



Nepal Health Sector Support Programme III (NHSSP – III)

Joint Hospital Assessment Report – Karnali Province

Dolpa Hospital, Dunai, Dolpa District

Final Draft

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4 Infrastructure

4.1 Site and Buildings

Dolpa Hospital is located in Dunai, the administrative headquarters of Dolpa district, in the northeast of Karnali Province.

Health facilities in Dolpa

There are 24 health facilities within Dolpa District. In line with the Nepal Health Infrastructure Development Standards (NHIDS), seven are currently categorized as Primary Hospital B3 level and hospital – Dolpa Hospital - as Primary Hospital A3. The remaining facilities are categorized as standard Type 4 Health Post (HP). Health facility details are set out in Table 1.

Table 1: Categories of Health Facilities in Dolpa District as per NHIDS

Local Authority	Health Facility Name	Categorised Status
Chharka Tangsong Gaunpalika	Chharka HP	Primary Hospital B 3
Chharka Tangsong Gaunpalika	Mukot HP	Type 4 HP
Dolpo Buddha Gaunpalika	Dho HP	Primary Hospital B 3
Dolpo Buddha Gaunpalika	Tinje HP	Type 4 HP
Dolpa Jagadulla Gaunpalika	Chaurikot HP	Type 4 HP
Dolpa Jagadulla Gaunpalika	Kaigaun HP	Primary Hospital B 3
Dolpa Jagadulla Gaunpalika	Rimi HP	Type 4 HP
Kaike Gaunpalika	Banthada HP	Type 4 HP
Kaike Gaunpalika	Sahartara HP	Primary Hospital B 3
Mudkechula Gaunpalika	Illa HP	Primary Hospital B 3
Mudkechula Gaunpalika	Kalika HP	Type 4 HP
Mudkechula Gaunpalika	Sarmi HP	Type 4 HP
Shey Phoksundo Gaunpalika	Bhijer HP	Type 4 HP
Shey Phoksundo Gaunpalika	Phoksundo HP	Type 4 HP
Shey Phoksundo Gaunpalika	Saldang HP	Primary Hospital B 3
Thuli Bheri Nagarpalika	Dolpa Hospital	Primary Hospital A 3
Thuli Bheri Nagarpalika	Jufal HP	Type 4 HP
Thuli Bheri Nagarpalika	Majhfal HP	Type 4 HP
Thuli Bheri Nagarpalika	Raha HP	Type 4 HP
Tripurasundari Nagarpalika	Fulching HP	Type 4 HP
Tripurasundari Nagarpalika	Likhu HP	Type 4 HP
Tripurasundari Nagarpalika	Pahada HP	Type 4 HP
Tripurasundari Nagarpalika	Sunhoo HP	Type 4 HP
Tripurasundari Nagarpalika	Tripurakot HP	Primary Hospital B 3

Dolpa Hospital

Dolpa hospital is in Dunai, the district headquarters, situated in relatively flat terrain with open boundaries. The hospital was established in 2048 BS (1991) and is an easy 15-minute walk from the centre of Dunai along the side of the Thuli Bheri river (see Figure 1). It is approximately two hours drive to the nearest airport to Jufal. The total dependent population of Dolpa Hospital is 41,053 and the immediate catchment population is 5,613 (see Table 2). The hospital has the 15-bed capacity, and in line with the dependent population size is categorised at Primary Hospital A3 level under the NHIDS.



Figure 1: Dolpa Hospital and nearby Dunai Bazar (District Headquarters) on the Thuli Bheri River

Table 2: Categorized status of Dolpa Hospital as per NHIDS

S.N	Hospital Name	Dependent Population	Catchment Population	Categorized Status
1	Dolpa Hospital	41,053	5,613	Primary Hospital A 3

Around 40 percent of the district population has road access to Dolpa Hospital, with good connections from Thuli Bheri Napa, Tripurasundari Napa, and Kaike Gaunpalikas. Access from Gajdula and Mudkechula Gaunpalikas will improve on the completion of the connecting road. The road link from Shey Phoksundo Gaunpalika is not good. Patients with no possibilities of road transport attend the Hospital on foot, by porter, and on stretchers.

