2025

CAPITAL INVESTMENT PLAN

KALASH VALLEYS

RURAL SPATIAL ASSESSMENT AND HABITAT PLANNING OF 10 VILLAGES IN KALASH VALLEYS, DISTRICT CHITRAL - PAKISTAN

Aga Khan Agency for Habitat Pakistan

SHEHER SAAZ
Creating Places For People

Copyright

Photo Credit:

- Images used on the cover page are captured by the Consultant.
- Logo of the client is taken from their official website.
- All the images used in the report are captured by the Consultant.

Protect Detail: Rural Spatial Assessment and Habitat Planning of Kalash Valley, District Chitral - Pakistan

Agreement Signing: 21st March 2025
Client: Aga Khan Agency for Habitat Pakistan (AKAH,P)
Consultants: Sheher Saaz Pvt. Ltd.

Report's Progress Status:

Date	Version	Description
30th June 2025	First Draft	Capital Investment Plan – Kalash Valleys
26th July 2025	Second Draft	Capital Investment Plan – Kalash Valleys
21st August 2025	Final Version	Capital Investment Plan – Kalash Valleys

Executive Summary

Kalash Valley, located in Chitral District of northern Pakistan, is renowned for its breathtaking mountain landscapes and the unique cultural heritage of the indigenous Kalasha people. This Capital Investment Plan (CIP) presents a strategic, long-term framework to preserve and advance this culturally rich and environmentally fragile region over the 2025–2045 horizon. The plan prioritizes multi-sectoral investments – spanning infrastructure, tourism, environmental resilience, cultural heritage, health, education, and livelihoods – to stimulate inclusive economic development, protect fragile ecosystems, and safeguard the Kalash cultural legacy. Drawing on proven models (e.g. Aga Khan Development Network and UN-Habitat frameworks), the CIP is structured into short-term (2025–2030), medium-term (2031–2040), and long-term (2041–2045) phases, ensuring that critical basic needs are met first, followed by scaled infrastructure development and future-oriented modernization.

The total proposed investment under this plan is on the order of PKR 12–15 billion (approximately USD 40–50 million) over 20 years. This funding will enable transformative improvements across sectors: upgrading roads, bridges, and digital connectivity; achieving universal access to clean water, sanitation, and electricity; developing eco-friendly tourism infrastructure; protecting forests and building disaster resilience; and strengthening education, healthcare, and livelihood opportunities. Key features include investments in climate-resilient infrastructure (flood protections, renewable energy), cultural revitalization projects with economic returns, local capacity-building and institutional development, and a diversified financing strategy leveraging public funds, donor grants, public-private partnerships (PPPs), and community contributions. Robust monitoring and accountability mechanisms are built into the plan to ensure transparency and impact.

By 2045, the Kalash Valley CIP envisions a region that is resilient, equitable, and self-sustaining, where all households have access to basic services, the local economy thrives through sustainable tourism and value-added agriculture, and the Kalasha cultural heritage is preserved for future generations. The planned investments are expected to yield high social and economic returns – for example, improved human development outcomes (literacy, health) and increased incomes – making the plan both a socially and financially sound endeavor. In summary, this 20-year, multi-billion-rupee roadmap balances human development, cultural preservation, environmental resilience, and economic upliftment in Kalash Valley. Through an inclusive and well-governed implementation, the Kalash Valley CIP can become a model of sustainable mountain development, benefit its indigenous community and contribute to national and global sustainable development goals.

Table of Content

List of Tables

List of Figures

1. Background and Objectives

1.1. Background of the Project

Aga Khan Agency for Habitat (AKAH) is the lead agency of the Aga Khan Development Network (AKDN), mandated to address the impacts of climate change and create safe and sustainable habitats, providing opportunities and focusing on the well-being of disaster-prone communities. AKAH has a diverse portfolio, including Climate-Smart Solutions, Green & Safe Construction, Energy Audits and Carbon Offsetting measures, WASH, Habitat Assessment, Planning & Designing, Emergency Preparedness and Response and Disaster Mitigation, Resilience and Adaptation.

In line with its commitment to sustainable habitat planning, AKAHP has engaged Sheher Saaz to conduct Habitat Planning for Villages in Kalash Valley, namely Birir (5 Sq. Km) divided into Birir Bala and Birir Payeen, Parakalak (1.55 Sq. Km), Rumboor Centre (2.0 Sq. Km), Sheikhandeh Rumboor (2.82 Sq. Km), Bumborate (1.78 Sq. Km), Kandisar (0.74 Sq. Km), Batrik (0.44 Sq. Km), Karakal (0.85 Sq. Km), Pehlawanandeh (4.13 Sq. Km), and Sheikhandeh Bumborate (17.22 Sq. Km). These villages have been severely impacted by climatic hazards, including a series of floods over the past two decades[1], as well as the threats posed by glacial melt[2] and rising temperatures due to global warming[3]. In collaboration with the AKAHP Habitat Resilience Programme team, Sheher Saaz played a key role in establishing project baselines, aligning sectoral goals, and designing holistic Habitat Plans.

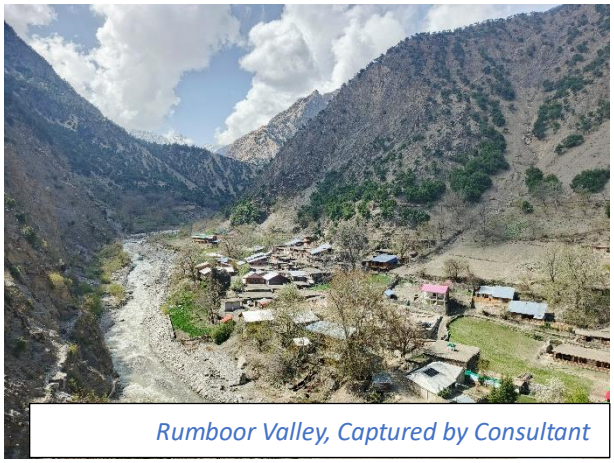
This report provides the Capital Investment Plan (CIP) as a companion to the Habitat Plans, translating the identified needs and sectoral priorities into concrete, costed, and fundable projects. While the Habitat Plans lay out the spatial and technical vision for resilient and sustainable development in the Kalash Valleys, the CIP serves as a financing and implementation roadmap. The CIP is intended to guide government authorities, donors, and development partners in mobilizing resources, coordinating interventions, and ensuring that the proposed initiatives move from plans on paper to real improvements in the lives of the Kalash communities.

1.1. Overview of Project Area

Kalash Valley, situated in District Chitral of Khyber Pakhtunkhwa (KPK), is a remote and culturally significant region located 40 kilometres from Chitral city. The valley spans over an area of 456.58 square kilometres (176.29 square miles)[4] and is home to a unique and indigenous community, the Kalasha people and the Muslims. The valley is characterized by steep slopes, narrow gorges, and rugged terrain, with settlements situated at elevations

[1] https://www.eco-business.com/news/pakistans-indigenous-community-left-to-battle-disasters-by-drawing-on-conventional-wisdom/
[2] https://www.nation.com.pk/01-Jan-2025/glacier-melting-a-serious-threat-to-pakistan
[3] https://www.icimod.org/article/climate-change-and-the-increasing-risk-of-hazards-in-chitral-pakistan
[4] https://www.100adventurestravel.com/kalash

ranging from 1,900 to 2,200 meters above sea level. The geographical coordinates of the region are 35°42'2"N 71°41'29"E.



Rumboor Valley, Captured by Consultant

The Kalash region consists of three major valleys—Bumborate, Rumboor, and Birir, each with its own distinct cultural and geographic features. These valleys are surrounded by the Hindu Kush Mountain range and face the Chitral River, approximately 20 km south of Chitral. The Bumborate Payeen and Rumboor Valleys join at Ayun village before merging into the Chitral River, while Birir Valley opens towards Gabhirat village. The highest passes in the region, reaching 4,500 meters, connect Kalash Valley to Afghanistan's Nooristan Province, highlighting the valley's historical and cultural linkages to the region.

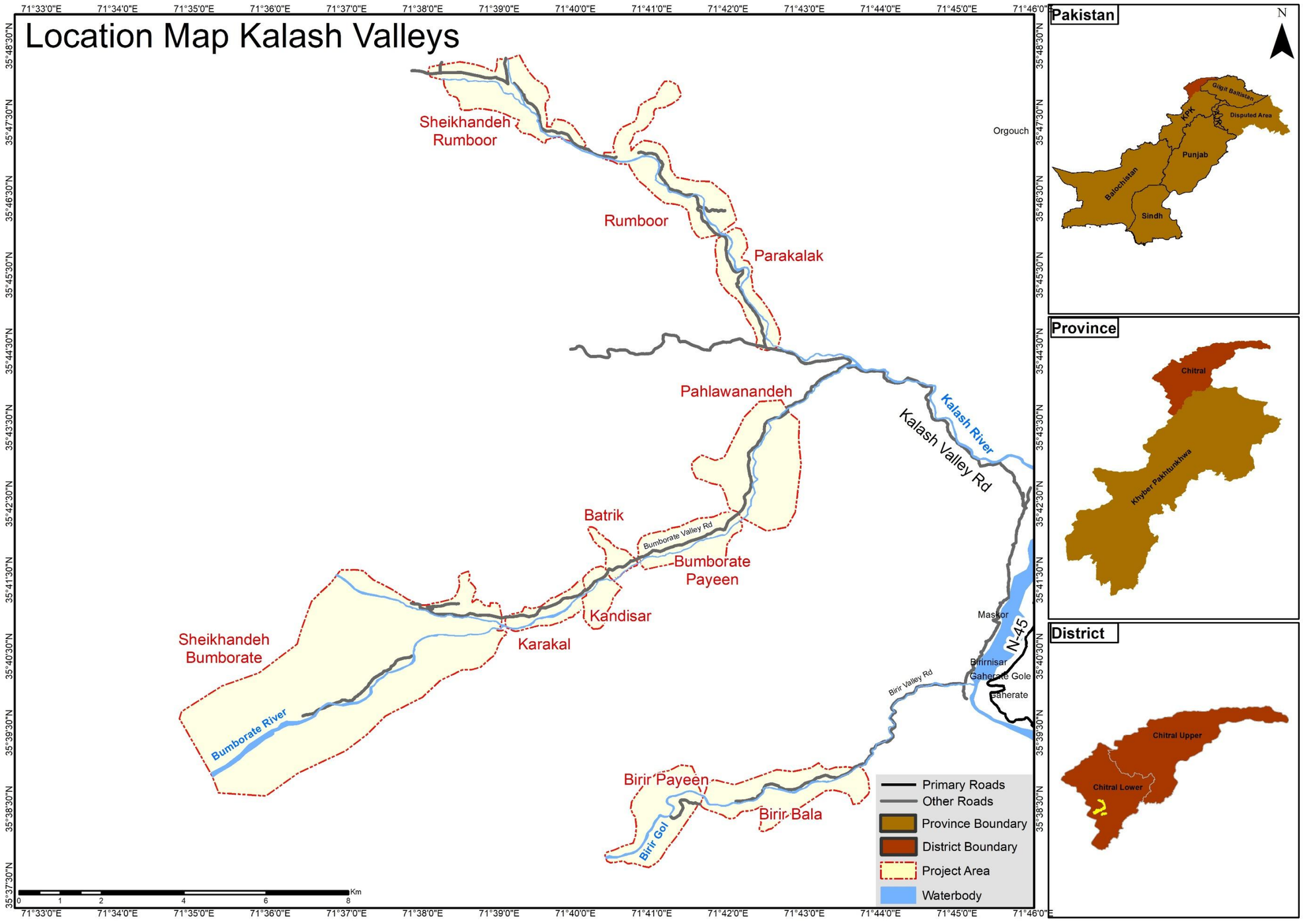
1.1.1. Villages of Kalash Valleys

The project area comprises of small villages within the three Kalash Valleys, each with unique topographic, cultural, and socio-economic characteristics. Among them, Bumborate, Birir Bala and Birir Payeen are the largest and most developed settlements, whereas Karakal is regarded as the most religiously significant village of the Kalasha people. The table below provides an overview of villages covered in this project, including their respective land area:

Table 1: Villages under Project Area

Village Name	Area (Sq. Km)
Birir (Birir Bala and Birir Payeen)	5.00
Parakalak	1.55
Rumboor	2.00
Sheikhandeh Rumboor	2.82
Bumborate	1.78
Kandisar	0.74
Batrik	0.44
Karakal	0.85
Pehlawanandeh Bumborate	4.13
Sheikhandeh Bumborate	17.22

Map 1: Location Map – Kalash Valley



Source: The Consultant, 2025

1.2. Objectives of Capital Investment Plan

The CIP is designed to:

- Provide a structured pipeline of priority projects for phased financing.
- Strengthen resilience to climate change and disasters through risk-reduction investments.
- Improve access to basic services such as water, sanitation, health, education, and energy.
- Safeguard and promote Kalash cultural heritage and linguistic identity.
- Expand sustainable livelihoods, with a special focus on women and youth.
- Strengthen institutional capacity through the Kalash Valleys Development Authority (KVDA) and community councils.

1.3. Strategic Vision and Development Goals

"A resilient Kalash Valley where culture is preserved, communities thrive with equitable access to services and opportunities, and the natural environment is safeguarded for future generations."

The key development goals include:

- **Basic Services:** 100% access to piped drinking water, sanitation, and electricity by 2045.
- **Connectivity:** All-weather road links to Chitral and within valleys by 2035; full digital coverage by 2035.
- **Education & Health:** Literacy rate above 85% and improved health indicators by 2035, with gender parity.
- **Cultural Heritage**: Restoration of key cultural and religious sites and operational cultural centers in each valley by 2030.
- **Livelihoods:** 50% increase in average household income by 2035 through eco-tourism, agriculture, and crafts.
- **Environment & Resilience**: Plant 200,000 trees and establish valley-wide flood and landslide protection by 2040.
- **Governance**: Strengthened KVDA and local councils ensuring participatory and accountable development.

The CIP is closely aligned with national and provincial development priorities, including Khyber Pakhtunkhwa's development strategies and Pakistan's commitments to the Sustainable Development Goals (SDGs). It also complements climate resilience initiatives supported by international partners, opening pathways for financing from PSDP, ADP, and global climate funds. By linking spatial planning with investment priorities, the CIP provides a practical roadmap for translating the Habitat Plan into action.

