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**FEASIBILITY STUDY REPORT ON THE PROPOSED BUSIA COUNTY REFERRAL ANNEX  
SPECIALIZED HOSPITAL**

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COUNTY GOVERNMENT OF BUSIA

**SECOND KENYA DEVOLUTION SUPPORT PROGRAM  
(KDSP II)**

FY 2025/20

**DECEMBER, 2025**

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## SECTION 1: PROJECT PROFILE

Project Name:	PROPOSED CONSTRUCTION BCRH ANNEX SPECIALIZED HOSPITAL
Project Reference Number:	BSA/CG/KDSP II/HEALTH/2025
Department:	HEALTH & SANITATION
Budget Vote (where applicable):	DEVELOPMENT(PSM)
Estimated Project Cost:	KSH. 1,352,122,276
Sector:	HEALTH
Accounting Officer:	CHIEF OFFICER DEVOLUTION
Official Contact Details (Provide email, telephone number, postal and physical address):	P.O BOX PRIVATE BAG-50400,BUSIA(K) <a href="mailto:busiacountydhealth@gmail.com">busiacountydhealth@gmail.com</a> , Tel. +254-727-814-591.
Project Threshold:	MEDIUM RISK
Project Geographic Location (Provide GPS coordinates here.):	0.46071 N; 34.10506E
County:	BUSIA COUNTY
Sub-County:	MATAYOS
Ward:	BURUMBA
Village:	48 ESTATE
Planned Start Date:	DECEMBER 2025
Planned End Date:	30 <sup>TH</sup> , JUNE,2026
Date of Submission:	17 <sup>th</sup> NOVEMBER, 2025

## **1.1 Project background: rationale and genesis**

This report presents the feasibility study for the proposed **Construction of BCRH Annex Specialized Hospital at Busia town, Busia County, Kenya**. The project aims to strengthen healthcare service delivery, reduce patient referrals to neighboring counties and national hospitals. The feasibility analysis covers the **technical, environmental, social, financial, and institutional aspects** of the project. The findings indicate that the project is viable and aligns with Kenya's Vision 2030, the County Integrated Development Plan (CIDP 2023–2027), the National Health Policy (2020–2030), and Kenya's climate resilience and disaster preparedness frameworks.

### **1.1.1 County Health Context; genesis**

Busia County has an estimated population of over 1 million residents (a population projection of 1,007,562 people (KNBS Summary projection 2019-KPHC), served by one County Referral Hospital and several Sub-County hospitals. Increasing population growth, cross-border disease burden, and limited capacity of existing health facilities have overstretched available infrastructure and personnel. Currently, Busia County relies on a combination of lower-level healthcare facilities (13 Hospitals, 18 Health Centers and 66 Dispensaries) and the Busia County Referral Hospital (formerly known as the Busia District Hospital), which is categorized as a Level 4 hospital. This hospital is often over whelmed due to the growing demand for health services, which includes not only residents but also individuals from neighboring Uganda who seek medical care.

In order to address the increasing population and healthcare needs in the region, there is a critical need to establish a Level 5 hospital in Busia County. A Level 5 hospital would provide specialized services, alleviate pressure on the current referral hospital, and significantly improve healthcare accessibility for the people of Busia County and its neighboring regions.

### **1.1.2 Rationale for the Project**

Currently, Busia County relies on Busia County Referral Hospital (Level 4), which lacks advanced medical equipment, specialized personnel, and capacity for major surgeries and critical care.

Patients requiring specialized treatment are often referred to hospitals in Bungoma, Kakamega, Kisumu, or Eldoret, leading to increased costs and delayed care. The Busia County therefore experiences;

a. High Disease Burden

Busia County records high prevalence of infectious diseases and rising non-communicable diseases (diabetes, hypertension, Cancer).

b. Limited Specialized Care

No Level 5 facility exists in the County, leading to over 40% of critical cases being referred outside (County Health Department, 2023).

c. Poor Maternal and Child Health

Maternal mortality stands at 495 per 100,000 live births (KDHS 2022), above the national average of 342 per 100,000 live births

d. Inadequate Infrastructure

Current facilities lack ICU units, cancer treatment, advanced surgical services, and specialized diagnostics.

Based on the above, there is need to provide climate-resilient healthcare infrastructure capable of withstanding disease outbreaks, and climate shocks/stress.

Further, the proposed project aligns with national devolution policy and the draft County Health Strategic Plan.

## **1.2 Objectives of the feasibility study**

- i. To identify potential risks and hazards associated with the proposed project
- ii. To examine possible mitigation measures for the identified risks
- iii. To establish project compliance to established standards and guidelines
- iv. To generate reports for communication with relevant bodies
- v. Generate an evaluation framework for the project

## **1.3 Approach and methodology of the feasibility study**

The feasibility study was undertaken using a multidisciplinary and participatory approach to

ensure that the proposed project is technically sound, economically viable, socially acceptable, and environmentally sustainable. The study process followed four main phases: preparation, data collection, analysis, and validation

### **Preparatory Activities**

Inception meeting was held with the County Department of Health, Infrastructure, and planning to define study objectives, scope, and deliverables. Review of existing documents was undertaken and some of reviewed documents included the Busia County Integrated Development Plan (CIDP 2023–2027), draft County Health Strategic Plan, Kenya Health Sector Strategic and Investment Plan (KHSSIP), and national policy documents

**Study design:** Development of work plan, data collection tools, and stakeholder engagement plan.

### **Data Collection and Situational Analysis**

Data were collected through a combination of primary and secondary sources:

#### **(a) Primary Data Collection**

**Site reconnaissance surveys:** Physical visits to the proposed hospital site (BCRH) to assess accessibility, topography, soil conditions, drainage, and available infrastructure (water, power, sewerage).

**Key informant interviews (KIIs):** Conducted with health administrators, county engineers, public health officers, and community representatives.

**Stakeholder consultations:** Public participation sessions to capture community health needs, gender perspectives, and social concerns was undertaken

**Environmental and climate screening:** Preliminary assessment of environmental risks, climate trends, and potential environmental impacts.

#### **(b) Secondary Data Collection**

1. Review of demographic data (Kenya National Bureau of Statistics, 2019 census).
2. Analysis of county health data on disease burden, patient referrals, and service gaps.
3. Review of existing hospital infrastructure and staffing levels.
4. Review of relevant engineering design standards and health facility guidelines.

### **Technical and Economic Analysis**

**Technical feasibility:** Assessment of land suitability, structural design options, utility connections, and compliance with Ministry of Health design standards.

**Environmental and social feasibility:** Screening based on the Environmental Management and Coordination Act (EMCA, 1999, amended 2015) and development of a preliminary ESMP.

**Economic and financial analysis:** Estimation of capital and operational costs, cost–benefit analysis, and identification of potential financing options (County budget, and donors).

**Institutional analysis:** Review of county capacity for project implementation, management, and maintenance.

## **1.5 Organization of the Feasibility Study**

This report begins with *project profile* that locates the project. Then the *market or demand* which justifies the need for the project by stating the problem and undertaking demand analysis. Next section is the *technical or engineering* which gives the planned implementation phases, project specifications and activities. The *human resources* in terms of management and labour requirements, and availability is addressed next. This moves to *institutional or legal* issues that would be of consideration before moving to the *financial* issues and costs. The next section then looks at analysis of the *social* and *economic* issues on the project. After this, the report presents *distribution analysis* and *sensitivity* analysis to identify the cost effective paths of reducing risks. The conclusion provides the next steps.

## **SECTION 2: MARKET/DEMAND**

### **2.1 Problem Statement**

The current health infrastructure and service delivery capacity of Busia County Referral Hospital (BCRH) is insufficient to meet the county’s complex and evolving healthcare demands. The hospital lacks specialized units such as a Burns Unit, Orthopedic Theatre, fully functional ICU, HDU, emergency surgery unit, obstetric care unit, trauma management center, and cancer

screening unit; necessitating referrals to other counties that have appropriate infrastructure to manage the cases. These secondary referrals introduce a 3–6-hour delay, significantly increasing the risk of preventable deaths (KHIS data) and loss in revenue.

The Primary Care Networks (PCN) and the referral systems depend on the BCRH that is inadequately prepared to handle specialized services expected of a level V facility. The breakdown of this referral system leads to costly and delayed secondary referrals, undermining public confidence and increasing mortality from otherwise treatable conditions. This therefore necessitates the hospital's upgrade to level V through the proposed infrastructural development

## **2.2 Relevance of the project idea**

Upgrading Busia County Referral Hospital to a Level 5 facility through the specialized Annex Hospital is strategically aligned with both national and county health priorities. The proposed project is in line with the objectives of the Kenya National Health Policy (2014–2030) and the Universal Health Coverage (UHC) Agenda, which emphasize equitable access to specialized healthcare and the strengthening of referral systems. According to the Ministry of Health's Service Delivery Framework, Level 5 hospitals are the apex of county referral networks and serve as centers for specialized care, training, and research.

At the county level, the project is consistent with the Busia County Integrated Development Plan (CIDP 2023–2027) and the County Health Sector Strategic and Investment Plan 2027 (CHSSIP), both of which prioritize upgrading BCRH to Level 5 status to enhance quality, accessibility, and efficiency of health service delivery.

The proposed infrastructure will expand the hospital's capacity to handle trauma, maternal emergencies, and specialized care, reducing referrals and improving outcomes. Currently Busia faces annual mortality of 12.6/1000 persons, Neonatal Mortality at 8.2/1000 live births, Maternal Mortality rate at 96/100,000 live births, and Infant Mortality Rate at 84/1000 live births (KDHS 2022)

Beyond health outcomes, the project has strong economic and social justification. A fully functional Level 5 hospital will retain within-county expenditure on specialized healthcare, generate new revenue streams through insurance reimbursements and service fees, the hospital

will serve as a training hub for medical professionals, fostering local capacity building and reducing dependence on external expertise.

### 2.3 proposed project interventions

S/No	Project Output	Indicator	Means of Verification
1	<b>Burns Unit (60 beds)</b>	Burns unit with 60 beds (30 male, 30 female), fully equipped with specialized burn care equipment.	Bed occupancy readiness report. Equipment delivery and installation certificates (e.g., for air-fluidized beds).
2	<b>Isolation Ward (60 beds)</b>	Isolation ward with 60 beds (30 male, 30 female) and negative pressure systems installed and functional.	Engineering test report for negative pressure. Handover certificate for the completed ward.
3	<b>Children's Wards (60 beds)</b>	Two Number of Separate wards for under-5 (30 beds) and 5-12 years (30 beds) established and child-friendly.	Completion report specifying ward allocations. Inventory of child-specific beds and equipment.
4	<b>Ophthalmic Ward (40 beds)</b>	Ophthalmic ward with 40 beds (20 male, 20 female) established and linked to the eye theatre.	Ward commissioning report. Inventory of ophthalmic-specific ward equipment.
5	<b>Oncology Ward (60 beds)</b>	Oncology ward with 60 beds (30 male, 30 female) equipped for chemotherapy administration.	Commissioning report. National Cancer Institute Certification.
6	<b>Eye Theatre</b>	A dedicated ophthalmic surgery room equipped with an operating microscope and ophthalmic surgery equipment.	Equipment installation and calibration certificates. First surgery conducted report.

7	<b>Advanced Pathology Lab</b>	Laboratory equipped with analyzers (e.g., hematology, biochemistry) and accredited to operate.	Equipment compliance reports. Laboratory accreditation certificate.
8	<b>Orthopedic Theater</b>	An operating room equipped with a C-arm image intensifier,	Equipment delivery notes and installation certificates.

S/No	Project Output	Indicator	Means of Verification
		Orthopedic table and orthopedic surgical sets.	Inventory of orthopedic surgical instruments.
9	<b>Sterilized Production Unit (SPU)</b>	A centralized sterile services department (CSSD) built and equipped with autoclaves and packaging stations.	Equipment commissioning reports.
10	<b>Conference Rooms</b>	At least one conference room constructed, furnished with seating for 100 people, and equipped with A/V systems.	Handover report. Inventory of furniture and A/V equipment.
11	<b>In-patient &amp; Out-patient Pharmacies</b>	Two separate pharmacy units operational, with dispensing counters and secure drug storage.	Pharmacy operational license. Inventory management system report.
12	<b>10 Specialized Clinics</b>	Ten clinic rooms constructed and designated for specific specialties (MOPC, SOPC, etc.).	Clinic allocation and commissioning report. Weekly clinic schedules published.
13	<b>2 Oro-Maxillofacial Surgery Rooms</b>	Two operating rooms equipped for oral and maxillofacial surgery.	Equipment inventory list (e.g., for plating systems). Room readiness and first surgery reports.

## **2.4 Stakeholders**

The table below identifies the stakeholders, their level of influence and the engagement strategy.

	Stakeholder	Level of Influence	Engagement Strategy
1	Hospital Management Board	High	Regular, formal reporting (monthly/quarterly). Involve in key decision-making and strategic oversight through the Project Implementation Committee. Provide oversight and governance
2	Busia County Assembly	High	Formal presentations during budget approval and at major project milestones. Provide periodic progress reports to ensure continued political and financial support. Provide oversight and governance t
3	Hospital Management Team	High	Daily collaboration and integration into the Project Management Committee. Weekly coordination meetings to ensure the project aligns with clinical needs and operational plans. Provide oversight
4	Dept. of Health & Sanitation	High	Regular strategic meetings to ensure alignment with county health policies and priorities. Provide Support and assist in supervision
5	Department of Public Works	High	Formal engagement through technical committees. They will review and approve architectural and structural designs, and monitor construction quality. Oversee the project implementation.
6	Department of County Treasury	High	Engage during budget planning and disbursement phases. Provide detailed financial reports and cash flow forecasts to facilitate timely release of funds. Procurement and Audit process
8	Departments of Social Services	High	Identification and inclusion of VMGs such as Youth, Women, PWDs
9	Kenya Power & Lighting Company	Medium	Formal coordination for power connectivity and infrastructure upgrades. Engage early in the project to plan for electrical load requirements.
10	Kenya Medical Training College (KMTC)	Medium	Establish a formal partnership for clinical placements and training. Involve in curriculum development for new specializations and hold periodic coordination meetings. Compliance to teaching and referral hospital needs.

11	<b>Alupe University</b>	Low	Collaborate on research opportunities, specialist referrals, and potential staff exchange programs.
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	<b>Stakeholder</b>	<b>Level of Influence</b>	<b>Engagement Strategy</b>
12	<b>Busia Chamber of Commerce &amp; Industry</b>	Low	Use as a channel for communicating business opportunities (supplies, services) to the local private sector. Newsletter updates and annual stakeholder forums.
13	<b>Busia Association of Contractors</b>	Low	Hold pre-tender briefings to build local capacity and ensure transparent procurement processes. Communicate contract opportunities fairly.
14	<b>Centre for Empowerment &amp; Community Development</b>	Low	Engage for community mobilization and sensitization. Provide project updates and gather community feedback through this CSO to ensure social accountability.
15	<b>Ministry of Health</b>	High	Formal engagement for policy alignment, potential national funding, and technical support. Submit mandatory periodic reports and involve in high-level launch events and milestone celebrations.
16	<b>NEMA (National Environment Mgmt. Authority)</b>	High	Proactive consultation for mandatory Environmental Impact Assessment (EIA) and licensing. Ensure full compliance with all environmental regulations to avoid stop orders. Provide all required monitoring reports.
17	<b>NCA (National Construction Authority)</b>	Medium	Formal notification and registration of the project as required. Engagement for quality assurance audits and ensuring compliance with national building standards and codes.
18	<b>Busia Municipality</b>	Medium	Coordinate for necessary county permits (e.g., land use, business permits), infrastructure access, and waste management services. Regular liaison with municipal engineers and planners.
19	<b>Department of Education</b>	Low	Explore and formalize partnerships for health education and promotion programs in schools. Provide informational updates about the new hospital services available to students and staff.

20	<b>Ministry of Interior</b>	Low	Notify and coordinate on matters of public order and security, especially during major construction phases or high-profile events. Engage local administration for community sensitization.
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	Stakeholder	Level of Influence	Engagement Strategy
21	Faith Based Organizations (FBOs)	Low	Engage as key community influencers for health promotion and mobilizing community support. Include in stakeholder forums and disseminate information through their networks.
22	Senate	High	Playing Oversight role and community engagements
23	Department of Public Service and Administration	High	Sensitization of the community and oversee the implementation of the project.

## 2.5 Demand Analysis

BCRH offers general curative services but falls short of comprehensive tertiary care. The absence of functional critical care, advanced diagnostics, and specialized sub-specialty units is the most glaring deficiency. See table 2 for service delivery gaps.

