

# Environmental and Social Monitoring Report

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Project Number: 44914-014  
Quarterly Report (July-September 2019)  
September 2019

## Pakistan: Patrind Hydropower Project

Prepared by Star Hydro Power Limited for the Asian Development Bank.

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# 147 MW PATRIND HYDROPOWER PROJECT

2019

## Environmental & Social Monitoring Report July 2019 to September 2019



9/30/2019

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## List of Abbreviations

AJK	Azad Jammu & Kashmir
KPK	Khyber Pakhtunkhwa
HSE	Health safety & environment
PTW	Permit to work
NEQs	National environmental quality standards
ESMP	Environmental & social management plan
CSR	Corporate Social Responsibility
OHSP	Occupational health & safety plan
ERP	Emergency Response Plan
E-flow	Environmental flow
WAH	Work at Height
POPL	Patrind Operation & Maintenance Private Limited
CEO	Chief Executive Officer
CLO	Community liaison officer

## 1. Health, Safety and Environmental (HSE) Performance Indicators

Table 1: HSE Performance Indicators

Indicators	Data (Reporting Period)	Data (From November 08, 2017 to September 30, 2019)
Plant Safe Man-Hours Plant Safe-Days	41,568 (0.041568) 92	288,576 (0.288576) 697
Lost Time Injury (LTI)	0	00
HSE / Environmental Accidents	0	00
Fire	0	00
Spills	0	00
HSE Audits / Inspections	06	24
HSE Training Sessions	07	17
Emergency Drills (Evacuation, Firefighting & First Aid)	00	04
PTW Issued	04	150
Community Consultations	13	41

## 2. Compliance NOC Conditions issued by EPA AJK

Table 2: Compliance Status of NOC Conditions

EPA Condition No	EPA NOC Conditions	Compliance Status	Compliance Action/Notes
I.	Compliance to National Environmental Quality Standards (NEQSs)	Yes	Compliance with NEQSs is being monitored internally and through third- party.
II.	2 Cumec water as E-flow, downstream during the operational phase	Yes	2.2 Cumec environmental flow is being released from the weir. Please refer to <u><a href="#">Annex-1</a></u> for E-flow data. Data shows compliance with the NOC condition.
III.	Metering arrangement to ensure and verify the release of approved E-flow downstream	Yes	The metering arrangement is in place.  Flow Sensors are installed on five (05) different locations. Data is being recorded on real-time basis on <b>10-</b> minute interval. Please refer to the <u><a href="#">Annex-2</a></u> for details about metering arrangements.  Data is being shared regularly.
IV.	Strictly adhered to mitigation measures, as suggested in the Operational Environmental Management Plan (OEMP)	Yes	Quarterly compliance reports verify adherence to the mitigation measures.

EPA Condition No	EPA NOC Conditions	Compliance Status	Compliance Action/Notes
V.	Environmental Management & Monitoring unit headed by an Environmental Monitoring Expert	Yes	Qualified and competent HSE team has been formulated which consists of HSE Manager, Environmentalist, HSE Officer and two Community Liaison Officers in the O&M team. Qualified and competent Senior Manager-E&S from SHPL is also monitoring the compliance from the SHPL side.
VI.	Carry out Fish Study through certified Fish Expert/Firm throughout the operational period of the project	Yes	The fish studies are being conducted on a quarterly basis. The study discusses the impacts on fish & aquatic fauna in reservoir & downstream and recommends measures including development of breeding grounds etc. to minimize impacts. Please refer to <b>Annex-3</b> for the study report.
VII.	Environmental Audit through 3rd party consultant after every 05 years during the Operational Phase of the Project	Yes	Will be complied when required. Still, the operation is in its second year. Before conducting the audit, audit terms of reference (ToR) will be prepared and shared with lenders.
VIII.	Plantation (of indigenous species) activity, in consultation with Forest Department, Govt. of AJ&K, both at the Weir & Powerhouse	Yes	Annual plantation campaigns are being conducted in powerhouse and weir site areas. Only indigenous species are being planted. Campaigns are conducted under the supervision of third-party fish and vegetation experts.  During 1 <sup>st</sup> quarter at powerhouse site 2,410 plants and at weir site 1,790 plants were planted. All the plants planted were indigenous and native.
IX.	Continuous monitoring & submission of quarterly compliance report	Yes	Quarterly compliance reports are being prepared and submitted.
X.	Adequate arrangements for addressing public grievances	Yes	Grievance redressal procedure is in place. The grievance redressal committee (GRC) has been formulated and functional. Three (03) complaint boxes have been installed at powerhouse area and two (02) complaint boxes have been installed at weir site area. Further two (02) complaint registers have been placed at powerhouse area and one (01) complaint register has been placed at the weir site area. Community Liaison Officers (CLOs) have also been

EPA Condition No	EPA NOC Conditions	Compliance Status	Compliance Action/Notes
			deputed on powerhouse and weir site areas. No complaint was received in the reporting period.
<b>XI.</b>	Findings of third-party monitoring shall be shared with AJK- EPA	Yes	The results/measurements of the reports from the third party are being shared with AJK-EPA and lenders.
<b>XII.</b>	Arrangements in-place for the execution of CSR plan	Yes	CSR procedure is in place. Based on the CSR procedure, CSR plan is developed every year and implemented. Annual CSR plan is developed and finalized in consultation with local communities and based on the needs of local communities. General areas of focus are education, health, livelihood, living conditions, water, and cultural, etc.
<b>XIII.</b>	Efficient Occupation Health & Safety Plan	Yes	Occupation health and safety plan is in place. The plan has been developed based on the findings of risk assessment. The plan has been proved effective as the operations are smooth and safe. As the plan is live document it will be updated when required.
<b>XIV.</b>	Local Employment	Yes	Hiring is being done keeping the locals on priority. Currently, the total staff is 73, out of which 66% from AJK, 18% from KPK and 16% from other parts of Pakistan.  Please refer to the <b>Annex-4</b> for details regarding the local employment. This annexure depicts information about local people employed in the company as regular and permanent staff. The annexure also shows the levels and designations at which these local people are working in the company. Local people are working from junior to senior roles including drivers, sub-technicians, technicians, operators, officers, assistant managers and managers etc.  Currently, no female staff is employed. However, there is no gender discrimination during job

EPA Condition No	EPA NOC Conditions	Compliance Status	Compliance Action/Notes
			<p>advertising and hiring process. Please refer to the <b>Annex-4</b> for photo of job advertisement.</p> <p>In addition, 12 unskilled and 14 security staff are also working, all of them are locals. These 12 unskilled staff are daily labors and while the security staff belongs to third-party security company and Police.</p>
<b>XV.</b>	Liability for the correctness and validity of the information provided in EMP	Yes	Agreed.
<b>XVI.</b>	Facilitate EPA team for any visit for inspection/monitoring, etc.	Yes	The Company will always facilitate all the stakeholders including EPA for site visits.

### 3. Compliance with Environmental and Social Management Plan (ESMP)

**Table 3: Compliance Status of ESMP**

ESMP Reference #	ESMP Requirement	Compliance Status	Compliance Action/Notes
<b>Section 6.1</b>	Quarterly Fish and Fauna assessment (Kunhar River)	Yes	Please refer to <b>Row VI of Table 2, Section 2.</b>
	Bi-Annual drinking & waste Water Quality	Yes	Bi-Annual drinking and wastewater analysis conducted in the last quarter. Reports are being shared with SHPL and lenders in quarterly reports. Next bi-annual drinking and wastewater analysis is planned in coming quarter.
	Quarterly Flora/vegetation monitoring	Yes	During the reporting period, Flora/vegetation monitoring study was conducted. The study reports that impact reported on the weir side is low and in some aspects it is positive. Please refer to <b>Annex-5</b> for the report.
	Annual Landslides monitoring	Yes	Annual landslide and catchment study will be conducted by the end of this year.
	Quarterly noise monitoring and noise impact management	Yes	Noise monitoring is being done monthly and data is being maintained. Monitoring locations include process area (Basement 1, 2 & 3), office building (Ground floor and first floor) and Alda village (village area close to the powerhouse). This monitoring is being done internally by the HSE team.



