Initial Environmental Examination

July 2013

People's Republic of China: Guangxi Nanning Vocational Education Development Project

Prepared by the Nanning Municipal Government for the Asian Development Bank

CURRENCY EQUIVALENTS
(as of 10 July 2013)

Currency Unit	–	Chinese Yuan (CNY)
CNY1	=	$. 0.16
$1	=	CNY 6.13

ABBREVIATIONS

ADB	-	Asian Development Bank
AP	-	affected person
ASL	-	above sea level
BOH		Bureau of Health
CIEE	-	Consolidated Initial Environmental Examination
CBC		competency-based curriculum
CPD		continuing professional development
DFR	-	draft final report
DMF	-	design and monitoring framework
EHS	-	Environmental Health and Safety
EIA	-	environmental impact assessment
EMC	-	environmental monitoring center
EMP	-	environmental management plan
EPB	-	Environmental Protection Bureau
FSR	-	feasibility study report
FYP	-	Five-Year Plan
GHG	-	Greenhouse Gas
GRM	-	grievance redress mechanism
GZAR	-	Guangxi Zhuang Autonomous Region
HH	-	Household
IFC	-	International Finance Corporation
MEP	-	Ministry of Environmental Protection
NDRC	-	National Development and Reform Commission
NGO	-	non-governmental organization
O&M	-	operation and maintenance
PAH	-	project affected households
PAP	-	project affected persons
PCC	-	public compliant center
PMO	-	project management office
PPMS	-	project performance management system
PPTA	-	project preparatory technical assistance
PRC	-	People's Republic of China
RRP	-	report and recommendation of the President
TOR	-	terms of reference
WWTP	-	wastewater treatment plant

WEIGHTS AND MEASURES

km^2	–	square kilometer
m^2	–	square meter

m^3/day – cubic meter per day
mu – Chinese unit of area (15 mu = 1 hectare)

NOTES

(i) The fiscal year (FY) of the Government of the People's Republic of China ends on 31 December.

(ii) In this report, "$" refers to US dollars.

CONTENTS

I. EXECUTIVE SUMMARY

A. Introduction

1. This Project initial environmental examination (IEE) report was prepared for the proposed Guangxi Nanning Vocational Development Project (the Project) in Guangxi Zhuang Autonomous Region (GZAR), People's Republic of China (PRC). The project IEE is prepared in accordance with the requirements of the Asian Development Bank's (ADB) Safeguard Policy Statement (SPS, 2009) on the basis of the domestic Tabular Environmental Impact Assessment Reports (TEIAR), feasibility study reports (FSR), the project preparatory technical assistance's (PPTA) social and economic assessments, and project policy dialogue discussions.

2. GZAR, located in southern PRC, is one of 14 PRC coastal provinces. Being the only province connected to the Association of Southeast Asian Nations (ASEAN) region by both land and sea, GZAR plays a key role in the social and economic exchanges between the PRC and ASEAN. Hence it needs to boost its technical and vocational education and training (TVET) system to meet growing manpower requirements and industry standards to help GZAR leverage on ASEAN's economic development.

3. Nanning is the capital city of GZAR, one of the 12 less-developed provinces and autonomous regions in the western part of the PRC and a gateway to the Pan-Beibu Gulf and ASEAN regions. The development of Nanning as a regional urban center has led to rapid urbanization and an annual growth rate of 15.5%. Industrialization has created a rising demand for skilled workers and extension of social services to provide balanced access and social development in rural and urban areas.

4. GZAR has spearheaded TVET reforms in the autonomous region. Investment in TVET development has played an important role in helping the disadvantaged people gain new skills and enjoy the growth benefits. Not withstanding this impressive progress, TVET development in GZAR faces a number of challenges. Currently, a common challenge is the limited industry involvement, which results in poor quality and industrial relevance of courses, and a lack of clear standards that guide study programs and assessment. A greater involvement of enterprises in advising and directing the TVET system is critical to increase TVET's responsiveness to the labor market needs. There is a need to established industry advisory groups as a catalyst to advance industry and employer groups, involvement in TVET.

5. There is a lack of (i) systematic processes for identifying training needs; and (ii) accurate and consistently sourced labor market information leading to inefficiencies in identifying priority skills areas and adjusting TVET programs and specialties so they can provide more marketable skills for TVET graduates and meet the skill requirements of Nanning's and GZAR's workforce. Nanning's TVET curriculum for nurse training and kindergarten teacher training is in need of modernization, as it is for other occupations. Many instructors, teacher trainers and nurse trainers have limited workplace experience, making it difficult for them to prepare their students for the world of work.

6. Nanning Municipal Government must build up the public social service system to respond to increased demand. In 2010, the national average was 7.6 health personnel per 1,000 urban residents but GZAR's average is only 3.6 health personnel per 1,000 residents. The Twelfth Five-Year Plan also responds to the challenge of an aging society by aiming to create improved elderly care and qualified personnel and there is an urgent need to expand the health services with well trained personnel.

7. Lack of and/or obsolete equipment to simulate a work place for practical demonstration and application hampers quality teaching-learning processes. Existing management and leadership provision (leadership in curriculum, teaching learning modes, assessment modes, PPP and entrepreneurial activities) needs to be improved to better prepare managers as leaders for a market-responsive, rather than supply-driven TVET.

8. At the Nanning No. 4 Vocational Secondary School (NVTS), the project will address the following challenges for kindergarten teacher training in (i) Improving the quality of preschool teacher training curriculum, teaching-learning methods, assessment and content; (ii) Improving quality of educational leadership and management including mentoring and monitoring; (iii) Training of new teaching staff to meet the new educational quality requirements in kindergarten teacher education; (iv) Improve the cooperation between NVTS and kindergartens for purpose of preschool teacher training including integrated classroom and work based learning; (v) fostering joint development of teaching-learning materials including teachers guides and textbooks; (vi) kindergarten training base; and (vii) construct new facilities at and provide new equipment for NVTS.

9. At the Nanning Health School (NHS), the project will address the following challenges for nurse teacher training at (i) improving the quality of nurse training curriculum, teaching-learning methods, assessment and content; (ii) improving quality of educational leadership and management, including mentoring and monitoring; (iii) training of new teaching staff to meet the new educational quality requirements in nurse education; (iv) improve the cooperation between the NHS for purpose of nurse teacher training including integrated classroom and work based learning; (v) integration of school-based learning with on-job learning including joint assessment of student nurses, nurses for the elderly and rural health training bases; (vi) foster joint development of teaching-learning materials including teachers guides and textbooks; and (vii) construct new facilities at and provide new equipment for NHS.

B. Project Impact, Outcome, and Outputs

10. The impact of the proposed project is to improved delivery of public social services in Nanning focusing on kindergarten/preschool teacher education and training and nurse education and training.

11. The outcome is improved human resources and capacity in NHS and NVTS. This will include building systemic and institutional capacity to optimize the TVET system by focusing on (i) teacher training, (ii) curriculum development, (iii) building regional cooperation and strategic TVET and industry partnerships, (iv) management capacity building, (v) supporting the design and implementation of a pilot model preschool and rural training base(s), and (vi) provision of facilities and equipment for NHS and NVTS. The project has four indicative outputs as follows:

1. Output 1: Technical and Vocational Education and Training Capacity Strengthening

12. The project will support improvements in the quality and management of TVET in Nanning by (i) developing competency-based standards and competency-based curriculum (CBC) for training of nurses, nurses for the elderly and rural doctors through the NHS and training of kindergarten teachers through NVTS and incorporating employability and entrepreneurship skills in curriculum modules, (ii) developing teaching and learning materials to support CBC, (iii) improving access to NHS and NVTS for disadvantaged with a focus on gender equity, (iv)

strengthening and upgrading teacher trainers and nurse trainers skills through industry placements and in-service training programs, and (v) strengthening TVET management capacity through leadership programs and interpersonal vocational colleges.

2. Output 2: Pilots.

13. The project will assist the NVTS in establishing a state-of the art kindergarten based on 'best international and national practice' and experiences, including mentoring, monitoring, provision of educational and pastoral care of children, assessment, leadership and management. The project will also support the establishment of rural training base(s) through (i) selection of sites based on the criteria determined in consultation with Nanning Bureau of Health and NHS, (ii) identifying training needs and demands and existing gaps, (iii) strengthening the existing curriculum to integrate theory-praxis nexus and syllabus, (iv) development of teaching-learning methods and materials, and (v) development of management and entrepreneurial capacity through in-service, pre-service, and continuing professional development.

3. Output 3: Civil Works and Equipment

14. The project's investments in human resource development will be accompanied by facilities upgrades as follows:

(i) **Nanning No. 4 Vocational Secondary School facilities** will be constructed by 2016, consisting of (i) teaching facilities, including No. 2 teaching building (6,400 square meters [m^2]), gymnasium (9,900 m^2), library (10,700 m^2), art building (10,300 m^2), experimental and training building (6,000 m^2),[1] kindergarten training base (5,000 m^2), landscaping training base (3,000 m^2); (ii) living facilities (including dormitory for trainees/ students (2,600 m^2); teacher management building (2,600 m^2); No.3 dormitory (4,850 m^2); No.4 dormitory (4,850 m^2); No.5 dormitory (4,140 m^2); No.6 dormitory (4,140 m^2) and other facilities (including performance platform (290 m^2); security guard room (120 m^2); first floor open space (4,020 m^2).

(ii) **Nanning Health School facilities** will be constructed by 2016, consisting of experimental building (52,541 m^2); library and office building (56,542 m2); auditorium (1,776 m^2); A3 and A4 teaching buildings (10,291 m^2); and underground structure (13,813 m^2).

(iii) **Equipment.** The project will support the improvement of learning environments through upgrading training equipment at NHS, NVTS, and Rural Health Base(s). This will include general teaching-learning equipment and furniture, multimedia production equipment, micro-teaching and seminar equipment and furniture. Adherence to the PRC green public procurement policies will be targeted for equipment and appliances procurement[2].

(iv) **Campus greening and sustainable management.** The project will support greening of the two TVET campuses by designing, constructing, and maintaining buildings that reduce energy and water use, while promoting sustainable practices, such as reducing, reusing, and recycling resources (3R). The project will develop guidelines for sustainable practices on the two TVET campuses and support these TVET institutions in setting up environmental management systems (EMS) with the

[1] The experimental building will include ten 50 seat computer rooms, ten 50 seat language teaching room, 15 practice laboratories (for teacher practice, without chemical reagents or other dangerous substances), and other service rooms.

[2] A rating weight will be assigned to equipment that meets green procurement standards during bid evaluation.

aim to avoid and mitigate adverse environmental impacts during operation of the new buildings.

4. Output 4: Project Management Support

15. This project output will (i) provide training and project implementation support; (ii) improve monitoring and evaluation to capture lessons from project activities under components 1, 2, and 3; and (iii) regularly disseminate the experiences gained.

C. Environmental Due Diligence

16. **Categorization.** The Project underwent initial appraisal during project preparation by ADB and was classified as Category B for environment on the basis of ADB's Rapid Environmental Assessment checklists, requiring an Initial Environmental Examination (IEE). The main anticipated environmental impacts and risks upon which the categorization was based included dust, noise, wastewater and solid waste arising from construction of 22 buildings on two TVET campuses (NHS and NVTS) under Component 3. Risks to occupational and community health and safety from construction activities were also considered potentially significant.

17. **Environmental assessment.** The environmental assessment documents upon which this IEE is based have been prepared under the provisions of PRC Environmental Impact Assessment Law of 2003 and the PRC Management Guideline on environmental impact assessment (EIA) Categories of Construction Projects (2008). The Project was classified as category B for environment, requiring a tabular environmental impact assessment report (TEIAR) for each campus. Zhongsheng Environmental Protection Science and Technology Corporation and Guangxi Transport Design Institute were engaged to prepare TEIARs for NHS and NVTS, respectively. The TEIAR for Nanning Health School has been approved by Nanning Municipal Environmental Protection Bureau (NEPB) in 2009. An initial TEIAR for NVTS has been submitted to the PPTA team, and was revised to include SPS safeguard requirements to the extent possible. The TEIAR was approved on 5 June 2013.

18. **Consultation, participation, and grievance redress mechanism.** In the framework of the environmental due diligence, meaningful consultation was conducted with key stakeholders and potentially affected people. Information was disclosed to affected people through the website of the NEPB and posters within the campuses of the TVET institutions. This IEE is disclosed on ADB's project website. Public consultation conducted during project preparation indicated that potentially affected people had a positive attitude toward the Project. A grievance redress mechanism (GRM) has been defined to deal with public complaints related to project activities during project implementation and operation.

D. Environmental Impacts and Environmental Management Plan

19. All buildings will be **designed** in compliance with relevant design standards and codes for energy-efficient, safe and green public buildings, including but not limited to: GB 50099-2011 (Code for design of schools); GB 50011-2010 (Building Seismic Design Code); GB 50189-2005 (Energy Conservation Design for Public Buildings); GB 50016-2006 (Code of Design on Building Fire Protection and Prevention); GB/T 50378-2006 (Evaluation Standard for Green Buildings); and other applicable national design codes. The use of VOC-emitting materials (including paints, coatings, adhesives, carpet, and furniture's) will be avoided to ensure high indoor air quality.

20. During **construction**, major anticipated impacts include noise, fugitive dust, solid wastes,

and community and occupational health and safety risks. Overall, construction-related impacts are localized, short term, and can be effectively mitigated through the application of good construction and housekeeping practices and implementation of construction phase community and occupational health and safety plans.

21. During **operation**, no major environmental impacts are anticipated. The current environment services of the two schools were assessed, and it is concluded that incremental water supply, wastewater and solid waste generation resulting from the project will not overburden existing services. The project's potential impacts on community and occupational health and safety during operation were analyzed and corresponding mitigation measures have been defined in the IEE and environmental management plan (EMP). Output 4 of the project will also provide expert support to the two IAs in developing an environment management system (EMS) based on the draft Green Campus Policy defined in Appendix 3.

22. An EMP has been developed for the design, construction, and operation phases of the project. The plan will be updated after detailed project design (as needed) and incorporated into bidding documents for subproject construction. The EMP defines mitigation measures, monitoring requirements, and institutional responsibilities and costs for implementing the mitigation measures and the monitoring requirements.

E. Main environmental Risks and Assurances

23. Environmental risks, and the assurances required to address these risks, have been identified in the IEE. The majority of environmental risks relate to design features and operational plans which will avoid or mitigate impacts, but which rely on the implementers' commitment and capacity to implement and consistently follow-up. The remainder relate to the likelihood of unexpected negative impacts. The major risks are listed below:

(i) design of project facilities not complying with relevant design standards and codes related to energy-efficient, safe and green public buildings;
(ii) inadequate capacity of the executing agency and implementing agencies in environment management, which could result in inefficient project and EMP implementation; and
(iii) inadequate environment, health, and safety management systems in the two schools.

24. Commitments by the executing agency and the implementing agencies will be incorporated into the loan documentation as loan covenants to ensure that the measures are implemented in a timely and complete fashion, including (i) a commitment to adhere to relevant design standards and codes for energy-efficient, safe and green public buildings, (ii) a commitment to adhere to PRC green public procurement policies,[3] and (iii) a commitment to promote campus greening through the development of environment management systems (EMS) for both schools on the basis of the *Green Campus Policy Framework* drafted for the project (**Appendix 3**).

25. The overriding assurance required is that the executing agency and the local government

[3] As defined in (i) *Public Procurement List of Environmental Labelling Products* (issued and regularly updated by NDRC and MOF) which includes 21 categories of products, such as light vehicle, photocopier, computer, water-based paint, furniture, etc; and (ii) *Public Procurement List of Energy Saving Products* (issued and regularly updated by MEP and MOF), which includes 27 categories of energy saving products, such as air conditioner, refrigerator, lighting product, television set, electric water heater, computer, printer, monitor, etc. and 7 categories of water saving products, such as toilet, faucet, shower etc.

bodies as appropriate will ensure that the full range of effective measures set out in the IEE and EMP are undertaken, and guarantees that the environmental management provisions and the environmental monitoring plan will be implemented effectively during project implementation, and that the implementation reports of the environmental management and monitoring plan in accordance with ADB requirements will be submitted in a timely fashion. Part of this monitoring and management commitment will be a commitment to implement and maintain an appropriate GRM.

F. Conclusion

26. The IEE concludes that as long as the environmental mitigation and management measures defined in the EMP are properly implemented, all adverse environmental impacts associated with the project will be prevented, eliminated, or minimized to an acceptable level. The project is feasible from an environment safeguards point of view.

II. POLICY, LEGAL AND ADMINISTRATION FRAMEWORK

A. Legislative Framework in the People's Republic of China

1. The subproject environmental assessment documents (TEIARs) upon which this initial environmental examination (IEE) is based have been prepared under the provisions of the People's Republic of China's (PRC) environmental impact assessment (EIA) Law of 2003 and the PRC Management Guideline on EIA Categories of Construction Projects (2008). Main laws, regulation, guidelines, and standards applicable to this project are described below.

2. The primary PRC laws that govern environmental safeguards of the project are provided in **Table II-1**.

Table II-1: Applicable Environmental Laws of the PRC

No.	Title of the Law	Year Issued
1	Environmental Protection Law	1989
2	Environmental Impact Assessment Law	2003
3	Water Law	2002
4	Water Pollution Prevention and Control Law	2008
5	Air Pollution Prevention and Control Law	2000
6	Noise Pollution Control Law	1999
7	Solid Waste Pollution Prevention and Control Law	2005
8	Water and Soil Conservation Law	1991
9	Forest Law	1998
10	Wild Fauna Protection Law	2004
11	Cleaner Production Promotion Law	2002
12	Urban and Rural Planning Law	2008
13	Land Administration Law	1999

Source: Project preparatory technical assistance.

3. The implementation of environmental laws and regulations is supported by a series of associated management and technical guidelines (**Table II-2**).

Table II-2: Applicable Environmental Guidelines

No.	Guideline	Year/Code
1	Guideline on Jurisdictional Division of Review and Approval of EIAs for Construction Projects	2009
2	Guideline on EIA Categories of Construction Projects	2008
3	Interim Guideline on Public Consultation for EIA	2006
4	Technical Guideline on EIA Regarding Surface Water	HJ/T 2.3-1993
5	Technical Guideline on EIA Regarding Atmospheric Environment	HJ 2.2-2008
6	Technical Guideline on EIA Regarding Acoustic Environment	HJ 2.4-2009
7	Technical Guideline on EIA Regarding Ecological Impact	HJ 19-2011

No.	Guideline	Year/Code
8	Technical Guideline on Environmental Risk Assessment for Construction Project	HJ/T 169-2004

Source: Project preparatory technical assistance.

4. The environmental quality standard system that supports and evaluates the implementation of the environmental protection laws and regulations in the PRC is classified into two categories by function (i.e., pollutant emission/discharge standards and ambient environmental standards). The relevant main standards applicable to the project are shown in **Table II-3.** During the construction and operation, the local Nanning Environmental Noise Pollution Control Ordinance (revised in 2008) is applicable.

Table II-3: Applicable Environmental Standards

No.	Standard	Code
1	Surface Water Quality Standard	GB 3838-2002
2	Urban Ambient Acoustic Quality Standard	GB 3096-2008
3	Ambient Air Quality Standard	GB 3095-1996 [4]
4	Integrated Emission Standard of Air Pollutants	GB 16297-1996
5	Integrated Wastewater Discharge Standard	GB 8978-1996
6	Underground Water Quality Standard	GB/T 14848-93
7	Domestic Drinking Water Quality Standard	GB 5749-2006
8	Emission Standards of Environment Noise for Boundary of Site Noise	GB 12523-2011
9	Noise Limit of Industrial Enterprises	GB 12348-2008
10	Emission Standard of Air Pollutants for Coal-burning Boiler	GB 13271-2001
11	Standard for pollution control on hazardous waste storage	GB 18597-2001
12	Standards for pollution control on the storage and disposal site for general industrial solid wastes	GB18599-2001

Source: Project preparatory technical assistance.

B. International Agreements

5. The PRC is a signatory of a large number of international agreements relevant to environment protection. Those with direct application to the project, along with the date of signing by the PRC, include:

(i) *Kyoto Protocol to the United Nations Framework Convention on Climate Change,* 23 February 2005. To further reduce greenhouse gas emissions by enhancing the national programs of developed countries aimed at this goal and by establishing percentage reduction targets for the developed countries.

(ii) *Montreal Protocol on Substances That Deplete the Ozone Layer,* 1 January 1989. To protect the ozone layer by controlling emissions of substances that depletes it.

(iii) *United Nations Framework Convention on Climate Change,* 21 March 1994. To achieve stabilization of greenhouse gas concentrations in the atmosphere at a low enough level to prevent dangerous anthropogenic interference with the climate system.

(iv) *UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage,* 1985. To integrate the practice of heritage conservation in PRC with that being done around the world.

[4] A new standard has been issued in 2012 (GB 3095-2012), which will become effective on 1 Jan 2016.

C. Assessment Categories

6. **Classification from the People's Republic of China.** The Project was classified as Category B under PRC classification. Zhongsheng Environmental Protection Science and Technology Corporation and Guangxi Transport Design Institute were engaged to prepare the TEIAR for Nanning Health School (NHS) and No. 4 Vocational School (NVTS), respectively. The TEIAR for the NHS components has been approved by Nanning municipal Environmental Protection Bureau (NEPB) in 2009. The TEIAR for NVTS components has been approved by NEPB on 5 June 2013.

7. **ADB classification.** The project underwent initial appraisal during project preparation and was classified as Category B on the basis of ADB's Rapid Environmental Assessment, requiring an Initial Environmental Examination (IEE). In compliance with ADB's Safeguard Policy Statement (2009),[5] an IEE was prepared using (i) feasibility study reports, and (ii) the domestic TEIARs prepared by Zhongsheng Environmental Protection Science and Technology Corporation and Guangxi Transport Design Institute.

D. Scope of Assessment and Evaluation Standards for Subprojects

8. In PRC EIA requirements, ambient levels of air, noise, and water quality in the proposed works area determine the appropriate category for point source or impacting emissions and effluent standards for the construction and operational phases of built infrastructure. The scope of investigation is the school campuses and areas 200 meters (m) surrounding the campuses unless otherwise stated.

9. ADB's Safeguard Policy Statement (2009) requires projects to apply pollution prevention and control technologies and practices consistent with international good practices as reflected in internationally recognized standards such as the World Bank Group's Environmental, Health and Safety (EHS) Guidelines.[6] The EHS guidelines are based on best practice construction and operational procedures.

Table II.4: Ambient Air Quality Grade II Standard

Pollutant	Time	GB 3096-1996 (mg/m^3)	EHS[7] (mg/m^3)
SO_2	Annual average	0.06	0.125-0.05 (0.02 guideline)
	Daily average	0.15	
	Unit hour average	0.50	
PM_{10}	Annual average	0.10	0.07-0.03 (0.02 guideline)
	Daily average	0.15	0.075-0.15 (0.05 guideline)
NO_2	Annual average	0.08	0.04 guideline
	Daily average	0.12	
	Unit hour average	0.24	0.20 guideline

[5]ADB. 2009. *Safeguard Policy Statement*. Manila.
[6]World Bank Group 2007, *Environmental, Health and Safety Guidelines General EHS Guidelines*, World Bank, Washington.
[7]World Bank Group 2007, ibid.

Pollutant	Time	GB 3096-1996 (mg/m^3)	EHS[7] (mg/m^3)
CO	Daily average	4.0	n/a
	Unit hour average	10.0	n/a

Source: GB 3096-1996, World Bank's EHS Guidelines

10. According to the *Technical Specifications for Urban Area Ambient Noise Applicable Area Classification* (GBT 15190-94), areas serving for cultural and educational institutions are classified as Class 1, and should comply with the corresponding provisions in *Acoustic Ambient Quality Standard* (GB3096-2008) according to the classification of the area. Residential, commercial and industrial mixed areas must comply with Class 2 standard. Lower standards apply for industrial areas and major roads. Standards are listed in Table II.5. The PRC standard is identical to the EHS guideline values.

Table II.5: Acoustic Ambient Quality Standards (Equivalent Sound Level: LAeq: dB)

PRC Standard Class	Applicable Area	GB3096-2008		EHS[8]	
		Day	Night	Day	Night
0	Areas needing extreme quiet, such as convalescence areas	50	40	55	45
1	Area mainly for residence, cultural and educational institutions	55	45		
2	Residential, commercial and industrial mixed area	60	50		
3	Industrial area	65	55	70	70
4	Area on both sides of urban road traffic trunk line	70	55		

Source: GB3096-2008, World Bank's EHS Guidelines

11. For water quality assessment, the determining standard will be *Surface Water Ambient Quality Standard* (GB3838—2002). This standard is set out in Table II.6. The class IV standard is the minimum required runoff standard for all construction projects in an urban environment. There is no EHS guideline or target for water quality in this context.

Table II.6: Surface Water Ambient Quality Standards (Unit: mg/L)

Standard	DO	I_{Mn}	BOD	COD	NH_3-N
(GB3838-2002) – Grade III	≥5	≤6	≤4	≤20	≤1.0
(GB3838-2002) – Grade IV	≥3	≤10	≤6	≤30	≤1.5
(GB3838-2002) – Grade V	≥2	≤15	≤10	≤40	≤2.0

Source: GB3838—2002

12. In the construction phase, air pollutants from dust and earthworks should comply with the Grade II standard specified in *Air Pollutant Comprehensive Emission Standard* (GB16297-1996).

13. Construction noise will be assessed against the standards in *Emission Standards of*

[8] World Bank Group 2007, ibid.

Environment Noise for Boundary of Site Noise, which are set out in Table II.7.

Table II.7: Construction Site Noise Limit (Unit: Leq[dB(A)])

Period	Major Noise Source	Noise Limit	
		Day	Night
Construction	Bulldozer, excavators and loader; Pile driving machines; Concrete mixer, vibrator and electric saw; Hoist and lifter	70	55

Source: GB12523-2011

14. Construction activities are likely to cause vibration impact, and should comply with the *Standard for Urban Area Environmental Vibration* (GB10070－88). The details are shown in Table II.8. The project works are located on existing school campuses, where standard 2 applies.

Table II.8: Vertical (Z) Vibration Standard Value for Various Urban Areas (Unit: Leq[dB(A)]

Scope of applicable area	Day	Night
Special residential area	65	65
Residential, cultural and educational area	70	67
Mixed area and commercial center	75	72
Industrial centralized area	75	72
Both sides of traffic trunk line	75	72
Both sides of railway main line	80	80

Source: GB10070－88

15. Because the subproject areas are not related to any special ecologically sensitive zones, the assessment of ecological environment belongs to Class III according to the Environmental Impact Assessment Technical Guidelines (HJ19-2011).