2. Current Situation and Needs Assessment

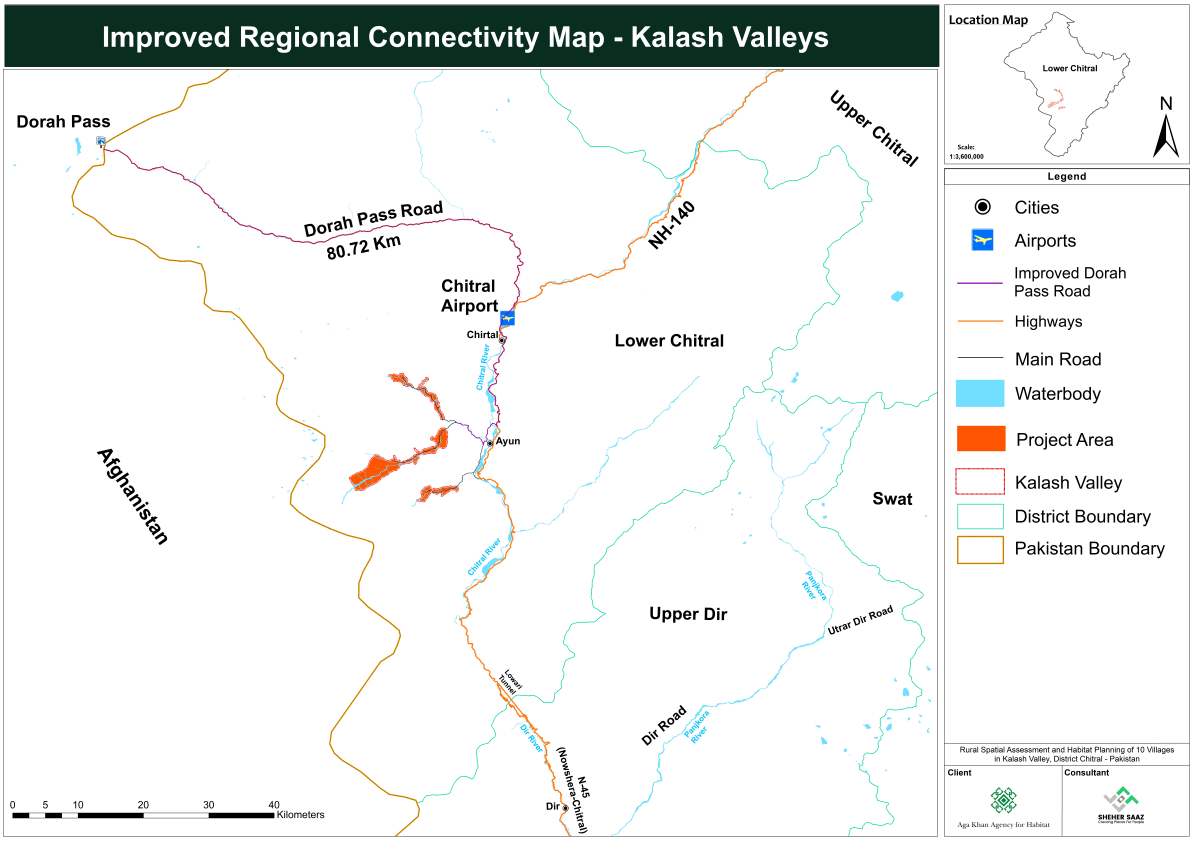
A thorough assessment of the current situation in Kalash Valley highlights the critical needs that CIP must address. Despite some improvements over the years, major gaps remain in infrastructure, basic services, and economic opportunities. Key findings from the situational analysis are summarized below:

2.1. Geography and Accessibility

The Kalasha Valleys, locally known as Kalasha Desh, are situated in the southern part of Chitral District within Khyber Pakhtunkhwa, Pakistan. Nestled in the Hindu Kush mountain range, these valleys are renowned for their unique cultural heritage and distinct natural environment. The region encompasses three primary valleys: Bumborate (Mumuret), Rumboor (Rukmu), and Birir (Biriu), each exhibiting its own cultural and ecological characteristics.

Geographically, the valleys are characterized by steep slopes, narrow gorges, and rocky terrains, with elevations ranging from approximately 1,360 meters to over 2,288 meters above sea level. The area is rich in biodiversity, hosting species such as the snow leopard and the Himalayan black bear.

Administratively, the Kalasha Valleys fall under the jurisdiction of Lower Chitral District, which was established in 2018 following the bifurcation of the former Chitral District. The district is subdivided into various tehsils and union councils, with Chitral city serving as the administrative center.



Map 2: Regional Connectivity Map
Source: Developed by Consultant

2.2. Socio economic Profile

The Kalasha people are widely recognized for their distinct cultural identity. Their origins are debated—linked by some to Alexander the Great, others to indigenous Nuristani roots, and still others to South Asian migration. Today, they continue to preserve unique traditions, though increasing outside influences and socio-economic pressures have made cultural continuity more fragile.

The Kalash language (Kalasha-mun), part of the Dardic subgroup of Indo-European languages, carries a rich oral tradition of myths, songs, and folklore. However, it is endangered due to dominance of other regional languages, necessitating urgent preservation measures.

Culturally, the Kalash practice a polytheistic belief system centered on ancestral reverence, sacred deities, and shamanic mediation. Festivals are integral to their agrarian and spiritual life, serving both as religious observances and as social anchors that strengthen community identity. Among the most significant are: Joshi (spring, marking renewal and livestock blessings); Uchaw (harvest, centered on wheat and pastoral rituals); Pul (autumn, linked to grape and walnut harvests); Biramor (a merit feast hosted by wealthy households); and Chawmos (winter solstice, the most sacred, spanning 14 days of purification, ancestral offerings, and initiation rites).

These traditions, combined with Kalash wooden architecture, sacred shrines, and communal rituals, constitute a cultural heritage of global significance. Yet, pressures from unregulated tourism, migration, and socio-economic marginalization threaten this way of life. Preserving both tangible assets (temples, graveyards, traditional housing) and intangible heritage (language, rituals, music, mythology) remains central to safeguarding the socio-cultural fabric of the valleys.

2.3. Transportation and Connectivity

The Kalash Valleys remain one of the most geographically isolated areas of Chitral, with connectivity largely dependent on a single unpaved road from Ayun that branches into Birir, Rumboor, and Bumborate. Although the valleys lie only 30–50 km from Chitral, poor road conditions, landslides, flooding, and winter snowfall often cut off entire communities for days or weeks. This remoteness severely limits socio-economic opportunities, access to healthcare and education, and tourism potential.

Road infrastructure is dominated by compacted gravel and earth tracks, with poor drainage, absence of safety barriers, and high roughness indices (IRI 5–16 m/km), reflecting low ride quality and vulnerability to erosion. A major improvement project — the 46 km Chitral–Ayun–Bumborate Road (Rs. 4.65 billion) — is underway, but progress has been slow, with completion now extended to 2026. Inter-village streets remain unpaved and fragile, intensifying mobility challenges within the valleys.

Bridges (43 in total) are mostly timber, suspension, or makeshift log structures; 53% are in poor condition, and only 23% can accommodate vehicles. Their fragility undermines both safety and continuity of access, especially during floods.

Mobility patterns reveal overwhelming reliance on walking (83%), while informal jeeps and vans provide irregular, costly, and unregulated transport. Goods movement is handled by Mazda trucks under similarly informal conditions. Formal public transport and designated terminals are absent.

Surveys highlight strong outbound travel linkages to Chitral, Ayun, and Drosh, but weak inter-valley movement due to poor roads. Bumborate functions as the regional hub, particularly during cultural festivals when mobility spikes and visitors arrive from across Pakistan. Traffic volumes, while within theoretical capacity (LOS A–C), are undermined by poor surfaces, drainage failures, and seasonal blockages. Overall, the analysis underscores that while traffic demand is modest, the structural fragility, climatic vulnerability, and lack of formal transport systems severely compromise accessibility. Targeted investments in road surfacing, drainage, slope stabilization, safe bridge replacement, and structured public transport are critical to unlock the region's socio-economic and tourism potential, while safeguarding communities against seasonal isolation.

2.4. Water, Sanitation and Health:

The Kalash Valleys rely on gravity-fed spring systems with storage tanks and household connections. While supply is mostly reliable, it drops in dry seasons and freezes in winter. Tanks and pipelines are aging, leaking, and poorly maintained, with no water quality testing, creating contamination risks. Sanitation is unregulated: wastewater is discharged into pits, drains, or fields, often mixing with irrigation channels and streams, posing serious health hazards. Solid waste management is absent, with open dumping common.

Figure 1: Retention tank & household connections

Overall, the system is functional but under stress. Key issues are seasonal shortages, poor infrastructure, lack of water testing, unsafe wastewater disposal, and absence of waste management. Upgrading tanks, repairing pipelines, introducing quality monitoring, and developing basic sanitation and waste systems are urgently needed.

2.5. Solid Waste Management

The Kalash Valleys, while globally recognized for their culture and landscape, face growing challenges from the absence of a formal solid waste management system. Rising tourism, changing lifestyles, and urbanization have steadily increased household and commercial waste, now averaging 431 grams per person per day, with Bumborate generating the most due to its larger population and tourist influx. Annually, Bumborate alone produces over 85,000 kg of waste, far exceeding Rumboor and Birir, underscoring the need for valley-specific interventions.

Figure 2: Disposal of Solid waste near River side – Birir Valley

Current management is limited to a few dustbins placed by KVDA and occasional collection by local authorities, with much of the waste still openly burnt or dumped along rivers, roadsides, and fields. The Town Municipal Administration (TMA), responsible for SWM, lacks resources, regular collection schedules, engineered disposal sites, or recycling facilities. A proposed landfill at Ghochar Kuh remains unapproved, leaving waste largely unmanaged.

This situation poses serious health and environmental risks, particularly during peak tourist seasons when plastic and other non-biodegradables accumulate. Without urgent, decentralized and sustainable solutions—including segregation at source, small-scale collection, community awareness, and environmentally sound disposal—the growing waste burden threatens the valleys' cultural integrity, ecological health, and tourism potential.

2.6. Environmental and Natural Resource Profile

The Kalash Valleys sustain a mixed mountain economy of small-scale agriculture, fruit orchards, and livestock rearing, heavily dependent on forests and natural resources. Forests, spread between 1,500–3,000m altitude, are dominated by conifer and oak species and provide timber, fuelwood, and medicinal plants. Over 145 plant species (35 with medicinal value), 31 bird species, and 27 mammals—including endangered Markhor, musk deer, and Himalayan ibex—highlight the region's biodiversity.

Vegetation zones include stream bank vegetation (water-dependent habitats), dry riverbeds (fruit trees like walnut, apricot, pear), and slope vegetation (shrubs and conifers). However, illegal logging, overgrazing, and fuelwood collection are driving rapid deforestation, habitat loss, and soil erosion, pushing wildlife to higher altitudes. Climate change is compounding risks through glacial melt, altered rainfall, and biodiversity decline.


Unregulated tourism further pressures ecosystems through waste, infrastructure expansion, and cultural disruption. Without conservation investments—such as GIS-based monitoring, reforestation, and biodiversity protection—the ecological base of local livelihoods will remain at risk.

2.7. Disaster Risk and Climate Resilience

The Kalash Valleys face compounding disaster risks from floods, landslides, earthquakes, and climate change. Historical records show repeated flash floods (2010, 2013, 2015, 2020, 2022, 2023) that destroyed farmland, homes, and critical infrastructure, with the 2015 floods alone eroding over 100 acres and 40 walnut trees. Steep slopes, deforestation, and seismic fault lines (Kalash, Chitral Gol, Chitral–Hunza) further increase vulnerability.

Climate trends show accelerated warming (+0.9°C since 1991), causing early snowmelt, shifting crop cycles, and water stress. In parallel, widespread deforestation exacerbates landslides and erosion. Despite abundant water bodies, infrastructure gaps lead to flooding in monsoons and scarcity in dry months.

Disaster preparedness remains limited. While AKAH has positioned stockpiles of emergency equipment in CERT/VERT centers (tents, ropes, helmets, first aid, lights), early warning systems, seismic-resilient infrastructure, and evacuation routes require urgent strengthening.

Key risks include:

- Floods and GLOFs damaging farmland, housing, and roads.
- Landslides cutting off access and burying cultivable land.
- Seismic activity threatening Sheikhandeh, Bumborate, Birir Bala, and Birir Payeen.
- Unregulated tourism aggravating environmental fragility.

Building resilience will require a combination of ecosystem protection, resilient construction, hazard mapping, early warning systems, and community training to safeguard both cultural heritage and fragile ecosystems.

2.8. Livelihoods and Economy

The local economy is primarily agrarian but at a subsistence level. Households farm terraced fields (maize, wheat) and orchards (grapes, mulberries, walnuts, apricots) mostly for their own use. Surplus is limited, and due to poor road connectivity, farmers struggle to bring products to larger markets before spoilage. There is great potential in fruit processing and high-value products (e.g. walnut oil, dried apricots, grape wine) but currently villagers lack facilities and training for these. Animal husbandry (goats, cows) is common, yet dairy yields are low and veterinary services scant. Traditional handicrafts (embroidery, woodwork) and the distinctive Kalash clothing could fetch good prices, but artisans have little access to wider markets. Unemployment, especially among young men and women, is high – apart from farming and some tourism or NGO jobs, opportunities are few. This has led many young people to migrate to cities (like Chitral or Peshawar), which in turn threatens the transmission of cultural knowledge. There is a pressing need to diversify livelihoods by developing local enterprises, improving agricultural productivity, and facilitating market access (e.g. cooperatives, microfinance, and marketing support for Kalash products).

2.9. Tourism and Cultural Heritage

Tourism in the Kalash Valleys has grown rapidly, with nearly 26,000 visitors (2024–25) generating PKR 3.1 million. Peaks during festivals create jobs in hospitality, crafts, and transport but also overwhelm roads, housing, sanitation, and sacred sites, especially in Bumborate. Uneven access to income persists, with men dominating hotels and guiding while women benefit mainly through handicrafts.

Figure 3:Images of the Gree (Dancing Place) at Grom Village in Rumboor Valley during off-peak and peak tourist times

The sector faces key challenges: poor roads, weak utilities, over-capacity during festivals, and risks of cultural commodification. At the same time, opportunities exist in ecotourism, heritage walks, youth and women training, and community-led visitor management. Strategic investment in infrastructure, cultural stewardship, and governance is essential to make tourism a sustainable contributor to livelihoods while protecting the Kalasha heritage.

2.10. Institutional and Governance Context

Historically, development in Kalash Valley has been led by external agencies (government programs, NGOs like AKRSP, SRSP, and donors) without a strong coordinating local institution. The Government of Khyber Pakhtunkhwa has recently established the Kalash Valley Development Authority (KVDA) to focus on the area's development, which is a positive step. However, local governance capacity remains nascent – the community voice needs to be systematically integrated into development planning. There is also overlap and sometimes fragmentation of roles between provincial departments, district authorities, and NGOs. Strengthening institutional frameworks (including community organizations) is needed to ensure the sustainability of any investments made.

In summary, the assessment demonstrates that Kalash Valley requires comprehensive development interventions across all sectors. Basic infrastructure must be upgraded to alleviate isolation and improve living conditions. Social services (education, health, water supply) need quality and coverage improvements to uplift human development indicators. Economic initiatives are necessary to create jobs and reduce poverty in a culturally appropriate way. Environmental conservation and disaster risk reduction are critical for sustainable development given the fragile ecosystem. And underlying all these, culturally sensitive approaches are needed so that the Kalash people are partners in development and their identity is preserved. The following section outlines the sector-wise Capital Investment Plans formulated in response to these needs.

3. Sector-Wise Capital Investment Plans

The Capital Investment Plan (CIP) translates the vision and strategies of the Kalash Valley Habitat Plan into a set of prioritized, costed, and phased projects. While the Habitat Plan was prepared through a participatory process with communities, CIP is primarily an expert-driven, technical exercise that identifies feasible investments, allocates financial requirements, and structures their delivery over the next two decades. It provides a bridge between community aspirations and the financial, engineering, and institutional resources needed to realize them.

The sectoral approach ensures that each domain—ranging from water supply and sanitation to energy, environment, transport, and livelihoods—is addressed with clear goals, phased interventions (short, medium, long term), and estimated costs. Cross-cutting principles such as climate resilience, gender inclusion, disaster preparedness, and cultural heritage preservation are embedded across all sectors to ensure sustainability and equity. Together, these sector-wise plans form the operational backbone of the CIP and offer a realistic pathway for mobilizing government, donor, and community resources toward the long-term development of the Kalash Valleys.

3.1. Water Supply & Sanitation (WATSAN)

3.1.1. Introduction and Rationale

The Kalash Valleys face a mounting water and sanitation challenge shaped by population growth, seasonal tourist influx, climate stress, and aging infrastructure. Current systems are predominantly gravity-fed networks from springs and community tanks, complemented by household soak pits. While historically effective, these systems are now insufficient, fragmented, and increasingly unreliable due to spring depletion, leaks, lack of treatment, and absence of organized wastewater management.

By 2045, the population is projected to grow from 15,827 (2023) to 26,611, while annual tourist arrivals—already 25,914 in 2024–25—will further intensify water and sanitation demands. The combined pressure translates into a fourfold increase in daily water demand, rising from 287,145 liters/day in 2023 to 1,330,560 liters/day in 2045, with wastewater generation expected to exceed 1 million liters/day. Without strategic investment, waterborne diseases, environmental degradation, and loss of cultural heritage linked to polluted springs and degraded landscapes will accelerate.