			<p>Please refer to <b>Annex-6</b> for the noise monitoring reports.</p> <p>Turbine units are installed at Basement areas 1, 2 &amp; 3. The noise level exceeds in the area depending on the unit operation. Keeping in view the noise level, necessary instructions are communicated to the staff working in that area and proper PPEs are ensured. Noise level in rest of the areas is within the limits.</p> <p>During the reporting period, company procured four (04) hearing muffs on test basis.</p>
	Environmentally-friendly disposal of solid waste	Yes	<p>Waste generated on both sites is being disposed of in an environmentally friendly manner through a third-party waste contractor.</p> <p>Please refer to <b>Annex-7</b> waste transfer notes.</p>
	Development and implementation of CSR Plan and procedure /Community Development Programs	Yes	Please refer to <b>Row XII of Table 2, Section 2.</b>
	Labors / Employees management as per applicable regulations and standards.	Yes	<p>Labors / Employees are being managed as per applicable regulations and standards.</p> <p>An internal grievance redressal mechanism is also in place. Internal GRC has been formed and the complaint box has been installed. A total of six (06) internal complaints received in the reporting period. For details, please refer to <b>Annex-8.</b></p>
	Workers/Staff Health & Safety as per applicable regulations and standards	Yes	Please refer to <b>Row XIII of Table 2, Section 2.</b>
	<p>Grievances from communities and any affected people</p> <p>Grievances from civil society organizations</p> <p>Grievances from labor/employees</p>	Yes	<p>For the external grievance redressal mechanism, please refer to <b>Row X of Table 2, Section 2.</b></p> <p>An internal grievance redressal mechanism is also in place. Internal GRC has been formed and the complaint box has been installed. A total of six (06) internal complaints received in the reporting period. For details, please refer to <b>Annex-8.</b></p>

#### 4. Compliance with Operational Requirements of EIA (Environmental Monitoring and Management Plan during Operations Phase)

Table 4: Compliance Status of EMP of EIA Addendum

EIA Addendum Reference #	Impacts	EMP Requirement	Monitoring Frequency	Compliance Status	Compliance Action/Notes
<b>Table: 6.4</b>	Water Impoundment	Water Elevation Level Incoming/outgoing flow	Monthly	Yes	Water impoundment is being monitored via sensors. Every ten-minute data is being uploaded on the system.  Sensors are being calibrated annually through third-party experts while all the sensors are being inspected/checked visually by maintenance team on monthly basis.  For details on sensors, please refer to the <b>Annex-2</b> .
	Environmental Flow	Water flowing down-stream in Kunhar river	Monthly	Yes	Please refer to <b>Row II of Table 2, Section 2</b> .
	Aquatic Fauna	Fish, upstream-downstream and in the pond	Quarterly	Yes	Please refer to <b>Row VI of Table 2, Section 2</b> .
	De-sanding	Accumulation of silt and de-siltation process	—	Yes	Monthly bathymetric surveys are being conducted to check the level of silt/sand in the reservoir. Flushing activity was conducted in the reporting period.

#### 5. Compliance Actions against other HSE Plans

Table 5: Compliance Actions against other HSE Plans

Sr#	Plan	Compliance Actions in the Reporting Period
<b>1</b>	OHS Plan	<ul style="list-style-type: none"> <li>• Implementation of permit to work system (PTW)</li> <li>• Risk assessments and job safety analysis</li> <li>• HSE trainings and awareness sessions for staff</li> <li>• Site HSE inspections</li> <li>• Implementation of lockout-tagout procedures (LOTO)</li> <li>• Monthly Fire extinguishers inspections</li> <li>• Monthly noise monitoring</li> <li>• Atmospheric testing</li> <li>• HSE management of flushing program 2019</li> <li>• Implementation of PPE policy and procurement of required PPEs</li> </ul>

2	Traffic Management Plan (TMP)	<ul style="list-style-type: none"> <li>Defensive driving training of all drivers</li> <li>Installations of warning signboards like speed limits, overtaking restriction etc.</li> <li>Prohibition on use of short-cuts and unsafe routes</li> <li>Installation of reverse alarm in all vehicles</li> <li>Regular vehicles inspection</li> <li>Regular vehicles maintenance</li> </ul>
3	Annual CSR Plan	<ul style="list-style-type: none"> <li>CSR budget released by K-water Head Office.</li> <li>CSR activities will be conducted in coming quarter.</li> <li>CSR activities by SHPL are conducted</li> </ul>
4	Waste Management plan	<ul style="list-style-type: none"> <li>Segregation of wastes being generated</li> <li>Placement of colored waste bins</li> <li>Collection, transportation, recycling and disposal of wastes by company hired waste contractor</li> <li>Data management of waste consignment notes being provided by company hired waste contractor</li> <li>Waste management monitoring by HSE team</li> </ul>
5	Public Health & Safety Plan	<ul style="list-style-type: none"> <li>Installation of public safety signboards</li> <li>Deputation of security / watch guards in weir downstream</li> <li>Continuous monitoring of seismic movements at weir sites by maintenance team</li> <li>Regular community consultations and meetings</li> <li>Continuous liaison with communities by company CLOs</li> <li>Installation of traffic sign boards</li> <li>Compliance with local norms</li> <li>Slopes protection measures by maintenance team</li> <li>Access control to prevent communities from high risk areas</li> <li>Management of public grievances</li> <li>Vehicular operation and driver's management as per the TMP for public safety</li> <li>Installation of weir downstream communication &amp; siren system in consideration</li> <li>Weir downstream flood marking in consideration</li> </ul>
6	Fisheries Management Plan (FMP)	<ul style="list-style-type: none"> <li>Meeting held with Fish expert regarding the implementation of the FMP.</li> <li>Meeting held with KPK Fisheries department staff regarding the implementation of the FMP.</li> <li>Joint visit (SHPL, POPL, Fisheries Department and Fish Expert) planned in the coming quarter for selection of breeding / Aquaculture sites.</li> </ul>

## 6. Stakeholder Engagement and Corporate Social Responsibility (CSR)

- No grievance from the local communities was recorded (both at powerhouse and weir site areas) in the reporting period.
- Six (06) community consultation sessions were conducted by CLOs in the reporting period. These sessions were given on flood safety, waste disposal and company social impact management measures. In addition, about 07 awareness sessions were also conducted during the flushing program for public safety. During these sessions some

of the communities' representatives requested company for deputation of additional security / watch guards in weir upstream and downstream for public safety. They also requested company to carry out CSR activities as done by the company in 2018. Company deputed 16 security / watch guards during flushing for public safety and will conduct the CSR activities as per the CSR plan 2019 in the coming quarter.

- As CSR support, company provided daily labors and electricians to the nearby Alda Government school for cutting of grasses/bushes/ lawns; installation of kids playing-items; and electrical repair works at the school.
- As CSR support, the company provided daily labors to lower Chatter village for cleaning of dirty stagnant water on lower Chatter road.
- Company conducted local internship program in the reporting period. A total for four (04) internees were hired for six (06) weeks duration. Three (03) of them were from the AJK and one (01) from the KPK. In the program, local universities were also involved.
- SHPL provided a water well in Naroka village KP as part of its CSR activities.
- Head Office (K-water) has released the budget for CSR activities. CSR activities outlined in the CSR plan 2019 will be completed and implemented in the coming quarter.
- Flushing program was conducted in July 2019. Company undertook following measures / steps to avoid any negative social impacts / incidents during the flushing program:
  - Letters were sent to relevant government departments / stakeholders (DC Muzaffarabad, DC Abbottabad, SSP Muzaffarabad, Police Station Gari Habibullah, Police Station Sadar- Muzaffarabad and Police Station Barar Kot) to inform them about the flushing and impounding program and to request them to take actions for public safety at their end.
  - Letters were sent to all commercial boat operators in weir upstream and to schools in weir downstream.
  - Company community Liaison officers (CLOs) and HSE team conducted meeting, consultations and awareness sessions among local communities in weir upstream and weir downstream.
  - Company CLOs pasted and distributed public safety notices among local communities in weir upstream and weir downstream.
  - Company CLOs remained in constant follow-up with communities' voluntary representatives for information dissemination among local communities in weir upstream and weir downstream.
  - Announcements were made periodically in all mosques in weir upstream and weir downstream.
  - Local communities were continuously alerted by company siren system at weir site.
  - For public safety company deployed 16 watch / security guards at 08 key sensitive locations at weir upstream and downstream.
  - Company CLOs and HSE team made constant & continuous monitoring / supervision and announcements in weir upstream and weir downstream.

## 7. Health, Safety and Environment (HSE)

- Compliance with HSE plans is being ensured for staff and public safety. Please refer above the **Section 05**.
- Flushing program was completed safely without any accident / incident. Please refer to the **Annex-9** for HSE Flushing Report.
- All the fire extinguishers of powerhouse were inspected. Discharged cylinders were replaced with new fire extinguishers.
- Three (03) monthly noise monitoring surveys were conducted by HSE in power complex and nearby community. The result findings were in compliance with NEQS.
- Waste generated during operations at sites is being managed in accordance with environmental and waste management plans. Different color waste bins are placed for segregation of waste. Waste collection and transfer by the waste contractor is in accordance with environmental standards.
- Two (02) awareness sessions were conducted in the reporting period to educate company staff regarding environmental and social management plan (ESMP). In each session, 15 company employees participated.
- Five (05) safety training sessions were conducted in the reporting period. These sessions include Lock-out & Tag-out (LOTO); confined space safety, tunnel safety, hand / power tools safety and welding safety.
- Six (06) HSE inspections / audits were conducted in the reporting period. Overall HSE compliance was satisfactory and no major HSE issues were recorded. Some minor issues observed include exposed conductor / panel in O&M building; oily rags found in fire hydrants at power house; flashback arresters not installed with oxy-fuel equipment; littering observed around weir site residency; and unavailability of fan in security check post at weir site etc. All these issues were rectified.
- New cover-all have been procured for maintenance team including daily labors. Two (02) cover-all were given to each staff member of the maintenance team.
- During the reporting period, company procured four (04) hearing muffs on test basis.
- During the reporting period, company contacted various vendors about the availability and rates of anti-vibration mats.
- During the reporting period, E-flow remained above 2.2 Cumecs throughout the period. E-flow data has been summarized as follows:

Sr. No	Month	Average Flow (Cumecs)	Minimum Flow (Cumecs)	Maximum Flow (Cumecs)
1.	July, 2019	173.76	72.43	291.26
2.	August, 2019	25.48	2.35	122.44
3.	September, 2019	2.33	2.27	2.54

- Three (03) HSE award ceremonies were conducted in the reporting period. Letters of appreciation and gifts were awarded to 12 best safety performers by the CEO POPL. Safety stars in the reporting period are summarized as follows:

Sr. No	Name	Designation	Department
1.	Javaid Iqbal Qureshi	Driver	Support Services
2.	Aqeel Sheikh	Sub-Technician (Electrical)	Maintenance
3.	Abdul Wajid	Technician (Electrical)	Maintenance
4.	Syed Rizwan Kazmi	C&I Technician	Maintenance
5.	Naeem Ahmed Qureshi	Sub-Technician (Electrical)	Maintenance
6.	Muhammad Javed Abbasi	Sub Technician (Mechanical)	Maintenance
7.	Shehryar Khan Jadoon	Shift Control Engineer	Operation
8.	Arshad Haroon	Junior Operator	Operation
9.	Muhammad Anwar-ul-Haq	Junior Operator	Operation
10.	Usman	Daily Worker	Maintenance
11.	Ali Abdullah	Daily Worker	Maintenance
12.	Omer Sudheer	Daily Worker	Maintenance

- Quarterly fish fauna study/monitoring was undertaken in Kunhar River (Up & downstream of weir site) in the reporting quarter. Sampling was carried out at six (06) study points. Some insignificant changes in the fish catch and quality of water observed during the study; that is only due to the irregular seasonal changes and pattern of water turbidity due to the intensity of rain or drought.
- Quarterly flora study/monitoring was undertaken at both (Powerhouse & weir) sites in the 3<sup>rd</sup> quarter. Overall there is no significant negative impact of operational activities however due to annual plantation campaigns and presence company security guard's vegetation cover on both sites has been improved significantly.

## 8. Livelihood Restoration Program

Apart from the employment to male members of APs (details are presented in Annex-4), the Company started an initiative to enhance the skills of female members of APs as part of the livelihood restoration strategy.

SHPL implemented programs related to stitching, hand and machine embroidery for females of not only the APs but for the entire villages of neighborhood. To start with, 6-months program in Alda village-AJK (powerhouse area) and 6-months program in Sarati village-KP (weir site) were completed in 2018.

This initiative has shown very positive results as the female members of the area are very much satisfied with the programs and suggested to continue the same in future as through this, they not only support their men by earning some money but they are now capable to stitch for their families which is a cost saving side of the program.

To continue the program in other areas in the Project vicinity, the arrangements are made in Naroka Village in KP and Shoran Village in AJK. The program will start in next quarter.

## 9. Land Acquisition

Payment status for the land acquisition during the reporting period is presented below. According to the details provided by the revenue departments in AJK and KP 97% and 90% payment has been done in AJK and KP respectively.

Village	Area (Kanal)	Award Amount (PKR)	Disbursed (PKR)	%age	No. of Persons	Persons received payment
<b>1. AJ&amp;K</b>						
<b>A. Land/Property</b>						
Powerhouse (Alda Village AJ&K)	81.80	92,479,824	89,397,034	96.67%	196	612
Head pond (Shoran Village AJ&K)	130.75	75,181,250	74,159,019	98.64%	611	201
Weir + Head pond (Patrind Village AJ&K)	341.10	204,037,798	203,670,449	99.82%		353
Forest land for Surge Tank (Alda village)	47.75					
<b>B. Additional Land/Property</b>						
Weir + Head pond (Patrind Village AJ&K)	3.70	2,127,500	1,955,000	91.89%	3	19
Weir + Head pond (Patrind Village AJ&K)	10.30	6,076,540	5,562,233	91.54%	3	19
Head pond (Shoran Village AJ&K)	4.66	6,054,188	6,054,181	100.00%	3	3
<b>B. Trees</b>						
Alda		1,815,089	1,804,468	99.41%		19
Alda		75,546	75,546	100.00%		
Shoran		757,391	685,073	90.45%		58
Shoran		106,053	106,053	100.00%	1	1
Patrind		837,882	829,515	99.00%		32
<b>Sub-Total</b>	<b>620.06</b>	<b>389,549,061</b>	<b>384,298,571</b>	<b>97.04%</b>	<b>817</b>	<b>1,320</b>
<b>2. KPK</b>						
Land/Property/Trees						
Weir + Head pond (Sarati Village KPK)	188.70	128,557,081	114,613,320	89.15%	196	Detail Yet to receive
Head pond (Deedal Village KPK)	5.45	3,133,750	Under Acquisition Process		1	Under Acquisition Process <sup>1</sup>
Head pond (Deedal Village KPK)	65.45	37,633,750			16	
Head pond (Dalola Village KPK)	1.40	805,000			1	
Head pond (Naroka Village KPK)	16.30	9,372,500			7	
<b>Sub-Total</b>	<b>277.30</b>	<b>179,502,081</b>	<b>114,613,320</b>	<b>89.15%</b>	<b>221</b>	<b>0</b>

<sup>1</sup> The land is under acquisition process since 2017. Section-4 was issued in 2017 but in LAA 1894, before issuance of section-5 an agreement under section-41 is to be executed between company and GoKP. The final agreement signed by the company has been sent to the cabinet division by revenue department for approval. Further process will be done once the agreement is executed. No grievances are raised on land acquisition.



## 10. Photographs



Safety Star Award Ceremony



Tool Box talk during Annual flushing



Fire Extinguishers Inspection



Noise Monitoring



Waste Management



Fish Monitoring Study





Vegetation Monitoring Study



Community Consultations



PowerHouse HSE Inspection



Awareness Session on ESMR



Awareness Session on hand & power tools safety



Grass cutting in local school by company daily labors



Fixing of electrical panels in local school by company electrician

## **Annexures**

# **Annexure-1**

## **Environmental Flow Data**

Environmental Flow Data- 3 <sup>rd</sup> Quarter-2019					
July, 2019		August, 2019		September, 2019	
Day / Sensor	Water Flow (m3/s)	Day / Sensor	Water Flow (m3/s)	Day / Sensor	Water Flow (m3/s)
1 Day	102.66	1 Day	119.95	1 Day	2.33
2 Day	86.37	2 Day	38.63	2 Day	2.33
3 Day	163.62	3 Day	122.44	3 Day	2.3
4 Day	180.97	4 Day	50.03	4 Day	2.3
5 Day	194.04	5 Day	65.39	5 Day	2.32
6 Day	167	6 Day	75.61	6 Day	2.33
7 Day	173.34	7 Day	30.73	7 Day	2.35
8 Day	183.69	8 Day	66.83	8 Day	2.33
9 Day	234.19	9 Day	25.25	9 Day	2.32
10 Day	238.93	10 Day	69.06	10 Day	2.31
11 Day	186.66	11 Day	12.32	11 Day	2.31
12 Day	181.57	12 Day	6.01	12 Day	2.31
13 Day	181.58	13 Day	6.47	13 Day	2.28
14 Day	154.14	14 Day	31.94	14 Day	2.27
15 Day	163.68	15 Day	2.8	15 Day	2.28
16 Day	125.16	16 Day	2.69	16 Day	2.28
17 Day	100.19	17 Day	19.22	17 Day	2.28
18 Day	141.47	18 Day	12	18 Day	2.3
19 Day	136.57	19 Day	2.6	19 Day	2.37
20 Day	72.43	20 Day	2.6	20 Day	2.45
21 Day	100.38	21 Day	2.59	21 Day	2.34
22 Day	85.55	22 Day	2.57	22 Day	2.31
23 Day	234.76	23 Day	2.54	23 Day	2.35
24 Day	245.98	24 Day	2.54	24 Day	2.33
25 Day	291.26	25 Day	2.52	25 Day	2.31
26 Day	245.82	26 Day	2.48	26 Day	2.34
27 Day	227.15	27 Day	2.47	27 Day	2.37
28 Day	218.71	28 Day	2.48	28 Day	2.33
29 Day	224.74	29 Day	2.43	29 Day	2.32
30 Day	218.58	30 Day	2.37	30 Day	2.54
31 Day	125.23	31 Day	2.35		



**Monthly Discharge Measurement at Bella (Boi)**

Sr. No	Month	Flow Reading (Cumec)	Requirement (Cumec)
1.	July, 2019	No monitoring was carried out as the flow was more than the required flow. Please refer to the e-flow data of July 2019 in above table. <sup>2</sup>	3.7
2.	August, 2019	4.217	3.7
3.	September, 2019	3.98	3.7

**Note: Please refer below for the flow measurement methodology.**

---

<sup>2</sup> The requirement is to monitor the flow downstream is not less than 3.7 cumecs. In the high flow season, the discharge released is much more than the minimum requirement.



