

A scenic view of a mountain valley. In the foreground, a river flows through a rocky bed. The middle ground shows a small settlement with several houses, some with red roofs, nestled on a green hillside. A small waterfall cascades down a rocky slope towards the river. The background features steep, forested mountains with patches of snow on their peaks. The sky is overcast.

# From the high Himalayas to The Hague the story of the Neelum River

Jackie King





Ring, ring ....

Late one evening in October 2009 – in Bergvliet, Cape Town ....

“Hello?”

*“Hello. Is this Dr Jackie King?”*

“Yes. Can  help you?”

*“This is the Government of Pakistan.”*

“Um, yes?”

*“We are having a border conflict with India. Can you please help us?”*



Afghanistan

Tibet

Iran

Pakistan

India

US Dept of State Geographer  
Image Landsat  
© 2014 Google  
© 2014 Mapabc.com

Google earth

Imagery Date: 4/10/2013 32°34'28.16" N 74°12'18.30" E elev 1273 m eye alt 7202.41 km



# Indus Water Treaty 1960



- A water-sharing treaty between India and Pakistan, brokered by the World Bank
- Western headwater rivers to Pakistan and eastern headwater rivers to India
- Makes no mention of environmental flows – concept did not exist in 1960





The problem re Kishenganga Dam:

India planned to divert all dry season flow to Wular Lake, no minimum flow release. Would impact the Pakistan Dam, the river itself, its people and the Musk Deer National Park



## INITIAL TIME LINE

- December 2009 JMK reviewed original Impact Assessment
- October 2010 JMK asked to help prepare court case
- 6 June 2011 Pakistan submitted an application for interim measures to the Permanent Court of Arbitration in The Hague
- 23 September 2011 The PCA delivered its ruling. Until the rendering of the Award:
1. India may construct temporary diversions at own risk
  2. India may not construct any permanent works on or above the river bed that would inhibit complete restoration of flow to its natural channel

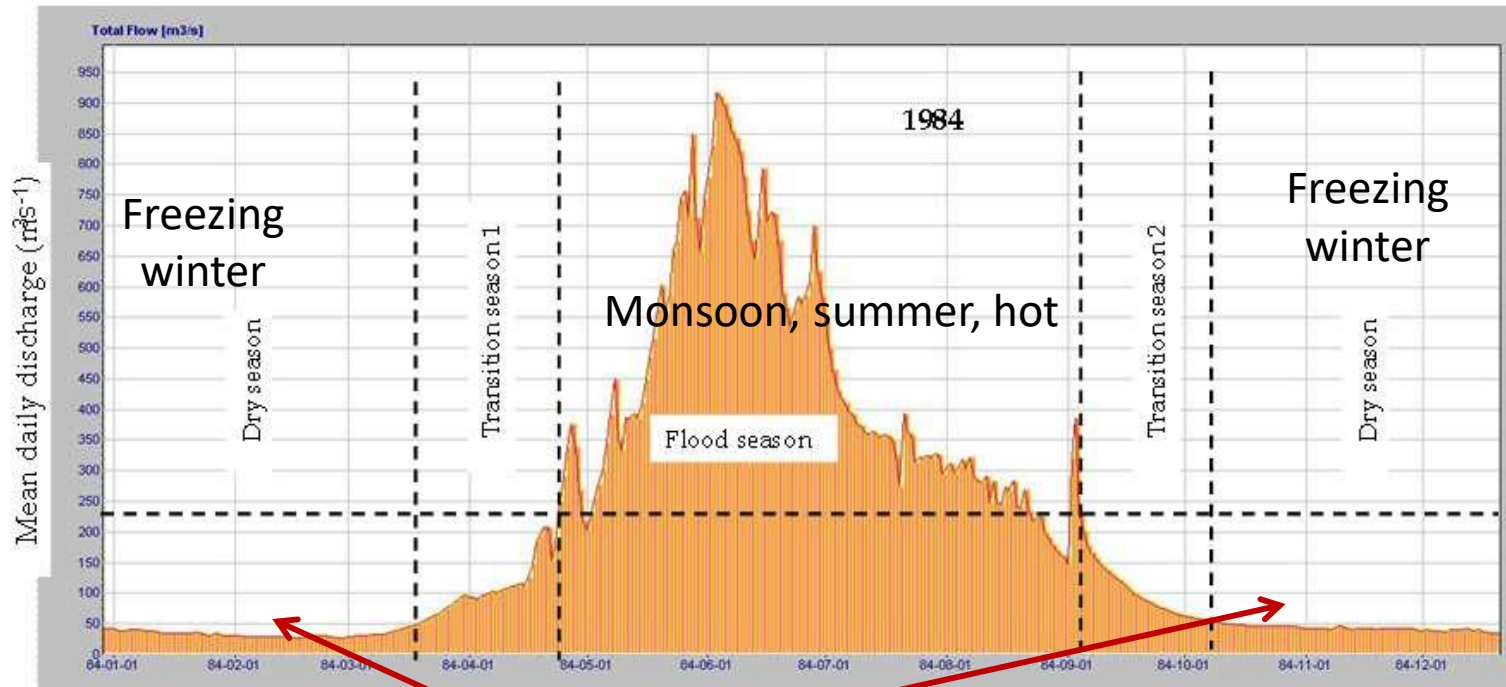
Letter to the team members from the Special Assistant to the Prime Minister of Pakistan : ..... *a truth that will recognise imbalance and seek to remedy it .....perhaps too it may just resolve a festering conflict and in some measure prevent a hideous war.*

