Report and Recommendation of the President to the Board of Directors

Project Number: 41949
September 2008

Proposed Loan
Columbia Asia Hospitals Development Project (India)

In accordance with ADB's public communications policy (PCP, 2005), this abbreviated version of the RRP excludes confidential information and ADB's assessment of project or transaction risk as well as other information referred to in paragraph 126 of the PCP.

Asian Development Bank

CURRENCY EQUIVALENTS
(as of 1 August 2008)

Currency Unit	–	Indian rupee/s (Re/Rs)
Re1.00	=	$0.02353
$1.00	=	Rs42.49

ABBREVIATIONS

ADB	–	Asian Development Bank
ALOS	–	average length of stay
BPL	–	below poverty families
CAG	–	Columbia Asia Group
CAH	–	Columbia Asia Hospitals Pvt. Ltd.
CAHM	–	Columbia Asia Health Care Sendirian Berhad
CPS	–	country partnership strategy
CSP	–	country strategy and program
DSCR	–	debt service coverage ratio
EBITDA	–	earnings before interest, tax, depreciation, and amortization
EBM	–	evidence-based medicine
EIRR	–	economic internal rate of return
FIRR	–	financial internal rate of return
ICM	–	International Columbia 2004
ICU	–	International Columbia US, LLC
IEE	–	initial environmental examination
NABH	–	National Accreditation Board for Hospitals and Health Care Providers
O&M	–	operation and maintenance
PAT	–	profit after tax
PBT	–	profit before tax
PRC	–	People's Republic of China
SHE	–	safety, health, and environment
SOP	–	standard operating procedure
TPA	–	third party administrators
TRAA	–	trust and retention account agreement
WACC	–	weighted average cost of capital

NOTES

(i) The fiscal year (FY) of the Government of India, Columbia Asia Hospitals Private Limited (CAH) and Columbia Asia Healthcare Sendirian Berhad (CAHM) ends on 31 March. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2008 ends on 31 March 2008.

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

Vice-President	B. N. Lohani, Vice-President-in-Charge, Operations 1
Director General	P. Erquiaga, Private Sector Operations Department (PSOD)
Director	M. Barrow, Infrastructure Finance Division 1, PSOD
Team leader	S. Gupta, Senior Economist, Operations Coordination Unit, PSOD
Team members	A. Akanda, Head, Operations Coordination Unit, PSOD
	P. Bailet, Counsel, Office of the General Counsel
	J. Munsayac, Operations Coordination Unit, PSOD
	M. Pascua, Operations Coordination Unit, PSOD
	A. Sagar, Principal Investment Specialist, India Resident Mission, PSOD
	S. Tu, Senior Environment Specialist, Operations Coordination Unit, PSOD

CONTENTS

		Page
MAP		
I.	THE PROPOSAL	1
II.	BACKGROUND	1
	A. Health Sector in India	1
	B. Government Policies and Plans	4
	C. ADB's Operations	5
III.	THE BORROWER AND THE SPONSOR	5
	A. Background	5
IV.	THE PROPOSED PROJECT	6
	A. Project Description	6
	B. Project Implementation Arrangements	7
	C. Environmental Aspects and Social Dimensions	9
	D. Development Impacts	9
V.	THE PROPOSED ASSISTANCE	10
	A. Loan	10
	B. Justification for ADB's Assistance	10
	C. Anticorruption Policy, and Combating Money Laundering and the Financing of Terrorism	11
VI.	ASSURANCES	12
VII.	RECOMMENDATION	12
APPENDIXES		
1.	Design and Monitoring and Development Effectiveness Frameworks	13
2.	Summary Initial Environmental Examination	17
3.	Summary Poverty Reduction and Social Strategy	33

INDIA
COLUMBIA ASIA
HOSPITALS DEVELOPMENT
PROJECT
72°00'E
79°00'E
25°00'N
10°00'N
HIMACHAL PRADESH
Shimla
Amritsar
Ludhiana
CHANDIGARH
100 BEDS
PEOPLE'S REPUBLIC
OF CHINA
PUNJAB
PATIALA
100 BEDS
Dehra Dun
Ambala
UTTARAKHAND
HARYANA
Panipat
Delhi
GURGAON
90 BEDS
GHAZIABAD
100 BEDS
Faridabad
Ballabhgarh
NEPAL
Bikaner
Mathura
Agra
UTTAR PRADESH
Jaisalmer
RAJASTHAN
PAKISTAN
Jaipur
LUCKNOW
100 BEDS
Raxaul
Jodhpur
Ajmer
Gwalior
Kanpur
BIHAR
Patna
Varanasi
Dehri
Barhi
Udaipur
Dhanbad
JHARKHAND
Asansol
Biaora
Kandla
Gandhinagar
Bhopal
Jabalpur
Ranchi
WEST
BENGAL
AHMEDABAD
100 BEDS
Indore
MADHYA
PRADESH
Lakhnadon
CHHATTISGARH
Jessaimer
GUJARAT
Bilaspur
Porbandar
Raipur
ORISSA
Surat
Nagpur
Durg
Paradip
Gulf of
Cambay
Dhule
Bhubaneswar
Chandrapur
Nasik
Aurangabad
Thane
Ramagundam
Mumbai
MAHARASHTRA
PUNE
100 BEDS
Natavalesa
Sholapur
Secunderabad
Anahapalle
Visakhapatnam
Hyderabad
KARNATAKA
Vijayawada
Arabian Sea
Belgaum
ANDHRA
PRADESH
Panaji
Dharwad
GOA
Hubli
Ankola
Chitradurg
BANGALORE
HEBBAL: 81 BEDS
YESHWANTPUR: 160 BEDS
Chennai
Mangalore
MYSORE
84 BEDS
Pondicherry
Salem
Cuddalore
Calicut
TAMIL NADU
Dindigul
Edapally
Madurai
Cochin
KERALA
Tuticorin
Thiruvananthapuram
SRI LANKA
INDIAN OCEAN
Location of Hospital
National Capital
State Capital
City/Town
River
State or Union Territory Boundary
International Boundary
Boundaries are not necessarily authoritative.
N
0 300 400 500
Kilometers

08-4520b EG

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan without government guarantee to Columbia Asia Hospitals Private Limited (CAH) of up to Rs1,642 million ($38.6 million equivalent), to develop 10 hospitals in India. The hospitals will be in the cities of Bangalore (where two will be developed), Ahmedabad, Chandigarh, Ghaziabad, Gurgaon, Lucknow, Mysore, Patiala, and Pune. The 10 projects are collectively referred to as the Project. The design and monitoring framework and the development effectiveness framework are in Appendix 1.

II. BACKGROUND

2. Human capital is often the only asset of the poor, and its development is of fundamental importance in poverty reduction.[1] Investment in health care is an investment in human capital necessary to ensure higher productivity and efficient participation of its human resources in the economy's development and growth. Adequate levels of expenditure on health care are also necessary to ensure improvements in life expectancy. Econometric evidence indicates that a 5-year gain in life expectancy is associated with a 0.06–0.58 percentage point increase in the gross domestic product (GDP) per capita.[2]

3. The share of public resources devoted to health care spending in India was only 1.2% of GDP in 2003.[3] As a result, the available public health care infrastructure is overcrowded, lacks adequate medical equipment and resources, and is poorly managed. As resources are stretched, there is inadequate implementation of regulatory and monitoring systems for medical services, resulting in a wide discrepancy in the quality of services provided. Improving the standard of health care services in India is of vital importance to ensuring an efficient investment in human capital thereby ensuring economic development and a better quality of life.

A. Health Sector in India

4. India has made significant progress in improving the health conditions of its population and its health-related statistics have improved over the last 50 years. Since the 1960s, female life expectancy has improved from 41 years in 1961 to 59 years in 1990 and 64 in 2005. Infant mortality rates have improved from 84 per 1,000 live births in 1990 to 56 in 2005. However, compared with other countries in Asia, India lags behind. The People's Republic of China (PRC), for example, had a female life expectancy of 74 in 2005 and an infant mortality rate of 23, and for Indonesia the estimate for female life expectancy was 70 in 2005 and for the infant mortality rate it was 28.

5. Demand for health care services is increasing, with the economy projected to grow at over 8% per annum. Consumer expenditure on health is expected to increase from $43 billion in 2006 to $92 billion by 2011.[4] Health care spending on a per capita basis in 2006 was $41 in India compared with an average of $226 for Asia and Australasia. Health care is gaining in importance and becoming a vital driver of growth. Indicator scores in business ranking models put the health of the Indian workforce over the period 2002–2006 at 1, which is much lower than

---

[1] ADB. 2004. *Enhancing the Fight Against Poverty in Asia and the Pacific: The Poverty Reduction Strategy of the Asian Development Bank*. Manila.
[2] Government of India. 2005. *Report of the National Commission on Macroeconomics and Health, Ministry of Health and Family Welfare*. New Delhi.
[3] World Health Organization. 2006. *World Health Report 2006*. Geneva.
[4] Economic Intelligence Unit. 2007. *India Country Forecast*. London (August).

the regional average of 3.2 (footnote 4).[5] For India to sustain its growth and to attract private and foreign investors, the productivity of the workforce has to improve. A reliable and widespread health care infrastructure is a key factor in achieving higher labor productivity. The existing medical facilities and services are inadequate to meet the rising demand for health services.

6. In India the number of hospital beds is 0.7 per thousand compared with 2.6 in the PRC and the global average of 3.2.[6] A limited supply of health care services and infrastructure has prevented India from achieving better health standards and there remains significant scope for improvement.

7. The national epidemiological profile is changing due to economic growth, demographic changes, access to health insurance, and urbanization. Economic growth is leading to an expansion of the middle class, which is looking beyond the basic requirements and demands better preventive health care services. With the increase in life expectancy, the number of older people in the population is also increasing. In 2001 the percentage of the population over 60 years of age was 6.9%, this increased to 7.5% in 2006 and is projected to increase to 8.3% by 2011. This section of society has greater need for medical services. It is estimated that fewer than 50 million Indians have health insurance although this is expected to increase to 160 million by 2010. Corporations and other employers are instituting health insurance and preventive health care measures to improve labor productivity and working conditions for their employees. Demand for health care services is also increasing given changes in lifestyles, especially in an urban environment as individuals become more inclined toward preventive health care. This is reflected by an increase in the percentage of private expenditure on health, which increased from 3.5% in 1993 to 5.5% in 2000. All these factors will further increase the shortfall between health care services available and required. The size of the health care industry is estimated to be $37.5 billion in 2007 (which was about 3.3% of the GDP) and is expected to increase at a compound annual growth rate of 15% over the next 5 years reaching $75 billion by 2012.[7]

8. Both the public and private sectors have a role to play in the delivery of health care in India; however, public expenditure on health is lower than in other developing countries and hence, the health care industry is dominated by the private sector. Historically, the Government was the main provider of health services; however, with demand far exceeding supply of such services, the private sector has been increasingly filling the gap. At present it is estimated that the private sector operates 93% of all the hospitals and provides 64% of the hospital beds nationwide. In the absence of a significant increase in public resources for health care, public resources alone are inadequate for developing a satisfactory health care infrastructure. Further, the scarce public health facilities are used by the high and middle income groups limiting access of the poor to these.

