



Nepal Health Sector Support Programme III (NHSSP – III)

**Joint Hospital Assessment Report – Karnali Province
Salyan Hospital
Final Draft
26 August 2019**



Disclaimer: -

This material has been funded by UKaid from the UK government; however the views expressed do not necessarily reflect the UK government's official policies”

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2 Introduction

2.1 Background

The Nepal Health Sector Support Programme 3 (NHSSP) is a four-year programme designed to support the Government of Nepal (GoN) in implementing the Nepal Health Sector Strategy (2015-2020). The NHSSP is funded by UK Aid / UK Department for International Development (DFID) and aims to enhance the capacity of the Ministry of Health and Population (MoHP) and Department of Urban Development and Building Construction (DUDBC) to build a resilient health system providing quality health services for all.

The health systems component of NHSSP provides support to the MoHP to improve health policy-making and planning, procurement and financial management, health services, and the use of evidence for planning and management. The NHSSP's infrastructure component focuses on strengthening the capacity of government to develop resilient health infrastructure able to withstand natural disasters and climate change-induced hazard. The NHSSP Health Infrastructure team comprises architects, engineers, and Geographical Information System (GIS) experts, operating in the following work areas:

- development/improvement of national and provincial health infrastructure policy
- promoting the use of a planned integrated approach to health infrastructure development
- development of appropriate standards and codes, including the national standards for health infrastructure, and codes for seismic retrofitting of health infrastructure
- building the capacity of MoHP in evidence-based health infrastructure policy-making and managing an integrated, resilient health service
- building the capacity of the DUDBC to develop, manage and maintain health infrastructure works more effectively and efficiently, and to build technical skills in specialist aspects of health infrastructure development including utility services, healthcare waste management, seismic retrofitting and procurement procedures
- providing technical support for the seismic and functional retrofitting of two major hospitals at Bhaktapur and Pokhara

In the context of the Nepal federal administrative structure, the NHSSP Health Infrastructure team is providing technical assistance to sub-national governments. It is assisting municipalities to develop short-, medium- and long-term interventions to improve health facilities.

Currently, the NHSSP health infrastructure team working with five Provincial Ministries of Social Development, primarily providing technical, design and planning support for improving health facilities. In Karnali Province, the team is working jointly with USAID's Strengthening Systems for Better Health and Saving Newborn Lives (SSBHSNL). The SSBHSNL programme is supporting the assessment of human resources and service delivery in selected hospitals across the province, the NHSSP team is carrying out assessments on health infrastructure, connectivity and utilities.

2.2 Assessment Methodology and Process

The NHSSP team is guided by the following key principles in making assessments and recommendations for development of health infrastructure:

- Promoting integrated and efficient use of health infrastructure to provide better services to users
- Maximizing the use of existing facilities, and extending their operational life span where feasible and economic

- Improving operational efficiency and connectivity within the health facilities network, and promoting referrals to relevant facilities
- Promoting the use of and compliance with the Nepal Health Infrastructure Development standards 2017 (NHIDS) and the Standard Guidelines for the Development of Health Infrastructure 2017

A technical team from the Nepal Health Sector Support Programme 3 (NHSSP) conducted an engineering assessment at Salyan Hospital, Karnali Province in April 2019 at the request of the Ministry of Social Development (MoSD).

The engineering assessment methodology and process were as follows:

- 1.1 Collection of data and information:** Collection of secondary data on the hospital from sources including Department of Urban Development & Building Construction (DUDBC) records – Divisional Offices and Provincial Project Implementation Units, hospital records, reports from previous project consultants.
- 1.2 Field assessment tools:** The NHSSP standard checklist and needs assessment tool were used for the field assessment.
- 1.3 Field assessment exercise:** The NHSSP technical experts carried out the field assessment on April 17-19, 2019, facilitated by the hospital management. The hospital infrastructure, site layout, location and linkages were assessed from the functional, structural and multi-hazard risk perspectives.
- 1.4 Consultation meetings:** The NHSSP team also consulted with representatives of hospital management, staff, the local authority, provincial government and other relevant stakeholders to secure information on functional needs, catchment areas, referral practices, potential linkages to other settlements, transportation services, road networks, and future plans.
- 1.5 Analysis of data and information:** The NHSSP team analysed the primary and secondary data against a range of factors, including Health Infrastructure Information System (HIIS) data, Geographical Information System (GIS) maps, existing drawings, health facility standards and categories drawn from Nepal Health Infrastructure Development Standards (NHIDS). This analysis identified infrastructure and service delivery gaps, problems and key issues, and from these findings recommendations were made for short-, medium- and long-term infrastructure interventions.