Hospital buildings

The site comprises twelve buildings all in 2048 BS (1991) with the exception of the Basic Emergency Obstetric Care (BEOC) unit which dates from 2065 BS (2008). See Table 3 for details.

All buildings are single-storied and construction was made of stone masonry in mud-mortar with CGI sheet roofing. The rapid visual assessment showed that the buildings lack the seismic element like lintels, sill bands. Similarly, the hair crack in the outer and inner wall of the quarters is visually observed. During the observation, it has been found that the hospital is lacking regular repair and maintenance programme which could place the hospital is well maintained.

Table 3: Building Details

SN	Building Name	Building Type	Year of Construction	Ground Coverage (Sq. ft)	Stories
1	Out-patient Department - Main Block (OPD)	Stone masonry in mud mortar with CGI roof	2048 (1991)	3829.33	1
2	Inpatient Block	Stone masonry in mud mortar with CGI roof	2048 (1991)	2340.20	1
3	Guard House	Stone masonry in mud mortar with CGI roof	2048 (1991)	558.552	1
4	Postmortem	Stone masonry in mud mortar with CGI roof	2048 (1991)	265.0384	1
5	Nursing Quarter	Stone masonry in mud mortar with CGI roof	2048 (1991)	613.312	1
6	Nursing Quarter	Stone masonry in mud mortar with CGI roof	2048 (1991)	613.312	1
7	Nursing Quarter	Stone masonry in mud mortar with CGI roof	2048 (1991)	613.312	1
8	Nursing Quarter	Stone masonry in mud mortar with CGI roof	2048 (1991)	613.312	1
9	Doctor Quarter	Stone masonry in mud mortar with CGI roof	2048 (1991)	1352.572	1
10	Doctor Quarter	Stone masonry in mud mortar with CGI roof	2048 (1991)	1352.572	1
11	Kitchen Block	Stone masonry in mud mortar with CGI roof	2048 (1991)	619.79	1
12	BEOC Unit	Stone masonry in mud mortar with CGI roof	2065 (2008)	2002.17	1
Notes: CGI Corrugated Galvanized Iron					

4.2 Existing Situation and Services

Dolpa Hospital is an important health service facility for the District. It serves a dependent population catchment of over 41,000 people, and the provincial government is planning to implement its upgrade to Primary A3 status (see Figure 2). This entails increasing the range of services provided to this level, requiring the upgrade of existing buildings or new-build

construction.