## Methodology of Discharge Measurement at Bella (Boi)

---

### Weir Downstream

Pakistan Patrind Hydropower Plant



Pakistan Office

sources Corporation

## 1. General

Measuring flow using digital current meter involves wading across a stream and taking velocity measurements at multiple places. Both velocity and water depth measurements are taken at the same time and place in multiple locations across the stream.

There are many types of current meters. The cup or propeller types determine flow velocity by the number of revolutions of the cups (or propeller) over a given period of time.

## 2. Purpose

The main purpose of discharge measurement at Bella (Boi) downstream of weir structure is to verify that enough environmental flow is being released by Patrind hydropower project.

## 3. Site selection



After visiting to several locations, one site i.e. Bella (Boi) has been selected for discharge measurement at weir downstream considering the following aspects.

- The site should be safely accessible and should be in a section of the stream that is free flowing.
- Stream should be straight enough to have uniform form.
- The flow should not be affected by tributaries or tides.
- There should not be any side channels so that all the water flows through the main channel.

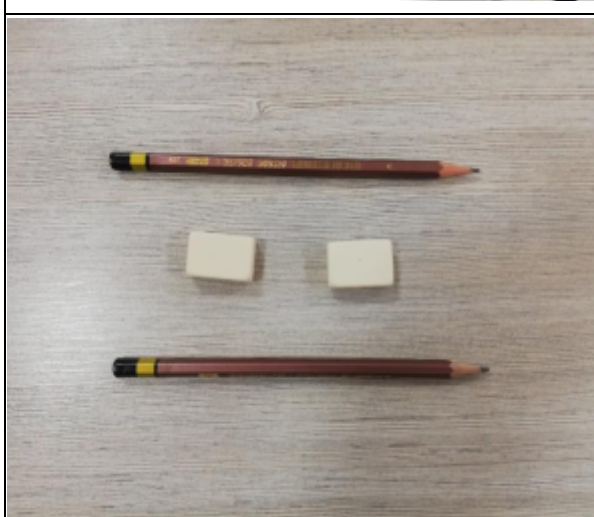
- Areas, where there are large boulders, logs, or thick brush which can create eddies, slack water, turbulence or disturbed flow, should be avoided.



#### **4. Equipment**

- Measuring tape
- Digital Current Meter
- Top-setting rod (if available) or measuring stick
- Paper and pencil for record keeping
- Waders (waterproof garment)





## 5. Procedure

- 1) Tighten a measuring tape across the stream at right angles to the flow. It should be snug and not sag in the middle.
- 2) Measure the total stream width and record this measurement.
- 3) Divide the total stream width into equal segments. If the stream is less than 10 feet wide, use  $\frac{1}{2}$  foot intervals. For streams greater than 10 feet, use 1 foot or greater intervals. (Note:

The standard method is to divide the width by 20, however  $\frac{1}{2}$  foot or 1-foot intervals are sufficient for the purposes of this guide.)

- 4) Step out to the first measuring point and position the rod. Stand downstream from the measuring tape with the rod next to the tape. The rod should be held vertically, the meter should face upstream and you should be standing off to the side or behind the meter.
- 5) Record the distance to the bank. Measure total stream depth and record this depth. Multiply the total depth by 0.6 and set the propeller at this depth. (Note: 0.6 times the total depth is considered the point of average discharge in a spot that is less than 2 feet deep. If the depth is greater than 2 feet, two different velocity measurements are required one at 0.2 times the depth and one at 0.8 times the depth.) Read and record the velocity at this depth. (Note: If your meter is attached to a “top setting rod” the propeller can be easily set at this 0.6 depth without calculation by you. Directions on using a top setting rod should be provided by the manufacturer.)
- 6) Move to the next measuring point and repeat the process. (Note: The standard method is to obtain three velocity measurements at each point and average them.) Make sure to record the distance to the bank, the total stream depth and the velocity at the 0.6 depth for each point across the stream.

## **6. Calculation & Conclusion**

For more accurate results, discharge measurement will be carried out for three times. Following steps will be taken to calculate the discharge at Bella (Boi) downstream of the weir structure.

- Calculate area for each section = width of section x depth of section
- Calculate flow for each section = area of section x velocity of section
- Determine total stream flow = Sum of the flow of each section

Average Discharge from three readings=

## **Annexure-2**

### **Water Sensors Location**



✚ Gauging stations and the reason for selection is given in below table.

Location	Purpose	Installed gauges	Calibration
Kaghan station	Forecasting of floods	Rainfall, Water Level, Temperature	Calibration of each sensor will be on annual basis by third party
Talhata station	Forecasting of floods	Rain & Water Level	
Weir upstream	Monitoring Water flow into reservoir	Water Level	
Reservoir	Monitoring Water flow into reservoir	Rainfall, Water flow, Temp & Humidity, Wind Speed & Direction	
Weir downstream	environmental flow	Rain & Level and e-flow	

## **Annexure-3**

# **Fish Monitoring Study**



# **Patrind Hydropower Fish Study**



**Jul-Sep 2019**

**Mohammad Yousaf Qureshi**

**Country Director**

**Edinburgh Direct Aid (EDA)**

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## 1. Abstract

For monitoring purposes, six sampling points were selected, four downstream and two upstream of the weir points. Comparisons were made above and below dam, which showed that community composition was significantly different above and below dams. Sites above dams had lower species richness, a lower percentage of migratory species compared to below dams. In summary, dams restrict the movement of migratory fish generally resulting in their reduction or loss from above-dam habitats and also create artificial lentic ecosystems that exotic species can successively exploit. These changes to fish communities often occur across the cold waters of the Himalayan (Kunhar, Neelum, Jhelum and Swat rivers) region and should be viewed as a general consequence of any new dam construction unless fish management and conservation measures are undertaken.

## 2. Introduction

The recognition that dams can have a multitude of direct and indirect effects on freshwater ecosystems has meant that their construction has become increasingly controversial (Rosenberg al. [1997](#)). Consequently, the construction of dams in AJK and Pakistan has become highly contentious, with stringent opposition to each new dam proposal (e.g. Kohala Dam in AJK), particularly from river-user and environmental groups. One focus of the debate on the environmental impact of dams relates to its potential effect on riverine fish communities. The cold-water riverine fish fauna is characterized by a high proportion of migratory species that need to move up- and downstream at different stages of their life cycle (*Scizothorax plagiostomous*, *S. curvifrons*, *S. dilatata*). Dams typically sever this connection, preventing fish species from migrating upstream and accessing habitats above the dam (Joy & Death [2001](#)Joy)

Dams have a wide range of social, cultural and economic effects but it specifically requires decision-makers to place a strong emphasis on ensuring that the environmental impacts associated with a new (or existing) dam are managed in a sustainable manner. However, the information available to aid this decision-making process often takes the form of catchment surveys that may fail to recognize other wider issues that can result from the construction of a dam reservoir (e.g. the proliferation of non-native species). In this study, we examine the role of dams in altering fish communities and determine if there are any

consistent and predictable patterns which might apply in River Kunhar. We define a dam as any anthropogenic structure, greater than 1.5 m in height, which spans a stream or river channel resulting in fresh water being stored or diverted.

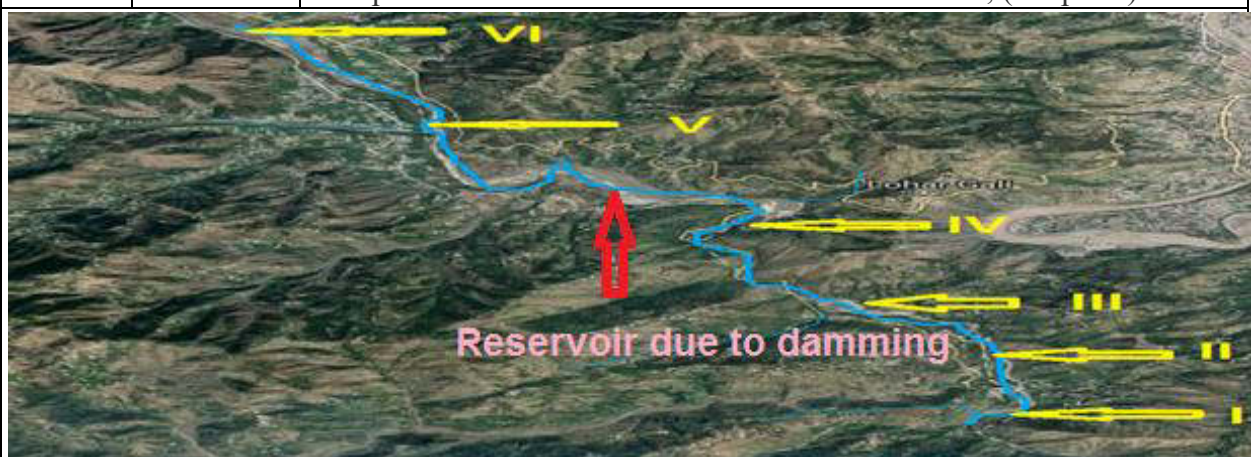
The construction of dam on Kunhar River started in 2012 and completed in 2017. Since then this dam is operational and periodic studies have been carried out throughout this period. Downstream and upstream fixed points were selected for comparison of effects. During this period, a reservoir has developed due to obstruction of river at Patrind. The fish migration has been fragmented and migration stopped beyond the weir point at Patrind. Fish sampling hampered at two points as the results show nonexistence of the fish at these points.