9. The private health care sector includes private, for-profit and non-profit, health care providers. Their range of practice varies from solo practice and small nursing homes (inpatient facilities with usually fewer than 30 beds) to large corporate hospitals. It is estimated that over

---

[5] The business ranking model measures the attractiveness of the business environment based on ten separate categories. Each category has indicators which are scored on a scale of 1 (very bad for business) to 5 (very good for business). Health of the workforce is 1 of the 12 indicators for the labor market category and is measured on a quantitative basis.

[6] World Health Organization. 2007. *World Health Statistics 2007*. Geneva.

[7] Technopak. 2008. Ten industry trends. *Health Care Outlook.* Volume 4.

90% of private health care is being serviced by the unorganized sector.[8] The large share of the unorganized and unregulated sector has implications for the quality of care provided as the infrastructure is mostly substandard and attracts low-quality or untrained staff. In the absence of a mandatory central quality protocol for health care providers, unorganized and unregulated health care units have mushroomed all over the country, especially those providing secondary health care services.

10. The organized sector refers to bigger hospitals with 100 or more beds which are usually non-profit charitable hospitals or corporate hospitals. This size of a hospital attracts proper planning and investments, modern technology and high-quality staff to promote optimum utilization of resources. Such hospitals are mostly concentrated in metropolitan centers. The absence of such infrastructure in smaller towns provides a big opportunity for investment in the sector. Surveys on the use of health services indicate that over 80% of people use the private sector for outpatient curative services as a first line of treatment in both urban and rural areas and over 58% of the rural population prefers to undergo treatment at private hospitals. The primary reasons for the shift in usage towards private health care are the inadequate availability of medical and nonmedical personnel at the public health establishments, and archaic infrastructure with obsolete or redundant technology. With few exceptions, there have been negligible investments in the public health system for expansion or upgrading.

11. Access to high-quality health care in the private sector has been limited by the high cost for the vast majority of India's population. However, this is changing and health insurance is becoming a preferred tool to finance most health care expenditures. The insurance industry is regulated by the Insurance Regulatory Development Authority (IRDA). The IRDA has the duty to regulate, promote and ensure orderly growth of the insurance business and re-insurance business. With the IRDA stipulating that 5% of insurance companies' business should be from the rural sector, a slew of innovative schemes and better coverage is emerging. Community health insurance schemes are slowly penetrating the rural market and at present there are more than 25 schemes covering over 8 million people all over India.

12. The health insurance companies work in conjunction with third party administrators (TPAs) to administer health policies. These are intermediaries that coordinate insurance companies and hospitals. While the insured benefit from better service, insurers benefit from a reduction in their administrative costs by outsourcing their management and administrative activities, including settlement of claims. Both the TPAs and the insurance companies come under the purview of the IRDA. Because of their large volumes of patients, the TPAs can negotiate competitive prices from the health service providers and prevent providers from overcharging.[9] To some extent, the existence of health insurance companies and TPAs mitigates the lack of adequate regulation and monitoring of the health care sector.

13. The Ministry of Health and Family Welfare, Government of India and the Indian health industry have established the National Accreditation Board for Hospitals and Health Care Providers (NABH), a constituent board of the Quality Council of India. NABH accreditation of facilities confirms quality assurance and its standards focus on patient safety and the quality of patient care. NABH standards have been based on a comparative analysis of various aspects of health care, including the standards in Australia, Thailand, the United Kingdom, and United States, which have been customized to the Indian health care setting. NABH standards also

---

[8] The unorganized sector refers to nursing homes, for-profit or not-for-profit hospitals, most of which have fewer than 30 beds.

[9] There are at present 27 TPAs registered under IRDA (as of 31 August 2007).

include all the 49 applicable licenses and statutory obligations required under Indian law. The cost and timelines incurred in acquiring NABH accreditation are less than those of other international accreditations. NABH is now an institutional member of the International Society for Quality in Health Care, an independent international umbrella health care accreditation organization which grants approval to health care accreditation bodies as a mark of equivalence of accreditation programs of member countries.[10]

B. Government Policies and Plans

14. Given the large gap in the supply of health care infrastructure and the limited availability of public resources, the Government is attempting to attract private investors through investor-friendly policies and tax incentives. The Government is using its own resources to focus on delivery of effective and affordable health care services to the vulnerable sections of population residing in rural areas through its common minimum program and national rural health mission, while encouraging the private sector to provide the health care infrastructure for urban middle- and high-income categories.

15. To promote private investment in health care and bridge the gap between supply and demand, steps taken by the Government include according infrastructure status to hospitals, permitting 100% foreign direct investment for all health-related services, and allowing lower tariffs and higher depreciation on medical equipment. The Government has also amended the Income Tax Act and proposed a 5-year tax holiday for new hospitals located in nonmetropolitan areas[11] effective from April 2009.

16. The Government realizes the significance of the health care industry for achieving sustainable growth and as an important service industry and recognizes its own constraints in providing adequate services. Therefore, its focus has been primarily on public health programs such as immunization programs, medical education, primary health care, and sustaining the existing infrastructure. Realizing their inability to provide adequate health care infrastructure and services, some state governments have recently started exploring the possibility of purchasing health insurance for below poverty families (BPL) as an alternative to its role in health care delivery. This in turn will empower the less privileged classes to choose health care service providers including private providers. In support of this, the federal Government announced the Rashtriya Swasthaya Bima Yojna, a new health insurance scheme for BPL families, on 15 August 2007. About 75% of the financing is provided by the Government of India, while the remainder is paid by the state government. BPL families are entitled to more than 700 inpatient medical procedures with a cost of up to 30,000 rupees per annum for a nominal registration fee of 30 rupees. Coverage allows for pre-existing medical conditions, and there is no age limit. It is a cashless service in case of hospitalization, and outpatient consultation is free. By 1 April 2008, almost every large state government had expressed its intention of joining the scheme and fifteen states (Delhi, Rajasthan, Gujarat, Haryana, Bihar, Uttrakhand, Kerala, Punjab, Chhattisgarh, Karnataka, Maharashtra, Tamil Nadu, Uttar Pradesh, West Bengal, and Jharkhand) have already issued advertisements announcing the scheme. The Government's plans are in line with the long-term objectives of the CAH initiative. The CAH model of decentralized and affordable community health care has potential spin-offs for health care in semi-urban and rural areas in the future.

---

[10] Joint Commission International, a well known international accreditation agency, and NABH are both members of the International Society for Quality in Health Care.

[11] The excluded areas are the urban agglomerations of Ahmedabad, Bangalore, Chennai, Delhi, Greater Mumbai, Hyderabad, and Kolkata, and the districts of Faridabad, Gandhinagar, Gautam Budh Nagar, Ghaziabad, Gurgaon, and Secunderabad.

C. ADB's Operations

1. ADB's Country Strategy

17. Private sector development is an integral part of ADB's draft country partnership strategy (CPS) for India for 2008–2012. The CPS identifies private sector investments for physical infrastructure for health care. It encourages greater private investment by ADB, particularly as a complement to public investment in easing critical infrastructure constraints. The Project will help address major health care infrastructure supply shortages by expanding access to medical services of international quality to a large population across the country.

2. ADB's Sector Strategy

18. The Project is consistent with ADB's health sector policy,[12] which recognizes the importance of the private sector in health care and supports increased private provision of health care services. Assisting the health sector in developing member countries provides a means to achieve ADB's key strategic development objectives of economic growth and poverty reduction. Improvements in health support economic growth through (i) increased work productivity, (ii) increased returns to investments in education, (iii) increased returns to other factors of production, and (iv) freeing up financial resources by preventing diseases. It recognizes that private sector interest in health care is already growing rapidly in the region and accounts for the majority of health expenditures. ADB's long-term strategic framework 2008–2020 (Strategy 2020)[13] confirms that health is vital to development, productivity, social inclusion, and gender equity and that ADB engages in well defined partnerships with specialized agencies. It also recognizes the relevance of access to affordable health care to achieving the Millennium Development Goals. ADB's draft operational plan for improving health access and outcomes under Strategy 2020[14] recommends health care investments when these are included in the CPS and are private sector operations. CAH is a private sector entity with specialized experience and expertise in providing efficient and high quality health care services at affordable prices.

III. THE BORROWER AND THE SPONSOR

A. Background

19. **The Borrower.** CAH, a limited liability company owned by ICU, is incorporated in India under the Companies Act, 1956 and its registered office is in the state of Karnataka, India. Further to its charter, CAH is to establish, construct, maintain, develop, acquire and operate hospitals, dispensaries, clinics, pathological laboratories, and other associated facilities. The Project is a key part of its overall business.

20. **Columbia Asia Group.** ICU also owns 99.9% of Columbia Asia Healthcare Sendirian Berhad (CAHM), a company incorporated in Malaysia which owns, operates, and manages its operations in Indonesia, Malaysia, and Viet Nam. CAH and CAHM are collectively referred to as the Columbia Asia Group (CAG). CAG currently has three medical facilities in operation in India, four in Malaysia, and two in Viet Nam. Its first community hospital was built and completed in

[12] ADB. 1999. *Policy for the Health Sector*. Manila.
[13] ADB. 2008. *Strategy 2020: The Long-Term Strategic Framework of the Asian Development Bank 2008–2020*. Manila.
[14] ADB 2008. Operational Plan for Improving Health Access and Outcomes under Strategy 2020. Manila (draft).

2000, in Seremban, Malaysia, and has been the model for future hospitals to be designed and operated by the group.

21. **Experienced Management Team.** CAH has an experienced management team headed by Dr. Nandakumar Jairam, who has over 30 years of national and international experience. CAH also draws on the international experience of the group and three of the seven board members are non-Indians closely associated with the CAG's international activity. This mix on the Board is an optimal blend of Indian and international expertise and knowledge of the industry.

22. In addition to the 10 hospitals under the Project, CAH has a facility at the new airport in Bangalore. It is a single-bed emergency center with a nurse and doctor available 24 hours all days of the year and a pharmacy attached. The medical center at the airport is responsible for emergency medical services in the event of a disaster. CAH was selected by the developers of the airport in recognition of its capacity to provide quality services and because the CAH Hebbal facility is the closest hospital to the airport.

