Planning and Prioritizing Water Resources Investments:

The Example of Kabul River Basin, Afghanistan

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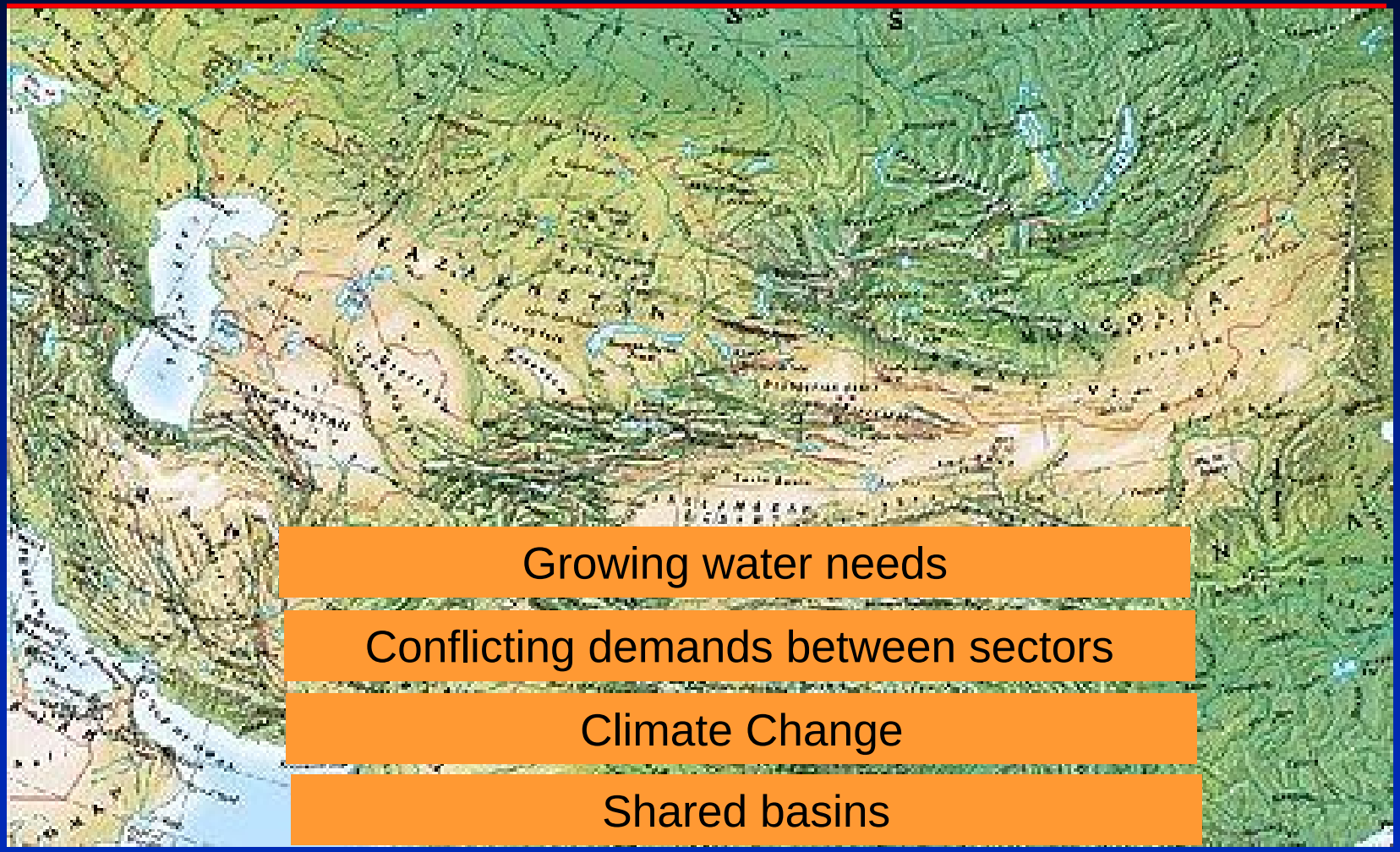
September 3, 2009

Water Resources in Central Asia: The Legacies

Water Resources in Central Asia: Today & Future



What can we learn from the Kabul basin?