**Table 1: service delivery gaps  
Equipment needs**

Level 5 Mandatory Service/Clinic	BCRH Current Status	Identified Gap
Specialized Burn Care Unit	Absent. Severe burn patients are stabilized in A&E and referred out, incurring critical delays of 3-6 hours.	Provide for a burns unit with capacity for 60 (30 male, 30 female)

At least 3 Functional Theatres	Two functional theatres; below 3-theatre minimum.	Theaters – At least 7 (maternity, general, orthopedic, pediatric, ENT, Dental, ophthalmology)
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Pathology Services (incl. Histopathology)	Basic laboratory services are available; comprehensive pathology is absent.	Provide for an advanced pathology lab
Chemotherapy and Radiotherapy	Absent; forces all cancer patients requiring chemotherapy to travel to other counties.	Provide for oncology ward with capacity for 60 (30 male, 30 female)
Specialized Clinics (Cardiology, Oncology, etc.)	Core clinics are active but operate in makeshift spaces; significant absence of sub-specialty clinics.	Provide for 10 specialized clinics
Training Centre for Interns & Specialists	Hosts some training but lacks full KMPDC accreditation as a comprehensive internship site.	Provide for conference rooms

Wards	298	Inpatient bed capacity with at least a total of 500 beds [Medical (30 male, 30 female), Surgical (30 male, 30 female), Pediatric (30 under 5 years and 30 above 5-12 years), Orthopedic (30 male, 30 female), Obstetric (30 Antenatal, 30 post-natal), Gynecology (30 beds), New born unit (20 cots), Burns unit ( 30 male, 30 female, 30 pediatric), Isolation ward (30 male, 30 female)
Theatres		Theaters – At least 7 (maternity, general, orthopedic, pediatric, ENT, Dental, ophthalmology)

**ESTIMATES OF EQUIPMENT TO OPERATIONALIZE NEW WING OF BUSIA COUNTY REFERRAL HOSPITAL**

S/NO	EQUIP.DESCRPTION/DEPARTMENT	UNIT	QTY	@/UNIT PRICE	TOTAL PRICE
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<b>A</b>	<b>ONCOLOGY DEPARTMENT</b>	<b>NO</b>		<b>KSH.</b>	<b>KSH.</b>
1	ULTRASOUND	NO	1	1000000	10,000,000
2	CELPOSCOPY	NO	2	700000	1400000
3	ENDOSCOPY	NO	2	10400000	20800000
4	HYPERTHAMIA SYTEM	NO	2	695000	1390000
5	PHOTODYNAMIC THERAPY MACHINE	NO	2	80000	160000
6	INFUSION PUMPS	NO	3	145000	4350000
7	HYPOTHEMIA SYSTEM	NO	2	570000	1140000
8	PATOLOGY WORKSTSTION	NO	2	400000	800000
9	EMBEDDING DEVICE	NO	3	3805000	3805000
10	SLIDE PREPARATION TOOLS	NO	4	7000	28000
12	FLOW CYTOMETERS	NO	1	6500000	6500000
13	BONE MARROW BIOPSY M/C	NO	3	70000	210000
14	CYROPRESERVATION FREEZERS	NO	1	520000	520000
15	STEM CELL HARVESTING MACHINE	NO	1	8385000	8385000
16	OB/GYN SURGICAL TOOLS	SET	3	260000	780000
17	MEDICAL ONCOLOGY KIT	NO	5	800000	4000000
18	TRIAD TREATMENT CHAIRS	NO	3	620000	1840000
19	PATIENT MONITORS	NO	2	520000	1040000
20	DEFIBRILATORS	NO	15	1444300	21664500
21	OTOSCOPE	NO	20	16000	320000
22	STETHESCOPE	NO	20	26000	520000
23	OPHTHALMOSCOPE	NO	10	78000	780000
24	ONCOMINE ASSAYS	NO	1	420250	420250
25	BIOSAFETY CABINET	NO	2	1677000	3354000
	<b>SUB-TOTAL</b>				<b>94,206,750</b>
<b>B</b>	<b>BURNS DEPARTMENT</b>				
1	ICU BEDS	NO	5	600000	3000000
2	VENTILLATORS	NO	5	2860000	14300000
3	MONITORS	NO	10	520000	5200000
4	SYRINGE PUMP	NO	5	1677000	8385000
5	INFUSION PUMP	NO	5	145000	725000
6	DRIP STAND	NO	10	12000	120000
7	FLUID WARMIG	NO	2	220000	440000
8	BLOOD GAS ANALYZER	NO	2	838500	1677000
9	PORTABLE X-RAY	NO	2	2600000	5200000
10	VIDEO BRONCHOSCOPE	NO	2	1341600	2683200
11	DEFIBRILATOR WUTH ECG	NO	3	1444300	4332900
12	CRASH CART	NO	5	120000	600000
13	DERMATOMES	NO	4	13000	52000
14	MESHER	NO	4	201240	804960
15	FIBREGLASS TUBS	NO	2	215500	431000
16	DEBRIDEMENT INSTRUMENT	SET	2	88000	176000
17	SHOULDER WHEELS	NO	4	67000	268000
18	OVERHEAD PULLEYS	NO	4	10000	40000
19	STATIC BICYCLE	NO	2	400000	800000
20	THERAPEUTIC ULTRASOUND	NO	1	838500	838500

21	CRADLE	NO	10	44200	442000
	<b>SUB-TOTAL</b>				<b>50,515,560</b>
	<b>THEATRE DEPARTMENT</b>				
1	HYDRAULIC SURGICAL TABLE	NO	6	400000	2400000
2	DOUBLE ARM SURGICAL LIGHTS	NO	6	600000	3600000
3	PATIENT MONITORS	NO	12	520000	6240000
4	ANAESTHETIC MACHINE	NO	8	2500000	20000000
5	SURGICAL DIATHERMY	NO	12	400000	4800000
6	SUCTION MACHINE	NO	12	150000	1800000
7	DEFIBRILATOR	NO	12	1444300	17331600
8	INSTRUMENT TROLLEY	NO	12	20000	240000
9	WARMING CABINET	NO	6	220000	1320000
10	C-ARM	NO	6	10400000	62400000
11	FLUOROSCPE MACHINE	NO	6	2600000	15600000
12	AIR CONDITIONER 24BTU	NO	24	180000	4320000
	<b>SUB-TOTAL</b>				<b>140,051,600</b>
	<b>OPHTHALMOLOGY DEPARTMENT</b>				
1	SLIT LAMP MICROSCOPE	NO	1	754650	754650
2	ADVANCED TONOMETER	NO	3	838500	2515500
3	OPHTHALMOSCOPE	NO	3	78000	234000
4	OPTICAL COHERENCE TOMOGRAPHY	NO	1	44505000	44505000
5	KRATOMETER	NO	2	503100	1006200
6	PHOROPTER	NO	1	2515500	2515500
7	PERIMETRY/VISUAL ANALYZER	NO	1	13416000	13416000
8	LENSOMETER	NO	2	670800	1341600
9	AUTOREFRACTOR/REFRACTOMETER	NO	1	845000	845000
10	UBM ULTRASOUND	NO	2	1950000	3900000
11	OPERATING MICROSCOPE	NO	1	2934750	2934750
12	PHACOEMULSIFICATION MACHINE	NO	1	1715700	1715700
13	VITRECTOMY MACHNE	NO	1	1677000	1677000
14	CRYOSURGICAL UNIT	NO	2	3380000	6760000
15	EXAMINATION CHAIR	NO	1	838500	835500
16	DIGITAL VISUAL ACUITY	NO	4	83850	335400
17	INTRAOCULAR LENSES	NO	5	60000	300000
18	SPECULUM	NO	2	50310	100620
	<b>SUB-TOTAL</b>				<b>85,692,420</b>
<b>C</b>	<b>WELNESS DEPARTMENT</b>				
1	TREADMILL	NO	2	400000	800000
2	ELLIPTICAL	NO	2	300000	600000
3	STATIC BIKE	NO	3	70000	210000
4	DUMB BELL	NO	3	35000	105000
5	RESISTANCE BANDS	NO	3	5000	15000
6	CABLE CROSSOVER	NO	3	500000	1500000
7	VARSATILE CABLE MACHINE	NO	3	750000	2250000
8	LEG PRESS	NO	4	350000	1400000
9	LAT PULL DOWN	NO	4	300000	1200000
10	BICEPS/TRICEPS MACHINE	NO	4	200000	800000

11	YOGA MATS	NO	10	14000	140000
12	BOSU/BALANCE BALL	NO	10	26000	260000
13	MEDICINE BALL	NO	10	10000	100000
14	FOAM ROLLERS	NO	5	7300	36500
15	MEDITATION CUSHIONS	NO	10	10000	100000
16	PRODUCT DISPLAY SHELVES	NO	5	50000	250000
17	CHEST PRESS	NO	4	451000	1804000
18	LOCKERS/SHWERS	NO	10	10000	100000
19	SOUND SYSTEM	NO	1	50000	50000
20	FIRST AID KIT	NO	3	20000	60000
21	DISPENSER	NO	1	20000	20000
22	CLEANING STATIONS	NO	1	20000	20000
	<b>SUB-TOTAL</b>				<b>11,820,500</b>
<b>D</b>	<b>TRAUMA AND ORTHOPAEDIC DEPARTMENT</b>				
1	LARYNGOSCOPES	SET	5	175000	875000
2	ENDOCTREAL TUBES	PIECES	10	28000	280000
3	BAG VALVE MASKS	NO	20	7000	140000
4	SUCTION MACHINE	NO	5	150000	750000
5	FIBREOPTIC BRONCHOSCOPE	NO	3	300000	900000
6	TRACHEOSTOMY	NO	10	28000	280000
7	MECHANICAL VENTILATOR	NO	2	3225000	6450000
8	CYLINDERS/FLOWMETERS	NO	10	140000	1400000
9	CHEST TUBES	PIECES	4	8385	33540
10	DEFIBRILATOR	NO	2	1444300	2888600
11	RAPID INFUSER	NO	5	100000	500000
12	BLOOD WARMER	NO	2	220000	440000
13	CHEST CLAMPS RONTE	NO	5	350000	1750000
14	PELVIC BINDERS	NO	15	4500	67500
15	TOURNIQUETS	NO	15	5000	75000
16	DIGITAL BP MACHINE	NO	10	20000	200000
17	ULTRASOUND Efast	NO	1	3354000	3354000
19	PORTABLE X-RAY	NO	1	2600000	2600000
20	PATIENT MONITORS	NO	4	520000	2080000
21	PULSE OXIMETER	NO	5	150000	750000
22	CRASH CART	NO	2	120000	240000
23	THORACTOMY TRAY	NO	4	10000	40000
24	SURGICAL INSTRUMENT	SET	5	160000	800000
25	SPECIALIZED RESUSCITATION KITS	NO	4	150000	600000
26	BLANKETS	NO	50	2000	100000
27	FLUID WARMER	NO	1	220000	220000
28	WHEEL CHAIRS	NO	10	20000	200000
29	PATIENT STRETCHERS	NO	4	250000	1000000
30	CRUTCHES	NO	20	6000	120000
31	BLOOD GAS ANALYZER	NO	2	838500	1677000
32	C-ARM	NO	1	10400000	10400000
33	ORTHOPAEDIC OPERATING TABLE	NO	1	400000	400000
34	DRILLS AND REAMERS	NO	2	70000	140000

35	ARTHROSCOPY	NO	1	258000	258800
36	OSTEOTOMES	SET	4	20000	80000
37	BONE CHISEL	NO	6	4000	24000
38	FILES	NO	10	2000	20000
39	GAUGES	NO	6	5500	33000
40	MALLETS	NO	4	3000	12000
41	FORCEPS/CLAMPS	NO	10	2000	20000
42	SURGICAL INSTRUMENTS	SET	2	160000	320000
43	TRAUMA SETS	SET	5	85000	425000
44	PLATES AND SCREWS	NO	10	200000	2000000
45	INTERMEDULLARY NAILS	NO	10	232200	2322000
46	TRACTION GEAR	NO	3	7000	21000
47	ORTHOTIC DEVICES	NO	10	50000	500000
48	CRUTCHES	NO	15	6000	90000
49	WHEELCHAIRS	NO	15	20000	300000
50	AMPUTATION	SET	2	33000	66000
51	SPINE SET	SET	2	80000	160000
	<b>SUB-TOTAL</b>				<b>48,402,440</b>
<b>E</b>	<b>LAUNDRY DEPARTMENT</b>				
1	WASHING MACHINE	NO	1	5000000	5000000
2	DRYERS	NO	1	2000000	2000000
3	STEAM IRONERS	NO	1	2000000	2000000
4	ROTARY IRONERS	NO	1	3000000	3000000
5	STEAM PRESSERS	NO	1	1500000	1500000
6	DRY CLEANING MACHINE	NO	1	2000000	2000000
7	LAUNDRY TROLLEYS	NO	20	40000	800000
8	LAUNDRY BUCKETS	NO	20	40000	80000
9	HAMPERS	NO	10	10000	100000
10	BASINS	NO	10	3000	30000
11	SHELVES	NO	10	150000	1500000
	<b>SUB-TOTAL</b>				<b>18,010,000</b>
<b>F</b>	<b>KITCHEN DEPARTMENT</b>				
1	CHEF'S KNIFE	NO	10	1000	10000
2	CUTTING BOARDS	NO	10	1000	10000
3	PEELERS	NO	2	30000	60000
4	SCISSORS	NO	3	1000	3000
5	PANGAS	NO	5	700	3500
9	ELECTRIC FRYERS	NO	3	10000	30000
10	GAS COOKERS	NO	2	20000	40000
11	OVENS	NO	2	20000	40000
12	STAINLESS STEEL	NO	3	50000	150000
13	REFRIGERATION UNITS	NO	1	5000000	5000000
14	FREEZERS	NO	1	200000	200000
	<b>SUB-TOTAL</b>				<b>5,545,500</b>
<b>G</b>	<b>CSSD DEPARTMENT</b>				
1.	AUTOMATED WASHER-DISINFECTOR	NO	2	250000	500000
2	ULTRASONIC WASHER	NO	2	200000	400000

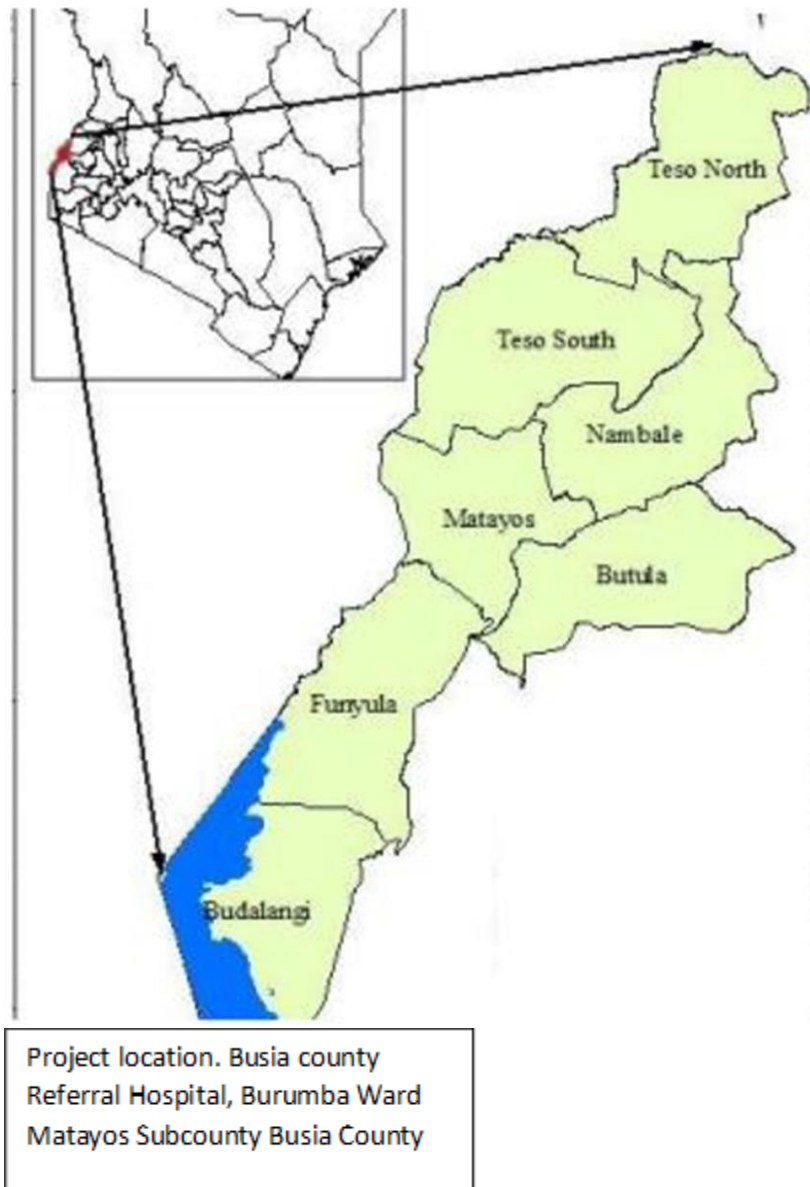
3	FULLY AUTOMATIC 150L AUTOCLAVE	NO	1	1000000	1000000
4	PLASMA STERILIZER	NO	1	500000	500000
5	DRYING CABINET	NO	3	20000	60000
6	ROTARY SEALER	NO	2	50000	100000
7	INSTRUMENT TROLLEYS	NO	5	20000	100000
8	STAIN STEEL WORKSTATION	NO	3	100000	300000
9	STORAGE RACKS	NO	10	10000	100000
	<b>SUB-TOTAL</b>				<b>16,560,000</b>
<b>H</b>	<b>GENERAL EQUIPMENT</b>				
1	STETHOSCOPE	NO	20	28000	560000
2	BP MACHINE	NO	30	20000	600000
3	THERMOMETER	NO	200	200	40000
4	PULSE OXIMETER	NO	20	200000	4000000
5	GLUCOMETER	NO	40	8000	320000
6	DIGITAL ADULT WEIGHING SCALE	NO	20	70000	1400000
7	DIGITAL PAEDIATRIC WEIGHING SCALE	NO	20	60000	1200000
8	OXYGEN COCENTRATORS	NO	20	250000	5000000
9	NEBULIZERS	NO	20	20000	400000
10	EXAMINATION COACH	NO	20	50000	1000000
11	OXYGEN CYLINDER/FLOWMETER	NO	100	140000	14000000
12	TOUNGUE PRESSERS	NO	20	1500	30000
15	FLASHLIGHT/PENLIGHT	NO	10	5000	50000
16	HOSPITAL BEDS	NO	150	120000	18000000
17	WHEELCHAIRS	NO	20	20000	400000
18	PATIENT SCREEN	NO	20	10000	200000
19	SUCTION MACHINE	NO	15	150000	2250000
20	DEFIBRILATOR	NO	5	1444300	7221500
21	PATIENT MONITORS	NO	10	520000	5200000
22	RESUSCITTAIRE	NO	5	3500000	17500000
	<b>SUB-TOTAL</b>				<b>79,371,500</b>
<b>I</b>	<b>ENT DEPARTMENT</b>				
1	TONSILLECTOMY	SET	1	240000	240000
2	NOSA/BONE FRACTURE	SET	1	3000	3000
3	SEPTOPLASTY	SET	1	51600	51600
4	CADWELL LUC	SET	1	91000	91000
5	FESS	SET	1	40000	40000
6	DIRECT LARYNGOSCOPE	NO	1	18000	18000
7	MCRO LARYNGOSCOPE	NO	1	20000	20000
8	TYMPANOPLASTY	SET	1	46500	46500
9	MASTOIDECTOMY	SET	1	32250	32250
10	STAPEDOCTOMY	SET	1	206400	206400
11	BRONCHOSCOPY	SET	1	1290000	1290000
12	TRACHEOSTOMY	SET	1	200000	200000
13	TROCAR	SET	2	130000	260000
14	CANULA	NO	2	3000	6000