IV. THE PROPOSED PROJECT

A. Project Description

23. The Project will establish an integrated network of medical facilities consisting of nine secondary hospitals and one tertiary hospital. The Project will be a systematic implementation of a new business model in the health care sector offering high-quality and affordable health services to the middle-income category. In the absence of such projects, the middle income groups would access public hospitals which would redirect health financing for the poor to the better off. The Project enables government resources to focus on the provision of health care needs in rural areas and for the lower income categories. The nine secondary hospitals are located at Bangalore (Hebbal), Gurgaon, Patiala, Mysore, Chandigarh, Lucknow, Pune, Ghaziabad, and Ahmedabad.

24. The CAH model represents a paradigm shift in the delivery of secondary care. CAH is institutionalizing the practice of secondary health care that was hitherto delivered predominantly in nursing homes. The CAH model typically has about 100 inpatient beds and provides secondary care health care services focusing on specialties such as internal medicine, surgery, obstetrics and gynecology, pediatrics, orthopedics, and ear, nose, throat (ENT), with basic laboratory and diagnostic facilities and operating theaters. Each secondary medical center will offer 24-hour pharmacy and pathology services. The secondary hospitals will function as community hospitals and cater to a population within a radius of 10 kilometers. The tertiary hospital will offer outpatient consultations and specialty surgeries. It is a 160-bed multispecialty hospital and will focus on providing services in cardiology, neurosurgery, gastroenterology, oncology, cardiothoracic vascular surgery, and transplants. It has high-end diagnostic facilities such as computerized tomography scanning and magnetic resonance imaging.

25. The 100-bed secondary care hospital model is considered to be the optimum size for delivery of a well-defined set of products and services that meet about 85% of the medical requirements of any ordinary Indian family. This model can be replicated easily and optimizes operational management. A 100-bed hospital can be established more quickly than a comparable 350-bed multi-specialty hospital, with lower capital expenditure, without compromising on the quality of services. This model is less likely to run the risk of asset

underutilization than a bigger facility. The hospital fits well with the image of a community or neighborhood hospital catering to a catchment area of 5–10 kilometers in radius.

26. Of the 10 facilities being considered under the Project, 3 have been completed and are operational, 2 are under construction (Mysore and Patiala), and for the other 5 land has been procured and detailed designing is in various stages for the different sites. All construction will be completed by July 2010 (Table 1).

Table 1: Project Details

Project	**Ownership**	**Number of Floors**	**Beds**	**Cost** (Rs million)	**Construction Completion** (date/status)
Hebbal, Bangalore	Land and building on lease	B+G+1	81	218	In operation since July 2005
Yeshwantpur, Bangalore (tertiary hospital)	Land and building on lease	B+G+4	160	564	In operation since July 2008
Gurgaon	Land and Building owned	B+G+1	90	588	In operation since July 2008
Patiala	Land on Lease Building owned	B+G+2	100	528	Construction ends July 2009
Mysore	Land and Building owned	B+G+1	84	637	Construction ends July 2009
Chandigarh	Land and Building owned	B+G+2	100	707	Construction ends October 2009
Lucknow	Land and Building owned	B+G+3	100	605	Construction ends April 2010
Pune	Land and Building owned	B+G+2	100	709	Construction ends April 2010
Ghaziabad	Land and Building owned	B+G+2	100	673	Construction ends July 2010
Ahmedabad	Land and Building owned	B+G+2	100	707	Construction ends July 2010

B = basement, G = ground.
Source: Columbia Asia Hospitals Private Limited.

27. The group owns the architectural and engineering plans for its hospital models, and utilizes proprietary operating software and service. All services of the group adhere to international standard medical procedures and evidence-based medicine. CAG recommends, where possible, non-invasive treatment using advanced medical technologies. This is effective and safe, resulting in shorter hospital stays and cost savings. CAH will also save costs by centralizing back-office operations such as accounting and reporting, procurement and purchasing, project management, and by using recent technology for tele-imaging.

B. Project Implementation Arrangements

1. Project Management

28. CAH has engaged reputed and experienced professionals with extensive private sector health care and hospital industry experience in its key senior positions. These include the chairman, the chief executive officer and the chief finance officer, as well as managers for each facility. In addition it draws on its international pool of expertise for hospital management.

2. Construction Management

29. CAH has two specialized project management teams, one for the construction of the new facilities and the other for the procurement of medical equipment. Members of the project management team have extensive experience in project and construction management. The construction contracts, including detailed designs, are tendered competitively to pre-qualified local companies, thus ensuring a competitive cost. CAH will award contracts to a single principal contractor on a fixed-cost, date-certain basis, and the construction cost will have adequate penalties for delay.

30. CAH has appointed different project management service providers for its various facilities. The CAH team and the project management contractors (PMC) constantly monitor the progress of work and the contractor has to submit weekly updates and monthly progress reports.

3. Project Operational Arrangements

31. CAH has set up a number of committees to improve the quality of medical service.[15] The required and applicable standard operating procedures for the entire hospital, hospital administration, human resource department, intensive care unit, blood bank, and the operation theater complex established for CAH were reviewed by the technical consultants and were found to be NABH-compliant. The hospital management at each CAH hospital constitutes a team with the requisite skill sets in hospital administration, nursing management, infection control procedures, medical record management and biomedical waste disposal to oversee implementation and compliance with the requisite standards. This helps in streamlining procedures and protocols in the facility.[16]

32. The CAH guidelines will ensure quality of service, standard pricing, and the most effective medicine prescribed in all facilities. All the physicians and medical staff of CAH are required to follow the clinical guidelines and standard operating procedures. To cover potential liabilities for medical malpractice, all medical facilities as well as doctors and medical staff of CAH will be insured with medical malpractice insurance. The performance of all consultants will be evaluated every month. Underperforming medical personnel will be referred for retraining and, if the problem persists, the contract will be terminated.

33. All the facilities of CAH are linked through a hospital management information system using CAH's own software, CARE21. The hospital information system stores patients' records electronically and these can be accessed at any CAH medical facility. CAH has established a number of operational targets to improve its services, e.g., on consultation time, and maintains records of its consultants' performance. These targets are also monitored regularly by the

---

[15] These include a drugs committee, an intensive care unit committee, a medical practices community, a quality assurance and safety committee, a medical records committee, an operation theater committee, and an infection control committee.

[16] Medical protocols refer to a set of rules followed by health care providers for a medical treatment. They include a treatment plan and summarized consensus statements, and they address practical issues. Medical protocols are a superset of clinical treatment guidelines and clinical processes as they often carry the weight of law.

software. CAH will be the first medical entity in India to have a fully integrated electronic medical records and management system.

34. CAH has obtained NABH accreditation for its Hebbal, Bangalore hospital and is in the process of obtaining accreditation for Gurgaon and the tertiary hospital in Bangalore. Although NABH certification is not required, CAH plans to get all its facilities accredited and to obtain the relevant certifications of the International Organization for Standardization.

C. Environmental Aspects and Social Dimensions

35. The Project has been classified as category B because it is unlikely to create any significant environmental impacts during the construction and operation of the hospitals. An initial environmental examination was undertaken in accordance with the environmental assessment requirements of ADB and its summary included a generic environmental management plan with mitigation measures and monitoring program. The Project does not expect to adversely affect natural resources, and the facilities are not located in or near any ecologically sensitive or cultural and/or historic sites. A limited number of specific environmental impacts resulting from project implementation are anticipated. However, such impacts are temporary and will be mitigated by the Project's environmental management plan implementation. The summary initial environmental examination is attached as Appendix 2.

36. A comprehensive program of storing, transporting, and disposing of biomedical wastes for the project hospitals is in place, following international best practices and Indian rules and standards laid down by the National Accreditation Board of Hospitals (NABH) and with clearance from the state pollution control boards (SPCBs). The audit conducted for operating hospitals found the program and its implementation adequate.

37. The Project is classified as category C for involuntary resettlement. Land and/or buildings required for the Project were either purchased or leased from private owners on a willing-buyer/lessee-to-willing-seller/lessor basis and at prices negotiated at market rates. The construction of the hospitals will not cause any involuntary resettlement, affect any physical structures, or lead to loss of livelihoods. The Project will have socioeconomic benefits, including providing limited employment to people living near the hospitals. The most direct socioeconomic benefit will be the smooth access to quality, reliable and affordable medical services.

38. The 10 hospitals are located in developed areas in urban centers. There are no indigenous peoples living close to or within the 10 project sites; hence, the Project is classified as category C for indigenous people.

D. Development Impacts

1. Impact, Outcome, and Output

39. The Project contributes to human development and increased productivity of the workforce in India by improving the health care services. The Project will institutionalize secondary health care based on international best practices and provide community health services at affordable prices. Private sector provision of these services will allow the Government to use its limited resources for primary health care and for meeting the needs of low-income categories and people living in remote rural areas that are not attractive to the private sector. The Project's output will be a network of secondary hospitals, a tertiary hospital, the practice of efficient medical protocols and evidenced-based medicine and the promotion of

preventive health care. The Project will raise the standards for the healthcare industry, implement a new business model of low cost, high quality health care which in future can be replicated in semi-urban and rural areas, and create employment opportunities and train local medical personnel in international best practice. Corporatization of hospital care supported by this Project will indirectly assist in strengthening self regulation of quality of care, support deepening of insurance markets, and in accelerating public-private partnerships in the sector. The Project's design and monitoring framework is in Appendix 1.

2. Development Effectiveness

40. The development effectiveness of the Project will be assessed in terms of private sector development, business success, and economic sustainability as per the guidelines for implementing the Good Practice Standards for Evaluation of Private Sector Investment Operations,[17] prepared by the Evaluation Cooperation Group of the multilateral development banks. The Project will lead to the development of high-quality health care services in the private sector and will set an international quality standard for other private sector operators. Catastrophic hospital expenditures are one of the main reasons for households regressing into poverty due to the poor penetration of health insurance. One of the main barriers to deepening of health insurance markets is the high level of fragmentation of hospital care segment and weak institutional support. The Project, by accelerating the corporatization of hospital care will assist in deepening of health insurance markets in India, and indirectly assist in reducing the incidence of poverty. Corporatization of hospital care can also assist in new forms of public-private partnerships and lead to outsourcing of health care by the government to the private sector. Corporate hospitals can train more paramedical and nursing staff in high quality health care services. The Project is financially and economically sustainable, and adopts environmentally sound operational and waste disposal practices. The Project's development effectiveness framework is provided in Appendix 1.