4 Infrastructure (NHSSP)

4.1 Site and buildings

Salyan hospital was established in 2024 BS (1967), and is located in Khalanga, Salyan District, Karnali Province. The hospital is situated approximately 3 kms from the main bazaar area and 7 kms from Srinagar, with a site area of 3.3 ha (see Figure 1). The hospital land belongs to the District Forest Office, which allows its use by the health facility.

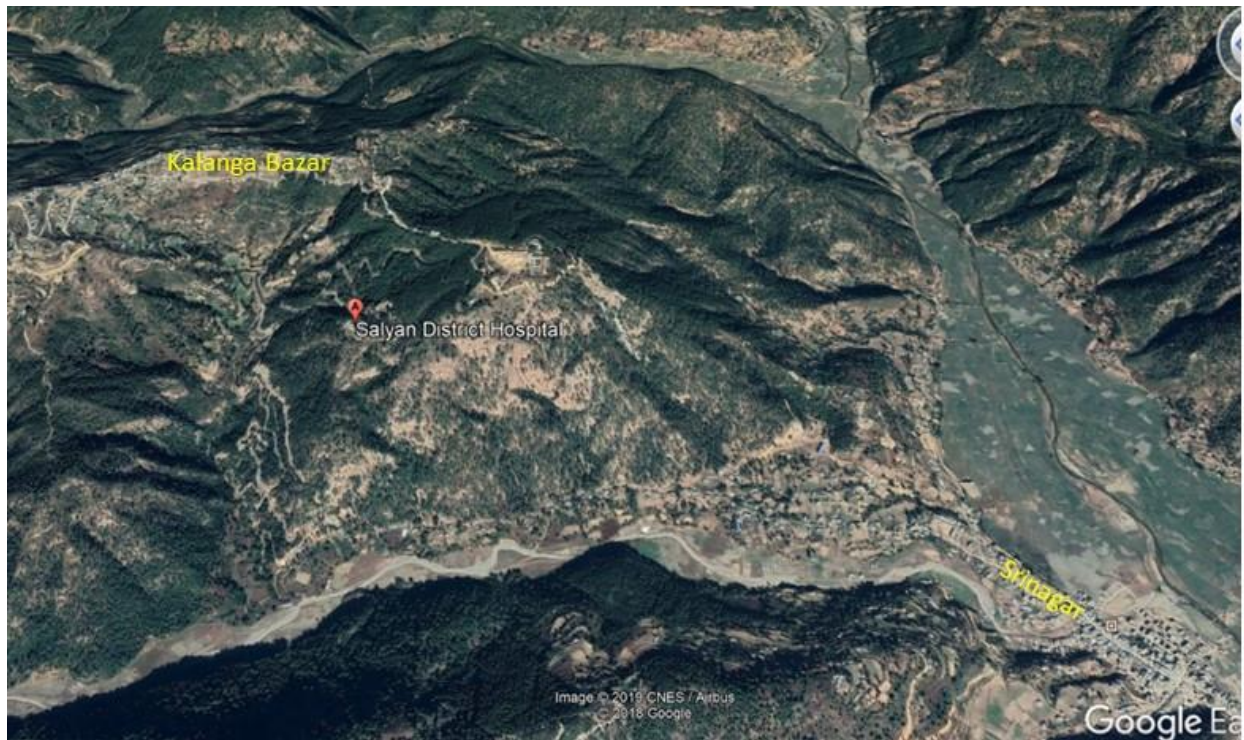


Figure 1: Location map of Salyan Hospital

The hospital location and network with other health facilities is shown below in Figure 2.