The WATSAN Capital Investment Plan (CIP) provides a phased, demand-driven, and climate-resilient roadmap to achieve:

- 100% household access to safe piped water by 2045.
- Universal sanitation coverage through decentralized systems, with selective centralized treatment in high-density clusters.
- Improved resilience of springs, tanks, and pipelines against floods, landslides, and climate variability.

- Sustainable O&M systems, anchored in KVDA–PHED leadership and community cost-sharing.

3.1.2. Current Gaps and System Deficiencies

- **Water supply:** Community-managed gravity systems with high leakage, uncovered and damaged tanks, no systematic chlorination, and no flow metering.
- **Sanitation:** Absence of centralized sewerage; reliance on septic tanks/soak pits, many poorly built and contaminating groundwater.
- **Tourism stress:** Seasonal inflows overwhelm sanitation facilities, especially in Bumborate and Rumboor festival sites.
- **Resilience gaps:** Flash floods and landslides frequently damage pipelines; spring flows are declining due to climate change.
- **Institutional gaps:** KVDA and PHED lack clear cost recovery and user fee mechanisms; O&M remains ad hoc.

3.1.3. Projected Demand and Wastewater Volumes

- **Daily Water Demand (2045):** 1,330,560 liters/day (population + baseline tourist load).
- **Wastewater Generation:** Approx. 80% of water demand → ~1,064,000 liters/day by 2045.
- **Tourist Load Equivalent:** 25,914 annual visitors ≈ additional 70 persons/day equivalent in peak months; effective demand impact equals a mid-sized Kalash village.
- **Household Demand:** Avg. 320 liters/day wastewater per household; septic tank–soak pit systems required for at least 3,000+ households by 2045.

3.1.4. Phased Capital Investment Plan for WATSAN in Kalash Valleys (2025–2045)

The following table….

Table 2: Phased Capital Investment Plan for WATSAN in Kalash Valleys (2025–2045)

PHASE / TIMELINE	KEY FOCUS AREAS	MAJOR ACTIVITIES	ESTIMATED INVESTMENT (PKR MILLION)	LEAD / PARTNERS
SHORT-TERM (2025–2030)	System rehabilitation and safe access	• Audit & rehabilitation of existing tanks and pipelines • Chlorination and microbial testing at intake & distribution points • Expansion of household tap connections (target: 70% HHs) • Sanitation baseline survey & roll-out of septic tanks + soak pits (priority clusters) • Feasibility study for centralized sewerage in dense settlements (Sheikhandeh Bumborate, Rumboor Centre, Birir Payeen)	**95**	KVDA, PHED, NGOs, Donors
MEDIUM-TERM (2031–2040)	Network expansion and universal decentralized sanitation	• Construction of additional storage tanks (flood-proof design) • Expansion of piped water networks to all HHs in 3 valleys • Universal household tap installation (100% HHs) • Large-scale rollout of septic tanks & soak pits (70% HHs) • KVDA-led user fee model for O&M • Community hygiene & O&M training • Semi-centralized sewerage pilots in festival hubs (Bumborate, Rumboor)	**185**	KVDA, PHED, Community, NGOs, Donors

LONG-TERM (2041–2045)	Selective centralization and system optimization	• Sewerage network extensions in dense cores (Sheikhandeh, Rumboor Centre, Birir Payeen) • Construction of 3–4 modular WWTPs (60–120 m^3/day) using low-energy tech • 100% HH coverage with septic tanks/soak pits • Flow meters, leak detection, and pressure optimization • Real-time water quality monitoring stations • Integrated stormwater & sewerage management	**190**	KVDA, PHED, KP Govt., Donors, Tech Partners

3.1.5. Financial Framework for WATSAN(2025–2045)

Delivering universal water and sanitation coverage across the Kalash Valleys requires a carefully structured financing model that mobilizes resources from households, local government, federal allocations, and external partners. The proposed framework ensures that immediate infrastructure needs are met while also guaranteeing long-term sustainability through community participation and climate-resilient funding.

Total 20-Year Investment Requirement

- **PKR 470 million (~USD 1.7 million)** across Bumborate, Rumboor, and Birir Valleys.

3.1.6. Indicative Financing Sources and Roles

SOURCE	ROLE / CONTRIBUTION	TARGET SHARE (%)	INDICATIVE FINANCING MECHANISM
LOCAL COMMUNITIES (HOUSEHOLDS, VILLAGE COMMITTEES)	Cost-sharing for household connections (pipes, taps), septic tanks, and O&M. In-kind labor for trenching and minor works. User fee contributions for sustainability.	10–15%	• One-time household connection charges • Community-managed O&M funds • Voluntary labor and local materials
KHYBER PAKHTUNKHWA GOVERNMENT (KVDA, PHED)	Core infrastructure (storage tanks, main pipelines, chlorination units). Institutional capacity building (KVDA O&M wing).	20–25%	• Annual Provincial Development Budget (ADP) • Dedicated allocations through PHED's WASH schemes • Co-financing in donor projects
GOVERNMENT OF PAKISTAN (FEDERAL)	Strategic infrastructure such as sewerage networks, wastewater treatment plants, resilience measures (flood-proofing).	15–20%	• Public Sector Development Programme (PSDP) allocations • Federal grants for heritage and indigenous communities National climate adaptation projects
FOREIGN DONORS / MULTILATERALS (ADB, WB, UNICEF, EU,	Capital investment for water supply and sanitation upgrades, wastewater treatment plants, and institutional strengthening.	25–30%	• Concessional loans • International grants • Climate/environment-linked funding • Heritage preservation support

USAID, JICA, UNDP, AKDN, ISDB)			
CLIMATE FINANCE (GCF, GEF, ADAPTATION FUND, ISDB CLIMATE WINDOW)	Resilience-oriented components: flood-proof tanks, groundwater recharge, low-energy WWTPs, leak detection, pressure optimization, monitoring systems.	5–10%	• Direct climate adaptation grants • Resilience financing mechanisms • Blended finance models (grant + soft loan)

3.1.7. Priority Investment Areas for Financing

1. Safe Water Access

- Spring protection and source enhancement.
- Rehabilitation and construction of storage tanks.
- Chlorination units and systematic water quality monitoring.
- Full piped household connections across Kalash Valleys
- Flow meters, leak detection, and pressure optimization for efficient use.

2. Sanitation and Wastewater Management

- Household septic tanks and soakage pits (70–100% HHs).
- Pilot central sewerage systems in high-density clusters (Sheikhandeh, Rumboor Centre, Birir Payeen).
- Low-energy modular WWTPs (60–120 m^3/day).
- Integration of stormwater management with sewerage systems.

3. Community Capacity & Financial Sustainability

- Training Kalash youth as WATSAN technicians for O&M.
- Hygiene education tailored to cultural norms.
- Establishment of community-led tariff collection and O&M funds.
- Institutional strengthening of KVDA to function as a dedicated service authority.

3.1.8. Sustainability and Financial Governance

- **Community Tariff System:** KVDA to establish a tiered user fee model (basic fee for HHs, higher seasonal surcharge for hotels/tourist lodges).
- **Dedicated WATSAN Fund:** Ring-fenced account managed jointly by KVDA and village committees for O&M.

- **Performance-Based Grants:** Donor disbursements tied to milestone completion (coverage, quality monitoring, reduction in waterborne diseases).
- **Climate-Linked Incentives:** Accessing GCF/GEF funds by demonstrating resilience benefits (reduced flood damage, improved drought resilience).

3.2. Solid Waste Management

3.2.1. Current Challenges

The Kalash Valleys face mounting challenges in managing solid waste due to growing populations and rising tourism (25,900+ annual visitors). At present:

- Waste is disposed of in open areas, riverbanks, and along trekking routes, contaminating water sources and degrading the cultural landscape.
- No formal collection, transfer, or disposal system exists; households rely on open dumping or burning.
- Tourism peaks (festivals, summer) multiply waste volumes, overwhelming the fragile environment.
- Lack of awareness, equipment, and institutional mechanisms limits effective management.

3.2.2. Strategic Objectives

1. Establish a climate-resilient, environmentally sound SWM system across all three valleys.
2. Protect natural springs, rivers, and landscapes from waste-related contamination.
3. Build institutional and community capacity for sustained operation (KVDA, village committees).
4. Integrate circular economy approaches (segregation, composting, recycling).
5. Secure co-financing through government, donor, and climate funds.

Table 3: Phased Investment Framework (2025–2045)

PHASE	FOCUS	KEY ACTIONS	ESTIMATED INVESTMENT
Short term (2025–2030)	Establishment of baseline systems	• Waste characterization study and mapping of hotspots. • Pilot door-to-door collection in 3 main tourist valleys (Bumborate, Rumboor Centre, Birir Payeen). • Procurement of waste bins (segregated for organic, recyclable, residual). • Designation of temporary waste transfer points (secure enclosures away from rivers). • Awareness campaigns on waste segregation, targeting households and hotels.	PKR 60 million
Medium term (2031–2040)	Scaling and semi-centralized systems	• Expansion of collection coverage to all villages. • Construction of 2 small-scale Material Recovery Facilities (MRFs) in Bumborate and Rumboor. Composting of organic waste for local agriculture. • Plastic, metal, and glass recycling partnerships with regional markets. • KVDA waste management unit fully operational with tariff collection (user + tourism fees).	PKR 120 million
Long term (2041–2045)	Full system optimization	• Establishment of a centralized controlled landfill site (engineered, climate-resilient, fenced). • Introduction of waste-to-resource solutions (biogas from organics, small recycling plants). • Integration of SWM with tourism infrastructure (festival waste zones, eco-friendly trails). • Smart monitoring (weighing, tracking of waste streams).	PKR 150 million

1.3.1. Financial Framework for SWM (2025–2045)

Total Investment Required: *PKR* ***330 million (~USD 1.2 million***

Table 4: Fund Raising Strategy for SWM

SOURCE	PROPOSED CONTRIBUTION	INDICATIVE MECHANISM	ESTIMATED VALUE (PKR)
Local households & tourism user fees	10%	• Monthly household waste tariff (PKR 100–150/month per HH, phased). Festival/tourist waste surcharge (PKR 50–100/tourist).	~33 million
KP Government (KVDA, LOCAL GOVT. DEPT.)	25%	• Annual Development Program (ADP) allocations. • Dedicated KVDA budget line for SWM O&M.	~82.5 million
Federal Government (TOURISM, CLIMATE CHANGE)	15%	• • Public Sector Development Programme (PSDP) allocations for "Eco-Tourism & Climate Resilient Infrastructure". • MOCC projects for pollution control.	~49.5 million
International Donors (ADB, WB, JICA, AKDN, GIZ, EU, USAID)	30%	• Direct grants/loans for SWM pilots, landfill construction, recycling systems. • Tourism infrastructure packages (eco-tourism).	~99 million
Climate Funds (GCF, GEF, AF, CIF)	10%	• Climate-resilient landfill design (flood-proofing, leachate control). • Circular economy pilots (composting, waste-to-biogas).	~33 million
Private Sector/CSR (Cement, Beverages, Hotels, Tour Operators)	10%	• Co-financing of bins, awareness campaigns, and recycling chains. Tourism-linked corporate partnerships (beverage bottlers → plastic recovery).	~33 million

The proposed financing mix will require a combination of domestic public resources, community cost-sharing, and external donor contributions. While KVDA and provincial allocations will cover core infrastructure, international development partners and climate funds will be critical to mobilize additional investment for resilience-oriented and low-carbon SWM solutions.

To support KVDA in accessing such funds, Table X below maps potential financing institutions, their focus areas, and relevant examples. This mapping is not prescriptive but provides a reference to aligning Kalash Valley SWM projects with donor priorities and increasing funding readiness.

Table 5: Reference Donor & Climate Finance Mapping for SWM in Kalash Valleys

Sr. no.	Agency / Fund	Focus Area	Example Project	Website
1.	**Green Climate Fund (GCF)**	Climate adaptation & mitigation, readiness programmes	Recharge Pakistan: Ecosystem-based Adaptation & Green Infrastructure. A project approved in July 2023 with a funding of USD 66 Million	https://www.greenclimate.fund
2.	**Adaptation Fund (AF)**	Climate adaptation in developing countries	Enhance community, local and national-level urban climate change resilience to water scarcity, caused by floods and droughts in Rawalpindi and Nowshera, Pakistan. Project cost USD 6,094,000	https://www.adaptation-fund.org
3.	**Global Environment Facility (GEF)**	Biodiversity, climate change, land degradation	New $282 million GEF program targets climate and environment action through agriculture and food systems	https://www.thegef.org
4.	**NDC Partnership**	Supporting Nationally Determined Contributions	Pakistan NDC Implementation Support – low-carbon municipal services	https://ndcpartnership.org
5.	**Climate Investment Funds (CIF)**	Clean technology, climate resilience	Balochistan Sustainable Energy Project. Grant of 0.57 Million USD	https://www.climateinvestmentfunds.org
6.	**UNFCCC Loss and Damage Fund**	Addressing climate impacts	Climate loss recovery programmes in flood-prone communities	https://unfccc.int
7.	**Multilateral & Bilateral Donor**	Country / Region	Example Project	Website
8.	**World Bank (IBRD/IDA)**	Global	"Karachi Solid Waste Emergency and Efficiency Project" – Pakistan	https://www.worldbank.org
9.	**Asian Development Bank (ADB)**	Asia-Pacific	As of 31 December 2024, ADB has committed 764 public sector loans, grants, and technical assistance totaling $43.4 billion to Pakistan. ADB's current sovereign portfolio in Pakistan includes 53 loans and 3 grants worth $9.13 billion.	https://www.adb.org
10.	**UNDP**	Global	Scaling-up of Glacial Lake Outburst Flood (GLOF) risk reduction in Northern Pakistan	https://www.undp.org

Sr. no.	Agency / Fund	Focus Area	Example Project	Website
11.	**UNEP**	Global	"Waste Wise Cities Programme" – Global South cities	https://www.unep.org
12.	**UNOP**	Global	PLEASE: Plastic Free rivers and Seas in South Asia-Pakistan Chapter	https://please-project.org/
13.	**JICA**	Japan	"Improvement of Solid Waste Management in Lahore" – Pakistan	https://www.jica.go.jp
14.	**GIZ**	Germany	"Climate-Smart Waste Management in Gilgit-Baltistan" – Pakistan	https://www.giz.de
15.	**AKDN**	Pakistan Focus	"Integrated Waste Management for Tourism Areas" – Hunza	https://www.akdn.org
16.	**EU SWITCH-Asia**	Europe-Asia	"Plastic Waste Reduction in South Asia"	https://www.switch-asia.eu
17.	**UKAID**	Global	Training of Government Stakeholders on Nature-based solutions in KP and GB region	chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://assets.publishing.service.gov.uk/media/5a7cb9cfe5274a2f304efb46/DFID-Pakistan-ebrochure-July-2013.pdf
18.	**USAID**	USA	"Clean Cities, Blue Ocean" – Philippines, Maldives	https://www.usaid.gov
19.	**UK FCDO**	UK	"Climate Action for Waste-Free Cities" – Africa & Asia	https://www.gov.uk/fcdo
20.	**Canadian Climate Fund**	Canada	"Climate Smart Waste Infrastructure" – Caribbean	https://www.international.gc.ca/world-monde/funding-financement/cfli-fcil/pakistan.aspx?lang=eng
National Funding Source				
21.	**National Funding Source**	Relevance	Example Project	Website

Sr. no.	Agency / Fund	Focus Area	Example Project	Website
22.	**Ministry of Climate Change**	GCF focal point, national climate projects	GCF Readiness Program – Pakistan	https://mocc.gov.pk
23.	**National Disaster Risk Management Fund (NDRMF)**	Resilience-focused infrastructure projects	Flood-Resilient Waste Facilities in KP	https://www.ndrmf.pk
24.	**Pak-EPA**	Environmental compliance & support	Municipal solid waste improvement in ICT	https://environment.gov.pk
25.	**Provincial Govt of KP/ KVDA**	Provincial infrastructure financing	KP Integrated Waste Management Plan	https://kp.gov.pk
26.	**KP Tourism Department**	Waste management for tourism	"Tourism Sites Clean-up Program" – KP	https://kp.gov.pk
27.	**PPAF**	Community infrastructure	Rural waste-to-compost project in Punjab	https://www.ppaf.org.pk
28.	**Corporate CSR Funds**	Private sector co-financing	Lucky Cement CSR – Environmental projects	Company websites

These potential sources can be selectively approached depending on project readiness, alignment with donor priorities, and co-financing available through KVDA and government channels. The donor mapping thus complements the financing framework by expanding the pool of potential funders without replacing core domestic contributions.