	<b>SUB-TOTAL</b>				<b>2,504,750</b>
<b>K</b>	<b>MEDICAL PLANTS</b>				
1	OXYGEN PLANT WITH REFILING OPTION	NO	1	100000000	100000000
2	1000 KVA GENERATOR	NO	1	40000000	40000000
	<b>SUB-TOTAL</b>				<b>140,000,000</b>
	<b>GRAND TOTAL</b>				<b>692,681,020</b>

**SECTION 3: TECHNICAL OR ENGINEERING**

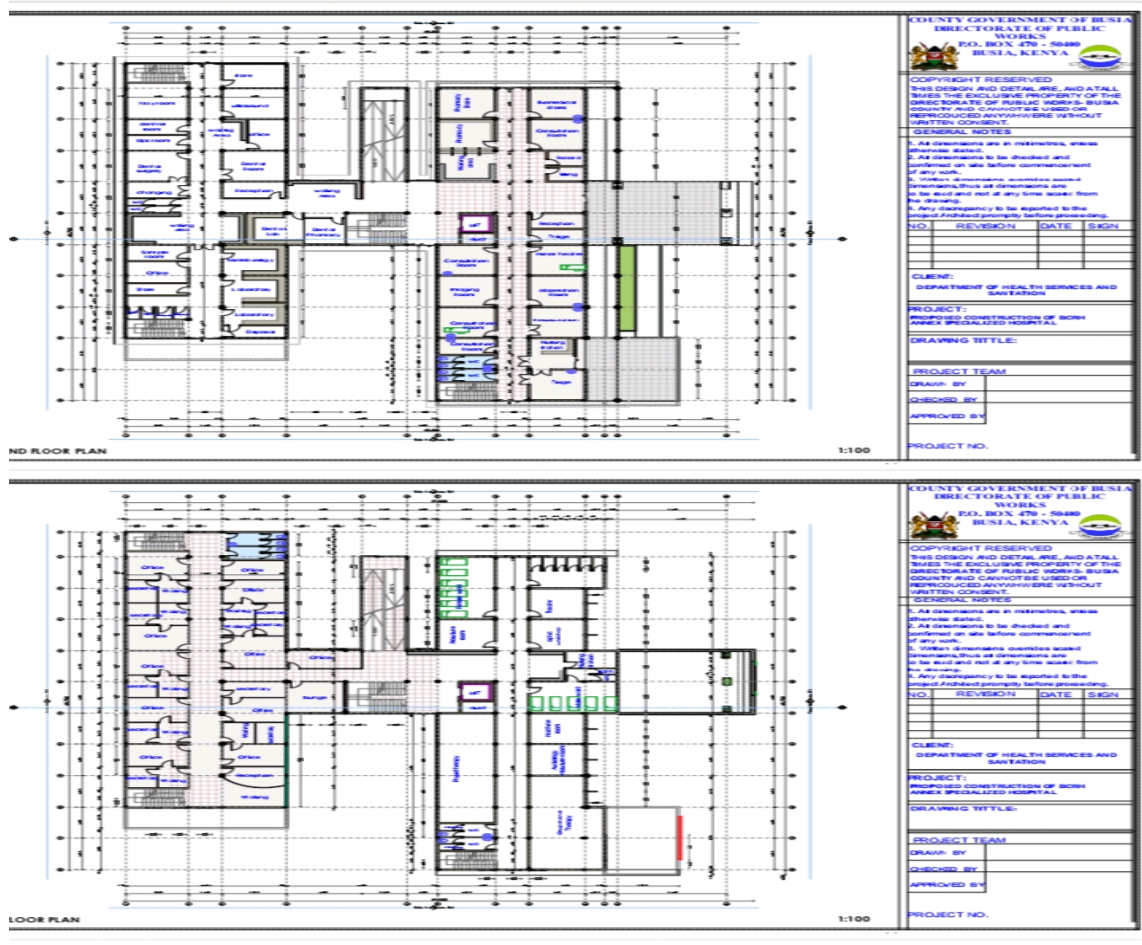
### 3.1 Location.

The project is located in Busia County, Busia Town, at the Busia County Referral Hospital Annex lan. The proposed site is geographical located along latitude 0.46 and longitude 34.1 The land is owned by the County Government of Busia



### 3.2 Technical design.

- (i) Scope of works: Comprises of a three-story building of a 193-bed capacity and will house several essential departments; Maternal and Child Health Unit, Specialized clinics, Casualty, Out-patient department, Pharmacy ,Advanced Laboratory, Theater, In-patient wards, Administrative offices and Resource centers
- (ii) technology adopted, design standards, and specification; use of reinforced concrete frame structure with energy efficient systems, PWLD friendly designs and in compliance with Ministry of Health Facility Design Standards (2021), Building code (2024), EMCA Cap 387, etc.



## (iii) Key output indicators;

S/N	Indicator	Target
1	Number of burns care units established	1
2	Number of wards established (Bed Capacity)	193
3	Number of pharmacy units established	2
4	Number of Theaters	3
5	Number of Specialized Clinics	10
6	Number of Sterilized Production Units established	1
7	Number of Laboratory units established	1
8	Number of Causality Units established	1
9	Number of Administrative and resource Centers Units established	1

(iv) **Production plan:**

The infrastructure is designed for 193 bed capacity with an expected utilization of 70- 80% within first three years post-commissioning.

- (v) **Costs estimates.** The estimated cost is KSH. 352 500 with 10 – 15% of total budget allocated for inflation, exchange rates fluctuations, and unforeseen technical variations.
- (vi) **Implementation timing.** A Gantt chart (or equivalent) with the works planned is presented below.

**Implimentation Matrix**

Task	Start Date	End Date	Duration (days)	% Complete	Predecessor
Pre-Construction	5-Jan-25	29-May-25	105		
Feasibility study	5-June-25	30-Dec-25	30		
Site acquisition & survey	19-Jan-26	13-Mar-26	40		
Design	2-Feb-26	24-Apr-26	60		
Permits (NEMA/NCA)	30-Mar-26	22-May-26	40		Design
Tendering	30-Mar-26	8-May-26	30		Design
Site Prep & Substructure	1-Jun-	25-	85		Permits

	26	Sep-26		
<b>Mobilization</b>	1-Jun-26	12-Jun-26	10	
<b>Foundations</b>	8-Jun-26	28-Aug-26	60	
<b>Basement/service ducts</b>	17-Aug-26	25-Sep-26	30	Foundations
<b>Superstructure</b>	14-Sep-26	16-Apr-27	155	
<b>Structural frame</b>	14-Sep-26	29-Jan-27	100	Foundations
<b>Masonry</b>	7-Dec-26	26-Feb-27	60	Frame(50%)
<b>Roofing</b>	15-Mar-27	23-Apr-27	30	Masonry
<b>MEP &amp;Specialized</b>	22-Mar-27	24-Dec-27	200	
<b>Electrical</b>	22-Mar-27	9-Jul-27	80	Frame
<b>Plumbing + Medical gases</b>	5-Apr-27	23-Jul-27	80	Frame
<b>HVAC</b>	19-Apr-27	3-Sep-27	100	Frame
<b>Lifts/BMS/Nurse call</b>	2-Aug-27	22-Oct-27	60	Electrical
<b>MRI/CT shielding &amp;install</b>	11-Oct-27	24-Dec-27	55	HVAC
<b>Finishes</b>	12-Jul-27	24-Dec-27	120	
<b>Flooring</b>	12-Jul-27	1-Oct-27	60	Masonry
<b>Ceilings &amp;doors</b>	9-Aug-27	15-Oct-27	50	Flooring
<b>Painting/signage</b>	4-Oct-27	24-Dec-27	60	Ceilings
<b>External Works &amp;Testing</b>	1-Nov-27	18-Feb-28	80	
<b>Roads/parking/landscaping</b>	1-Nov-27	7-Jan-28	50	Roofing
<b>Water/sewer/STP</b>	1-Nov-27	21-Jan-28	60	Roofing
<b>KPLC power connection</b>	22-Nov-27	14-Jan-28	40	External
<b>Fire/commissioning</b>	17-Jan-28	25-Feb-28	30	MRI,Power
<b>Handover</b>	14-Feb-28	21-Apr-28	50	
<b>Equipment install</b>	14-Feb-28	7-Apr-28	40	Commissioning
<b>Staff training/dry run</b>	21-Mar-28	14-Apr-28	20	Equipment
<b>Licensing &amp;opening</b>	10-Apr-	21-Apr-	10	Training

## **SECTION 4: ENVIRONMENTAL AND SOCIAL ASSESSMENT**

### **4.1 Hazard, Environmental and Social Safeguards**

The proposed project will comply with the Environmental Management and Coordination Act (EMCA, 1999 [Amended 2015]) and the National Environmental Management Authority (NEMA) requirements. Environmental social climate and disaster screening will be undertaken on the site. A site-specific Environmental and Social Impact Assessment (ESIA) will be undertaken prior to construction to identify and mitigate potential risks, including waste generation, air and noise pollution, and occupational health hazards. The contractor will implement an Environmental and Social Management Plan (ESMP) to ensure compliance with national standards, promote worker safety, and prevent adverse community impacts. Gender inclusion and community engagement will form part of the safeguards implementation to ensure social sustainability.

### **4.2 Environmental and Social Risk Assessment**

The construction of a Level 5 Hospital in Busia County presents potential environmental and social risks, including land disturbance, waste generation, increased water and energy demand, and temporary community disruptions. A site-specific Environmental and Social Impact Assessment (ESIA) will be conducted prior to construction, identifying mitigation measures to minimize adverse impacts. The contractor will implement an Environmental and Social Management Plan (ESMP) in compliance with EMCA (1999), NEMA regulations, and county environmental guidelines.

### **Economic Effects of Environmental Norms**

The project will adhere to environmental norms, which carry both economic costs and benefits. Compliance costs may include investments in construction waste management, erosion control, and pollution mitigation measures. While these increase upfront project expenditures, they prevent long-term costs associated with environmental degradation, health impacts, and resource depletion. Adhering to these norms supports sustainable resource use, promotes cleaner construction technologies, and aligns with Kenya's Vision 2030 and Green Economy Strategy.

### **Compensation for Ecological Damages**

In the event of environmental damage, the County Government of Busia will enforce the Polluter Pays Principle (PPP), ensuring that responsible parties finance remediation, restoration, or compensation. These measures ensure that the project not only minimizes environmental harm but also safeguards economic and social interests. Proactive environmental management will reduce risks, protect community health, and maintain the sustainability of natural resources critical for Busia County's long-term development.

### **Monitoring and Compliance**

site visits and compliance reporting which includes tracking waste management, emissions, and mitigation of social impacts. Any deviations will be corrected promptly in coordination with NEMA and county authorities.

## **4.3 Major Risks Affecting the Project**

### **Financial Risks**

1. **Budget Overruns:** Costs for construction materials, labor, and equipment may escalate due to inflation or market fluctuations.
2. **Delayed Payments:** Late disbursement of funds from the County Government or development partners could slow construction progress.
3. **Funding Gaps:** Inadequate financing may stall the project, especially for specialized equipment or staff recruitment.

### **Technical and Construction Risks**

- ✓ **Contractor Capacity:** Lack of experience or inadequate technical expertise could lead to poor workmanship or delays.
- ✓ **Design and Engineering Errors:** Errors in architectural or structural design can result in costly rework.

- ✓ **Equipment Procurement Delays:** Specialized medical equipment (ICU beds, diagnostic machines) may face long delivery times or import challenges.
- ✓ **Site Constraints:** Difficulties with soil stability, drainage, or utilities could affect construction timelines.

### **Environmental Risks**

- **Regulatory Non-Compliance:** Failure to comply with NEMA regulations or EMCA (1999) standards may result in fines or work stoppages.
- **Natural Hazards:** flashfloods from, heavy rainfall, or other extreme weather events could damage partially completed structures or delay construction.
- **Waste Management Issues:** The hospital will generate medical waste
- **Asbestos that requires proper disposal**

### **Social Risks**

1. **Community Opposition:** Local communities may resist the project due to land use concerns or perceived disruptions.
2. **Health and Safety Risks:** Accidents on site could harm workers or visitors if proper occupational safety measures are not enforced.
3. **Labor Disputes:** Strikes or conflicts with workers may delay construction.

### **Institutional and Governance Risks**

- ✓ **Coordination Challenges:** inadequate stakeholder synergies may delay operation
- ✓ **Political Interference** Changes in local leadership or priorities may affect project continuity.
- ✓ **Monitoring and Oversight Weaknesses:** Inadequate supervision may result in deviations from quality standards or delays.

### **Operational and Post-Implementation Risks**

- ✓ **Staffing Shortages:** After construction, inadequate recruitment of qualified medical personnel could limit service delivery.
- ✓ **Maintenance Challenges:** Without a proper maintenance plan, medical equipment and infrastructure may deteriorate rapidly.
- ✓ **Revenue Shortfalls:** Lower-than-expected revenue from hospital services may affect operational sustainability.

#### 4.4 Mitigation Strategies

- Financial: Contingency budgets phased funding, and timely disbursement agreements.
- Technical: Pre-qualification of contractors, peer review of designs, and robust procurement planning.
- Environmental: Conduct ESIA, implement ESMP, and adhere to NEMA compliance guidelines.
- Social: Community engagement, occupational safety protocols, and grievance mechanisms.
- Institutional: Clear roles and responsibilities, regular coordination meetings, and monitoring frameworks.
- Operational: Recruitment plans, staff training programs, and preventive maintenance schedules.

### SECTION 5: HUMAN RESOURCES AND ADMINISTRATIVE SUPPORT MODULE

This section outlines the human resource requirements for both implementing and operating the Integrated Health and Wellness Complex. It details the management structure, labor needs, sourcing strategy, and alignment of HR planning with the project timeline.

#### 5.1 Managerial and Labor Needs of the Project

##### 1. Project Implementation Phase (Construction & Setup):

###### ✓ **Managerial Needs:**

- **Project Manager:** To oversee the entire project lifecycle, from planning to handover.
- **County Architect/Engineer:** To provide technical supervision and ensure compliance with designs and standards.
- **County Procurement Officer:** To manage the tendering and procurement of works, goods, and services.
- **Hospital Management represented by the medical superintendent:** To oversee the entire project lifecycle as the client
- **Finance officer:** To provide financial insights and financial support during the implementation period

###### ✓ **Labor & Specialist Needs:**

- **Construction Firm:** A contractor providing all necessary skilled and unskilled labor (e.g., masons, electricians, plumbers).
- **Consultants:** Architectural, engineering, and environmental consultants for design and oversight.
- **Quantity Surveyor:** For cost management and valuation of works.