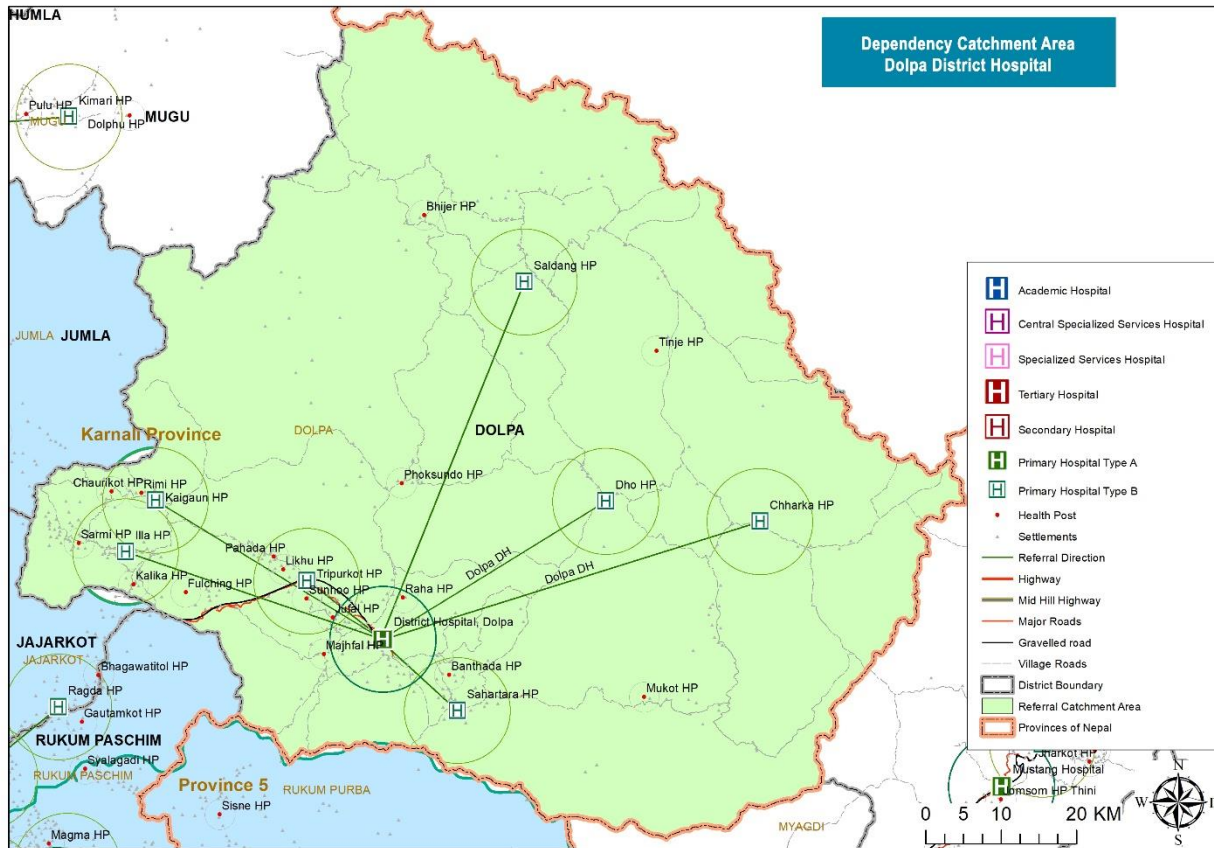


Figure 2: Dependent population and the immediate catchment area of Dolpa Hospital

4.2.1 Current services

The hospital is designed to provide 15 beds. The highest number of OPD visitors is around 100 per month, dropping to 40 during the Yarshagumba collection season as the population moves into the mountains. Each year, the hospital makes 4-5 air-transfers of patients to the main hospitals at Nepalgunj and Surkhet. Currently, the following services are provided at the hospital:

- In-patients - 15 bed with 40 to 50% occupancy
- Maternity:
 - Normal delivery: there were 81 normal deliveries in the year 2074/75 (2017/18) and 61 in the year 20075/76 (208/19)
 - Delivery services: There is no provision for cesarean section (CS) operations, and there are no obstetric forceps.
 - Vacuum delivery: Each year there are 4-5 vacuum deliveries and 3-4 cases of eclampsia
 - Referrals: Around 4-5 twins deliveries and CS operations are referred each year
- Tuberculosis - Directly Observed Treatment Short-course (DOTS) and Multi-Drug Resistant (MDR) treatments
- Family Planning
- Human Immunodeficiency Virus (HIV) – anti-retroviral therapy (ART)
- Use of concentrated oxygen

4.2.2 Utilities

The NHSSP team assessed the level and condition of utility services as follows:

Water supply:

- The source of the water supply is by pipeline from the Thado Khola river. The source has a temporary and relatively open intake.
- The Hospital has a 5,000-liter Reinforced Cement Concrete (RCC) water tank which is in poor condition and needs replacing.
- There is no filtration treatment on the water supply inside the hospital.
- The water supply freezes during winter and is turbid during the rainy season

Electricity:

- Hospital has 3-phase electricity supply but lacks dedicated supply and transformer
- It has a generator in working condition
- There is a solar power back-up system of approximately 4 KW output but this is not in working condition (see Figure 3). It appears that the system is over 5 years old.



Figure 3 (left) Solar Panel on BEOC building (right) Solar Power Battery (not working) inside the BEOC building

Waste management:

The hospital uses the pit disposal method. There is no autoclave. The majority of wastes are burned out in the open, and the burning of plastics was observed, contravening health standards (see Figure 4). It has also been observed that there was no segregation of the wastes.



Figure 4 (left) Open waste and (right) open burning of unsegregated waste

4.2.3 Equipment

The hospital is supplied with the following equipment:

- Vacuum device (suction): 1
- X-ray machine: 1
- Electrocardiogram machine (ECG): 1
- Concentrator: 2
- Ultrasonography (USG): 2 – one operational, the other only partially operational

4.2.4 Human resources

The hospital has 29 staff in total – 12 are permanent members while the remainder is on service contracts.