August 2012

Full submissions to the PCA by both countries



# Our initial task was to describe the impact of Kishenganga Dam, as planned by India, on Pakistan



No downstream release of water from dam in dry season



Muzaffarabad: Earthquake 8 October 2005: 100,000 died; 138,000 seriously injured; 3.5 m displaced









# Pakistan's Neelum-Jhelum River Hydroelectric Power Dam





# Setting off from the foothills to the high Himalayas









# Changpa herders and cashmere goats







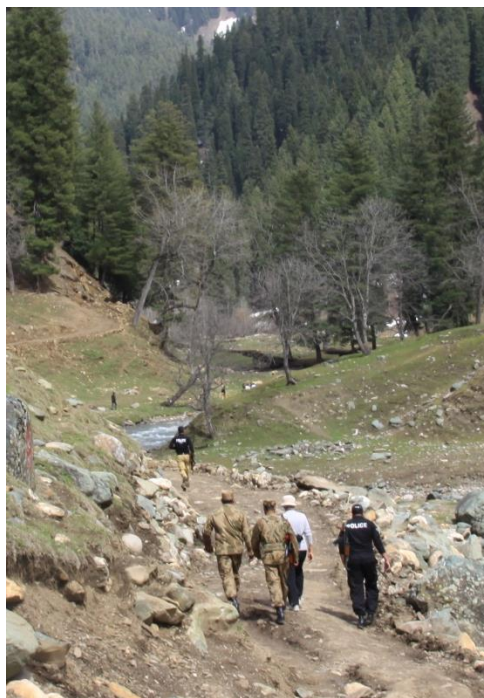
















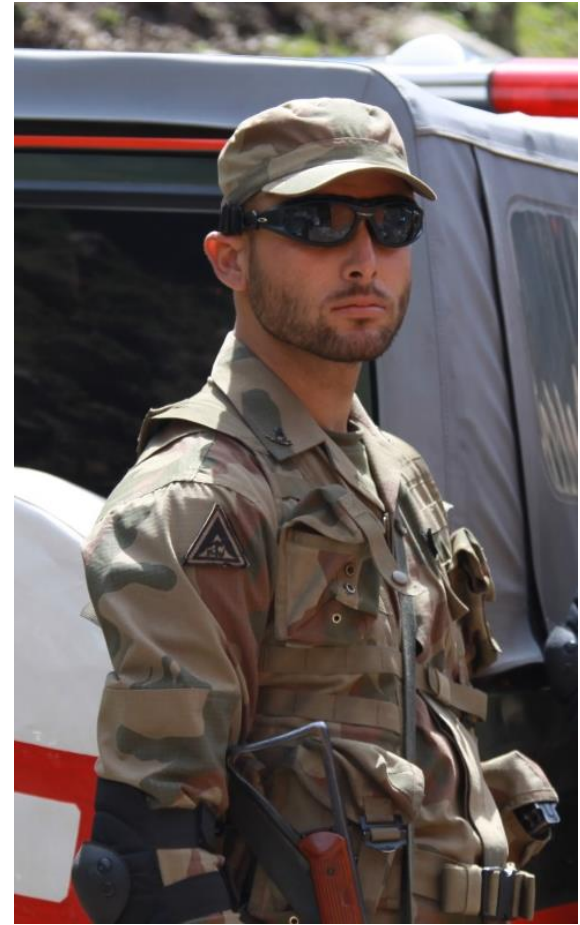
















THEY LIVE

المقدم  
مقدم

القوى  
بهت قوی

النسبی

النسبی

SHOUKAT

PAK ARMY

PAK ARMY

PAK ARMY











# Taobat – just before the Line of Control







شوق کربانہ جتھرا سٹور  
ہائے بان  
گولڈن ٹریڈنگ کمپنی

SIQUENT PARWA  
AFIQUED  
JARN

S S S  
H













# Saying goodbye to most of the security team





# Working with Pakistani colleagues







Tibetan snow trout



Kashmir hill stream loach

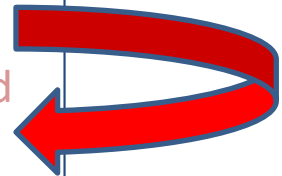
- Musk deer
- Brown bear
- Black bear
- Snow leopard
- Common leopard
- Kashmir stag
- Himalayan ibex



Tourism

**River condition**

- A=Natural ecosystem
- B=Largely natural
- C=Moderately modified
- D=Largely modified
- E=Critically modified





# The Peace Palace, The Hague, August 2012: submissions by both countries; cross-examinations





The Large Vestibule with the Small Hall of Justice at the end: Permanent Court of Arbitration