16. Considering the characteristics of the project, the project will not cause groundwater level changes nor cause groundwater pollution. No assessment for groundwater is therefore required.

III. DESCRIPTION OF THE PROJECT

A. Justification and Rationale for the Project

1. Over the last three decades, the Peoples' Republic of China (PRC) has made commendable achievements by successfully advancing and establishing a market-oriented and open economy. This resulted into PRC overtaking EU as the second biggest economy in the World. This massive economic development has increased demand for skilled labor. The PRC is currently experiencing skill and labor shortages. National labor market data from 91 cities in 2012 showed that demand exceeded supply in almost all technical and skilled categories. Furthermore, the PRC's comparative advantage in unskilled labor-intensive products is projected to decline with the economy shifting to more skill-intensive products and production technologies.

2. The central government's priorities include, among others, rebalancing the economy from export- to consumption-oriented growth, from low to higher value-added industries, supporting rapid urbanization and environmentally sustainable and socially inclusive development. All these priorities require significant investments in human capital.

3. The PRC Government is increasingly emphasizing the value of highly skilled human capital. In 2010, the PRC Government identified Technical Vocational Education and Training (TVET) as the key target for educational expansion, with the aim to develop a skilled workforce. There are two key government documents, which are relevant to TVET: (i) the Twelfth Five-Year Plan that outlines measures to establish "a sound and sustainable basic public service system", with a focus on public education and medical care; and (ii) the National Medium- and Long-Term Strategy on Education (2010–2020).

4. The National Medium- and Long-Term Strategy on Education (2010–2020) calls for preschool education to be developed so that by 2020, one-year preschool will become the norm, two-years universalized, and three-years popularized. The priorities in the National Health Care Reform include strengthening primary health care services and the grassroots health workforce. Thus, development of TVET for preschool education and health is urgently needed to meet these goals.

5. Guangxi Zhuang Autonomous Region (GZAR), located in southern PRC, is one of 14 Chinese coastal provinces and autonomous regions. Being the only region connected to the Association of Southeast Asian Nations (ASEAN) region by both land and sea, GZAR plays a key role in the social and economic exchanges between the PRC and ASEAN. Hence it needs to boost its TVET system to meet growing manpower requirements and industry standards to help GZAR leverage on ASEAN's economic development.

6. GZAR is fully committed to strengthen TVET and embarked on a master plan to reform its TVET system, by upgrading its 459 technical colleges by 2010. To help achieve this, the Education Department of GZAR has collaborated with Nanyang Polytechnic International to train 333 principals, teachers and senior education officials from seven major cities (Nanning, Liuzhou, Guilin, Wuzhou, Beihai, Qinzhou, and Fangcheng) in the region.

7. GZAR has spearheaded TVET reforms in the region. Investment in TVET development has played an important role in helping the disadvantaged people gain new skills and enjoy the growth benefits. Not withstanding this impressive progress, TVET development in GZAR faces a number of challenges. Currently, a common challenge is the limited industry involvement, which results in poor quality and industrial relevance of courses, and a lack of clear standards that guide study programs and assessment. A greater involvement of enterprises in advising and directing the TVET system is critical to increase TVET's responsiveness to the labor market needs. There is a need to established industry advisory groups as a catalyst to advance industry and employer groups, involvement in TVET.

8. Nanning's s TVET curriculum for nurse training and kindergarten teacher training is in need of modernization, as it is for other occupations. Many instructors, teacher trainers and nurse trainers have limited workplace experience, making it difficult for them to prepare their students for the world of work.

9. At the regional level there is the Three-Year Action Plan for Preschool Education Development (2011–2013). According to this Plan, the provincial government will build, renovate, or expand 6,628 kindergarten schools to increase enrollment to 1.33 million. In order to achieve this target there will be the need to employ an additional 21,000 new teachers. At present there is a severe shortage of qualified teachers, kindergartens, and medical personnel. In 2011, there were only 600 preschool teachers graduated in the region. Increasing the numbers and providing assessment, retraining, and certification to existing teachers are all urgent needs.

10. Nanning is the capital city of GZAR, one of the 12 less-developed provinces and autonomous regions in the western part of the PRC and a gateway to the Pan-Beibu Gulf and Association of Southeast Asian Nations (ASEAN) regions. The development of Nanning as a regional urban center has led to rapid urbanization and an annual growth rate of 15.5%. Industrialization has created a rising demand for skilled workers and extension of social services to provide balanced access and social development in rural and urban areas.

11. The Nanning Municipal Government must build up the public social service system to respond to increased demand. In 2010, the national average was 7.6 health personnel per 1,000 urban residents but GZAR's average is only 3.6 health personnel per 1,000 residents. The Twelfth Five-Year Plan also responds to the challenge of an aging society by aiming to create improved elderly care and qualified personnel and there is an urgent need to expand the health services with well trained personnel.

12. Lack of and/or obsolete equipment to simulate a work place for practical demonstration and application hampers quality teaching-learning processes. Existing management and leadership provision (leadership in curriculum, teaching learning modes, assessment modes, PPP and entrepreneurial activities) needs to be improved to better prepare managers as leaders for a market-responsive, rather than supply-driven TVET.

13. At the Nanning No. 4 Vocational School, the project will address the following challenges for kindergarten teacher training at: (a) Improving the quality of preschool teacher training curriculum, teaching-learning methods, assessment and content; (b) Improving quality of educational leadership and management including mentoring and monitoring; (c) Training of new teaching staff to meet the new educational quality requirements in kindergarten teacher education; (d) Improve the cooperation between the Nanning No. 4 Vocational School and kindergartens for purpose of preschool teacher training including integrated classroom and work based learning; (e) Fostering joint development of teaching-learning materials including teachers guides and textbooks; (f) Kindergarten Training Base; (g) Construct new facilities at and provide new equipment for Nanning No. 4 Vocational School.

14. At the Nanning Health School, the project will address the following challenges for nurse teacher training: (a) Improving the quality of nurse training curriculum, teaching-learning methods, assessment and content; (b) Improving quality of educational leadership and management including mentoring and monitoring; (c) Training of new teaching staff to meet the new educational quality requirements in nurse education; (d) Improve the cooperation between the Nanning Health School for purpose of nurse teacher training including integrated classroom and work based learning; (e) Integration of school-based learning with on-job learning including joint assessment of student nurses, nurses for the elderly and rural health training bases; (f) Foster joint development of teaching-learning materials including teachers guides and textbooks; (g) Construct new facilities at and provide new equipment for Nanning Health School.

15. **Strategic fit.** The project is the second ADB-financed lending project for TVET in the PRC and is envisaged to play a demonstration role for TVET development in the province and the country. Because of a lack skilled labor force generally, and in preschool / kindergarten and heath industry specifically, are seen as a limiting factor for PRC's social and economic growth, ADB's involvement in the TVET sector is convincingly warranted. The proposed project is in line with the ADB's PRC Country Partnership Strategy (2011–2015) and supports ADB's education policy and education sector strategies. It supports the above stated PRC's 12th Five-Year Plan, which prioritizes developing high-quality human resources, increasing scientific and technological innovations, and accelerating educational reform. The project will contribute to creating a qualified labor force and access to social services and has the demonstration features for replication within GZAR and in other provinces of the PRC.

B. Proposed Project Components and Subcomponents

16. The impact of the proposed project is to improved delivery of public social services in Nanning focusing on kindergarten/preschool teacher education and training and nurse education and training.

17. The outcome is improved human resources and capacity in Nanning No. 4 Vocational School (NVTS) and Nanning Health School (NHS). This will include building systemic and institutional capacity to optimize the TVET system by focusing on (a) teacher training; (b) curriculum development; (c) building regional cooperation and strategic TVET and industry partnerships; (d) management capacity building; and (e) supporting the design and implementation of a pilot model preschool and rural training base(s); and (e) provision of facilities and equipment for Nanning No. 4 Vocational School and Nanning Health School. The project has four indicative outputs as follows:

(i) **Output 1: TVET capacity strengthening.** The project will support improvements in the quality and management of TVET in Nanning by (i) developing competency-based standards and CBC for training of nurses, nurses for the elderly and rural doctors through the Nanning Health School and training of kindergarten teachers through the Nanning No. 4 Vocational School and incorporating employability and entrepreneurship skills in curriculum modules; (ii) developing teaching and learning materials to support CBC; (iii) improving access to Nanning No. 4 Vocational School and Nanning Health School for disadvantaged with a focus on gender equity; (iv) Strengthening and upgrading teacher trainers and nurse trainers skills through industry placements and in-service training programs; (v) Strengthening TVET management capacity through leadership programs and interpersonal vocational colleges.

(ii) **Output 2: Pilots.** The project will assist the NVTS in establishing a Kindergarten Training Base based on best practice and experiences, including mentoring, monitoring, provision of educational and pastoral care of children, assessment, leadership and management. The project will also support the establishment of rural training base(s) through (i) selection of sites based on the criteria determined in consultation with Nanning Bureau of Health and NHS, (ii) Identifying training needs and demands and existing gaps; (iii) Strengthening the existing curriculum to integrate theory-praxis nexus and syllabus; (iv) Development of teaching-learning methods and materials; (v) Development of management and entrepreneurial capacity through in-service, pre-service, and continuing professional development.

(iii) **Output 3: Civil Works and Equipment.** The project's investments in human resource development will be accompanied by facilities upgrades as follows:

a. **Nanning Health School (NHS) facilities,** including (a) an experimental building[9]; (b) a library and an office building; (c) an auditorium; (d) two teaching buildings; and (e) underground structure. See **Table III.1 and Figure III.1.**

b. **Nanning No. 4 Vocational School (NVTS) facilities**, including: (a) a teaching

[9] The experimental building will not include chemistry laboratories, but provide training "laboratories" for practical training of nurses and medical support staff.

building; (b) a gymnasium; (c) a library; (d) an art building; (e) an experimental and training building; (f) a kindergarten training base; (f) a landscaping training base; (g) a teacher management building; (h) 5 dormitories; and (i) other facilities (including performance platform, security guard room, first floor open space). The project scope also includes deconstruction of 9 old and unsafe buildings. See **Table III.2 and Figure III.2**.

c. **Equipment.** The project will support the improvement of learning environments through upgrading training equipment at NHS and NVTS. This will include general teaching-learning equipment and furniture, multi-media production equipment, micro-teaching and seminar equipment and furniture. See **Table III.3 and Table III.4**.

d. **Green Campus Policy and Sustainable Management.** The project will support greening of the two TVET campuses by designing, constructing, and maintaining buildings that reduce energy and water use, while promoting sustainable practices such as reducing, reusing, and recycling resources (3R):

e. **Stormwater management:** Rainwater harvesting systems will be installed in both schools. At NHS, the system will be installed at A-3 and A-4 Teaching Buildings. The collected water will be used for campus landscaping irrigation.

f. **Solar hot water systems** will be installed for student dormitories. The systems will consist of a roof solar heating unit, water tank, piping, and water pump. An electrical backup heating system associated with the solar hot water system will be included to provide additional hot water during winter.

g. **Energy efficient construction materials and equipment** will be used for the school buildings. Concrete hollow blocks, with better insulation properties than conventional concrete masonry blocks and of lighter weight, will be used for all exterior walls. Energy saving lighting is proposed for the new school buildings. High strength reinforcing steel will be used in the building structure, which will save steel usage in comparison to the conventional steel. Exterior glass walls will be avoided as much as possible to improve building energy efficiency.

h. **Green Campus Policy and environmental management system (EMS).** The project will provide support to both schools in developing and implementing a green campus policy, and in setting up environmental management systems (EMS).

(iv) **Output 4: Project management support.** This project output will: (i) provide training and project implementation support; (ii) improve monitoring and evaluation to capture lessons from project activities under components 1, 2, and 3, and (iii) regularly disseminate the experiences gained.

Table III.1: Civil works on Xiangsihu campus (Phase 2 of NHS)

No		Description	Unit	Quantity	Footprint Area
1		Total Land Use	m^2	46,600	4.66 ha
2		Actual Land Use	m^2	43,667.13	
3		Total Building Area	m^2	105,292.51	
	3.1	Experimental Building	m^2	52,541	4,620
	3.2	Library and Office Building	m^2	26,897	1,990
	3.3	Auditorium	m^2	1,776	2,106
	3.4	A-3, A-4 Teacher Buildings	m^2	10,305.8	2,421
	3.5	Underground Structure	m^2	13,812.71	

Source: Consultant

Table III.2: Summary of civil works of NVTS

No		Description	Unit	Quantity	Remark
1		Total Area in Planning	㎡	98,963.9	Note 1
2		New Building Area	㎡	89,167.5	
	2.1	Basement Area	㎡	2,353.2	
	2.2	First Floor Open Space	㎡	4,200.0	
	2.3	Usable Building Area	㎡	82,614.3	
	2.3.1	Library	㎡	10,960.0	
	2.3.2	Gymnasium	㎡	9,295.4	Note 2
	2.3.3	No. 2 Teaching Building	㎡	8,959.9	Note 3
	2.3.4	Experiment & Training Bld	㎡	7,539.3	
	2.3.5	Art Building	㎡	13,060.5	Note 4
	2.3.6	Kindergarten Training Base	㎡	5,728.2	Note 5
	2.3.7	Landscaping Training Base	㎡	2,054.4	
	2.3.8	Dormitory for Trainees	㎡	5,220.3	Note 8
	2.3.9	No.3 - No. 6 Dormitories	㎡	19,076.3	Note 6
	2.4	Stage & Platform	㎡	300.0	Note 7
	2.5	Security Guard Room	㎡	120.0	
	2.6	Utility Facilities & Others	㎡	300.0	

(Source: Consultant)

Notes:

1. Exclude teacher dormitory.
2. Exclude first floor open space of 2400 m^2 and four basketball training courts on rooftop.
3. Exclude first floor open space of 280 m^2.
4. Exclude first floor open space of 100 m^2
5. Exclude first floor open space of 400 m^2
6. Exclude first floor open space of 500 m^2
7. Exclude first floor open space of 520 m^2
8. Includes trainee domitoriy of 2601.1 m^2 and teacher use building of 2601.2 m^2.

Source: FSR, April 2013

Table III.3: Major Equipment List of NVTS

No	Equipment	Description	Unit	Quantity
Experiment & Training Building				
1	Control Room Equipment	Control exchange machine, routers, UPS, firefighting, etc.	Set	1
Gymnasium & Track Field				
2	Water Treatment	Water treatment equipment	Set	1
Management Building and Trainee Dormitory				
3	Hot Water	Hot water system	Set	1
Kindergarten Training Base				
4	Children Study	Computer, TV, CD, AC, Storage, bed, keyboard, bench, toy, etc.	Set	15
5	Cafeteria	Kitchen equipment including cooking, cleaning, refrigerator, table, etc.	Set	1

No	Equipment	Description	Unit	Quantity
6	Playground	Playground equipment	Set	1
7	Art and activity Room	Computer, TV, AC, projector, piano, CD, stereo, etc.	Set	1
8	Computer Room	Computer and accessory	Set	1
Library				
9	Lecture Hall	Furniture, sound system, lighting, central control, etc.	Set	1
10	Backup Power	Generator & accessory	Set	1
Campus Broadcasting System				
11	Broadcasting System	Campus wide broadcasting system	Set	1

Source: FSR, June 2013

Table III.4: Major Equipment List of NHS

No	Description	Unit	Quantity	Remark
Xiangsihu Campus				
1	Campus Broadcasting Equipment	set	1	
2	Campus Security Card Reading System	set	1	
3	Security Monitoring System	set	1	
4	Multifunction Audio & Lighting System	set	1	
5	Large LED Display	set	1	Auditorium
6	Multimedia System	set	2	Conference
7	Classroom Multimedia System	set	8	
8	Auditorium Sound and Light System	set	1	
9	Stage Equipment	set	1	Auditorium
10	Large LED Display	ea	1	on stage
11	Teaching Multimedia System	set	1	
12	Gymnasium Lighting and Sound System	set	1	
13	Teaching Projector System	set	40	Classroom
14	Mini Bus (23 seats)	ea	1	
15	Pickup Truck	ea	1	
Elderly Care Equipment				
1	CPM Joint Recovery Machine	set	6	
2	Joint Recovery Machine	set	10	
3	Arm Recovery Machine	set	10	
4	Wrist Recovery Machine	set	10	
5	Shoulder Recovery Machine	set	10	
6	Adjustable Grinding Plate	set	10	
7	Steps	set	4	
8	Twin Stand Supporters	set	4	
9	Roller	set	10	
10	Balance Board	set	10	
11	Muscle Training Board	set	10	
12	Supporter	set	10	

No	Description	Unit	Quantity	Remark
13	Upper Arm Excise Machine	set	6	
14	Walker	set	20	
15	Crutches	set	20	
16	Training Board	set	20	
17	PT Recovery Excise Bed	set	4	
18	OT Training Table	set	6	
19	Clothing Board	set	10	
Dental Experiential & Training				
1	Digital Image Machine	set	1	
2	Digital Dental Image System	set	1	
3	Planting Machine	set	1	
4	Planting Accessories	set	1	
5	Pre-vacuum Sanitary Stove	set	1	
6	Dental Treatment Machine	set	20	
7	Dental Cleaning Machine	set	10	
8	UV Curing Machine	set	10	
9	Wireless UV Curing Machine	set	2	
10	Root Carnal Machine	set	2	
11	Root Canal Measuring Machine	set	2	
12	Root Canal Filling Machine	set	1	
Rural Medical Training Base				
1	Wutang Town Central Hospital (existing)			
1.1	Foetus ECG monitor, defibrillator, electronic manometer, respirator, operating bed etc (for training of medical staff)	set	20	
1.2	Multimedia teaching equipment	set	1	
2	Wuming Shuangqiao Central Hospital (existing)			
2.1	Anesthesia respirator, gastroscope, coagulation analyzer, color transcranial Doppler detector, urine analyzer, etc.	set	12	
2.2	Multimedia teaching equipment	set	1	

Source: FSR, June 2013

C. Project Implementation Schedule

18. EMP and Green Campus Policy related activities will be implemented over a period of 36 months, from June 2013 to June 2016. Construction works will take approximately 24 months, estimated to commence in December 2013 and to be completed in November 2015 (Figure III.3).

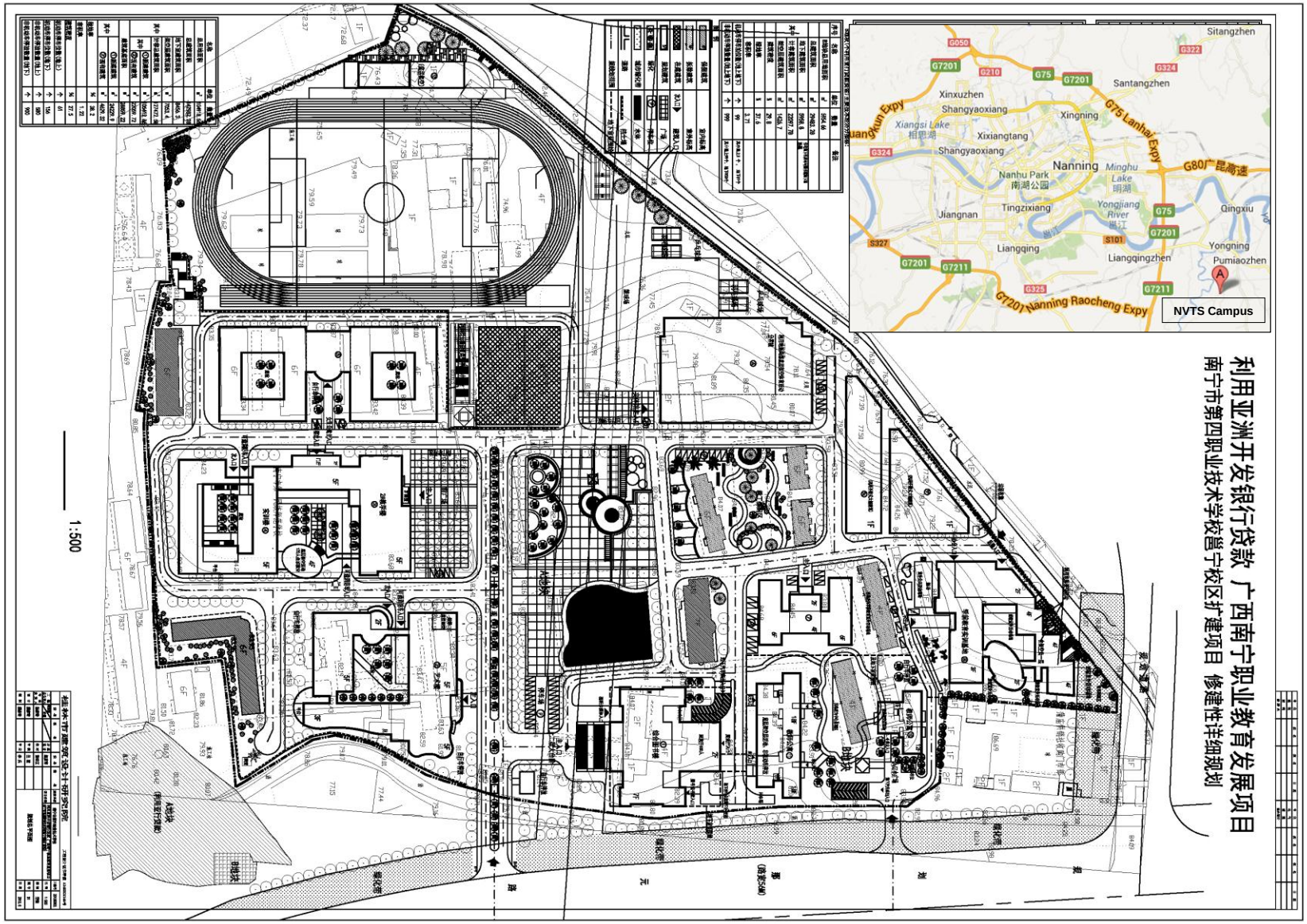


Figure III.1: Layout of NVTS Campus and Facilities Financed by Project

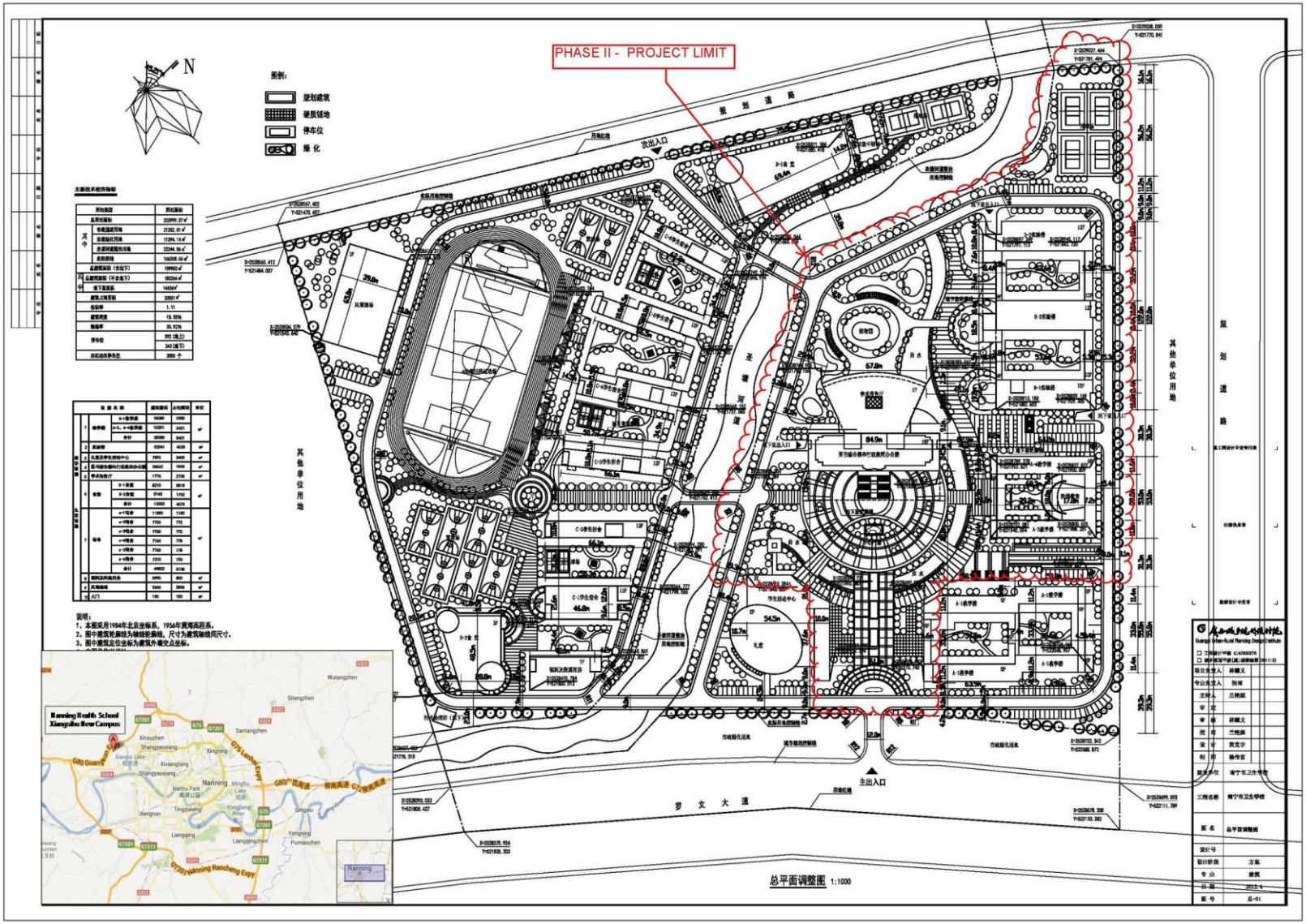


Figure III.2: Layout of NHS Campus and Facilities Financed by Project

	Activities	Start	Finish
A. DESIGN AND MONITORING FRAMEWORK			
1	Nanning Health School		
	1.1 FSR Preparation		9-Jul-13
	1.2 Preliminary Design	1-Apr-13	6-Aug-13
	1.3 Construction Documents Development	1-Jun-13	30-Sep-13
	1.4 Bidding Documents & Procurement	1-Aug-13	31-Dec-14
	1.5 Construction	1-Dec-13	30-Nov-15
	1.5 Acceptance and Delivery	1-Dec-15	31-Dec-15
2	Nanning No. 4 Vocational Technology School		
	2.1 FSR Preparation		9-Jul-13
	2.2 Preliminary Design	1-Apr-13	6-Aug-13
	2.3 Construction Documents Development	1-Jun-13	30-Sep-13
	2.4 Bidding Documents & Procurement	1-Oct-13	31-Dec-14
	2.6 Construction	1-Dec-13	30-Nov-15
	2.7 Acceptance and Delivery	1-Dec-15	31-Dec-15
3	Capacity Development		
	3.1 Recruit and mobilize consultants	1-Sep-13	31-Dec-13
	3.2 Development training plan	1-Jan-14	30-Jun-14
	3.3 Carry out training	1-Mar-14	31-Dec-15
	3.4 Project implementation support	1-Jan-14	31-Mar-16
	3.5 Environmental monitoring	1-Jan-14	31-Dec-15
	3.6 PPMS monitoring	1-Jul-14	31-Mar-16
	3.7 Capacity Development Tasks	1-Jan-14	30-Jun-16
B. MANAGEMENT ACTIVITIES			
1	Consultant selection procedures	1-Sep-13	31-Jan-14
2	Bidding & procurement support	1-Nov-13	31-Dec-15
4	EMP and EMS activities	1-Jun-13	30-Jun-16
5	Gender action plan key activities	1-Feb-14	30-Nov-15
6	Ethnic minority action plan key activities	1-Feb-14	30-Nov-15
7	Social development action plan key activities	1-Feb-14	30-Nov-15
8	Public participation key activities	1-Feb-14	30-Nov-15
9	Annual/Mid-term review	1-Dec-13	31-Dec-15
10	Project completion report	1-Jan-16	30-Jun-16