### 3. Methods

#### 3.1 Site selection

Different representative sites were identified for fish sampling based on the criteria:

Sr. No	Point No	Point Details/Criteria for selection
1.	Point 1	downstream of the weir point where side creeks and streams join River Kunhar
2.	Point 2	Minimum 6 Km river stretch downstream and 5km upstream
3.	Point 3	There are no downstream waterfall barriers that might impede migratory fish access to the dam site
4.	Point 4	The area where work construction pressure was high i.e., reservoir and dam sites
5.	Point 5	The point where maximum water retention was proposed
6.	Point 6	The point where river Kunhar falls into the reservoir, (tail point)



Google Map of study points and Reservoir

#### 3.2 Material

Material used during the study:



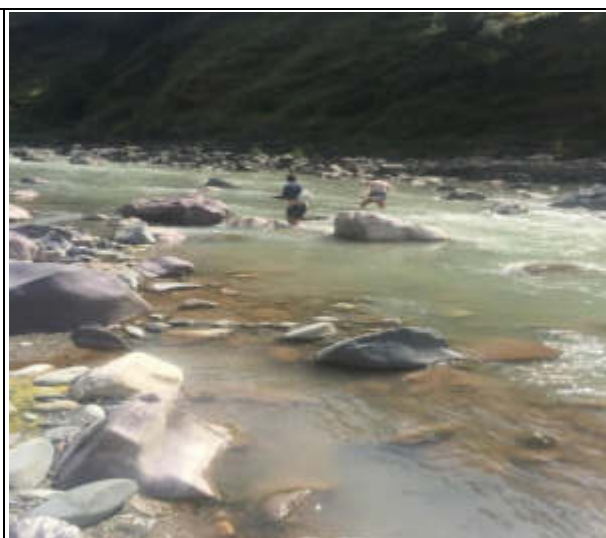
- i). Cast net of 6km weight with a mesh size of 1.5x1.5 inches and;
- ii). Gillnet of 15-meter length and 3.5 feet width with the mesh size of 1.5x1.5 inches. The gill net was placed at the weir point where maximum concentration is expected.
- iii). PH paper was used at each point to find out the pH of the water.
- iv). Thermometer was used every time to know the water temperature.
- v). TDS meter was used to test the total dissolved solid value of the water.
- vi). A digital balance was used for weighing the caught fish and measuring tap to find out the length of the fish.

### 3.3 Local Knowledge.

Local fishermen were interviewed to collect the local knowledge about the trend of the fisheries status in the river Kunhar. Two fishermen, Mr. Mohammad Shafiq and Mr. Ibtesam were found casting net between Point-I and Point-II of our sampling sites. They were the residents of Village Gotha situated at the left bank of the river near Boi. They are the professional fishermen who used to earn their livelihood through the sale of the fish but due to excessive and unsustainable fishing activities, their fish catch has gone down with the reduced size of the fish. So, they are now working as laborer but sometimes they come and catch fish when they don't get labor.



Interview with Local fisherman



Local fisherman catching fish

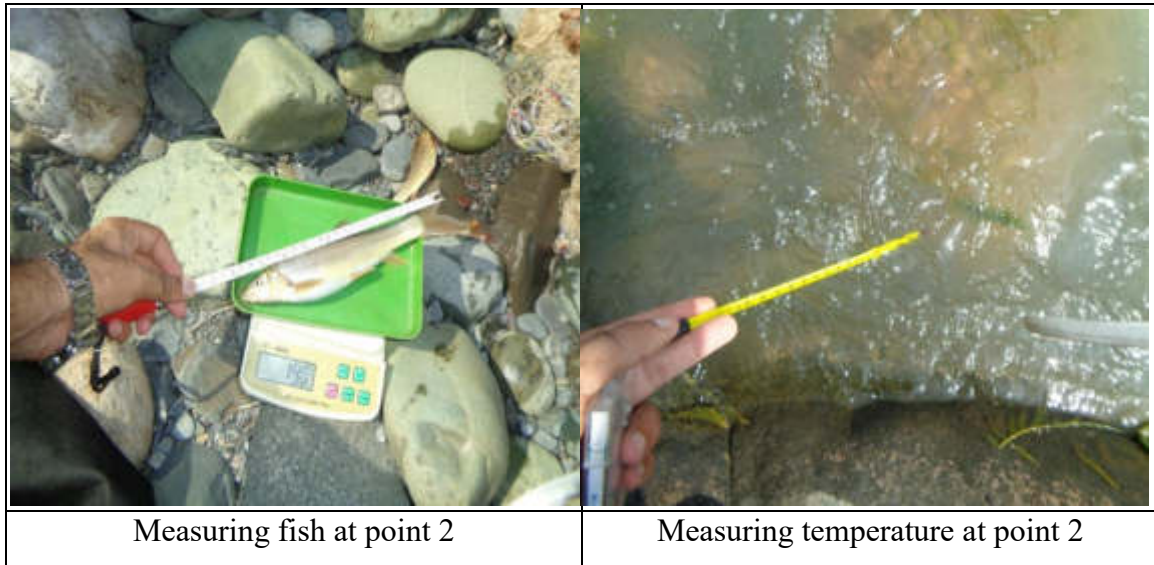
## 4. Field Results: (Sampling Points)

### 4.1 Sampling Point-I (Batangi)

This point is situated at 34°18' 8.12" N 73°26'32.79" E with an altitude from sea level is 2371 feet. The water flow is slow and river watercolor is clear as the side creek. Water flow is 90 meter per minute, TDS is 435, water temperature is 19.0°C and pH is 6.5. No fish could be caught. Water depth is low and the river base is visible from the sides. Lot of medical waste was observed at the sides of the river brought during the floodwater.

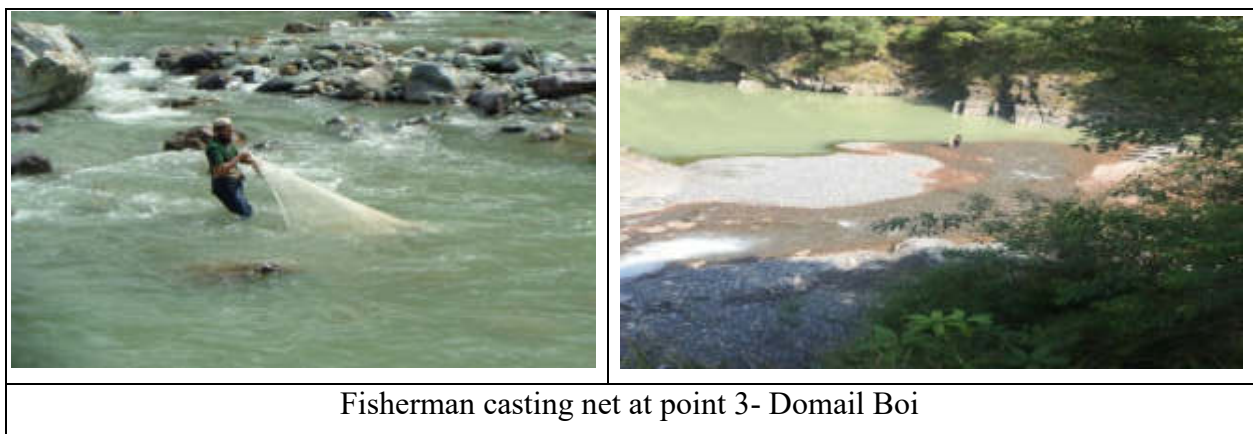
#### 4.2 Point II (Boi)

This second sampling point of the study is situated at 34° 18' 19" N, 73° 26' 44" E at an elevation of 2422 ft above mean sea level. Color of the river water is clear and water flow is slow, air temperature at this point is 22°C, water temperature 19°C and pH 6.5. Three number of fish (shizothorax plagiostomus) could be caught here with a weight of 20 grams with 11 cm length, 25 gram with 11 cm length, 25 grams with 13 cm length.



#### 4.3 Point-III (Domail Boi)

The third point of sampling is Domail at the junction of Nallah Boi with River Kunhar. This point is situated at 34° 18' 36" N, 73° 26' 43" E at an elevation of 2398 ft above sea level. The river and nallah water are clear and very slow. Air temperature is 22°C and water temperature 19.°C. This is the only bigger source of water contributing in the river Kunhar down the Boi to Domeshi up to the confluence of River Kunhar with River Jhelum. No fish could be caught here.



