Habitat Assessment & Planning – Rural Spatial Development for Climate-Resilient Villages

Client: Aga Khan Agency for Habitat (AKAH), Pakistan

Timeline: September 2022 – September 2023

Location: Villages of Bilhanz Bala, Bilhanz Payeen, and Batswat, Gilgit Baltistan, Pakistan

Role: Existing Data & GIS Analyst

Technical Methods & Tools

- Data Processing: ArcGIS Pro, Google Earth Pro, ERDAS Imagine
- Terrain & Hydrology Analysis: DEM processing, slope classification, flow accumulation & watershed delineation
- Spatial Suitability Modelling: Boolean logic and Weighted Sum overlay for multi-criteria analysis
- Visualization: High-precision map layouts with georeferenced zoning overlays
- Data Integration: GPS field survey data, local land records, and socio-economic survey inputs

Contribution

- Geospatial data acquisition & preprocessing from multiple sources, including Sentinel-2 imagery, field GPS surveys, and high-resolution DEMs.
- Topographic & slope analysis to identify terrain constraints for safe housing and agricultural expansion.
- Hydrological and drainage mapping to inform placement of infrastructure and to prevent flood-related risks.
- Hazard exposure mapping for floods, landslides, and riverbank erosion, enabling evidence-based Disaster Risk Reduction (DRR) strategies.
- Optimized land allocation for residential, commercial, institutional, and agricultural zones using spatial suitability models tailored for small settlements.
- Emergency infrastructure mapping, including evacuation routes, rescue service locations, and safe community assembly areas.