**2. Project Operation Phase (Post-Construction):**

The following staff will be required for expanded wing of Busia County Referral Hospital:

**1. ONCOLOGY UNIT (CANCER CENTRE)**

	<b>DESIGNATION</b>	<b>NO. REQUIRED</b>	<b>UNIT COST</b>	<b>ANNUAL TOTAL</b>
<b>1</b>	MEDICAL ONCOLOGIST	1	339230	4,070,760
<b>2</b>	RADIATION ONCOLOGIST	1	339230	4,070,760
<b>3</b>	PALLIATIVE CARE PHYSICIAN	1	339230	4,070,760
<b>4</b>	NURSES	15	1,239,000	14,868,000
<b>5</b>	ONCOLOGIST PHARMACIST	1	339230	4,070,760
<b>6</b>	MEDICAL PHYSICISTS	1	339230	4,070,760
<b>7</b>	RADIATION THERAPIST	2	678,460	8,141,520
<b>8</b>	PATHOLOGIST	1	339230	4,070,760
<b>9</b>	NUTRITIONISTS	3	78,750	2,835,000
<b>10</b>	SUPPORT STAFF (CLEANERS)	3	28035	1,009,260
	<b>SUB TOTAL KSHS</b>			<b>51,278,340</b>

**2. BURNS UNIT**

	<b>DESIGNATION</b>	<b>NO. REQUIRED</b>	<b>UNIT COST/MONTH</b>	<b>ANNUAL TOTAL</b>
<b>1</b>	NURSES	15	1,239,000	14,868,000
<b>2</b>	PLASTIC SURGEON	1	339230	4,070,760
<b>3</b>	GENERAL SURGEON	1	339230	4,070,760
<b>4</b>	PHYSIOTHERAPIST	1	80750	969,000
<b>5</b>	OCCUPATIONAL THERAPIST	1	80750	969,000
<b>6</b>	SUPPORT STAFF CLEANERS	3	28035	1,009,260
<b>7</b>	NUTRITIONIST	2	78,750	1,890,000
	<b>SUB TOTAL KSHS</b>			<b>27,846,780</b>

**3. TRAUMA CENTRE**

	<b>DESIGNATION</b>	<b>NO. REQUIRED</b>	<b>UNIT COST</b>	<b>TOTAL</b>
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<b>1</b>	NURSES	24	1,982,400	23,788,800
<b>2</b>	REGISTERED CLINICAL OFFICERS	4	394,800	4,737,600
<b>3</b>	ANETHEOLOGIST	1	339230	4,070,760
<b>4</b>	ORTHOPEDIC TRAUMA TECHNICIAN	2	155,100	1,861,200
<b>5</b>	RADIOGRAPHERS	2	161,500	1,938,000
<b>6</b>	SUPPORT STAFF (CLEANER)	3	28035	1,009,260
	<b>SUB TOTAL KSHS</b>			<b>37,405,620</b>

#### 4. THREE OPERATING THEATRES

	DESIGNATION	NO. REQUIRED	ANNUAL UNIT COST	TOTAL
1	NURSES	21	1,239,000	14,868,000
2	ANESTHETIST	3	277,800	3,333,600
3	SUPPORT STAFF (CLEANER)	2	28,035	672,840
	<b>SUB TOTAL KSHS</b>			<b>18,874,440</b>

#### 5. AMENITY WARDS WITH 80 BEDS

	DESIGNATION	NO. REQUIRED	UNIT COST/MONTH	TOTAL
<b>1</b>	NURSES	14	1,156,400	13,876,800
<b>2</b>	MEDICAL OFFICERS	2	444,220	5,330,640
<b>3</b>	SUPPORT STAFF (CLEANERS)	3	28035	1,009,260
	<b>SUB TOTAL KSHS</b>			<b>20,216,700</b>

#### 6. GENERAL WARDS WITH 120 BEDS

	DESIGNATION	NO. REQUIRED	UNIT COST/MONTH	ANNUAL TOTAL
<b>1</b>	Nurses	20	1,652,000	19,824,000
<b>2</b>	Medical Officers	2	444,220	5,330,640
<b>3</b>	SUPPORT STAFF (CLEANERS)	4	28035	1,345,680
	<b>SUB TOTAL</b>			<b>26,500,320</b>

#### 7. EYE UNIT

	DESIGNATION	NO REQUIRED	UNIT	ANNUAL TOTA;
<b>1</b>	NURSES	15	82,600	14,868,000
<b>2</b>	OPHTHALMOLOGIST	1	339,330	4,071,960

3	CLINICAL OFFICERS/CATARACT SURGEONS	6	116,833	8,411,976
4	SUPPORT Staff (CLEANERS)	2	28,035	672,840
	<b>SUB TOTAL KSHS</b>			28,024,776

### 5.2 Ability to Acquire required Managerial and technical Skills

- ✓ **For Implementation:** The County Government and BCRH have the ability to source these skills internally from existing departments (Public Works, Health, County Treasury). Where there are gaps the county can hire additional staff on fixed-term contract to ensure dedicated, professional oversight.
- ✓ **For Operation:** The core management capacity exists within the **BCRH senior management (Medical Superintendent, Hospital Administrator)**. Therefore, the county will:
  - **Recruit Externally:** Advertise competitively to attract qualified candidates from the private and public health sectors.
  - **Invest in Training:** Provide intensive training in strategic leadership and financial management for the existing BCRH management team to elevate their capacity.

### 5.3 Wage Rates for Labor Skills Required

Wage rates will be determined by the following frameworks:

- **Public Sector Roles:** All county-employed staff (clinical, administrative, support) will be remunerated according to the **Scheme of Service for the Public Health Sector** and the **County Government Salary Scale**. This provides standardization and ensures equity.

#### Staff needs

The following staff will be required for expanded wing of Busia County Referral Hospital:

#### 8. ONCOLOGY UNIT (CANCER CENTRE)

	DESIGNATION	NO. REQUIRED	UNIT COST	ANNUAL TOTAL
1	MEDICAL ONCOLOGIST	1	339230	4,070,760
2	RADIATION ONCOLOGIST	1	339230	4,070,760
3	PALLIATIVE CARE PHYSICIAN	1	339230	4,070,760
4	NURSES	15	1,239,000	14,868,000

5	ONCOLOGIST PHARMACIST	1	339230	4,070,760
6	MEDICAL PHYSICISTS	1	339230	4,070,760
7	RADIATION THERAPIST	2	678,460	8,141,520
8	PATHOLOGIST	1	339230	4,070,760
9	NUTRITIONISTS	3	78,750	2,835,000
10	SUPPORT STAFF (CLEANERS)	3	28035	1,009,260
	<b>SUB TOTAL KSHS</b>			<b>51,278,340</b>

#### 9. BURNS UNIT

	DESIGNATION	NO. REQUIRED	UNIT COST/MONTH	ANNUAL TOTAL
1	NURSES	15	1,239,000	14,868,000
2	PLASTIC SURGEON	1	339230	4,070,760
3	GENERAL SURGEON	1	339230	4,070,760
4	PHYSIOTHERAPIST	1	80750	969,000
5	OCCUPATIONAL THERAPIST	1	80750	969,000
6	SUPPORT STAFF CLEANERS	3	28035	1,009,260
7	NUTRITIONIST	2	78,750	1,890,000
	<b>SUB TOTAL KSHS</b>			<b>27,846,780</b>

#### 10. TRAUMA CENTRE

	DESIGNATION	NO. REQUIRED	UNIT COST	TOTAL
1	NURSES	24	1,982,400	23,788,800
2	REGISTERED CLINICAL OFFICERS	4	394,800	4,737,600
3	ANESTHESIOLOGIST	1	339230	4,070,760
4	ORTHOPEDIC TRAUMA TECHNICIAN	2	155,100	1,861,200
5	RADIOGRAPHERS	2	161,500	1,938,000
6	SUPPORT STAFF (CLEANER)	3	28035	1,009,260
	<b>SUB TOTAL KSHS</b>			<b>37,405,620</b>

#### 11. THREE OPERATING THEATRES

	DESIGNATION	NO. REQUIRED	ANNUAL UNIT COST	TOTAL
1	NURSES	21	1,239,000	14,868,000
2	ANESTHETIST	3	277,800	3,333,600

3	SUPPORT STAFF (CLEANER)	2	28,035	672,840
	<b>SUB TOTAL KSHS</b>			18,874,440

### 12. AMENITY WARDS WITH 80 BEDS

	DESIGNATION	NO. REQUIRED	UNIT COST/MONTH	TOTAL
1	NURSES	14	1,156,400	13,876,800
2	MEDICAL OFFICERS	2	444,220	5,330,640
3	SUPPORT STAFF (CLEANERS)	3	28035	1,009,260
	<b>SUB TOTAL KSHS</b>			20,216,700

### 13. GENERAL WARDS WITH 120 BEDS

	DESIGNATION	NO. REQUIRED	UNIT COST/MONTH	ANNUAL TOTAL
1	Nurses	20	1,652,000	19,824,000
2	Medical Officers	2	444,220	5,330,640
3	SUPPORT STAFF (CLEANERS)	4	28035	1,345,680
	<b>SUB TOTAL</b>			<b>26,500,320</b>

### 14. EYE UNIT

	DESIGNATION	NO REQUIRED	UNIT	ANNUAL TOTAL;
1	NURSES	15	82,600	14,868,000
2	OPHTHALMOLOGIST	1	339,330	4,071,960
3	CLINICAL OFFICERS/CATARACT SURGEONS	6	116,833	8,411,976
4	SUPPORT Staff (CLEANERS)	2	28,035	672,840
	<b>SUB TOTAL KSHS</b>			28,024,776

### 15. MENTAL HEALTH UNIT

		NO	UNIT	ANNUAL
1	NURSES	15	82,600	14,868,000
2	CONSULTANT PSYCHIATRIST	1	339230	4,070,760
3	SUPPORT STAFF (CLEANERS)	8	28035	2,691,360
4	CLERKS	4	28035	1,345680

5	HEALTH ADMINISTRATIVE OFFICER	3	78,300	2,818,800
	<b>SUB TOTAL KSHS</b>			25,794,600

**GRAND TOTAL** **KSHS.** **209,441,256**

- **Contractor Labor:** Wages for construction labor will be determined by market rates through the competitive tendering process, in line with the **National Construction Authority (NCA)** guidelines.

## 5.4 Reconciliation of HR Requirements with Availability and Project Timing

A phased recruitment and training plan ensures human resource needs are met in sync with the project timeline.

- **Implementation Phase (FY1-FY2):**
  - **FY1, Q1: Project Manager and Procurement Team** are mobilized.
  - **FY1, Q2: Consultants and Contractor** are engaged.
  - **This ensures managerial and technical skills are in place before major expenditures begin.**
- **Operational Phase (Lead-up to Opening):**
  - **FY2, Q3: Recruitment process begins** for key managerial and clinical specialist positions. This lengthy process is initiated well in advance.
  - **FY2, Q4: Offers are made** to the first wave of staff. **Training programs** commence for existing BCRH staff who will transition to the new complex.
  - **At Handover (End of FY2):** The first wave of new staff is on-boarded, and the **operational team is ready for service commencement.**

This proactive, time-phased approach ensures that the right people with the right skills are available precisely when they are needed, preventing delays in project implementation or the opening of the complex. The staffing plan will be formally annexed to the County's Integrated Development Plan to secure budgetary allocation.

## SECTION 6: INSTITUTIONAL OR LEGAL MODULE

### 6.1 Legal or regulatory issues that could be detrimental to or assist the project

#### Risk mitigation

- ✓ Approval of building plans: Approvals of building plans ensures ensure standards are enforced and therefore building are stable and durable
- ✓ Inspection of works: Inspection ensures the works continue to comply and avoid costly errors
- ✓ Use of approved construction materials: The use of approved materials ensures quality of the structures
- ✓ Disposal of construction waste: Improper Disposal can cause injuries and pollute the environment. The requirement protects community, workers and users

- ✓ Contractor sourcing

## Labor management

- ✓ Proper engagement of workers: Lack of clear contracts with job descriptions and well guided remuneration could lead to costly labor disputes
- ✓ Non-discrimination: Discrimination on gender, age, and lack of inclusivity of VMGs could lead to feeling of exclusion, tension with workers unions and disruption of work
- ✓ Working conditions: Poor working conditions could lead to injuries leading to high costs in compensations.

## 6.2 Organization/ management of the project

The County government is organized into interdependent departments that will be critical for implementation of the project. These are;

- ✓ Department of health; Proponent department; has the required expertise; have enough public health officers in decentralized units and at County level to support OSH assessments
- ✓ Department of public works: Has the right expertise for project management; having adopted modern standards, the department is able to handle all risks
- ✓ Finance department: has economists, accountants and procurement offices who will effectively manage the project
- ✓ Environment department; has enough staff to undertake EIA and reports on the implementation of ESIA
- ✓ Department of Social Services: Has enough Safeguards officers; Social Services has relevant laws as policies (GBV, Social Protection, Code of Conduct on Child Labor)

## 6.3 Uses of building

Facilities	Use against capabilities
BCRH Laboratory	Limited space; handles 130% of capacity.
Current pharmacy	Handles 150% of capacity
Current ward	Handles 110% of their capacity

## 6.4 Status of policy and institutional setup

This project is in line with **Governor's** manifesto, **vision 2030 CIDP**, strategic plans, UHC policy, **and the county finance act**

## 6.5 Suggestions on Policy Changes at the National and County Governments

- -National **Construction** Authority should advocate for friendly services to all forms of disabilities
- National Construction Authority Act (NCAA); should provide for approvals related to persons with disability at various levels; users, workers, contractors and experts
- A new policy should provide for Social Safeguards and their approvals through social protection body to enable follow up. The use of Environmental Management and Coordination Act (EMCA) connects with NEMA only therefore the social safeguards management is lacking.
- There should other bodies checking on projects including external consultants
- Need for Busia County infrastructure policy
- Domestication of building regulation

## 6.6 Legal and regulatory requirements expected before the project is implemented

Requirement	Description
<b>Environmental Impact Assessment (EIA) License from NEMA</b>	-Obtain an EIA license from the National Environment Management Authority (NEMA) after conducting an environmental impact assessment and submitting a project report.  - Pay a fee of 0.1% of the total construction costs.
<b>Architectural Plan Approval</b>	- Submit architectural plans to the county's planning department for review and approval.  - Ensure compliance with Kenya's Building Code and Physical Planning Act.
<b>Structural Plan Approval</b>	- Obtain structural plan approval from the county's civil and structural engineering department.  - Submit structural drawings and documentation, including a copy of the approved architectural plans.

<b>Construction Permit</b>	<ul style="list-style-type: none"> <li>- Obtain a construction permit from the county government after completing the architectural and structural plan approval process.</li> <li>- Pay construction permit fees, which vary by county.</li> </ul>
<b>NCA Project Registration</b>	<ul style="list-style-type: none"> <li>- Register your project with the National Construction Authority (NCA) if the building contract value exceeds Kshs 5,000,000.</li> <li>- Pay a registration fee of 0.5% of the total construction costs.</li> </ul>
<b>Fire Safety Compliance Certificate</b>	Required for commercial or multi-story buildings, ensuring compliance with fire prevention and safety measures.
<b>County-specific regulations</b>	The County has regulations that govern contractors, business operations, licensing and changes on movement of goods. Obtain permits from relevant authorities, such as the Ministry of Water, Sanitation, and Irrigation, if your project involves water resources or irrigation.

**6.7 Legal and regulatory obligations that could increase costs or decrease the benefits**

The below listed issues provide an important checklist in ensuring that the project is not derailed. They include:

Risks	Effect on costs/decrease of benefits
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Lack of adequate advertisement for jobs	Tensions with labor unions and community leading to legal costs
Lack of approvals	Sanctions and stoppages in project for approvals to be sought leading to time wasted/ some works could be redone leading to more costs

Lack of stakeholder engagement	Lack of ownership and participation by community leading to white elephant projects.
Noncompliance of contactors to labor laws	Labor unrests due to limited clarity on remunerations
Use of unapproved materials	Costly repairs due to project breakdowns.

### 6.8 Possession of requisite skills and capacity in line with the project requirements

<b>Project requirement</b>	<b>Description/requisite skills</b>	<b>Institutional capacity</b>
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<p><b>Project Management</b></p>	<p>The hospital infrastructure project will require expertise in building, structural design, and engineering among others in the area of project management. requisite skills include quantity survey and building</p>	<p><b>Architects;</b> Architects are trained in structural designs. They will be actively engaged on coming up with the required designs</p> <p><b>ii. Quantity Surveyors.</b> The County has qualified quantity surveyors. They will be able to actualize the projects in terms of balancing spaces, designs and relevant quantities. They will give the right estimates of materials and other requirements.</p> <p><b>iii. Building inspectors;</b> The County has also a dedicated team of building inspectors. This group will be able to help in project monitoring and Evaluation to ensure every stage occurs according to the project designs and the use of materials is the right one.</p>
<p><b>Legal understanding and practice</b></p>	<p>The project will require different legal commitments, understanding and the</p>	<p><b>i. The County Attorney;</b> The County Attorney will guide any legal issue related to the</p>

	<p>production of legal notices among others. This means the institution need a</p>	<p>project and the engagement with outside parties on the legal basis</p> <p><b>ii. County Solicitor;</b> the County solicor will guide the address to emerging issues that require legal representation and response</p> <p><b>iii. Legal officers;</b> The County has a number of legal officers who will provide day to day guidance in drafting relevant documents and responses related to the project</p>
<p>Health and Sanitation Management</p>	<p>This project is centered on bettering health services by putting up required infrastructure. Relevant skills for the required structures is needed. Further, skills on assessment of health and Sanitation/occupational health standards is required</p>	<p>The department of health will provide officers dedicated to the project in the areas of;</p> <p><b>i. Public health officers;</b> for compliance to standards at the construction site</p> <p><b>iii. Experts (Doctors) on</b> specialized services</p>
<p>Environmental and Social Safeguards; Climate and Disaster risk management</p>	<p>Safeguards officers will be key to ensure the project related risks and hazards are controlled</p>	<p>The County has a dedicated team of;</p> <p><b>Social and Environmental Safeguards officers</b></p> <p>This team will guide the adherence to environmental, Social, climate, disaster, gender Safeguards across all project levels. They will also guide stakeholder engagement to ensure there is participation, inclusivity and</p>

		employee issues are addressed to the labor. They will address issues of child labor in the project construction.
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### 6.9 Incentives or penalties

Relevant laws and regulations

- i. Procurement regulations;
- ii. Containment of project variations;
- iii. Contract obligations

### 6.10 Governance issues that may affect

#### implementation

- ✓ Statutory changes affect project value and costs
- ✓ Changes in project management team
- ✓ Knowledge management is critical
  - i. The project accounting officers are Chief Officers. Any changes in their work scope as may be done from time to time could lead to loss of institutional memory.
  - ii. Further, changes in project implementation could also lead to loss of critical Safeguards.