What can we learn from Afghanistan/ Kabul basin?

Context: Water Resources Development in Afghanistan

Water Supply

- Kabul is one of the fastest-growing cities with half of Afg urban pop.
- Present water supply 16 lpcd and falling

Hydropower

- Hydro development is 5-10% of potential
- Only 25% of the population has intermittent access to electricity
- Electricity consumption < 40kWh per capita

Irrigation

- 80% of the population depends on agriculture for livelihoods
- New irrigation development essential to escape subsistence, ensure food security and critical for poppy eradication programs

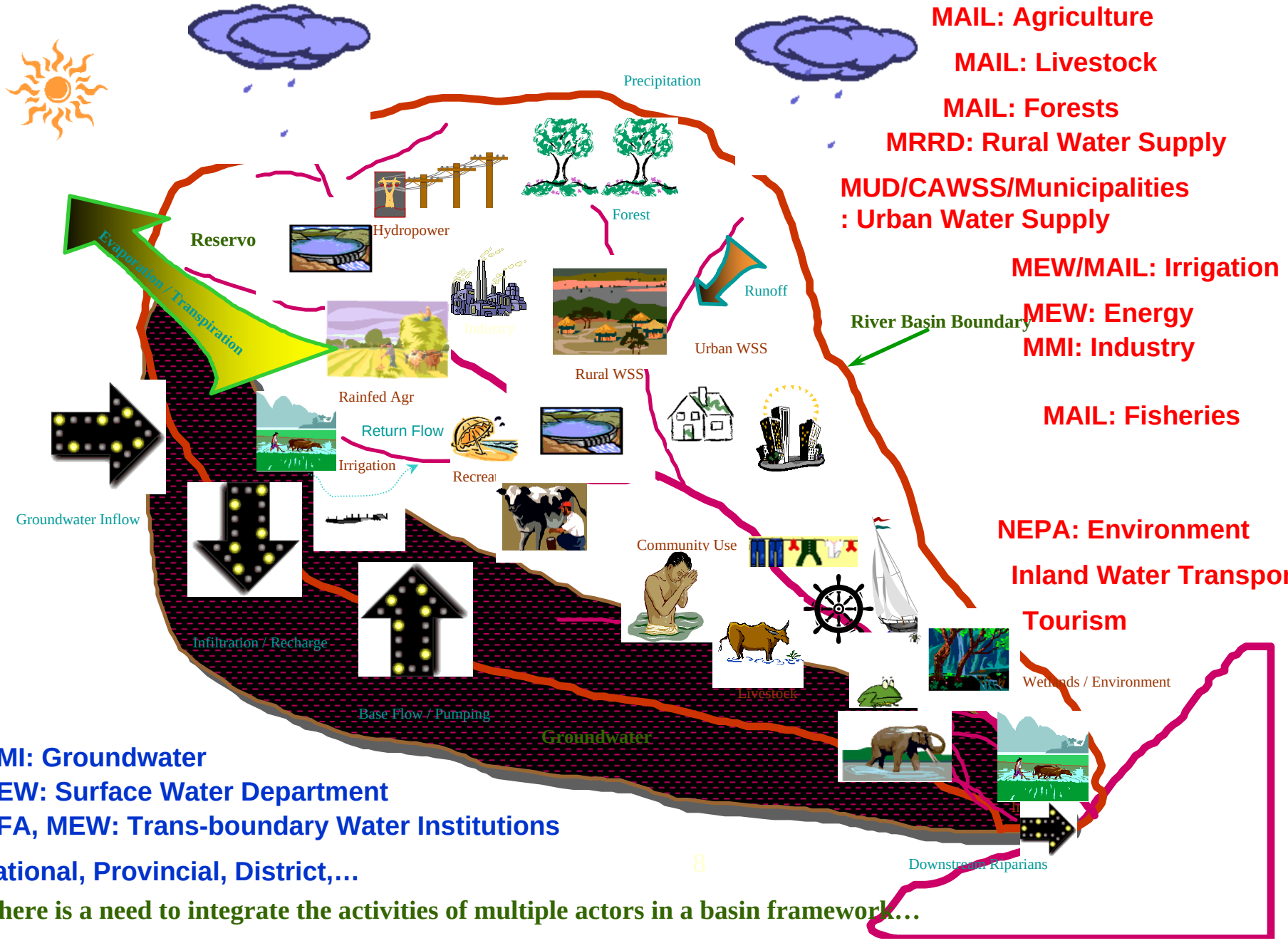
Mining

- Mines such as Aynak Copper Mine will potentially use a substantial amount of water

The Challenges: What's broken?