3.3. Water Supply, Sanitation and Hygiene (WASH)

The Capital Investment Plan (CIP) for the Kalash Valleys presents a phased, technically integrated, and culturally responsive framework for achieving universal access to safely managed water, sanitation, and hygiene (WASH) services across the region by 2045. Spanning three interlinked horizons—short-term (2025–2030), medium-term (2030–2040), and long-term (2040–2045)—the plan outlines critical capital investments in infrastructure, operational systems, and institutional mechanisms, with an estimated total requirement of PKR 4.42–6.61 billion.

The Kalash Valleys Development Authority (KVDA), in coordination with donor agencies, will be responsible for mobilizing and managing capital investments across all WASH infrastructure tiers—ensuring technical design compliance, cost-efficiency, and phased disbursement aligned with SDG 6 targets. KVDA will lead on-ground implementation and procurement, while donor partners (e.g., World Bank, UNICEF, GCF) will support through results-based financing, climate-resilient fund integration, and financial safeguards to ensure transparency, equity, and long-term sustainability. The short-term phase (PKR 530M–845M) prioritizes foundational access and emergency hygiene interventions through the construction of decentralized sanitation systems, household water storage facilities, and basic faecal sludge containment and desludging equipment. In alignment with WHO minimum service levels, this phase also integrates culturally significant menstrual hygiene infrastructure—Bashaleni homes—with low-cost water access, incineration pits, and reusable hygiene kits. Additionally, a modest but critical allocation is made for O&M activities and point-of-use water quality monitoring.

The medium-term phase (PKR 1.265B–2.097B) aims to scale infrastructure through clustered deployment of Faecal Sludge Treatment Plants (FSTPs), piped water supply networks, and decentralized slow sand filtration and chlorination systems. Bashaleni infrastructure is upgraded with ventilated kitchens, VIP latrines, and scheduled incineration services. Operational investments target desludging logistics, water laboratory development, and training of Village Water Management Committees (VWMCs), ensuring reliable system performance and transition toward preventive maintenance.

The long-term phase (PKR 2.627B–3.67B) envisions full integration of smart, climate-resilient WASH systems. Key investments include a centralized Sewerage Treatment Plant (STP) with digital SCADA-based monitoring, household-level water metering, and resource recovery systems (biogas digesters, composting). Bashaleni units evolve into solar-powered, fully plumbed shelters with bio-toilets and remote health hygiene monitoring systems. Institutional costs are earmarked for digital infrastructure, biosolids management, tariff modeling, and cost-recovery mechanisms to ensure sustainability and climate adaptation.

Table 6: Capital cost investment plan for WASH

Time Horizon	Key Focus	Components	Estimated Cost (PKR)	Rationale	Remarks
Short-Term (2025–2027)	Foundational Access & Safety	Community-based sanitary systems, septic tanks, household storage, desludging kits, point-of-use filters, FSTP design	500M – 800M	Cost range is based on estimated unit cost per system including excavation, masonry, and plumbing materials. Cost inflation accounts for remote transport logistics, stone availability, and skilled labor constraints	Focus on remote villages, women-led operations
	Safe Access and Emergency Hygiene Facilities	Construction of 15 basic Bashaleni shelters using local materials; provision of handwashing stations; reusable pad kits; menstrual hygiene awareness sessions; incineration or burial pit setup	25M – 40M	Unit costs for storage tanks (500–1000 liters) sourced from Chitral & other KP vendors (PKR 12,000–25,000 each), with added markup for freight to Kalash. Desludging kits (manual pumps, gloves, buckets, PPE) priced at PKR 20,000 per kit, aligned with UNICEF & WaterAid project pilots. Unit cost per Bashaleni structure estimated at PKR 1.5M–2.2M, inclusive of stone masonry, wood joinery, water supply point, basic incineration pit, and MHM setup (preferably vertical structures). Gravity-based filters priced at PKR 5,000–7,000/unit, considering bulk procurement. Imported ceramic filter option increases cost (up to PKR 15,000). Assumes coverage of 70–80% of households.	Focus on privacy, cultural sensitivity, hygiene education
	Operational and Maintenance cost	Water Testing and hygiene assurance at households and public toilets	3.5-5 M	Annual operational cost (PKR 3.5M–5M) derived from WHO/UNICEF Water Safety Plan budgeting tools. Includes reagents, field test kits, training, and logistics. Shared testing approach among valleys reduces per capita cost	Community-managed with donor support
		Sub-Total	**530M-845M**		
Medium-Term (2028–2035)	Infrastructure Expansion	FSTPs in each valley, piped networks, sand filtration, sewer networks, pumping stations, rainwater harvesting, water labs	1.2B – 2B	Cost range (PKR 50M–80M per FSTP) based on modular design, pre-cast tanks, anaerobic baffles, and drying beds.	Cluster treatment scaling, gender-inclusive water access

	Improved Infrastructure and Waste Management	Upgrade of Bashaleni facilities with VIP latrines, water storage tanks, ventilated kitchens, menstrual waste incinerators, training of female WASH workers, quarterly supply of hygiene kits	60M – 90M	Addition of more Bashaleni facilities. Maintenance and operational costs. Incremental upgrade cost reflects high-quality construction, latrine superstructure, incinerator, and low-emission stoves. Hygiene kit resupply (quarterly) priced at PKR 300–400 per girl, supported via donor-led procurement.	Standardize across valleys, linked to WASH committee operations
	Community-Wide System Maintenance	Piped network maintenance, desludging of FSTPs, sanitation facility repair, water lab operation	5M-7M	Annual cost (PKR 5M–7M) projected based on desludging frequency (every 3–5 years per household) and shared O&M contracts. Vacuum tankers (or mobile desludging units).	Shared responsibility with local govt and VWMCs
		Sub total	**1.265-2.097 B.**		
Long-Term (2040–2045)	Smart & Circular Systems	Full sewer connections, valley-wide STP, digital water quality monitoring, resource recovery (biogas, compost), glacier protection	2.5B – 3.5B	Cost derived from biodigester models adapted for cold climates. Composting units include shredders, compost beds, and pathogen testing.	Digital integration, circular economy, private-public models
	Integrated Health, Hygiene, and Energy Systems	Solar-powered Bashaleni homes with attached sanitation unit; bio-toilets, automated water storage and heating systems; integration into health monitoring system; digital tracking for supply and feedback	120M – 160M	Fully plumbed, solar-powered, toilets, Bashaleni with hygiene tracking priced at PKR 7M–8M each. Includes water storage, incinerator, and remote monitoring system.	Smart Bashaleni units promoting dignity and climate resilience
	Smart O&M Systems and Institutionalization	SCADA-based monitoring, biosolid reuse systems, automated sensor maintenance, and workforce salaries	7M-10M	Up-gradation of the WASH infrastructure, installation of sensor systems for tracking and monitoring. Cost recovery assumed via Polluter Pays Principle (PPP)	Long-term cost recovery via public-private models
		Sub total	**1.265-2.09M**		
		Total	**PKR 4.42 Billion – 6.61 Billion**		

3.4. Transportation (Roads, Bridges & Mobility)

3.4.1. Goal

To create a resilient, inclusive, and all-weather transportation system in Kalash Valley that links all villages internally and to Chitral by 2045. This system will replace unsafe tracks and log bridges with safe, climate-resistant infrastructure while supporting local mobility and eco-tourism.

3.4.2. Current Baseline:

The transport system in Kalash Valley is fragile and highly vulnerable to seasonal disruption:

- **Roads:** The 36 km Ayun–Bumborate road is gravel and mostly single-lane; internal valley roads (approx. 95 km) are unpaved and eroded annually.
- **Bridges:** 19 log bridges remain in use; 10 RCC bridges require strengthening.
- **Mobility:** Nearly 70% of households still rely on mule tracks or footpaths; there is no formal public transport.
- **Tourism Pressure:** An estimated 50,000–70,000 visitors annually put additional stress on narrow roads and parking-deficient settlements. This poor connectivity restricts economic activity, delays emergency response, and undermines safe, sustainable tourism.

3.4.3. Proposed Investments:

The estimated cost for the Kalash Valley Transport Infrastructure Plan is based on KP's Composite Schedule of Rates (CSR-2023), recent PC-1s of similar projects in Chitral and Swat, and engineering norms from the C&W Department. Assumptions also factor in terrain complexity, seasonal constraints, and local material transport costs. Non-road components like electric shuttles and parking areas were benchmarked against donor-funded rural mobility projects. These are planning-level estimates and will be refined during detailed design and PC-1 preparation.

Transportation CIP is phased into short, medium, and long-term actions, each building on the previous:

Table 7: Capital cost investment plan for Transportation

Time Horizon	Key Focus	Components	Estimated Cost (PKR)
Short-Term (2025–2027)	Foundational Access & Safety	Upgrading 24 ft (24.67 km) and 32 ft (22.21 km) roads in accessible areas of Birir, Rumboor, and Bumborate	700M – 900M
		Replacement of 19 log bridges with 18 pedestrian & 1 road bridge; strengthening 10 existing road bridges	120M – 180M
		Paving of 101.08 km internal village pathways and Old Bumborate Road; improvement of 61.69 km of trails	80M – 120M

		Construction of 17 bus stops, 11 taxi stands, and three valley entry parking areas	50M – 70M
Sub-Total			950M – 1.27B
Medium-Term (2028–2035)	Network Expansion & Connectivity	Construction of 5 new RCC road bridges; upgrading 12 pedestrian bridges; converting three pedestrian bridges to road standard	500M – 700M
		Development of secondary feeder bus stops, and inner-village taxi stands	60M – 90M
		Drainage infrastructure along inter-village roads	120M – 180M
		Initiation of 25.57 km alternate emergency routes in Rumboor and Bumborate	250M – 350M
Sub-Total			930M – 1.32B
Long-Term (2040–2045)	Sustainable & Integrated Mobility	RCC upgrade of remaining high-traffic road bridges; complete road connectivity to remote clusters in Birir Payeen and upper Bumborate	800M – 1.2B
		Introduction of solar/electric shuttles between parking areas and village centers	300M – 500M
		Establishment of maintenance & emergency response units for road/bridge upkeep	100M – 150M
		Completion of alternate routes in Rumboor and Bumborate	200M – 300M
Sub-Total			1.4B – 2.15B
Total			PKR 3.28B – 4.74B

3.4.4. Implementation Roles

Table 8 Implementing Bodies and their Roles

Lead Agency	**Role**
C&W Department KP	Engineering design, procurement, and construction supervision
KVDA	Coordination, land facilitation, and community engagement
District Administration	ROW clearance, permits, and disaster response coordination
Tourism Department KP	Design of parking areas, bus stops, and pedestrian facilities
Local Communities	Land contribution and participation in maintenance activities

3.4.5. Financing Framework

Table 9: Proposed Financing Mix – Transport Investments (2025–2045)

Source	*Role / Focus Area*	*Share %*	*Indicative Value (PKR Million)*
KP Government (C&W, KVDA, ADP)	Core roads and bridges, annual maintenance	35%	**1,400**
Federal Government (PSDP, NHA, MoCC)	Strategic inter-valley routes, RCC bridges	20%	**800**
Donors/Multilaterals (ADB, WB, JICA, EU, AKF, KfW)	Eco-mobility pilots, climate-resilient designs, alternate routes	30%	**1,200**
Climate Funds (GCF, GEF, CIF, AF)	Slope stabilization, flood-proof drainage, disaster-proof bridges	10%	**400**
Local Contributions (land, user fees, in-kind labor)	ROW clearance, minor maintenance, tourism fees	5%	**200**
Total		100%	~4,000

3.4.6. Potential Donors

Potential donors for the Kalash Valley transport infrastructure include the Asian Development Bank (ADB), World Bank (WB), USAID, European Union (EU), KfW (German Development Bank), Japan International Cooperation Agency (JICA), UK Aid (FCDO), Swiss Development Cooperation (SDC), UNDP, UNESCO, the Aga Khan Foundation (AKF), and the Government of Pakistan through PSDP and KP's Annual Development Program (ADP).

3.4.7. Cost Summary and Implementation:

Transport CIP requires **PKR 4.0 billion** over 20 years. Priority will be given to life-saving access (emergency routes, health facilities), inter-valley connectivity, and tourism-driven improvements. Climate resilience will be mainstreamed through slope protection, drainage, and bridge reinforcement. By 2030, pilot eco-shuttles will be introduced in Bumborate and Rumboor to reduce vehicular congestion. Community participation will be institutionalized via "road brigades" for minor works and upkeep.

3.5. Energy (Hydropower & Solar Systems)

3.5.1. Goal

Ensure 24/7 access to affordable and clean energy for all households, businesses, and public facilities in Kalash Valley by developing renewable energy sources – primarily small hydropower and solar – and improving energy efficiency. The plan aims for the valleys to

become self-sufficient energy using their abundant water resources and sunshine, thereby reducing reliance on firewood and diesel, cutting carbon emissions, and enabling socio-economic activities (lighting, heating, and communications) year-round.

3.5.2. Current Baseline

Energy access in the Kalash Valleys is limited, fragmented, and unreliable:

- **Generation**: A handful of micro-hydropower plants exist (e.g., ~200 kW in Bumborate), but many operate at <50% capacity due to seasonal flow variability and poor maintenance.
- **Household Access:** Fewer than 40% of households receive electricity for more than 4–6 hours/day; in winter, outages and blackouts are common.
- **Alternative Sources**: Households rely on kerosene lamps and wood stoves, driving indoor smoke pollution and deforestation.
- **Solar:** Use of household-level solar panels is emerging but limited (mainly for lighting 1–2 bulbs).
- **Demand Gap**: Estimated energy demand is nearly double current supply, with schools, health centers, and tourist facilities particularly affected.

3.5.3. Proposed Projects

(A) Hydropower Development

- **Upgrading Existing Micro-Hydro Plants (Short-Term, 2025–2027):**
  - Rehabilitate at least 2 existing schemes (150–200 kW each).
  - Investments: turbine replacement, generator upgrades, civil works, transformers.
  - Cost: PKR 13–20 million per upgrade (~PKR 300,000 per kW).
- **New Micro-Hydro Plants (Medium-Term, 2028–2035):**
  - Construct 6 new plants (20–100 kW each) across tributaries.
  - Community-managed with technical support.
  - Estimated cost: PKR 200–250 million total.
- **Maintenance & Local Training:**
  - Annual O&M fund; local technicians trained in repair and operation.
  - ~PKR 1–2 million per plant reserved for spares and capacity building.

(B) Solar Energy Expansion

- **Household Solar Systems (Short-Term):**
  - Subsidize 2–3 panel kits (300–500 W each) per household in off-grid areas.
  - Target: 2,000 households by 2030.
  - Estimated cost: PKR 80–100 million.
- **Institutional & Commercial Solar (Medium-Term):**
  - Install rooftop solar for schools, health units, community halls, and guesthouses.
  - Offsets unreliable grid supply and reduces diesel use.
  - Cost: PKR 60–80 million.

- **Solar-Powered Street Lighting & Public Spaces:**
  - 200+ units across village centers, pathways, and tourist areas.
  - Cost: PKR 20–30 million.