V. THE PROPOSED ASSISTANCE

A. Loan

41. ADB will provide a local currency loan of up to Rs1,642 million from its ordinary capital resources without a government guarantee. Proceeds from the loan will be used for eligible expenditures by CAH for the purposes of one tertiary and nine secondary hospitals in India..

B. Justification for ADB's Assistance

42. ADB's assistance for the Project is justified for the following reasons:

(i) The proposed loan is consistent with ADB's draft country partnership strategy (CPS) 2008–2012 for India, which emphasizes private sector participation in physical infrastructure development. The CPS recommends public–private partnerships for the health sector and underscores that private sector development is an integral part of ADB's strategy in the country.

(ii) Developing the private health care infrastructure and services for the middle-income category releases public resources for policy and regulatory work and allows public resources to focus better on the needs of the rural and poorer

[17] Multilateral Development Banks Evaluation Cooperation Group. 2006. *Good Practice Standards for Evaluation of Private Sector Investment Operations – Third Edition*.

sections of society. India's middle-income group is growing rapidly and its demand for health care services is expanding. Public sector resources are stretched and committed to the minimum needs program for delivering affordable health services to the vulnerable sections of the population. The Project will support private sector investment for the development of quality and affordable health care services in India for the middle-income population, freeing public resources for treatment of the poor.

(iii) Private health care development has so far focused on tertiary health care. The provision of institutionalized secondary health care is relatively new in India. The presence of ADB has catalyzed financing in this transaction among local banks. Availability of long-term fixed-interest rate credit will increase the stability of the Project's financing plan, reduce its financing uncertainty, and ultimately contribute to providing affordable health care services.

(iv) The Project is consistent with ADB's paper *Policy for the Health Sector,* [18] which promotes the private provision of hospital services. It is also consistent with the current draft of *An Operational Plan for Improving Health Access and Outcomes under Strategy 2020*.

(v) The proposed loan addresses the short supply of affordable and high-quality health care services to the middle-income class in India. This will lead to an improvement in the productivity of the workforce and reduce incidence of morbidity.

(vi) The Project will contribute to sustainable economic growth in India by expanding access to international standard medical services and improving the productivity and quality of the workforce. Improved health and productivity of the workforce through the provision of modern medical services will accelerate efficient economic growth and also induce foreign direct investment. The Project will indirectly contribute to poverty reduction through economic growth.

(vii) ADB's participation in the Project will demonstrate that commercially viable private health care projects can be undertaken through long-term project finance. The Project's successful implementation will provide a new business model for India and other developing member countries.

(viii) The Project is expected to be the source of best practices for the industry by instituting professional health care, management and training. The Project will be a showcase of modern medical practices and will therefore have a beneficial effect on the entire health sector and raise the overall standard of medical practice in India.

(ix) The Project will provide employment for over 5,600 staff by the end of its third year of operation, and will help train local medical staff as per international standards, thus increasing the supply of highly-qualified local medical professionals.

(x) ADB's participation in the Project will ensure that it is implemented with due consideration for safeguard aspects (especially environmental), there are well designed countermeasures for any adverse impacts, and such measures are properly implemented and monitored.

C. Anticorruption Policy, and Combating Money Laundering and the Financing of Terrorism

[18] ADB. 1999. *Policy for the Health Sector*. Manila.

43. CAH was advised of ADB's *Anticorruption Policy* (1998, as amended to date) and policy relating to the *Combating of Money Laundering and the Financing of Terrorism* (2003). Consistent with its commitment to good governance, accountability, and transparency, ADB will require CAH to institute, maintain, and comply with internal procedures and controls following international best practice standards for the purpose of preventing corruption or money laundering activities or the financing of terrorism and covenant with ADB to refrain from engaging in such activities. The financing documentation between ADB and CAH will further allow ADB to investigate any violation or potential violation of these undertakings.

VI. ASSURANCES

44. **No-Objection Letter.** Consistent with the Agreement Establishing the Asian Development Bank, the Government of India will be requested to confirm that it has no objection to the proposed assistance to CAH. No funding will be disbursed until ADB receives such confirmation.

45. **Documentation.** ADB will enter into suitable documentation, in form and substance satisfactory to ADB, following approval of the proposed financing by ADB's Board of Directors.

VII. RECOMMENDATION

46. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve the loan of up to Rs1,642,000,000, without a government guarantee, to Columbia Asia Hospitals Private Limited for the Columbia Asia Hospitals Development Project from ADB's ordinary capital resources on terms and conditions as are substantially in accordance with those set forth in this report, and as may be reported to the Board.

Haruhiko Kuroda
President

18 September 2008

DESIGN AND MONITORING AND DEVELOPMENT EFFECTIVENESS FRAMEWORKS

Table A1.1: Design and Monitoring Framework

Design Summary	Performance Targets and/or Indicators	Data Sources and/or Reporting Mechanisms	Assumptions and Risks
Impact • Improved health and human development of the people in India	• India's indicator for health of the workforce increases from 1 for 2002–2006 (compared with a regional average of 3.2) to 2 in 2011 • Life expectancy in India increases above 64 for females and 62 for males	• Economic Intelligence Unit's country assessments and forecasts • National demographic data	**Assumptions** • Continued macroeconomic and political stability • Alleviates congestion in government and public hospitals • Releases government resources for rural areas and low-income categories **Risk** • Government health insurance coverage for the below poverty line is not effective
Outcome • High-quality and improved health care provided at affordable prices in selected cities in India	• CAH operates the proposed 8 facilities in phase 2 of its expansion • Private sector hospital beds increase by at least 20% by 2014 • Corporate hospitals support an annual growth of 10% in health care insurance till 2012	• CAH's operating reports • Reports of health care insurance regulators • Government reports	**Assumptions** • The Project (phase 1) is completed in a timely manner. • Improved implementation of regulatory policies for the health care sector • Continued Government support for the health care industry **Risk** • Health insurance industry is not an effective implicit regulator

Outputs 1. Network of affordable, international quality secondary hospitals across India 2. Establishment of a competitive state of the art tertiary hospital 3. Practice of evidence-based medicine and efficient medical protocols increases 4. Promotion of preventive health care 5. Generates employment and a group of professionals trained according to international standards	• Hospitals reach 50% occupancy after 1 year of operation and 75% after 3 years of operation • Between 3-15 health sector third party administrators/ insurance companies enter in to agreements with CAH for each facility • Medico-legal claims against CAH are less than 3 per hospital per year which is lower than the industry norm for similar sized hospitals since operations • All facilities are accredited by QCI approved NABH in the first 6 months of their operation. • Annual increase of 10% in the number preventive health care check-ups by CAH till 2015 • The CAH hospitals provide over 3,600 professionals (doctors, nurses, administrators, and paramedics) direct employment and indirect employment to at least 2,000 people through outsourced services	• CAH reports • Statistics and information disclosure by the NABH • NABH reports	**Assumptions** • Construction contractors perform in a timely manner and in accordance with guaranteed performance standards as per respective contracts • CAH is able to attract qualified medical personnel. • CAH rates are competitive. **Risk** • CAH is not able to replicate a high quality second tier management at all facilities
Activities with Milestones 1.0 Opening of secondary hospitals 1.1 Opening of Hebbal, Bangalore hospital – July 2005 1.2 Opening of Palamvihar, Gurgaon hospital – July 2008 1.3 Opening of Patiala hospital – July 2009 1.4 Opening of Mysore hospital – October 2009 1.5 Opening of Chandigarh hospital – April 2010 1.6 Opening of Lucknow hospital – April 2010 1.7 Opening of Pune hospital – July 2010 1.8 Opening of Ghaziabad hospital – July 2010 1.9 Opening of Ahmedabad hospital – July 2010 2.0 Opening of tertiary hospital in Yeshwantpur, Bangalore– July 2008 3.0 Medical protocols and CAH operating procedures are adopted at all facilities on commencement of operations 4.0 Marketing strategy is implemented 2 months before launch of operations for each facility 5.0 Recruitment of personnel commences 3 months prior to completion of construction			**Inputs** Equity from CAH • Rs3.612 billion ADB loan • Rs1.642 billion Other co-lenders • Rs1.313 billion

ADB = Asian Development Bank, CAH = Columbia Asia Hospitals Private Limited, QCI = Quality Council of India, NABH = National Accreditation Board for Hospitals and Health Care Providers.

Table A1.2: Development Effectiveness Framework

Objective	Impact	Performance Targets	Measurements
Private Sector Development	**Project Company Impact** • CAH establishes its brand in India through the implementation of international standards in health care • CAH demonstrates the practice of evidence-based medicine and efficient medical protocols • CAH provides community health care services at affordable prices by implementing its prototype model **Impact Beyond the Company** • Project raises the benchmark for secondary health care services across the country • Project provides training and exposure to local medical and nonmedical personnel to international best practices in India • Project demonstrates effective implementation of environment and sector regulations	• NABH accreditation • CAH is able to attract qualified and capable personnel due to its superior work environment • High occupancy ratios in CAH hospitals, reaching 75% after 3 years of operation • Outpatients reach 80% of the capacity after 4 years of operation of each facility. • At least 3-15 third party administrators/ insurance companies for the health sector enter in agreements with CAH • At least 3,600 medical personnel, (doctors, nurses, and paramedics) trained in international medical best practices.	• CAH's operating, financial and environmental performance reports • CAH's success in implementing phase 2 of its operations and establishing 8 more hospitals. • NABH reports
Business Success	• Financially profitable and sustainable operations	• Timely repayment of debt • Satisfactory financial internal rate of return (greater than weighted average cost of capital)	• Amortization of loans • Financial internal rate of return • CAH financial reports

Objective	Impact	Performance Targets	Measurements
Economic Sustainability	• Contributes to economic growth through mitigation of shortages in health care services. • Contributes in improving the health of the workforce. • Reduces pressure on public hospitals and allows better access by the poor • Deepening of health insurance market due to corporatization of secondary health care	• Economic internal rate of return greater than 12% • Increase in the number of corporate employers that register for health care programs • Government outsources health care services for its employees and below poverty line families • 10% annual growth rate in health care insurance till 2012	• Economic rate of return • Increase in preventive health care programs by 10% per year • Government reports

ADB = Asian Development Bank, CAH = Columbia Asia Hospitals Private Limited, NABH = National Accreditation Board for Hospitals and Health Care Providers.