Behind is the Great Hall of Justice: public sittings of the International Court of Justice – the highest judicial body of the United Nations



## The Vestibule: Peace through Justice













# The 7 Arbitrators, with Indian and Pakistan delegates



PROF. HOWARD S. WHEATER FRIED

JUDGE STEPHEN M. SCHWEREL  
Chairman

JUDGE  
INO SIM

OLIVUS CARLISCH

MR. GARTH SCHOFIELD  
PCA



# Example of DRIFT output

Three volumes of descriptions and findings.

Presented predictions of change from present conditions for several ecological indicators

<i>Indicator</i>		<i>Baseline</i>	<i>Kishen Max</i>
		Percentage change	
Hydraulics	Depth over riffles at Dry season: Minimum 5-day discharge	-	-50.0
Geomorphology	Embeddedness of riffles	-	19.0
	Depth of pools	-	-21.2
	Area of backwaters	-	-15.1
	Overbank sedimentation	-	-2.3
Water Quality	Dilution of pollution	-	-30.5
	Temperature	-	-49.7
Vegetation	Algae	-	5.0
	Marginal vegetation	-	7.0
	Natural flood terrace vegetation	-	-2.9
Macroinvert	EPT Score	-	-52.7
	Simuliidae	-	0.0
	Other flies and midges	-	6.0
Fish	Brown trout	-	-79.5
	Tibetan Snow Trout	-	-65.5
	High Altitude Loach	-	-74.4
	Kashmir Hillstream Loach	-	-74.7
	Himalayan Cat Fish	-	-38.4

India, surprisingly, relied largely on a rudimentary rule-of-thumb method



Feb 2013

Partial Award

*India can build dam, but no drawdown flushing*

*Emphasised need for 'sustainable development'*

*More information needed on a sufficient range of minimum flows so as to give the Court a full picture of the sensitivity of the river system*