#### 4.4 Point IV (Outlet)

Fourth point of sampling is situated at 34° 20' 30" N and 73° 25' 43" E. with an elevation of 2519 ft above mean sea level. A Gill net of 15-meter length and 1-meter width had been placed here one day before the sampling day to catch the fish for assessment. No fish could be caught here this time. During the possible breeding time, a good catch of fish was caught during April. The probability of fish migration is possible in September. Further migration is hampered here due to the weir construction. The migration is blocked here because of the weir constructed at this point. The E-flow of the water is maintained as 2.25 m<sup>3</sup>/s. The pH value of the water is 6.5 and temperature 19°C.



Point 3- Weir Outlet

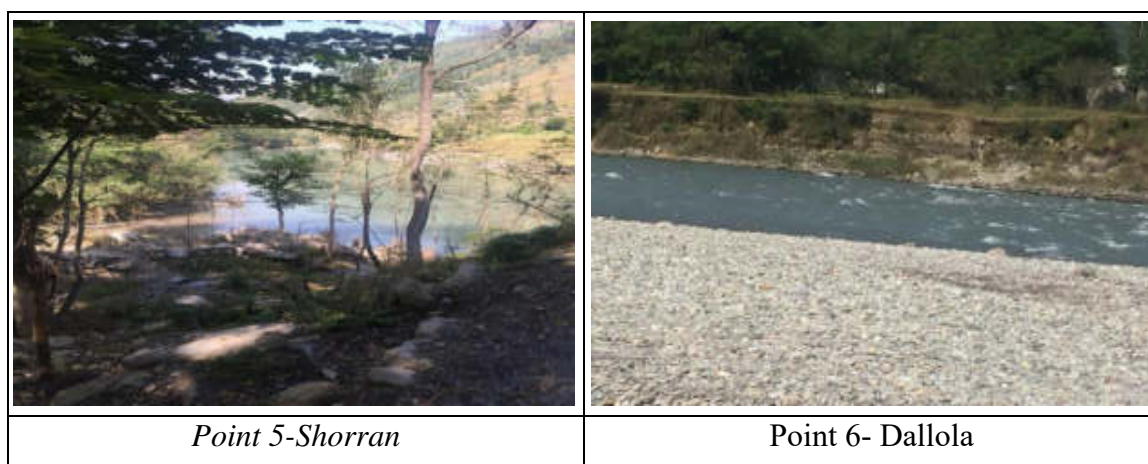
#### 4.5 Point-V (Shorran)

This sampling point is at the tail of the reservoir and is situated at 34° 21' 09" N and 73° 24' 1" E with an elevation of 2556 ft above mean sea level. The sides of the river are rich and thick in vegetation. The air temperature is 22°C and water temperature was 20°C with pH 6.5. The area has become a good ground for the mosquitos and mollusks. No fish was caught here.

#### 4.6 Point VI (Dallola)

This is new sampling point for comparative study. It is situated at 34° 22' N and 73° 23' 34" E, with an elevation of 780 meters. The river flow is quite fast here 35km/h. water temperature is 20°C and ph. 6.5. TDS 400. There is a stone crusher placed beside the river

and many trucks and tractor trolleys visit to transport sand and crush for the market. No fish was caught here



## 5. Result

The migration of the fish has been stopped by the weir at Patrind some 13 km above the point of confluence of River Kunhar with River Jhelum. Species richness index shows that the migratory fish, Schizothorax has more concentration downstream than in the upstream.

**Table 1**

**Water quality of River Kunhar**

Parameter	Point -1	Point- 2	Point- 3	Point- 4	Point- 5	Point-6
Electrical conductivity (mS)	68	68	65	68	76	79
Temperature (°C)	19	19	19	19	20	20
Dissolved oxygen (mg/L)	9.5	9.5	9.5	9.5	8	9.5
pH	6.5	6.5	6.5	6.5	6.5	6.5
Total dissolved solids (mg/L)	430	430	445	424	475	460
Transparency	clear	clear	clear	clear	clear	clear
Odor	No	No	No	No	No	No
Taste	No	No	No	No	No	No



These results remain the same with comparison to last studies depending on the seasonal changes

### 5.1 Reported Fish species of river Kunhar recorded in the Past

Sr. No	Family	Name of species
01	Salmonidae	Oncorhynchus mykiss {Salmo gairdneri} (Rainbow Trout) Salmo trutta (Brown Trout)
02	Cyprinidae	Schizothorax esomus Schizothorax plagiostomus Schizothorax micropogon Schizothorax curvifrons (Snow Trout) Schizothorax labiatus Tor putitora Tor Labeo spp Cyprinus carpio
03	Sisoridae	Glyptothorax kashmiriensis

## 6. Discussion

Dams often act as significant barriers to upstream and downstream fish movement and in our study the presence of the Patrind dam resulted in fish species catch above and below dams. Our analysis demonstrated that species catch was considerably higher downstream of the dam, which is consistent with findings from individual dam impact studies

The most common fish species that were found across the 6 sampling sites were *Schizothorax*. Most astonishingly, *Shizothorax curvifrons* and *Shzithorax dilatata* are not coming in the catch for the last four studies. The only fish species now found is *Shizothorax plagiostomus*. No other lentic water species has ever come into our catch during the studies.

Dams play a vital role supporting Pakistan's development and economy but they do need to be managed and designed in a way that both recognizes and minimizes their direct (e.g. barriers to migration) and indirect (e.g. proliferation of exotic species) impacts to native fish communities. During our study it was found that freshwater fishes, 60% of the migratory species were listed as having declining populations with habitat loss and river modification identified as some of the major causal mechanisms. Due to their cultural and fisheries value in cold waters of Pakistan, the effect of dams on Coldwater fish species have been extensively leading to a requirement for habitat improvement and stocking of fish. However, very little

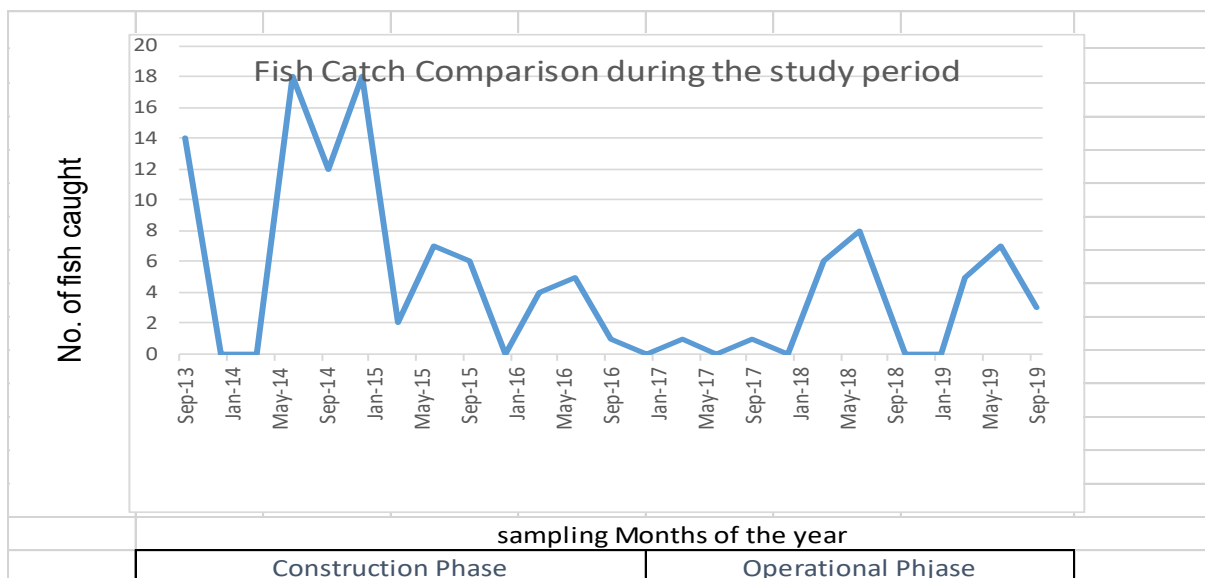
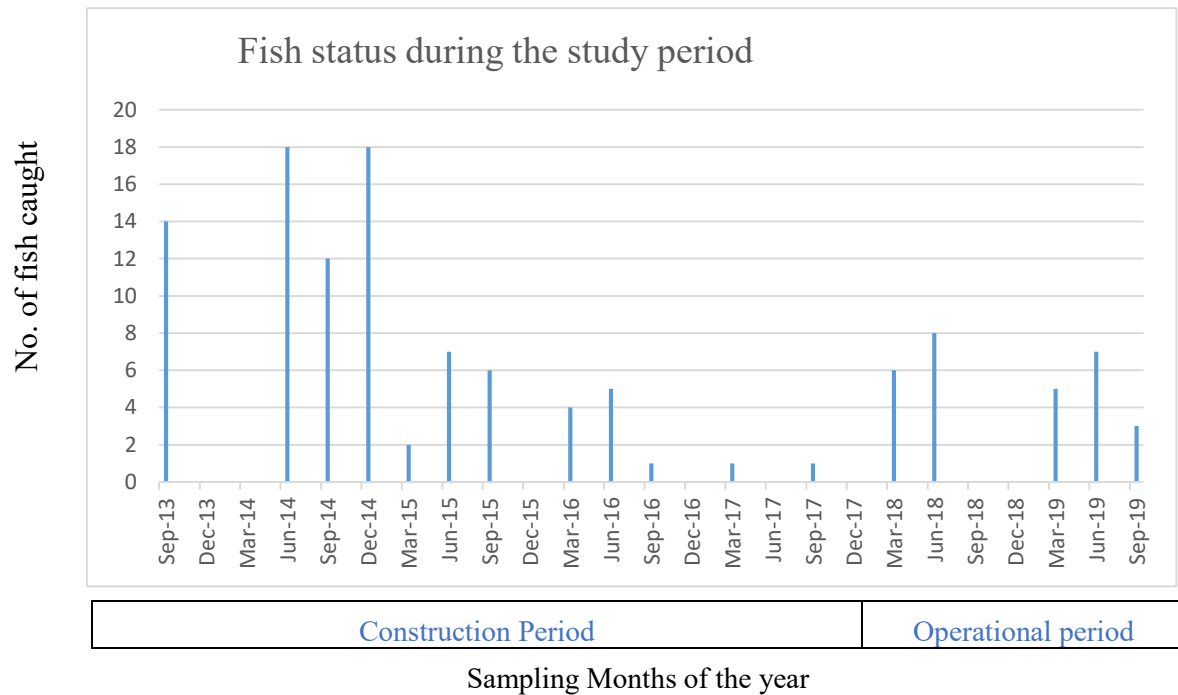
research on the effect of dams and fish passage requirements for other native species has been conducted, so their capture and relocation are generally not a specified resource consent condition.