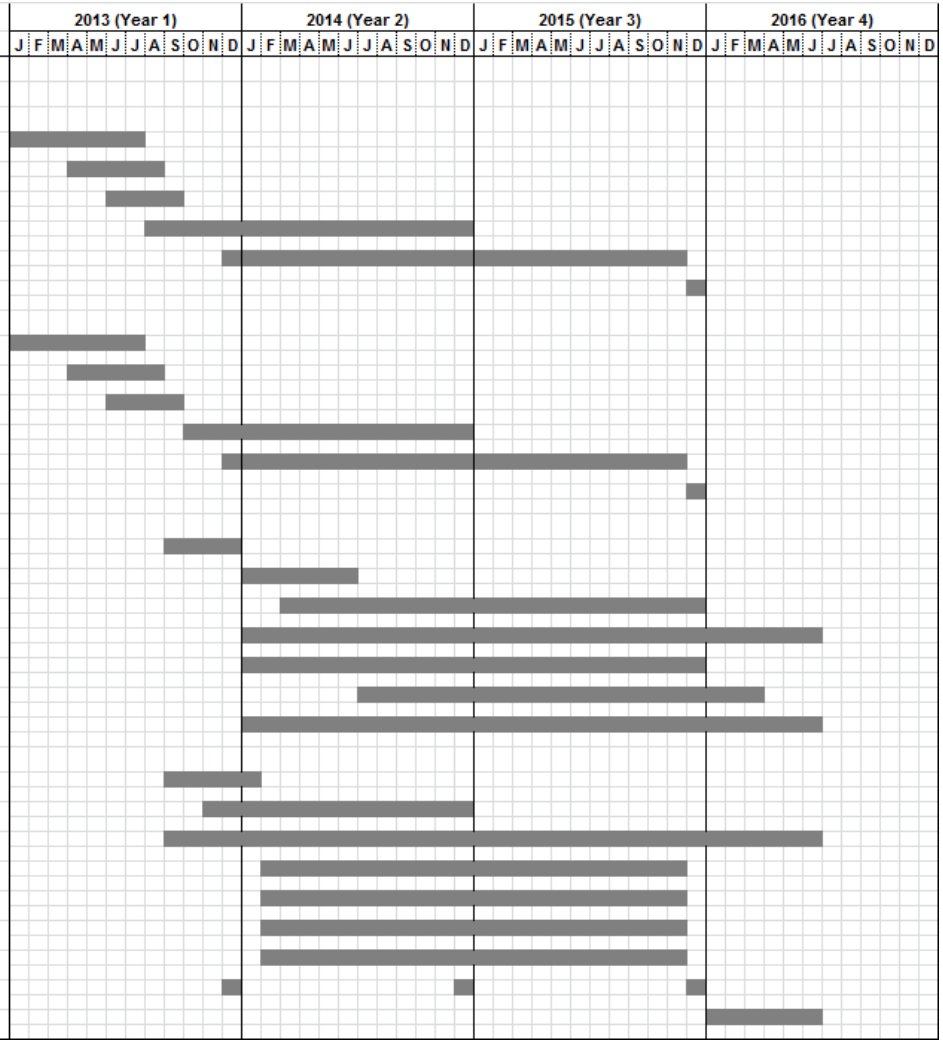


Figure III.3: Project implementation schedule

IV. DESCRIPTION OF THE ENVIRONMENT

1. The description of the pre-project environment (biophysical and socio-economic) establishes (i) the environmental setting within which the project will be implemented, and therefore needs to be designed to suit, and (ii) the environmental values which will be changed (either negatively or positively) by the Project. Both these roles are encompassed by the concept of the "baseline" environment.

A. Physical Environment

2. **Location.** Nanning is located in the southern part of the Guangxi Zhuang Autonomous Region (GZAR), 160 km from the border with Vietnam. It has an administrative area of 22,293 km^2.

3. **Climate.** Nanning has subtropical seasonal monsoon climate, with long summer and short winter. Mild climate occurs in the mountainous regions to the north and south, while hot and dry in the Youjiang Basin. Summers are hot and humid with a 24-hour average temperature of 28.4 °C (83.1 °F) in July. Winters are mild and somewhat damp with a 24-hour average temperature of 12.9 °C (55.2 °F) in January. It is often windy or breezy and very rainy in the city, with about 1,310 millimeters of rainfall annually. Nanning is also frost-free for all but 3 or 4 days a year and snowfall is virtually unheard of in the city. Extreme temperatures have ranged from −2.1 to 40.4 °C (28 to 105 °F).

4. **Soil.** The soils of the project area comprise zonal and azonal soil types. The zonal soils include yellow brown soil and red soil and the azonal soil include black limestone soil, red limestone soil, paddy soil and alluvial soil. The most widely distributed soils are the red soil, and paddy soil, developed from parent materials such as shale, sandstone, purple rocks and Quaternary red clay, with acid characteristics.

5. **Seismicity**. Based on the *Earthquake Parameters Zoning Map of China* (GB 18306-2001) and *Earthquake Protection Design Specification of Buildings* (GB 50011-2010), the seismic peak acceleration is 0.05g, the characteristic period of response spectra of ground vibration is 0.35s.

6. **River system and hydrology.** Yongjiang is the major river in Nanning crossing the city from northwest to south east with normal water level of 61.17- 64. 67m and an average annual flow of 41.12 billion m^3. The new campus of NHS is 3km away from the section of Yongjiang. The river is 2 km away in the north of NVTS. Kelijiang, a tributary of Yongjiang, is located 1.1km away from NHS in the north east. Bachijiang is the largest tributary of Yongjiang, currently receiving untreated sewage of NVTS. Bachijiang is 174km long with an annual average flow of 2.76 cubic meters.

7. **Groundwater.** The site of NVTS campus contains two layers of groundwater, i.e. perched water characterized by seasonal existence (1.5-3.5m deep), and karst fissured water (8.4-8.6m) with annual variation of 5-8m, which has slight corrosion resistance to the concrete structure and reinforcing steel bars.[10]

8. The groundwater depth of perched water in the proposed new campus site of NHS is 0.1-1.60m and the depth of fissured water is 0.3-1.10m.[11]

[10] "Geotechnical Engineering Investigation Report for Yongning Campus of Nanning No.4 Vocational School", prepared by Nanning Institute of Geographic Information. 25 April 2013.

[11] "Geotechnical Engineering Investigation Report for Part of New Buildings in the New Campus of Nanning Health School", prepared by Guangxi Geotechnical Engineering Investigation Company, May 2012.

B. Environmental Quality Baseline

9. **Air quality.** The PRC ranks air quality into 3 classes according to its *Ambient Air Quality Standard* (GB 3095-1996), with Class I being the best air quality and Class III the worst air quality. Typically, ambient air quality baseline monitoring for environmental impact assessment in the PRC consists of measuring the daily average concentration levels of PM_{10}, sulfur dioxide (SO_2) and nitrogen dioxide (NO_2) on seven consecutive days. The two TEIAR for this project presented monthly average ambient air quality monitoring data on SO_2, NO_2, and PM_{10}, collected from the nearest air quality monitoring station in January 2013. Monitoring data is summarized in Table IV.1 below, in comparison with GB 3095-1996 Class II and World Bank Group EHS standards, showing compliance with Class II standards on NO_2, SO_2 and PM_{10} on the days of monitoring.

Table IV.1: Air Quality in Project Areas Unit: mg/m^3

Subproject Area	SO_2	NO_2	PM_{10}
NVTS (Xianhu Development Zone)	0.030	0.037	0.099
NHS (Xixiangtang Zone)	0.027	0.050	0.136
PRC Standard GB3095-1996 (1d average)	*≤0.15*	*≤0.12*	*≤0.15*
EHS Guidelines (Interim Targets 1 and 2)	*≤0.125-0.05*	*≤0.10*	*≤0.075-0.15*

Source: Domestic TEIARs, June 2013

10. **Noise.** Typically, baseline noise monitoring for environmental impact assessment in the PRC consists of noise level measurements at sensitive receptors once in the day time and once in the night time each day for two consecutive days. **Table IV.2** shows baseline noise monitoring data collected on 25th-26th Feb 2013, showing that noise levels measured at these locations and on these days and night time complied with GB 3096-2008 day time and night time noise standards for Functional Area Category 2 (according to the "Nanning Urban Acoustical Functional Zoning, [2012] No. 135, Category 2 is applicable to the proposed project area).

Table IV.2: Noise Quality in Project Areas

Subproject	Noise (dB(A))	
	Day	Night
NVTS (Yongning District)	46.5-53.0	42.8-47.2
NHS (Xixiangtang Zone)	52.9-58.6	42.2-44.8
PRC Standard GB3096-2008 Category 2	*≤60*	*≤50*
World Bank's EHS Guidelines	*≤55*	*≤45*

Source: Domestic TEIARs, June 2013

11. **Water quality.** As the regional WWTP is under construction, all domestic sewage in in and around NVTS is currently discharged into Bachijiang River. As a result, the COD and SS of Bachijiang exceeds the requirements of Class III. Wastewater from NHS will be treated in WWTP and finally discharged into Yongjiang at Xitangjiang section. The functional zone of Xitangjiang section is Class IV. The current water quality of Xitangjiang is relatively good, reaching the requirements of Class III. The water quality of Kelijiang is complying with the requirements of Class II. The new campus of NHS is in the downstream of Kelijiang River and will not discharge effluent into the river. The source of water supplied to the two campuses is from the municipal water supply, which is not affected by the quality of nearby surface waters.

C. Ecological Resources

12. **Flora and fauna.** GZAR is rich in ecological resources. There are many species of animals and more than 3,000 species of plants. The green coverage area in Nanning is 36.4%, provided

largely by the surrounding hills in the suburbs, while the green area in the urban city is 30.9%. The average per capita public green area rate is 7.2 $m^{2,}$ among the highest in major Chinese cities. The TEIARs recorded no rare or endangered wildlife species in the areas of the two campuses.

13. **Land use and current vegetation.** The current land use and main vegetation on the campus sites is presented in Table IV.3. The TEIARs recorded no impingement of the proposed works on any habitat area.

Table IV 3: Current land use and vegetation on areas of campuses affected by construction

Subproject	Current land use	Vegetation
NVTS (Yongning District)	Existing campus	Landscaping vegetation
NHS (Xixiangtang Zone)	Reserved land for new campus, former agriculture land	Scattered weeds

Source: PPTA Consultant team

D. Socioeconomic Conditions

14. **Gross domestic product.** GZAR is one of PRC's key production centers for nonferrous metals. The region holds approximately 1/3 of all tin and manganese deposits in the PRC. In recent years GZAR's economy has languished behind that of its wealthy neighbor and twin, Guangdong. GZAR's 2011 nominal GDP was about CNY 1,171.4 billion.

15. **Demographics, ethnic minorities.** GZAR has a total population of 51.6 million, with the Han comprising some 62.8 % and ethnic minorities 37.2 % of the population. Among the ethnic minorities, the totaling 55%, the Zhuang minority accounts for 31.4 %.

16. **Physical cultural resources.** Consultations with the relevant cultural authority and site investigation during the IEE and TEIAs showed that the project-influenced areas do not have any known cultural or historical sites. Should buried artifacts of archaeological significance be uncovered during the construction stage within the project areas, construction will be stopped and immediately reported to the Nanning Cultural Heritage Bureau in accordance with the PRC's *Cultural Heritage Protection Law*.

V. ANTICIPATED IMPACTS AND MITIGATION MEASURES

A. Screening of Potential Impacts, Sensitive Receptors

1. The potential impacts were screened during the IEE process in order to (i) identify the relative significance of potential impacts from the activities of the proposed outputs and sub-outputs; (ii) establish the scope of the assessment which assists in focusing on major, critical, and specific impacts; and (iii) enable flexibility in regard to consideration of new issues, such as those that reflect the requirements by ADB's SPS.

2. The screening process showed that Component 3, involving civil works in 2 vocational schools, was the only component with potential environmental impacts. The project impact area will be confined to the campus premises. No significant direct impacts outside the campuses are anticipated. The main emissions relating to the construction, operation and deconstruction of buildings are indicated in Figure V.1.

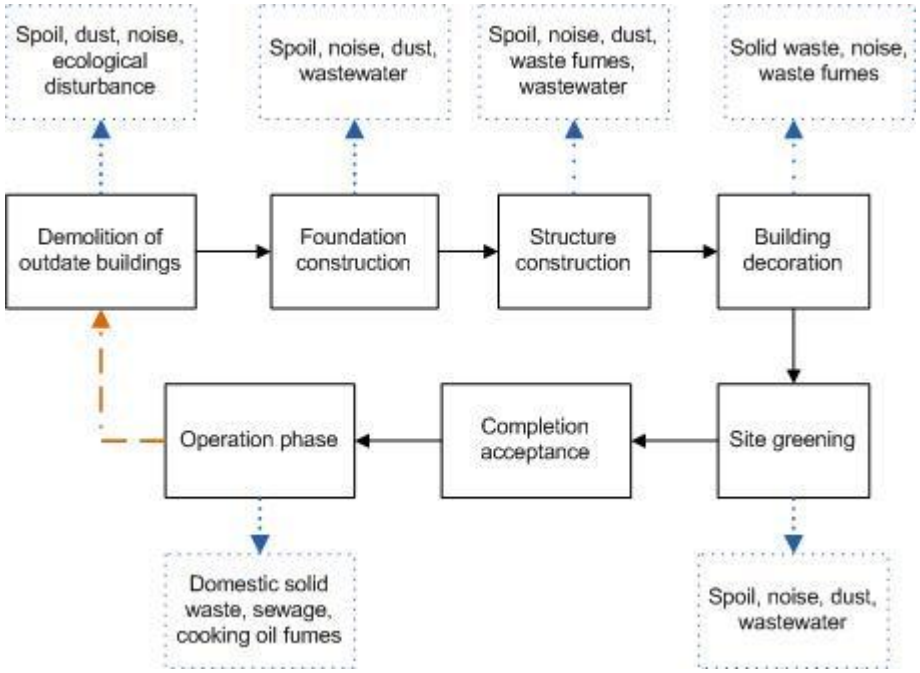


Figure V.1: Major emissions of buildings during construction, operation and deconstruction

3. During the **construction phase**, the major negative environmental impacts are associated with increased level of noise and dust due to the usage of heavy vehicles and building mechanization. In the phase of construction, waste soil and construction debris will be generated because of excavation, soil back cover, concrete structure, etc. Risks to occupational and community health and safety from construction activities are also considered potentially significant.

4. During the **operation phase**, no significant environmental impacts and risks are anticipated. Minor concerns include noise from the air-conditioners and ventilation facilities, practice training wastes, municipal solid waste and domestic sewage. To ensure that project facilities will be safe, energy efficient and green, the Implementing Agencies (IAs) agreed that all buildings shall comply with relevant design standards and codes, including but not limited to: GB 50176-1993 (Thermal Design Code for Public Buildings); GB/T 50378-2006 (Evaluation Standard

for Green Buildings); GB 50099-2011 (Code for design of schools); GB 50016-2006 (Code of Design on Building Fire Protection and Prevention); DB45/T392 (Energy Conservation Design for Public Buildings) and other applicable national design codes. In addition, the PPTA consultant has drafted a Green Campus Policy Framework (see in **Appendix 3**). The strategy aims to create a healthy, environmental friendly, economic and socially responsible living and learning environment for all students and staff.

5. The results of the impact screening are shown in **Table V.1** below. Impacts during construction and operation phases are considered separately in the following sections.

Table V.1: Screening of Environmental Impacts

Project Phase	Assessment Item	Potential for Impact
Construction	Wastewater	Domestic sewage from workers; Washing wastewater;
	Air	Vehicles and exhaust gas from mechanical facilities
	Noise	Noise from bulldozers; excavators and loader; pile driving machines; concrete mixer; vibrator and electric saw; hoist and lifter
	Solid waste	Municipal and construction wastes, especially from the demolition buildings in Nanning No.4 vocational school.
	Soil	Erosion with surface runoff
	Health and safety	Construction site safety; Occupational health and safety; safety of students and staff during construction activities (including construction traffic).
Operation	Wastewater	Waste cooling water containing oil; domestic sewage from buildings;
	Air	Cooking oil fumes from the restaurants of the campuses
	Noise	Noise from air-conditioners and ventilation facilities; mechanical training equipment.
	Solid waste	Municipal waste and waste from mechanical practice
	Health and safety	Fire and earthquake safety; indoor air quality and light; waste management; water supply; campus traffic management; etc.

6. **Sensitive receptors.** During the domestic TEIA of the project outputs with civil works, sensitive receptors within and around the campuses of the involved the two school campuses were identified.

Table V.2: Sensitive Receptors within Project Area of Influence

Subproject	Sensitive Receptors	Distance to construction site	Sensitivities
NVTS	4# student dormitory building	25m	Noise, air
	1# teaching building	25m	Noise, air
	administrative building	10m	Noise, air
	1#2#3#4#5# teacher dormitory buildings	5-50m	Noise, air
	Yongning District teacher training school	40m	Noise, air
	Nanning City No.42 middle school	14m	Noise, air

Subproject	Sensitive Receptors	Distance to construction site	Sensitivities
	Yongning Minority middle school	45m	Noise, air
	Namei village	150m	Noise, air
	Bachijiang River	10km	Water quality
NHS	Siniang village	East-North 400	Noise, air
	Part of Siniang village	North 700	Noise, air

B. Impacts and Mitigation Measures during the Construction Phase

7. The following impacts and mitigation measures refer to construction impacts which are mostly common to both the NHS and NVTS. Construction will require soil erosion protection and spoil management, construction wastewater management, dust and noise control as well as management of the impacts from machinery operation, transport and haulage of materials and measures to ensure occupational and community health and safety.

1. Impacts to Physical and Biological Environment

8. **Impacts on soil.** Three types of potential impacts on soil include (i) soil erosion, (ii) soil contamination, and (iii) inappropriate management of spoil. Details of impacts are listed below:

(i) Soil erosion. May be caused by construction, excavation, and borrow pits, stockpiles and spoils from earthwork during construction of buildings and grading. The factors that are expected to contribute to accelerated erosion in the project area are winds and rainfall, especially during the rainy months of March to September. Construction works should be programmed to minimize soil excavation works in rainy seasons. If erosion prevention measures described below in the construction phase are implemented, no significant induced soil erosion is anticipated.

(ii) Soil contamination. Contamination of soil in the construction phase may result from the inappropriate transfer, storage, and disposal of petroleum products, chemicals, liquids and solid waste.

(iii) Spoil and deconstruction waste disposal. Significant spoil disposal will not be required, and potential impacts will be short-term and localized. But, the outdated building demolition spoil should be appropriately disposed in a designated landfill (discussed further below).

9. **Mitigation of impacts on soil.** The construction sites in the two school campuses targeted by the project are relatively small and the impacts on soil will be mitigated through a number of remedial measures which are defined in the EMP, which shall be defined in construction contracts and the site-EMPs, to be developed by Contractors:

(i) **Soil erosion.** If soil excavation cannot be avoided during rainy season or at any time of the year when rainstorms are likely, temporarily exposed slope surface should be covered e.g. by tarpaulin. Arrangements should be in place to ensure that adequate surface protection measures can be carried out well before the arrival of rainstorm. Since disturbed areas are relatively small, the plan can be an overlay to the site plan showing how runoff will be controlled at site perimeter to control soil and water runoff, and how disturbed areas will be reclaimed.

(ii) **Soil contamination.** (a) Store small amount of chemicals/hazardous products at short time and waste on impermeable surfaces in secure, covered areas, (b) Remove all construction wastes from the site to approved waste disposal sites, (c)

Establish Spill Management Plan, (d) Provide spill cleanup measures and equipment at each construction site, and (e) Conduct training in emergency spill response procedures.

10. **Impacts on surface and groundwater.** Site dewatering is not needed for foundation construction as depth of groundwater is below foundation limits at all sites. No impacts to groundwater resources are anticipated in either the construction or operation phases of the project. The major risk to groundwater and surface waters is through spills of dangerous substances, and inappropriate construction waste management. The potential risks to surface and groundwater will be mitigated through a number of activities defined in the EMP, which will be incorporated construction contracts and clearly defined in site-EMPs to be developed by the Contractors.

(i) Develop and implement spill management plan.
(ii) Construction wastes and materials (e.g. fuel) shall be properly contained during construction. Wastes shall be removed from the construction sites and taken to approved disposal facilities.
(iii) Water collection basins and sediment traps shall be installed in all areas where construction equipment is washed.
(iv) Wastewater generated from the washing down of mixer trucks and drum mixers and similar equipment should wherever practicable be recycled. The discharge of wastewater should be kept to a minimum. Surplus wastewater and wastewater generated from building construction activities, including concreting, plastering, cleaning of works and similar activities should be discharged in to sewer after removal of solids in a silt removal facility.
(v) Sewage from temporary toilets, kitchens and similar facilities should be stored in an on-site facility (such as septic tank), emptied regularly and transported to a designated wastewater treatment plant for further treatment.

11. In the new campus of NHS, there is an artificial waterway (526m long and 36m wide) running through the campus. This waterway is a tributary of the Nanning municipal landscaping water course. The waterway has no ecological or flood protection function, was originally constructed as an irrigation channel for nearby agricultural fields, and is now designated as urban water course for landscaping purposes only. The works on the waterway are ongoing and are being implemented by the Nanning Water Resources Bureau. The waterway is outside the project scope.

12. **Impacts on air quality.** Minor temporary air quality impacts during the construction stage of the project are anticipated due to fugitive dust generation in and around the two campuses. Minor increases in the level of nitrogen oxides (NO_x) and sulphur oxides (SO_x) from construction plants and machinery are expected. These construction phase impacts will be localized and temporary, but could affect NHS students and staff as well as nearby residential areas. The potential impacts on air quality will be mitigated through a number of activities defined in the EMP, to be reflected in site-EMPs of Contractors. The civil works contract documents will specify that:

(i) Water shall be sprayed on construction sites where fugitive dust is generated.
(ii) Fuel & chemicals shall be covered / stored to minimize emissions.
(iii) Trucks carrying earth, sand or stone shall be covered with tarps or other suitable cover to avoid spilling.
(iv) Construction vehicles and machinery shall be maintained to a high standard to ensure efficient fuel-burning.
(v) Regular air quality monitoring shall be undertaken in around the two campuses in accordance with the environmental monitoring plan.

(vi) Contractors and IUs shall regularly consult TVET students and staff as well as nearby residents to identify concerns, and implement additional measures as necessary.

(vii) Perimeter fences shall be constructed at each site prior to construction to limit access to the construction site. The fence shall be at least 2m high and be able to bear. The perimeter fence will have cumulative benefits of dust mitigation, noise diffusion and community safety.

13. **Solid waste management.** Inadequate disposal of construction wastes could have adverse impacts on soil, water and health of workers and the students and staff of both schools, as well as nearby communities. Waste streams will include inert construction wastes (soil, debris, concrete etc), municipal type wastes (construction workers' food and packaging wastes from construction consumables) and potentially hazardous wastes (fuel containers, oil filters, oily rags etc.).

14. For NVTS, 9 buildings will be demolished (as described in Table V.3). Deconstruction waste will mainly include concrete, bricks, glass, steel bar and woods. The presence of asbestos or asbestos containing materials (ACM) is deconstruction waste is highly unlikely as no ACM were used for insulation in the existing buildings that will be demolished. This was confirmed through visual spot-checks during IEE and TEIAs. Should hazardous materials be found during deconstruction, the IAs and contractors will immediately inform the NEPB and recruit a specialized treatment center for final disposal.

Table V.3: Construction waste produced by the outdated building at the Nanning No. 4 Vocational School

Demolished Building	Floor Area (m^2)	Amount of solid waste (t)	Remarks
Canteen	1490	1788	Brick structure
Library building	1566	1880	Brick-concrete structure
Music building	1327	1600	Brick-concrete structure
Practice building	1380	1660	Brick-concrete structure
1# Teaching Building	1199	1440	Brick-concrete structure
2# Teaching Building	1199	1440	Brick-concrete structure
1# Student Dormitory	2046	2460	Brick-concrete structure
2# Student Dormitory	3069	3680	Brick-concrete structure
3# Student Dormitory	2046	2450	Brick-concrete structure
Total	*15,322*	*18,386*	

Source: domestic TEIAR

15. The potential impacts arising from solid waste production and disposal will be mitigated through a number of activities defined in the EMP. In compliance with "Construction Waste Management in Nanning", construction waste shall be transported by licensed agencies and the transport vehicles should be cleaned timely. The following measures will be incorporated in

construction contracts and reflected in the site-EMPs of the Contractors:

(i) Storage and containment: Provide appropriate waste storage containers for worker's construction and hazardous wastes; Install confined storage points of solid wastes away from sensitive receptors, regularly haul to an approved disposal facility;

(ii) Use of contractors: Use licensed contractors to remove wastes from the construction sites;

(iii) Management: Prohibit burning of waste.