SUMMARY INITIAL ENVIRONMENTAL EXAMINATION

A. Introduction

1. Columbia Asia Hospitals Private Limited (CAH) a subsidiary of Columbia Asia Group (CAG)[1] has requested support from the Asian Development Bank (ADB) for the development and operation of 10 hospitals in India (the Project). The tertiary[2] hospital is located at Yeshwantpur in Bangalore while the nine secondary[3] hospitals are located at Hebbal in Bangalore, Gurgaon, Patiala, Mysore, Chandigarh, Lucknow, Pune, Ghaziabad, and Ahmedabad. This aims to provide affordable international standard health care to the growing middle-income class of India by delivering quality health care service.

2. CAH carried out an environmental analysis as part of the market, financial and operational due diligence of the Project through a consultant, Technopak Advisors Private Limited for the 10 operational and upcoming hospitals. Environmental due diligence also included a detailed waste management practice study in one operational secondary hospital through consultant EPTRI and an initial environmental examination (IEE) through a staff consultant for the tertiary hospital. In accordance with ADB's *Environment Policy* (2002) and *Environmental Assessment Guidelines* (2003), this summary initial environment examination (SIEE) is prepared in line with the environmental assessment requirements for environmental category B[4] project. The SIEE covers the general assessment of the anticipated environmental impacts of the Project in consideration of common design criteria, performance standards and guidelines, general and specific features such as environmental, social and economic settings, permitting requirements and status, and the environmental and waste management practices of the operational and upcoming CAH hospitals. A generic environmental management plan (EMP) for the Project was also prepared, based on the IEE for the tertiary hospital at Brigades Gateway, Yeshwantpur, Bangalore, Karnataka State, in which impacts and appropriate mitigating measures were identified.

3. A comprehensive program of storing, transporting, and disposing of biomedical wastes for the project hospitals is in place, following international best practices and Indian rules and standards laid down by the National Accreditation Board of Hospitals (NABH) and with clearances from the state pollution control boards (SPCB). The audit conducted for operating hospitals found the program and its implementation to be adequate.[5]

4. The Project does not expect to adversely affect natural resources, and the facilities are not located in or near any ecologically sensitive or cultural and/or historic sites. A limited number of specific environmental impacts resulting from project implementation are anticipated. However,

---

[1] Columbia Asia Group (CAG) is a regional health care company with medical centers in Malaysia, Viet Nam, Indonesia, and India providing multispecialty health care facilities including out patient and inpatient services.

[2] A tertiary health care hospital provides multispecialty services in cardiology, neurosurgery, gastroenterology, oncology, cardiothoracic vascular surgery and transplants and has high end diagnostic facilities like computerized tomography scan and magnetic resonance imaging.

[3] A secondary health care hospital provides services focusing on specialties like medicine, surgery, obstetrics and gynecology, pediatrics, orthopaedics, and ear nose throat (ENT), with basic laboratory and diagnostic facilities and operating theaters.

[4] A project is classified as category B if its potential adverse environmental impacts on human populations or environmentally sensitive areas are less adverse than those of category A projects.

[5] The audit was carried out at the hospital in Hebbal to: (i) assess existing systems and processes; (ii) determine compliance level as per standards prescribed by the hospital management; (iii) benchmark existing standards and processes with national level quality guidelines and best practices; and (iv) recommend corrective and preventive actions to streamline and improve the processes. The methodology included direct observations of process flows, patient flows, departments and facility as a whole, mapping of systems and processes with NABH standards by means of a checklist, interviews of staff, patients and visitors, and analysis of documents.

such impacts are temporary and will be avoided or mitigated by adhering to the Project's EMP implementation.

B. Project Description

1. Project Components

5. The Project will establish an integrated network of medical facilities consisting of a tertiary hospital and nine secondary hospitals. Three of these are operational and seven are in various stages of design and construction. The Project components and details are summarized in Table A2.1.

Table A2.1: Project Details

Project Locations	Plot Area (square meters)	Number of Floors	Beds	Cost (Rs million)	Status
		Tertiary Hospital			
Yeshwantpur	8,255	B+G+4	160	564	In operation since July 2008
		Secondary Hospitals			
Hebbal	7,648	B+G+1	81	218	In operation since July 2005
Gurgaon	10,158	B+G+1	90	588	In operation since July 2008
Patiala	6,932	B+G+2	100	528	Construction ends July 2009
Mysore	8,129	B+G+1	84	637	Construction ends July 2009
Chandigarh	6,635	B+G+2	100	707	Construction ends October 2009
Lucknow	8,363	B+G+3	100	605	Construction ends April 2010
Pune	6,812	B+G+2	100	709	Construction ends April 2010
Ghaziabad	6,161	B+G+2	100	673	Construction ends July 2010
Ahmedabad	4,978	B+G+2	100	707	Construction ends July 2010

B = Basement; G = Ground.
Source: ADB Staff compilation.

6. Forthcoming hospitals will follow the typical CAH secondary model design: (i) 100 inpatient beds; (ii) secondary care multispecialty hospital focusing on specialties such as medicine, surgery, obstetrics and gynaecology, pediatrics, orthopaedics, ear nose throat (ENT) with basic laboratory and diagnostic facilities; (iii) internationally accepted standard policies and procedures; (iv) proprietary operating software and electronic medical records; (v) unique, modern and efficient design and; (vi) modern medical equipment. These hospitals are in various stages of design and construction and are being planned to follow the same design and operational benchmarks as the existing facilities.

2. Status of Compliance with Environmental Laws and Regulations

7. The environmental clearances and environmentally related permits have been issued for CAH's operational hospitals and are being processed and/or will be obtained for the forthcoming hospitals from the respective State Pollution Control Boards (SPCBs). Environmentally related permits include the Consent for Establishment (CFE), the Consent for Operation (CFO), the annual Water Consent as per the Water Pollution Control and Prevention Act, 1974 and Air Consent as per the Air Pollution Control and Prevention Act 1981, and the No Objection Certificate (NOC) as per Ministry of Environment and Forests (MoEF) notified Biomedical Waste Management and Handling Rules, 1998.

3. Biomedical Waste and Liquid Wastes Management Practices

8. The biomedical wastes generated at CAH operational facilities are collected, segregated, stored and disposed off at a common biomedical waste treatment facility. The operational hospitals at Hebbal and Yeshwantpur outsource biomedical waste management services to M/s SembRamky Environmental Management, an authorized agency by Karnataka State Pollution Control Board, while the hospital at Gurgaon outsources services to Vulcan Waste Management Company.

9. A detailed waste management study was carried out for the hospital in Hebbal to assess its waste management practices and environmental measures. The hospital follows the MoEF notified Biomedical Waste Management and Handling Rules, 1998 with respect to waste segregation, collection, following the color coding norms for collecting different categories of waste and usage of symbols on the collection containers, internal transportation and storing of the waste. The hospital separates the infectious waste from the noninfectious waste and the waste is collected in color-coded bags by housekeeping in three shifts; morning, afternoon, and evening or as required when a waste bin or sharps bin is 75% full. Mobile garbage bins are used. Housekeeping staff wear heavy duty gloves, masks and rubber boots while collecting waste. The quantities of waste generated per day are presented in Table A2.2.

Table A2.2: Daily Waste Generation at Hospital in Hebbal

Color	Container	Category	Quantity of waste generated /day (in kilograms)
Blue Infectious (Non biodegradable)	Blue plastic bag in plastic bin	Tubing's, catheters, IV tubes, blood bags, drains, gloves, aprons and endotracheal tubes	57
Red Infectious (Biodegradable)	Red plastic bag in plastic bin	Cotton, gauze, bandages, plaster, dressing.	46
Yellow (Organ and tissue waste)	Yellow plastic bag in plastic bin	Human tissues, organs, body parts, placenta, pathological and surgical waste, microbiology and biotechnology waste	3
Black	Black bag in plastic bin	General paper waste; and also kitchen waste, that is disposed separately.	40

IV = intravenous.
Source: Due Diligence Report, Technopak Advisors Private Limited, 2008.

10. The biomedical wastes are weighed and stored in the airconditioned waste holding room before they are taken by the contracted agency for treatment and disposal at the common

biomedical waste treatment facility. The segregation and disposal of biomedical waste is recorded and log books are maintained on a day to day basis.

11. The hospital has a biomedical waste management protocol with trained staff in hospital waste management. A maintenance engineer, with mechanical engineering background looks after the overall biomedical waste management and other environmental aspects. The practice for the biomedical waste disposal conforms with the prescribed requirements and the biomedical waste management protocol.

12. The liquid wastes generated from the hospital wards and the sewage from cafeteria and toilets are combined and treated in a sewage treatment plant. The total quantity of wastewater entering the facility is 39 kiloliters per day (KLD); 31 KLD of domestic wastewater and 8 KLD of chemical wastewater from different wards. The treated water is reused for gardening within the premises. CAH follows a typical design for its hospitals, replicating the liquid waste management and design of the sewage treatment plant.

C. Description of the Environment

13. General and specific descriptions of the environment for the purpose of overall impact assessment and development of a generic environmental plan for the Project are provided below.

1. General Environmental Conditions

a. Yeswantpur, Bangalore

14. The town of Yeshwantpur, which is located in the northern region of Bangalore, is a planned area with a mix of industries and residential colonies. It is adjoining the Peenya industrial area and hosts over a dozen industries, including Bharat Heavy Electronics, Mysore Lamps, Chandan Chemical Corporation, Karnataka Government Soap Factory, Mafatlal Plywood, Suryodaya Industries and Kirlosker Batteries. The town is crossed by a railway line, with industries on one side and residential colonies on the other. The renowned Indian Institute of Science is in the heart of Yeshwantpur and is considered a green area. The ISKCON temple is on the outskirts of town. The hospital in Yeshwantpur is inside a self-contained, integrated township called Brigades Gateway.This complex is about 5 km from the central business district of Bangalore, 15 km from the airport, 4 km from the main railway station, and near the satellite Yeshwantpur railway terminal. It is also well connected by the National Highway 4 and via the outer Ring road to many residential areas.

b. Hebbal, Bangalore

15. Hebbal is an area north of Bangalore which hosts various industries as well as educational institutions. These include government-run organizations such as the Karnataka Agro Industries Corporation, Institute of Veterinary Biologicals, University of Agricultural Sciences, Veterinary College, Mahatma Gandhi Polytechnic and office of Directorate of Biological Control. The Geetha Nursing home and 200-bed Baptist hospital are the other medical establishments in this area. The opening of the Bengaluru International Airport (BIAL) in 2008 has ensured that Hebbal will become an important location in terms or real estate value, economic development, and urbanization. The hospital in Hebbal is at Kirloskar Business Park Bellary Road. The hospital is not located in or near any ecologically sensitive or cultural and/or historic sites.