## SECTION 7: FINANCIAL AND PRIVATE ANALYSIS

This analysis evaluates the project's financial viability at market prices and explores methods for financial leverage. It integrates technical, operational, and demand assumptions to project the financial profile of the BCRH Annex Hospital Complex.

### 7.1 Integration of Financial and Technical Variables

The financial model is built on the integrated variables from prior analyses:

- i. **Demand Analysis:** Based on BCRH's existing patient work load and the unmet need for specialized and comprehensive services in Busia County, projecting a gradual uptake of services.
- ii. **Technical Analysis:** The construction cost of **K s h . 4 5 0 , 0 0 0 , 0 0 0** and the detailed operational cost structure from the Sustainability Plan form the basis of the

cash outflows.

- iii. **Management Analysis:** The phased recruitment plan, operational timeline, and management structure (BCRH management) inform the timing and scale of costs.

### **(b) Cash Flow Profile of the Project**

The project has a distinct two-phase cash flow profile:

- ✓ **Investment Phase (Years 0-2):** Characterized by significant negative cash flow due to upfront capital expenditure for construction, design, and equipment.
- ✓ **Operational Phase (Year 3+):** Cash flow turns positive as revenue generation begins. The profile shows initial modest net cash flow, growing steadily as service uptake increases and the wellness programs mature.

### **(c) Key Variables for Economic and Social Analysis**

- **Financial Variables:** Construction cost, operational costs (personnel, maintenance), revenue per service unit (SHIF rates, private fees), and patient number.
- **Social & Economic Variables:**
  - **Reduced Patient Travel /Cost:** Saving for residents who previously traveled for specialized care.
  - **Reduced referral numbers-** most patients will get specialized treatment at BCRH
  - **Job Creation:** Direct employment (clinical, administrative, support staff) and indirect jobs (local suppliers).
  - **Preventive Health Benefits:** Long-term cost savings to the community from managed wellness versus acute care.
  - **Improved goodwill-** people will have confidence with the county

## **KEY FINANCIAL QUESTIONS**

### **(a) What is the relative certainty of financial variables?**

- ✓ **High Certainty: Capital Costs** are based on detailed Bills of Quantities (BoQs). **Base Operational Costs** (salaries, utilities) are derived from known public sector scales and current hospital expenditure.
- ✓ **Moderate Certainty: FIF** revenue will increase
- ✓ **Lower Certainty: Uptake of Fee-Based Services and Corporate Partnership**

**Revenue** the existing partners are certain

**(b) What are the sources and costs of financing?**

- **Primary Source:** Grant and counterpart contribution
    - **Source:** Busia County Government Exchequer and/or conditional grants from the National Government.
    - **Cost:** This is public equity with no direct financial interest cost. The "cost" is the opportunity cost of not deploying these funds elsewhere.
  - **Alternative Leverage Method: Public-Private Partnership (PPP).**
    - **Source:** Build partnerships to operate the complex e.g Special purpose vehicle (SPV).
      - **Cost:** With ppp arrangement, a sharing formula will be decided
4. **County Government:** Must cover any operational deficit after revenues, estimated at ~**Kshs 7.5 - 11 million annually** for the first 3-5 years. This is the minimum to keep the Specialized Hospital running without service interruption.
  5. **BCRH Management:** Requires a positive net cash flow from clinical operations to reinvest in staff incentives and minor upgrades through facility improvement financing. A minimum of **Kshs 0** deficit is the primary goal.
  6. **Private Partner (if applicable):** Would require a minimum annual cash flow sufficient to cover their operational costs and provide a return on investment, likely a minimum of **15-20% Internal Rate of Return (IRR)** on their invested capital.

**(c) What can be adjusted to satisfy each of the stakeholders?**

- **To Satisfy the County Government:** Phased implementation of the costliest specialized services can manage initial cash flow demands. Aggressive marketing of specialized service packages can increase revenue and reduce the county's subsidy burden faster.
- **To Satisfy a Private Partner:** The county could offer a longer concession period, a guaranteed minimum revenue from clinical referrals to the unit, or a capital contribution to reduce the private partner's upfront investment and risk.

**(d) What is the Financial Internal Rate of Return (FIRR) and Financial Net Present Value (FNPV)?**

**(e) Note:** As a social infrastructure project, the primary return is economic and social. A purely financial analysis from a market-prices perspective is challenging due to the heavy public subsidy.

- ✓ **Financial Net Present Value (FNPV):** Using a discount rate of 12% (reflecting public

sector cost of capital), the project's **FNPV is likely negative** over a 20-year horizon. This is typical for public health projects where social benefits are not fully captured in financial revenues.

- ✓ **Financial Internal Rate of Return (FIRR):** The **FIRR is likely below the discount rate**, for the same reasons. The project is not designed to be highly profitable on a purely financial basis but to be a sustainable and high-impact public service.

**(f) What is the probability of getting a negative return?**

- ✓ From a purely **financial perspective**, the probability of a negative return is **100%** if only the project's own revenue and costs are considered, as it relies on a county subsidy.
- ✓ However, from a **broader public finance and economic perspective**, the "return" must include the social benefits. When quantified (e.g., value of lives saved, increased productivity, jobs created), the **Economic Internal Rate of Return (EIRR)** is expected to be significantly positive, justifying the public investment. The primary financial risk is the county's ability to consistently provide the operational subsidy, which is considered a high-priority, budgeted item.

## **SECTION 8 ECONOMIC OR SOCIAL ANALYSIS**

### **8.1 Economic analysis**

The proposed Integrated Health and Wellness Complex is meant to complement existing services at Busia County Referral Hospital (BCRH) by expanding preventive, curative, rehabilitative, and wellness-oriented

care. The project responds to rapid population growth, the rising burden of non-communicable diseases (NCDs), and congestion in existing facilities. It supports the objectives of Kenya Vision 2030, the Kenya Health Policy 2014–2030, and the Busia County Integrated Development Plan (CIDP 2023–2027), which all prioritize universal access to quality health services

### **Economic rational**

The construction of integrated health and wellness complex at (BCRH) has a lot of economic benefits as mentioned below

- ✓ **Increased Productivity:**  
Improved health services will reduce morbidity and mortality, leading to higher labour productivity and fewer lost working days.
- ✓ **Reduced Out-of-County Referrals:**  
Modern diagnostic and treatment facilities will reduce costly patient referrals to Kisumu, Eldoret, and Nairobi.
- ✓ **Cost Savings for Households:**  
Local access to quality healthcare will reduce household expenditure on transport and accommodation during medical treatment.
- ✓ **Employment Creation:**  
Construction and upgrading activities will generate short-term jobs, while expanded hospital services will create permanent positions for healthcare professionals.
- ✓ **Enhanced Private Sector Activity:**  
Improved healthcare infrastructure attracts private medical suppliers, pharmacies, diagnostic service providers, and hospitality services, stimulating the local economy.
- ✓ **Cross-Border Economic Benefits:**  
Given Busia’s strategic position at the Kenya–Uganda border, the upgraded facility will serve regional patients, generating additional revenue from cross-border medical tourism.

### **Cost benefit considerations**

- ✓ **Costs:** Construction, renovation, procurement of medical equipment, ICT systems, and staff capacity-building.
- ✓ **Benefits:** Improved service delivery, reduced disease burden, increased hospital revenue, and strengthened public health outcomes.

A simplified **cost-benefit ratio (CBR)** or **economic internal rate of return (EIRR)** should be estimated, but preliminary analysis suggests a **positive net present value (NPV)** due to strong service demand and health productivity linkages.

## **Sustainability**

The project aligns with the national push toward Universal Health Coverage (UHC) and will be sustained through:

- National and county budget allocations;
- Social health insurance fund (SHIF) reimbursements;
- User fees and other cost-recovery mechanisms;
- Strategic partnerships (PPP models, donor funding, private laboratories, etc.)

## **8.2 Social Analysis**

### **Social Context**

Busia County has a population exceeding 950,000 people, with high poverty levels (over 60%) and limited access to specialized healthcare. The upgrading project directly addresses social inequities by improving access to affordable, quality health services for low-income and vulnerable populations

### **Social Benefits**

- iv. **Improved Access and Equity:** Expansion of inpatient wards, maternity units, and emergency services ensures equitable access for women, children, and persons with disabilities.
- v. **Gender and Inclusion:** Upgraded maternal and child health facilities will reduce maternal and neonatal mortality. Design features (ramps, signage, and accessible toilets) will support inclusion of people with disabilities.
- vi. **Community Health Outcomes:** Improved facilities enhance disease surveillance, emergency response, and pandemic preparedness.
- vii. **Social Stability:** Access to quality healthcare reduces frustration and conflict arising from inadequate services.

- viii. **Educational Benefits:** The upgraded facility supports medical training and internships, enhancing local capacity for health professionals.

## Potential Negative Social Impacts and Mitigation

Potential Issue	Description	Mitigation Measure
Temporary displacement of vendors or informal users during construction	Loss of income or disruption of livelihoods	Implementation of a Temporal <b>Services Relocation Plan</b> support
Construction noise, dust, and traffic	May affect patients and nearby communities	Use noise barriers, proper scheduling, dust suppression, and traffic management
Gender-Based Violence (GBV) and Sexual Exploitation and Abuse (SEA) risks	Risk from construction workforce	Enforce Codes of Conduct, hire community liaison officers, and provide awareness and reporting mechanisms
Occupational safety risks	Risks to workers and hospital staff	Implement Occupational Health and Safety (OHS) plans and training

## Stakeholder and Community Benefits

- ✓ **Patients and Families:** Better service quality and reduced travel time/costs.
- ✓ **Healthcare Workers:** Improved working environment and motivation.
- ✓ **Community:** Enhanced public health outcomes and reduced disease transmission.
- ✓ **Local Economy:** Job opportunities, improved service sector demand, and stable health workforce retention.

## Social Sustainability

Social sustainability will be enhanced through:

- Continuous stakeholder engagement and community participation;
- Gender-sensitive and inclusive design;
- Public awareness on health service upgrades;
- Strengthened hospital governance and accountability mechanisms.

## Evaluation of Externalities Including Environmental

Externalities are indirect effects of the proposed project not fully captured in financial accounts. They can be positive or negative, influencing the broader social, economic, or environmental landscape. The evaluation identifies both categories and recommends mitigation for negative externalities.

### Positive Externalities:

Externality	Description	Economic/Social Benefit
Improved Public Health	Reduced disease burden, mortality, and morbidity	Increased labor productivity and reduced absenteeism
Reduced Out-of-County Referrals	Patients receive specialized care locally	Reduced household and national treatment costs
Knowledge Spillovers	Facility supports medical training and internships	Builds national human capital in healthcare
Cross-Border Health Services	Serves patients from Uganda and nearby regions	Generates regional health cooperation and foreign exchange
Gender and Social Inclusion	Specialized maternal, child, and disability-friendly facilities	Promotes equity and social inclusion

Negative Externalities and Mitigation Measures:

Externality	Description	Mitigation Measure
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Construction Noise and Dust	Temporary nuisance to patients and neighbors	Implement Environmental Management Plan (EMP) – noise control, dust suppression, and work scheduling
Waste Generation	Biomedical and construction waste may cause pollution	Adopt Waste Management Plan: segregation, autoclaving, and incineration per NEMA standards
Traffic Congestion	Construction vehicles may affect hospital access	Enforce traffic management plan and coordinate with authorities
Energy and Water Use	Higher resource consumption post-construction	Integrate solar systems, rainwater harvesting, and energy-efficient appliances
Occupational Risks	Safety risks to workers and hospital staff	Provide OHS training, PPE, and ensure compliance with labor regulations

**Conclusion**

The **Proposed Construction of the Hospital Annex at Busia County Referral Hospital** is both **economically viable** and **socially transformative**, well above standard viability thresholds. Socially, it promotes inclusivity, gender equity, and preventive health, contributing directly to Kenya’s **Universal Health Coverage (UHC)** and **Vision 2030** goals. The investment therefore qualifies as a **high-impact, sustainable public infrastructure project** for Busia County

**SECTION 9: DISTRIBUTIONAL ANALYSIS**

This analysis evaluates the project's economic benefits and costs from the perspective of different stakeholders, focusing on the distribution of impacts, poverty alleviation, and the fulfillment of basic needs.

**(a) Identification and Quantification of Extra-Economic Impacts**

The project generates significant positive externalities beyond its direct financial returns:

- ✓ **Improved Health Outcomes:** Quantifiable through reduced morbidity and mortality from specialized care (e.g., reduced maternal and infant mortality, early cancer detection). This translates into economic value through a healthier, more productive community
- ✓ **Time and Cost Savings:** Patients and their families save significant travel time and costs previously spent seeking specialized care in distant cities like Kisumu or Nairobi. This income is retained within the local economy.
- ✓ **Job Creation:** Direct employment during construction (temporary) and operation (permanent) for clinical, administrative, and support staff. Indirect jobs are created for local suppliers and service providers.
- ✓ **Training and research centre:** The complex will attract a wide range of medical professionals who are a prerequisite for training and development of various medical students.

**(b) and (c) Distributive Appraisal & Income, Cost, and Fiscal Impacts**

<b>Stakeholder Group</b>	<b>Benefits Received</b>	<b>Costs / Burdens Incurred</b>	<b>Net Impact</b>
<b>Patients &amp; Families</b>	<ul style="list-style-type: none"> <li>• Access to advanced, affordable healthcare.</li> <li>• Savings on travel and accommodation for referrals.</li> <li>• Improved quality of life and productivity.</li> </ul>	<ul style="list-style-type: none"> <li>• Temporary service disruption during relocation/construction.</li> <li>• Potential small, subsidized user fees for services.</li> </ul>	<b>Highly Positive</b> (Benefits far outweigh costs)
<b>BCRH Staff</b>	<ul style="list-style-type: none"> <li>• New career opportunities and specialized training.</li> <li>• Improved working environment with modern</li> </ul>	<ul style="list-style-type: none"> <li>• Operational strain and overcrowding during temporary relocation.</li> <li>• Increased workload during transition.</li> </ul>	<b>Positive in long-term, negative in short-term.</b>

<b>Stakeholder Group</b>	<b>Benefits Received</b>	<b>Costs / Burdens Incurred</b>	<b>Net Impact</b>
	equipment. <ul style="list-style-type: none"> <li>• Enhanced professional prestige.</li> </ul>		
<b>County Government of Busia</b>	<ul style="list-style-type: none"> <li>• Political capital from delivering high-impact project.</li> <li>• Reduced need for costly patient referral contracts.</li> <li>• Attraction of private investment and skills.</li> </ul>	<ul style="list-style-type: none"> <li>• Ongoing fiscal responsibility for operational deficits.</li> </ul>	<p><b>Positive social return, negative financial return.</b> The County will have a significant financial investment on the project.</p>
<b>Local Businesses</b>	<ul style="list-style-type: none"> <li>• Increased revenue from supplying goods/services to the complex and its employees.</li> <li>• Opportunity for corporate wellness partnerships.</li> </ul>	<ul style="list-style-type: none"> <li>• Minimal direct costs.</li> </ul>	<p><b>Highly Positive</b></p>
<b>Vulnerable Groups (Women, Children,</b>	<ul style="list-style-type: none"> <li>• Targeted services (MCH, oncology, chronic disease management)</li> </ul>	<ul style="list-style-type: none"> <li>• Potential to be most affected by temporary service disruptions.</li> </ul>	<p><b>Highly Positive</b> once operational.</p>

<b>Stakeholder Group</b>	<b>Benefits Received</b>	<b>Costs / Burdens Incurred</b>	<b>Net Impact</b>
<b>Elderly and PWDs)</b>	address their specific needs. <ul style="list-style-type: none"> <li>• Reduced financial burden of illness.</li> </ul>		
<b>Political class</b>	<ul style="list-style-type: none"> <li>• Achieving the governor’s manifesto towards achieving universal health coverage in the county</li> </ul> Bottom-up agenda Vision 2030, African Agenda 2063, East Africa Agenda 2040	Increases routine operational Cost which are recoverable through increased revenue	<b>Highly Positive</b> once operational
<b>Training institutions Researchers and students</b>	<ul style="list-style-type: none"> <li>• Accessibility to a training center to the students and researchers</li> <li>• Labour supplement on the existing staff</li> <li>• Interns and Apprenticeships benefit through absorption</li> </ul>	Strain on the available limited learning resources	<b>Highly Positive</b> once operational.