3.5.4. Phased Investment Framework and Strategies

Table 10: Phased Energy Investment Plan (2025–2045)

Source	*Role / Focus Area*	*Share %*	*Indicative Value (PKR Million)*
Local Households (user fees, co-financing)	Pay-per-use for hydro; partial solar kit cost-sharing.	10%	55
KP Government (Energy Dept., KVDA, PEDO)	Core financing for micro-hydro upgrades & new schemes.	30%	170
Federal Government (PSDP, AEDB, MoCC)	Strategic allocations for renewable energy pilots & biogas.	15%	85
Donors/Multilaterals (WB, ADB, JICA, EU, AKDN, UNDP)	Large-scale renewable expansion, institutional solar, training.	30%	170
Climate Funds (GCF, GEF, CIF, AF)	Resilience-focused hydro & off-grid solar, energy efficiency.	15%	90
Total	—	100%	~570

3.5.5. Financing Framework

Table 11: Proposed Financing Mix – Energy Sector

Source	*Role / Focus Area*	*Share %*	*Indicative Value (PKR Million)*
Local Households (user fees, co-financing)	Pay-per-use for hydro; partial solar kit cost-sharing.	10%	55
KP Government (Energy Dept., KVDA, PEDO)	Core financing for micro-hydro upgrades & new schemes.	30%	170
Federal Government (PSDP, AEDB, MoCC)	Strategic allocations for renewable energy pilots & biogas.	15%	85

Donors/Multilaterals (WB, ADB, JICA, EU, AKDN, UNDP)	Large-scale renewable expansion, institutional solar, training.	30%	170
Climate Funds (GCF, GEF, CIF, AF)	Resilience-focused hydro & off-grid solar, energy efficiency.	15%	90
Total	—	100%	~570

3.5.6. Potential Donors & Partners

- **Multilaterals:** ADB, WB, JICA, EU, UNDP, GIZ.
- **Foundations/NGOs:** AKDN, AKRSP, USAID, WWF (clean cookstoves).
- **Climate Funds:** GCF, GEF, CIF, Adaptation Fund.
- **National Agencies:** AEDB, PEDO, MoCC, Ministry of Energy.

3.5.7. Implementation & Outcomes

- **Lead Agency:** PEDO (Pakhtunkhwa Energy Development Organization) with KVDA.
- **Community Role:** Local cooperatives to manage micro-hydro, tariff collection, and minor repairs.
- **Expected Outcomes by 2045:**
    - 100% household electrification with reliable renewable energy.
    - 50% reduction in firewood use.
    - Solar-powered institutions and tourism facilities.
    - Reduced emissions aligned with SDG 7 (Affordable & Clean Energy) and SDG 13 (Climate Action).

3.6. Environmental Protection & Disaster Mitigation

3.6.1. Goal

Enhance the environmental resilience of Kalash Valley by protecting and restoring its ecosystems (forests, watersheds) and implementing measures to mitigate natural disasters like floods and landslides. This sector plan aims to safeguard the ecological health of the valleys – which is the foundation of local livelihoods and culture – while reducing the community's vulnerability to climate-induced hazards. By 2045, the vision is that forest cover is increased, water resources are well-managed, and the valleys are significantly safer from flash floods, soil erosion, and other disasters.

3.6.2. Current Challenges

The environment of Kalash is under pressure. **Deforestation** has been substantial, with many slopes now sparsely vegetated – this has led to habitat loss and greater runoff during rains.

The biodiversity (including species like cedar and pine forests, and wildlife such as markhor and snow leopard in nearby areas) is threatened by habitat degradation. Soil erosion and landslides are frequent on unstable slopes, sometimes endangering settlements. The valleys experienced destructive **flash floods** in recent years, exacerbated by glacial melt and extreme weather events. In 2015 a major flood swept through parts of Bumborate causing loss of lives and property. The community currently has minimal flood defenses, aside from a few gabion walls villagers built themselves. Climate change trends (unpredictable heavy downpours, faster snowmelt) pose a serious risk to these valleys. Additionally, unmanaged waste (solid waste in water, lack of proper waste disposal sites) is emerging as an environmental pollutant in tourist areas.

3.6.3. Proposed Investments

The environment and disaster mitigation plan has several components:

- **Reforestation & Afforestation:** A flagship project is the **planting of 200+ acres of community forests and riparian buffers**. Drawing inspiration from Pakistan's 10 Billion Tree program, the CIP will support planting of native tree species on degraded hillsides and along riverbanks. For example, a 220-acre reforestation initiative is estimated at **PKR ~252 million** (based on costs of ~PKR 1.146M per acre including planting 100 trees/acre and maintenance). This cost may be mitigated by government programs (Billion Tree Tsunami) and community labor. The plan is to phase this: Plant ~50 acres by 2030, another 100 acres by 2035, and total 220+ acres by 2045. Communities will be engaged via creating **community forest enclosures** (protecting regenerating patches from grazing). The impact will be reduced erosion, improved slope stability, and restoration of traditional oak and deodar forests important for watershed health.

- Potential site for **planting of 200+ acres of community forests and riparian buffers would be degraded hillside regions, riparian zones along major rivers, buffer zones around agriculture, or community managed wetlands or common lands or ecological/ biodiversity hotspots.**

- **Slope Stabilization & Erosion Control:** Implement engineering and nature-based solutions on critical slopes above villages and roads. This includes building **gabion walls**, terracing, and bioengineering (planting deep-root shrubs, using vetiver grass etc.) on landslide- prone sites. A number of **gabion retaining walls** will be constructed near vulnerable settlements and along river banks; typical gabion wall costs vary by size but the cost doc suggests aggregated structural measures costing ~PKR 70 million under disaster mitigation. This likely includes gabions and check structures. Additionally, **check-dams** (small check dams in gullies to slow floodwater) will be built – each check dam roughly costs PKR 2.8–3.0 million. Perhaps 10 check-dams at key torrents (e.g. tributaries feeding Bumborate river) are planned (PKR ~30

million). These will slow water flow and capture sediment.

3.7. Telecommunication (Digital Connectivity)

3.7.1. Goal:

Bridge the digital divide in Kalash Valley by establishing a robust telecommunication infrastructure so residents have access to reliable voice and data services, enabling education, health, commerce, and disaster response. By 2045, every village will have mobile coverage (4G or better), and all public institutions (schools, health centers) will be connected to broadband internet. Digital connectivity is treated as essential for the economic and social integration of these remote communities.

3.7.2. Current Baseline

The valley's mountainous terrain and sparse settlements have limited telecom investment. Existing coverage is patchy, only a few cell towers (e.g., lower Bumborate, Ayun) provide signals, which are mostly 2G/3G and often weak indoors. Several villages have no mobile coverage at all, forcing reliance on walking or messengers for communication. Internet use is minimal; speeds are slow where available. Emergency communication relies on a few NGO-provided satellite phones, and community internet points operate with very limited bandwidth. These gaps hinder emergency response, education, tourism, and economic participation.

3.7.3. Proposed Investments:

The estimated cost ranges for the Kalash Valley Telecommunication Development Plan are based on market assessments, previous rural telecom infrastructure projects in Gilgit-Baltistan and Chitral (e.g., USF-backed tower deployments), and benchmark costs from Universal Service Fund (USF) and PTA reports. A new mobile tower installation in mountainous terrain typically ranges between PKR 30–45 million per site, while upgrades to 4G LTE cost PKR 8–12 million per tower. Satellite internet setups and fiber optic extensions were benchmarked from recent KP digital backbone projects, with per-kilometer fiber deployment costing PKR 4–6 million depending on topography and access. Community digital centers (25–35M), public Wi-Fi hotspots (5–10M per valley), and solar backups (3–5M per site) were aligned with recent interventions in upper Dir and Skardu. The total envelope was broadened using ±15–20% contingency for remote logistics, seasonal access constraints, and inflation.

Table 12: Capital cost investment plan for Telecommunication

Time Horizon	Key Focus	Components	Estimated Cost (PKR)	Remarks
Short-Term (2025–2030)	Coverage Expansion & Stabilization	Installation of two new mobile towers (Birir Bala, Sheikhandeh)	70M – 90M	Covers previously unserved areas
		Upgrade of existing towers in Pehlawanandeh, Batrik, and Sheikhandeh-Bumborate to 4G LTE standards	40M – 50M	Improves signal quality and data capacity

		Deployment of signal boosters in terrain-shadowed settlements (e.g., Rumboor Centre, Kandisar, Karakal, Parakalak, Birir Payeen)	20M – 30M	Eliminates local dead zones
		Solar-powered power backup systems at five tower sites	15M – 25M	Ensures uptime during outages
		Establishment of two community internet hubs (Rumboor Centre, Birir Payeen) with VSAT	15M – 20M	Internet access for students, youth, and communities
		Provision of emergency satellite phones/radios to three disaster-prone villages	10M – 15M	Enhances emergency communication in isolated zones
Sub-Total			160M – 230M	
Medium-Term (2031–2040)	Capacity Building & Broadband Initiation	Satellite internet rollout for five additional remote villages/institutions	50M – 70M	Interim broadband for hard-to-reach areas
		Fiber optic extension to central valley nodes (Bumborate, Rumboor)	90M – 110M	Backbone infrastructure for future broadband
		Construction of three new digital centers (Bumborate Payeen, Bumborate Bala, Birir Bala)	25M – 35M	Access to digital literacy, e-learning, e-services
		Local technical training for telecom maintenance (youth certification in solar, network upkeep, etc.)	8M – 12M	Builds local capacity for sustaining infrastructure
		Expansion of Wi-Fi hotspots in community areas (e.g., Bumborate Payeen, Birir Bala)	10M – 20M	Wider digital access beyond centers
		Resilient infrastructure upgrades: disaster integration, waterproofing, backup links	15M – 25M	Ensures telecom sustainability under extreme weather conditions
Sub-Total			198M – 272M	
Long-Term (2041–2045)	Digitization & Future-Ready Network	Completion of fiber network to all remaining villages; wireless distribution systems where needed	100M – 140M	Ensures universal high-speed broadband access
		Rollout of e-services platforms: telemedicine, digital governance, Kalasha language e-learning	30M – 50M	Enhance education, health, and governance access
		Upgrade all towers to 4G+ or 5G-ready with new antennas and radio units	50M – 70M	Prepares the valley for future data needs

		Standardization of weather-resilient telecom systems (moisture/temperature resistant equipment, ring topology for redundancy)	20M – 30M	Ensures year-round service even during extreme mountain weather
		Scaling green power (solar + battery) across all telecom installations	25M – 35M	Reduces outages and diesel dependency
Sub-Total			225M – 325M	
Total			PKR 583M – 827M	

3.7.4. Implementation Roles

Table 13 Implementing Bodies and their Roles

Level	Implementing Body	Role/Responsibility
Lead Agency	Pakistan Telecommunication Authority (PTA)	Regulatory oversight, licensing, and ensuring compliance with national telecom standards.
Financing & Coordination	Universal Service Fund (USF) – Ministry of Information Technology & Telecommunication	Funding for infrastructure in underserved areas, coordination with operators for service delivery.
Private Sector	Jazz, Telenor, Zong, Ufone	Network expansion, installation of telecom towers, and provision of mobile and internet services.
Provincial Support	Khyber Pakhtunkhwa Information Technology Board (KPITB)	Policy alignment, technical facilitation, integration with provincial ICT development programs.
Local Government	District Administration – Chitral	Local facilitation, permits, and coordination with community stakeholders.
Community Role	Kalash Valley Development Authority (KVDA), Local Community Organizations	Community engagement, site facilitation, and ensuring solutions are culturally appropriate and inclusive.

3.7.5. Potential Donors

Potential donors for the telecommunication improvement project in Kalash Valley may include multilateral development agencies, bilateral donors, and private-sector partners with a focus on digital inclusion and rural connectivity. Organizations such as the Asian Development Bank (ADB), World Bank, and International Telecommunication Union (ITU) have funded similar projects aimed at enhancing ICT infrastructure in remote regions. Bilateral donors like USAID and DFAT (Australia) have prioritized digital access as a driver for education, commerce, and disaster resilience. Additionally, corporate social responsibility (CSR) programs of telecom operators such as Jazz, Telenor, and Zong present viable co-financing opportunities. Aligning the project with global frameworks such as the UN's Digital Development Goals can further attract investment from technology philanthropies like the Bill & Melinda Gates Foundation and Google.org, ensuring that the valley benefits from sustainable, climate-resilient, and inclusive communication systems.

The outcome of these investments will be transformative digital inclusion of Kalash communities, which will unlock new opportunities (students can take online courses, artisans can sell crafts online, early warning of disasters via SMS, etc.) and help preserve Kalash culture through digital archiving and sharing. Moreover, better connectivity aids all other sectors (e.g., telemedicine for health, e-learning for education), making this a high-impact sector for investment.

4. Village-wise Development and Budget Estimates

Kalash Valley comprises numerous small villages spread across the three main valleys (Bumborate, Rumboor, Birir). Development needs and costs have been estimated on a village-specific basis to ensure equitable investment and context-specific planning. The spatial habitat plan conducted for 10 Kalash villages provides a detailed breakdown of required interventions (housing, infrastructure, community facilities, etc.) and their costs. Below is a summary of development estimates by village, indicating the scale of investment needed in each (figures in Pakistani Rupees):

Village	***Estimated Total Development Cost (Range)***
Birir Bala	1.04 B – 2.35 B PKR
Birir Payeen	0.78 B – 1.76 B PKR
Bumborate Payeen	1.09 B – 2.35 B PKR
Rumboor (Center)	0.87 B – 1.85 B PKR
Sheikhandeh (Rumboor)	0.92 B – 2.04 B PKR
Sheikhandeh (Bumborate)	1.06 B – 2.32 B PKR
Pehlawanandeh *(Bumborate.)*	0.92 B – 2.07 B PKR
Kandisar *(Bumborate)*	0.53 B – 1.18 B PKR
Karakal *(Bumborate)*	0.42 B – 0.90 B PKR
Batrik *(Bumborate)*	0.20 B – 0.50 B PKR
Parakalak *(Bumborate)*	0.28 B – 0.62 B PKR

(B = Billion, meaning 10^9 PKR. The ranges represent low-end to high-end estimates based on different development scenarios or standards.)

These figures encapsulate comprehensive development needs including residential area upgrades, tourism/commercial area development, community facilities (cultural centers, etc.), education/health facilities, infrastructure (roads, water, power) within each village, and contingencies. For example, Birir Bala (the upper Birir settlement) has an estimated cost range of ~1.04 to 2.35 billion PKR, reflecting significant investment needed in tourism facilities and residential rehabilitation in that village. On the other hand, smaller villages like Batrik (in Bumborate) show a lower range (0.20–0.50 B PKR) given their smaller size and fewer infrastructure needs.

Summing across all villages, the total aggregated development cost comes to roughly PKR 8.09 billion (low-end) to PKR 17.84 billion (high-end), with an average expected investment of around PKR 12.96 billion for the 10 villages assessed. This aggregate aligns with the sectoral investment figures outlined earlier (as those sector plans will be implemented distributed across villages). The wide range accounts for different design options and uncertainties in unit costs; the higher end might assume more stringent standards and higher capacity facilities (or inclusion of additional villages outside the initial 10).

4.1.1. Village-wise prioritization:

In implementation, priority will be given to villages with acute needs or opportunities:

- In Birir Valley, *Birir Payeen* and *Birir Bala* require substantial work on basic infrastructure (water, access) and hence see high per-capita costs.
- In Rumboor, *Rumboor Center* (the main Kalash village in that valley) plus *Sheikhandeh-Rumboor* (a nearby Muslim-majority village) both need investments in cultural centers, roads, and WASH.
- In Bumborate (the largest valley), multiple settlements – *Kandisar, Karakal, Batrik, Pehlawanandeh, Parakalak,* plus *Sheikhandeh-Bumborate* (Muslim village at valley mouth) – all have defined projects. Bumborate being the tourism hub gets a significant share of tourism facility costs (hence high ranges for Pehlawanandeh, etc., which host commercial/tourism zones).