c. Gurgaon District, National Capital Region, Delhi

16. Gurgaon is a district in the National Capital Region (NCR) of Delhi which hosts a large number of corporate organizations. NCR is the fastest growing urban conglomerate in the country. The hospital in Gargaon is strategically located in Palam Vihar, a prime residential area. The hospital site is about 5 km from the City Railway Station and 6 km away from National Highway 8. The domestic and international airport of New Delhi is 10 km away from the hospital site. The hospital is not located in or near any ecologically sensitive or cultural and/or historic sites.

d. Patiala City, Punjab

17. Patiala is fast emerging as an important industrial growth center in Punjab. Besides traditional goods, other products manufactured in the area include cutting tools, power cables, Vanaspati ghee, bicycles, and agriculture implements including harvester combines and threshers, milk products, and pesticides. The industrial units are scattered all over the district mainly at Rajpura, Dera bassi, Patiala, Samana and Nabha. The hospital site is located near Thapar University and is easily accessible by road, railway and bus. The hospital will not be located in or near any ecologically sensitive or cultural and/or historic sites.

e. Mysore City, Karnataka

18. While tourism is the major industry in Mysore City, the growth of information technology has resulted in the city emerging as the second largest software exporter in the state of Karnataka, after Bangalore. Infosys has established one of the largest technical training centers in the world and Wipro has established its Global Service Management Center (GSMC) at Mysore. In the eastern part of the city there is a huge residential area. The hospital in Mysore City is located on the Bangalore–Mysore Highway about 7 km from Mysore city center and in close proximity to IT Parks. The hospital will not be located in or near any ecologically sensitive or cultural and/or historic sites.

f. Chandigarh City, Punjab

19. Chandigarh City serves as the capital of two states, Punjab and Haryana, and is a union territory of India. The hospital in Chandigarh is located in Baltana Village, Dera Bassi (Mohali). The area is about 600 meters from Zirakpur City Center, along Zirakpur Kalka Highway and near the Kalka-Shimla, Chandigarh, Delhi Ambala roads. The hospital site is about 5 km from the airport and 4.6 km from the nearest Chandigarh railway station. The hospital will not be located in or near any ecologically sensitive or cultural and/or historic sites.

g. Lucknow City, Uttar Pradesh

20. Lucknow is among the top 10 fastest growing non-major-metropolitan cities in India. It is the second largest city in Uttar Pradesh state. The population is mostly upper middle class and middle class. Big oil marketing companies such as Indian Oil Corporation, Hindustan Petroleum, Bharat Petroleum, and Reliance have their offices in Lucknow. Leading information technology (IT) companies such as TCS and IBM are also operating in Lucknow. Biotechnology and information technology are the two focus areas promoting economic development in and around the city. The Ministry of Science and Technology is setting up a biotech park in the city. The hospital site is a prime city location, facing the Faizabad Road, and is adjacent to government facilities and educational institutions. The hospital site is near the National Highway 28 (main Faizabad Road), and Hindustan Aeronautics Road. It is accessible by all modes of public transport. It is 6 kilometers from Hazratganj, the city center, 16 km from the Amausi Airport. The

nearest railway station is Badshah Nagar. The hospital will not be located in or near any ecologically sensitive or cultural and/or historic sites.

h. Pune City, Maharashtra

21. Pune is one of the fastest growing cities in the country, as large national and international corporations are making it the center of their corporate activities. The area where the hospital will be located, Magarpatta, is one of the prime focuses of major economic and residential developments mostly for the middle-class population and new settlers coming in the city for employment. Magarpatta is one of the biggest residential and commercial development areas in the city. The hospital land plot is attached to the Nayati Empire, a residential colony with 7000–8000 apartments that have been built or are planned at the site. The EON freezone IT SEZ, a special economic zone, is about 2 km from the site. The area is not well connected by local transport. Koregain Park, the city center, is about 4 km from the hospital site. The airport is 11.5 km away, while the nearest railway station is 7.5 km away. The hospital will not be located in or near any ecologically sensitive or cultural and/or historic sites.

i. Ghaziabad, National Capital Region, Delhi

22. Ghaziabad is a part of the National Capital Region (NCR). The hospital in Ghaziabad is located on the National Highway 24, which is the focus of all economic, residential and commercial developments in Ghaziabad. The schedule for the hospital commissioning in July 2010 is expected to coincide with residential developments in the vicinity. The city center is 5 km away, New Delhi airport 50 km away and the nearest railway station is located 5 km away. The hospital will not be located in or near any ecologically sensitive or cultural and/or historic sites.

j. Ahmedabad City, Gujarat

23. Ahmedabad City also known as Ahmedabad Municipal Corporation,is the seventh largest city in India with a population of 3.5 million. It is the largest city in the state of Gujarat. It has had great importance in the economy of Gujarat becuase of the large concentration of economic activities, high growth rates and productivity. The city established itself as the home of a booming textile industry, which earned it the nickname "the Manchester of the East." The city also has a thriving chemicals and pharmaceuticals industry. In recent years, the Gujarat government has increased investment in the modernization of the city's infrastructure, providing for the construction of larger roads and improvements to water supply, electricity, and communication. The information technology industry has also developed significantly in recent years. The city is among the largest exporter of gems and jewellery in India. The city's educational and industrial institutions have attracted students and young skilled workers from the rest of India. The hospital site in Thaltej, near the Thaltej crossroads area, and is about 1 km from the Sarkhej–Gandhinagar highway, toward the west of the city. It lies between two parallel roads. The plot is in the midst of high-end residential areas, surrounded by more than 50 residential housing villages including Thaltej, Bodakdev, Sola, Memnagar, Jodhpur and Ambli. All these areas fall in Ahmedabad Urban Development Authority's residential zone and and have been developed in the last 10 to 15 years. The hospital will not be located in or near any ecologically sensitive or cultural and/or historic sites.

2. Specific Baseline Environmental Conditions for Hospital in Yeshwantpur

24. A specific description of the existing environmental conditions is provided below for the tertiary hospital in Yeshwantpur, Bangalore. Although these conditions are specific to Yeshwantpur, the urban setting in which the facility is located can be considered general to all project hospitals.

a. Topography, Soil and Land Use

25. The hospital site is relatively flat and sparsely covered with trees and vegetation. The soil is generally red with yellow clayey silty sand down to a depth of 5 meters (m) followed by silty sand strata which is highly disintegrated rock down to a depth of 10 m reaching stable strata.

26. The present land use pattern in the immediate surroundings of the project site is a mixture of commercial and residential areas with very little or no farming activities.

b. Climate

27. The mean monthly wind speed values for a 4-year period during 2000–2003 recorded at the India Meteorological Department (IMD) station at Bangalore showed that the highest wind speed of 9.8 kilometers per hour (km/hr) was recorded in June 2001 and lowest at 2.9 km/hr in October 2000. In the middle months of the year the prevailing wind direction is westerly, while it is easterly in the remaining months, which are influenced by the southwest and northeast monsoon, respectively.

28. The site in Bangalore has an equitable temperature regime. The hottest months are March, April and May, with monthly mean maximum temperatures ranging from 32.4 degrees centigrade (^{0}C) to 32.7^{0}C followed by a perceptible drop of nearly 4.5^{0}C in the month of June, signaling the onset of monsoon season. The monthly mean temperatures for these months are in the range 26^{0}C–27.5^{0}C. The coolest month is December with mean maximum temperature between 16^{0}C.

29. Average annual rainfall in Bangalore over the 30-year period from 1951 to 1980 is 970 millimeters (mm), with 60 days of rainfall. The wettest months are September and October, while the driest period is between January and March. In recent years the city received significantly less average rainfall, e.g., 767 mm in 2002 and 727 mm in 2003.

c. Air Quality

30. There are no industries near the hospital site. The source of air pollution can be attributed to the movement of vehicles. Records of ambient air quality within a 3-km radius from the project site indicate that values of suspended particulate matter ranging from 50 micrograms per cubic meter (µg/m^3) to 150 µg/m^3, sulfur dioxide from 7 to 23 µg/m^3, and oxides of nitrogen from 4.5 to 23.5 µg/m^3 are within the National Ambient Air Quality Monitoring standards prescribed by Central Pollution Control Board.[6]

d. Noise Level

31. Data on the ambient noise levels gathered from the 10 locations near the hospital site indicate a high value due to considerable human, commercial and vehicular activities in the surrounding areas. The day-time maximum noise levels around the project site range from 57.80 decibels, (dB(A)) to 97.90 dB(A). Noise levels at the project site are in the range of 58.7 dB(A) to 60.6 dB(A).[7]

---

[6] Based on Environment (Protection) Rules (1986), ambient air standards for residential, rural and other areas are 140 - 200 microgram per cubic meter (µg/m^3) for suspended particulate matter (SPM) and 60–80 µg/m^3 for both sulfur dioxide (SO_2) and oxides of nitrogen (NO_2).

[7] Based on Noise Pollution (Regulation and Control) Rules (2000), noise limits for residential areas are 55 dB(A) for day time (6:00 am to 10:00 pm) and 45 dB(A) for night time (10:00 pm to 6:00 am).

e. Water Quality

32. There are no significant surface water bodies in the vicinity, except the Sankey Tank and the Bangalore Water Supply and Sewerage Board (BWSSB) open sewer (Arkavathy valley) which are at some distance from the hospital site. Groundwater around the hospital site has no objectionable odor, has good taste and color, and is within the permissible limit of 5 Hazen units prescribed for potable water. The maximum total dissolved solids (TDS) levels are in the range of 850 to 950 milligrams per liter (mg/L) and nitrate levels are in the range of 100 to116 mg/L[8].

3. Biological Environment

33. The hospital site and immediate surroundings have been thoroughly urbanized. Habitats for flora and fauna are very limited due to the intensive commercial and residential development. No wildlife sanctuary or game reserve is located in the vicinity of the study area.

34. The hospital area has no vegetation cover and/or forest lands nor environmentally sensitive or protected areas.

4. Socioeconomic Environment

35. The population is considered totally urban with no farming or agricultural activities of commercial scale. Education facilities such as colleges and technical training institutes are well established. Telecommunication, power, water supply and transportation facilities are available and adequate.

36. There are no settlements or residences at the hospital site. Therefore, no resettlement is required.

37. No archaeological, historical and religious sites exist in the hospital area. No indigenous group of people was identified.

D. Anticipated Environmental Impacts and Mitigation Measures

38. An assessment of the potential environmental impacts and identification of mitigating measures was carried out for the tertiary hospital in Yeshwantpur to prepare a generic environmental management plan (EMP) for the all project hospitals.