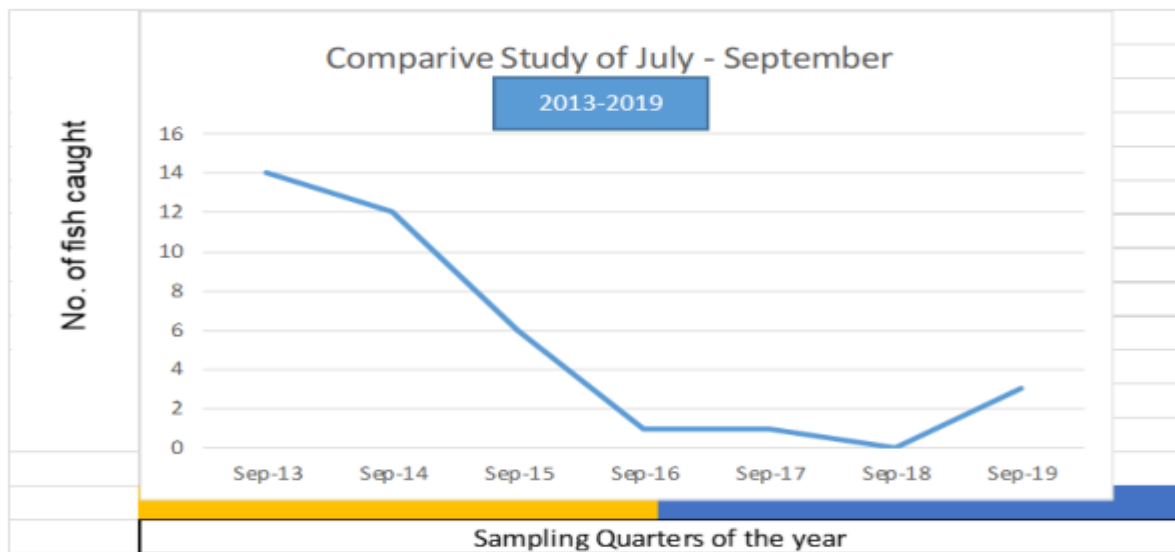
There is plan to construct a new dam about 30 km above Patrind near Balakot. This will further habitat fragmentation of fish habitat and will cause ecological barriers for the fish to survive. Further up to this point, starts the zone of trout fish where survival of the Scizothorax species are limited as trout are the carnivore fish species.

**Table-2: Comparative number of fish Caught at sampling points**

S.#	Study Month	Sampling Point						Total
		1	2	3	4	5	6	
1	September 2013	3	6	4	0	1	0	14
2	December 2013	0	0	0	0	0	0	0
3	March 2014	0	0	0	0	0	0	0
4	June 2014	5	7	4	0	0	2	18
5	September 2014	0	4	1	2	3	2	12
6	December 2014	6	5	0	4	0	3	18
7	March 2015	2	0	0	0	0	0	2
8	June 2015	3	1	1	0	0	2	7
9	September 2015	4	1	1	0	0	0	6
10	December 2015	0	0	0	0	0	0	0
11	March 2016	0	3	3	0	1	0	4
12	June 2016	4	0	0	0	0	1	5
13	September 2016	0	0	0	0	0	1	1
14	December 2016	0	0	0	0	0	0	0
15	March 2017	1	0	0	0	0	0	1
16	June 2017	0	0	0	0	0	0	0
17	September 2017	1	0	0	0	0	0	1
18	December 2017	0	0	0	0	0	0	0
19	March 2018	1	0	1	4	0	0	6
20	June 2018	1	0	0	6	0	1	8
21	October 2018	0	0	0	0	0	0	0

22	December 2018	0	0	0	0	0	0	0
23	April 2019	1	1	0	2	0	1	5
24	June 2019	1	4	1	0	1	0	7
25	October 2019	0	3	0	0	0	0	3





## 7. Recommendations

- Conservation and management of Coldwater fisheries is the main challenge in the project area of the dam on River Kunhar. There is Fisheries conservation staff at Gharri Habibullah but they don't have the official facility of fast mobility to check the illegal and destructive means of fisheries. AJK and KPK Fisheries Department should authorize the project security staff to exercise the powers under relevant Act.
- Expansion of cold-water aquaculture will help local people and sustain livelihood of fisher communities
- Intensive fish culture development in sport fishery will enhance tourism and strengthen local and national income
- Fish breeding grounds should be improved downstream for the resident and migratory species.
- Some hatchery facilities should be developed for the native cold-water fish to be stocked in the potential areas of the streams.
- Implementation and completion of fisheries management plan (FMP) will improve the fish population and will compensate the effects on fish population.

## 8. Acknowledgement

I'm thankful to the organization for having confidence in me and giving me the responsibility of conducting this study. I am also thankful to them for implementing the recommendations to a maximum level and I hope they will do it with the same spirit in the future

My special thanks to Mr. Qamar and Mr. Imran Yousaf for giving me all the support for conducting this study. It would have been extremely difficult to do it without their company and provision of all kind of support to me.

My colleague Ms. Samina Tahir, Ph.D scholar from University of AJK has facilitated me for laboratory work and water sampling. I am grateful to her and Madam Nuzhat Shafi, Head of the Zoology Department, University of AJK for supporting me in collection and sampling facilitation.

All other staff members of the Patrind Hydropower Project have extended every type of facilitation whenever I came to them. I am so grateful to all of them.

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## **Annexure-4**

# **Local Employment Status**

**Total Employment of the Project- Village wise**

Departments	Chatter	Alra	Patrind	MZD	Mirpur	KPK	Other	Total
CEO								
Service Support	6	3	2	3		4	3	21
Maintenance	6	0	0	7		3	7	23
Operation	3	0	2	11	1	5	2	24
HSE (inc CLO)	0	1	1	2		1	0	5
<b>Total</b>	<b>15</b>	<b>4</b>	<b>5</b>	<b>23</b>	<b>1</b>	<b>13</b>	<b>12</b>	<b>73</b>

**Total Employment of the Project- General area wise**

Departments	AJK	KPK	Other	Total
CEO				
Service Support	14	4	3	21
Maintenance	13	3	7	23
Operation	17	5	2	24
HSE (inc CLO)	4	1	0	5
<b>Total</b>	<b>48</b>	<b>13</b>	<b>12</b>	<b>73</b>
Total %	65.75%	17.81%	16.44%	