(iv) Reuse the construction waste from demolished buildings as possible. The fragments of waste concrete, bricks and stones can be used for backfill. The construction waste that cannot be reused shall be transported to the designated sites.

16. **Noise.** The major sources of noise pollution are movement of construction vehicles, the haulage of construction materials to the construction sites and the noise generating activities at the sites. Concrete mixing and material movements are the primary noise generating activities and will be uniformly distributed over the entire construction period.

17. Each construction machine can be treated as one point noise source. The point source noise attenuation formula and noise superimposed formula have been used to predict the major construction machinery noise impacts during construction.

***Point source noise attenuation formula**:*

$$L_2 = L_1 - 20\lg\left(\frac{r_2}{r_1}\right) - \Delta L$$

Noise superimposed formula:

$$L_{eqs} = 10\left(\sum_{i=1}^{n} 10^{0.1L_{eqi}}\right)$$

Where,

L1,L2-the noise value at points of r1.r2 (dB(A));

r1,r2-the distances of the points to the noise source(m);

⊿L-Houses, trees and other shield contributions to noise attenuation value (dB(A));

Leqs-The equivalent sound level value at the prediction point (dB(A));

Leqi-Equivalent sound level of the i-th point source on the prediction point (dB(A)).

18. Without consideration of the construction fence contribution to machinery noise attenuation (i.e., the ⊿L=0), machinery attenuation only rely on spatial distance natural attenuation, the intensity and scope of the noise caused by the project have been modeled (Table V.4).

Table V.4: Predictive noises of construction machinery with various distances (Unit: dB(A))

Major construction machinery	**Predictive noise values**						**Distances required to meet with standard(m)**	
	10m	20m	40m	80m	160m	200m	day	night
Loader	78.0	71.9	65.9	59.9	57.2	56.1	53	225

Major construction machinery	Predictive noise values						Distances required to meet with standard(m)	
Excavator	78 0	71.9	65.9	59.0	56.6	56.0	53	225
Bulldozer	78.0	71.9	65.9	59.9	57.2	56.1	53	225
Pneumatic hammer, pneumatic drills	88.0	81.9	75.9	69.9	59.1	57.8	120	359
Air compressor	88.0	81.	75.9	69.9	59.1	57.8	120	359
Static pressure piling	78.0	71.9	65.9	59.9	57.2	56.1	53	225
Tower crane	73.0	66.9	58.9	54.9	54.2	48.9	30	159
Bar Straightening Machine	78.0	71.9	65.9	59.9	57.2	56.1	53	225
Stone cutting machine	83.0	79	70.9	64.9	57.9	57.1	90	292
Chainsaw	73.0	66.9	60.9	54.9	57.2	56.1	53	159
Hammer	73.0	66.9	60.9	54.9	57.2	56.1	53	159
Multi-function woodworking plane	83.0	76.9	70.9	64.9	57.9	57.1	92	292
All of machineries operated at the same time	93.1	87.0	81.0	75.0	72.6	68.2	200	400

19. Table V.4 shows that the construction machinery noise in the unobstructed case, and single machine used, the scope of the environmental impact at daytime will be 30-159m distance and at night it will be 159 to 359m distance to meet construction site boundary environmental noise emission standards "(GB12523-2011) requirements. If all of the machinery and equipment operate at the same time, the distance should be as far as 227m at daytime and 427m at night that can meet the requirements of the Construction field boundary environmental noise emission standard ”(GB 12523-2011).

20. At NVTS, construction activities will take place within the existing campus, near existing buildings and noise-sensitive receivers as identified in Table V.2. Contractors shall regulate their construction activities and implement the following mitigation measures to ensure compliance with the relevant provisions of the PRC Environmental Noise Pollution Prevention Ordinance and Nanning Environmental Noise Pollution Control Ordinance (revised in 2008):

(i) Limit construction working hours from 0800–2000H. Nighttime works should only be conducted in exceptional cases, and a permit should be obtained for that purpose. Potentially affected people including students, staff and nearby residents should be informed in advance.

(ii) Maintain equipment and machinery in good working order; undertake regular equipment maintenance, ensure compliance with PRC standard of GB 12523-2011.

(iii) Locate sites for concrete-mixing and similar activities at least 300 m from sensitive areas if without any mitigations.

(iv) Reach an agreement with NVTS management and nearby residents regarding the

timing of heavy machinery work, to avoid any unnecessary disturbances;

(v) Monitor noise within NVTS campus and at nearby sensitive areas at regular intervals (as defined in the monitoring plan).

(vi) Install temporary anti-noise barriers to shield school buildings where non-compliance with Category 2 in Environmental Quality Standards for Noise (GB3096-2008) is monitored.

(vii) Seek suggestions from two school management and potentially affected sensitive receptors to reduce noise annoyance. Disseminate information on procedure of handling complaints through the grievance redress mechanism.

21. **Flora and fauna.** The two campuses are typified by urban ecological setting already influenced and disturbed by human activities, dominated by herbaceous species and plantations, and of low ecological value. Field investigations have established that there are no threatened or endangered flora and fauna species within the two subproject's direct area of influence. Therefore, no adverse impact on such species is likely to occur during the construction activities. All sites will be re-vegetated after construction in accordance with the campus master plans.

2. Socioeconomic Impacts

22. **Land acquisition and resettlement.** No involuntary resettlement effects are foreseen and the project is classified as a Category C project for resettlement. There is no land acquisition and resettlement (LAR) involved for NVTS since all construction activities are within the perimeter of the existing campus. The LAR work for NHS was completed prior to the commencement of the project. In accordance with ADB requirements, LAR due diligence has been conducted to confirm that LAR conformed with relevant PRC and ADB policies. Should there be any change in scope or other changes with unanticipated resettlement impacts during project implementation, land acquisition and resettlement activities will be implemented in accordance with ADB's Safeguard Policy Statement (2009).

23. **Economic displacement.** There will be no economic displacement or impacts on livelihoods through environmental media associated with the project.

24. **Loss of Physical Cultural Resources.** There is no record of important heritage or archaeological sites on the two campuses. Should archaeological objects be discovered during site works, government requirements for excavating and preserving those items will be strictly followed. The mitigation measures will include immediate suspension of construction activities if any archaeological or other cultural relics are encountered. The relevant cultural relic protection authorities, as well as the implementing agencies and PMO, will be promptly notified, and construction will resume only after thorough investigation and with the permission of the appropriate authority. This requirement is included in the EMP.

25. **Risks to community health and safety (including students and staff).** Construction sites will be located close to existing school buildings and residential areas (especially for the NVTS), representing a threat to public health and safety. The potential impacts on community health and safety will be mitigated through a number of activities defined in the EMP (in addition to the measures defined to control noise and dust). The contractors will implement the following measures:

(i) **Traffic management.** Contractors will prepare temporary traffic control and operation plans in consultation with NVTS and NHS management and local traffic police prior to construction. The plans shall include provisions for diverting or scheduling construction traffic to avoid peak traffic hours, main teaching activities

such as exams, regulating traffic at road crossings with an emphasis on ensuring public safety through clear signage. Contractors shall designate staff members to control traffic during on-school and off-school hours.

(ii) **Access to construction sites.** All sites will be made secure, discouraging access through appropriate fencing. Heavy machinery will not be used after day light and all such equipment will be returned to its overnight storage area/position.

(iii) **Information and communication.** In conjunction with the school management, the Contractor shall hold a meeting prior to commencing construction to discuss issues associated with ensuring the safety of students and staff, as well as nearby communities, in the vicinity of the construction site. Clear signs will be placed at construction sites in view of the people at risk (including students, staff and nearby communities), warning people of potential dangers such as moving vehicles, hazardous materials, excavations etc and raising awareness on safety issues.

26. **Occupational health and safety.** The civil works contractors will implement adequate precautions to protect the health and safety of construction workers. Each contractor will prepare a Site-EMP on the basis of the EMP. It will be submitted to the implementing agencies and PMO for review and appraisal. In terms of health and safety, the Site-EMP will include the following provisions:

(i) **Staffing.** Each Contractor will appoint one staff to implement and supervise the implementation of the Site-EMP and the performance of subcontractors;

(ii) **Clean water.** Provide a clean and sufficient supply of fresh water.

(iii) **Sewage and wastewater.** Provide an adequate number of latrines and other sanitary arrangements at the site and work areas, and ensure that they are cleaned and maintained in a hygienic state.

(iv) **Solid waste.** Garbage receptacles at construction site, which will be periodically cleared to prevent outbreak of diseases will be setup;

(v) **Personal protection.** Provide personal protection equipment, such as safety boots, helmets, gloves, protective clothing, goggles, and ear protection, in accordance with relevant health and safety regulations, for workers;

(vi) **Emergency preparedness and response.** An emergency response plan to take actions on accidents and emergencies, including environmental and public health emergencies associated with hazardous material spills and similar events will be prepared, and submitted to the IAs and the PMO for review and appraisal. A fully equipped first-aid base at each construction site will be organized;

(vii) **Records management.** A Records Management System that will store and maintain easily retrievable records protected against loss or damage will be established. It will include documenting and reporting occupational accidents, diseases, and incidents. The records will be reviewed during compliance monitoring and audits.

(viii) **Safety communication.** Ensure that safety, rescue and industrial health matters are given a high degree of publicity to all persons regularly or occasionally on the site. Posters drawing attention to site safety, rescue and industrial health regulations will be made or obtained from the appropriate sources and will be displayed prominently in relevant areas of the site;

(ix) **Training, awareness, and competence.** Train all construction workers in basic sanitation and hygiene issues, general health and safety matters, and on the specific hazards of their work. To minimize the risk of conflicts between workers and staff/students of the schools, contractors shall also implement HIV/AIDS and sexually transmitted infections (STIs) awareness and prevention training for all employees, and together with the local centers of disease control and the school

management, disseminate information on the risks, hazards, impacts and prevention know-how on HIV/AIDS and STIs among the staff/students, workers on the construction sites, students and staff of NVTS and NHS, and local community.

27. **Labor standards and rights.** In order to ensure Contractors adhere to core labor standards and workers' rights, XIDC will ensure that works contracts will include provisions to require the contractors to (i) provide equal pay for equal work, regardless of gender or ethnicity; (ii) provide the timely payment of wages; (iii) use local unskilled labor, as applicable; (iv) comply with core labor standards and the applicable labor laws and regulations, including stipulations related to employment, e.g. health, safety, welfare and the workers' rights, and anti-trafficking laws; and (v) not employ child labor. XIDC will further ensure that Contractors maintain records of labor employment, including the name, ethnicity, age, gender, domicile, working time, and the payment of wages. These requirements shall be clearly specified in all relevant bidding documents.

28. **Utilities provision interruption.** At the two campus construction sites, construction may require relocation of local utilities such as water, sewers and communication cables. Temporary suspension of services (planned or accidental) can affect the campus institutions' daily operation. The potential impacts on utilities provision will be mitigated through a number of activities defined in the EMP (and flagged as assurance in the project agreement), to be incorporated in construction contracts and the site-EMPs of the Contractors:

(i) Contractors shall assess potential disruption to services and identify risks before starting construction.
(ii) If temporary disruption is unavoidable the Contractor will develop a plan to minimize the disruption and communicate the dates and duration in advance to all affected people, in conjunction with the TVET management.

3. Environmental Impact and Mitigation Measures during Operation

29. No major environmental impacts are anticipated during the operation of project facilities. The project facilities will create emissions (summarized in Table V.5 and discussed below), but these can easily be addressed by integrating new facilities into the TVET institutions' and the municipal services (water supply, solid waste and wastewater collection and disposal). To ensure high level of campus health and safety, the project facilities will comply with relevant design standards and codes for energy-efficient, safe and green public buildings, including but not limited to: GB 50189-2005 (Design Standard for Energy Efficiency of Public Buildings); GB 50176-1993 (Thermal Design Code for Public Buildings); GB/T 50378-2006 (Evaluation Standard for Green Buildings); and GB 50099-2011 (Code for design of schools). Adherence to PRC green public procurement policies will be targeted for equipment and appliances procurement[12]. In addition, the project will support NHS and NVTS to develop and implement environment management systems (EMS) aiming at institutionalizing procedures to enhance campus environmental sustainability.

Table V.5: Main Emissions and Proposed Abatement Measures

Subproject	Assessment Item	Pollution Source	Pollutant	Anticipated Amount	Disposal/ Measures
NHS	Wastewater	Domestic	SS, COD,	2696 m^3/d[13]	Municipal sewer

[12] A rating weight will be assigned to equipment that meets green procurement standards during bid evaluation.
[13] Refers to the sewage amount of the entire campus (phase one+phase two)

Subproject	Assessment Item	Pollution Source	Pollutant	Anticipated Amount	Disposal/ Measures
		wastewater	NH_3-N		
	Solid Waste	Municipal SW	Domestic Waste	7t/d 750t/a	Reduce and reuse as possible; Landfill by sanitation contractor
	Noise	Fan and air conditioner			Insulation facilities
	Air	Cooking oil fumes from the restaurants of the campuses			Insulation facilities
NVTS	Wastewater	Domestic wastewater	SS, COD, NH_3-N	783 m^3/d	Municipal sewer
	Solid Waste	Municipal SW	Domestic Waste	1.75 t/d 525 t/a	Reduce and reuse as possible; Landfill by sanitation contractor
	Noise	Fan and air conditioner			Insulation facilities
	Air	Cooking oil fumes from the restaurants in the campuses	Benzopyrene, SS, CO, etc		Insulation facilities

Source: domestic TEIAR

30. **Waste gas emissions from cooking**. Waste gas will be produced in the canteens of the two campuses. Restaurant cooking oil fumes will be emitted through the standpipe chimney leading to the building top. Kitchen cooking oil fume purification devices will be installed for purification of the fumes generated. The emissions will satisfy the requirements of GB18483-2001 (Cooking oil fume emission standard).

31. **Water supply.** For the NVTS, it is estimated that the total population of the campus will reach 4500, with a water demand of 1497 m^3/d, which could not be satisfied by the existing supply. Two DN250 water supply pipes will be connected to the municipal water supply pipe for campus use, including firefighting use. The campus water supply system includes the water storage tanks and pumping system and control. For NHS, the municipal water supply pipelines are ready and adequate to meet the water demands of the new campus (3200 m^3/d). DN200 water supply pipes will be connected to the municipal water supply pipe located in Luowen Avenue for campus use, including firefighting use. The campus water supply system includes water storage tanks, a pumping system, and a control unit.

32. **Storm water.** Storm water from campus roads will be discharged into the municipal stormwater drainage system. At NVTS, a detention tank will be built to collect the rain water from roofs of 2# training building, art building and practice building. At NHS, a detention tank will be built for the A-3 and A-4 training buildings to collect initial rain water. After pre-treatment by modular filtering medium, the collected rainwater will be used for landscaping irrigation. The overflow will be discharged into separate municipal storm water drainage.

33. **Wastewater collection and treatment.** NHS and NVTS will produce 2696 m^3/d and 783

m^3/d respectively, of domestic wastewater. More details are presented below.

(i) For **NHS**, wastewater from new buildings will be pre-treated by underground septic tanks first before discharging into the campus sewer line, which will be connected to the municipal sewer line along the road in front of the campus[14], leading to the Jiangnan WWTP (completed in 2011). Two pumping stations and a section of sinking sewer crossing Yong River are under construction and will be complete by the end of 2013. Effluent from the Jiangnan WWTP (class 1B) will be discharged into the Yongjiang.

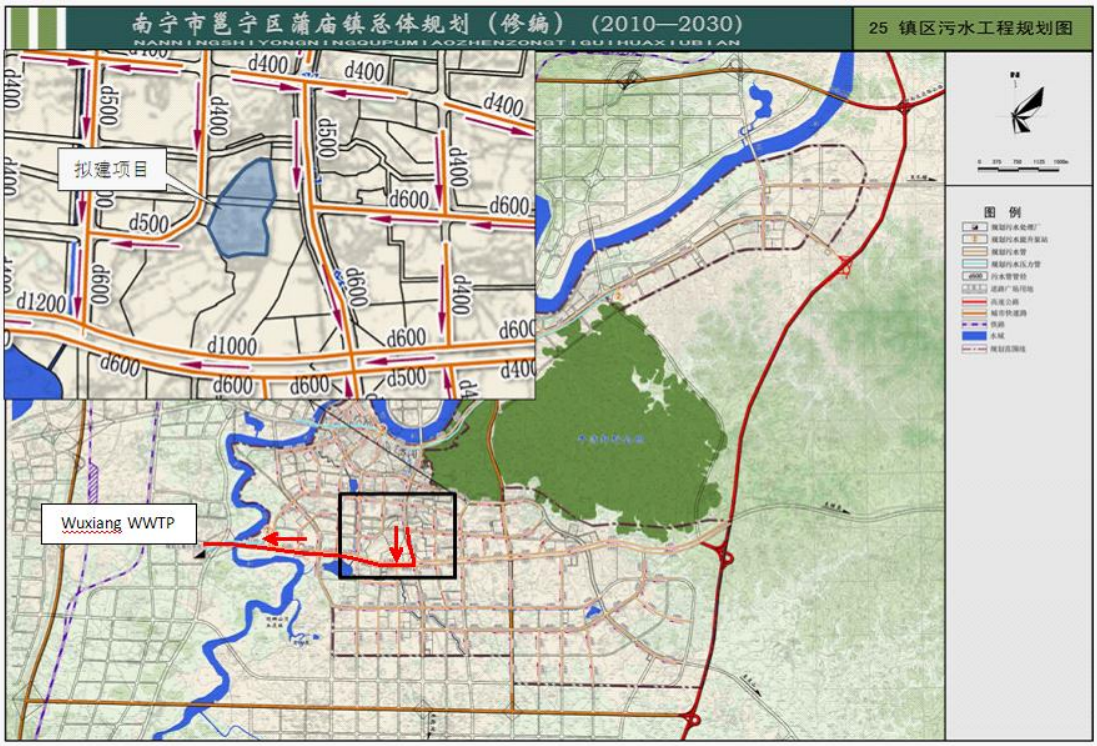
Note: Collected wastewater at campus → Louwen road sewer pipeline → Louwen Road extension sewer system → Jiangnan wastewater treatment station → Yongjiang River

Figure V.2: Sewage Network Plan for Xiangsihu New District of Nanning

(ii) For **NVTS**, after simple pre-treatment by septic tanks, the sewage will be discharged to the municipal sewer system. A new sewage system is currently being constructed in compliance with the approved master plan of Pumiao Town[15]. Part of sewage network and the Wuxiang WWTP are under construction and are expected to be put in operation by the end of 2013. Effluent from the Wuxiang WWTP (class 1B) will be discharged into the Bachijiang.

[14] " Regional Master Plan of Xiangsihu Disctrict (revised)" prepared by Tsinghua Urban Planning Institute and Nanning Urban Planning Institute.

[15] Master plan of Pumiao Town, Yongning District of Nanning (revised) (2010-2030)" prepared by Nanning Urban Planning Institute.



Note: Collected wastewater at campus → Nayuan road sewer pipeline → Yudong Road sewer pipeline and the extension sewer system → Wuxiang wastewater treatment station → Bachijiang River

Figure V.2 Sewage Network Plan for Pumiao Town, Yongning District of Nanning

34. **Solid waste and waste management strategy.** During operation, the two schools will generate solid wastes such as paper, cardboard, plastics, and general refuse by routine activities. The amount of solid waste to be disposed (see Table V.3) can be reduced through the application of 3R's: Reduce, Reuse, and Recycle. The Green Campus Policy will identify options to reduce, re-use and recycle waste on campuses. NHS and NVTS management, with support of EMS specialists, will develop and implement a waste management and minimization strategy. Solid waste shall be segregated into biodegradable and non-biodegradable waste. Where recycling is feasible, these wastes will be stored in segregated bins and removed as required. Other solid wastes will be removed by sanitary contractors on a regular basis and disposed to designated municipal landfill sites.

35. **Power supply**. The power supply for both campuses will be provided from the municipal power line near the campuses. The campuses will use 220/380V system and the supply will be provided by a 0.4KV transformer in each campus.

36. **Energy conservation.** Both schools are committed to energy-efficiency and resources conservation. The project will adopt the technologies included in the "Key Technologies promoted in Guangxi Province", such as (i) new grade III steel; (ii) thermal insulation concrete hollow bricks; (iii) new waterproof technologies. Electricity consumption will be reduced through using various new materials and equipment such as (i) solar heating system to provide hot water for student dormitories; (ii) solar street lighting system; (iii) vertical greening; (iv) high efficient lights for classroom; (v) aerated concrete blocks, polystyrene board and polystyrene insulation mortar for building envelope.

37. **Traffic management.** The campus traffic plans of both schools were critically reviewed during technical due diligence with support of the PPTA, and were reviewed and strengthened in the revised FSRs. The traffic management plans of both schools are presented below:

(i) **Nanning health school.** The major campus roads are placed along the perimeter of the campus and an interior road along the east side of the artificial water channel. The living and teaching areas are connected by three bridges in the south, north, and middle parts of the campus. The traffic planning and traffic organization is shown in **Figure V.3.** The campus roads will mainly serve the students and teachers for walking and bicycling; motorized traffic will be strictly controlled due to tight space and traffic safety concerns. The campus parking will be provided by both an underground parking garage and ground level parking lots. Currently, a total of 292 underground and 243 surface parking spaces are designed. The proposed traffic planning can serve the school teaching activity demands and the design is acceptable.

(ii) **Nanning no. 4 vocational secondary school.** The major campus roads are laid out along the campus major axis from the entrance at Nayuan Road in the east to the sports center in the west. In the southern part of the campus, where the No. 2 Teaching Building, student dormitories, and Art Building are located, a loop road is placed around the No. 2 Teaching Building to provide access for students and teachers as well as the fire trucks. Since the area is mainly used for teaching and student living, motorized traffic will be limited by implementing a campus traffic control system after the school construction is completed. The teacher living area is located in the northern part of the campus. In order to facilitate teacher and family living needs, two secondary campus entrances are located on Qingquan Road and Nayuan Road. The arrangement can effectively separate the traffic from the living area from the teaching and student living area. The campus roads will mainly serve the students and teachers for walking and bicycling and motorized traffic will be controlled due to the tight space of the campus and campus traffic safety concern. A minimum of 2 m wide sidewalks along all campus roads will be provided. The campus parking will be provided with both underground parking garage and ground level parking lots. Currently, a total of 156 underground and 61 surface parking spaces have been designed. For the non-motorized vehicle parking, a total of 580 surface parking spaces and 900 underground spaces are provided. The proposed traffic planning can serve the school teaching activity demands and the design is acceptable.

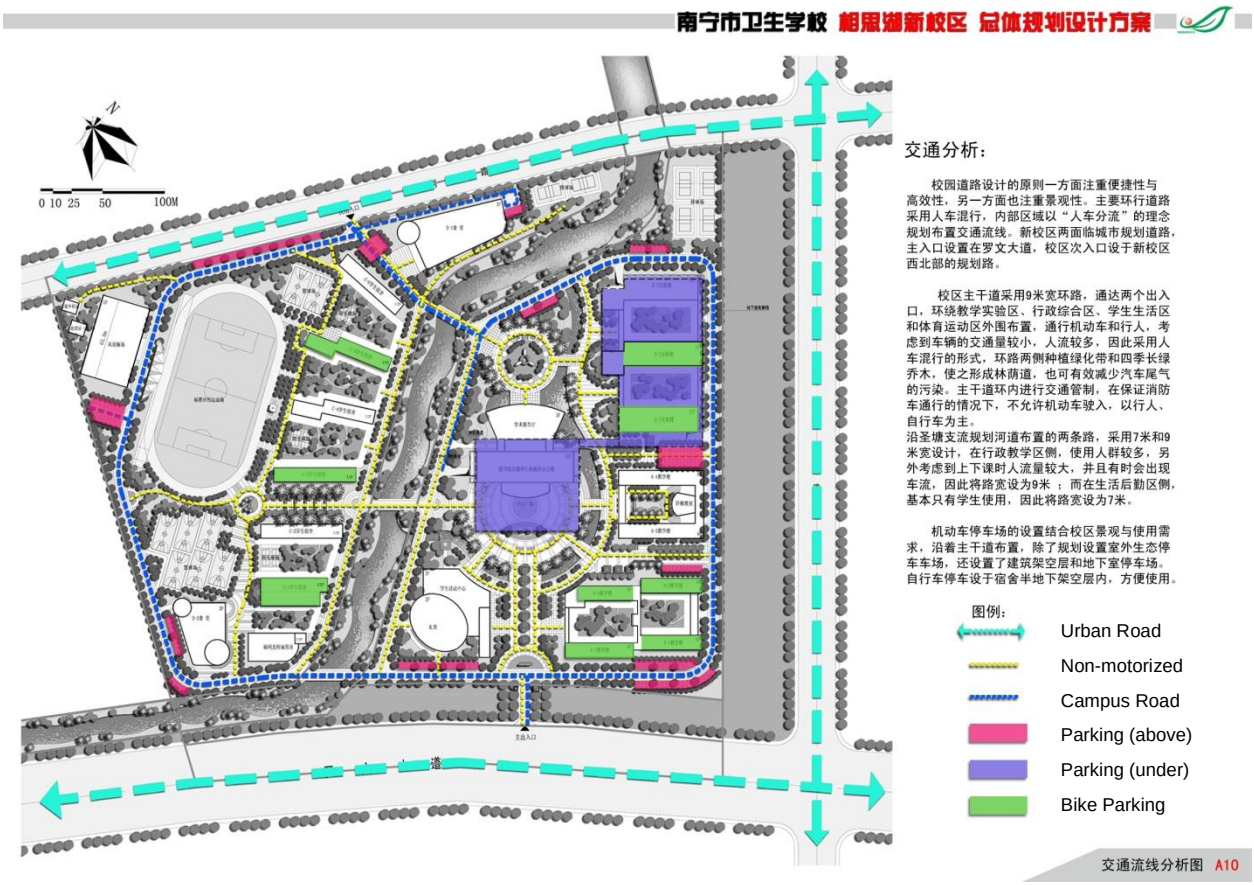


Figure V.3: Nanning Health School Traffic Planning

38. **Emergency preparedness and response.** Nanning municipal people's government has established PRC's first Integrated City Emergency Preparedness and Response System (EPRS) in 2002. This system streamlines under one roof all the city's police and fire emergencies, paramedic ambulance responses and traffic accident reporting systems, along with 30 other non-emergency public services that were previously managed by a variety of different administrative departments. The schools' campus safety and emergency preparedness and response systems have been reviewed and strengthened during PPTA. The systems will be linked to the city's EPRS. The fire evacuation design of buildings follows the "Architectural Design Code for Fire Protection" (GB50016-2006) and "Fire Protection Design for Tall Residential Buildings" (GB50045-95) (2005). The key features of both campuses' campus safety and emergency preparedness and response mechanism are presented in Table V.6 below.