June 2013

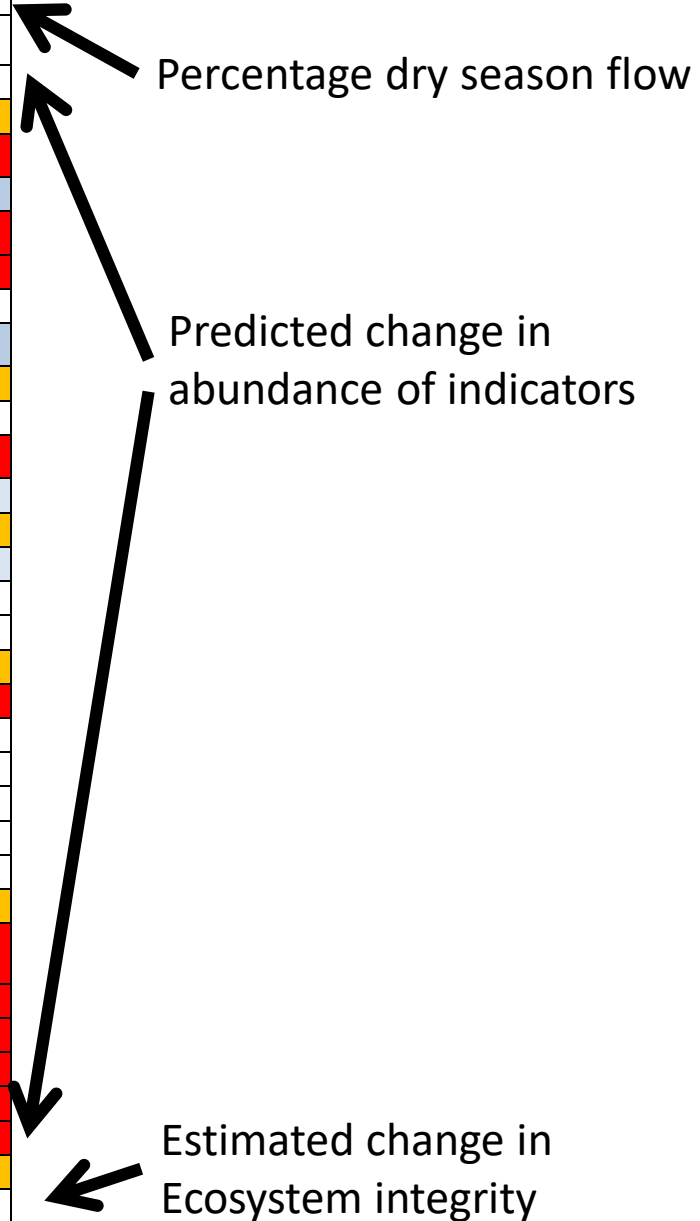
Further submissions on environment by each country