- Rehabilitation program has worked reasonable well, but is not enough
- The current approach to planning and design of new water projects is fragmented:
  - project-by-project
  - sector-by-sector
- Not enough water, financial, or human resources to undertake preparation and implementation of this huge portfolio
- As a consequence - new investments have not moved although there is a huge portfolio of possible projects

The Complex Story in a Typical Afghan River Basin…



MAIL: Agriculture

MAIL: Livestock

MAIL: Forests

MRRD: Rural Water Supply

MUD/CAWSS/Municipalities
: Urban Water Supply

MEW/MAIL: Irrigation

MEW: Energy

MMI: Industry

MAIL: Fisheries

NEPA: Environment

Inland Water Transport

Tourism

MMI: Groundwater

MEW: Surface Water Department

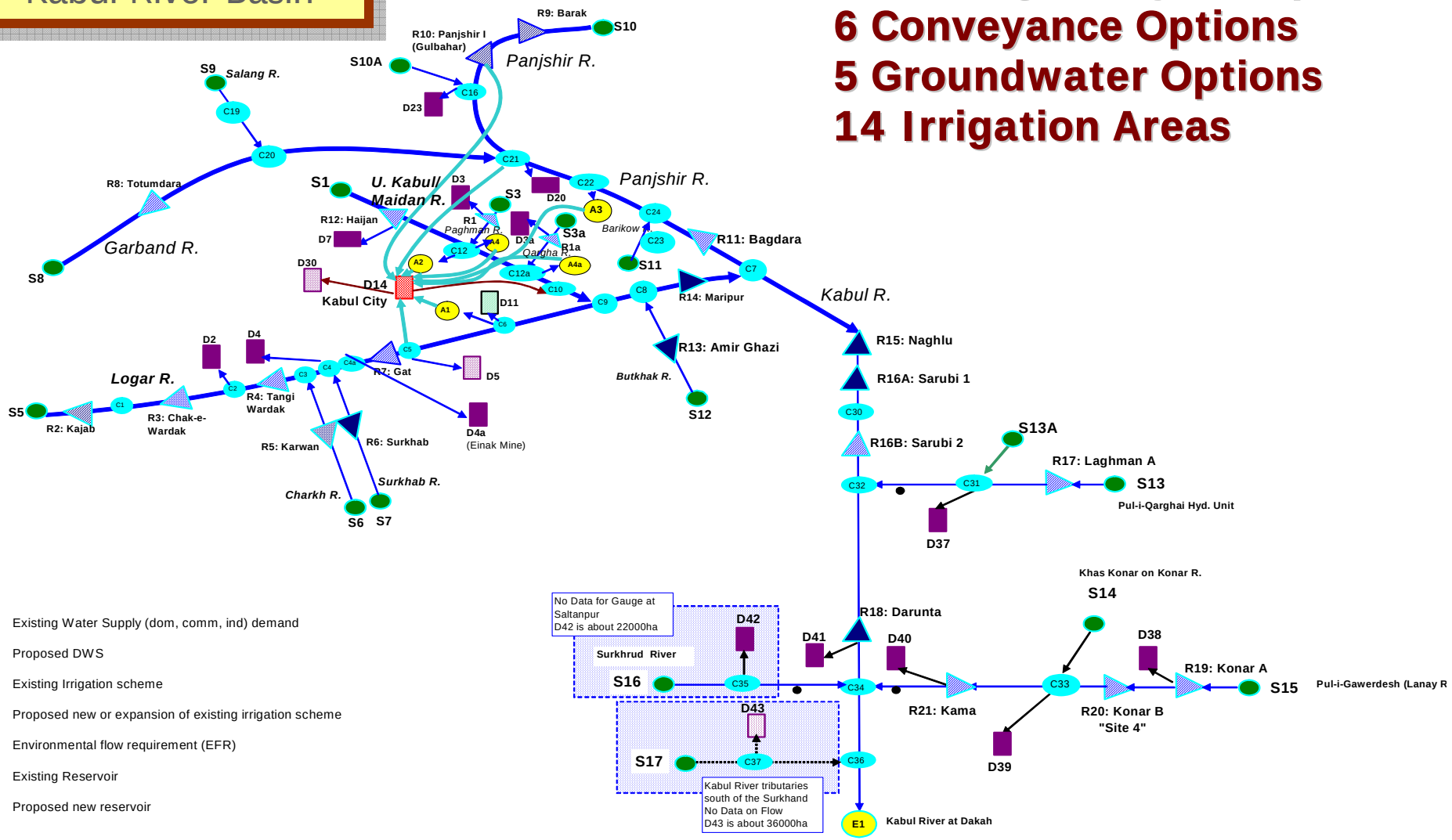
MFA, MEW: Trans-boundary Water Institutions