39. There are no significant differences in the potential impacts and mitigation measures of the different hospitals, nor between the tertiary and the secondary hospitals. The anticipated impacts and mitigation measures are considered relevant and are essentially the same, if of larger scale, for the remaining project hospitals. The key environmental issues associated with the hospitals and impacts on various environmental components and the appropriate mitigating measures have been assessed for construction and operational phases.

1. Impacts during construction

40. The Project will build hospitals, including facilities such as the water system and sewage treatment plants. The construction activities would create the environmental disturbance normally

[8] Based on Drinking Water Quality Standards (IS:10500) the permissible limit for total dissolved solids (TDS) is 2,000 milligrams per liter (mg/L) and for nitrate 100 mg/L as NO_3.

associated with major construction works, such as dust, noise, exhaust emissions from construction equipment and vehicles, and waste generation. As construction will be confined to the hospital compound and there are no nearby settlements, the impacts of such environmental disturbances will be insignificant. The Project and its Contractors will comply with applicable government environmental legislative requirements.

41. Dust generated during construction is expected to have some impact on air quality. However, this will be mitigated by regular spraying paths of heavy vehicles with water, and controlling the speed and limiting movement of construction equipment and vehicles. All equipment and vehicles will undergo routine maintenance to reduce engine emissions. Vehicles transporting construction materials will be covered with tarpaulin to avoid spills.

42. Noise will be generated during construction. Construction activities will be planned to avoid noisy operations. Efforts will be made to limit the sound of powered mechanical equipment such as bulldozers, air compressors, concrete pumps, excavators, and concrete mixers. Protective devices will be provided to workers to minimize the effects of high noise levels. Specific mitigation measures and appropriate techniques for the control of noise will include (i) siting fixed pieces of equipment, such as generators, away from settlements; (ii) fitting pneumatic tools operated near settlements with effective air exhaust ports; (iii) fixing noise labels to air compressors; (iv) maintaining noise suppression devices on construction vehicles and equipment; (v) notifying landowners of intended work and duration if noise from construction activities is likely, and (vi) considering construction works schedules to mitigate noise emission impacts during the day and night time.

43. Solid wastes generated during construction include trash and scrap metal (which will be reused and recycled if possible). During the peak of the construction phase, laborers will be employed locally and temporary construction camps will be established. Sewage from construction camps and wastewater from the contractor's workshop and equipment washing yard will be generated. Labor camps will be provided with adequate sanitation infrastructure and amenities. Sewer drains will lead to an onsite disposal area for treatment or holding in septic tanks with leach fields.

2. Impacts during Operations

a. Air and Noise Quality

44. One source of likely air pollution will be the operation of diesel generators. To reduce pollution, the fuel to be used for the diesel generators will have a low sulfur content (less than 0.05%) and diesel generators will be used during emergencies and power shortages only. The expected emission of SO_2 and particulate matters will be mitigated by installing an exhaust chimney with height to be prescribed by respective State Pollution Control Boards (SPCBs).

45. The noise impact on the surrounding areas because of the commissioning of the hospital will be insignificant. The diesel generators will be the only major noise generating sources in the project hospitals. Adequate precautions will be taken to prevent noise and vibration at the source by proper acoustic treatment, anti-vibration mountings, and acoustic enclosure to keep noise levels within the stipulated limits.[9]

[9] Based on Noise Pollution (Regulation and Control) Rules (2000), noise limits for silence zone, e.g., hospital are 50 dB(A) for day time (6:00 am–10:00 pm) and 40 dB(A) for night time (10:00 pm–6:00 am).

b. Water and Wastewater Quality

46. Potable water will be sourced from local water companies and from existing bore wells within the hospital site. The water requirement of 10,000 liters (10 m^3) per day will not have a severe impact on groundwater resource (such as depletion or subsidence).

47. The wastewater to be generated from the wards, kitchen, cafeteria, toilets, and other parts of the hospital will be combined and treated in an onsite sewage treatment plant. The treated water will be reused for gardening within the hospital premises.

48. The sewage treatment plant will conduct primary and secondary treatment with an aeration system followed by filtration through pressure sand filters and an activated carbon column and finally with chlorination. Rooftop rain water harvesting, coupled with storm water harvesting and impoundment in an artificially created water body, will help to recharge the groundwater table near the hospital.

c. Terrestrial Environment

49. No major impacts on the terrestrial environment are anticipated. Each tree that is cut to give way for the development of the forthcoming hospitals will be replaced by planting a minimum of two trees or saplings. A green belt along the periphery of the hospital sites will be implemented to enhance the aesthetics at the same time as a measure to reduce air and noise pollution.

50. To avoid soil or land contamination, the general standards prescribed for treated effluents for discharging on land for irrigation[10] will be met before they are reused on land for lawns, gardening, and plantations.

d. Biomedical and Domestic Waste Management

51. The process of biomedical waste management in India has been well established under the Ministry of Environment and Forests (MoEF) Biomedical Management and Handling Rules 1998. The guidelines required all health care establishments to undertake the proper method of segregation, storage, treatment and disposal. The types of containers, color coding and the labels to be used for segregation and storage are defined in the guidelines. The sources of hospital wastes include the emergency room, pharmacy, laboratory, day care, operation theater, dialysis section, and radiology division. Infectious and noninfectious wastes must be segregated and placed in color coded bags properly labeled and stored in the waste holding room before collection, treatment, and disposal to a common biomedical waste treatment facility. The waste holding room must have proper storage and temperature control facilities. Wastes should be stored at 4^oC in the holding room in case they have to be stored for more than 48 hours before collection for final treatment and disposal by waste management firms. There are specialized waste management firms in all states, registered with SPCBs. These have to collect and process waste for disposal at government-approved sites as a precondition for establishing any hospital and as part of the environment clearance process. These rules will be strictly followed by the project hospital management. This ensures that the impacts and risks will be minimal, and will be strictly monitored.

---

[10] Standards for treated effluents for discharging on land for irrigation (plantation) per IS 2490 are as follows: (i) color and odor = remove as far as practicable; (ii) suspended solids, milligrams per liter (mg/L) = 200; (iii) pH = 5.5 to 9.0; (iv) Oil and Grease, mg/L = 10; (v) biochemical oxygen demand, mg/L = 100; (vi) arsenic (as As), mg/L = 0.2; (vii) cyanide (as Cn), mg/L = 0.2; (viii) alfa emitters, millicurie per milliliter = 10^{-8}; (ix) beta emitters microcurie/milliliter =10^{-7} and (x) bioassay test = 90% survival of fish after 96 hours in 100% effluent.

52. Domestic waste generated by the hospital staff and patients will be collected separately from the biomedical waste. It will be collected by municipal waste corporations for further treatment and final disposal.

E. Institutional Requirements and Environmental Management Plan

1. Environmental Management Plan

53. The Project's environmental management plan (EMP) is formulated as a generic one that can be applicable to all project hospitals. CAH has committed to update the EMP as part of the IEEs for the remaining project hospitals and the environmental clearance process. CAH will provide adequate staff and budget to ensure EMP implementation in the project hospitals. ADB will review the IEEs, including the site-specific EMPs, of the remaining hospitals when available.

54. The generic EMP commits CAH to manage and mitigate the environmental impacts of the project hospitals. It provides the actions to be undertaken during the preconstruction, construction, and operation phases as well as the responsible entities for implementation (in Appendix 1 of the EMP).

55. Environmental monitoring will be undertaken. All project hospitals will have a mini-laboratory exclusively for regular monitoring and testing of the quality of the treated wastewater to ensure that it is suitable for reuse for plantation. The mini-laboratory will handle basic parameters such as pH, total suspended solids, dissolved oxygen, chemical oxygen demand (COD) and biochemical oxygen demand (BOD).

56. All project hospitals will have a maintenance engineer with a mechanical engineering background who will look after the overall biomedical waste management and other environmental aspects. The engineer will also carry out the periodic monitoring of the emissions from the chimneys, ensure the smooth operation of the sewage treatment plant, and prepare reports that are statutory requirements of the respective SPCBs. Annual environmental monitoring reports will be submitted to ADB.

F. Public Consultation and Disclosure

57. CAH undertook a comprehensive market and feasibility study, including informal discussions with officials of the major cities, before deciding on the location of the hospitals. Project sites are either part of property development that has been ongoing for several years, are part of an overall town planning exercise, or are on industrial estates sold by the government to private developers.

58. The hospital in Yeshwantpur is inside a self-contained integrated township, Brigades Gateway, under a lease agreement with Brigade Enterprises. Public consultation was carried out as part of the township development phase and it included discussion on social services that would be provided as part of the complex, including health facilities such as a hospital. Township residents have expressed strong support for the hospital as it would generate employment and contribute to local and regional economic development by ensuring a healthy workforce.

G. Findings and Recommendations

59. A comprehensive program of storing, transporting, and disposing of biomedical wastes for the project hospitals is in place, following international best practices and Indian standards, laid down by the National Accreditation Board of Hospitals (NABH), with clearances from the

respective State Pollution Control Boards. The audit conducted on the three operating hospitals found the program and its implementation adequate.

60. The biomedical waste management guidelines as stipulated and required by MoEF will be strictly followed by management in each hospital. All biomedical wastes generated will be sent to a common biomedical waste treatment and disposal facility operated by a private agency approved by the respective SPCBs.

61. No significant environmental impacts are expected during construction and operation because of the nature of the Project and the hospitals' location. The generic EMP to mitigate potential environmental impacts, including air and water quality, has been prepared and will be updated if necessary, and will be strictly implemented during the construction and operation phases of each project hospital.

H. Conclusion

62. The Project will support private sector investment in the development of quality and affordable health care services in India for the urban middle-income categories.

63. The Project's potential environmental impacts can be mitigated effectively provided the mitigating measures are implemented properly. The maintenance engineer designated by the Project will oversee and monitor all environmental activities. The engineer will ensure that national and local regulatory requirements (on air, water quality and biomedical waste management) are properly handled and complied with.

64. The IEE suffices as the environmental assessment of the Project. Potential environmental impacts are well understood. The Project's environmental management plan isa generic one that can be applied to all project hospitals. CAH has committed to update the generic EMP as part of the IEEs for the remaining project hospitals and the environmental clearance process. CAH will provide adequate staff and budget to ensure EMP implementation in the Project hospitals. ADB will review the IEEs, including the site-specific EMPs of the remaining Project hospitals when they become available. No further environmental investigation is necessary.