Table V.6: Campus safety management measures

	NHS	NVTS
Firefighting	Proposed campus road width is 9.0 m and most of the turning radii are bigger than 10.0 m, which is adequate for firefighting requirements. However, there are a few locations with turning radii as small as 8.0 m. It is suggested the Design Institute check if the 8.0 m radius meets the current design code requirements and make necessary adjustments as needed. The	The proposed campus road width is 7.0 m and most of the turning radii are bigger than 10.0 m, which is adequate for firefighting requirements.

	NHS	NVTS
	fire truck routes are shown in Figure V.4.	
Emergency Evacuation Plan	An emergency evacuation plan has been developed in the FSR. The emergency evacuation sites as well as the emergency exits have been identified in the plan. As part of the EMS, the school shall establish a designated safety and security unit in charge of the campus security and safety, develop an emergency evacuation plan, and conduct emergency evacuation drills and education program.	An emergency evacuation plan (Figure V.5) has been developed based on campus planning and design. Emergency evacuation sites and exits have been identified in the plan. As part of the EMS (after the construction is completed) the school shall establish a designated safety and security unit in charge of the campus security and safety, develop an emergency evacuation plan, and conduct emergency evacuation drills and education program.
Campus security	A campus security monitoring system will be installed, including monitoring cameras, a network, and a control center. The security system will be able to monitor and record the campus activities full time.	During EMS establishment, the need to establish a security monitoring system (as in NHS) shall be assessed. Such a system would include monitoring cameras and a network and control center. The security system can monitor and record the campus activities full time during the school hours.

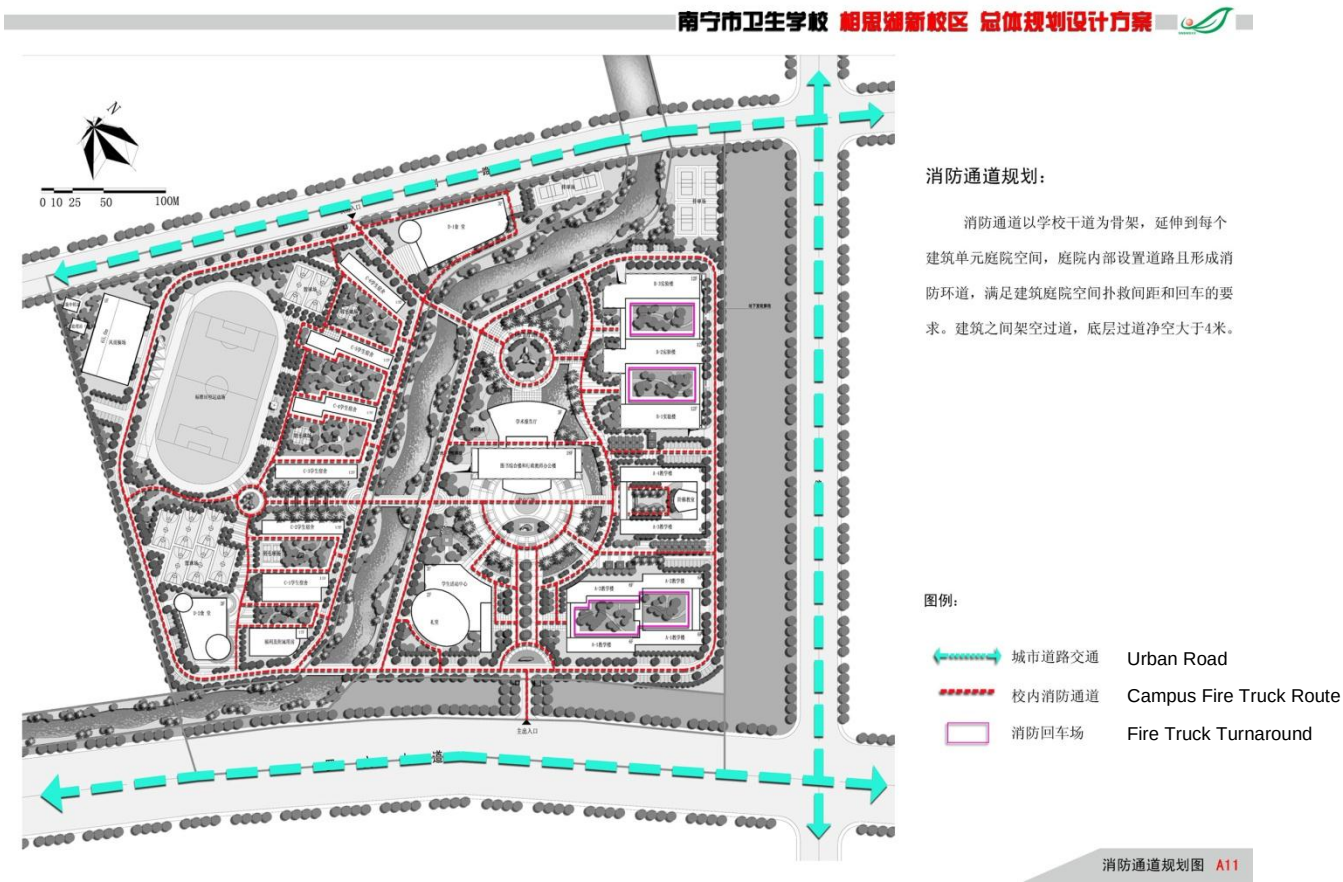


Figure V.4: NHS Campus Firefighting Routes

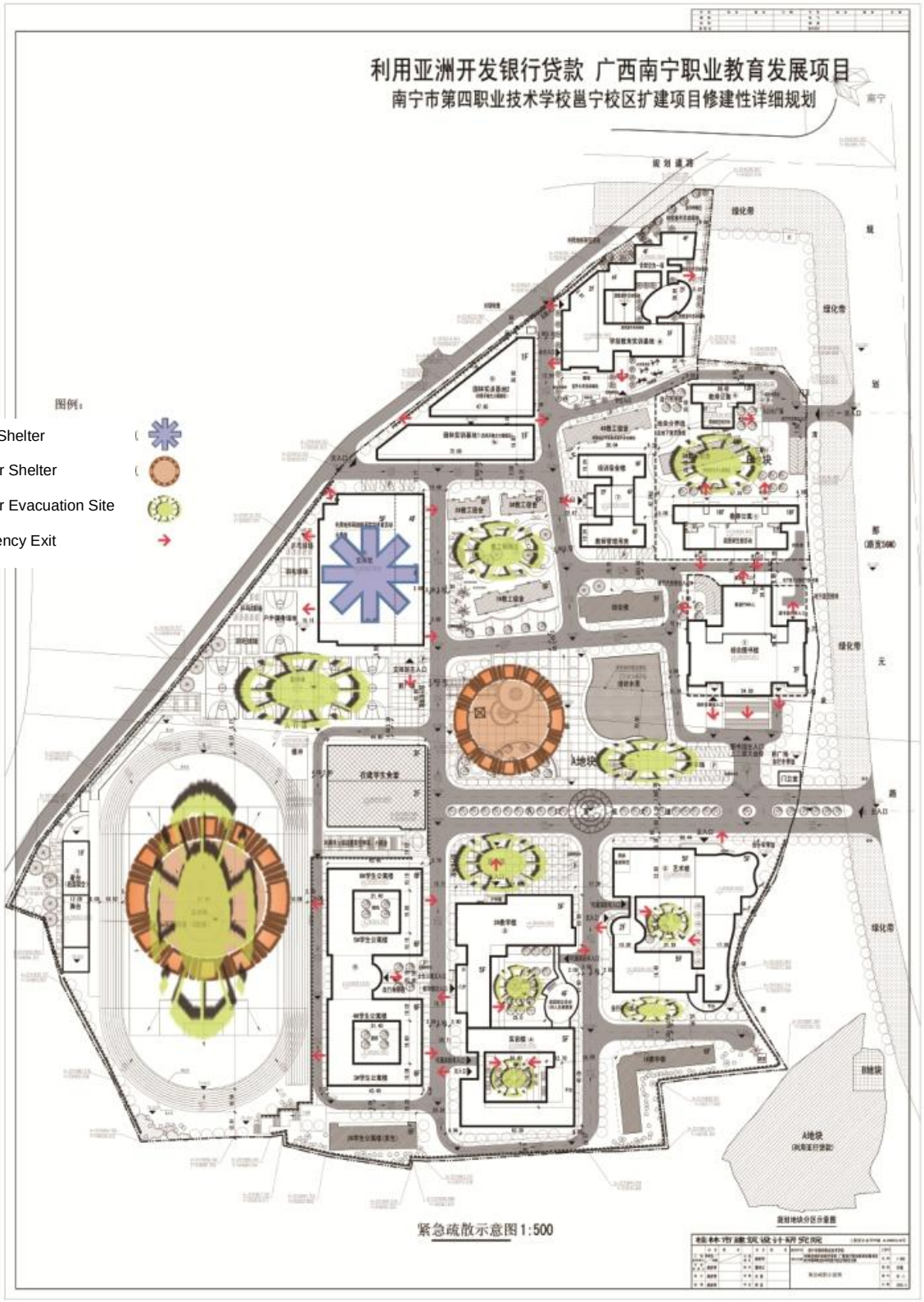


Figure V.5: Nanning No. 4 Vocational Technology School Emergency Evacuation Plan

39. **Environment management systems.** The above listed operational issues will be further assessed and defined through the development and implementation of an environment management system as component of the Green Campus Policy, outlined in **Appendix 3**. A commitment to strengthen environment, health and safety management systems for both schools targeted by the Project will be incorporated into the loan documentation as loan covenants to ensure that the measures are implemented in a timely and complete fashion.

VI. INFORMATION DISCLOSURE, CONSULTATION, AND PARTICIPATION

A. Legislative Framework for Public Consultation

1. Public participation and consultation in the evaluation of project planning, feasibility study, design and implementation is an important environment safeguards requirement; it can directly reflect the public's perceptions on environmental quality in the project's area of influence. Relevant provisions in the Environmental Protection Law of PRC and the Regulations on the Administration of Construction Project Environmental Protection (Order of the State Council, No. 253) require that domestic environmental impact assessments shall solicit the opinions of units concerned and inhabitants of project construction site. ADB's Safeguard Policy Statement (2009) also has detailed and strict requirements on meaningful participation, consultation and information disclosure. The consultation process for this project therefore followed both the PRC requirements and the ADB requirements.

2. Information disclosure and public consultation for each subproject involving civil works have been conducted during preparation of the FSR, the domestic TEIAR and the project IEE. Information disclosure and consultation included internet disclosure, informal communication with key stakeholders which included residents, local authorities and sector specific institutions and authorities; and a questionnaire survey.

B. Information Disclosure

3. Proposed civil works, including type and location of new buildings, as well as construction schedule, were disclosed in all campuses where civil works will take place (Table VI.1). Summaries of domestic TEIAR have been disclosed on the schools' websites and related medium. The IEE is disclosed on ADB's project website, and the project's annual environmental monitoring reports will be disclosed by ADB. The domestic TEIARs are available from the PMO on request.

Table VI.1 Information Disclosure

Project component	Information Disclosure	
	Date	Location
NHS (domestic TEIAR)	February, March 2013	Notice Board on NHS Campus, School website; Xixiangtang Zone (construction site) Notice on Information Board.
NVTS (domestic TEIAR)	March, April 2013	Notice Board on NVTS Campus (Yongning District) and school website; Guangxi Transport Design Institute website (EIA Institute)
Overall project (project IEE)	July 2013	ADB project website

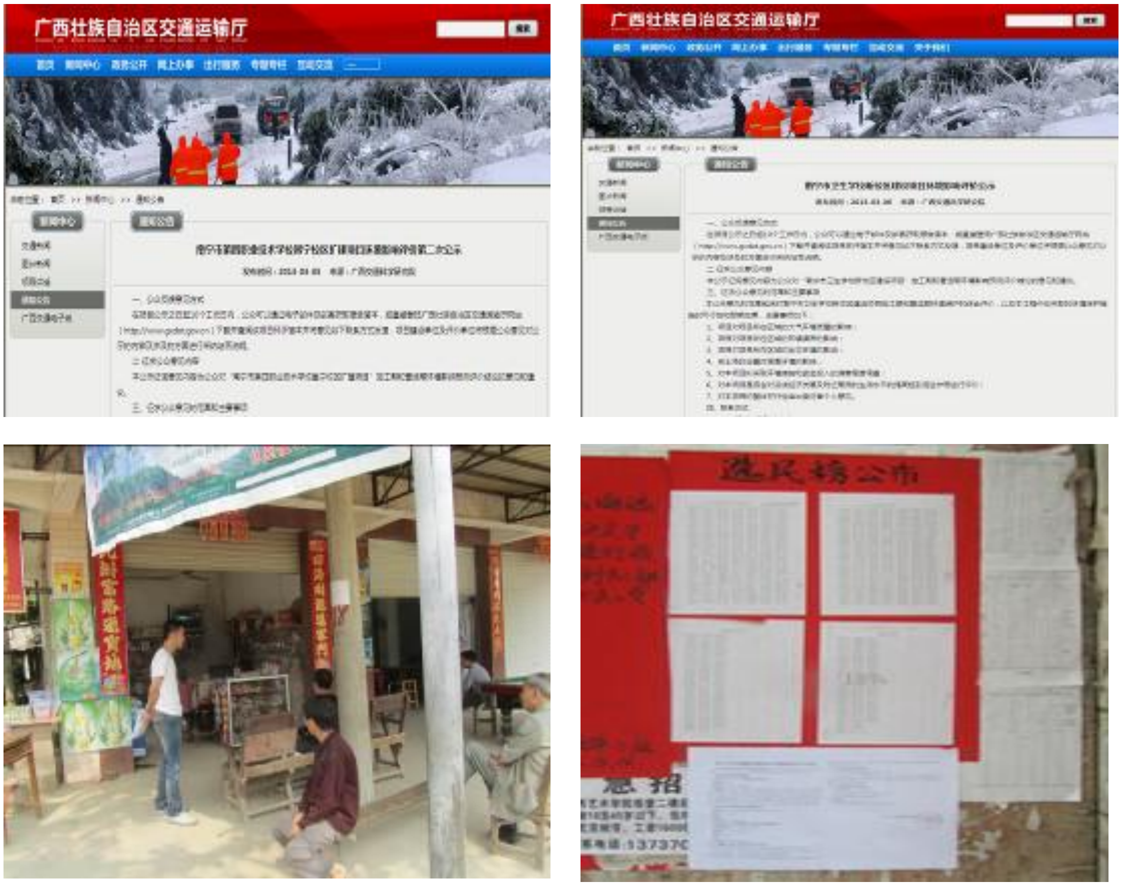


Figure VI-1: Disclosure of project information on websites and information boards within nearby community

C. Consultation

4. **Meaningful public consultation** for each subproject was undertaken by the EIA Institute and PPTA consultant.

5. For **the NHS**, the domestic TEIAR was completed in 2009. Although the approved domestic TEIAR remains valid until 2014 (confirmed by Nanning EPB) and despite the fact that public consultation is not mandatory for category B projects according to PRC regulations, the project team decided to include the NHS and people potentially affected by the construction of the campus in the consultation process. The consultation included two processes:

(i) A consultation meeting, conducted by the PPTA consultant in March 2013, and involving 36 people. During the consultation meeting, the subproject background, such as location; content, major environmental impacts and proposed mitigation measures, were presented. 36 questionnaires were distributed during the meeting, with a 100% return rate. Information on participants is presented in **Table VII.3**; the questionnaire questions and responses are presented in **Table VII.4**.

(ii) A questionnaire survey, conducted by Guangxi Transport Design Institute in March 2013. 40 copies were distributed, completed and collected (100%). Information on participants is presented in **Table VII.5**; the questionnaire questions and responses are presented in **Table VII.6**.

6. **For the NVTS component**, consultation was conducted by the EIA institute (Guangxi Transport Design Institute), in collaboration with, and under the guidance of, the PPTA consultant.

A total of 100 copies were completed and returned. The consultation results are shown in **Table VII.7**.

Table VII.3: Background Information of Participants in Questionnaire Survey of NHS by PPTA team

Gender		Occupation						
Male	Female	Cadre	Worker	Peasant	Teacher	Self employed	Student	Other
15	21	3	6	5	10	3	4	5
Residence						Education level		
Nearby		Not very far		Far		University	Middle school	Primary school
11		16		9		23	11	2

Table VII.4: Questionnaire Survey results for NHS by PPTA team

	Questions and responses
1	*Did You know that the proposed Subproject will be conducted close-by?* A. Yes (36) B. No (0)
2	*Are you satisfied with the local (city) economic and environmental situation?* A. Very satisfied (31) B. Satisfied (5) C. Unsatisfied (0)
3	*What are the major environmental issues at the local (city) level?* A. Air Pollution (5) B. Water pollution (7) C. Noise pollution (11) D. Ecological Disturb (4) E. No issue (19)
4.	*Are You satisfied with the school campus environmental setting and quality?* A. Very satisfied (25) B. satisfied(6) C. unsatisfied(1)
5.	*What are major environmental issues at your school campus?* A. Air Pollution (1) B. Water pollution (4) C. Noise pollution (6) D. Ecological Disturb (5) E. No issue (21)
6	*What phase of the project will have adverse environmental effects?* A. construction phase (32) B. Operation Phase (0) C. Both of them (4)
7	*What issue should be paid special attention to during construction?* A. wastewater management (8) B. Air pollution (1) C. Noise pollution (10) D. solid waste pollution (16) E. ecological disturb (4)
8	*Are you satisfied with the proposed measures to prevent water pollution during construction?* A. Very satisfied (33) B. satisfied (3) C. unsatisfied (0)
9	*Are you satisfied with the proposed measures to prevent air pollution during construction?* A. Very satisfied (31) B. satisfied (5) C. unsatisfied (0)
10	*Are you satisfied with the proposed measures to prevent noise pollution during construction?* A. Very satisfied (29) B. satisfied (6) C. unsatisfied (1)
11	*Are you satisfied with the proposed measures to prevent solid waste pollution during construction?* A. Very satisfied (27) B. satisfied (7) C. unsatisfied (2)
12	*Are you satisfied with the proposed measures to prevent ecological disturbance during construction?* A. Very satisfied(30) B. satisfied(6) C. unsatisfied(0)

13	*What impacts will the project have during operation?* A. positive (23) B. negative (0) C. both of them (2) D. do not know(11)
14	*Do you think that the subproject will promote the local life and educational opportunities?* A. Yes (31) B. No (0) C. un-certain (5)
15	*Do you think that the subproject will improve the local environmental quality and school campus environmental settings?* A. Yes (32) B. No (0) C. uncertain (4)
16	*Do you think the project will promote local social and economic development?* A. Yes (33) B. uncertain (3) C. No (0)
17	*If you do not support this subproject, please state the major reasons* A. yes (34) B. No (0) C. uncertain (2)
C. *Comments and suggestions*	
Local peasants hope the subproject can be started as early as possible. They hope that the project will provide employment opportunities.	

Table VII.5: Participants in Questionnaire Survey of NHS by Guangxi Transport Design Institute

Affected persons	Number	Percentage (%)
Siliang Village	16	40.00
Luowen Village	16	40.00
Guangxi Art Institute	8	20.00

Table VII.6: Questionnaire Survey results for NHS by Guangxi Transport Design Institute

Items	responses	Persons (Num)	Percentage (%)
1. Do you know this project and its components?	No	7	17.50
	Partly	30	75.00
	Yes	3	7.50
2. What is the most urgent environmental issues at the project area (multiple options)	Air pollution	1	2.50
	Water pollution	4	10.00
	Noise pollution	5	12.50
	Ecological disturbance	4	10.00
	Others	7	17.50
	(None) Good environment	28	70.00
3. What are the main environmental impacts during construction phase (multiple-option)?	noise impact	17	42.50
	air impact	5	12.50
	water environmental impact	2	5.00
	ecological disturbance	4	10.00
	Travel inconvenience caused by the construction	20	50.00
4. Which measures do you suggest to mitigate the impacts?	Reasonable arrangements for the construction activities	11	27.50
	Sprinkler to reduce dust	4	10.00
	Temporary fencing	7	17.50

Items	responses	Persons (Num)	Percentage (%)
	Part area by part area for the construction, and greening one by one just construction fulfilled	10	25.00
	Others	8	20.00
5. What impacts do you anticipate during project operation phase?(multiple-option)	Noise	15	37.50
	Domestic solid waste	11	27.50
	Air emissions	2	5.00
	Wastewater	4	10.00
	Others	8	20.00
6. Will the project affect daily life outside the campus during operation?	No	14	35.00
	Yes, but at the acceptable level	18	45.00
	Yes, at the unacceptable level	8	20.00
7. Do you agree with the project location? (if not, please state the season)	Yes, agree	30	75.00
	No, don't agree	0	0.00
	Do not know	4	10.00
	Others	6	15.00
8. Assuming that adequate mitigation measures are applied, do you support the project? (if not, please state the season)	Support	30	75.00
	Against	0	0.00
	No commend	10	25.00

Table VII.7: Result of Consultation on NVTS Subproject

Question	Response	Persons (Num)	Percent (%)
1. Do you know this project and its components?	No	0	0
	Partly	36	36
	Yes	64	64
2. What is the most urgent environmental issues at the project area (multiple options)	Air pollution	0	0
	Water pollution	0	0
	Noise pollution	4	4
	Ecological disturbance	6	6
	Others	20	20
	(None) Good environment	88	88
3. Do you hear the "Zizi" sound emitted by the high-voltage line in your campus? (multiple options)	never	20	100
	Yes, occasional	0	0
	Yes often	0	0
4. What are the main environmental impacts during construction phase (multiple-option)?	noise impact	64	64
	air impact	4	4
	water environmental impact	10	10
	ecological disturbance	10	10
	Travel inconvenience caused by the construction	50	50
5. Which measures do you suggest to mitigate the impacts?	Reasonable arrangements for the construction activities	36	36

Question	Response	Persons (Num)	Percent (%)
	Sprinkler to reduce dust	34	34
	Temporary fencing	24	24
	Part area by part area for the construction, and greening one by one just construction fulfilled	6	6
6. What impacts do you anticipate during project operation phase?(multiple-option)	Noise	42	42
	Domestic solid waste	28	28
	Air emissions	14	14
	Wastewater	10	10
	Others	46	46
7. Will the project affect daily life outside the campus during operation?	No	0	0
	Yes, but at the acceptable level	88	88
	Yes, at the unacceptable level	12	12
8. Do you agree with the project location? (if not, please state the season)	Yes, agree	86	86
	No, don't agree	0	0
	Do not know	14	14
	Others	0	0
9. Assuming that adequate mitigation measures are applied, do you support the project? (if not, please state the season)	Support	86	86
	Against	0	0
	No commend	14	14

7. Based on the results shown in the above tables, more than 80% of the consulted public is supportive of the project. The suggestions provided by the consulted public included: (i) high noise mechanization activities should be forbidden between 10:00 pm to 6:00 am; (ii) to provide septic tanks for the sewage during construction phase to avoid pollution to the surroundings and take appropriate measures to control soil erosion; (iii) to implement dust control measures. All these considerations have been included as mitigation and management measures in subproject designs and in the EMP. Some concerns expressed, and actions requested, were reflected in the social action plan, including (but not limited to): (i) At least 30% of jobs generated by the project will be offered to local population; (ii) Local materials will be used where possible and local contractors will be prioritized; (iii) Contractors will be required to comply with the core labor standards to ensure the health and safety of employees; and (iv) A clause will be included in the tender documents for civil works on the inclusion of HIV/AIDS awareness training for construction workers.

8. **Consultation of key institutions.** The consultation process also involved frequent exchange with key institutional stakeholders, including the Nanning Education Bureau, Nanning Finance Bureau; Nanning Environment Protection Bureau, Nanning Health Bureau as well as the two schools during the feasibility study process and TEIA and IEE process. The project team has undertaken three site visits during project preparation and shared the environmental requirements and anticipated impacts with the project schools. In addition, a questionnaire survey was conducted to assess the project schools' current environment, health and safety management practices and policies, and to identify gaps as compared to PRC and international standards and best practices (**Table VII.8**). While some of the responses must be partly questioned (indicating that comprehensive EMS are already in place), both projects schools clearly expressed their willingness to strengthen their EMS and improve campus management.

D. Future Public Consultation and Information Disclosure

9. Public involvement during construction and operation phases will mainly rely on informal interviews with the staff and students from two project schools and nearby residents. The implementing agencies and civil works Contractors will consult potentially affected people during their regular site inspections. The Project's environmental information will be disclosed by the executing agency and ADB. Annual environment monitoring and EMP implementation reports will be disclosed on ADB's project website.