National, Provincial, District,…

…there is a need to integrate the activities of multiple actors in a basin framework…

Kabul River Basin

13 Storage & Hydro Options
6 Conveyance Options
5 Groundwater Options
14 Irrigation Areas



Planning requires a *systems approach* in the basin rather than a project-by-project approach

Strategic Water Planning in Kabul River Basin

- **Objective:**

  To develop an integrated basin planning framework for analyzing and prioritizing water resources development options in Afghanistan, and to demonstrate its application in the Kabul River Basin

- **Approach**
  - **Knowledge base**
  - **Model to illustrate prioritization of options**
  - **Discussions & capacity-building**

Analytical Framework

Objective:

Maximize net benefits of developing water resources in the Kabul Basin

By selecting storage, hydropower, irrigation, and water supply options to ensure:

Basic water needs (e.g. domestic/industrial) are met

Minimum environmental needs are met

Economic benefits (irrigation and hydropower) are maximized

Resource sustainability

Base Case (Likely Scenario)

Year - 2020
Water availability – (conservative: dry year)
Options - All available

Storage costs and parameters

- **Baghdara – Fichtner pre-feasibility study**
- **All others – MECO with cost escalated to 2005**

Energy

- **Minimum annual demand in Basin: 1,350 GWH/yr (Max 2,180 GWH/yr)**
- **Export/Import from Basin: 0%**