Table A2.3: Environmental Management Plan

Project Activities	Predicted Impact	Degree of Impact	Mitigation/Enhancement Measure	Responsible Person	Remarks
Pre-Construction Stage					
Initial site preparation – cleaning and clearing of the site	• Air pollution in the form of dust • Noise pollution due to transportation, e.g., movement of vehicles • Generation of solid waste, e.g., cutting of shrubs, unwanted debris	Not very Significant	• Carry out water spraying at appropriate location to reduce dust emissions. • Provide workers with protective devices such as ear plugs. • Implement solid waste collection and management	Contractor	Incorporated in the contract documents and scope of work by the contractor
Temporary construction camps	• Wastewater generation	Moderately Significant	• Provide temporary shelters with proper drinking water and sanitation facilities for the construction workers • Collect and divert sewage to the nearby municipal sewer line	Contractor	Incorporated in the contract documents and scope of work by the contractor
Construction Stage					
Excavation and Foundation works	Deterioration of air quality and increase in noise level • Increase in dust levels • Increase in noise levels	Moderately Significant	• Shorten storage of construction spoils and/or excavated materials at temporary disposal area • Provide construction equipment with silencers, mufflers whenever practicable • Maintain construction equipment and vehicles in good working condition • Use sound barriers by enclosing work area • Cover delivery trucks or vehicles hauling waste materials with tarpaulin to avoid spills.	Contractor	Incorporated in the contract documents and scope of work by the contractor
Construction of superstructure					
Providing utilities (e.g., light, power, plumbing, telephone systems)					
Carpentry and tin smithy works (e.g., providing ceiling and roofing, fabrication and installation of cabinets and shelves)					
Installation of medical equipment.					
Painting works	• Odor problem		• Use water-based rather than kerosene-based paints • Store paint solvents properly • Provide construction workers with face masks	Contractor	Incorporated in the contract documents and scope of work by the contractor
	• Occupational risk and health hazard to construction	Not Significant	• Observe standard construction and safety measures	Contractor	Incorporated in the contract

Project Activities	Predicted Impact	Degree of Impact	Mitigation/Enhancement Measure	Responsible Person	Remarks
	workers		• Provide all workers with appropriate safety equipment, such as helmets, safety shoes, raincoats, and welding goggles • Prohibit any visitor from entering the construction site without safety gadgets • Ensure all workers undergo periodic medical check ups • Ensure construction area is properly barricaded and well lit and that warning signs are placed in strategic locations.		documents and scope of work by the contractor
	• Traffic congestion	Not Significant	• Schedule delivery of construction materials and hauling out of waste materials for disposal during lean traffic hours	Contractor	Part of contract
			• Deploy traffic aids to help ensure free flow of traffic		
	• Increase in solid waste generation	Moderately Significant	• Develop and implement a proper solid waste management plan during construction	Contractor	Part of contract
			• Limit dumping of solid waste in designated areas only		
			• Shorten storage time of construction excavated materials at temporary disposal area.		
			• Cover spoil and delivered materials		
			• Regularly clean, collect and dispose waste materials from the garbage disposal area		
			• Orient construction workers on proper waste disposal		
			• Assign a staff member to be in charge of solid waste		

Project Activities	Predicted Impact	Degree of Impact	Mitigation/Enhancement Measure	Responsible Person	Remarks
Operation and Maintenance					
Operation and maintenance of hospital facility	Generation of solid biomedical wastes	Significant	• Implement a biomedical waste management plan following the Biomedical Waste (Handling and Management) Rules 1989, stipulated by MoEF, Govt. of India • Follow guidelines on method of segregation, treatment and disposal. • Follow rules categorizing biomedical waste into ten categories. Use appropriate type of containers, color coding and labelling. • The biomedical waste generated will be sent to a common biomedical waste treatment facility, authorized for this purpose by the Karnataka State Pollution Control Board for treatment and disposal of the waste. • Domestic solid waste will be collected separately without mixing with the biomedical waste. Domestic waste will be collected by the Bangalore Municipal Corporation for further treatment and disposal.	Chief of Hospital and Hospital Utilities Manager	
Operation and maintenance of hospital facility	Generation of liquid wastes, e.g., wastewater generated from the from kitchen and/or cafeteria and toilets and other liquid waste from hospital wards	Significant	• Treat wastewater generated from the facility in a sewage treatment plant and render it fit for reuse on lawns and gardens within the Project site • Conduct rooftop rainwater harvesting, coupled with storm water harvesting and impoundment in an artificially created water body in order to recharge the groundwater table in the vicinity. • Upon installation of the sewage treatment plant, performance will be evaluated periodically by collecting samples from different stages of the	Chief of Hospital and Hospital Utilities Manager	

Project Activities	Predicted Impact	Degree of Impact	Mitigation/Enhancement Measure	Responsible Person	Remarks
			treatment. Daily treated effluent samples will be collected and analyzed for monitoring the quality of the treated wastewater. Parameters to be tested are pH, oil and grease, total suspended solids (TSS), biological oxygen demand (BOD_5), and chemical oxygen demand (COD).		
Operation and maintenance of hospital facility	Improved health care service to the community	Moderately Significant	• Undertake human resource development activities, such as training, to upgrade the skill level of medical administrative personnel. • Enhance maintenance of hospital facilities and equipment.	Chief of Hospital and Hospital Utilities Manager	

Source: Initial Environmental Examination.

SUMMARY POVERTY REDUCTION AND SOCIAL STRATEGY

Country/Project Title: India/Columbia Asia Hospitals Development Project

Lending/Financing Modality:	Direct Loan	Department/ Division:	Private Sector Operations Department/ Infrastructure Finance Division 1

I. POVERTY ANALYSIS AND STRATEGY

A. Linkages to the National Poverty Reduction Strategy and Country Partnership Strategy

1. Based on the country poverty assessment, the country partnership strategy, and the sector analysis, describe how the project would directly or indirectly contribute to poverty reduction and how it is linked to the poverty reduction strategy of the partner country.

In 2002, roughly two thirds of the 15,393 hospitals in India were public. After years of underfunding, most public health facilities are inefficient, inadequately managed and staffed, have poorly maintained medical equipment, and provide only basic care. ADB's draft country partnership strategy for India (2008–2012) confirmed ADB's support for private sector development of infrastructure, which includes health care.[a] The Project will support private sector investment in quality and affordable health care services in India, especially for the middle-income population. This will free public sector resources for the treatment of the poor. The Project is consistent with the Government of India's 11th Five Year Plan, which aims to enhance the contribution of the private sector to the provision of primary, secondary, and tertiary services, including through partnership with the government.

B. Poverty Analysis **Targeting Classification:** General intervention

1. Key Issues

The Project will provide international quality secondary health care services to the middle-income group and raise standards of the health care industry. This will allow the Government to use its limited resources to provide health care services for the lower-income categories.

2. Design Features. The Project is the development and operation of 10 hospitals (9 secondary and 1 tertiary) by Columbia Asia Hospitals (CAH).

C. Poverty Impact Analysis for Policy-Based Lending

1. Discuss the impact channels of the policy reform(s) (direct and indirect, short and medium term) to the country and major groups affected. N/A
2. Discuss the impact of the policy reform(s) on vulnerable groups and ways to address it/them. N/A
3. Discuss how the policy reform(s) contribute(s) to poverty reduction, pro-poor growth, and the MDGs. N/A

II. SOCIAL ANALYSIS AND STRATEGY

A. Findings of Social Analysis

The Project will indirectly improve the socioeconomic condition of key cities in India where the CAH hospitals are located by generating jobs for qualified medical staff, leading to improved health standards, life expectancy, and infant mortality rates. With respect to land requirements for the hospitals, all hospitals will either be constructed on land owned by the company or leased from private landowners. For example, the proposed 120-bed Bangalore Brigades Gateway hospital will lease about 1.5 ha of land inside the 16.9 hectares (ha) of the Brigades Gateway complex owned by Brigade Enterprises Pvt. Ltd. No archaeological, historical and religious sites exist in the project areas. No indigenous peoples were identified among the local populations.

B. Consultation and Participation

1. What level of consultation and participation (C&P) is envisaged during the project implementation and monitoring?
   ☒ Information sharing ☐ Consultation ☐ Collaborative decision making ☐ Empowerment

2. Was a C&P plan prepared? ☐ Yes ☒ No If a C&P plan was prepared, describe key features and resources provided to implement the plan (including budget, consultant input, etc.). If no, explain why.

The project sponsor undertook a comprehensive market and feasibility study, including informal discussions with the officials of the major cities before deciding on the location of the hospitals. For the Bangalore Brigades Gateway Hospital, public consultation was carried out as part of the township development phase. This included a discussion on the social services that would be provided as part of the complex, including health facilities such as a hospital. Township residents have expressed strong support for the hospital as it would generate jobs and contribute to local and regional economic development by ensuring a healthy workforce.

C. Gender and Development

1. Key Issues. The Project is not expected to cause any specific cultural or social impact on or exclude any socioeconomic group, including women, from benefiting from the Project

2. Key Actions. Measures included in the design to promote gender equality and women's empowerment—access to and use of relevant services, resources, assets, or opportunities and participation in decision-making process:
☐ Gender plan ☐ Other actions/measures ☒ No action/measure

Summarize key design features of the gender plan or other gender-related actions/measures, including performance targets, monitorable indicators, resource allocation, and implementation arrangements.

III. SOCIAL SAFEGUARD ISSUES AND OTHER SOCIAL RISKS

Issue	Significant/Limited/ No Impact	Strategy to Address Issue	Plan or Other Measures Included in Design
Involuntary Resettlement	No impact. Hospitals are being constructed on land owned by the Project Sponsor or leased from private entities at competitive rates.	None	☐ Full Plan ☐ Short Plan ☐ Resettlement Framework ☒ No Action
Indigenous Peoples	No impact. Hospitals will be constructed in key cities.	None	☐ Plan ☐ Other Action ☐ Indigenous Peoples Framework ☒ No Action
Labor ☒ Employment opportunities ☐ Labor retrenchment ☐ Core labor standards	No impact. Employment arrangements will comply with employment and labor standards as provided in the applicable laws and regulations.	None	☐ Plan ☐ Other Action ☒ No Action
Affordability	No impact. The Project Sponsor has a track record for providing effective and affordable medical services in a clean and caring environment	None	☐ Action ☒ No Action
Other Risks and/or Vulnerabilities ☐HIV/AIDS ☐Human trafficking ☐Others(conflict, political instability, etc), please specify	No impact.	None	☐ Plan ☐ Other Action ☒ No Action

IV. MONITORING AND EVALUATION

Are social indicators included in the design and monitoring framework to facilitate monitoring of social development activities and/or social impacts during project implementation? ☐ Yes ☒ No

AIDS = acquired immunodeficiency syndrome, HIV = human immunodeficiency virus, MDGs = millennium development goals

[a] ADB. 2008. *Country Partnership Strategy (2008–2012): India*. Manila.