Table VII.8: Existing environment, health and safety management of project schools

Topic	Question		NVTS	NHS
Background Information	1. Location		Yonning District of Nanning City	existing Campus : Jiangnan District of Nanning City; proposed Campus: Xiangsi Lake District of Nanning District
	2. How many students and school personnel are currently staying on this campus	Students	2069	4800
		Faculty Staff	92	230
		Admin. Staff	30	75
		O & M staff	36	
		Others	3	
	3. Do you know the size of the school campus and the building area?	Size of campus	159.1 mu	32 mu
		Number of buildings	17	13
		Total floor area	35,235 m^2	40,000 m^2
Water, Wastewater, Solid Waste, Energy	4. Do you know how much water, energy, waste and wastewater is consumed or produced?	Water consumption (m3/year)	898,500	1,950,000
		Energy consumption (kWh/year)	385,800	1,400,000
		Non-hazardous waste (kg/year)	432,000	2,090,000
		Hazardous waste (kg/year)	0	0
		Wastewater (m3/year)	850,000	1,850,000
	5. Do you know by whom and where solid waste is being transported and discharged?	Who collects your waste?	Yongling District Environment and sanitation administrative station	Jiangnan District Environment and sanitation administrative station
		Where is it disposed?	Landfill	Landfill
		Satisfied with service?	Yes	Yes
	6. Do you know where your wastewater is being transported, treated and discharged?		Treated in on-site septic tank and discharged into municipal sewer	Treated in on-site septic tank and discharged into municipal sewer

Topic	Question		NVTS	NHS
	7. Do you have an energy conservation policy? If yes, what is specific measure to minimize energy consumption?		Buy water and hot water and electricity power by card to pay the expense; to control the light at class room by the timing. Solar energy to heat the water.	Buy water and hot water and electricity power by card to pay the expense; to control the light at class room by the timing. Solar energy to heat water.
	8. Do you have a waste management policy promoting waste reduction, reuse recycling? If yes, what are specific measures to reduce reuse and recycle waste?		Put waste at the designed point, central collection and transfer. School sanitation workers conduct the regulated collation and transfer	Put waste at the designed point, central collection and transfer. School sanitation workers conduct the regulated collation and transfer
Environment, Health and Safety System	9. Does you campus or school have an environment, health and safety Policy? If yes, please shortly describe the main component of the policy		Solar energy used for heating water, solid waste separate collection and some reused such used papers should be collected for reproduced.	Solar energy used for heating water, solid waste separate collection and some reused such used papers should be collected for reproduced.
	10. Do you have established procedures for communicating relevant environment, health and safety requirement and provisions to school students and employees? If yes, please shortly describe the system.		There is health and disease reporting system, patrol security for whole day of 24 hours; sharing of information through the sanitation health and safety committee; giving all committee members a reasonable opportunity to express their views	Health and disease reporting system, patrol security for whole day of 24 hours; sharing of information through the sanitation health and safety committee; giving all committee members a reasonable opportunity to express their views
	11. Do you have an environment management system for the school or campus?		Department of environment and sanitation to conduct the daily work and monthly checked by the one of the vice principal and find the issues to update them.	Department of environment and sanitation to conduct the daily work and monthly checked by the one of the vice principal and find the issues to update them. Conduct the campus environment protection education
	12. Are role, responsibilities and authorities, including the appointment of a specific manager in charge of environment, health and safety, clearly defined?		Department of environment and sanitation to conduct the daily work and monthly checked by the one of the vice principal and find the issues to update them. Conduct the campus environment protection education	One of the vice principal is pointed to be in charge of environment, sanitation, health and safety. Several department leaders are in charge of environment, sanitation, health and safety respectively. The

Topic	Question		NVTS	NHS
				relevant campus occupation health and safety officer acts as executive officer of the campus committees.
	13. Who is responsible for the following activities on you campus (indicate number of full time or part time staff):		One of the vice principal is appointed to be in charge of environment, sanitation, health and safety. Several department leaders are responsible for environment, sanitation, health and safety respectively. The relevant campus occupation health and safety officer acts as executive officer of the campus committees. A. Indoor air quality control; (administrative and education Depts 3 at full time, 7 at part time) b. Wastewater collection and sewer maintenance: (administrative Dep. 4 at full time) c:Solid waste collection and maintenance: (administrative Dep. 4 at full time) d. hazardous waste management: (not applicable) e. Laboratory safety: (education Dep. 5 at part time) f. Campus maintenance (outdoor): (local construction Dep.) g. School building maintenance (indoor): (administrative Dep. 2 at full time) h. Fire safety: (security Dep. Of school 5 at part time) i. First aid: (phone call 119 for local fight fire police) j. Water supply safety and quality: (administrative Dep. 2 at full time) k. Emergency response: (security Dep. Of school 5 at part time) l. Others (please specify): (local social security and safety Dep. Of local	a. Indoor air quality control; (administrative and education Depts 3 at full time, 9 at part time) b. Wastewater collection and sewer maintenance: (administrative Dep. 3 at full time) c. Solid waste collection and maintenance: (administrative Dep. 4 at full time) d. hazardous waste management: (not applicable) e. Laboratory safety: (education Dep. 7 at part time) f. Campus maintenance (outdoor): (local construction Dep.) g. School building maintenance (indoor): (administrative Dep. 3 at full time) h. Fire safety: (security Dep. Of school 6 at part time) i. First aid: (phone call ii9 for local fight fire police) j. Water supply safety and quality: (administrative Dep. 2 at full time) k. Emergency response: (security Dep. Of school 5 at part time) l. Others (please specify): (local social security and safety Dep. Of local government)

Topic	Question		NVTS	NHS
			government)	
	14. Have you developed, Implemented and documented operating procedures for activities associated with environment management;	a. Non-hazardous solid waste collection:	yes	yes
		b. Hazardous solid waste collection:	yes	yes
		c. Laboratory safety:	yes	yes
		d. Waste supply quality assurance:	yes	yes
		e. Wastewater collection and treatment:	yes	yes
		f. Safety plans for laboratories	yes	yes
		g. Hazardous waste management:	yes	yes
		h. Indoor air quality assurance:	yes	Yes Notes: Campus greening action, sanitation action daily and supervised by the officers, supervised by the district EPB
	15. Do you have a fire safety plan for your school		yes	yes
	16. Do you have established emergency identification, preparedness and response procedures		yes	Yes, establish the emergency response procedure including the emergency withdraw road map and safety place and water sources

Topic	Question		NVTS	NHS
	17. Are all employees/faculty/students whose work involves significant environment and safety aspects competent by training, experience and/or education?		Yes	Yes
Capacity Building	18. Would you be interested to strengthen the environment, health and safety management system for your school/institution?		Yes	yes
	19. Which aspects of environment, health and safety in your school/institution do you think should be improved?		Improvement of facilities on environment, health and safety administrative	improvement of facilities on environment, health and safety administrative
	20. Any other suggestions, recommendations observations		more trainings, more watch dogs points	more trainings, more watch dogs points, more education activities on environment protection and energy conservation

Source: PPTA consultant team

VII. GRIEVANCE REDRESS MECHANISM

A. Proposed Mechanism

1. A grievance redress mechanism (GRM) was defined in compliance with ADB's SPS (2009) requirement to prevent and address community concerns. In addition to serving as a platform to resolve grievances, the GRM has been designed to help establish an environment of trust and an open channel for effective communication, including the identification of new environmental issues of concern arising from the project.

2. In consultation with the PMO and the two IAs, it was agreed that a Public Complaint Center (PCC) will be established within the PMO. The PCC will instruct contractors, IAs and construction supervision companies (CSC) if people complain about the Project. The PCC will coordinate with the local government and EPB, as necessary, and will be supported by the environment specialist of the project implementation support (PIS-ES).

3. The contact persons for different GRM entry points (contractors, IAs, PCC) will be identified prior to construction. The contact details for each entry point (including phone numbers, e-mail addresses, and postal address) will be disclosed on information boards at all construction sites.

4. The PCC will establish a GRM tracking and documentation system. The system will include the following elements: (i) tracking forms and procedures for gathering information from project personnel and complainant(s); (ii) a process for informing stakeholders about the status of a case; and (iii) a procedure to retrieve data for reporting purposes, including the periodic reports to ADB.

B. Types of Grievances Expected and Eligibility Assessment

5. Public grievances addressed by the GRM will most likely be limited to environmental issues during the construction phase. Grievances will most likely relate to dust emissions, construction noise, disposal of waste materials in inappropriate places, and inadequate construction site safety.

6. Eligible complaints include those where (i) the complaint pertains to the project; and (ii) the issues arising in the complaint fall within the scope of environmental issues that the GRM is authorized to address. Ineligible complaints include those where: (i) the complaint is clearly not project-related; and (ii) the nature of the issue is outside the mandate of the environment GRM (such as issues related to allegations of fraud or corruption). Complaints ineligible to the GRM will be recorded and passed onto relevant authority. Meanwhile, the complainant will be informed of the decision and the reasons for rejection.

C. GRM Procedure and Timeframe

7. Procedures and timeframes for the grievance redress process are as follows:
   (i) Stage 1: If a concern arises during construction or operation, the affected person will submit the complaint to one of the GRM access points (contractor, PCC, IA). Whenever possible, the contractor and IA will resolve the issue of concern directly with the affected person. The contractor or IA will give a clear reply within one week. If successful, the IA will inform the PCC accordingly.

(ii) Stage 2: If no appropriate solution can be found during Stage 1, the IA has the obligation to forward the complaint to the PCC. The AP may also decide to submit a written or oral complaint to the PCC directly. For an oral complaint, proper written records must be made. The PCC will assess the eligibility of the complaint, identify a solution in consultation with the complainant, IA (or its PIU) and contractor, and provide a clear reply for the complainant within five (5) working days. The PIS-ES will assist the PCC in replying to the affected person. The PCC will inform the ADB project team on the complaint. The contractors during construction, and the IA during operation, will implement the agreed upon redress solution and report the outcome to the PCC within two (2) weeks.

8. The implementing agency, contractor, and PCC shall accept the complaints/grievances lodged by the AP free of charge. Any cost incurred should be covered by the contractor or the contingency of the project. The grievance procedures will remain valid throughout the duration of project construction and until project closure.

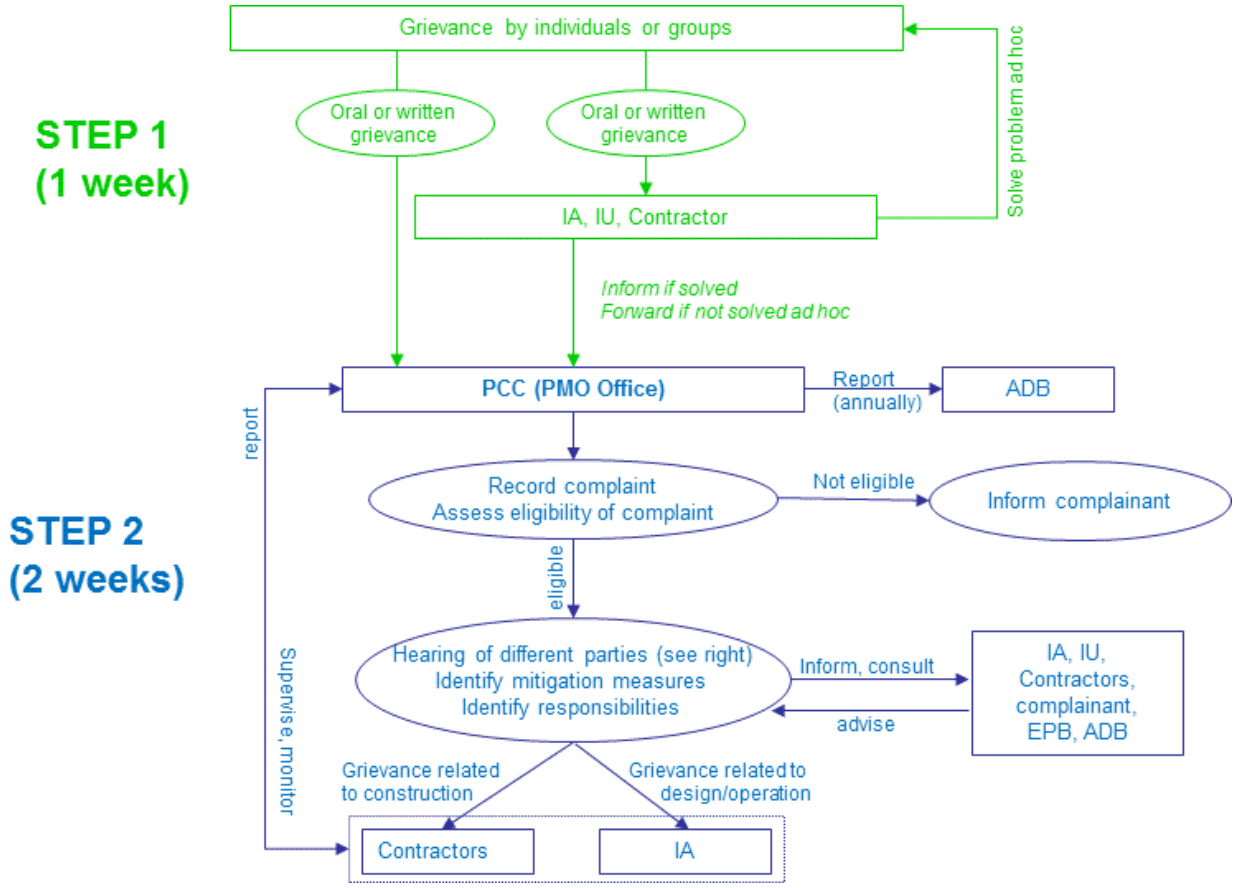


Figure VII.1: Grievance Redress Mechanism

Note: EPB = Environmental Protection Bureau, IA s= Implementation Agency, PMO = Project management office, PCC = Public complaint center

VIII. ENVIRONMENTAL MANAGEMENT PLAN

1. An environmental management plan (EMP) has been prepared for the project. It is an essential document to ensure the implementation of mitigation measures. The full EMP will be attached to the Project Administration Manual (PAM) of the project.

2. The EMP defines all potential impacts of different project outputs and the mitigation and protection measures with the objective of avoiding or reducing these impacts to acceptable levels. The EMP also defines the institutional arrangements and mechanisms, the roles and responsibilities of different institutions, procedures and budgets for implementation of the EMP. The EMP is based on the TEIAR and feasibility study report (FSR), and draws on the findings of the project IEE, PPTA and ADB review mission discussions and agreements with the relevant government agencies.

3. The EMP, presented in **Appendix 1**, defines (i) responsibilities and authorities for EMP implementation;, (ii) summary of impacts and mitigation measures; (iii) environmental monitoring and inspection plan; (iv) institutional strengthening and training plan; (v) reporting requirements; (vi) public consultation plan, (vii) cost estimates, and (viii) mechanism for feedback and adjustment. The EMP will be reviewed and updated at the end of the detailed design in order to be consistent with the final detailed design. The EMP will also be included as separate annex in all bidding and contract documents. Contractors will be required to develop site-EMPs that are fully responsive to the EMP. The PMO-SO will be assigned with the responsibility to ensure Contractors' compliance with the Site-EMP and EMP.

IX. CONCLUSION

A. Environmental Impact Assessment Results

1. The main anticipated environmental impacts relate to the construction phase and include dust, noise, wastewater and solid waste arising from construction of buildings under component 3.

2. At design stage, the design institutes will design all buildings in compliance with relevant design standards and codes for energy-efficient, safe and green public buildings, including but not limited to: GB 50189-2005 (Design Standard for Energy Efficiency of Public Buildings); GB 50176-1993 (Thermal Design Code for Public Buildings); GB/T 50378-2006 (Evaluation Standard for Green Buildings); and GB 50099-2011 (Code for design of schools). Adherence to PRC green public procurement policies will be targeted for equipment and appliances procurement.[16]

3. **During construction**, major anticipated impacts include noise, fugitive dust, solid wastes, and community and occupational health and safety risks. Overall, construction-related impacts are localized, short term, and can be effectively mitigated through the application of good construction and housekeeping practices and implementation of construction phase community and occupational health and safety plans.

4. **During operation**, no major environmental impacts are anticipated. The current and proposed environment services of the two schools were assessed, and it is concluded that incremental water supply and solid waste generation resulting from the project will not overburden existing services. The regional wastewater pipelines and WWTPs are under construction and the campuses will connect to the municipal wastewater facilities. The capacity will be adequate to receive sewage from the campuses. The project's potential impacts on community and occupational health and safety during operation were analyzed and corresponding mitigation measures have been proposed in the IEE and EMP. Component 4 of the Project will also provide expert support to develop and implement an environment management system (EMS) in both schools.

5. An environmental management plan (EMP) has been developed for the design, construction, and operation phases of the Project. The EMP defines mitigation measures, monitoring requirements, and institutional responsibilities and costs for implementing the mitigation measures and the monitoring requirements. The EMP will be included as separate annex in all bidding and contract documents. Contractors will be required to develop site-EMPs that are fully responsive to the EMP.

B. Risks and Assurances

6. Project risks related to environment safeguards have been analyzed, and the assurances required to address these risks, have been defined. The major risks are listed below:

(i) Design of project facilities not complying with relevant design standards and codes related to energy-efficient, safe and green public buildings;

(ii) Inadequate capacity of the executing agency and implementation agencies in environment management, which could result in inefficient project and EMP implementation; and

[16] A rating weight will be assigned to equipment that meets green procurement standards during bid evaluation.

(iii) Delays in construction of municipal sewer systems and wastewater treatment plants.

7. Commitments by the executing agency and the two IAs will be incorporated into the loan documentation as loan covenants to ensure that the measures are implemented in a timely and complete fashion, including: (i) a commitment to adhere to relevant design standards and codes for energy-efficient, safe and green public buildings; (ii) a commitment to adhere to PRC green public procurement policies; and (iii) a commitment to promote green campuses through the development of environment management systems (EMS).

8. The overriding assurance required is that the executing agency and the local government bodies as appropriate will ensure that the full range of effective measures set out in the IEE and EMP are undertaken, and guarantees that the environmental management provisions and the environmental monitoring plan will be implemented effectively during project implementation, and that the implementation reports of the environmental management and monitoring plan in accordance with ADB requirements will be submitted in a timely fashion. Part of this monitoring and management commitment will be a commitment to implement and maintain an appropriate grievance redress mechanism (GRM) covering the construction of all project subprojects.

C. Conclusion

9. The IEE concludes that as long as the environmental mitigation and management measures defined in the EMP are properly implemented, all adverse environmental impacts associated with the project will be prevented, eliminated, or minimized to an acceptable level. The Project is feasible from an environment safeguards point of view.

APPENDIX 1

ENVIRONMENTAL MANAGEMENT PLAN

A. Introduction

1. This environmental management plan (EMP) is developed for the Guangxi Nanning Vocational Education Development Project (the project) and defines all potential impacts of the project outputs and the mitigation and protection measures with the objective of avoiding or reducing these impacts to acceptable levels. The EMP also defines the institutional arrangements and mechanisms, the roles and responsibilities of different institutions, procedures and budgets for implementation of the EMP. The EMP seeks to ensure continuously improving environmental protection activities during preconstruction, construction, and operation in order to prevent, reduce, or mitigate adverse impacts and risks. The EMP draws on the findings of the project IEE, the domestic TEIA reports, PPTA and ADB review mission discussions and agreements with the relevant government agencies.

2. The EMP will be reviewed and updated at the end of the detailed design in order to be consistent with the final detailed design. The updated EMP will be disclosed on the ADB project website. The updated EMP will also be included as a separate annex in all bidding documents. The contractors will be made aware of their obligations to implement the EMP, to budget EMP implementation costs in their bids, and to develop site-EMPs fully responsive to the EMP.

B. Institutional Responsibilities

3. Figure EMP.1 defines the organizational structure for the Guangxi Nanning Vocational Education Development Project.

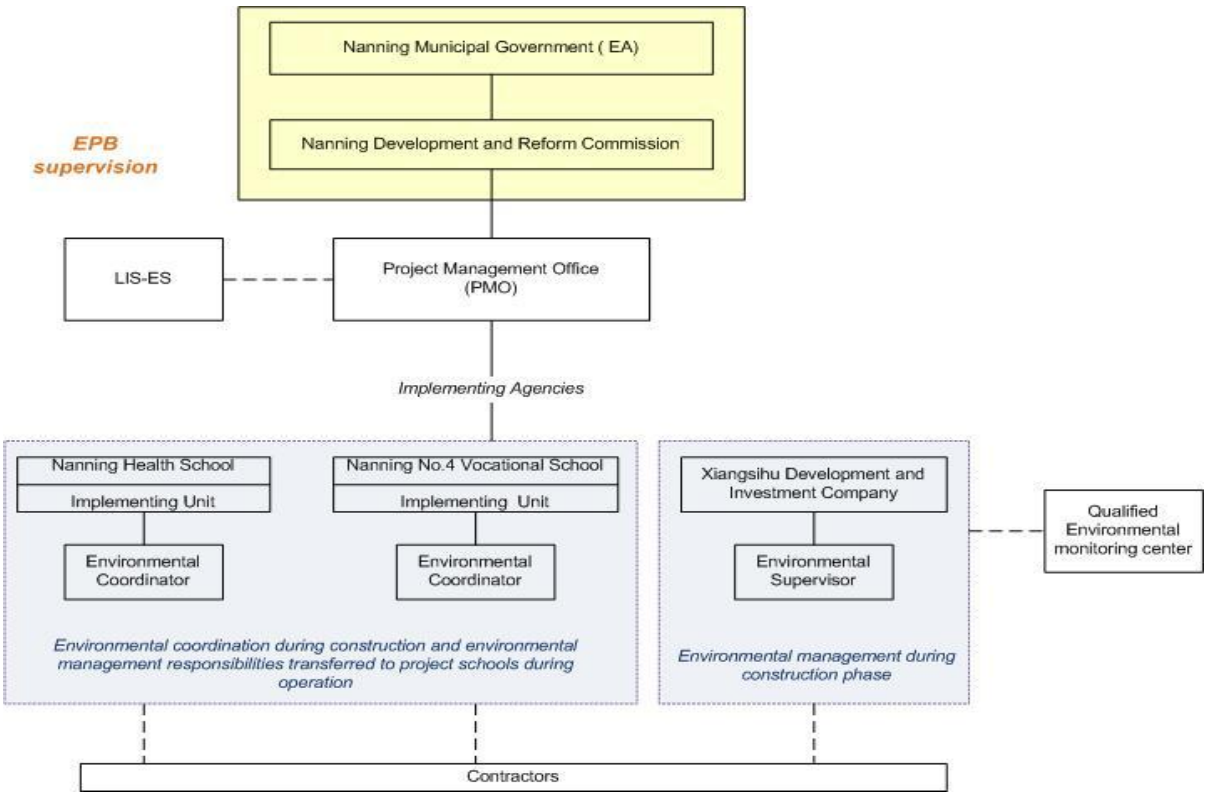


Figure EMP.1: Institutional arrangement for environmental management of Guangxi Nanning Vocational Education Development Project.

4. As **executing agency**, the **Nanning Municipal Government (NNMG)** will be responsible for the overall implementation of the project, including the EMP and its Environmental Monitoring Plan. The executing agency will have the overall responsibility for coordinating project implementation in the project schools and organizing provincially managed activities. NNMG has established the **Nanning project steering committee**, led by the Vice Mayor of Nanning Municipality and including high level officials from BEP, BOE, BOF, BOH, HURDC, and Nanning Development and Reform Commission (NNDRC) and to (i) provide overall project direction and any required policy guidance; (ii) oversee the preparation and implementation of the project; (iii) provide overall guidance to the project; (iv) support cross-agency policy dialogue; (v) review project progress and provide strategic advice to support effective implementation.

5. NNDRC will exercise day-to-day oversight of the project and will be responsible for (i) approval of domestic feasibility study and submission of authorization requests for foreign capital utilization; (ii) approval of any major changes needed to project scope; (iii) liaison with NDRC; (iv) facilitating interdepartmental and inter-sector cooperation needed for effective project implementation; (v) economic planning and managing the alignment of individual sector plans and reforms with the approved economic plans; and (vi) involvement in policy dialogue.

6. NNDRC has established a **project management office (PMO)** to direct project preparation and implementation activities, coordinate implementation of environmental safeguards plans, monitor project progress and project impacts, and facilitate the communication and coordination with ADB. The PMO is staffed from NNDRC. For environment safeguards, the PMO will have the overall responsibility delegated by NNDRC for supervising the implementation of the EMP, coordinating the Project level grievance redress mechanism (GRM) and reporting to ADB. The PMO will assign one safeguards officer (PMO-SO) in charge to supervise the effective implementation of the EMP.

7. To ensure that the contractors comply with the EMP provisions, the PMO-SO with the help and technical support of environment specialist of the Loan Implementation Support (LIS-ES), will prepare and provide the following specification clauses for incorporation into the bidding procedures: (i) a list of environmental management requirements to be budgeted by the bidders in their proposals; (ii) environmental clauses for contractual terms and conditions; and (iii) major items in the IEE and EMP. In addition the PMO-SO will prepare annual environment monitoring and EMP progress reports in English, and submit them to ADB for appraisal and disclosure.

8. **Implementing agencies and implementing units.** The Project will include three implementing agencies: Nanning Health School (NHS) and Nanning No. 4 Vocational Secondary School (NVTS) as well as the Xiangsihu Investment and Development Company (XIDC). NHS and NVTS will each set up an implementing unit to coordinate the preparation and implementation of subproject components. The implementing unit will be fully staffed with technical experts and administrators in charge of school reform, procurement, financial management, disbursement, monitoring, evaluation, and coordination.

9. **XIDC environment supervisor.** XIDC will lead the preparation and implementation of component 3 (civil works) under the assistance of NHS and NVTS. XIDC will appoint one environment supervisor (XIDC-ES) to (i) review and approve contractors' site-EMP; (ii) conduct site inspections following the site inspection checklist (Appendix 2); (iii) organize periodic environmental monitoring in compliance with the approved monitoring plan; (iv) act as local entry point for the

project grievance redress mechanism (GRM); (v) assess the contractors' compliance with the site-EMP and PRC environmental quality standards for ambient air, water and noise quality; (vi) submit quarterly inspection and monitoring results to the contractors for information, and to the 3 implementing agencies and the PMO for verification and confirmation.

10. **School environmental coordinators.** NHS and NVTS will appoint one environmental coordinator to (i) liaise with the XIDC-ES and contractors and manage school activities potentially affected during construction; (ii) act as one team member of the EMS committee (the EMS committee is composed by one management representative and members from relevant departments of the school) to participate in environmental management in the daily school activities during operation; and (iii) act as local entry point for GRM.

11. **Construction contractors** will be responsible for implementing the mitigation measures during construction. In their bids, contractors will be required to respond to the environmental management requirements defined in the EMP. Each contractor will be required to develop site-EMPs and will assign a person responsible for environment, health and safety. After project completion, environmental management responsibilities will be handed over to the project schools.