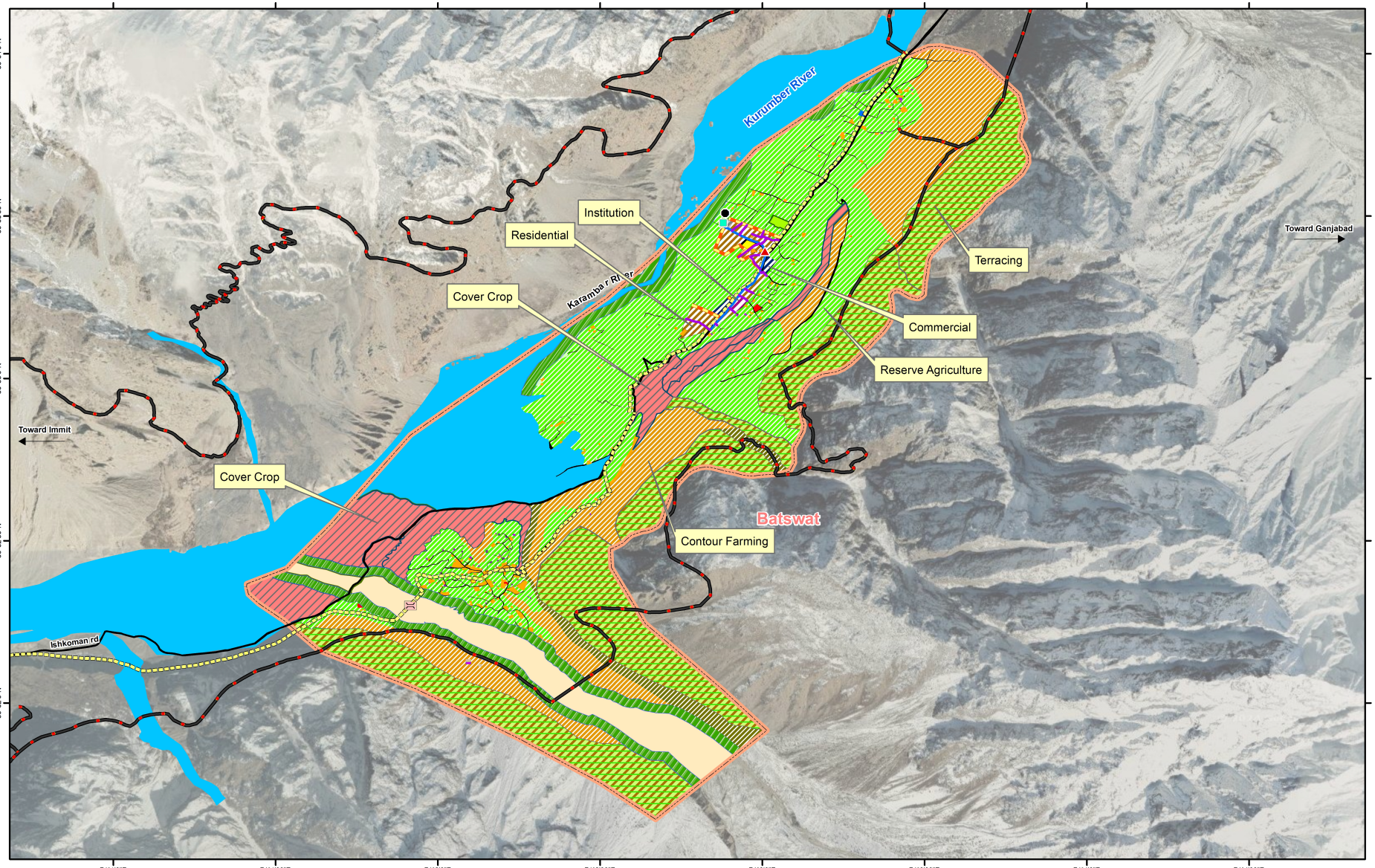
Key Outputs

- Village-level master plans integrating hazard risk layers with development zoning to minimize exposure.
- Detailed maps showing Reserve Agriculture Zones, Contour Farming Areas, Commercial & Institutional Nodes, and Safe Zones.
- Community-scale DRR infrastructure network with pre-identified evacuation routes and safe assembly points.
- Agro-environmental recommendations include cover cropping, terracing, and riparian vegetation buffers.

Impact

The project delivered climate-resilient and community-focused spatial plans that safeguard livelihoods, reduce hazard exposure, and enhance long-term sustainability for rural communities in Gilgit Baltistan.

Final maps are from the next page:



Master Plan - Batswat 2042

Aga Khan Agency for Habitat (AKAH)