**(d) Poverty Alleviation and Political Necessities**

- ✓ **Poverty Alleviation:** Illness is a primary driver of poverty. By providing affordable, accessible advanced care, the project directly prevents families from falling into poverty due to catastrophic health expenditures and loss of income. The creation of jobs, both skilled and unskilled, provides direct income to households.
- ✓ **Political Necessities:** The project addresses a key political mandate: improving universal healthcare access and reducing health inequities between rural and urban areas. Its success is a tangible demonstration of the County Government's commitment to its citizens' welfare.

**(e) Relevant Basic Needs & Project Impact:**

The most relevant basic needs in this context are **health, agriculture and Education.**

- ✓ **Impact on Health:** The project's primary impact is a direct, enhanced improvement in meeting the basic need for health and well-being i.e. through specialized services.
- ✓ **Impact on agriculture:** A healthier population is more productive in agriculture and other income-generating activities, strengthening food security.
- ✓ **Impact on education:** Reduced retardation and school dropouts.

**(f) Alternative Ways to Generate Desirable Social Impacts:**

- ix. **Alternative 1: Dispensary-First Strategy:** Focus on building many small, basic health units. This improves access for rural communities but does not provide the specialized, life-saving care that a referral hospital does.
- x. **Alternative 2: Mobile Clinics:** Deploy specialized mobile clinics for outreach. This improves access but is limited in the complexity of care it can provide and lacks continuity.
- xi. **Alternative 3: Voucher System for Private Care:** Provide subsidies for patients to seek care in private facilities. This is administratively complex and does not build permanent public capacity.
- xii. **Alternative 4: Outreach services and medical camps:** To offer basic services at the hard-to-reach areas
- xiii. **Alternative 5: Improved reverse referral:**
- xiv. Strengthen primary care networks:

**(g) Cost-Effectiveness in Generating Desirable Social Impacts**

**Yes, the project is highly cost-effective** when compared to the alternatives.

- While the upfront cost is high, it creates a **permanent, institutional asset** that will serve the population for decades.
- It is more cost-effective than continuously paying for expensive, ad-hoc referrals to distant hospitals.
- It addresses the root cause of poor health outcomes a lack of specialized capacity rather than just the symptoms.
- The **integrated wellness model** is a proactive, cost-effective approach that aims to reduce the future economic burden of chronic diseases through prevention.
- It addresses the trainees gap and reduce the recruitment cost of fully fledged staff

and workload

**Conclusion:** The BCRH Annex Hospital represents a highly equitable and cost-effective investment. The primary costs are borne by the County Government, while the vast benefits especially improved health, poverty prevention, and economic stimulation are widely distributed among the citizens of Busia, with the most significant positive impact falling on the poor and vulnerable.

## SECTION 10: RISK (UNCERTAINTY) AND SENSITIVITY ANALYSIS

### 10.1 Project Risks and Mitigation Measures

The construction of an Integrated Health and Wellness Complex in Busia County is subject to several risks that could affect timelines, costs, and quality of service delivery. These risks have been identified across financial, technical, environmental, social, institutional, and operational dimensions. The table below presents a summary of the major risks along with their probability, potential impact, and proposed mitigation measures.

<b>Risk Type</b>	<b>Description</b>	<b>Probability</b>	<b>Impact</b>	<b>Mitigation Measures</b>
Financial Risk	Budget overruns due to inflation or material cost escalation	Medium	High	Include contingency budget; monitor market prices; phased procurement
	Delayed disbursement of funds from County or partners	Medium	High	Establish funding schedule; enforce prompt payment mechanisms
Technical/Construction Risk	Contractor lacks technical capacity	Medium	High	Pre-qualify contractors; vet previous experience; close supervision
	Design or engineering errors	Low	High	Conduct peer reviews; quality assurance checks; periodic audits
	Delay in procurement of specialized medical equipment	Medium	High	Early procurement planning; engage multiple suppliers; track delivery timelines
Environmental Risks	Non-compliance with NEMA/EMCA regulations	Low	High	Conduct ESIA; implement ESMP; regular environmental audits

	Natural hazards e.g heavy storm, flashflood	Medium	Medium	Site drainage planning; weather monitoring; insurance coverage
	Improper disposal of construction or biomedical waste	Low	Medium	Develop waste management plan; train staff and contractors; monitor compliance
Social Risks	Community opposition or disputes	Low	Medium	Early stakeholder engagement; grievance redress mechanism; public sensitization
	Health and safety incidents on site	Medium	High	Enforce occupational safety standards; provide PPE; regular safety audits
Institutional/Governance Risks	Poor coordination among departments	Medium	Medium	Establish project steering committee; regular coordination meetings
	Political interference or policy changes	Low	High	Maintain legal and regulatory compliance; stakeholder advocacy
Operational/Post-Implementation Risk	Shortage of qualified staff	Medium	High	Recruit and train health personnel; phased onboarding plan
	Maintenance and equipment breakdown	Medium	High	Preventive maintenance program; allocate funds for spares and servicing
	Revenue shortfalls affecting sustainability	Low	Medium	Develop hospital revenue plan; diversify income sources; monitor utilization

**10.1.1 Likely Environmental Impacts and Mitigation Measures for the Construction of an Integrated Health and Well Complex at BCRH**

<b>Environmental Aspect</b>	<b>Potential Impact</b>	<b>Description of Impact</b>	<b>Significance / Magnitude</b>	<b>Proposed Mitigation Measures</b>
<b>Soil and Land Resources</b>	Soil disturbance and erosion	Excavation, grading, and leveling expose soil to erosion by wind and rain, causing sedimentation in nearby water bodies.	Low to Moderate	<ul style="list-style-type: none"> <li>- Limit clearing to designated areas.</li> <li>- Re-vegetate disturbed areas.</li> <li>- Use sediment traps and silt fences.</li> <li>- Stockpile topsoil for reuse.</li> </ul>
<b>Vegetation and Biodiversity</b>	Loss of vegetation and habitat	Site clearing may remove natural vegetation and displace fauna.	low	<ul style="list-style-type: none"> <li>- Restrict clearing to minimum area.</li> <li>- Compensate with tree planting and landscaping.</li> <li>- Avoid sensitive ecological areas.</li> </ul>
<b>Air Quality</b>	Dust and emissions	Construction dust and machinery exhaust may degrade air quality and affect nearby residents.	High (temporary)	<ul style="list-style-type: none"> <li>- Regular water sprinkling on dusty surfaces.</li> <li>- Maintain vehicles and equipment.</li> <li>- Cover trucks transporting materials.</li> <li>- Use low-emission machinery.</li> </ul>
<b>Noise and Vibration</b>	Noise pollution	Operation of heavy machinery, vehicles, and equipment will generate high noise levels.	Moderate to High	<ul style="list-style-type: none"> <li>- Restrict noisy activities to daytime hours.</li> <li>- Use silencers and well-maintained equipment.</li> <li>- Provide PPE to workers.</li> <li>- Install noise</li> </ul>

				barriers where necessary.
<b>Water Resources</b>	Water pollution	Runoff with sediments, oil, and chemicals can contaminate surface and groundwater sources.	Moderate	<ul style="list-style-type: none"> <li>- Construct proper drainage systems.</li> <li>- Install oil interceptors.</li> <li>- Avoid washing machinery near watercourses.</li> <li>- Dispose wastewater in approved facilities.</li> </ul>
<b>Solid and Hazardous Waste</b>	Improper waste disposal	Generation of construction debris, packaging materials, and chemical residues.	Moderate to high	<ul style="list-style-type: none"> <li>- Segregate and recycle waste where possible.</li> <li>- Dispose waste through licensed waste hand.</li> <li>- Store hazardous materials in contained areas.</li> </ul>
<b>Drainage and Hydrology</b>	Altered drainage patterns	Construction and impervious surfaces may block natural drainage, increasing runoff and flooding risk.	Moderate	<ul style="list-style-type: none"> <li>- Incorporate storm water management structures.</li> <li>- Design proper site grading.</li> <li>- Maintain natural drainage channels.</li> </ul>
<b>Traffic and Transportation</b>	Traffic congestion and safety risk	Increased movement of trucks and equipment can cause road congestion and accidents.	Moderate to High	<ul style="list-style-type: none"> <li>- Schedule material delivery during off-peak hours.</li> <li>- Use warning signage.</li> <li>- Enforce speed limits near site.</li> <li>- Develop traffic management plan.</li> </ul>
<b>Public and Worker Safety</b>	Accidents and occupational hazards	Risk of injuries due to construction machinery, heights, or materials handling.	High	<ul style="list-style-type: none"> <li>- Enforce site safety rules and PPE use.</li> <li>- Provide first aid facilities.</li> </ul>

				<ul style="list-style-type: none"> <li>- Conduct regular safety training.</li> <li>- Erect warning signage and barriers.</li> </ul>
<b>Socio-Economic Impacts</b>	Employment and local economy	Job creation for skilled and unskilled labour during construction.	Positive	<ul style="list-style-type: none"> <li>- Prioritize local hiring.</li> <li>- Ensure fair employment conditions.</li> <li>- Encourage capacity building.</li> </ul>
<b>Community Well-being</b>	Nuisance from dust, noise, and traffic	Temporary disturbance to nearby residents and institutions.	Moderate	<ul style="list-style-type: none"> <li>- Continuous stakeholder engagement.</li> <li>- Provide advance notice of disruptive works.</li> <li>- Implement grievance redress mechanism.</li> </ul>
<b>Visual/Aesthetic Quality</b>	Visual intrusion	Construction works may temporarily affect landscape aesthetics.	Low to Moderate	<ul style="list-style-type: none"> <li>- Maintain clean and organized site.</li> <li>- Restore and landscape after completion.</li> </ul>
<b>Operational Waste (Future Phase)</b>	Biomedical and hazardous waste	Hospital operations will generate infectious and chemical waste.	High	<ul style="list-style-type: none"> <li>- Install functional waste segregation systems.</li> <li>- Develop a healthcare waste management plan.</li> <li>- Train staff in waste handling.</li> </ul>
<b>Water and Energy Use (Future Phase)</b>	Resource consumption	High demand for water and electricity may strain local supply.	Moderate	<ul style="list-style-type: none"> <li>- Install water-saving devices and energy-efficient systems.</li> <li>- Consider solar power and rainwater harvesting.</li> </ul>
<b>Wastewater (Future Phase)</b>	Pollution from effluents	Effluents from laboratories, kitchens, and laundries may	High	<ul style="list-style-type: none"> <li>- Ensure compliance with NEMA waste</li> </ul>

		contain pathogens and chemicals.		discharge standards. - Regularly maintain treatment system.
--	--	----------------------------------	--	--

The most significant potential impacts **during construction are expected on** air quality, noise, soil erosion, and waste management, **while** during operation, **key concerns relate to** biomedical waste, water pollution, and energy use.

**Proper implementation of the Environmental and Social Management Plan (ESMP) and adherence to NEMA, World Bank environment safeguard policies will minimize these impacts.**

### 10.1.2 Cost of mitigating the negative impacts

#### Estimated Cost of Mitigation Measures for the Construction of an Integrated Health and Wellness Complex at BCRH

Environmental / Social Issue	Proposed Mitigation Measures	Estimated Cost (KES)	Implementation Phase	Responsible Party
Soil erosion and land degradation	Erosion control structures, silt fences, re-vegetation, topsoil conservation	200,000	Construction	Contractor / Environmental Officer
Dust suppression and air pollution control	Regular water sprinkling, covering trucks, maintenance of equipment	150,000	Construction	Contractor
Noise and vibration management	Use of silencers, noise barriers, and PPE for workers	200,000	Construction	Contractor
Waste management of (construction debris, hazardous materials, medical waste)	Provision of waste collection bins, segregation, transport to licensed disposal sites	1,500,000	Construction	Contractor / NEMA-licensed waste handler
Water pollution prevention	Oil interceptors, sediment traps, proper storage of chemicals, site drainage, regular water quality test	250,000	Construction	Contractor / Site Engineer

Occupational health and safety	PPE (helmets, gloves, masks), safety signage, first aid kits, training,	1,800,000	Construction	Contractor / Supervising Engineer
Traffic management and public safety	Traffic signs, flagmen, scheduling of material deliveries, site access control	600,000	Construction	Contractor / County Works Department
Community engagement and grievance redress	Stakeholder consultations, communication materials, grievance desk	700,000	Construction & Operation	Proponent / County Government
Visual and aesthetic restoration	Site landscaping, tree planting, and beautification after construction	500,000	Post-construction	Contractor / County Environment Office
Biomedical and hazardous waste management (Operational phase)	Procurement of color-coded bins, autoclaves/incinerators, training staff	6,000,000	Operation	Hospital Administration / CGB/ NEMA
Water and energy efficiency measures	Installation of solar systems, rainwater harvesting, low-flow fixtures	5,500,000	Operation	Contractor / Facility Manager
Environmental monitoring and auditing	Air, water, noise, and waste monitoring; annual audits and reporting	1,500,000	Construction & Operation	Environmental Consultant / NEMA
Emergency preparedness and response	Firefighting equipment, spill kits, evacuation plan, staff training	1,200,000	Construction & Operation	Hospital Management / Safety Officer
Capacity building and ESMP supervision	Environmental training for staff, supervision, and periodic reviews	1,000,000	All phases	Project Proponent / Consultant
Total Estimated Environmental and Social Mitigation Cost				21,100,000

### 10.1.3 "Without the Project" (No-Action Scenario)

This scenario describes **what would happen if the project is not implemented**. It helps determine the **existing environmental and socio-economic conditions** and whether these might deteriorate or improve naturally over time.

- The area remains in its current or near-current state (undeveloped or underdeveloped).

- No new construction, infrastructure, or services are introduced.
- Natural environmental processes continue largely unaffected.

### Likely Environmental and Social Conditions Without the construction of the hospital Project

Aspect	Expected Situation Without Project
<b>Land and Soil</b>	Land remains idle or used for current purposes; no soil disturbance or erosion from construction.
<b>Air Quality</b>	No construction dust or emissions; current air quality maintained.
<b>Noise and Vibration</b>	Ambient noise remains at current low to moderate levels.
<b>Water Resources</b>	No risk of pollution or increased water demand; existing hydrological patterns remain stable.
<b>Waste Generation</b>	No increase in solid, liquid, or hazardous waste.
<b>Biodiversity</b>	Existing vegetation remain undisturbed.
<b>Socio-Economic Development</b>	Lost opportunity for improved healthcare, employment, and local development.
<b>Public Health</b>	Continued strain on existing health facilities; higher morbidity and mortality rates from inadequate healthcare.
<b>Land Use and Infrastructure</b>	Area may remain underutilized; limited investment in supportive infrastructure.

### Summary for “Without Project” Scenario

- Environmental risks:** Low
- Social and economic risks:** High (due to continued lack of healthcare, jobs, and infrastructure)

### 10.2 Evaluation "With the Project" (Implementation Scenario)

This scenario evaluates **anticipated changes to the environment and society resulting from construction and operation of the hospital.**

### Likely Environmental and Social Impacts with the Project

Aspect	Expected Impact With Project	Risk Level
<b>Soil and Land</b>	Disturbance during excavation and site clearing leading to erosion.	Moderate (temporary, mitigable)
<b>Air Quality</b>	Dust and emissions from machinery during construction.	Moderate (temporary, mitigable)
<b>Noise and Vibration</b>	Elevated noise from machinery and vehicles.	Moderate (temporary, mitigable)
<b>Water Resources</b>	Potential for contamination from runoff, oil, or wastewater.	Moderate (manageable with mitigation)
<b>Biodiversity</b>	Vegetation clearance and habitat disturbance.	Low to Moderate (localized)

<b>Solid and Hazardous Waste</b>	Generation of construction and biomedical waste.	High (during operation, but controllable)
<b>Public Health and Safety</b>	Temporary risks during construction; long-term health benefits from improved services.	High Positive (operation phase)
<b>Employment and Livelihoods</b>	Job creation and income generation during and after construction.	High Positive
<b>Infrastructure Development</b>	Improved access roads, utilities, and social amenities.	High Positive

### 10.3 Comparative Summary: With vs. Without the Project

Category	Without Project	With Project	Overall Assessment
<b>Environmental Quality</b>	Preserved in short term but no improvement	Some temporary disturbances; manageable with mitigation	Net Neutral (if well managed)
<b>Social and Economic Development</b>	Limited growth, poor healthcare access	Major socio-economic benefits from hospital	Highly Positive
<b>Public Health Outcomes</b>	High disease burden; pressure on existing facilities	Improved healthcare access and reduced mortality	Highly Positive
<b>Employment and Livelihoods</b>	No new opportunities	Significant employment and economic stimulation	Positive
<b>Sustainability</b>	Status quo maintained	Long-term institutional and community benefits	Positive
<b>Environmental Risk Level</b>	Low	Moderate (manageable through ESMP)	Acceptable

### 10.4. Conclusion of Evaluation

- **Without the project:** The environment remains largely unaffected, but social and economic benefits are lost.
- **With the project:** There are **short-term, localized environmental risks** during construction, but these can be effectively **mitigated** through the ESMP.
- **Overall:** The **“With Project” scenario is preferred** because it provides significant **public health, economic, and social benefits** that **outweigh the manageable environmental risks**.

