they are used in areas prone to arsenic and fluorides contamination. A SERP-II financed water quality testing in PPRS schools would be very important to ensure the children´s health.

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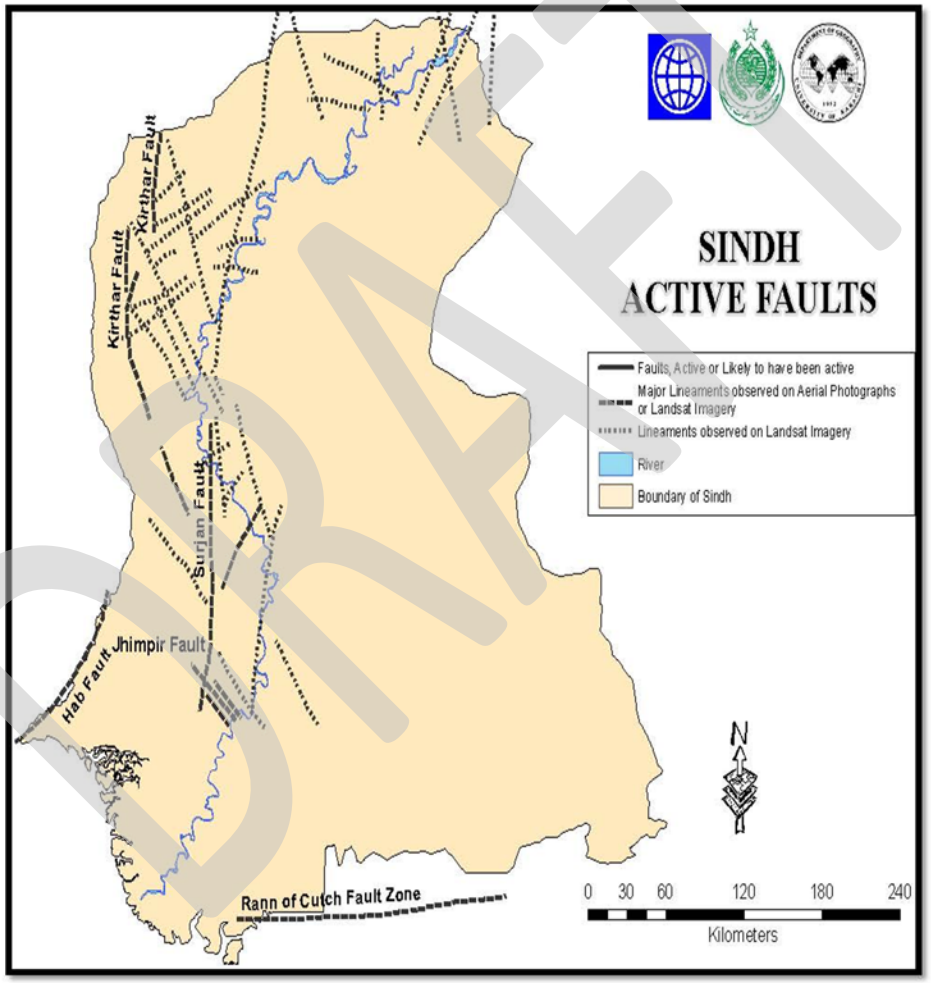
ANNEX 2 – Sindh Active Faults / Arsenic Contamination

ANNEX 2

Sindh Active Faults



Source: **Gulraiz, H., and Kazmi, J.**, 2012. Progress Report of the Component of Geology for SERP-PERP November 20, 2012. Karachi, Pakistan.