Kabul population: 4.7 million

Irrigation

- **Total potential area – 316,000 ha**

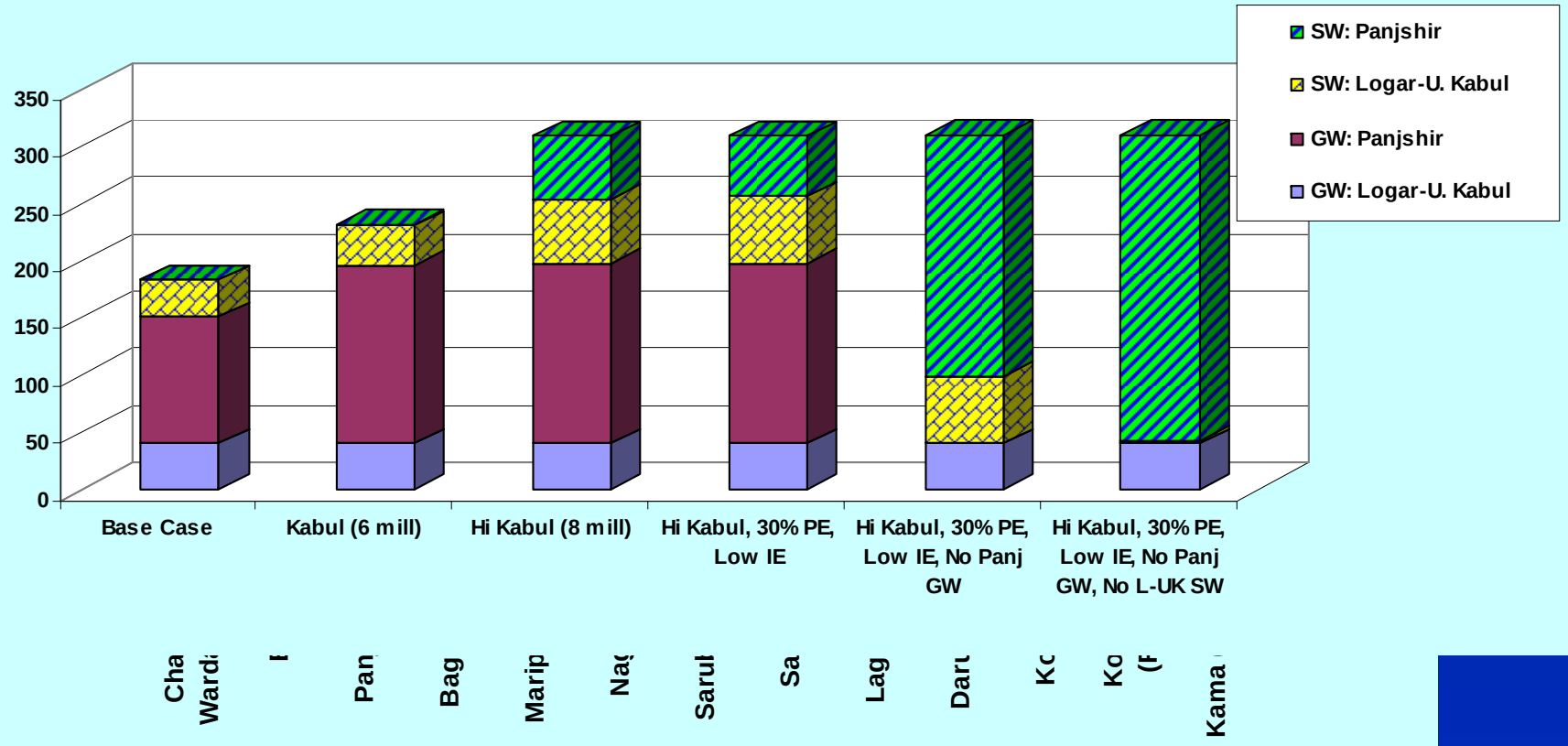
Mining

- **Aynak Mining Water Requirement: 43 MCM/yr**

+ a number of other hydrologic, economic, environmental, and other parameters (e.g. irrigation efficiency, value of energy, groundwater availability, etc.)

Strategic Findings:

Figure 6-14 Sources of Kabul Water Supply (MCM/yr) under High Kabul Population Scenarios



Major Uncertainties

Costs
Hydrology
Topography
Project Characteristics

- **Storage (resettlement, cost curves)**
- **Irrigation (agronomy, economics)**
- **Hydropower (installed capacity, transmission)**
- **Water Supply (gw availability, conveyance & treatment costs)**

Need to address these knowledge gaps

Developments in Afghanistan:

Water Resources Planning Unit set up in Ministry of Energy and Water (2007)

Preliminary study results presented (2008)

- **Ministry of Energy and Water**
- **Ministry of Finance**
- **Supreme Council on Water chaired by the First Vice-President**
- **Government of Afghanistan cabinet meeting**
- **Donors' meeting called by Deputy Minister of Finance**

Implementation of Afghanistan Water Resources Development TA;
Project Preparation Unit strengthened at Ministry of Energy and Water;
Basin-level analysis initiated for other basins (2009)

Opportunities in Central Asia:

NEW INFRASTRUCTURE:

Basin-level planning:

- **Country-level analysis (to coordinate between different sectors and identify best investments in each country)**
- **Regional-level analysis (to build common platforms for exploring opportunities for win-win investments)**

EXISTING INFRASTRUCTURE

- **Operations Optimization to increase net benefits (national and regional) from existing assets**

Water and Energy in Central Asia