12. **Environment Specialist of the loan implementation support.** Under the loan implementation consultancy services, one international (1 person-month) and one national (3 man-months) EMS specialists will be recruited to assist the project schools establishing integrated EMS for the daily operation of campus, following the green campus framework defined in Appendix 3 of the IEE. The EMS will aim at ensuring continual improvement by incorporating ongoing monitoring, reviews, and revisions of the environmental procedures. In addition, one national LIS-ES will support the project with (i) project preparation, including EMP update; (ii) EMP training, (iii) annual environment monitoring and EMP progress reporting; (iv) identifying environment-related implementation issues and necessary corrective actions; (v) undertaking site visits as required; and (vi) provide assistance to the EMS specialist to support implementing agencies in developing environment management systems (EMS). The LIS-ES will be hired for 3 person-months during project implementation. The specialist will support the implementation of the EMP, including:

(i) assess the project outputs' environmental readiness prior to implementation based on the readiness indicators defined in Table EMP.4;
(ii) update the EMP including mitigation measures, monitoring plan, institutional arrangements, and training plan as necessary, to reflect the final project scope and detailed design, submit to ADB for review and disclosure;
(iii) if required, update the IEE report for changes in the project during detailed design (for example if there is a scope change) that would result in adverse environmental impacts not within the scope of the approved IEE;
(iv) support the executing agency, PMO, implementing agency, implementing units and tendering companies in preparing tender documents; ensure that the bidding documents and civil works contracts contain provisions requiring contractors to comply with the mitigation measures in the EMP and that relevant sections of the updated project EMP are incorporated in the bidding and contract documents;
(v) support XDIC-ES and PMO-SO in reviewing and approving contractors' site-EMPs and organizing the conduct of periodic environmental impact monitoring;
(vi) assist the executing agency and PMO to establish a GRM, and provide training for the PMO and GRM access points;
(vii) Conduct regular EMP compliance verification, undertake site visits as required, identify any environment-related implementation issues, and propose necessary corrective actions;
(viii) Prepare, on behalf of PMO, annual EMP monitoring and progress reports to ADB;

(ix) provide training to PMO, implementing agencies, implementing units, and contractors on environmental laws, regulations and policies, SPS 2009, EMP implementation, and GRM in accordance with the training plan defined in the EMP; and

(x) assist the PMO, implementing agencies, and implementing units in conducting consultation meetings with relevant stakeholders as required, informing them of imminent construction works, updating them on the latest project development activities, GRM; and

(xi) conduct rapid assessment of project facilities after project completion and approximately one year of operation to confirm compliance with EMP as well as sound management practices (environment audit).

13. Overall environmental responsibilities are outlined in **Table EMP-1**.

Table EMP-1: Environmental Responsibilities by Project Phase

Phase	Responsible Agencies	Environmental Responsibilities
Detailed Design	design institutes	Incorporation of environmental mitigation measures in detailed designs
	PMO, LIS-ES	Update EMP based on detailed design, if necessary
	ADB	Approve updated EMP, if necessary
Tendering	PMO, XIDC, implementing units, tendering company	Ensure that mitigation measures and the EMP clauses are incorporated in tendering documents, civil works contracts and contractors' site-EMPs
	LIS-ES, ADB	Review tendering documents; confirm project's readiness
Construction	Contractors	Develop site-EMP; appoint one environmental specialist to coordinate site-EMP implementation; ensure health and safety.
	PMO	Coordinate GRM; supervise EMP implementation; prepare annual environmental progress report (with support of LIS-ES)
	XIDC, XIDC-ES	Assign one XIDC-ES; conduct environmental inspections and regular monitoring; prepare quarterly environmental inspection and monitoring reports; act as local GRM entry point.
	NHS, NVTS, S-EC	Assign one S-EC to liaise with the XIDC-ES and contractors; manage school activities potentially affected during construction; act as local entry point for GRM and member of the EMS committee.
	LIS-ES	Advise on the mitigation measures; provide comprehensive technical support to PMO, implementing agencies, and implementing units for environmental management; conduct training; conduct annual EMP compliance review; support PMO in preparing annual environmental progress reports.
	ADB	Conduct review missions; review and approve annual environmental progress reports, including disclosure
	NEPB	Conduct periodic inspections of all construction projects relative to compliance with PRC regulations and standards.
Operation	PMO	Conduct EMP compliance review, instruct implementing agencies on environmental management requirements; prepare annual environmental progress report for first year of operation
	NHS, NVTS	Establish tailored EMS to manage the environmental, health and safety aspects in a systematic way and promote implementation of 3"R" and green campus measures.

3R = reuse, reduce, recycle, ADB = Asia Development Bank; GRM = grievance redress mechanism, LIS-ES = Loan Implementation Support Environment Specialist; PMO = Project Management Office; XIDC = Xiangsihu Development and Investment Company; NHS = Nanning Health School; NVTS = Nanning No. 4 Vocational Training School; EMP = Environment Management Plan; NEPB = Nanning Environment Protection Bureau; XIDC-ES = XIDC environmental supervisor; S-EC = school environment coordinator; EMS = Environment Management System.

C. Summary of Potential Impacts and Mitigation Measures

14. Potential environmental issues and impacts during the pre-construction, construction and operation phases, as identified in the IEE, as well as corresponding mitigation measures designed to minimize the impacts are summarized in Table EMP-2. The contractors will reflect these mitigation measures in their site-EMPs, to be reviewed and approved by the XIDC-ES, the PMO-SO and the LIS-ES.

15. The effectiveness of these measures will be evaluated based on the results of the environmental inspections and monitoring conducted by the XIDC-ES, and through EMP verification conducted by the LIS-ES.

16. Many of the mitigation measures will be shouldered by construction contractors in the construction phase. Periodic monitoring and regular supervision costs will be shouldered by XIDC. The PMO will ensure that adequate funds for mitigation measures and monitoring activities have been allocated by the contractor and XIDC, respectively.

Table EMP-2: Anticipated Impacts, Mitigation Measures

Impact factor / Project stage	Potential Impacts and/or Issues	Location	Mitigation measures	Implementation Agency	Supervision Agency	Monitoring Indicators
A. Pre-construction Phase						
1.Detailed Design Stage	Institutional strengthening	*Not applicable*	– Implementing agencies to establish implementing units, – PMO to assign PMO-SO; – PMO to engage LIS-ES; – XIDC to engage XIDC-ES; – NVTS and NHS to appoint S-EC;	Implementing agencies, implementing units, PMO	Executing agency, ADB	Project readiness assessment by LIS-ES, First EMR.
	Design complying with relevant national health, safety and environmental codes and standards, including green and energy-efficient building codes and specifications.	All new buildings	– Design buildings in compliance with relevant design standards and codes for energy-efficient, safe and green public buildings, including but not limited to: GB 50176-1993 (Thermal Design Code for Public Buildings); GB/T 50378-2006 (Evaluation Standard for Green Buildings); GB 50099-2011 (Code for design of schools); GB 50011-2010 (Building Seismic Design Code); GB 50016-2006 (Code of Design on Building Fire Protection and Prevention); GB 50189-2005 (Energy Conservation Design for Public Buildings) and other applicable national design codes. – Ensure use of no VOC-emitting materials (including paints, coatings, adhesives, carpet and furniture's) to ensure high indoor air quality;	DIs	Executing agency, LIS	Approved detailed designs, First EMR
	Updating EMP	*Not applicable*	– Review mitigation measures defined in this EMP, update as required to reflect detailed design.	LIS-ES, PMO-SO	ADB	Updated EMP approved by ADB and disclosed.
2. Bidding and Contract Award Stage	Bidding documents and contractors qualifications	*Not applicable*	– Include updated EMP of the IEE as annex to the Requests for Proposals; – Include an environmental section in the TOR for bidders;	design institutes, XIDC-ES, NHS, NVTS, LIS-ES	Executing agency, PMO, ADB	Bidding documents, construction and supply

Impact factor / Project stage	Potential Impacts and/or Issues	Location	Mitigation measures	Implementation Agency	Supervision Agency	Monitoring Indicators
			– Ensure that construction and supply contracts are responsive to EMP provisions and mitigation and monitoring measures are adequately budgeted; – Implement a Green Public Procurement policy, with references to Public Procurement List of Energy-Saving Products (NDRC & MOF, 2011, or as updated) and Public Procurement List of Environmental Labeling Products (MEP & MOF, 2011, or as updated).			contracts
	GRM	*Not applicable*	– Establish a GRM, appoint a GRM coordinator; – Brief and provide training to GRM access points (S-EC, XIDC-ES, contractors); – Disclose GRM to affected people before construction begins.	PMO-SO, LIS-ES	Executing agency, ADB	Operational GRM, First EMR
	EMP Training	*Not applicable*	– Provide training to implementing agencies, implementing units, and contractors on implementation and supervision of EMP, GRM, reporting, in compliance with training plan (Table EMP.5)	LIS-ES	PMO, ADB	Evidence of training provided, satisfaction survey of participants, First EMR
	Site-EMPs	*Not applicable*	– Develop Site-EMPs, responding to all clauses and requirements of this EMP, and including sub-plans such as Spill Management Plan, Waste Management Plan, Temporary Traffic Management Plan, Occupational Health and Safety Plan, Soil Erosion Control Plan, and others.	Contractor	PMO-SO, XIDC-ES, LIS-ES	Approved Site-EMPs, First EMR.
B. Construction Phase						
1. Soil	Soil erosion	All construction sites, spoil disposal sites	– Prepare soil erosion control plan (showing how runoff will be controlled at site perimeter to control soil and water runoff, and how disturbed areas will be reclaimed);	Contractor	XIDC-ES, S-EC, LIS-ES	Quarterly inspection reports of XIDC-ES,

Impact factor / Project stage	Potential Impacts and/or Issues	Location	Mitigation measures	Implementation Agency	Supervision Agency	Monitoring Indicators
		(if any)	– Minimize active open excavation areas; – Construct intercepting ditches and drains to prevent runoff entering construction sites, and divert runoff from sites to existing drainage; – Stabilize all earthwork disturbance areas within maximum 14 days after earthworks have ceased; – Properly slope and re-vegetate disturbed surfaces			annual EMRs
	Soil contamination	All construction sites	– Store chemicals/hazardous products and waste on impermeable surfaces in secure, covered areas; – Remove all construction wastes from the site to approved waste disposal sites; – Establish emergency preparedness and response plan (Spill Management Plan); – Provide spill cleanup measures and equipment at each construction site; – Conduct training in emergency spill response procedures.	Contractor	XIDC-ES, S-EC, LIS-ES	Quarterly inspection reports of XIDC-ES, annual EMRs
2. Surface and Groundwater	Pollution of surface and groundwater resources	All construction sites	– Install water collection basins and sediment traps in all areas where construction equipment is washed; – Wastewater generated from the washing down of mixer trucks and drum mixers and similar equipment should wherever practicable be recycled. – Surplus wastewater and wastewater generated from building construction activities, including concreting, plastering, cleaning of works and similar activities should be discharged in to sewer after removal of solids in a silt removal facility; – Sewage from temporary toilets, kitchens and similar facilities should be stored in an on-site facility (such as septic tank), emptied regularly and transported to a designated wastewater treatment plant for further treatment; – Develop and implement Spill Management Plan;	Contractor	XIDC-ES, S-EC, LIS-ES	Quarterly inspection reports of XIDC-ES, annual EMRs

Impact factor / Project stage	Potential Impacts and/or Issues	Location	Mitigation measures	Implementation Agency	Supervision Agency	Monitoring Indicators
			– Properly manage solid waste (see below).			
3. Solid waste	Construction and domestic wastes generated on construction sites	All construction sites	– Maximize reuse/recycling of construction and deconstruction wastes (e.g. iron, bricks, windows, doors, steel bars etc.); – Provide appropriate waste storage containers for worker's construction and hazardous wastes; – Install confined storage points of solid wastes away from sensitive receptors, regularly haul to an approved disposal facility; – Use licensed contractors to remove wastes from the construction sites; – Prohibit burning of waste.	Contractor	XIDC-ES, S-EC, LIS-ES	Quarterly inspection reports of XIDC-ES, annual EMRs
4. Noise	Noise from construction activities	All construction sites	– Maintain equipment and machinery in good working order; undertake regular equipment maintenance, ensure compliance with PRC standard of GB 12523-2011; – Operate between 0800H-2000H only and reach an agreement with NHS and NVTS management and nearby residents regarding the timing of heavy machinery work, to avoid any unnecessary disturbances; Nighttime works should only be conducted in exceptional cases, and a permit should be obtained for that purpose; potentially affected people including students, staff and nearby residents should be informed in advance; – Install temporary anti-noise barriers to shield school buildings where non-compliance with Category 2 in Environmental Quality Standards for Noise (GB3096-2008) is anticipated/monitored; – Locate sites for concrete-mixing and similar activities at least 300 m from sensitive areas if without any mitigations; – Monitor noise within NVTS campus and at nearby	Contractor	XIDC-ES, S-EC, LIS-ES	Quarterly inspection reports of XIDC-ES; annual EMRs;

Impact factor / Project stage	Potential Impacts and/or Issues	Location	Mitigation measures	Implementation Agency	Supervision Agency	Monitoring Indicators
			sensitive areas at regular intervals (as defined in the monitoring plan); – Seek suggestions from two school management and potentially affected sensitive receptors to reduce noise annoyance. Disseminate information on procedure of handling complaints through the Grievance Redress Mechanism.			
5. Ambient Air	Dust generated during construction	All construction sites, including nearby residential areas	– Install perimeter fences at each site prior to construction. The fence shall be at least 2m high; – Spray water at least twice a day where fugitive dust is generated during deconstruction of old buildings and civil works; – Cover trucks carrying earth, sand or stone with tarps or other suitable cover to avoid spilling and dust generation; – Undertake regular air quality monitoring in around the two campuses in accordance with the monitoring plan; – Regularly consult students and staff as well as nearby residents to identify concerns, and implement additional dust control measures as necessary.	Contractor	XIDC-ES, S-EC, LIS-ES	Quarterly inspection reports of XIDC-ES; annual EMRs;
	Air emissions from construction vehicles and machinery	All construction sites	– Store petroleum or other harmful materials in appropriate places and covering to minimize fugitive dust and emission; – Maintain vehicles and construction machineries to a high standard to ensure efficient running and fuel-burning and compliance with the PRC emission standards (GB18352-2005, GB17691-2005, GB11340-2005, GB2847-2005, and GB18285-2005).	Contractor	XIDC-ES, S-EC, LIS-ES	Quarterly inspection reports of XIDC-ES; annual EMRs;
6. Physical cultural resources	Damage to known or unknown above- or below-ground cultural relics	All construction sites with excavation	– Establish chance-find procedures for physical cultural resources – If a new site is unearthed, work must be stopped immediately and the implementing agency and local	Contractor	XIDC-ES, S-EC, LIS-ES; local cultural relics	Quarterly inspection reports of XIDC-ES;

Impact factor / Project stage	Potential Impacts and/or Issues	Location	Mitigation measures	Implementation Agency	Supervision Agency	Monitoring Indicators
		works	cultural relic bureau promptly notified, and construction will resume only after a thorough investigation and with the permission of the appropriate authority.		bureau	annual EMRs;
7. Flora and Fauna	Protection of vegetation, re-vegetation of disturbed areas; greening of sites	NHS and NVTS campuses	– Preserve existing vegetation where no construction activity is planned; – Remove trees or shrubs only as a last resort if they impinge directly on permanent structures; – Properly re-vegetate disturbed areas after completion of civil works;	Contractor	XIDC-ES, S-EC, LIS-ES;	Annual EMRs;
8. Health and Safety	Occupational Health and Safety	All construction sites, work camps	– Appoint one staff to implement and supervise the implementation of the Site-EMP and the performance of subcontractors; – Provide safe supply of clean water and an adequate number of latrines and other sanitary arrangements at the site and work areas, and ensure that they are cleaned and maintained in a hygienic state; – Provide garbage receptacles at construction site; – Provide personal protection equipment (PPE) for workers in accordance with relevant health and safety regulations; – Develop an emergency response plan to take actions on accidents and emergencies; document and report occupational accidents, diseases, and incidents; organize fully equipped first-aid base at each construction site; – Establish Records Management System that will store and maintain easily retrievable records on occupational accidents, diseases, and incidents. – Train all construction workers in basic sanitation and hygiene issues, general health and safety matters, and on the specific hazards of their work. – To minimize the risk of conflicts between workers and	Contractor, (NVTS, NHS)	XIDC-ES, local center of disease control, LIS-ES	Inspection report of ES, report on number of incidents and complaints in annual EMRs

Impact factor / Project stage	Potential Impacts and/or Issues	Location	Mitigation measures	Implementation Agency	Supervision Agency	Monitoring Indicators
			staff/students of the schools, implement HIV/AIDS and sexually transmitted infections (STIs) awareness and prevention training for all employees, and together with the local centers of disease control and the school management, disseminate information on the risks, hazards, impacts and prevention know-how on HIV/AIDS and STIs among the staff/students, workers on the construction sites, students and staff of NVTS and NHS, and local community. – Ensure that safety, rescue and industrial health matters are given a high degree of publicity to all persons regularly or occasionally on the site. Posters drawing attention to site safety, rescue and industrial health regulations will be made or obtained from the appropriate sources and will be displayed prominently in relevant areas of the site;			
	Community Health and Safety	All construction sites, NVTS and NHS campuses, plus nearby residential areas	– Prepare traffic control plan within and around NVTS and NHS campuses during construction, to be approved by XIDC, NVTS and NHS management, and local traffic management administration. The plan shall include provisions for diverting or scheduling construction traffic to avoid peak traffic hours, main teaching activities such as exams, regulating traffic at road crossings with an emphasis on ensuring public safety through clear signage; – Designate staff members to control traffic during on-school and off-school hours; – Ensure that all sites are secure, discouraging access through appropriate fencing; place clear signs at construction sites in view of the people at risk (including students, staff and nearby communities), warning people of potential dangers such as moving vehicles, hazardous materials, excavations etc and	Contractor, (NVTS, NHS)	XIDC-ES, S-EC, LIS-ES; local traffic police	Inspection report of ES, report on number of incidents and complaints in annual EMRs

Impact factor / Project stage	Potential Impacts and/or Issues	Location	Mitigation measures	Implementation Agency	Supervision Agency	Monitoring Indicators
			raising awareness on safety issues; – Return machinery to its overnight storage area/position. – In collaboration with the school management, held a meeting prior to commencing construction to discuss issues associated with ensuring the safety of students and staff, as well as nearby communities in the vicinity of the construction site.			
	Utilities provision interruption	All construction sites, NVTS and NHS campuses, nearby areas	– Assess potential disruption to services and identify risks before starting construction; – If temporary disruption is unavoidable, develop a plan to minimize the disruption and communicate the dates and duration in advance to all affected people, in conjunction with the NHS and NVTS management.	Contractor	XIDC-ES, S-EC, LIS-ES;	Annual EMRs;
9. Labor standards and rights	Social protection of workers	*Not applicable*	– Contractors shall (i) provide equal pay for equal work, regardless of gender or ethnicity; (ii) provide the timely payment of wages; (iii) use local unskilled labor, as applicable, (iv) comply with core labor standards and the applicable labor laws and regulations, including stipulations related to employment, e.g. health, safety, welfare and the workers' rights, and anti-trafficking laws; and (v) not employ child labor. – Contractors shall maintain records of labor employment, including the name, ethnicity, age, gender, domicile, working time, and the payment of wages.	Contractor	XIDC, LIS, PMO	Project progress reports
10. EMS		NVTS, NHS	– Development of a campus-wide environment management system (EMS), including development of simple tools and programs, based on the strategy outlined in Appendix 3, to improve the TVET institutions' environment, health and safety systems.	EMS specialist, NVTS, NHS	Executing agency, ADB	EMS established and operational.
C. Operation Phase						

Impact factor / Project stage	Potential Impacts and/or Issues	Location	Mitigation measures	Implementation Agency	Supervision Agency	Monitoring Indicators
1. EMS	Implementation of EMS	NVTS, NHS	– Ensure implementation of the EMS to manage the activities in campus to achieve green, safe and sustainable campus in compliance with the Green Campus Policy.	EMS specialist, NVTS, NHS	Executing agency, ADB	EMS system to be reported on in first operation phase EMR
2. Wastewater	Inadequate wastewater disposal	NVTS, NHS	– Ensure connection of new buildings to on-site pretreatment facilities (septic tanks) and to municipal sewer system. – Periodically monitor (visual inspection) sludge accumulation in septic tanks, and request licensed company to desludge as needed.	NVTS, NHS	Local EPB	First operation phase EMR
3. Solid waste	Inappropriate management of non-hazardous solid waste	NVTS, NHS	– Provide adequate solid waste collection facilities in all buildings and on the campus; – Promote segregation of waste through (i) provision of separate collection bins for paper, biodegradable waste, metallic waste, and other wastes; and (ii) provision of training and awareness raising for TVET staff and students; – Reach agreement with waste collection service provider(s) for different types of waste; – Regularly clean and disinfect waste collection facilities.	NVTS, NHS	Local EPB	First operation phase EMR
4. Health and safety	Campus health and safety	TVET classrooms, workshops, outdoor areas	– Ensure compliance with relevant health and safety regulations pertaining to ventilation, indoor air quality, lighting, noise, fire escape, etc; – Establish preparedness plan and operation plan under emergency conditions, such as fire, flood, earthquake, wind, storm, water contamination, epidemic, air contamination, infestation, explosion etc, as part of the campus-wide EMS to ensure safe environment for all student, faculty, staff and visitors. – Prepare safety checklist and reporting forms as	NVTS, NHS	executing agency, occupational health authorities	First operation phase EMR

Impact factor / Project stage	Potential Impacts and/or Issues	Location	Mitigation measures	Implementation Agency	Supervision Agency	Monitoring Indicators
			procedure control documents of EMS; – Provide guidelines and reference materials to help campus reduce or eliminate potential hazards which may cause injury, illness or property loss.			

ADB = Asia Development Bank, EHS = environment, health, and safety, EMP = environmental management plan, EMR = annual environment monitoring and EMP progress report, EMS = environment management system, EPB = Environment Protection Bureau, GRM = grievance redress mechanism, IEE = initial environmental examination, LIC = Loan Implementation Consultant, LIS-ES = Loan Implementation Environmental Consultants, PMO = project management office, TVET = technical vocational education and training.

D. Environmental Inspection and Monitoring Plan

17. The inspection and monitoring plan in the EMP will serve as the template for assessing the potential adverse impacts caused by the project components, and identifying adequacy of protection measures implemented.

18. The plan defines the items to be inspected and parameters to be monitored, the frequency of inspection and monitoring, and the location of sampling. The environment supervisor appointed by Xiangsihu Development and Investment Company (XIDC-ES) will be in charge of conducting regular inspections and organizing periodical environmental monitoring for noise and air quality. The Environment Coordinators of the two schools (S-EC) will support XIDC-ES during field inspections.

19. The XIDC-ES will compile inspection and monitoring reports on a quarterly basis during construction. These reports will be shared with the contractors, and submitted to the relevant implementing agency (NVTS or NHS) and its implementing unit for information, as well as to the PMO-SO for review and appraisal. The PMO-SO will summarize the quarterly environmental inspection and monitoring results of the XIDC-ES into the quarterly project progress report prepared for ADB. More details on environmental inspection and monitoring will be included in the annual environmental monitoring and EMP progress reports prepared for ADB by the PMO-SO (with support of the LIS-ES). These will be disclosed on the project website.

Table EMP-3: Environmental Monitoring and Inspection Plan

Environmental Media/Issue	Location, Parameters, Monitoring Technique	Responsibility & Frequency
Pre-Construction Phase		
Project readiness	**Method:** Review of PMO's, implementing agencies, implementing units, and contractor's readiness to implement the project based on assessment of Project Readiness Indicators **Parameters:** Readiness indicators (Table EMP-4)	LIS-ES–once before construction
Construction Phase		
Soil erosion and contamination	**Method, Location:** Visual inspection of the construction sites; **Parameters:** (i) adequacy of soil erosion prevention measures; (ii) adequacy of soil contamination prevention techniques; (iii) evidence of excessive soil erosion or soil contamination (based on Site inspection checklist, Appendix 2)	XIDC-ES – every ten days during peak construction period, monthly after; LIS-ES - yearly
Solid and liquid waste management	**Method, Location:** Visual inspection of construction sites **Parameters:** (i) adequacy of solid and liquid waste management, storage and containment system; (ii) presence of solid waste dumps, waste fires (based on Site inspection checklist, Appendix 2)	XIDC-ES - every ten days during peak construction period, monthly after; LIS-ES – yearly
Construction site health and safety	**Method, Location:** Visual inspection and interviews with construction workers and	XIDC-ES – every ten days during peak

Environmental Media/Issue	Location, Parameters, Monitoring Technique	Responsibility & Frequency
	contractors at construction sites **Parameters:** Site inspection checklist (Appendix 2)	construction period, monthly after; LIS-ES – yearly
Community health and safety	**Method, Location:** Visual inspection of the construction sites, informal interviews with TVET staff and students, and nearby residents. **Parameters:** (i) adequacy of construction site signage and fencing; (ii) adequacy of temporary noise mitigation measures; (iii) accidents involving public and workers; (iv) emergencies and responses; (v) public complaints about noise, air pollution, construction site safety, localized flooding, etc.	XIDC-ES – every ten days during peak construction period, monthly after; LIS-ES - yearly
Air quality	**Method, Location:** Air quality monitoring, at least 3 points per campus, around construction site, and at boundaries of sensitive receptors (dormitories, nearby residential areas) **Parameters:** TSP, PM10	Contractor- weekly during peak construction period; XIDC-ES – monthly during first two months of construction, quarterly thereafter, or in response to complaints
Noise	**Method, Location:** at 4 points at boundary of construction site, and at least 3 points around at boundaries of sensitive receptors (dormitories, nearby residential areas) **Parameters:** Leq dB(A)	Contractor- weekly during peak construction period; XIDC-ES – monthly during first two months of construction, quarterly thereafter, or in response to complaints
Construction Completion and Operation Phase		
Construction Completion Approval	**Method, Location:** NVTS/NHS formal application to local EPB; the approval / inspection procedure to be arranged by local EPB. **Parameters:** As required by local EPB requirement	NVTS/NHS – application before operation; Local EPB –environmental completion acceptance approval
Campus operation	**Method, Location:** NVTS/NHS campuses, audit to be arranged by ADB OD in consultation with local EPB and education department. **Parameters:** DMF, EMP, others as required by local EPB.	ADB OD, local EPB – once after one year of operation (during review mission), before PCR is issued.

20. **Assessment of project readiness**. Before construction, the LIS-ES will assess the project's readiness in terms of environmental management based on a set of indicators (Table EMP-4) and report it to ADB, PMO, XIDC, NHS, and NVTS. This assessment will demonstrate that environmental commitments are being carried out and environmental management systems are in place before construction starts, or suggest corrective actions to ensure that all requirements are met.