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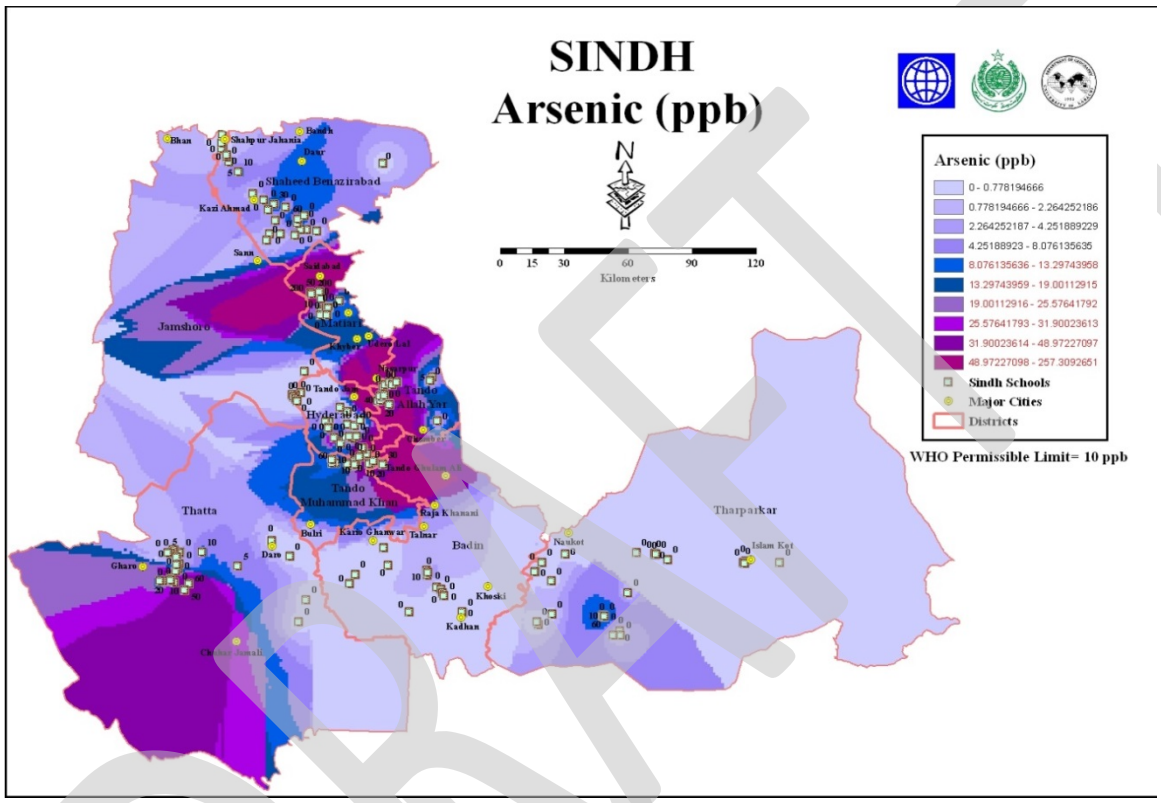
Arsenic concentrations in Sindh



Source: Kazmi, J., et ali. 2013. Second Progress Report of the GIS Project of Sindh Education. January 2013. Karachi, Pakistan.

ANNEX 3 - ESMF-II Implementation Strategy

SECOND SINDH EDUCATION REFORM PROGRAM (SERP-II) Environmental, Safety and Safeguards Aspects Implementation Strategy				
Activity	**Implementation Schedule**			
	Year 1 March 2012- March 1st 2013	**Year 2 March 31 2014**	**Year 3 March 31 2015**	**Year 4 March 31 2016**
1. Mapping of areas with moderate to high risk of natural disasters (earthquakes, floods, landslides, etc.); and with arsenic and fluoride water contamination.	**Bank Analytical work done in 2012 on:** • Assessment of needs, design of the most appropriate GIS system, and preparation of specifications for software and hardware purchase. To be done by an individual consultant hired with funds from TA. • Acquisition of required hardware and software. • Data collection & digitalization. Development of a fully operational GIS System. • Training of key personnel. • Mapping of natural	• Natural Hazards maps for Sindh based on results of work done by the Bank consultants are available in a 1:10,000 scale. • Incorporation of the natural hazard maps into the Guidelines for School Siting. • Dissemination of the Natural Hazard maps for Sindh to other public agencies. • To be done by the consulting firm being hired by the RSU to implement ESMF-II actions.		

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SECOND SINDH EDUCATION REFORM PROGRAM (SERP-II) Environmental, Safety and Safeguards Aspects Implementation Strategy				
Activity	**Implementation Schedule**			
	Year 1 March 2012- March 1st 2013	**Year 2 March 31 2014**	**Year 3 March 31 2015**	**Year 4 March 31 2016**
	hazards prepared by the Geologist and Hydrologist hired by the World Bank, based on the available data from official sources.			
2. Inspection of existing schools in high risk areas.	**Bank Analytical work done in 2009 on:** • Preliminary inspection of schools located in areas of Sindh province classified as prone to natural disasters. • Drinking water testing in 200 schools inspected (i.e., arsenic levels, coliforms, etc.). To be carried out by consultants hired by the Bank.	• Detailed inspection of the remaining schools in high risk areas including testing of materials when deemed necessary (about 400 schools). • Preparation of a list of priorities. Priorities include severely damaged schools, schools with inadequate structure or foundations, schools built in fault lines, and high levels of water contamination. (To be done by the consulting firm being hired for ESMF-II implementation).		