- Permanent doctor (Bachelor Medicine / Surgery MBBS): 1
- Doctor of Medicine General Practice MD/MDGP: 0 (vacant post)
- Temporary Medical Officers (MO): 2 (in a contract) from the scholarship. One will leave in Bhadra (September) after completion of service tenure
- Skilled Birth Attendant (SBA): 5
- Anesthesia: 0 (vacant post)
- Health Assistant: 2 (service contract)
- Auxiliary Health Worker (AHW): 6 (2 Permanent)
- Auxiliary Nurse Midwife (ANM): 3 (1 permanent)
- Staff nurse: 3 (2 permanent)
- Administrative staff: 0 (vacant post)
- Accountant: who also looks after Health office and Veterinary Service office
- Office assistant: 6 (2 permanent)

4.2.5 Development plan

It has been observed that in 2072 B.S. (2015), the hospital management initiate to prepare the preparation of a master plan for its expansion to 50 bed capacity with increased specialised

services. But those efforts are not materialised yet, as there is no presence of such a master plan. Therefore, it has noticed that the master plan is of keen requirement for the interventions to be made regarding upgrading the hospital to the primary A3 level. However, it has also been observed that the current situation does not truly warrant an increase in bed numbers from 15 to 50 beds.

4.3 Assessment Findings

4.3.1 Use of existing spaces

The BEOC block was built in 2065 BS (2007) using the standard type design (see Figure 5). However, it is used currently only for deliveries, while the sluice and other spaces are not used for the purposes they were designed for. This may be because the hospital management was never given or less effort in an orientation on the plan, design, and functions of the buildings during and after its construction. Neo-natal related services are not provided.



Figure 5: views of the BEOC Block

4.3.2 Boundary security

There is no proper boundary wall to the north of the precinct. This enables animals and people to trespass onto the hospital premises. (see Figure 6). It also opens hospital land up to the risk of encroachment from outside.



Figure 6: Open boundary of hospital and animals on site

4.3.3 Walls Damage

Wall cracks were observed in most of the buildings, including the main building (see Figure 7). In the residential quarters their walls with cracks to both sides (see Figure 8). Cracks to corner joints, window and door spaces are often the result of seismic activity. Other cracks can be due to settlement and unequal load bearing.



Figure 7: Cracks in the main building

Relatively, the quarter buildings consist of more cracks on both sides of the wall. It was visually observed on the outer wall of the quarter (see figure 8).



Figure 8: Cracks on the outer wall of the quarter

4.3.4 Building deterioration

The buildings on the site are in general poorly maintained – there are various examples of deterioration, including crumbling mortar and stonework, and spalling concrete (see Figure 9).



Figure 9: Lack of maintenance to stone and concrete elements

4.3.5 Missing seismic components

Various blocks lack components that would improve seismic strength and resilience, notably a lack of sills and lintels on windows and doors (see Figure 10).



Figure 10: Building without seismic resilient elements - sills and lintels – at the windows

4.3.6 Corrugated Galvanized Iron (CGI) roofing

The NHSSP team noted various cases of loose and lifted CGI roofing sheets, due to weak fixings and poor maintenance. Rotten sheets will need replacing. Given the local climate and high winds, it is important that that the CGI roofs are anchored securely (see Figure 11).



Figure 11: CGI roofing needs replacement and proper anchorage

4.3.7 Unreinforced masonry wall and unbalanced load path

The main hospital building has a story height of 3m – the upper meter of this consists of unreinforced masonry, which is not properly anchored and restrained. This will create an unbalanced load path in the wall during a seismic event, which the possibility of buckling and collapse (see Figure 12).



Figure 12. Unreinforced masonry wall above the false ceiling

4.3.8 Poor drainage system and landscaping with access road

The hospital site slopes from north to south, and there is no surface drainage system for rain and stormwater. Ground surfaces are not well maintained. There are no gutters on buildings, and so no provision for rainwater harvesting. (See Figure 13)



Figure 13. The poor drainage system and unmanaged landscaping at the rear of the hospital precinct

4.3.9 Lack of Heating, Ventilation, and Air-conditioning (HVAC)

There is no heating system nor heating, ventilation, and air-conditioning (HVAC) units in critical care areas and the in-patient area. This is especially problematic in areas used for mother-child cases (see Figure 14).