Table EMP-4: Project Readiness Assessment Indicators

Indicator	Criteria	Assessment	
EMP update	The EMP was updated after detailed design, and approved by ADB	Yes	No
Compliance with loan covenants	The borrower complies with loan covenants related to project design and environmental management planning	Yes	No
Public involvement effectiveness	Meaningful consultation completed; GRM established with entry points	Yes	No
Environmental Supervision in place	LIS-ES is in place XIDC-ES appointed PMO-SO appointed S-EC assigned	Yes Yes Yes Yes	No No No No
Bidding documents and contracts with environmental safeguards	Bidding documents and contracts incorporating the environmental activities and safeguards listed as loan assurances;	Yes	No
Contractor readiness	Site-EMPs prepared by contractors, reviewed and approved by XIDC-ES, PMO-SO	Yes	No
EMP financial support	The required funds have been set aside to support the EMP implementation according to the financial plan.	Yes	No

21. **Environmental monitoring and inspection cost estimates.** Costs for environmental monitoring and inspection include salaries and consultancy fees for the PMO-SO, the LIS-ES, LIS-EMS specialists and the XIDC-ES, as well as costs for the environmental monitoring performed by the XIDC-ES. The salary costs of the PMO-SO and LIS-ES will be covered by the EA; the salaries of the XIDC-ES will be covered by the XIDC. Air and noise monitoring costs will amount to approximately $3,000 per school over 2 years. These expenses will be covered by XIDC.

E. Institutional Strengthening and Training

22. The capacity of the implementing units, implementing agencies, and the PMO's staff responsible for EMP implementation and supervision will be strengthened. All parties involved in implementing and supervising the EMP must have an understanding of the goals, methods, and practices of project environmental management. The project will address the lack of capacities and expertise in environmental management through (i) institutional strengthening, and (ii) training.

23. **Institutional strengthening.** The capacities of the PMO, implementing agencies, and implementing units to coordinate environmental management will be strengthened through a set of measures:

(i) The appointment of a staff member within the PMO (PMO-SO) in charge of EMP coordination, including GRM;

(ii) The appointment of one national environmental consultant under the loan implementation consultancy to guide PMO and IAs in implementing the EMP and ensure compliance with ADB's Safeguard Policy Statement (SPS 2009);

(iii) The appointment of an environment specialist by the XIDC (XIDC-ES) to conduct regular site inspections and coordinate periodic air and noise monitoring; and

(iv) The assignment of one member of NVTS and NHS to act as school environment coordinator (S-EC) during construction and operation.

24. **Training.** The executing agency, PMO, implementing agencies (NVTS, NHS, and XIDC) and IUs will receive training in EMP implementation, supervision, and reporting, and on the Grievance Redress Mechanism (Table EMP-5). Training will be facilitated by the LIS-ES with support of other experts under the loan implementation support (LIS).

Table EMP-5: Training Program

Training Topic	Targeted Agencies	Timing	Duration, Costs
EMP Implementation: Roles and Responsibilities, Monitoring, Supervision and Reporting Procedures, Review of Experience (after 12 months)	PMO, NVTS, NHS, XIDC, IUs, Contractors	Once prior to, and once after one year of project implementation	2 x 0.5 day, $1,000
Grievance Redress Mechanism: Roles and Responsibilities, Procedures, Review of Experience (after 12 months)	PMO, NVTS, NHS, XIDC, IUs, Contractors community representatives, Contractors	Once prior to, and once after one year of project implementation	2x 0.5 day, $1,000

F. Environmental Reporting

25. **Project progress reports.** The executing agency will provide ADB with (i) Project quarterly progress reports in a format consistent with ADB's project performance reporting system; (ii) consolidated annual reports including (a) progress achieved by output as measured through the indicator's performance targets, (b) key implementation issues and solutions, (c) updated procurement plan, and (d) updated implementation plan for next 12 months; and (iii) a project completion report within 6 months of physical completion of the project.

26. The quarterly progress reports will also include a summary of EMP implementation status, results of inspections conducted by the XIDC-ES, problems encountered during construction and operation, if any, and the relevant corrective actions undertaken.

27. **Yearly environmental progress reports.** To ensure proper and timely implementation of the EMP and adherence to the agreed environmental covenants, the PMO shall submit to ADB yearly environmental progress reports, based on the quarterly inspection and monitoring reports of the XIDC-ES. The LIS-ES will support the PMO in developing the annual reports. The report should confirm the project's compliance with the EMP, and identify any environment related implementation issues and necessary corrective actions. The performance of the contractors will also be reported on with respect to environmental protection and impact mitigation. The operation and performance of the project GRM, environmental institutional strengthening and training will also be included in the report. Table EMP-6 summarizes the reporting requirements.

Table EMP-6: Reporting Requirements

Report	Frequency	Purpose	From	To
Inspection and monitoring reports	Quarterly	Confirmation of contractors compliance with EMP, presentation of monitoring results	XIDC-ES	Contractors, implementing agencies, PMO, LIS-ES
Project Progress Reports	Quarterly	General project progress, including summary of EMP implementation	PMO	ADB
Annual Environmental Progress Report	Annually	Adherence to Environmental Covenants and EMP, presentation of monitoring results	PMO, LIS-ES	ADB

G. Mechanisms for Feedback and Adjustment

28. Based on environmental monitoring and reporting systems in place, the PMO shall assess whether further mitigation measures are required as corrective action, or improvement in environmental management practices are required. The effectiveness of mitigation measures and monitoring and inspection plans will be evaluated by a feedback reporting system. If the PMO identifies a substantial deviation from the EMP, or if any changes are made to the project scope that may cause significant adverse environmental impacts or increase the number of affected people, then the PMO shall immediately consult ADB to identify EMP adjustment requirements.

H. Cost Estimates for Environmental Management

29. The total project cost for the Guangxi Nanning Vocational Education Development Project is approximately $ 103.260 million. The environmental protection related cost is $ 227,000 of the total project budget. The major environmental protection costs include protection and mitigation measures during construction, institutional strengthening (salary costs for counterpart environment experts), environmental management training, and development and implementation of the Green Campus Policy for the NVTS and NHS campuses. Excluded from the costs estimates are infrastructure costs which are included in the project direct costs. Cost estimates for mitigation measures, environmental monitoring, public consultations, and capacity building are summarized in Table EMP.7.

Table EMP.7: Cost Estimates for EMP Implementation and EMS Capacity Building

Item	Costs per contract or school (USD)	Total (USD)	Costs covered by
Environmental mitigation during construction - Erosion control - Dust control - Noise control - Solid waste control - Site safety and hygiene - Traffic management - Site re-vegetation - Contractor environment coordinator (salary)	13,000 (per civil works contract) 12,000 (per civil works contract)	52,000 48,000	Contractors (contracts CT01, CT02, CH01, CH02)
Environment impact monitoring - Periodic air and noise quality monitoring during construction - Completion environmental and safety audit	3,000 (per school) 1,000 (per school)	6,000 2,000	XIDC operational budget
Counterpart environmental staff			
XIDC-ES (salary, site inspections)		40,000	XIDC operational budget
PMO-SO (salary, GRM coordination, reporting)		10,000	NNDRC operational budget
Project implementation consultants: - LIS-ES (national, 3 person-months, including consultant fees, travel costs, per diem) - EMS specialist (international, 1 person-month, including consultant fees, travel costs, per diem) - EMS specialist (national, 3 person-months, including consultant fees, travel costs, per diem)		18,000 20,000 18,000	Project implementation support (Loan package SO2)
Training and capacity building: - EMP implementation & GRM -EMS: on-the-job training on approaches and steps to develop campus-wide EMS - EMS: auditor training - Exchange and study tour to one of the members of the China Green University Network		2,000 2,000 1,000 8,000	Project capacity building (Loan package SO2)
Total (USD)		**227,000**	

Source: Local EIA report (TEIAR) + PPTA consultant

30. During project implementation, the budget will be adjusted based on actual requirements. Contractors will bear the costs of all mitigation measures during

construction, which will be included in the tender and contract documents. NVTS and NHS will bear the costs related to mitigation measures during operation (not covered here). Costs related to environmental inspection during construction will be borne by the XIDC. Training costs will be borne by the project as a whole.

APPENDIX 2

ENVIRONMENTAL SITE INSPECTION CHECKLIST

ADB-financed Guangxi Vocational Education Development Project

Note: This form is designed for use by the XIDC-ES during site inspections and may not be exhaustive. The Environmental Coordinator of each project school (S-EC) will assist the XIDC-ES during inspections. Modifications and additions may be necessary to suit individual projects and to address specific environmental issues and mitigation measures.

Sub-Project Name: _____
Site Location: _____

Construction stage: _____
Inspection Date: _____
Inspection Time: _____
Weather: _____
Inspected by: _____

Inspection Item	Yes	No	N.A.	Remarks (i.e. problem observed, possible cause of nonconformity and/or proposed corrective/ preventative actions)
Site-EMP, GRM, information disclosure				
1. Has contractor appointed an environment supervisor and is the supervisor on-site?				
2. Is Site-EMP established?				
3. Is information pertaining to construction disclosed at construction site (including construction period, contractor information, etc)?				
4. Is Grievance Redress Mechanism (GRM) disclosed at construction site?				
Soil erosion and contamination				
5. Are intercepting ditches and drains constructed to prevent runoff entering construction sites, and divert runoff from sites to existing drainage?				
6. Are disturbed areas stabilized after earthworks have ceased, and re-vegetated?				
7. Are chemicals/hazardous products and waste stored on impermeable surfaces in secure, covered areas?				
8. Is there evidence of oil spillage?				
9. Are spill kits / sand / saw dust used for absorbing chemical spillage readily accessible?				

Inspection Item	Yes	No	N.A.	Remarks (i.e. problem observed, possible cause of nonconformity and/or proposed corrective/ preventative actions)
10. Are chemicals stored and labeled properly?				
Air quality control				
11. Are construction sites regularly watered?				
12. Are stockpiles of dusty materials covered or watered and cement debagging process undertaken in sheltered areas?				
13. Are trucks carrying earth, sand or stone covered with tarps or other suitable cover to avoid spilling and dust?				
14. Is equipment well maintained? (any black smoke observed, please indicate the plant/equipment and location)				
15. Are there enclosures around the main dust-generating activities?				
16. Does contractor regularly consult with PIU, NVTS/NHS, students as well as nearby residents to identify concerns?				
17. Was air quality monitoring conducted since the last inspection? If yes, present results. If no, indicate date of next monitoring campaign.				
Noise				
18. Is there evidence of excessive noise? If yes, describe location and equipment.				
19. Does the contractor undertake regular equipment maintenance, ensure compliance with relevant PRC standard?				
20. Are sites for concrete-mixing and similar activities located at least 300 m from sensitive areas?				
21. Is the CNP (Construction Noise Permit) valid for work during restricted hours?				
22. Do air compressors and generators operate with doors closed?				
23. Is idle plant/equipment turned off or throttled down?				
24. Any noise mitigation measures adopted (e.g. use noise barrier / enclosure)?				
25. Was noise monitoring conducted since the last inspection? If yes, present results. If no, indicate				

Inspection Item	Yes	No	N.A.	Remarks (i.e. problem observed, possible cause of nonconformity and/or proposed corrective/ preventative actions)
date of next monitoring campaign.				
26. Does contractor regularly consult with PIU, NVTS/NHS, students as well as nearby residents to identify concerns related to noise?				
Surface water pollution				
27. Did the contractor develop Spill Management Plan?				
28. Are wastewater treatment systems being used and properly maintained on site? (e.g. desilting tank)				
29. Is construction wastewater and domestic wastewater discharged to sewer systems (if possible), or are on-site treatment facilities provided to ensure compliance with effluent discharge standard?				
30. Are there any wastewater discharged to the storm drains?				
Solid waste management				
31. Is the site kept clean and tidy? (e.g. litter free, good housekeeping)				
32. Are separate chutes used for inert and non- inert wastes?				
33. Are separated labeled containers/ areas provided for facilitating recycling and waste segregation?				
34. Are construction wastes / recyclable wastes and general refuse removed off site regularly?				
35. Are chemical wastes, if any, collected and disposed of properly by licensed collectors?				
Health and safety				
36. Is safe supply of clean water and an adequate number of latrines provided for workers?				
37. Are garbage receptacles provided at construction site?				
38. Is personal protection equipment (PPE) provided for workers in accordance with relevant health and safety regulations?				
39. Does the contractor have emergency response plan to take actions on accidents and emergencies?				
40. Are clear signs placed at construction sites in view of the TVET				

Inspection Item	Yes	No	N.A.	Remarks (i.e. problem observed, possible cause of nonconformity and/or proposed corrective/ preventative actions)
students and staff as well as the public, warning people of potential dangers such as moving vehicles, hazardous materials, excavations etc, and raising awareness on safety issues?				
41. Are all construction sites made secure, discouraging access through appropriate fencing?				
42. Are traffic control measures (speed control, access control) applied?				
43. Are fire extinguishers / fighting facilities properly maintained and not expired? Escape not blocked / obstructed?				
Vegetation				
44. Is there any evidence of excessive destruction of existing vegetation where no construction activity is occurring?				
45. Are disturbed areas properly re-vegetate after completion of civil works?				
Physical cultural resources				
46. Are they any chance found relics? If yes, ensure appropriate measures taken to preserve them.				
Others				
47. Any other problems identified or observations made?				

_____

Date, Name and Signature of Site Inspector

APPENDIX 3

GREEN CAMPUS POLICY FRAMEWORK (DRAFT)

A. Preamble

1. **National policy for sustainable campuses.** The promotion of environmental sustainability and safety on school campuses ("Green Campus") is an important objective of key authorities in the People's Republic of China (PRC), as the following demonstrates:

(i) The Ministry of Housing and Urban-Rural Development (MOHURD) and the Ministry of Education (MoE) jointly issued a guideline on the development of resources-saving college campuses in May, 2008. Other guidelines, design codes and opinions have been issued, all aiming at promoting pollution prevention and abatement, resource-conservation, and safety in governmental building, university and college campuses, and other public facilities.

(ii) In 2011, the China Green University Network (CGUN) was established. The CGUN, sponsored by Tongji University and established with support from the Ministry of Housing and Urban-Rural Development, aims at facilitating the formation and development of green campus at national level. The CGUN includes 11 professional committees, covering building intelligence, energy saving, green campus policy research, water utilization, etc.

B. Background

2. **Nanning Health School** was founded in 1972 which is a state-level key secondary vocational school and a state-level demonstration school for the reform and development of secondary vocational education. It now has two campuses; namely, Nanning campus (including five teaching schools) and Litang campus. Currently, the school has over 8,000 students (excluding the interns), including 4,868 students in Nanning campus (excluding the interns) and 3,840 students in Litang campus. The limited land space and facilities have significantly affected the development of the school so that the whole school will move to a new campus located in Xiangsihu New District in Nanning in the future.

3. **Nanning No. 4 Vocational Secondary School** founded in 1965, it is a public comprehensive secondary vocational school. The school now has three campuses: Zhuxi campus, Tanluo campus, and Yongning campus. The Yongning campus is oriented to train high quality preschool education teachers and professional personnel to inherit traditional ethnic arts by focusing on preschool education while considering the development of other related specialties such as culture, arts, and sports. The Yongning campus will be built to provide education for about 4,500 full-time students by the year 2013 and to satisfy the short-term training of 2,000 teachers per year. The existing teaching buildings and students' dormitories of Yongning campus were built in the 1980s.

4. The proposed project will construct phase II of the new campus at Xiangsihu for Nanning Health School, and upgrade the school infrastructure for Nanning No. 4 Vocational School. The new and updated vocational school facilities in each campus will

effectively alleviate the pressures on current school facilities to ensure the safety of its teaching activities and realize its sustainable development.

5. **Current practices at project schools.** Although many environmental protection measures can be seen at the two schools, there is still challenge for the school management facing increasing student population and new campus. Meanwhile, the school management has recognized a more systematic and sustainable approach to reduce the negative impacts of operation activities and enhance the campuses environmental sustainability is generally lacking. With the support of the PPTA environmental consultant, the existing environment management systems of NVTS and NHS were assessed and the following observations were made:

(i) NVTS and NHS have procedures in place and responsibilities assigned to manage environmental services (such as water supply, wastewater and solid waste management, emergency response mechanism, health and safety). However, there is no mechanism to coordinate these services, and there is no vision or strategy related to campus greening, campus sustainability, or campus health and safety;

(ii) NVTS and NHS have little understanding of what a campus-wide environmental management system (EMS) is, and what environmental, social and monetary benefits it could bring; and

(iii) NVTS and NHS expressed interest in exploring options to strengthen and formalize their existing environmental management systems.

6. Clearly, there is a <u>need</u> and a <u>demand</u> for a comprehensive, campus-wide environmental management, but a <u>lack of expertise</u> to establish such an EMS. During PPTA, NVTS and NHS agreed to promote environmental sustainability of their campuses, through the definition of a Green Campus Policy Framework.

7. This Green Campus Policy Framework has been defined in consultation with the management of both schools, under the lead of the PPTA environment consultant. The Framework includes the following key components: (i) a declaration and policy statement by both schools to promote environmental sustainability; (ii) the definition of key objectives and proposed actions to reach these objectives; (iii) institutional setup, and responsibilities for implementation of the Green Campus Policy; and (iv) next steps.

C. Declaration and Policy Statement

DECLARATION: "NVTS/NHS agrees to set an example of environmental responsibility by establishing institutional environmental policies and practices of resource conservation, recycling, waste reduction, and environmentally sound operations."

Nanning No. 4 Vocational School

Green Campus Policy Statement

The Nanning N0.4 Vocational School recognizes that environmental issues are fundamental to the future health and well-being. Thus, we are seeking to minimize these impacts and to find sustainable solutions to environmental concerns. We will actively pursue a policy of environmental best practice aimed at achieving sustainable development and will continually strive for improvement. We accept the responsibility of demonstrating leadership in environmental protection and enhancement through our actions as an institution.

In support of these principles, we are committed to:

- Promoting the protection of the natural and cultural environment on campus and at other sites used by the school;
- Promoting efficient natural resources utilization;
- Continually improving the school's environmental performance through the introduction of an Environmental Management System(EMS);
- Complying with all the relevant environmental legislation related to the school's activities;
- Reducing and where possible preventing pollution through the development of effective resource and waste management strategies;
- Increasing awareness of environmental responsibilities among staff and students;
- Monitoring and auditing the school's environmental performance and practice at regular intervals.

President

Nanning Health School

Green Campus Policy Statement

The Nanning Health School (NHS) recognizes that environmental issues are fundamental to the future health and well-being. Thus, we are seeking to minimize these impacts and to find sustainable solutions to environmental concerns. We will actively pursue a policy of environmental best practice aimed at achieving sustainable development and will continually strive for improvement. We accept the responsibility of demonstrating leadership in environmental protection and enhancement through our actions as an institution.

In support of these principles, we are committed to:

- Promoting the protection of the natural and cultural environment on campus and at other sites used by the school;
- Promoting efficient natural resources utilization;
- Continually improving the school's environmental performance through the introduction of an Environmental Management System(EMS);
- Complying with all the relevant environmental legislation related to the school's activities;
- Reducing and where possible preventing pollution through the development of effective resource and waste management strategies;
- Increasing awareness of environmental responsibilities among staff and students;
- Monitoring and auditing the school's environmental performance and practice at regular intervals.

President

D. Objectives and Actions

8. NVTS/NHS will take all reasonable steps to meet the green campus policy principles. The following areas have been prioritized for action:

1. Education, Awareness, Communication

9. With regards to education and communication, NVTS/NHS will:

(i) Increase awareness of environmental issues amongst faculty teachers and students, irrespective of their field of study, through the incorporation into courses of material on the environment and sustainable development.

(ii) Encourage and provide education on environmental issues to NVTS/NHS employees, so that they can pursue their work in an environmentally responsible way.

(iii) Keep all staff and students informed of the school's environmental and sustainable development initiatives.

2. Operations

10. With regards to achieving improvements in environmental performance related to institutional practice, NVTS/NHS will take actions on:

(i) Protect and enhance the outdoor environment quality of campuses.

(ii) Develop and operate responsible energy management practices through reducing consumption of fossil fuels whist investigating and utilizing new renewable technologies.

(iii) Adopt ways to minimize energy use and reduce water consumption in all the school's facilities, thus using these resources more effectively and efficiently.

(iv) Develop an effective waste management policy, which will manage waste in the following order of priority: reduce, reuse, recycle, safe disposal; ensure there are sufficient facilities to allow students, staff and visitors to reduce, reuse and recycle waste with the aim of minimizing the amount of waste ultimately sent to landfill.

(v) Control emissions and discharges to prevent pollution; manage and minimize polluting effluents and emissions into air, land and water; avoid the unnecessary use of hazardous materials.

(vi) Define an environmentally sustainable equipment procurement policy that adheres to PRC green public procurement policies (such as *Public Procurement List of Environmental Labeling Products* issued and regularly updated by NDRC and MOF, and *Public Procurement List of Energy Saving Products* issued and regularly updated by MEP and MOF).

(vii) Adhere to national best practice for design of new buildings and refurbishment of old building, promoting water and energy efficiency, reduce any adverse environmental impacts the building may cause, whilst creating a productive and healthy environment for work, studies, and leisure.

E. Implementation Organization and Responsibilities

11. **Green campus committee.** In order the further develop the Green Campus Policy and implement its objectives and actions, NVTS/NHS will establish a Green Campus Committee (GCC), tentatively consisting of the following (see institutional setup in Figure 1):

(i) **President.** The President is responsible for the (a) approval of the Green Campus Policy, (b) appointment of GCC Director; (c) approval and issuance of sectoral

policies and plans; and (iv) periodic review and approval of Green Campus Policy, the institutional setup, targets, etc.

(ii) **Green campus committee director.** The GCC will be directed by a senior administrative staff of the school (a Vice-President), appointed by the President. The GCC Director will be primarily responsible for (a) setting setup the GCC and defining the roles of its Members, (b) developing and implementing programs and plans in accordance with the Green Campus Policy, and (c) monitoring implementation of the Policy, including reporting to the President.

(iii) **Green campus committee members.** The implementation of the Green Campus Policy will comprise activities within the school's daily education and administrative operations, maintenance of buildings and the procurement of goods and services. Therefore, the GCC will include representatives from the following divisions and services:

a. ***Finance and Accounting Division*** (to establish and manage system for tracking costs of operations, screening suppliers and purchasing environmental friendly products);

b. ***Academic Admin Division*** (to integrate environment education into training courses);

c. ***General Services Division*** (overall responsibility for identifying environmental aspects and preparing environmental target and management program; organizing environmental performance inspection; preparing emergency preparedness plan, etc). Will include members from the school clinic, sanitation and cleaning unit, admin office, maintenance unit, logistic warehouse.

d. ***Students' Affair Division*** (to organize student society, conduct awareness raising programs on green campus, resource conservation, pollution prevention and abatement, etc). The Students' Affair Division will involve student representatives.

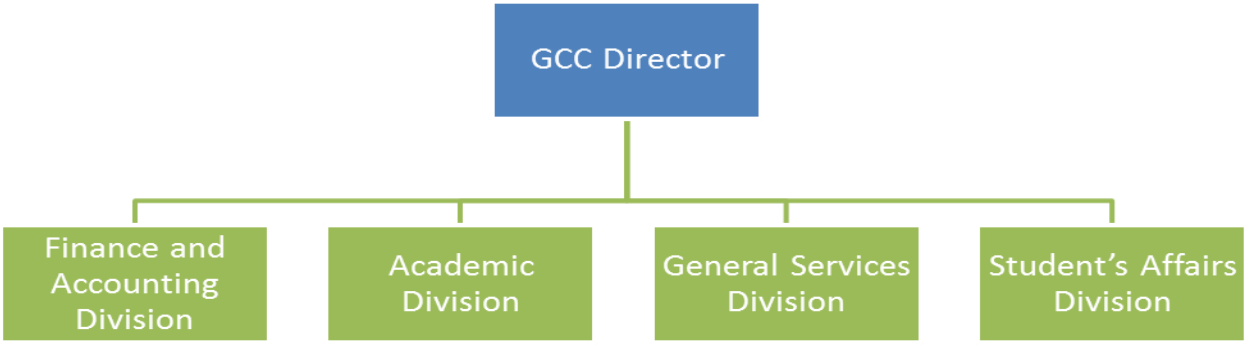


Figure 1: Tentative institutional setup of Green Campus Committee (GCC)

F. Next steps

12. Under the loan implementation consultancy services of the ADB financed project, one international (one man-month) and one national EMS specialist (3 man-months) will support NVTS/NHS with refining the Green Campus Policy and elements of the EMS), identifying a suitable methodology for its implementation, and initiating its implementation. The EMS specialists will support NVTS and NHS with (i) conducting gap analysis and needs assessment,

including training and capacity building needs assessment; (ii) refining the Green Campus Policy (as drafted in above), including definition of a vision, environmental objectives and targets; (iii) defining setup and TOR of the EMS committee and its members; (iv) defining specific environmental management programs (including, but not limited to, energy conservation program; solid waste management program, water saving program); (iv) preparing EMS documentation (manuals); (v) plan and conduct specific training and workshops on EMS for faculty and students of NVTS/NHS, including exposure to the "China Green University Network" (Table 1); (vi) organize and facilitate review workshop with TVET institutions to evaluate the EMS establishment process and define follow-up actions; and (vii) write best practice note on EMS establishment for TVET institutions for dissemination to other schools and colleges in Guangxi.

Table 1: Tentative training plan on Green Campus Policy and environmental management system for GCC members

Subject	**Participants**	**Timing**	**Budget**
Green Campus Policy (GCP); GCP objectives and actions; Approaches and steps to develop campus-wide EMS	GCC members (all)	Once at the start of project implementation and once during project implementation	$ 2,000
Study Tour to member universities of China Green University Network	Key members of the GCC (3-4)	Once when the GCC is established	$ 8,000
GCP review and appraisal; EMS implementation, monitoring, auditing	GCC members (all)	Once when the GCP finalized, and EMS established.	$ 1,000

南宁市第四职业技术学校

环境政策声明

南宁市第四职业技术学校认识到环境对未来发展的重要性，一直努力减小对环境的不利影响，寻求可持续的发展模式。我们将积极践行最佳的环境友好做法，以可持续发展为目标并不断改进。我们愿意承担环境保护的示范责任，通过我们的行动不断加强环境保护。

为实现上述目标，我们承诺

- 促进校园及学校其它活动场所的自然和文化环境的保护；
- 通过建立和采用环境管理系统，不断改善学校在环境方面的实践；
- 学校的活动遵守所有环境相关的法律和规范；
- 制定有效的资源利用和废弃物管理战略、计划就，实现减量、回收和再利用；
- 提高师生的环境责任意识；
- 定期考核学校在环境方面的绩效。

签字 _____

日期 2013年7月10日.

南宁市卫生学校

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签字(代表)：

日期 2013.7.2