The majority of building blocks in the hospital complex are single-storey stone masonry structures built in cement mortar with corrugated galvanized iron (CGI) roofing. There are reinforced cement concrete buildings (RCC) housing the Comprehensive Emergency Obstetric and Neo-natal Care (CEONC) service, two-family staff quarters. And emergency service One three-storey RCC building with brick infill masonry is under construction for a new in-patient block.

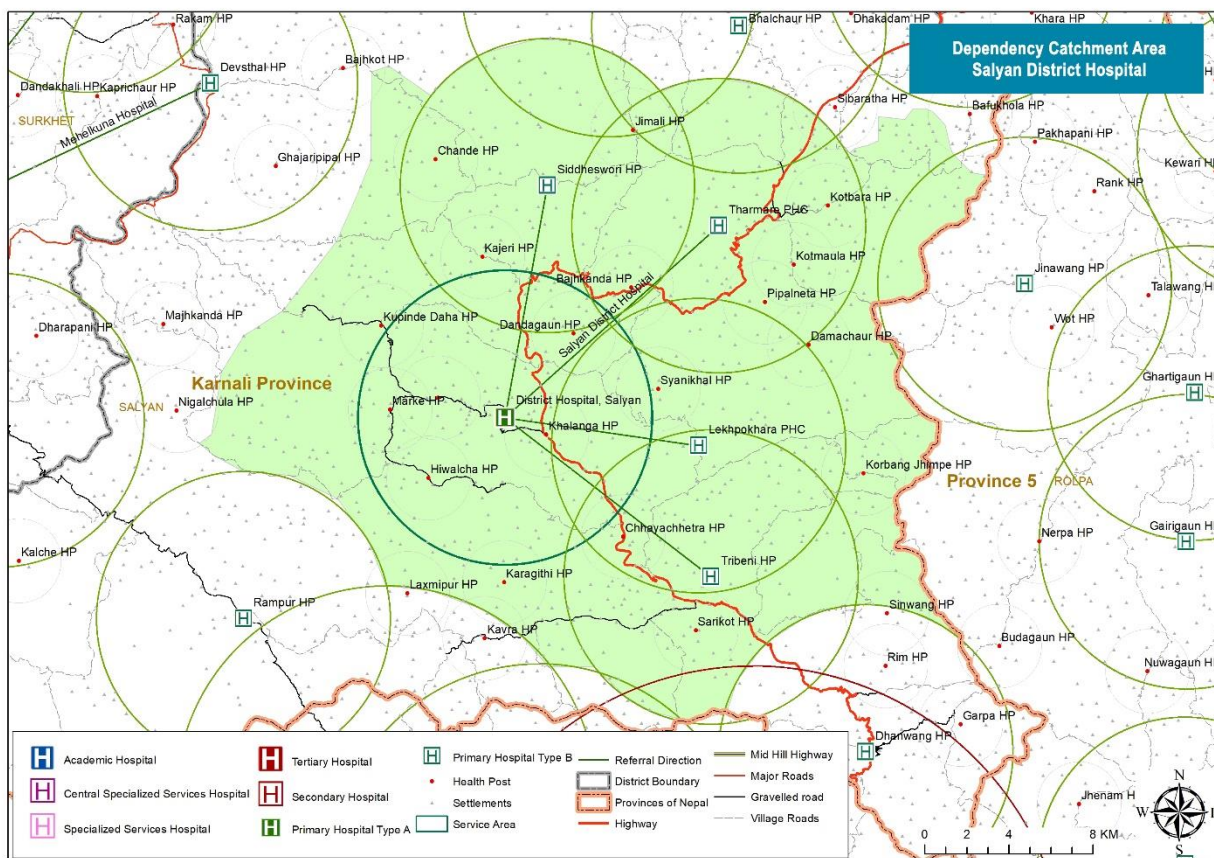


Figure 2: Dependent catchment area of Salyan Hospital

SN	Hospital	Dependent Population	Catchment Population (within 7kms radius)	Categorized Status
1	Salyan District Hospital	124,194	28,378	Primary Hospital Type A 3