Figure 14. BEOC building without HVAC (Photo from rear of the hospital)

4.3.10 Entry Access

There is a narrow entry gate in the hospital, which is pedestrian access only. Even this would hamper access for patients on stretchers (see Figures 15 and 16)



Figure 15: Narrow entry gate to the hospital



Figure 16: Stretcher patient being carried to the hospital

4.3.11 Floors and finishes

Almost all floors inside the buildings were in poor condition. The covered pathways have relatively better floor surfaces than those inside (see Figures 17 and 18).



Figure 17: Interior floor finishes in poor condition



Figure 18: Exterior walkway floor surface

4.3.12 False ceiling and roof trusses

The NHSSP team found that the false ceiling of the main building was made from wooden boards. In some cases, these had deteriorated to the point of requiring replacement, while other sections could be repaired. Roof trusses were checked and need repair work (see Figure 19).



Figure 19: False ceilings requiring repair or replacement

4.4 Gap Analysis

4.4.1 Need for additional services

Upgrading Dolpa hospital to the Primary A3 level requires the provision of additional services and space to house them. At present, space is constrained and this challenge needs to be addressed.

The lack of an operating theatre (OT) is an immediate challenge, as neither major nor minor procedures take place at the hospital, including CS deliveries. Cases requiring such interventions are referred to as Nepalgunj or Surkhet. Emergency transfers use aircraft or helicopter charter and are expensive. There is an existing post for MD doctor on the hospital establishment, so if the OT were to be in place then these procedures could be provided.

As well as the OT, the Hospital management has already identified four key services that need immediate provision – Comprehensive Emergency Obstetric and Neo-natal Care Unit (CEONC), Special Neonatal Care Unit (SNCU), Dental service and Blood Bank.

In addition, the NHSSP team identified the following service gaps and issues:

- **Emergency Block** – there is no dedicated Minor OT in the emergency block and the Emergency service itself is not appropriately located.
- **Central Sterile Supplies Department (CSSD)** – there is no Central Sterile Supplies Department.
- **Laundry** – there is no specialised laundry unit.
- **Waste management area** – health care waste management is not efficient and doesn't comply with standards. There is a need for a dedicated and organized waste management area and service.
- **Infection control** - protocols are not properly observed

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 has identified interventions set out below.

4.5.1 Preparation of Master Plan for the Hospital

As observed and discussed earlier, Dolpa Hospital has not a Master Plan in place though it was initiated but never been completed and materialised. Hence, the starting point for the interventions will be the preparation of the overall master plan for the upgrading of infrastructure and services to the Primary A3 level, and for sustainable development in the future. The NHSSP team identified two key aspects that should be included in the preparation of the master plan:

- **Site efficiency:** The Master Plan shall be prepared to focus the existing building blocks, its existing conditions, linkages, functionality and required new interventions for the new structures to cater upgraded services in line with the NHIDS 2017. While proposing the new structures, consideration must also be given to maximizing the use of the current buildings and ensuring that there is an efficient use of the built fabric.
- **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 new Master Plan should support the addition of extra floors extending the external stone-facing walls after detailed engineering assessment and design. New blocks can be inserted into the site, but the design should be appropriate and blend with existing buildings in line with current standards.

4.5.2 Landscaping, public open space, and connectivity

The hospital precinct has developed in a fairly random fashion over the years, with little thought to the use of and quality of public open space. The residential quarters are positioned in a haphazard manner with no proper connectivity to the rest of the precinct. Landscaping overall is in poor condition, while the dirt roads and footpaths in the precinct should be properly leveled and graded, drainage lines cleared, and paved. Public open spaces and pathways should be integrated and upgraded in line with landscape design principles.

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 the heating system. Similarly, HVAC services should be in place in critical areas like emergency and proposed OT block.

4.5.4 Maintenance of buildings

Visible deterioration of the building fabric – particularly seismic bands and cracks - should be repaired. CGI Roofing should be replaced, should properly be anchored, should have rainwater harvesting mechanism and should ensure on regular cleaning. Hospital management should initiate a regular cycle of building maintenance through the preparation and implementation of maintenance plans.