Rural Spatial Assessments and Design Services of 03 Villages in Gilgit-Baltistan

SHEHER SAAZ
Creating Places For People

Legend

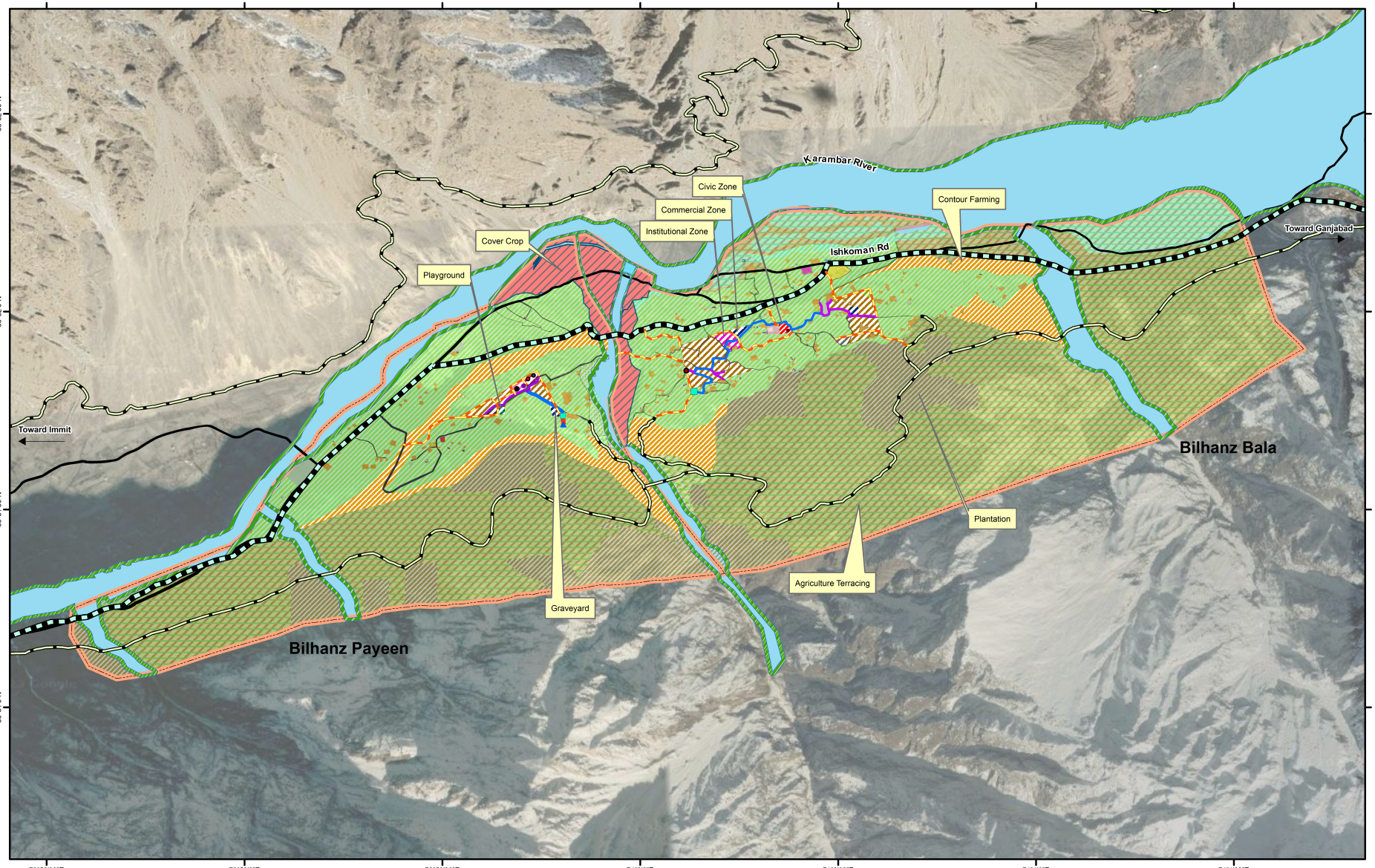
- Filtration Unit
- Water Tank (4000 Gallons)
- Tapping off Point
- Proposed Bridge
- Proposed Village Roads
- Emergency Escape route
- Proposed Existing Road for Improvement
- 0.5 in Water Pipe
- 1 in Water Pipe

Proposed Landuse

- Agriculture Terracing
- Contour Farming
- Proposed Commercial
- Proposed Cover Crops
- Proposed Graveyard
- Proposed Institution
- Proposed Residential
- Proposed Agriculture
- Riparian Zone
- Project Boundary

N

0 115 230 460 690 920 Meters



Master Plan - Bilhanz 2042

Rural Spatial Assessments and Design Services of 03 Villages in Gilgit-Baltistan

Aga Khan Agency for Habitat (AKAH)

SHEHER SAAZ
Creating Places For People

Legend

- Existing Water Tank
- Water Tank (4000 Gallons)
- Proposed Health
  - Hospital
  - Rescue Services
- Perposed Civil Dispensary
  - Vocational Training Institude
  - Degree College
  - Tapping off Point from Existing
  - Proposed Rescue station
- Proposed Bridge
- Proposed Village Roads
- Emergency Escape route
- Proposed Village Roads
- Proposed Existing Road for Improvement
- 0.5 in Water Pipe
- 1 in Water Pipe
- 1.5 in Main Pipe
- Proposed Landuse
  - Agriculture Terracing
  - Contour Farming
  - Reserve Agriculture
- Proposed Civic Zone
- Proposed Commercial
- Proposed Cover Crops
- Proposed Graveyard
- Proposed Institution
- Proposed Plantation
- Proposed Residential
- Riparian Zone
- Project Boundary

N

0 90 180 360 540 720 Meters