4.2 Existing Situation and Services

Salyan Hospital is an important health service facility for the District. Federal policy has the objective of providing one primary hospital in each palika. Under the categorisation of health facilities set out in the NHIDS, Salyan District currently comprises 10 Primary B level hospitals. Salyan Hospital has an immediate catchment area of 28,378 people within a radius of 7 kms (2-3 hours walking distance) which makes it eligible to be a Primary A3 level Hospital. The provincial administration is currently planning to upgrade the hospital to this level, which means the extra functions provided will serve an increased District-wide dependency population of 124,194.

Current services: The hospital is designed to house 15 beds, although at present it provides 37 beds. Current services are as follows:

- In-patients - 37 beds (94% bed occupancy)

- Surgery – cesarean section (CS), hernia, minor orthopaedic cases
- Maternity – 100 deliveries per month
- Tuberculosis - Directly Observed Treatment Short course (DOTS) and Multi-Drug Resistant (MDR) treatments
- Family Planning
- Human Immuno-deficiency Virus (HIV) – anti-retroviral therapy (ART)

Utilities: the level and condition of utility services is as follows:

- **Water:** Water is provided from a local spring source and piped supply. For now, the supply is sufficient. The water is stored in two tanks each of 10 000 litre capacity.
- **Electricity:** The hospital is connected to the national grid but has no transformer. Consequently, voltage fluctuations have caused damage to medical equipment.
- **Power backup:** The hospital has solar backup of capacity of 3.5KVA and two generators of 15KVA, and 63KVA. Uninterrupted Power Supply (UPS) backup is provided for the operating theatre (OT).
- **Waste management:** The hospital uses the pit disposal method. There is no autoclave.

Development initiative: The hospital management prepared a master plan in 2015 for its expansion to 50 bed capacity with increased specialist services (see Figure 3). This is still relevant and will serve to support the upgrade of the hospital to Primary A3 level.



Figure 3: Proposed Master Plan prepared by Hospital Management in 2015

4.3 Assessment Findings

4.3.1 Use of existing spaces

The CEONC block was built in 2068 BS (2011) using the standard type design (see Figure 4). However, it is used currently only as an OT, while the delivery room, sluice, and other spaces are not used for the purposes they were designed for. This may be because the hospital

management was never given an orientation on the plan and design of the buildings during and after the construction of the building.



Figure 4: CEONC Block

4.3.2 Fire Risk

The hospital is surrounded by pine forest (see Figure 5a), and dry pine leaves collect on building roof tops. This increases the risk of fire (see Figure 5b) and must be addressed by ensuring dead leaves are not allowed to build up. There was a forest fire two years ago, and the need to prepare for such incidents in future should be addressed in the hospital disaster management plan and emergency drills.



Figure 5: Salyan Hospital surrounded by forest (left) and dry pine leaves on building roofs (right)

4.3.3 Seismic Damage

Cracks and settlement damage were observed in the CEONC eastern side apron and retaining wall (see Figure 6). Hospital staff reported that this damage was a result of the Gorkha Earthquake 2015.



Figure 6: Cracks and settlement CEONC building walls and apron

4.3.4 Building deterioration

The NHSSP team observed various examples of deterioration in the built fabric due to lack of maintenance. These include corrosion of seismic bands in stone masonry building and exposed reinforcement (see Figure 7).



Figure 7: Exposed reinforcement

4.3.5 Parapet walls and deficient masonry

The assessment exercise recorded weak parapet walls in the Emergency block as shown below. in the following photo. In the new In-patient building (under construction) there as a vulnerable single brick parapet wall at the edge of the roof slab, and inadequate bonding in the brick masonry work (see Figure 8).