4.1.2. Budgeting and Phasing:

Each village's development will be phased. The short-term will address critical needs (water supply schemes in each village, one school or health post improved per village, urgent slope stabilization if a village is under threat, etc.). Medium-term will take on larger projects (e.g. cultural center construction in the major villages, road paving). Long-term covers completion of housing improvements and higher-end facilities (like museums or parks).

A contingency of ~10% is included in the village estimates to cover unforeseen costs. For instance, Kandisar's base cost 476M–1,064M plus 10% contingency gave 532M–1,176M PKR total.

Village-level planning ensures that no community is left behind – even smaller villages get dedicated investments suitable to their size (e.g. a water tank and primary school in Batrik, as opposed to multiple projects in a big village like Birir Bala). This granular approach also facilitates community participation: each village can have its own development committee to oversee works and align them with local needs. The aggregated village budgets will be used by KVDA and planning authorities to allocate resources annually, ensuring balanced regional development.

It's important to note that these numbers are planning estimates; actual costs will be refined with detailed designs. The CIP provides the framework so that donors and government can see the needs at a village scale and fund accordingly. As implementation proceeds, some economies of scale or adjustments may occur (for example, combining facilities to serve two villages, or cost savings via community contributions of labor/materials).

In conclusion, the village-wise analysis confirms that on average about PKR 1–1.5 billion of investment per major village is needed to comprehensively uplift it (with variation by size and function). This underscores the magnitude of investment required but also provides a roadmap for targeted interventions that collectively achieve the valley-wide transformation envisioned.

5. Financial Plan and Cost-Benefit Analysis

A sound financial strategy is central to translating the Capital Investment Plan (CIP) into action. Given the magnitude of the proposed investments in infrastructure, environment, energy, and social sectors, financing must be sustainable, diversified, and phased. This chapter outlines (i) the proposed financing approach and structure, (ii) institutional mechanisms for fund management, and (iii) the expected economic and social returns of the CIP through a cost-benefit framework.

5.1. Financial Plan and Funding Sources

The total estimated investment for the Kalash Valley CIP is approximately PKR 17–18 billion over a 20-year horizon. Mobilizing such an amount requires a blended financing model, where multiple actors contribute according to their comparative advantage and mandate. The approach combines public sector allocations, international donor grants/loans, private sector investment, climate finance, and community contributions.

- **Government Funding:** The Federal and Khyber Pakhtunkhwa Provincial governments will finance core infrastructure and social sector projects through budgetary allocations. This includes:
    - **Public Sector Development Program (PSDP) & Annual Development Program (ADP):** Major roads, bridges, schools, and health centers will be included in government ADP/PSDP schemes. For example, the main valley road upgrade might be a PSDP project. The provincial ADP can cover construction of schools (Education Dept) and BHUs (Health Dept).
    - **KVDA's Budget:** The Kalash Valley Development Authority will have its own annual budget (from KP Government) to fund smaller local projects and operational expenses. As a special authority, KVDA can advocate for dedicated grants.
    - We anticipate the Government covering perhaps **50% or more of the total funding**, given its commitment to marginalized areas. For instance, KP Govt may allocate ~PKR 5 billion over 20 years for Kalash (averaging 250M per year).
- **Aga Khan Development Network (AKDN) & NGOs:** AKDN institutions (AKRSP, AKESP, AKHS, AKCSP) have been active in Chitral. They are expected to provide technical assistance and catalytic funding:
    - **AKRSP** could fund community mobilization, livelihood programs, and co-finance micro-hydro or irrigation schemes.
    - **AKESP/AKHS** might support education and health projects (teacher training, running costs of health centers initially).

  - These contributions might not be huge in monetary terms but critical in expertise. Say ~PKR 500 million equivalent in grants and services over the plan (like AKRSP's rural development grants, AKCSP's restoration efforts, etc.).

- **Multilateral and Bilateral Donors:** Engage agencies such as UNDP, UNESCO, World Bank, Asian Development Bank (ADB), EU and friendly countries for grant funding or soft loans:
  - **UNDP** could support climate resilience and governance capacity-building.
  - **UNESCO** may fund cultural heritage preservation and documentation.
  - **World Bank/ADB** might include Kalash Valley in larger rural development or tourism projects, providing infrastructure funding (possibly as loans to the government with soft terms).
  - **Green Climate Fund (GCF) and Adaptation Fund:** These climate finance sources can be tapped for reforestation, flood mitigation, renewable energy – aligning with CIP's environment and energy components.
  - We estimate donors could cover around **20-25% of total costs**. For instance, a $10 million (~PKR 1.6B) grant from a consortium for climate and culture projects over a decade is plausible.
- **Private Sector and Public-Private Partnerships (PPPs):** Attract private investment especially in sectors like tourism and telecom:
  - **Telecom Operators** (Telenor, SCO, etc.) will invest in tower infrastructure if viability gap funding is provided (via USF or gov incentives).
  - **Hospitality investors** might partner in building eco-resorts or managing tourist facilities (with land or capital provided by government/community). E.g., a private company could build/manage an eco-lodge under a lease.
  - **Local Entrepreneurs:** As livelihoods improve, local business investments (guesthouses, shops, transport services) will increase.
  - We project the private sector could contribute about **15%** of the total funding required, largely to revenue-generating projects. For example, ~PKR 1–2B in telecom infrastructure and tourist facilities by 2045.
- **Diaspora and Philanthropy:** Leverage the goodwill of patrons and Kalash supporters globally:
  - **Philanthropic Foundations:** Some foundations focus on indigenous cultures or mountain communities, which could grant funds for education/culture (for instance, the Soros Foundation or Prince Claus Fund).

- **Pakistani Diaspora:** Many Pakistanis abroad support development back home. A **"Friends of Kalash" fund** could be established to channel donations, particularly for heritage preservation and scholarships.
- While this may be a smaller slice, even 5% contribution (about PKR 500–800M) could cover critical gaps for things like the Kalash cultural centers or an endowment for maintenance.

Table 14: Proposed Financing Matrix

Source	***Indicative Share (%)***	***Examples of Contribution Mechanisms***
Government (Federal + KP/ADP/PSDP + KVDA)	45–50%	Roads, schools, health, energy plants
Multilaterals/Donors (WB, ADB, EU, UN, JICA, etc.)	20–25%	Infrastructure grants, concessional loans
Climate Finance (GCF, GEF, AF, CIF)	5–10%	Flood-proofing, renewable energy, DRR
Private Sector / PPPs	10–15%	Tourism facilities, telecom towers, eco-transport
Community & Diaspora	5–10%	User fees, labor, diaspora philanthropy
Total	**100%**	Blended financing over 20 years

5.2. Institutional Mechanisms for Financing

To coordinate the multiple streams of financing, dedicated institutional arrangements are necessary:

- **Kalash Valley Investment Facilitation Office (KV-IFO):** A one-stop unit under KVDA to prepare project proposals, liaise with donors, and manage PPP frameworks.
- **Kalash Climate & Cultural Trust Fund**: A pooled donor facility for environment, resilience, and cultural heritage projects. It can also sustain an endowment for O&M of critical facilities.
- **Village Endowment Funds**: Community-managed funds (seeded by donors/government) to finance maintenance of local water supply, sanitation, or cultural centers, topped up through user tariffs or tourism fees.

These mechanisms will improve transparency, build donor confidence, and ensure long-term sustainability.

5.3. Cost-Benefit and Economic Analysis

5.3.1. Analytical Foundation

To assess the value of the CIP holistically—from infrastructure to environmental resilience—we use universally accepted financial indicators:

- **Net Present Value (NPV):** The difference between discounted benefits and costs. A positive NPV indicates a net gain over time.
- **Internal Rate of Return (IRR):** The discount rate where NPV equals zero; projects with IRR above the cost of capital (typically ~8–10%) are considered viable.
- **Benefit-Cost Ratio (BCR):** Ratio of the present value of benefits to costs. BCR greater than 1.0 signals economic worth.
- **Payback Period:** The time taken for cumulative benefits to equal initial investment, useful for gauging recovery speed.
- These metrics are complemented by **sensitivity analysis** to test financial robustness under changing assumptions, as recommended by institutions like the Inter-American Development Bank and OECD.

5.3.2. Project-Level Metrics

While detailed modelling requires design-stage data, indicative metrics for CIP include:

- **Estimated NPV (20-year horizon):** Positive in most sectors (transport, energy, WASH), with an earlier estimate of PKR 1.45B over ten years—actual long-term NPV should be significantly higher.
- **Internal Rate of Return (IRR):** Sector studies show IRR in the 15–20% range, above typical public-sector benchmarks.
- **BCR Examples:**
    - Transport investments often yield BCR of 1.5–2.5 in rural settings.
    - Micro-hydro/energy projects may exceed BCR of 1, due to fuel savings and income generation.
- **Sensitivity Analysis:** Test performance under reduced tourism flows, delayed climate finance, or cost overruns, to assess resilience of returns.

5.3.3. Intangible Benefits & Social Returns

Quantitative CBA should also note broader social and environmental benefits even if not fully monetized:

- **Cultural Preservation:** Heritage value and identity retention.
- **Environmental Services:** Ecosystem restoration, flood buffering, air and watershed protection.
- **Social Equity:** Women's livelihoods, reduced healthcare costs, educational outcomes.

- **S-ROI and Triple Bottom Line Approaches:** These capture non-financial returns in sustainability and social impact.

Economic Indicators

While detailed cash-flow modeling must wait for refined design data, experience from similar contexts provides guidance:

Indicator	*Estimate (20-Year Horizon)*	*Interpretation*
Net Present Value (NPV)	PKR +3 to +4 billion	Substantially exceeds total costs
Internal Rate of Return (IRR)	~12–18%	Surpasses typical public sector thresholds
Benefit-Cost Ratio (BCR)	~1.3–2.0	Generates 13%-100% return per rupee spent
Payback Period	5–7 years (energy/tourism); up to 10 years (social sectors)	Rapid return on key investments

These ranges align closely with global infrastructure benchmarks and rural connectivity analyses—such as rural roads in Punjab costing Rs1.76M–4.38M/km. While not exact, they provide confident direction and help justify investment priorities.

5.3.4. Sensitivity and Risk Assessment

Investments must be resilient to real-world variability:

- **Scenario testing:** Simulating 20% lower tourism or 10% higher construction costs tests NPV and BCR robustness.
- **Local labor models:** Community-based road builds (e.g., Rs2M/km vs Rs4.5M baseline) can reduce costs significantly.
- **Multiple metrics:** Using NPV, IRR, and BCR together ensures balanced assessment of scale, return, and value.

5.3.5. Conclusion

This CIP demonstrates strong economic viability—positive NPV, high IRR, and BCR well above 1—affirming that costs are justified by long-term returns. Sensitivity testing further strengthens confidence, identifying areas (like tourism and energy) with rapid payouts and enabling phased transitions to financial sustainability. In short: this is a financially sound investment, not just a social imperative.

6. Governance, Institutional Roles, and Partnerships

The success of the Kalash Valley Capital Investment Plan (CIP) depends not only on financial resources and technical designs but also on a robust governance framework. Effective coordination among multiple stakeholders, government, donors, civil society, and the Kalash community—is essential to ensure that investments are delivered transparently, efficiently, and in a culturally sensitive manner. This chapter outlines the institutional architecture, partnership mechanisms, and accountability systems required to implement the CIP over its 20-year horizon.

6.1. Institutional Architecture:

The following governance setup is recommended:

- **Kalash Valley Development Coordination Council (KVDCC):** This will be a high-level policy and oversight body guiding CIP execution. The council can be chaired by a senior official (e.g., Commissioner or Secretary of a relevant department) and include local Kalash elders, representatives of KP Government departments (P&D, Culture, Tourism, C&W, Health, Education, etc.), AKDN representatives, and NGOs. The KVDCC will ensure that development strategies remain culturally sensitive and aligned with community priorities. It will meet, say, bi-annually to review progress, resolve inter-departmental issues, and endorse annual work plans.

- **Kalash Cultural Advisory Board:** To protect intangible heritage, a board of Kalasha cultural leaders, scholars, and activists should be established. This Board will review all interventions from a cultural lens – e.g., vet building designs to ensure they respect Kalash aesthetics, set guidelines for tourism conduct, and advise on cultural content in education. They'll ensure development does not inadvertently erode traditions. The Board's advice will be binding for projects that directly impact cultural sites/ practices.

- **Kalash Valley Development Authority (KVDA):** The recently formed KVDA be the central executing agency on ground. It will have technical staff (engineers, planners) to implement or supervise projects and a mandate to work across sectors in the Kalash area. Under the CIP governance, KVDA acts as the secretariat of the DIC and the KVDCC, preparing reports and following up on decisions. Strengthening KVDA's capacity is part of CIP (staff training systems). Over time, KVDA should become the primary institution for valley development planning and maintenance.

- **Investment Facilitation Office (KV-IFO):** As mentioned in the financial plan, set up an office (maybe under KVDA or the Council) to coordinate all funding and PPP initiatives. This office will maintain a portfolio of projects, prepare proposals for donors, liaise with private investors, and track expenditures. It will ensure transparency in fund flows and help navigate bureaucratic processes for external partners.

- **Community Organizations:** At the grassroots, village development committees or VOs (Village Organizations) will be revitalized or formed. These committees (with representation of men, women, elders, and youth) will help prioritize village-level projects, contribute community labor, and take responsibility for O&M of completed schemes (like water supply). Many villages already have Jirgas, or committees often supported by AKRSP in the past – these will be linked formally to the CIP structure by giving them a role in monitoring and feedback. Possibly a union of Kalash valley VOs can have a seat in KVDCC to voice community concerns directly.

6.2. Interagency Coordination and MoUs:

To avoid duplication and ensure resource alignment:

- MoUs between KVDA and KP Departments (Culture, Tourism, Health, Education, Energy, C&W, PHE) will specify responsibilities, cost-sharing, and staffing commitments.
- Agreements with AKDN and NGOs to leverage technical expertise, community mobilization, and monitoring.
- Partnerships with multilateral/bilateral donors (ADB, WB, EU, UNESCO, UNDP) for co-financing and specialized programs aligned with CIP priorities.

6.3. Transparency and Accountability:

Good governance requires transparency mechanisms:

- Use **PPRA (Public Procurement Regulatory Authority) rules** for all procurements to ensure competitive bidding and value for money. Possibly have third-party audits for major contracts to deter corruption.
- Establish a **Monitoring & Evaluation framework** (as outlined in section 10) that feeds into governance – with scorecards and regular progress reports that are made public. The community should know where money is spent and what progress is made.
- Implement a grievance redressal system for locals – e.g. a hotline or complaint cell at KVDA where villagers can report issues like contractor negligence or social impacts and get timely responses.

6.4. Community Participation:

The CIP governance emphasizes that **local participation is institutionalized**:

- Community reps in KVDCC (as mentioned) and possibly in district committees.
- The Cultural Advisory Board is entirely community-centric.

- Women's participation: ensure women members in village committees and maybe a separate **Women's Forum** under KVDA to voice gender-specific concerns (like water point locations, etc.).
- Youth involvement: form Kalash youth groups to engage them in monitoring (they can be champions for things like waste management, tourism hospitality, etc.).