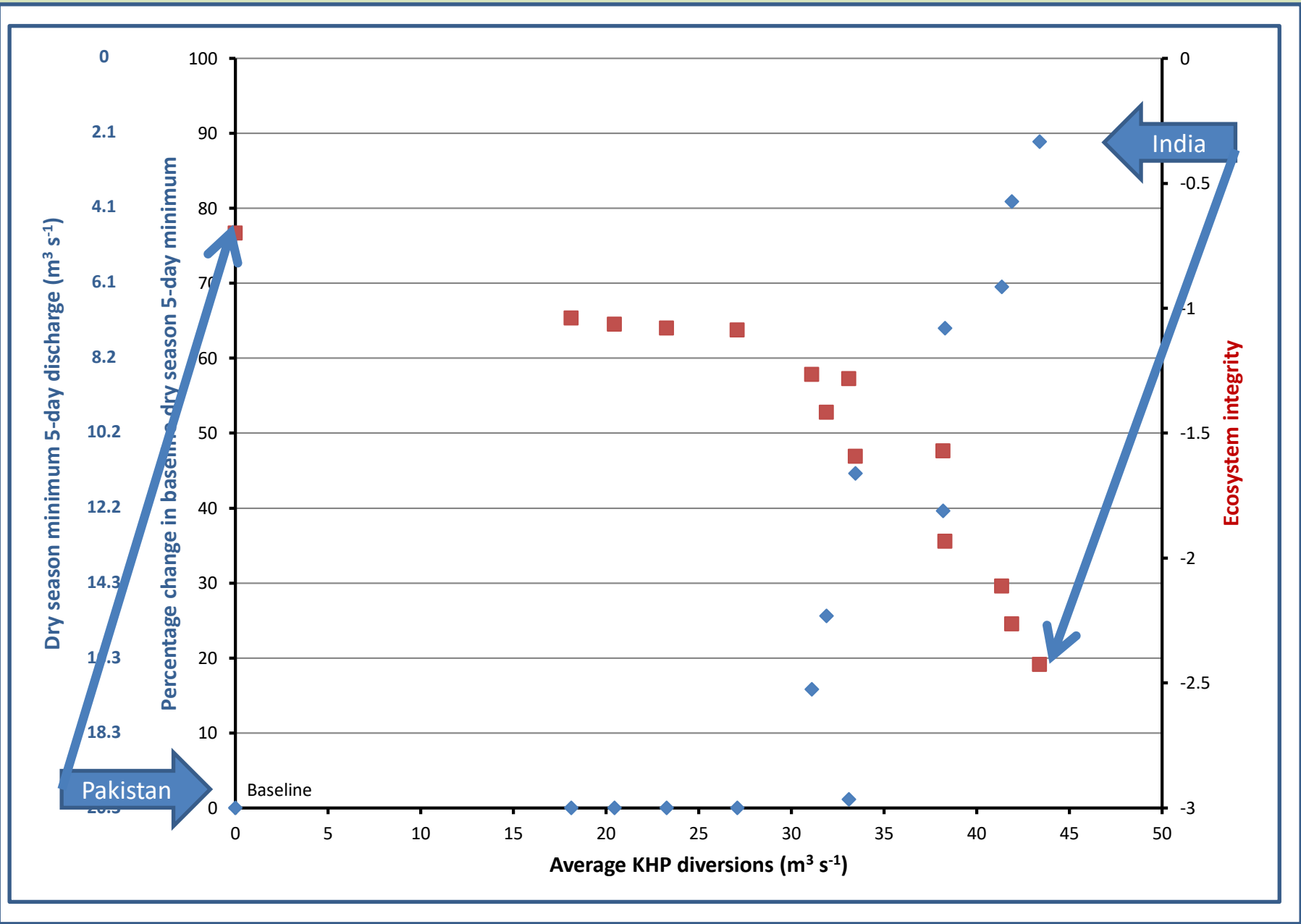
# DRIFT outputs

Hydrology  
Habitat  
WQ  
Plants  
Invertebrates  
Fish

Minimum release as a percentage of natural dry-season inflow		Scenarios							
		100%	90%	80%	70%	50%	30%	10%	0%
<b>Hydrological predictions</b>									
Hydrology	Mean annual runoff	-15.1	-18.8	-21.2	-23.6	-27.8	-31.8	-34.8	-36.1
	Dry season: minimum 5-day discharge	0	-9.4	-18.7	-27.1	-44.6	-64	-80.9	-88.9
	Dry season: onset	0	-2.4	-4.9	-4.9	-11	-14.6	-14.6	-14.6
	Dry season: average daily discharge	0	-8.3	-16.8	-25.4	-42.08	-58.9	-75.43	-83.48
	Dry season: duration	0	8.4	13	18.2	31.2	41.2	42.9	42.2
	Wet season: onset	6.7	0	0	6.7	10	6.7	6.7	6.7
	Wet season: peak 5-day discharge	-14.2	-14.2	-14.2	-14.2	-14.2	-14.2	-14.2	-14.2
	Wet season: duration	-10.7	-5.7	-11.4	-15	-22.5	-22.1	-21.8	-21.8
<b>Physical and chemical predictions</b>									
Habitat	Secondary channels, backwaters	-9	-11.66	-14.58	-18.61	-25.14	-30.39	-41.13	-49.6
	Cobble and boulder bars	1.96	1.46	2.94	4.61	7.96	10.83	12.87	13.96
	Sand and gravel bars	-21.59	-23.46	-23.6	-23.89	-23.4	-22.25	-21.05	-20.19
	Bed sediment size	17.38	16.88	16.7	16.35	15.21	13.54	11.52	10.21
	Active channel width	-4.15	-5.99	-6.79	-7.67	-8.75	-9.34	-9.32	-9.31