Figure 8: Vulnerable parapet (left) and inadequate brick bonding (right)

4.3.6 New story and block extensions

A new story has been added to the Delivery block and Biomedical engineering department block using prefab materials (Figure 9 left). In the opinion of the NHSSP team the quality of this construction is very poor. In addition, additions have been built between two building blocks as shown in Figure 9 right. These type of unplanned extension affects structural integrity of the blocks, causes maintenance problems and increases seismic vulnerability.



Figure 9 Extension of floor on the delivery block and biomedical engineering department (left) and additional blocks (right)

4.3.7 Emergency Block and access road

The Emergency Department is located at the rear site, and is hardly visible from the entrance area. The building does not comply with the Standard Guidelines for Design and Construction of Health Infrastructure 2017 – internal space arrangements and capacity are inadequate. The access road to the Emergency block is not of good quality, particularly to the rear of the new In-patient block (see Figure 10)



Figure 10: Access road to Emergency block

4.3.8 Window replacements

In some cases, wooden frame windows have been replaced by aluminium frame windows. As reported by hospital staff, this was carried out to increase light levels in the buildings (see Figure 11).



Figure 11: Replacement of wooden frames to windows

4.3.9 Poor drainage system and landscaping with access road

There are various storm water drainage structures in front of the hospital compound (see Figure 12). The NHSSP team observed that construction and demolition (C&D) waste had been dumped in a storm water drainage channel, increasing the risk of flooding. In addition, the hospital access road is basic earth, and has not been leveled or graded.



Figure 12: Drainage channel with C&D waste (left) and access road and drainage in front of hospital compound (right)

4.3.10 Lack of Heating, Ventilation and Air-conditioning

There is no heating system or heating, ventilation and air-conditioning (HVAC) units in critical care areas and the inpatient area. This is especially problematic in areas used for mother-child cases. Mothers and children take advantage of fresh air and sunlight when possible (see Figure 13).



Figure 13: Patients taking a sun bath

4.3.11 Disabled-friendly access components

Most buildings on the site have ramps. Two levels of the hospital - Out-patient department (OPD) and In-patient area - are also connected via a ramp. However, an access ramp to the OPD block has been partially blocked by the construction of a concrete step for patients to access the medicine counter. This hampers wheelchair access and an example of poor design (see Figure 14). The ramp at the Emergency Block for second floor access does not meet design standards. There are no disabled-friendly access components at the entry to the hospital compound.



Figure 11: Ramps and accessibility

4.4 Gap Analysis

4.4.1 Lack of space for additional services

Upgrading Salyan hospital to Primary A3 level requires provision of additional services and space to house them. At present, space is constrained and this challenge needs to be addressed. Hospital management have already identified three key services that need immediate provision – Special Neo-natal Care Unit (SNCU), Dental service and Blood Bank.

In addition, the following service gaps and issues were identified:

- **Emergency Block** – there is no dedicated Minor OT in the emergency block (non-compliant with NHIDS) and the Emergency service is not appropriately located.
- **Operation Theatre** – the OT in CEONC is being used for all general operations. A separate OT is required for general operations, leaving the OT in CEONC dedicated for provision of cesarean sections (CS).
- **Central Sterile Supplies Department (CSSD)** – lack of Central Sterile Supplies Department (CSSD)
- **Laundry** – lack of specialised laundry unit
- **Waste management area** – need for a dedicated and organized waste management area and service
- **Infrastructure does not support effective infection control**– dirty out / clean in in OT is lacking, HVAC in sterile areas / maternity is lacking, lack of anti-bacterial floors and finishes

4.5 Interventions

Based on the on-site site assessment, gap analysis, situation analysis, and consultation with the hospital management and local stakeholders, the NHSSP team have identified the following interventions:

4.5.1 Revision of Master Plan

The draft master plan need to be revisited to make it as an integrated Master Plan that guides future development of the hospital in line with Multi-hazard resilience perspective and that address identified needs and following issues.