6.5. Partner Roles:

Summarizing key partner institutional roles for clarity:

- **Kalasha Community:** Beneficiaries and co-implementers; contribute local knowledge, labor, and monitor projects as primary stakeholders.
- **Government of KP:** Main financier and implementer through its departments; ensures policy support and sustainability (will eventually take over operations of schools, health centers, roads maintenance via its line departments).
- **AKDN/AKRSP:** Technical partner providing capacity building, helping with community mobilization and specialized interventions (like micro-hydro installation, cultural documentation).
- **Development Partners (Donors):** Funding support and technical expertise in respective domains (e.g. UNESCO for cultural, GCF for climate, etc.), aligning CIP with global best practices.
- **Private Sector:** Service delivery in telecom, transport, tourism under oversight of regulatory frameworks; invest capital in PPP and maintain commercial viability while respecting local context.
- **Local Government (District & Tehsil):** The District administration will facilitate land acquisition if needed, security arrangements (especially during festivals or for foreign tourists), and integration of CIP projects with district plans.
- **Security and Law Enforcement:** Ensuring a safe environment for development and tourism – local police will coordinate with community to protect tourists and projects (this is particularly relevant given a past militant attack on foreign tourists in the region years ago – security is a precondition for success).

Given the sensitive cultural context, governance decisions will err on the side of inclusivity and respect. No project that significantly affects cultural or religious practices will proceed without the explicit endorsement of Kalash leaders (hence the Cultural Board veto power). This will build trust in the development process.

In terms of legal framework, if KVDA is the statutory body, its act should empower it to coordinate multi-sector projects. Possibly, the CIP might recommend an amendment to KVDA Act to broaden its mandate or composition to include community reps formally.

7. Risk Assessment and Sustainability Plan

No development plan is without risks. Kalash Valley's CIP faces a variety of potential risks – from natural disasters to institutional challenges – that could impede implementation or the sustainability of outcomes. This section identifies key risks and outlines mitigation strategies for each, ensuring that the plan remains resilient and adaptive. Additionally, it details measures built into the CIP to ensure the sustainability of projects well beyond their completion.

1.1. Risk Assessment and Mitigation

- **Climate and Natural Disasters:** The region is prone to flash floods, landslides, and potentially glacial lake outburst floods (GLOFs). A major flood could damage roads, bridges, and water systems, setting back progress.
    - Mitigation: Disaster Risk Reduction (DRR) is integrated across sectors – e.g., roads with drainage and retaining walls, relocation of facilities out of flood zones, and early warning systems installed. Environmental projects (reforestation, check dams) also reduce disaster impact. Additionally, establishing emergency response plans and safe havens in each village (e.g., multi-purpose community centers on higher ground) will help communities cope when events occur.
- **Institutional Weaknesses:** Given remote location, **bureaucratic delays or weak local governance capacity** could hamper execution. For example, slow release of funds or lack of coordination between departments is a risk.
    - **Mitigation:** The governance structure (KVDCC, DIC) is specifically designed to improve coordination. Capacity-building programs (with AKDN support) will train KVDA staff and community committees in project management. Also, having AKRSP/local NGOs deeply involved means there's on-ground support to keep things moving even if official processes slow down. The plan also suggests tripartite MOUs (Govt-AKDN-community) which create mutual accountability.
- **Cultural Sensitivity Risks:** There's a risk of **over-commercialization or cultural dilution** if tourism and modernization aren't carefully managed. E.g., the influx of tourists or migrant workers could disrupt social norms, or development might inadvertently offend cultural practices.
    - **Mitigation:** The Cultural Advisory Board and code of ethics for tourism ensure that Kalash traditions guide project design. For instance, ensuring privacy around women's bathing places in river when building bridges, or preserving sacred groves from any land use change. Continuous community consultation is mandated for all projects. The CIP also includes cultural orientation for all outside contractors/workers, so they respect local customs.
- **Economic/Market Risks:** Planned livelihood enhancements assume there will be markets for products (crafts, produce, tourism). A **risk** is lower than expected demand – e.g., tourist numbers might not grow due to external factors, or craft sales might stagnate.

  - **Mitigation:** A diversified approach is taken – multiple livelihood options (agri, tourism, microenterprise) rather than reliance on one. The CIP also includes strong **market linkage programs and marketing efforts** – such as branding Kalash products, connecting co-ops with urban markets, and perhaps developing e-commerce channels. For tourism, the plan focuses on improving quality and promotion (with diaspora marketing and provincial tourism campaigns) to stimulate demand.
- **Technological Risks:** Introduction of new technologies (solar systems, telecom, etc.) faces risk of **lack of local capacity to maintain them** or technology obsolescence.
  - **Mitigation:** The plan heavily emphasizes training – vocational training for solar/hydro technicians, embedding maintenance requirements (like O&M manuals) in project contracts. Choosing appropriate technology scale (e.g., proven micro-hydro designs already used in Chitral, robust telecom gear for mountains) will reduce failure rates. The plan also budgets spare parts and maintenance contracts in initial years of each tech project.
- **Security Risks:** Though generally peaceful, any region can have **security incidents** or law-and-order issues (the Kalash have historically been subject to social frictions with neighbors, and foreigners' presence could be a target). A single security incident can scare away tourists and donors.
  - **Mitigation:** Coordination with local law enforcement is planned – e.g., establishing a small police check post near tourist areas, ensuring year-round road access for security forces. Community policing (involving Kalash youth) can also help monitor and diffuse tensions. The CIP will also work on social cohesion projects (like sports, interfaith dialogues) to maintain harmony between Kalash and Muslim neighbors, indirectly supporting a secure environment.
- **Financial Sustainability Risks:** Post-project, there is a risk of **infrastructure falling into disrepair** due to insufficient maintenance funds or institutional neglect.
  - **Mitigation:** The CIP's sustainability plan (below) addresses this by establishing maintenance funds, training local operators, and setting up user fees for cost recovery in water, energy, etc. For example, the user fee system for water and power ensures that communities generate revenue for O&M. Also, involving communities in construction yields greater care for upkeep. The trust fund concept and endowments aim to have funds specifically for maintenance.
- **Environmental Risks of Development:** Construction itself can have negative environmental impacts (e.g., road building causing erosion, increased waste from more tourists).
  - **Mitigation:** Environmental Impact Assessments (EIAs) will be conducted for major projects and guidelines followed (like proper slope stabilization in roads, waste management in construction camps). The CIP encourages eco-friendly designs – solar-powered streetlights, use of local materials for buildings, etc. Also, the solid

waste management initiative should cope with increased waste generation from development and tourism, preventing long-term pollution.

- **Pandemic/Global Risks:** As seen with COVID-19, pandemics can disrupt tourism and supply chains. If something similar happens, CIP implementation could slow, or benefits (like tourist revenue) might temporarily drop.
    - **Mitigation:** Building robust local systems (community healthcare readiness, diversified local economy less reliant solely on external tourists) will provide resilience. Digital connectivity also provides a buffer (people could leverage the internet for remote work or online markets if physically cut off).

In sum, the CIP is designed with a **resilience mindset**, addressing many risk factors proactively (the integration of DRR, community involvement, and diversified development all contribute to risk mitigation).

7.1. Sustainability Plan

Ensuring that the outcomes of the CIP are sustainable in the long run – financially, institutionally, and environmentally – is a core consideration. Several measures are built into the plan:

Operation & Maintenance (O&M): For each infrastructure project, an O&M plan is prepared:

- **Community O&M Committees:** As mentioned, water user committees, road maintenance committees, etc., will be established/trained. They will perform routine maintenance (e.g., clearing drains, greasing hydro turbines). Major repairs will be escalated to KVDA or line departments.
- **User Charges:** Introduce modest user fees or tariffs where appropriate to fund maintenance. Water supply might have a monthly household fee; micro-hydro could charge per kWh or a flat community rate. These fees feed into maintenance funds managed by the community with oversight. For example, even a fee of PKR 50/month per household for water, when everyone pays, accumulates a fund for fixing pipes.
- **Local Maintenance Funds:** The idea of village endowment funds (seeded by CIP and raised by user fees or donor contributions) will ensure money is available for upkeep. Annual audits of these funds will be made for transparency.

7.2. Institutional Sustainability:

- **Capacity Building:** Heavy investment in training local people (teachers, health workers, technicians) so that after external actors leave, locals can run the show. For example, training Kalash youth to become schoolteachers or LHVs (lady health visitors) means those services persist with local human resources.
- **Absorption into Government Systems:** Where CIP creates new facilities (schools, health centers), the goal is to fully integrate them into government's regular budget for staffing and operations by plan end. Already, coordination with Education/Health

departments is ensuring they plan to sanction posts and recurrent budgets for these facilities.

- **Policy and Legal Support:** Advocate for supportive policies e.g., heritage protection regulations that guard against harmful exploitation of culture, land-use plans to prevent unsustainable development (the Spatial Habitat Plan will become a legally endorsed plan). Also, formalizing community rights (like securing land titles for Kalash or communal land) can sustain their control over resources.
- **Partnership Continuity:** Maintain long-term partnerships: e.g., AKDN's involvement will likely continue beyond project if community institutions remain linked; similarly, tourism associations once formed will continue promoting the area.

7.3. Economic & Financial Sustainability:

- By focusing on livelihoods, the plan ensures people have increased income to sustain improvements. For instance, if households earn more, they can afford to pay user fees for services, buy educational materials, etc., reducing dependency on aid.
- The plan fosters the creation of revolving funds or microfinance that continue beyond initial grants (e.g., a microfinance scheme once initiated continues lending from repayments).
- Encouraging private sector operation of some services ensures continuity (e.g., maybe outsourcing maintenance of hydro plants to a local enterprise that gets paid by user tariffs – they will keep it running to earn income).

7.4. Environmental Sustainability:

- All physical investments incorporate climate-resilient design to endure future conditions (e.g., building for a 100-year flood level rather than historical).
- The reforestation and conservation efforts ensure that development doesn't degrade the natural resource base – indeed it improves it. Sustainable land use planning (from Spatial Plan) will be followed: for example, limiting construction in hazard-prone or ecologically sensitive zones (no building zones along river meanders, protection of high pasture).
- **Renewable energy focus** means the valley's carbon footprint remains low and locals aren't locked into expensive fossil fuel dependencies. Environmental projects (like community forestry) are community-run, which typically ensures trees are guarded and maintained because people have ownership.
- Solid waste management plans will protect the environment long-term (with possibly moving towards zero plastic in valley, use of biodegradable materials for tourist facilities etc. to maintain pristine nature).

Monitoring & Adaptation: Sustainability is also about adapting to change:

- The plan includes a Monitoring & Evaluation system (M&E) (see next section) that tracks outcomes and allows mid-course corrections. If something isn't working or unforeseen issues arise, the governance mechanism can adjust strategy – this adaptability is crucial for long-term success.
- There's a provision for third-party evaluations every few years, which can give independent feedback on sustainability aspects (are communities maintaining projects? is environment better? etc.), and recommendations will be fed back into project design tweaks.

7.5. Community Ownership and Cultural Endorsement

Perhaps the most important sustainability factor is that the Kalash community feels this is "our plan". All efforts in participatory planning, community contributions, and cultural sensitivity are aimed at building that ownership. A community that is proud of and values the new infrastructure and services will naturally sustain them – e.g., villagers will not allow a water supply to fall apart if they remember how life was without it and they contributed to building it. Similarly, culturally appropriate solutions (like maintaining Kalash aesthetic in architecture) means they integrate into daily life rather than being alien fixtures that might be abandoned.

In conclusion, the CIP incorporates robust measures to manage risk at every level and to embed sustainability – financial, institutional, environmental – in each intervention. By preparing for risks and planning for the long-term from the outset, the investments made will continue to yield benefits many years beyond 2045, making the Kalash Valley a sustained success story of integrated development.

7.6. Monitoring, Evaluation, and Impact Metrics

An effective Monitoring & Evaluation (M&E) framework is essential to track progress, ensure accountability, and measure the impact of the CIP interventions. The Kalash Valley CIP will implement a comprehensive M&E and results management system, aligned with best practices (such as AKDN's Results-Based Management and Government of Pakistan's SDG monitoring approaches).

Key Components of the M&E System:

- **Baseline Data Collection:** In Year 1 of implementation, thorough baseline surveys will be conducted for all key indicators. This includes household socioeconomic surveys, infrastructure condition assessments, baseline health and education stats, etc., likely coordinated with AKRSP and the Bureau of Statistics. (Note: Some baseline info was gathered during the spatial assessment; it will be expanded and updated.)
- **SMART Indicators:** For each sector and project, Specific, Measurable, Achievable, Relevant, Time-bound indicators have been defined. These cover both outputs (e.g., number of schools built, km of roads upgraded) and outcomes (e.g., increase in literacy

rate, reduction in travel time). The M&E plan includes an indicator matrix mapping each CIP objective to one or more performance indicators.

- **Digital M&E Platform:** A mobile-enabled dashboard or MIS (Management Information System) will be developed to collect and visualize data in real-time. Field officers (KVDA staff or community monitors) can upload progress data via smartphones (like photos of project milestones, or inputting school attendance figures). The **Kalash Valley Investment Facilitation Office (KV-IFO)** will host this dashboard, enabling stakeholders to see up-to-date progress on each component at a glance.
- **Third-Party Evaluations:** To ensure objectivity, an independent evaluation will be commissioned every 3 years. This could be done by a local university (like Karakoram International University or a research institute) or independent consultants. They will evaluate effectiveness, efficiency, and impact, and recommend course corrections. For example, by 2030 a mid-term evaluation will check if targets are on track.
- **Community Scorecards:** The plan will incorporate **annual community scorecard exercises** where residents themselves evaluate the services (e.g., rating water supply reliability, teacher presence, healthcare quality). Separate focus groups for elders, women, and youth will be held to gather qualitative feedback. This social audit mechanism ensures that implementation is accountable to beneficiaries and that their satisfaction is measured and acted upon.

Monitoring Indicators and Targets: The CIP identifies sample indicators across sectors to track outcomes. Some of the **key impact metrics** include:

- **Education:** *Enrollment rates* (by gender and level), *dropout rates*, *literacy rate*. For instance:
    - Enrollment of primary-school-age children – baseline maybe ~60%, target to reach >95%.
    - Female secondary enrollment – baseline low, target e.g. 75%.
    - Literacy (esp. female literacy) – baseline ~15% for women, target 70% by 2034.
    - % of schools with functional toilets and boundary walls – target 100%.
- **Health:** *Immunization coverage* (children fully immunized by age 2), *skilled birth attendance* (proportion of births attended by trained personnel), *child malnutrition rates*. E.g.:
    - Immunization coverage – baseline maybe 50-60%, target >90%.
    - Maternal mortality – baseline high (exact unknown given small pop), target to reduce to zero if possible (no mother should die giving birth in a facility).

  - Average distance or time to nearest PHC – baseline 2-3 hours for some, target <1 hour for all (with new centers).

- **Tourism:** *Number of tourist arrivals per year*, *average length of stay*, *% local employment in tourism sector*. Baseline perhaps ~20,000 domestic/foreign visits (estimated); target +50% by 2030, +100% by 2040.
  - Also track tourist satisfaction maybe by surveys.
  - Local employment: baseline maybe 5-10% directly in tourism, target >25% of households earn from tourism by 2035.
- **Environment:** *Number of trees planted,* or area reforested, *incidence of severe flood events*, *water quality measures*.
  - E.g., Trees planted – target 200,000 by 2040, survival rate >70%.
  - Flood incidents/year causing damage – baseline perhaps one major every 2-3 years, target reduce frequency or impact (maybe measure average flood damage cost per year, aim to cut by 50%).
  - Water quality: % of water samples meeting WHO standards (target 90%+).
- **Energy:** *Households with electricity (% round-the-clock)*, *renewable energy capacity installed (kW)*, *hours of electricity per day on average*.
  - Baseline households with some electricity maybe 60% (few hours), target 100% with 24/7 by 2040.
  - kW installed – track increase (target e.g. additional 500 kW hydro, 100 kW solar).
- **Livelihoods:** *Number of new enterprises established*, *% increase in average household income*, *unemployment rate*.
  - Baseline average HH income ~PKR 9,000/month, target e.g. PKR 20,000 by 2034.
  - Unemployment (especially youth) – reduce by say 50%.
  - Also measure women's economic participation (women in local enterprises, baseline <5%, target 40% by 2034).
- **Governance:** *Project implementation rate* (projects completed on time vs planned), *stakeholder satisfaction*.
  - Could use a metric like "% of annual targets achieved" each year.
  - Stakeholder (community) satisfaction via scorecards – aim for improvement each year.

