



THE NEED TO COMBINE ROAD AND WATER MANAGEMENT IN TAJIKISTAN

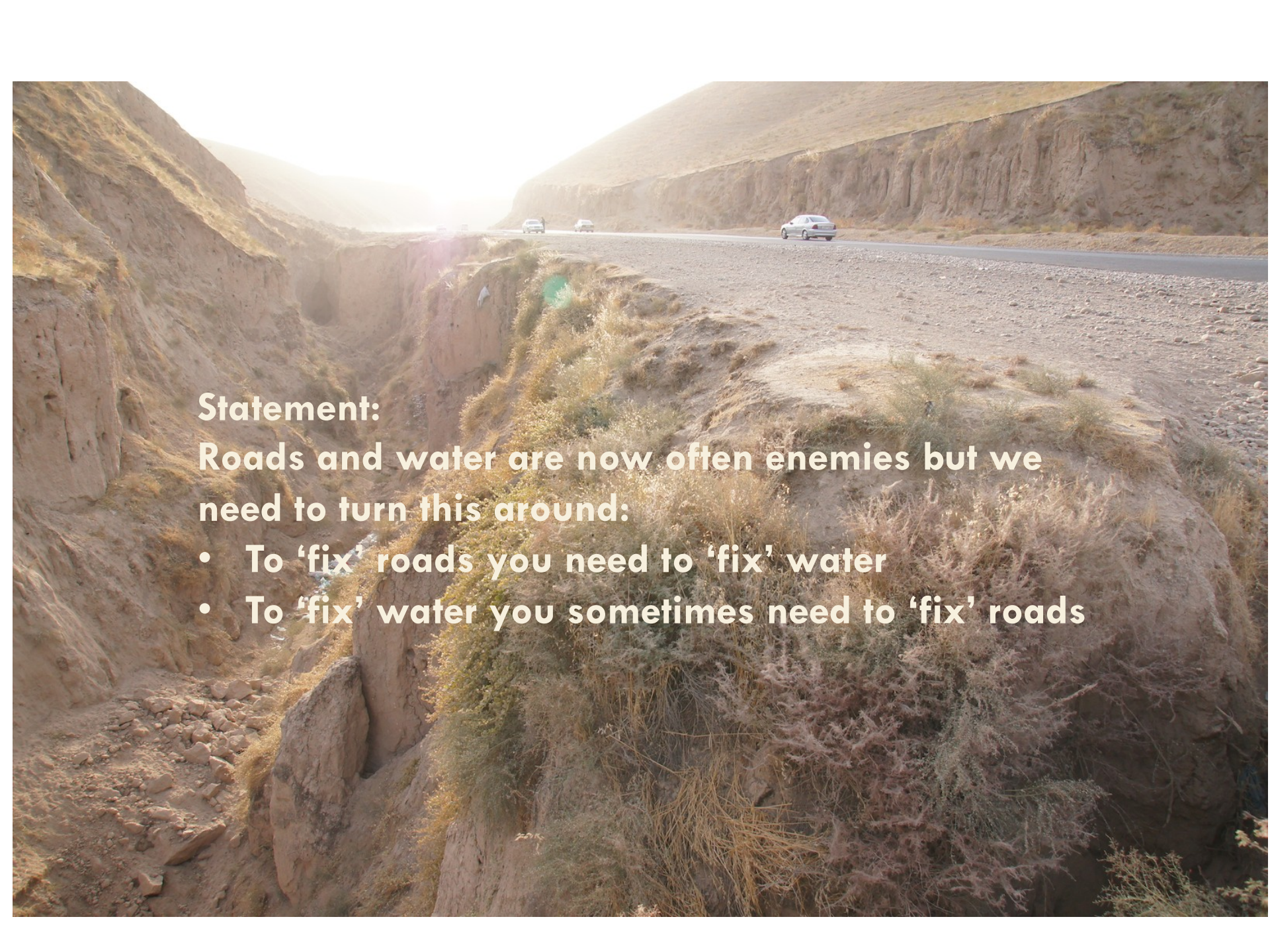


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META
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A photograph of a road in a desert canyon. In the foreground, a large, deep erosion gully with exposed roots and sparse vegetation runs down the slope. A road runs horizontally across the middle ground, with several cars visible. The background shows steep, eroded canyon walls under a bright sky.

Statement:

Roads and water are now often enemies but we need to turn this around:

- **To 'fix' roads you need to 'fix' water**
- **To 'fix' water you sometimes need to 'fix' roads**

Opportunities

(1) Current road program is opportunity to do well and create strong link between roads and water management

- Main roads in Tajikistan date from 1960-70s: now need to be renewed
- Priority are the international roads/ economic corridors
- Next local feeder roads and loop road need to be upgraded

(2) Need to better deal with water-related natural disasters (floods/ landslides/ lakes) that can be expected increase with climate change

(3) Need to avoid man-made disasters by integrating road and water development from beginning at concept basis not as an afterthought



Better deal with water-related natural disasters:

- Floods/ landslides/ new lakes
- Can be expected increase with climate change





Avoid man made disasters::

Example new Dushanbe – Kanak road

- 163 drainage structures collapsed and causing erosion
- Side of main bridge eroded





Avoid road-induced erosion which
damages land and ultimately roads
As well



On top of this: deal with climate change

- We have different situation now than the past:
 - Higher and rising temperatures
 - Unusual peak temperature events
 - Rainfall and wet snow – was not there before
 - Unseasonal rain and snow
 - Different flood regions – higher water levels and floods in branch valleys
- Need to incorporate situation in 20 years as it concerns both roads and surrounding landscape
 - Height of roads
 - Route of the roads – incl tunnels
 - River bank protection
 - Bridges
 - Slope protection measures
 - Measures that improve catchment/ environment
 - Water harvesting opportunities from roads
- Try to create **stronger and more productive** environments around the roads

What to do?