- **Site efficiency:** The proposed Master Plan is largely focused on construction of additional structures. While there is a role for new-build, consideration must also be given to maximizing use of the current buildings, and ensuring that there is efficient use of the built fabric. The Master Plan needs to be revised to document fully the existing structures, clearly identifying which should be demolished, reconstructed and/or retrofitted. New structures should be planned in relation to the efficient use of existing structures. This revision should also be carried out with the Standard Guidelines 2017.
- **Design aspects:** Many of the existing structures are attractively built, with exposed stone masonry structures. This style not only reflects local heritage and local architecture but also reduces maintenance costs. The revision of the Master Plan should support the addition of extra floors extending the external stone-facing walls. Hence, Additional and expanded services can also be located in new building blocks, but design should be appropriate and blend with existing buildings.
- **Integrated approach:** The new Master Plan should be guided by an integrated approach, identifying a coherent and rational process of physical development and

service improvement. The plan should identify short-, medium- and long-term interventions, taking account of population projections:

- Short-term – from immediate to 2 years
- Medium – 2 to 5 years
- Long – post 5 years

- **Suggested Short term intervention**
 - Construction of new hospital building accommodating standard Operation Theater, wards with additional inpatient Beds, ICU, CSSD, x-ray room, emergency department, pathology department.
 - After moving the current OT function from CEONC block, CEONC function will be restored into the CEONC block after necessary upgradation.
 - Construction of Standard Postmortem Building
 - Development and implementation of maintenance plan for hospital infrastructure and equipment
 - Detailed condition assessment, including defects and seismic safety assessment, and production of programme of works in the area with existing building structures.
 - Electricity supply survey, and production of programme of works
 - Water supply survey, and production of programme of works

Medium- and long-term activities will be confirmed after the findings of surveys and development of Master Plan, but could include:

- Seismic retrofitting of buildings where required
- Demolition of the most vulnerable buildings and decanting space construction to support retrofitting process

4.5.2 Road improvement, public open space and landscaping

Dirt roads should be properly leveled and graded, drainage lines cleared and repaired. Public open spaces and pathways should be upgraded in line with landscape design principles and principle of universal accessibility.

The road to the Emergency Department should be widened and upgraded at vulnerable points to ensure safe and easy access.

4.5.3 Provision of heating and HVAC services

The Critical Care and In-patient areas (especially for mother-child cases) should be provided with heating system and / or HVAC services.

4.5.4 Orientation to the Hospital Management

The CEONC block was built in 2068 using the standard type design, however the Delivery room, Sluice and other spaces are not used for the purposes they were designed. Management and staff should be given a re-orientation and briefing on the layout, functions and operation of the CEONC to maximize effective and safe use of the space.

4.5.5 Relocation of Emergency Department

The Emergency Department should be re-located from its current position at the rear of the site to a more visible and accessible location nearer the entrance. The Emergency service block should be relocated as per the Standard Guidelines 2017.

4.5.6 Maintenance of buildings

Visible deterioration of the building fabric – particularly seismic bands and exposed reinforcement - should be repaired. Roofs should be kept clear of dried leaves and tree debris to reduce fire hazards. Hospital management should initiate a regular cycle of building maintenance.

4.5.7 Removal of Parapet Wall of Emergency building

The parapet wall of emergency building at first floor is vulnerable. It should be removed.

4.5.8 Repair cracks, settlement and foundations of CEONC building

The cracks, settlement and foundations at the left/north side of the CEONC building and retaining wall should be given a detailed examination, and appropriate repairs made.

4.5.9 Disaster Management Plan

Hospital management should develop and adopt a Disaster Management Plan for mitigating all risks and hazards to the facility. Given its location, the Plan should pay particular attention to fire dangers.

4.6 Conclusion

Salyan Hospital is a very significant facility in the lower SE corner of the province, with good connections to the Karnali Highway. It has a dependent population four times the size of its catchment, and merits its designation as a Primary A3 Hospital, although key services are urgently required. The Master Plan needs to be updated as a matter of urgency, and a programme of works assembled.