	Depth of pools	5.19	2.84	3.41	3.89	3.66	3.29	3.28	3.29
WQ	Dilution of pollution loads	-2.69	-5.28	-7.5	-9.9	-14.31	-20.16	-27.24	-30.89
	Temperature	0.36	-0.59	-1.49	-2.66	-8.02	-23.67	-42.74	-47.05
<b>Biological predictions</b>									
Vegetation	Algae	2.43	1.66	1.97	3.35	7.31	7.97	6.23	5.28
	Marginal vegetation	-0.78	0.56	1.33	2.69	4.51	4.52	4.51	4.5
	Natural terrace vegetation	-3.62	-3.43	-3.5	-3.53	-3.62	-3.61	-3.57	-3.57
Invertebrate	Simuliidae (blackfly)	4.79	5.17	6.12	7.14	8.86	7.43	5.24	4.79
	Flies and midges	10.24	11.7	13.88	16.14	22.19	21.29	21.67	21.92
	Ephemeroptera-Plecoptera-Trichoptera (EPT) abundance	5.77	0.63	1.85	-0.24	-9.9	-22.41	-35.66	-42.7
Fish	Brown Trout	19.15	10.73	7.89	4.18	-9	-36.66	-66.64	-76.92
	Tibetan Snow Trout	-15.08	-19.82	-23.64	-28.45	-37.85	-51.86	-67.11	-74.68
	Alwan Snow Trout	-12.17	-14.21	-16.74	-19.7	-26.61	-37.57	-53.57	-64.15
	High Altitude Loach	-16.96	-21.99	-26.16	-33.1	-48.08	-65.54	-76.79	-79.06
	K. Hillstream Loach	-21.85	-27.39	-31.62	-37.69	-50.3	-64.93	-76.49	-78.84
	Himalayan Cat Fish	0.61	-2.35	-1.51	-2.09	-5.94	-18.51	-29.28	-36.56
Overall ecosystem integrity (Baseline = B: Good)		B	B/C	C	C	C/D	D	D	D/E









# Final Award

Based only on ecological considerations:

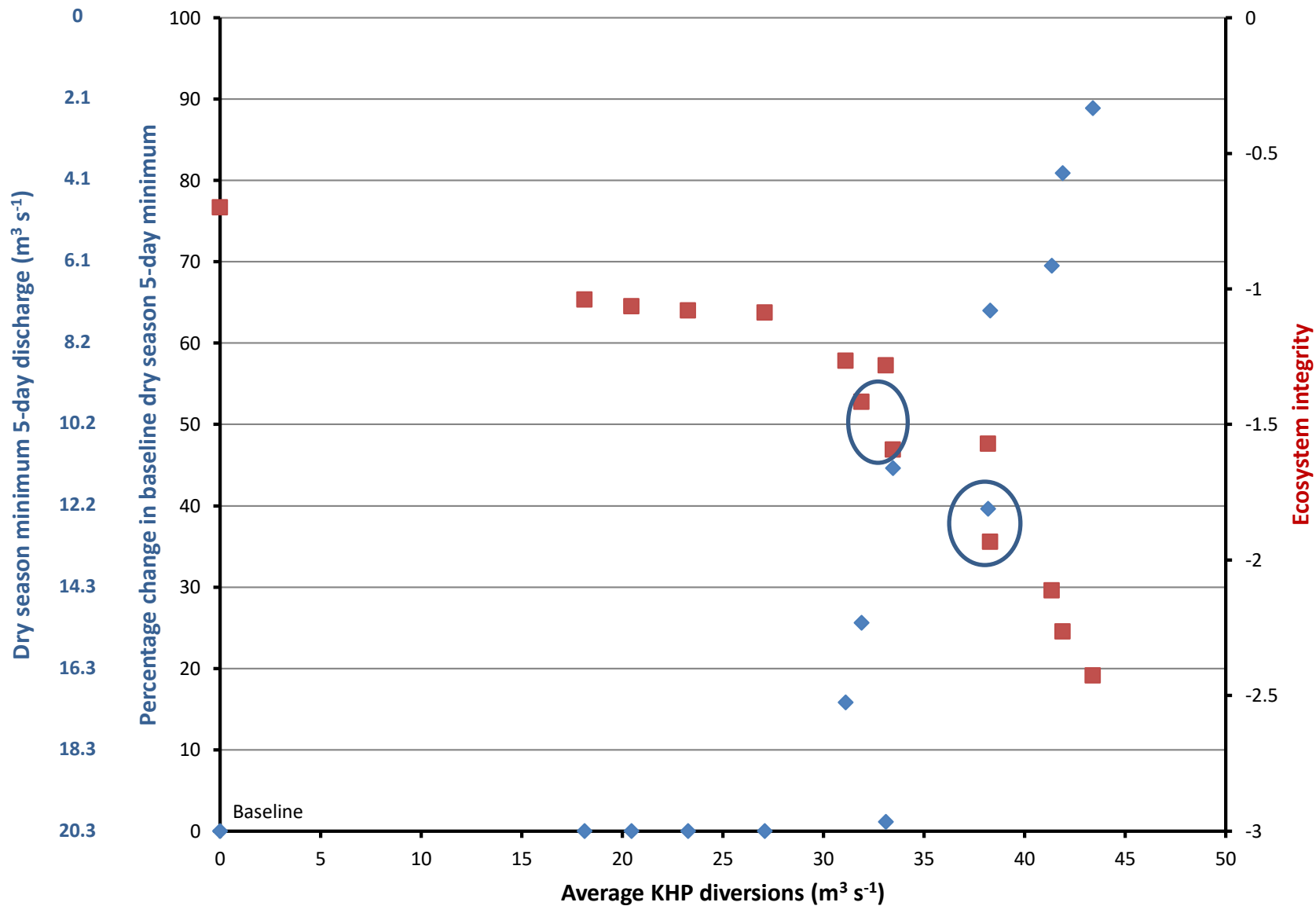
- dry-season releases of about 50% of natural inflows.

But India has the right under the Indus Water Treaty to generate power using this river:

- dry-season releases of about 30% of inflow.

(PCA, December 2013)







Industrial Emissions Treaty

**Environmental Flows**



# The Hague: Permanent Court of Arbitration

*For project of the magnitude of the KHEP, the Court is of the view that an in-depth assessment of the type that Pakistan has attempted for these proceedings is an appropriate tool for estimating potential changes in the downstream environment.*

*.... for the Court, these criticisms go to the degree of certainty to be ascribed to Pakistan's specific results, not to the general value of the attempt to apply contemporary international practices in a challenging setting.*




Seven years monitoring.....



2017 Dead Himalayan Catfish at Taobat



# Thoughts on The Hague

The image shows the interior of a grand, classical building, likely a government or institutional structure. A central staircase with a red carpet leads up to a platform where a white statue stands. The staircase is flanked by ornate, curved marble balustrades. Two large, ornate chandeliers with multiple lit bulbs are positioned on either side of the staircase. The background features high, arched windows with colorful stained glass. The overall atmosphere is one of historical grandeur and formal architecture.

The Arbitrators were 6 judges and 1 engineer

They emphasised the need for sustainable development – but do they understand that concept?

Decision makers – still skewed toward development/engineering with few skills in natural resource management and dependent social structures

Would the Award have been different if ecological and social specialists had joined the engineer as advisors to the legal team?





Nov 2015: Request from Geneva

Prof. Laurence Boisson de Chazournes: help with investigation of role of experts in international court cases and ability of judges to assess expert testimony