- Plan roads and road environments using future hydrological analysis as captured in data sets by Hydromet
- Align with Committee for Emergency Situation and Civil Defense (particularly the Geology Department and avoid disaster prone areas where possible
- Have water related road infrastructure (road drainage, bridges and flood protection measures, land scape and water harvesting measres) designed by professional water engineers

Hydrological analysis



Flood occurrence

Future peak floods

Future river flows

High risks for landslides/ mudflows

Future water availability and possible shortages

Future precipitation

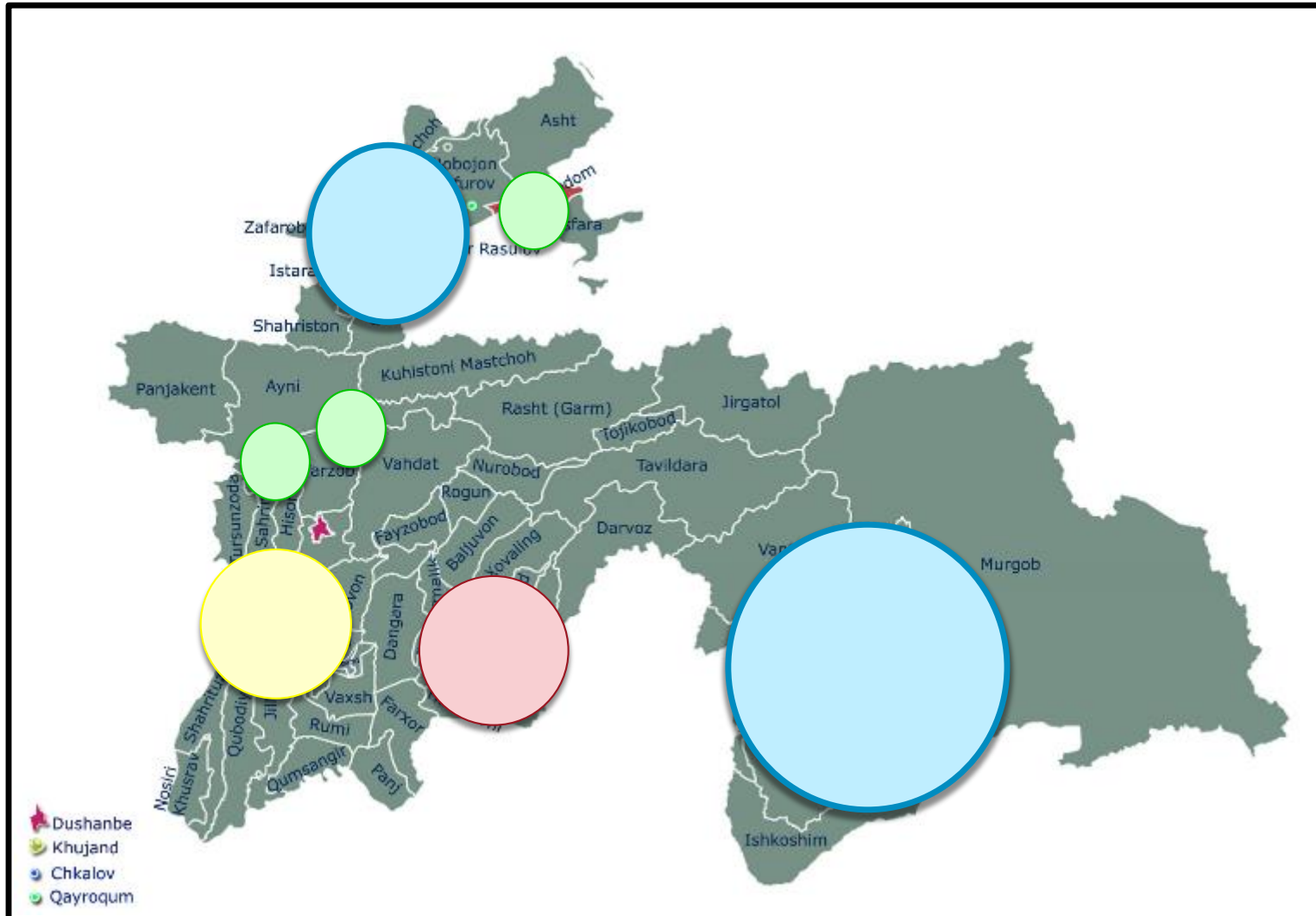
Opportunities for strengthening of catchment

Opportunities to harvest water

Need to care of roads and environment of roads

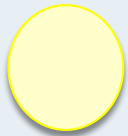
- Preserving and strengthening the water/environment should be standard and well-resourced component of road construction
- Preserving and strengthening the water/catchments should be done both the create more productive environments and to protect and make best use of the road
- Where possible we can use the road itself for beneficial use, for instance to harvest water and road side tree planting
- We can also use such programs to generate employment (for instance in gabion making)
- Strategies are depemdent on the local situation

Main opportunities

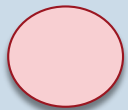




Mountain environment: road/ river protection and catchment improvement



Low rainfall hills: erosion and scour control, very modest water harvesting



Medium rainfall hills: erosion control and water harvesting



Large irrigation systems: improved drainage