## 10.5 Permits and Approvals Required

No.	Permit / Approval	Legal Basis / Issuing Agency	Purpose / Requirement	Estimated Cost (KES)	Frequency / Stage
1	Environmental Impact Assessment (EIA) License	NEMA (under EMCA, Cap 387)	Approval of ESIA report before project commencement.	0.1% of total project cost, <b>subject to min KES 10,000</b>	One-time (before construction)
2	Annual Environmental Audit (EA) Report	NEMA	Monitoring of environmental performance after project begins.	50,000 – 150,000	Annually (operation phase)
4	Waste Transportation and Disposal License	NEMA	Required for transporting and disposing of hazardous/biomedical waste.	20,000 – 50,000	Annual
5	Air Emission / Incinerator Operation License	NEMA	Approval for installation and use of medical waste incinerator.	50,000 – 100,000	Annual renewal
6	Building Plan Approval & Construction Permit	County Government (Physical Planning Dept.)	Approval of building plans and compliance with zoning regulations.	300,000 – 600,000	One-time (before construction)
7	Public Health Approval / Waste Management Certification	County Public Health Office	Compliance with public health and sanitation standards.	10,000 – 20,000	Annual
8	Fire Safety Inspection & Certificate	County Fire Department	Ensures building meets safety and emergency standards.	10,000 – 30,000	Annual renewal
9	Occupational Safety and Health Registration (Workplace Registration)	Directorate of Occupational Safety and Health (DOSHS)	Registration of workplace and compliance with occupational health standards.	30,000 – 60,000	One-time + periodic renewals

<b>10</b>	Energy Audit & Certification (if using solar systems)	Energy and Petroleum Regulatory Authority (EPRA)	Required for facilities using renewable or major energy systems.	50,000 – 100,000	Every 3 years
<b>11</b>	Occupational Health and Safety Audit License	DOSH	Annual audit of hospital's safety and health management systems.	40,000 – 80,000	

ANNEXES

Annex 1: Project Engineering Designs



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2. All dimensions to be checked and confirmed on site before commencement of any work.
3. Where dimensions override scaled dimensions, thus all dimensions are to be read and not at any time scaled from the drawing.
4. Any discrepancy to be reported to the project Architect promptly before proceeding.

NO.	REVISION	DATE	SIGN

CLIENT:  
DEPARTMENT OF HEALTH SERVICES AND SANITATION

PROJECT:  
PROPOSED CONSTRUCTION OF BORN ANNEX SPECIALIZED HOSPITAL

DRAWING TITLE:

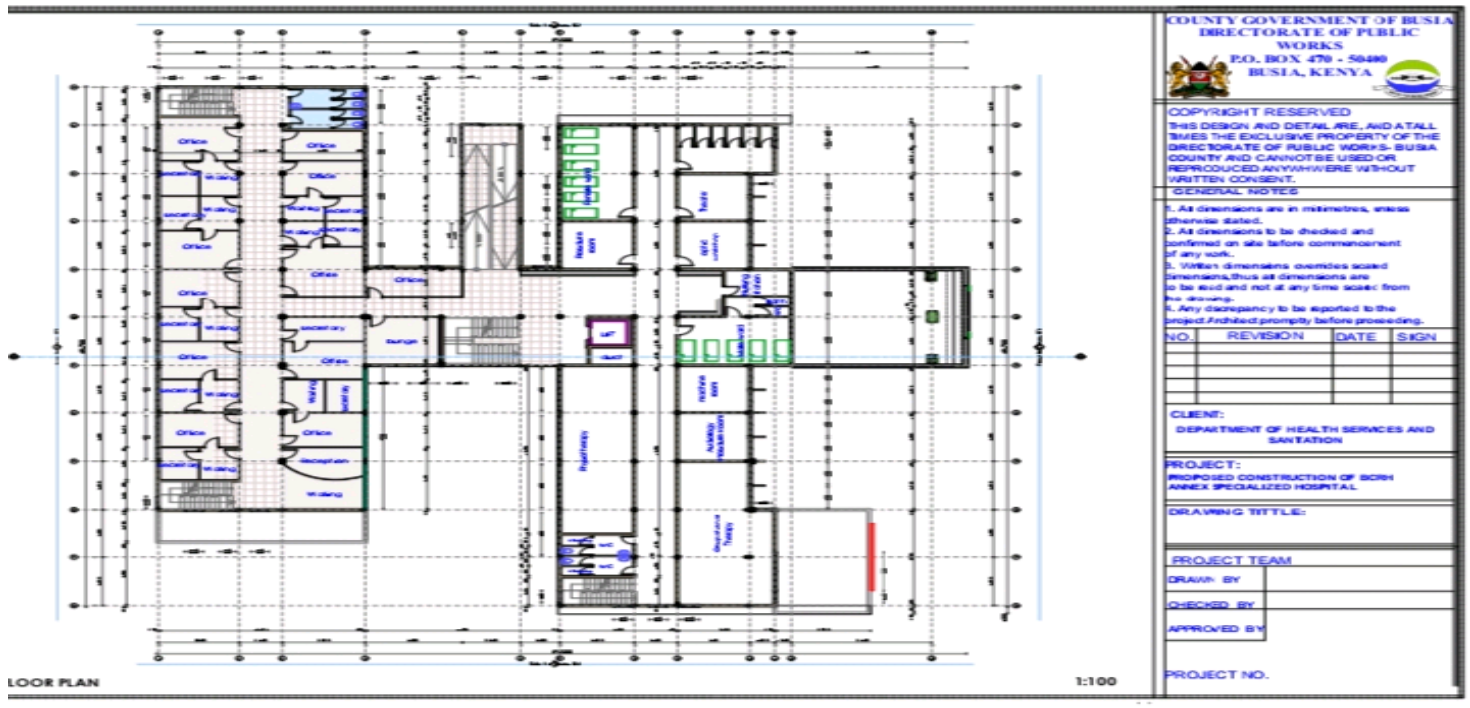
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DRAWING TITLE:

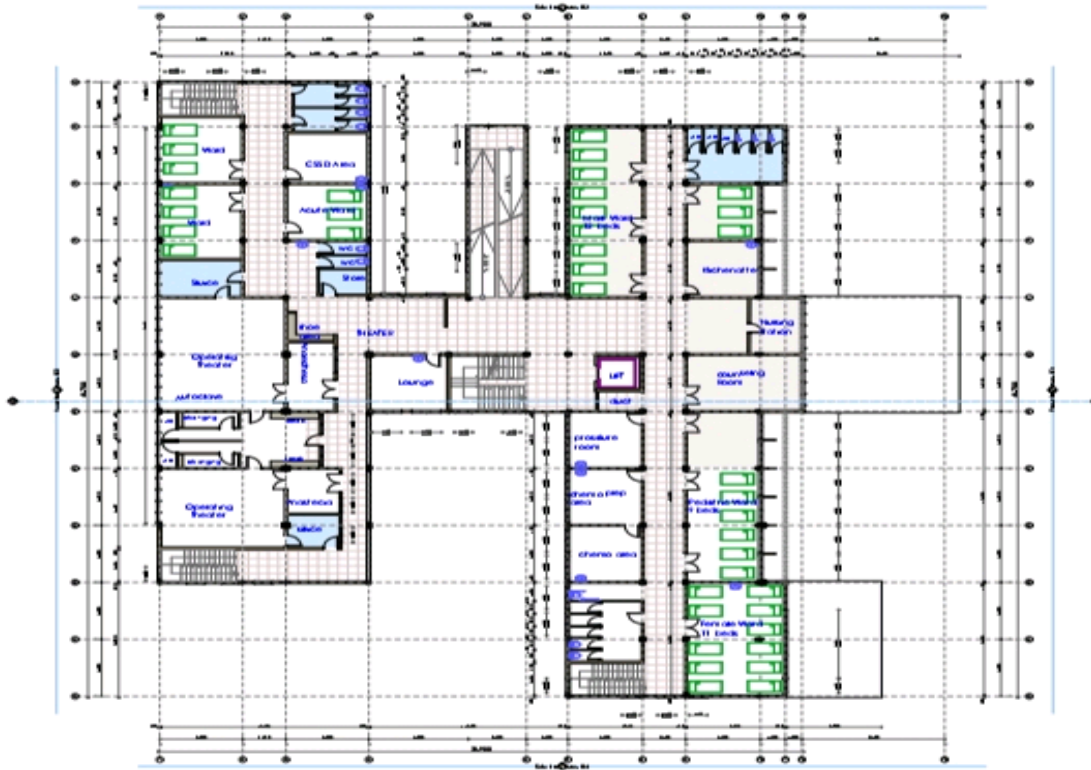
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SECOND FLOOR PLAN

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PROJECT:  
PROPOSED CONSTRUCTION OF BCRH  
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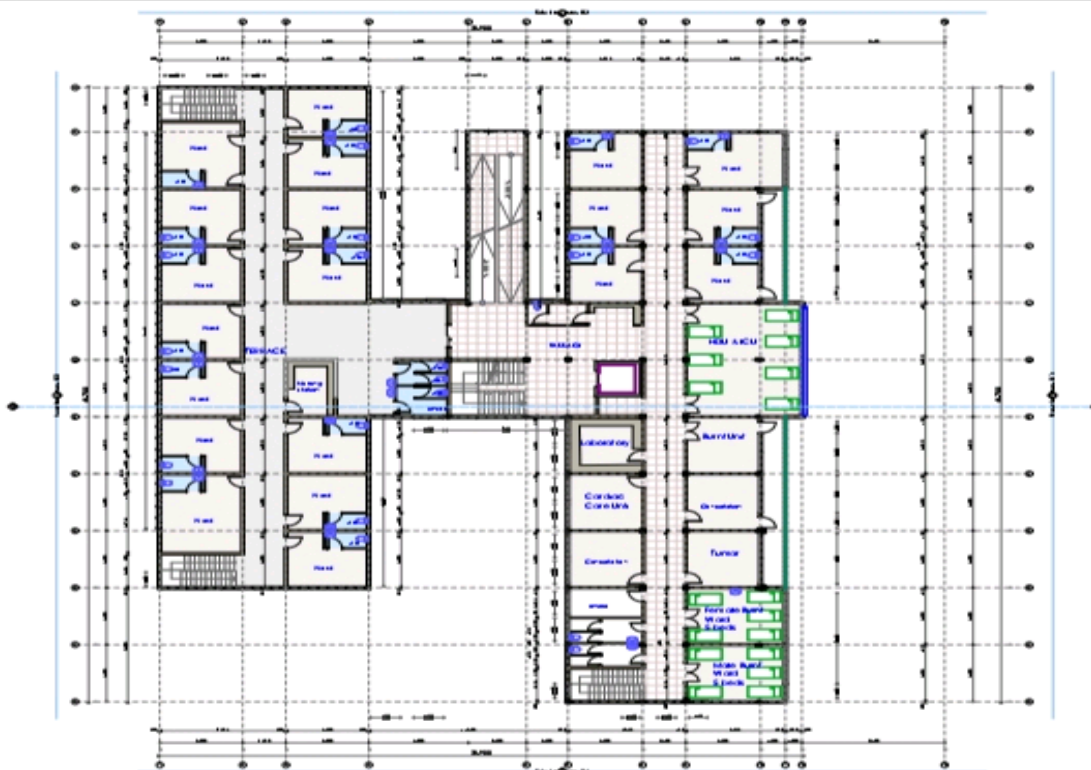
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THIRD FLOOR PLAN

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DEPARTMENT OF HEALTH SERVICES AND  
SANITATION

PROJECT:  
PROPOSED CONSTRUCTION OF BCRH  
ANNEX SPECIALIZED HOSPITAL

DRAWING TITLE:

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**Annex 2: Hazard Checklist**

#	Hazard	Question	Yes /No	Remarks, If Yes
1	River flood	Is the project located near a river or a stream prone to flooding or breaking its banks?	NO	
2	Urban flood	Is the project located in an urban area prone to flooding?	NO	
3	Coastal flood	Is the project located in a low-lying coastal area prone to storm surges or coastal flooding from increased water levels?	NO	
4	Backflow	Is the project located in an area prone to backflow flooding?	NO	
5	Landslide/mudslide	Is the project located on or near slopes prone to landslides (that is, mass movements of soil, rock, or debris)?	NO	
6	Geological hazards (earthquake, subsidence, and volcano)	Is the project located in an area with geological formations prone to shifts in fault lines, sink holes, or craters? Is the project located in an area prone to the sinking of the ground due to erosion, groundwater movement, or tectonic activity? Is the project prone to potential structural damage or disruption from earthquakes/earth tremors? Is the project located within 50 km from a volcano for which a potentially damaging eruption has been recorded in the past 2,000 years and future damaging eruptions are possible?	NO	
7	Wildfire	Is the project located in a vegetated area prone to wildfires?	NO	
8	Drought/water scarcity	Is the project dependent on water resources susceptible to droughts which can adversely affect water availability and quality?	YES	
9	Extreme heat	Is the project susceptible to prolonged periods of extreme heat?	NO	
10	Storms and wind Gusts	Is the project located in an area prone to strong winds, storms, or gusts?	NO	
11	Lightning and thunderstorms	Is the project located in an area that is prone to lightning and thunderstorm that could compromise the structural integrity and reliability of the asset?	YES	

**Annex 2: Hazard Checklist**

### Annex 3. Climate and Disaster Risk Screening Template

Hazard	Hazard Exposure (very low, low, medium, high)	Vulnerability (very low, low, medium, high)	Risk (very low, low, medium, high)	Risk Reduction Strategies	Risk Reduction Costs
River flood	Very low	Very low	Very low		
Urban flood					
Coastal flood	Very low	Very low	Very low		
Geological hazards (earthquake, subsidence, and volcano)	Very low	Very low	Very low		
Wildfire	Very low	Very low	Very low		
Drought/water Scarcity	Medium	Medium	Medium	Roof water harvesting	
Extreme heat	Very low	Very low	Very low		
Storms and wind gusts	Low	Low	Low	Sprinkling water on dusty surfaces, covering construction materials	

## **Annex 4: Climate and Disaster Risk-Screening Report**

<b>Project tittle;</b>	<b>PROPOSED CONSTRUCTION OF AN INTEGRATED HEALTH AND WELLNESS COMPLEX AT THE BUSIA COUNTY REFERRAL HOSPITAL</b>
<b>Project Number</b>	
<b>Location</b>	<b>BUSIA COUNTY REFERRAL HOSPITAL</b>
<b>Date</b>	
Report prepared by;	Name <b>DR CHARLES MUSUMBA WAKHAYA</b>
	Position <b>SOCIAL SAFEGUARDS OFFICER</b>
	Sign
	Date;
<b>Reviewed by;</b>	Name <b>MS MOUREEN ONYANGO</b>
	Position <b>KDSP II PROGRAM COORDINATOR, BUSIA COUNTY</b>
	Sign
	Date;
<b>INTRODUCTION</b>	This report captures results of Disaster and Climate Screening done on the proposed project ". <b>INTEGRATED HEALTH AND WELLNESS COMPLEX AT THE BUSIA COUNTY REFERRAL HOSPITAL</b>
<b>Project Description</b>	The County Government of Busia through the KDSP II program for FY 2025/2026 intends to construct an <b>Integrated Health and Wellness Complex</b> that will fill the gaps experienced in the provision of advanced medical services. The project entails the construction to completion of a multi-storey building that will provide critical infrastructure including theaters, wards, advanced laboratory,
<b>Objectives of the climate and disaster screening</b>	<ul style="list-style-type: none"> <li>i. To identify potential climate and disaster hazards that might affect the proposed project</li> <li>ii. To assess the potential vulnerability of the project to the identified hazards</li> <li>iii. To undertake risk assessment by categorizing impacts</li> <li>iv. To derive risk mitigation and adaptation strategies.</li> </ul>
<b>Methodology</b>	<p>The focus of this report was on the potential climate and Disaster hazards. Based on World Bank assessment guidelines and potential hazards</p> <p>The assessment of risks was undertaken though a stepwise processes; <b>i) Assessment of Hazard Likelihood</b> (very low, low, medium, high), <b>ii. Vulnerability assessment</b> (insignificant, very low, low, medium, high) and <b>iii) matix of</b></p>

	likelihood and vulnerability mix ratings (very low, low, medium, high).
<b>a. Potential Hazards</b>	<p><b>Landslides/Mudslides:</b> Busia County's terrain makes it susceptible to landslides and mudslides, especially during heavy rainfall. These events can be triggered by soil instability and construction activities.</p> <p><b>Earthquakes:</b> Kenya is located near the East African Rift System, making it seismically active. Earthquakes can occur in Busia County, potentially causing damage to infrastructure at the proposed BCRH site</p> <p><b>Drought-induced water scarcity:</b> Busia County is prone to drought, which can lead to water shortages, affecting agriculture, livestock, and human consumption. The region's drylands occupy a significant portion of Kenya, and the impact of drought on water resources can be severe.</p> <p><b>Urban Flood:</b> Busia is also susceptible to floods, particularly given the region's history of climate-related disasters. Heavy rainfall can cause flash flooding, landslides, and damage to infrastructure. The BCRH area is part of the urban water and sewage system that can result in urban floods when there is system breakdowns.</p> <p><b>Heatwaves:</b> While not extensively documented for Busia specifically, Kenya as a whole experiences heatwaves, which can exacerbate drought conditions and impact human health.</p> <p><b>Storms and Wind gusts:</b> Busia County experiences strong winds and storms, particularly during the rainy season. These can lead to property damage, power outages, and disruptions to essential services.</p> <p><b>Lightning and Thunderstorms:</b> Thunderstorms are common in the region, and lightning can cause damage to infrastructure, injury, or loss of life.</p>

<b>b. Findings On Hazard Likelihood</b>	
<b>Hazard</b>	<b>Likelihood</b>
Landslides/Mudslides	Very low
Earthquakes	Very Low
Drought induced Water scarcity	Low

	Urban flood	Low
	Heatwaves	Low
	Storms and wind gusts	Low
	Lightning and thunderstorms	Low

**Findings on project vulnerability (vulnerability assessment)**

<b>Hazard</b>	<b>Vulnerability</b>	<b>Description</b>
Landslides and Mudslides	Medium	The project is susceptible to this hazard when it occurs. Landslides when they occur could lead to damages to the infrastructure that would require extensive repairs.
Earthquakes	Medium	Earthquakes could also cause damage to the project since it is a building. This would require extensive maintenance and repairs when it occurs
Drought induced water scarcity	Low	The infrastructure would be greatly affected when there is drought induced water scarcity due to the need in construction and in operationalizing healthcare services. However, there exists several alternative sources to water and thus the impact can be managed
Urban floods	Low	The hospital is located in Busia town and therefore the potential risk of urban floods is possible. The project can however withstand the floods when they occur
Heatwaves	Very Low	Heatwaves have a very low chance of occurring and their occurrence cannot greatly affect the project
Storms and wind gusts	Low	Storms and wind gusts can occur in the project area although the occurrence is minimal.
Lightning and thunderstorms	Low	There is minimal impact on the project although there is a likelihood of the hazard occurring.