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SECOND SINDH EDUCATION REFORM PROGRAM (SERP-II) Environmental, Safety and Safeguards Aspects Implementation Strategy				
Activity	**Implementation Schedule**			
	Year 1 March 2012- March 1st 2013	**Year 2 March 31 2014**	**Year 3 March 31 2015**	**Year 4 March 31 2016**
3. Reinforcement of vulnerable schools included in the priorities listed above		• Preparation of designs for reinforcement of vulnerable schools in high risk areas. To be done by the consulting firm with TA funds. • Implementation of a Pilot Project with TOP funds aimed at reinforcing the most vulnerable schools identified in the inspections (about 15 schools).	• Implementation of reinforcement program according to degree of priority to at least 200 schools • Compliance is certified by Supervision Consulting firm.	• Implementation of the reinforcement program to at least 400 additional schools • Compliance is certified by the Construction Supervision firm.
4. -Guidelines for school siting, and specifications for design and construction; including safety aspects, and drinking water and sanitation facilities.		• Preparation of the guidelines based on the GIS mapping and on the school inspection results. • Preparation of specifications for school design and construction, to be included in all bidding documents issued by the Works and Services department. Specifications must comply with Pakistan's Building Code - 2007 (in process of approval). To be done by the consulting firm being hired. • Creation of a Technical Panel conformed by the Sindh government officials to review the work carried out	• Inclusion of the school siting guidelines in the Public Works department existing procedures (*). • Inclusion of the construction specifications in all bidding documents for school construction, improvement or rehabilitation (*). • No TOP funded construction should be done without complying with all the guidelines and specifications. (*) To be done by the consulting firm being hired	

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SECOND SINDH EDUCATION REFORM PROGRAM (SERP-II) Environmental, Safety and Safeguards Aspects Implementation Strategy				
Activity	**Implementation Schedule**			
	Year 1 March 2012- March 1st 2013	**Year 2 March 31 2014**	**Year 3 March 31 2015**	**Year 4 March 31 2016**
		by the consulting firm.		
5. Model designs for schools that would be: **- Energy efficient,** **- Structurally safe,** **- Cost-effective,** **- Well built, and** **- Appealing to students.**		• Preparation of model architectural and structural designs (about 4-6), done by the consulting firm being hired. Model designs should take into account the different climatological regions in Sindh. • Review of the consulting firm's proposals by the Technical Panel mentioned above. • Adoption of the models designs by the Education and Public Works departments. • Workshop in Karachi for about 50 (50 is very high number, difficult to gather this number and there will reap no result. In EC opinion the numbers should be at least (10) and maximum 25 to cover all districts technical persons from GoS to present and discuss results of the work carried out by the consulting firm.	• All new schools should be built using the model designs. • Compliance is certified by third party construction supervision firm.	

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SECOND SINDH EDUCATION REFORM PROGRAM (SERP-II) Environmental, Safety and Safeguards Aspects Implementation Strategy				
Activity	**Implementation Schedule**			
	Year 1 March 2012- March 1st 2013	**Year 2 March 31 2014**	**Year 3 March 31 2015**	**Year 4 March 31 2016**
6. Water quality testing with priority given to those located in the areas with geological structures prone to the contamination with arsenic and fluoride; and installation of drinking water treatment facilities in schools with high contamination.	**Bank Analytical work done in 2009 on:** • Preliminary identification of contaminated areas by the consultants hired by the Bank. • Testing of the drinking water in about 200 schools according to priorities listed above. • Carry out a complementary water testing program in at least 400 priority schools in the areas defined previously. Parameters should include arsenic and fluoride levels and total coliforms. • Literature review of low-cost and efficient methods for arsenic, fluoride removal and	• Design and implement a drinking water treatment Pilot study in about 10-15 schools. Based on their performances, identify the best option for the local conditions. • Upscale the Pilot study, and install drinking water treatment facilities in at least 200 priority schools, according to their degree of contamination. To be carried out by the consulting firm being hired.	• Upscale the Pilot study, and install drinking water treatment facilities in at least 300 priority schools, according to their degree of contamination. To be carried out by the consulting firm being hired.	• Install drinking water treatment facilities in at least300additional priority schools, according to their degree of contamination. To be carried out by the consulting firm being hired. • Carry out a water quality monitoring program in all schools built, improved, or rehabilitated by the Program, to ensure the safety of drinking water (to be done by a specialized consulting firm to be hired for this specific purpose). Main parameters to be monitored: - Arsenic; - Fluorides;