These indicators form a results framework that will be regularly populated. Annual progress reports will present data (for example: "Water: X number of taps installed, Y% decrease in waterborne diseases this year").

Data Collection and Reporting:

- KVDA's M&E unit (or the KV-IFO's M&E staff) will collect data quarterly on outputs and annually on outcomes. They will use **GIS mapping** for spatial indicators (like mapping reforested areas or improved infrastructure).
- There will be **public annual progress reports** summarizing achievements, shortfalls, and next year plan – this fosters transparency and continuous support from donors and higher authorities.
- **SDG Alignment:** The indicators will be mapped to SDGs, so progress can also be reported against Pakistan's SDG targets (e.g., SDG 4 for education, SDG 6 for water, etc.), showing how Kalash Valley's development contributes to national and global goals.

Use of M&E for Adaptive Management: The monitoring is not just for show – it's for learning and adapting. If an indicator shows under-performance (e.g., dropout rate not improving despite school building), the Council/DIC will investigate why (maybe need more teachers or community advocacy) and adjust strategy. The third-party evaluation recommendations will be directly used to refine project designs and resource allocations in subsequent phases.

Accountability: The M&E framework also ensures accountability:

- Government officials have clear targets to meet (if they don't, it's visible to higher-ups and community).
- Donors see their funds translating to outcomes via the dashboard and reports, building trust.
- Community sees promise vs reality; with scorecards they hold implementers accountable for service quality.

In summary, CIP's M&E system will function as the eyes and ears of the project, providing continuous feedback. By measuring the **impact metrics** diligently – from literacy rates to tourist numbers to forest cover – all stakeholders can celebrate successes or course-correct issues. Importantly, this rigorous M&E culture will likely persist in local institutions beyond the project, ingraining a practice of data-driven decision-making in Kalash Valley's development initiatives.

8. Implementation Timeline (Phased: 2025–2030, 2031–2040, 2041–2045)

The Capital Investment Plan will be rolled out in **phases** to manage resources effectively and to achieve early wins while laying groundwork for long-term projects. The timeline is divided into:

- **Short-Term Phase: 2025–2030** (Years 1–5)
- **Medium-Term Phase: 2031–2040** (Years 6–15)
- **Long-Term Phase: 2041–2045** (Years 16–20)

Each phase has specific focus areas and deliverables, building upon the previous phase.

8.1. Short-Term (2025–2030) – Laying the Foundation

Focus: The first 5 years prioritize **quick-impact projects and essential groundwork**. The aim is to address the most urgent needs, demonstrate visible improvements to gain community confidence, and establish the institutional setup for later expansion.

Key short-term initiatives include:

- **Emergency and Basic Services Setup:** Immediately, baseline studies will be completed (as part of Year 1) to gather data. **Pilot interventions** will be launched, such as installing a few communal water tanks and repairing existing ones in each valley, upgrading one school and one BHU per valley as models, and executing critical flood protection at one high-risk site (e.g., a gabion wall where flooding has repeatedly occurred).
- **Infrastructure Quick Wins:** Start **road repairs and bridge replacements** on a priority basis. For example, by 2026 replace the most dangerous log bridges with safe pedestrian bridges and repair the worst segments of the main access road. Widen a short stretch of road near Ayun to show progress. Also pave key footpaths in village centers to immediately improve daily life.
- **Communications & Power Kickstart:** Erect one new telecom tower (say in Birir) to bring first-time signal to that valley by 2025–26. Distribute solar home kits to dozens of households and commission one micro-hydro rehab by 2027 to start delivering 24/7 power to a pilot village.
- **Human Development Spurts:** Conduct **teacher training workshops** and **health camps** early on. Start the community health worker training by Year 2 so that by Year 3 each village has a trained health lady. Also roll out the mobile health unit visits and mobile library van (adult literacy) in this phase.
- **Tourism and Heritage Early Actions:** Set up the main **Kalash Valley Visitor Information Center** by 2026 at the entry, and improve festival management logistics (like toilets, campsites) by the Joshi festival of 2025 or 2026. Commence restoration of one iconic cultural site (perhaps the Karakal Jestak han) as a showcase.

- **Institutional Setup:** Very importantly, **establish and staff KVDA offices** in the valley by Year 1. Form the KVDCC and hold inaugural meeting in 2025 to approve detailed project plans. Sign the needed MoUs with departments and AKDN in Year 1. The **Investment Facilitation Office** should also be operational in this phase to start attracting funds.
- **Community Engagement:** Carry out extensive community engagement and planning at village level. By 2027 every target village should have its development committee in place and the community action plan refined. Use participatory rural appraisals to fine-tune project designs.

By the end of 2030, we expect to see **tangible outcomes**: e.g., each valley has at least 50% population with improved water access, an increase in school enrollment due to improved facilities and outreach, 30 km of roads improved, 2 cell towers operational, 100 kW of new or revived power capacity, and a functioning governance mechanism. Short-term total investment is roughly PKR 1.45 billion as per the consolidated plan (this includes a lot of the institutional and pilot costs front-loaded).

8.2. Medium-Term (2031–2040) – Expansion and Acceleration

Focus: The next 10 years represent the **major scale-up period**. With foundations laid, the CIP will accelerate infrastructure development and expand services to full coverage in most sectors.

Major activities in 2031–2040 include:

- **Infrastructure Build-Out:** Complete all-weather road networks connecting the remaining villages. Roughly 50+ km of road paving and widening will be done in this period (the bulk of road budget is here). Build new RCC bridges as planned, and alternate emergency routes concluding by mid-30s. By 2040, all main travel routes should be finished.
- **Universal Basic Services:** Achieve universal coverage of water, sanitation, electricity by around 2035. This means installing remaining water supply schemes, community septic solutions, etc., and constructing the planned micro-hydro plants and solar mini-grids. By the end of this phase, essentially every household is reached with a tap and a light (even if small scale).
- **Social Infrastructure Completion:** Construct 6 model schools and 3 PHCs during this phase. We expect each year one or two major facilities to be built. For example, a girls' high school in Rumboor by 2032, a cultural museum center in Bumborate by 2033, Birir's new PHC by 2034, etc. By 2040, all planned schools, health centers, and cultural centers should be completed and staffed.
- **Livelihoods and Enterprise Growth:** The **enterprise hub and cooperatives** established in the first phase will mature. Through the 30s we expect them to *scale*

up production and marketing. Possibly by 2030s, Kalash products (nuts, embroidered garments) have found steady external markets. The Youth Fund disburses multiple rounds of grants. Anecdotally, one could aim that by 2035 at least 50 new micro-businesses have started.

- **Tourism Peak Development:** Develop eco-lodges and multi-purpose terminals around mid-30s (PPP projects that might take a few years to plan and build). By late 30s, the valley can host significantly more tourists comfortably (with proper accommodations, guide services, etc.). Also implement smart mobility/tourism systems (apps, real-time info) as internet is now reliable. The cultural centers in each valley will be fully operational hosting events and exhibitions.
- **Environmental & DRR Consolidation:** Through 2031–2040, most reforestation and check dam construction will occur (since it takes time for trees to grow, better to plant early 30s so by 40s forest cover effect is realized). The bulk of flood infrastructure (drainage, embankments) also gets built by mid-30s. By the end of this phase, hills should be noticeably greener and major flooding hopefully mitigated. Possibly, measure could be no severe flood disaster occurred in late 30s as a success marker.
- **Governance and Capacity Peak:** At this point, the local institutions (KVDA, committees) should be at full capacity managing many projects simultaneously. It's expected that by Phase 2 end, some sectors are ready to be fully handed over to routine government management (for example, schools and BHUs integrated and running in govt system, KVDA more of a coordinating body as line departments handle O&M). The Council may start transitioning focus from building to maintaining.

By 2040, **Phase 2 outcomes** would include: near 100% literacy among youth, significant improvements in health indicators (e.g., maternal mortality nearing 0, child vaccination >90%), poverty rate cut drastically (maybe from ~50% to <20%), and environmental recovery signs (wildlife returning, no major deforestation going on). Quantitatively, the medium term concentrates on the largest share of investment (~PKR 2.05 billion), reflecting the heavy infrastructure works.

8.3. Long-Term (2041–2045) – Consolidation and Future-Proofing

Focus: The final 5 years will address **any remaining gaps, ensure long-term sustainability, and introduce advanced systems** to modernize Kalash Valley for the future.

Key tasks in 2041–2045:

- **Completion of Outstanding Projects:** If any sector lagged or any remote pockets still lacked a service, this phase will ensure **100% coverage**. For example, complete the last 5% of households with sanitation, connect the final villages with fiber optic cable, and convert any remaining timber bridges to RCC. Essentially tie up loose ends.

- **Scale-up of Technology and Innovation:** Implement **next-gen upgrades** – e.g., upgrade telecom to 5G if relevant, add more sophisticated automation in water networks (smart meters widely installed), consider solar EV charging stations if electric vehicles become common for tourists. Possibly pilot **electric shuttle services** fully in this phase when roads are perfect and power is ample. Also, any new global best practices (like climate adaptation measures or digital tools) that emerged since plan inception can be integrated now.
- **Institutional Handover and Phase-out:** By 2045, the CIP as a "project" winds down. Thus, this phase focuses on ensuring **sustainability mechanisms are running independently**. All maintenance funds fully capitalized, community orgs legally recognized, and local government has absorbed CIP functions into normal operations. Perhaps KVDA's role transitions from development to just regulatory oversight of valley (ensuring cultural and environmental safeguards).
- **Impact Evaluation and Documentation:** A comprehensive **end-of-plan evaluation** will be done to document results and lessons. Possibly publish a report or even host a "Kalash Development Conference" in 2045 to present outcomes (maybe to serve as model for other remote communities).
- **Long-term Maintenance Agreements:** Finalize long-term arrangements, e.g., sign a maintenance contract for major infrastructure (like a 10-year road maintenance PPP that outlives the project, ensuring roads remain good as new).
- **Monitoring post-2045:** Recommend a mechanism for continued monitoring beyond CIP – maybe KVDA or local govt continues annual surveys of key indicators to ensure no backsliding.
- **Vision Beyond 2045:** Use the final years to develop the next 20-year vision (2045–2065), by which time Kalash might be aiming for something like a UNESCO World Heritage Site status or higher-order goals (like maybe even export of local products, advanced ecotourism).

By 2045, **the vision of the CIP should be largely realized**: Kalash Valley will be a resilient, prosperous region. We expect:

- **All families enjoy modern amenities** (electricity, clean water, sanitation, communications).
- **Cultural heritage thriving** festivals vibrant as ever, younger generation speaking Kalasha (bilingual education has prevented language loss), heritage sites well-preserved and even earning income via cultural tourism.
- **Economic self-reliance:** Many small businesses and cooperatives export products, tourism provides significant local GDP share, reducing need for continued external aid.

- **Environmental recovery:** A visibly greener valley, wildlife sightings more common, and a community actively protecting their environment.

Grand Total Investment Timeline: Summarizing from the earlier budget table (Annex A in draft CIP):

- 2025–2030 (Short Term): ~PKR 1.45B (about 29% of total 20-year budget)
- 2031–2040 (Medium Term): ~PKR 2.05B (41% of budget)
- 2041–2045 (Long Term): ~PKR 1.35B (27% of budget)
- Plus, maybe ~0.1B beyond (residual or overhead). This matches the earlier aggregate of ~4.95B for 10-year plan and extended to ~5.9B for 20-year in annex (which might exclude some added water & tourism investments we included, but overall, in ballpark).

The timeline ensures that **early actions yield quick benefits** (e.g., safer bridges by 2025, some power and water improvements by 2026) which builds momentum and community support for the longer, harder tasks that follow. By phasing logically, we manage workloads and finances – not trying to do everything at once, but sequencing: capacity building and pilots first, heavy construction next, then fine-tuning and sustaining last.

9. Conclusion

Kalash Valley's Capital Investment Plan (2025–2045) is a **transformative roadmap** that charts the course for one of Pakistan's most unique regions to achieve sustainable, inclusive development while safeguarding its cultural soul. Over the past two decades, this comprehensive plan will have invested in human capital, built resilient infrastructure, and created economic opportunities, fundamentally improving the quality of life for the Kalash people and their neighbors.

Through the CIP, by 2045 the Kalash Valleys will have evolved from relative isolation and underdevelopment to a region characterized by:

- **Modern infrastructure** – all-weather roads, clean water systems, reliable renewable energy, and digital connectivity – linking Kalash communities both internally and with the wider world.
- **Thriving social services** – schools filled with learning children (boys and girls alike) and health centers providing essential care, resulting in a literate, healthy population that can pursue its aspirations.
- **A vibrant, preserved culture** – Kalasha traditions, language, and festivals flourishing, supported by cultural centers and respectful tourism, rather than threatened by development. The community's heritage sites are restored and protected for future generations.
- **A robust local economy** – diversified livelihoods in agriculture, crafts, and eco-tourism that have raised incomes and reduced poverty. Many Kalash youths are employed locally in skilled jobs or running small enterprises, stemming the tide of out-migration.
- **Restored environment and resilience** – hillsides reforested, clear rivers and managed watersheds, and effective disaster mitigation infrastructure in place, making the valleys safer from natural calamities and contributing to global environmental goals.
- **Empowered institutions** – a functioning local governance framework (KVDA, councils, community organizations) that continues to plan and maintain development gains with transparency and accountability. The Kalash people have a strong voice in their development decisions.

The total investment of roughly PKR 12–15 billion over 20 years is **justified by the immense returns** it brings – not only measurable economic benefits and improved human development indices, but also the intangible value of preserving a rich cultural legacy and fostering harmony and integration in this remote part of Pakistan. CIP's cost-benefit analysis indicated a high internal rate of return and a positive net present value, underscoring that this plan is an economically sound and wise use of resources. Moreover, the diversified financing strategy – blending government commitment with donor support, private sector participation, and

community contribution – has proven viable in mobilizing the needed funds, building a coalition of support for Kalash Valley's development.

Sustainability is a cornerstone of the plan. By its conclusion, the projects initiated will have local custodians and revenue streams for maintenance, ensuring they continue to function long after donor involvement winds down. The early emphasis on capacity building means the Kalash community and local institutions are now equipped to manage their own development journey forward, reducing dependency on external technical assistance. Environmental and social safeguards integrated into the plan guarantee that development has not come at the cost of ecological degradation or cultural loss but rather enhanced them.

In implementing this CIP, valuable **lessons have been learned** that can inform other rural development efforts:

- Culturally-informed planning yields better outcomes and community buy-in.
- Multi-sectoral integration (the "habitat" approach) ensures that progress in one area (e.g. health) is not held back by neglect in another (e.g. water or roads).
- Patience and phasing are crucial – early wins secure trust, and persistent follow-through delivers the long-term vision.
- Community ownership at every stage is key to sustainability – as seen by Kalash youth and women emerging as champions in maintaining projects and continuing initiatives.

The journey was not without challenges – difficult terrain, climatic events, and the delicate task of balancing tradition with modernity required adaptive management and collaboration. Yet, through resilience and partnership, the stakeholders overcame these hurdles, making the Kalash Valley CIP a success story. It stands as a model of how inclusive development can be achieved in Pakistan's remote, culturally distinct regions by combining infrastructure investment with human development and cultural preservation.

In conclusion, the CIP demonstrates that protecting heritage and advancing development are not mutually exclusive, but in fact mutually reinforcing. The Kalash people enter the mid-21st century with strengthened identity, improved prosperity, and greater resilience, showing that with careful planning and collective effort, even the most isolated communities can thrive in our modern world while keeping their unique spirit alive. The stakeholders – from government officials to donor partners to the Kalash villagers – can be proud of what has been accomplished together. As we end this 2025–2045 plan, we look ahead with optimism that Kalash Valley will continue to progress on its own terms, its rainbow of culture shining brightly alongside the benefits of development.