**Overall Risk rating**

The RS assessment indicators below provide the overall risk rating, being a matrix combining the likelihood and vulnerability ratings. The matrix therefore identifies the overall rating of identifies hazards in terms of their significance in the project.

Hazard	Likelihood	Vulnerability score	Risk Level
Landslides and Mudslides	Very Low	Medium	Low
Earthquakes	Very Low	Medium	Low
Drought induced water scarcity	Low	Low	Low
Urban floods	Low	Low	Low
Heatwaves	Low	Very Low	Low
Storms and wind gusts	Low	Low	Low
Lightning and thunderstorms	Low	Low	Low

From the table above, all the identified hazards have been rated as LOW RISK. This means climate and disaster hazards present minimal, if any, risk to the construction and operationalization of the proposed hospital project in Busia County.

### RISK MITIGATION AND ADAPTATION STRATEGIES

To mitigate the impacts of floods, heatwaves, mudslides, urban floods, and earthquakes on construction projects, the following strategies will be implemented:

Hazard	Mitigation
<b>Urban flood mitigation</b>	<ul style="list-style-type: none"> <li>i. Implement flood-resistant construction: Use materials and designs that can withstand floodwaters, such as elevated foundations and waterproof materials.</li> <li>ii. Floodplain management: Avoid constructing in flood-prone areas or implement flood mitigation measures, such as levees or floodwalls.</li> <li>iii. Green infrastructure: Incorporate green spaces, such as parks or green roofs, to absorb rainfall and reduce storm water runoff.</li> </ul>
<b>Heat Wave Mitigation</b>	<ul style="list-style-type: none"> <li>i. Design for heat resilience: Use materials and designs that can withstand extreme temperatures, such as reflective roofing and shading devices.</li> <li>ii. Cooling systems: Implement cooling systems, such as air conditioning or evaporative cooling systems, to maintain a safe working environment.</li> </ul>

	<ul style="list-style-type: none"> <li>iii. Worker protection: Provide workers with protective gear, such as hats and sunscreen, and implement heat stress monitoring and prevention programs.</li> </ul>
<b>Mudslide mitigation</b>	<ul style="list-style-type: none"> <li>i. Site selection: Avoid constructing on unstable slopes or areas prone to landslides.</li> <li>ii. Geotechnical investigations: Conduct thorough geotechnical investigations to identify potential landslide risks.</li> <li>iii. Stabilization measures: Implement stabilization measures, such as retaining walls or drainage systems, to prevent landslides.</li> </ul>
<b>Urban flood mitigation</b>	<ul style="list-style-type: none"> <li>i. Urban planning: Implement urban planning strategies that reduce flood risk, such as zoning regulations and floodplain management.</li> <li>ii. Storm water management: Implement storm water management systems, such as drainage networks and green infrastructure, to reduce flood risk.</li> <li>iii. Flood-resilient design: Design buildings and infrastructure to be flood-resilient, using materials and designs that can withstand floodwaters.</li> </ul>
<b>Earthquake mitigation</b>	<ul style="list-style-type: none"> <li>i. Seismic design: Design buildings and infrastructure to withstand seismic forces, using techniques such as seismic isolation or ductility design.</li> <li>ii. Material selection: Use materials that can withstand seismic forces, such as reinforced concrete or steel.</li> <li>iii. Regular inspections and maintenance*: Regularly inspect and maintain buildings and infrastructure to ensure they remain earthquake-resistant.</li> </ul>
<b>Windstorm and wind gust mitigation</b>	<ul style="list-style-type: none"> <li>i. Robust Building Design: Design buildings with wind-resistant materials and shapes to reduce wind loads.</li> <li>ii. Aerodynamic Building Forms: Use aerodynamic shapes to reduce wind pressure and loads on buildings.</li> <li>iii. Secure Outdoor Objects: Secure outdoor objects and equipment to prevent damage or loss during strong winds.</li> <li>iv. Wind-Resistant Materials: Use wind-resistant materials for building envelopes and roofing.</li> <li>v. Regular Maintenance: Regularly inspect and maintain buildings to ensure they remain wind-resistant.</li> </ul>
<b>Drought-induced water scarcity mitigation</b>	<ul style="list-style-type: none"> <li>i. Water Conservation Measures: Implement water-saving measures, such as low-flow fixtures and greywater reuse systems.</li> <li>ii. Rainwater Harvesting: Collect and store rainwater for non-potable uses, reducing demand on municipal water supplies.</li> <li>iii. Water-Efficient Landscaping: Use drought-resistant plants and efficient irrigation systems to minimize water usage.</li> <li>iv. Water Recycling: Implement water recycling systems to reuse water for non-potable purposes.</li> </ul>

<b>Lightning and thunderstorms mitigation</b>	<ul style="list-style-type: none"> <li>i. Lightning Protection Systems: Install lightning protection systems, including air terminals, down conductors, and grounding systems.</li> <li>ii. Surge Protection Devices: Install surge protection devices to protect electrical systems from power surges caused by lightning strikes.</li> <li>iii. Weather Monitoring: Monitor weather forecasts and warnings to prepare for potential thunderstorms.</li> <li>iv. Emergency Procedures: Develop emergency procedures for lightning storms, including evacuation plans and safe shelters.</li> </ul>	
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## FINDINGS AND RECOMMENDATIONS

### . Summary of key risks, impact levels and recommended actions

- i. Landslides and mudslides have a low likelihood of occurring but present high vulnerability in causing damage to the proposed infrastructure project. It is therefore recommended that site selection uses geotechnical tools to avoid those with potential for landslides while stabilization measures are also implemented.
- ii. Earthquakes present very low likelihood of occurring but a medium risk in causing damage to the proposed infrastructure project. Focus should be on the design such as use of seismic isolation design that is able to withstand earthquakes. Materials used on construction should be steel or reinforced concrete. Regular inspection is also needed.
- iii. The likelihood of drought induced water scarcity is low and the vulnerability of the project to it's impacts is also low. There is however need for water harvesting, water conservation and the use of water efficient landscaping to ensure this risk is minimized
- iv. The likelihood of urban floods occurring in the project area is low. Impacts when such occur is also rated as low. There is however need for proper urban planning, storm water management strategies and use of flood resilient design and materials in the proposed project
- v. The likelihood of heatwaves occurring in the project site are rated low. The impact on the project is further rated as very low. However, design should consider heat resistance materials and provide for cooling systems. Workers should also be provided with protective materials.

Wind storms and wind gusts present low likelihood and low impact when they occur. It is however necessary that wind resistant designs and materials are used such as the use of aerodynamic shapes. There is also need to remove loose materials that may cause damage during wind storms

<b>B. M &amp; E FRAMEWORK FOR RISKS MITIGATION</b>			
<b>Objective</b>	<b>Indicators</b>		
Track progress in reducing hazard risks  Evaluate effectiveness of mitigation measures	Risk Reduction Indicators  Number of people protected from hazards: Measure the number of people benefiting from mitigation measures.	Mitigation Measure Indicators  Number of mitigation measures implemented: Track the number of	Capacity Building Indicators  Number of people trained: Measure the number of

<p>Identify areas for improvement</p>	<p>Area protected from hazards: Track the area of land or infrastructure protected from hazards.</p> <p>Economic losses avoided: Estimate economic losses avoided due to mitigation measures.</p>	<p>mitigation measures implemented (e.g., flood-resistant construction, storm water management systems).</p> <p>Quality of mitigation measures: Assess the quality and effectiveness of mitigation measures.</p>	<p>people trained on hazard risk mitigation.</p> <p>Institutional capacity: Assess the capacity of institutions to implement hazard risk mitigation measures.</p>
<p>Data Collection Methods:</p> <p>Surveys and assessments: Conduct surveys and assessments to gather data on indicators.</p> <p>Monitoring systems: Establish monitoring systems to track hazard risk reduction progress.</p> <p>Stakeholder engagement: Engage with stakeholders to gather feedback and insights.</p>	<p>iv. Evaluation Methods:</p> <p>Outcome evaluations: Evaluate the outcomes of mitigation measures.</p> <p>Impact evaluations: Assess the impact of mitigation measures on reducing hazard risks.</p> <p>Process evaluations: Evaluate the implementation process of mitigation measures.</p>	<p>Frequency of Data Collection:</p> <p>Regular monitoring: Collect data regularly (e.g., quarterly, bi-annually).</p> <p>Annual assessments: Conduct annual assessments of progress and impact.</p>	<p>Roles and Responsibilities:</p> <p>Government agencies: Oversee M&amp;E framework implementation.</p> <p>Stakeholders: Provide feedback and insights.</p> <p>M&amp;E team: Collect and analyze data, prepare reports.</p>

## CONCLUSION

### a. Final assessment of project resilience

- i. The hazard likelihood and project vulnerability mix gives an overall assessment of the project as; **Low Risk**.
- ii. The project is therefore categorized as **LOW RISK** on the climate and Disaster rating.

### b. Recommendations for decision-making and Project approval

The LOW RISK rating means;

1. The project team can continue with project development with **no need for additional climate risk studies or measures**.
2. The implementation of the recommended mitigation measures is for precautionary and best practice.

**c. Next steps and follow-up actions**

This report will be presented for approval and adoption and will provide general guidance in the project implementation.

**Annex 8: Project Environmental, Social, Occupational Health and Safety, and Gender Screening Checklist**

PROJECT ENVIRONMENTAL, SOCIAL, OCCUPATIONAL HEALTH AND SAFETY AND GENDER SCREENING CHECK LIST			
Project Name;			
Location ;		GPS Location;	
Brief Project Description ;			
<b>A: Triggers to EMCA</b>			
Does the project fall under the second schedule of EMCA Cap. 387		YES	NO
<b>B. Triggers to WB Safeguard Policies</b>			
Does the project trigger one or more of the World Bank Environment Social Standards		YES	NO
<b>C. GoK Policies and Laws applicable</b>			
Does the project fall under/trigger any other GoK Policies and Laws?		YES	NO
Item No	Answer if the Project .... ?	Yes/No. Briefly Describe	Is this likely to result in a significant effect? Yes/No/? -why
<b>D. Environmental, Health and Safety Impacts</b>			
1.	Adversely affect natural habitats nearby, including forests, rivers wetlands, wildlife or areas of high ecological value?		
2.	Is it located within or nearby environmentally sensitive areas (for example, intact natural forests, mangroves, wetlands, coastal zone, watercourses, mountains, wildlife, migratory routes ) or threatened species?		
3.	Are there any areas on or around the location which are protected under international or national or local legislation for their ecological, landscape, cultural or other value, which could be affected by the project?		
4.	Requires large volumes of construction materials (for example, gravel, stone, water, timber, firewood)?		

5.	Uses water during or after construction, which will reduce the local availability of groundwater and surface water?		
6.	Affects the quantity or quality of surface waters (for example, rivers, streams, wetlands), or groundwater (for example, wells, reservoirs)?		
7.	Is the project location susceptible to earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions e.g. temperature Inversions, fogs, severe winds, which could cause the project to present environmental problems?		
8.	Leads to soil degradation/erosion in the area?		
9.	Creates waste that could adversely affect local soils, vegetation, rivers and streams or groundwater?		
10.	Creates pools of water that provide breeding grounds for disease vectors (for example malaria or bilharzia/schistosomiasis)?		
11.	Involves significant excavations, demolition, and movement of earth, flooding, or other environmental changes?		
12.	Disposes of bush clearance residue and may cause the spreading of invasive species?		
13.	Has the potential to introduce a non-native animal or plant species?		
14.	Involve directly or indirectly handling of veterinary drugs and vaccines?		
15.	Will the project involve actions which will cause physical changes in the locality (topography, land use, changes in waterbodies, etc.)?		
16.	Will the project use natural resources such as land, water, materials or energy, especially any resources which are non-renewable or in short supply?		
17.	Will the project involve use, storage, transport, handling or production or release of hazardous substances?		
18.	Will the project cause noise and vibration or release of light, heat energy or electromagnetic energy?		
19.	Will the project lead to risks of contamination of land or water from releases of pollutants onto the ground or into surface waters, ground water, coastal waters or the sea?		
20.	Will there be any risks of accidents, ill-health, and occupational diseases during the construction or operation of the project?		
21.	Results in standing water, which could cause public health risks?		
<b>E. Social Impacts</b>			
22.	Does the project require acquisition of land?		
23.	Alienation of any type of government land including that owned by urban local body?		
24.	Clearance of encroachment from government/ urban local body land?		
25.	Clearance of squatting from Government/Urban local body?		
26.	Does the project require physical displacement of households?		
27.	Does the project require economic displacement of persons (less than 200 persons)?		
28.	Are there any routes or facilities on or around the location which are used by the public for access to recreation or other facilities, which could be affected by the project?		
29.	Will restrict people's access to crops, pasture, fisheries, forests or cultural resources, whether on a permanent or temporary basis?		
30.	Are there any areas on or around the location which are occupied by sensitive land uses e.g. hospitals, schools, places of worship, community facilities which could be affected by the project?		
31.	Results in a significant change/loss in livelihood of individuals?		
32.	Cause increased settlement or degradation of surrounding areas?		
33.	Do minority and/or majority Vulnerable and Marginalized Groups (VMGs) live on or near the site?		
34.	Will the project lead to gender disparity?		
35.	Causes disadvantage to persons with disabilities, women, youth or older persons or forgotten/low status groups within the community?		

36.	Create tensions within communities or likely to lead to elite capture or grabbing of benefits by particular groups				
37.	Will the project result in social and cultural degradation?				
38.	Result to child delinquency (school drop-outs, child abuse, child labour, etc.?)				
39.	Involves inward migration of people from outside the area for use of services or other purposes?				
40.	Will the Project result in social changes, for example, in demography, traditional lifestyles, employment?				
41.	Are there known archaeological, historical or other cultural property? Are any of these world heritage/ UNESCO designated etc				
<b>F. Public Participation and Consultations and Grievance Redress Mechanisms</b>					
42.	Has extensively consulted and included beneficiaries and project-affected persons in the selection, planning and project benefits?				
43.	Maintenance and management responsibilities have been defined and accepted by concerned parties?				
44.	An accessible Grievance Redress mechanism has been setup and the community made aware				
<b>G. Result/Outcome of Environmental/ Social and Resettlement Screening Exercise</b>					
<b>Environment Social Impact Assessment Required</b>			<b>YES</b>	<b>NO</b>	
<b>Category of ESIA Required</b>		<b>ESMP</b>	<b>SPR</b>	<b>CPR</b>	<b>FULL STUDY</b>
<b>Resettlement Action Plan required (RAP)</b>			<b>YES</b>	<b>NO</b>	
<b>Category of RAP Required</b>		<b>STAKEHOLDER ENGAGEMENT PLAN</b>		<b>A RAP</b>	<b>RAP</b>
<b>Any special conditions</b>			<b>YES</b>	<b>NO</b>	
<b>H: Authorization</b>					
<b>Screening undertaken by: County ESHS Officer</b>					
Name; .....			Signature and Stamp Contact No;		
Designation; .....					
<b>Screening Confirmed by : NEMA</b>					
Name; .....			Signature and Stamp Contact No;		
Designation; .....					

**NOTE:**

**Venue:** Project site

**Participants:** Beneficiary Community, NEMA, DOSH, Department of Social protection and Senior Citizen affairs, Ward Climate Change Committee members, civil society, Private Sector, Local leaders, area chief

**Attachments:** Public participation minutes, pictures, signed attendance list

**Authorization:** Ensure the checklist is fully signed and stamped before submission to National KDSP II ESHS Team.

Name Gypon O. Kijuku ..... 28<sup>th</sup> December, 2025

Designation Chief Officer ..... Department Health & Sanitation

*[Handwritten signature]*