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SECOND SINDH EDUCATION REFORM PROGRAM (SERP-II) Environmental, Safety and Safeguards Aspects Implementation Strategy				
Activity	**Implementation Schedule**			
	Year 1 March 2012- March 1st 2013	**Year 2 March 31 2014**	**Year 3 March 31 2015**	**Year 4 March 31 2016**
	for water disinfection. Select the 2-3 most cost-effective for piloting. To be done by the consulting firm being hired.			- Total & Fecal Coliforms. • Arsenic concentration must be lower than 0.01 mg/liter[9] • Fluorides concentration must be less than 1.5 mg/liter[10] • Total Coliforms must be absent. • Sampling frequency in problematic areas should be at least once a year.

[9] World Health Organization Standard
[10] World Health Organization Standard

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SECOND SINDH EDUCATION REFORM PROGRAM (SERP-II) Environmental, Safety and Safeguards Aspects Implementation Strategy				
Activity	**Implementation Schedule**			
	Year 1 March 2012- March 1st 2013	**Year 2 March 31 2014**	**Year 3 March 31 2015**	**Year 4 March 31 2016**
7. Renewable power supply in schools located off the power grid		• Identification and evaluation of cost-effective technologies that are applicable to Sindh schools including the operation and maintenance aspects. Identification of schools that should be included in a Pilot Program. To be done by the consulting firm being hired. • Design a Pilot Study for the installation of renewable power systems in 10-15 selected schools. At least two designs should be evaluated. To be done by the consulting firm being hired. • Implementation of the Pilot Program in selected schools, and evaluation of their performances.	• Certification by the construction supervision firm that the power systems installed are working properly in the selected schools. • Upscale the Pilot Program to include at least 300 schools. In areas not far from the power grid, compare the costs of the renewable systems with the costs of connection to the nearest power grid.	
8. Training on injury & fatality prevention during natural disasters.		• Design of a training program for teachers and head teachers on schools located in areas with moderate to high risk of natural disasters. To be done by the consulting firm being hired. • Implementation of the teacher and head teacher training program. At least	• Dissemination of the teacher and head teacher training program. Teachers will train children in their schools. At least 1,000 teachers should be trained. Once trained, teachers will train the	• All children in all schools located in moderate to high risk areas must have been trained in injury and fatality prevention during natural

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SECOND SINDH EDUCATION REFORM PROGRAM (SERP-II) Environmental, Safety and Safeguards Aspects Implementation Strategy				
Activity	**Implementation Schedule**			
	Year 1 March 2012- March 1st 2013	**Year 2 March 31 2014**	**Year 3 March 31 2015**	**Year 4 March 31 2016**
		200 teachers should be trained by the firm's master trainer • Once trained, teachers will train the children in their schools.	children in their schools. • School books should be updated to include the basics on casualty prevention.	disasters. • Training should be disseminated to all public and PPRS schools.
9. Training on healthy habits on personal hygiene.		• Design of a training program for teachers and head teachers on healthy habits on personal hygiene. To be done by the consulting firm being hired. • Implementation of the teacher and head teacher training program. At least 200 teachers should be trained by the firm's master trainer. Teachers will then train children in their schools. • School books should be updated to include the basics on healthy habits on personal hygiene prevention.	• Dissemination of the teacher and head teacher training program. Teachers will train children in their schools. At least 1,000 teachers should be trained. Once trained, teachers will train the children in their schools.	

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SECOND SINDH EDUCATION REFORM PROGRAM (SERP-II) Environmental, Safety and Safeguards Aspects Implementation Strategy				
Activity	**Implementation Schedule**			
	Year 1 March 2012- March 1st 2013	**Year 2 March 31 2014**	**Year 3 March 31 2015**	**Year 4 March 31 2016**
10. Contamination prevention and optimization of use of natural resources.	**Bank Analytical work done in 2009 on:** • Preparation of preliminary construction environmental management guidelines to minimize or avoid contamination resulting from activities such as school construction and operation.	• Complement, and implement the recommendations specified in the preliminary construction guidelines. Bidding documents for school construction or renovation must include guidelines. • Certification by the third party construction supervision firm that the guidelines are being complied with in all construction activities.	• Certification by the third party construction supervision firm that the guidelines are being complied with in all construction activities.	• Certification by third party construction supervision firm that the guidelines are being complied with in all construction activities.

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