4.5.5 Repair cracks, settlement, and foundations of the building

The cracks, settlement, and foundations at the left/north side of the buildings should be given a detailed damage assessment, and appropriate repairs made.

4.5.6 Mortuary

The existing mortuary building is in an insecure location within the hospital grounds and is in a vulnerable condition. The existing mortuary does not comply with the current standards so it needs to be demolished and reconstructed in compliance with current standards. The proposed new mortuary needs to be protected and secured from trespass by providing a perimeter wall and security system.

4.5.8 Repair/replacement of false ceiling

Repairs have to be made to the false ceilings, and areas that cannot be saved should be replaced.

4.5.9 Internal floors

Internal floors should be repaired and/or refurbished as necessary. In critical service areas, the anti-bacterial flooring and interior walls with anti-bacterial paint including the sterilise indoor environment should be provided as of current standards

4.5.10 Dedicated OT Block

The NHSSP team has proposed a rapid intervention to provide a dedicated OT block. The existing hospital kitchen would be demolished and the service relocated, with a new OT block constructed instead. The OT block will comply with NHIDS standards and will be equipped to provide minor and major procedures, as well as CS deliveries.

4.5.11 Disaster Management Plan

Hospital management should develop and adopt a Disaster Management Plan as a hospital emergency preparedness and response plan for mitigating all risks and hazards to the facility. Given its location, the plan should pay particular attention to most exposure risks, including seismic hazards and other epidemics

4.5.4 Orientation and briefing to the Hospital Management and Staff

Management and staff should be given a re-orientation and briefing on the layout, functions, and operations of the different buildings to ensure effective planning and operational use.

4.6 Proposed short-, medium- and long-term planning

The NHSSP team has recommended that preparation of Master Plan as a point of departure, the Hospital Management and staff should develop an integrated development plan covering short-, medium- and long-term interventions:

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

An outline of activities in each period is set out below.

4.6.1 Short-term plan

The activities proposed for the short-term plan are required for immediate improvements and the smooth running of the hospital. These can be implemented and constructed within a period of 2 years.

- Preparation of Master Plan for hospital development (see figure 3)
- Development of Multi-hazard resilience perspective to guide future development of the hospital
- Development and implementation of the maintenance plan for hospital infrastructure and equipment
- Demolition of the existing hospital kitchen to construct dedicated OT building
- Relocation of the hospital kitchen
- Replacement/repairs of floors and finishes
- Repair/maintenance/ replacement of the CGI roof sheets and false ceilings where necessary
- Repair/maintenance/ replacement of the solar power back-up system
- Repair and maintenance of the residential quarters
- Construction of proper surface drainage
- Construction of new mortuary block
- Provision of semi-permanent fencing to precinct boundary
- Repair and maintenance of the water source and intake
- Construction of overhead (50 K liter) and underground (1 lakh liter) water tanks
- Upgrade existing emergency block (dedicated emergency service)
- Develop and adopt the Hospital Emergency Preparedness and Response Plan and mock drill

4.6.2 Medium-term plan

Medium-term activities will be scheduled to take place within the next 2-5 years. These include:

- Seismic retrofitting of buildings where required
- Demolition of the most vulnerable buildings and decanting space construction to support retrofitting process
- Landscaping architectural elements
- Permanent compound wall
- Improved gate and accessibility from the road (aligned with road upgrading)
- Provision of dedicated medical oxygen plant

4.6.3 Long-term plan

In the main, these activities will emerge as development takes place over the next five years. Interventions that are identified as a result of responses to climate change-induced hazards are possible. Similarly, changes in the dependent area population could have an impact on the size and nature of health facilities required. At this stage, the following activities are feasible:

- Demolition of the existing residential quarters and re-construction in the western part of precinct
- Construction of larger capacity multi-storied hospital building on the residential quarter site to take advantage of direct road access.

4.7 Conclusion

Dolpa Hospital has the scope to provide increased services to this remote district. Much preliminary work has already been done, and the Master Plan is inevitable for any future interventions (physical upgrading and services) and development. There is a clear sense of what works are needed over the short- to medium-terms, and given commitment and financial backing from the provincial government, the capital works could move swiftly into design and tender stages.