**List of employees with their details**

Sr.NO	Name	Title	Village	Adress	Proviencie
<b>OPERATION TEAM</b>					
1	Habib ur rehman	1 <sup>st</sup> Engineer	Tarbela	House # B-12, R.V.C Tarbela KPK, Pakistan.	KPK
2	Amir Latif khan	Shift Charge Engineer	Chatter	House # B-12, Upper Chattar Housing Scheme Muzaffarabad, Ajk.	AJK
3	Nokhaiz Javed	Shift Charge Engineer	Mirpur	House # 129-A. Sector F-1, Mirpur, AJK.	AJK
4	Shameem Walayat	Shift Charge Engineer	MZD	Ward # 5, Near Zibah Khana, Eid Gah Road, Muzaffarabad, Ajk.	AJK
5	Raja Tahir Qayyum	Shift Control Engineer	MZD	Airport Road, Manak Pian, Muzaffarabad, AJK.	AJK
6	Yasir Ahmed Awan	Shift Charge Engineer	MZD	D2 Electricity Colony, Gojra bypass road, Muzaffarabad, AJK.	AJK
7	Shehryar Khan Jadoon	Shift Control Engineer	Nawsher	S.S House, Karachi Wala Colony, Lower Muhallah Shoaibzai, Nawansher Abbottabad, Pakistan.	KPK
8	Arshad Haroon	Junior Operator	MZD	Village & P.O.Box, Lawat Balla, Tehsil Athmuqam, District Neelum, AJK.	AJK
9	Muhammad Fiaz	Junior Operator	MZD	Village Kiamanja, Ghari Dupkata, Muzaffarabad, AJK.	AJK
10	Muhammad Usman	Sub-Engineer	Thanda Choha	Village Thanda Choha Post Office Nawana Shehr Tehsil And Dist Abbottabad	KPK
11	Yasir Malik	Senior Charge Engineer	Chatter	House# 13-A, Near MLA Hostel, Lower Chatter, Muzaffarabad, AJ&K	AJK
12	Ahsin Mumtaz Gilani	3 <sup>rd</sup> Engineer	MZD	Rasheedabad, Muzaffarabad, AJK	AJK
13	Sarfraz Ashraf	Shift Control Engineer	Bhakar wali	Chak No. 136 RB Bhakrewali Tehsil Chak Faisalabad, Punjab, Pakistan	Other
14	Umair Kiani	Shift Control Engineer	MZD	Ward # 18, Chella Bandi, Muzaffarabad, AJ&K	AJK
15	Sikandar Ali	Junior Operator	Sararti	Sarati Rehmanabad Boi, District Abbotabad, KPK	KPK
16	Ahsan Qureshi	Shift Control Engineer	Patrind	Village Patrind, AJ&K	AJK
17	Muhammad Mudassir	Shift control Engineer	Kumgran	Anderwan Hussain Aghahi house No. 797/3 muhalla kumgran Multan	Other
18	Mehtab Ahmed	Sub Engineer (Weir)	Nakra Janderbari	Village Nakra Janderbari P.O.Box Nakra Janderbari Abbottabad	KPK
19	Addil Yusaf	Shift Charge Engineer	Chatter	Upper Chatter Qureshi Muhalla, Muzaffarabad, AJ&K	AJK
20	Raheel Chan Zab Mughal	Junior Operator	MZD	kangar serameel, Muzaffarabad AJK	AJK
21	Hammad Raza	Block Operator	MZD	Darra Battangi, Muzaffarabad	AJK
22	Muhammad Khizar Farooq	Junior Operator	MZD	village Sarrar, Muzaffarabad	AJK
23	Ahsaanullah	Block Operator	Patrind	village Patrind, Muzaffarabad	AJK
24	Muhammad Anwar-ul-Haq	Junior Operator	MZD	P.O.Box Lawat Tehsil Athmuqam, District Neelum, AJK.	AJK
<b>Maintenance Team</b>					
1	Safdar Yasin	2 <sup>nd</sup> Engineer (Mechanical)	Darya Khan	Farooqabad Darya Khan, Distt. Bhakkar Punjab, Pakistan.	Other
2	Ishaq Ahmed	2 <sup>nd</sup> Engineer (Electrical)	Abbotabad	House # 377, Link Road, Abbotabad KPK, Pakistan.	KPK
3	Syed Haider Ali Hashmi	3 <sup>rd</sup> Engineer (Mechanical)	Lahore	House # 11-B, Hashmi Street # 17, Tajpura Shad Bagh, Lahore, Pakistan.	Other

4	S.M Zaheer U Din	3 <sup>rd</sup> Engineer(C&I)	Chatter	Near Patrind Hydro Power Project, Lower Chatter, Muzaffarabad Ajk.	AJK
5	Waqas Khan	3 <sup>rd</sup> Engineer(Electrical)	Abbotabad	CB-500,Emplpyee colony Jhangi seadain,Abbottabad	KPK
6	Aaqib Khan	Sub-Engineer (Mechanical)	MZD	Ward No 18, Chella Bandi, Muzaffarabad, AJK.	AJK
7	Salar Khan Jadoon	2 <sup>nd</sup> Engineer (Civil)	Abbotabad	S.S House, Karachi Wala Colony,Lower Muhallah Shoaibzai,Nawansher Abbottabad,Pakistan.	KPK
8	Sadaqat Bashir	Sub-Engineer (Civil )	MZD	ward 18, Chella Bandi ,Muzaffarabad,AJK	AJK
9	Azmat Husain Shah	Senior Officer ( Civil )	Chatter	Nisar Karyana Store, Lower Chatter, Muzaffarabad	AJK
10	Ahmed Shamas	Officer (Civil)	MZD	Mohala Shahnara, Ward No.14, Muzaffarabad	AJK
11	Ammar Ikram	Sub Engineer (C&I)	Lahore	House No. 78-F1 Model Town,Lahore	Other
12	Muhammad Ashfaq	Foreman(Electrical)	Minwali	Pakki Shahmardan, Mianwali,Pakistan.	Other
13	Atif Bashir	Foreman(Mechanical)	MZD	Ward#19, Rajpoot House,Mohala Shaukat Lines, Muzaffarabad, AJK	AJK
14	Aqeel Sheikh	Sub-Technician(Electrical)	Chatter	Lower Chatter, Muzaffarabad, AJK	AJK
15	Abdul Wajid	Technician(Electrical)	Mianwali	Mianwali,Pakistan.	Other
16	Ghulam Mustafa	Technician(Mechanical)	Bhakar	Daggar Shada, Bhakkar,Pakistan.	Other
17	Ajmal Baloch	Crane Operator	Mianwali	Kala Bagh, Mianwali,Pakistan.	Other
18	Tanveer Butt	Sub-Technician(Electrical)	MZD	Mohala Nisar Chela Bandi,Muzaffarabad	AJK
19	Safeer Ahmad Mughal	Sub-Technician(Mechanical)	MZD	Meeran Kalla Muzaffarabad,AJ&K	AJK
20	Syed Rizwan Kazmi	C&I Technician	MZD	Ambore , Muzaffarabad	AJK
21	Sohail Ahmed Qureshi	Sub-Technician(C&I)	Chatter	Lower Chatter, Muzaffarabad, AJK	AJK
22	Naeem Ahmed Qureshi	Sub-Technician (Electrical)	Chatter	Upper Chatter Sundgali Ward No 3, Muzaffarabad	AJK
23	Javed Abbasi	Sub-Technician (Mechanical)	Chatter	Ward No.2 Lower Chatter Muzaffarabad AJK	AJK
Support Service Team					
1	Iftikhar Rouf	Sr. Manager	Lahore	Garhi Shaho , Lahore	Other
2	Usman Mahmood	Manager	Lahore	House#485, Nasheman Iqbal housing Socity, Lahore	Other
3	Muhammad Afan	Senior Officer	Rawalpindi	House#E 65/16,E block Sattlitetown, Rawalpindi	Other
4	Adeel Manzoor	Senior Officer	MZD	Dahriyan syedian ward 13, Muzaffarabad	AJK
5	Ramiz Ahmed Hashmi	Senior Officer	Chatter	Ward 3, Chatter Domail,muhalla sund Gali, Muzaffarabad	AJK
6	Babar Hussain	Officer	MZD	Dak-khana Domail,sanwan,Muzaffarabad,AJ&K	AJK
7	Itizaz Khan Usmani	Officer	Tili Kot	Tili Kot,Dakhkhana Chinari,Hatian Bala,AJ&K	AJK
8	Ishtiaq Ali	Driver	Swabi	Swabi Dar Kala.Po box Dobian,Tehsile Lahore,Distt Swabi	KPK
9	Javaid Iqbal Qureshi	Driver	Chatter	Ward No 2,Gazi Chok,Lower Chatter	AJK
10	Muhammad Mohsin Abbasi	Driver	Alra	PO Box Muzaffarabad Alra, Tehsil & district Muzaffaraabd	KPK
11	Zamir Ahmed	Driver	Patrind	Village Patrind ,Muzaffarabad	AJK

12	Imran Ahmed	Driver	Sarati	Village Didal Sarati Po Dulola ,Abbottabad	KPK
13	Nazar Hussain Shah Kazmi	Driver	Chatter	Mohala Lower Chatter, Muzaffarabad	AJK
14	Raja Shoaib Khan	Driver	Chatter	Ward 2, Lower Chatter , Muzaffarabad	AJK
15	Naeem Khan	Driver	Chatter	Ward No 02,Lower Chatter, Muzaffarabad	AJK
16	Rameez Ahmed	Cleaner	Alra	Alra Dakhkhana,Muzaffarabad	AJK
17	Tabarak Ali	Cleaner	Alra	PO Box Muzaffarabad Alra, Tehsil & district Muzaffaraabd	AJK
18	Jalal Aurangzeb	Cleaner	Patrind	Dakhkhana Muzaffarabad,Patrind, Muzaffarabad	AJK
19	Raja Zohaib	Cleaner	Chatter	Ward No 2, Lower Chatter, Muzaffarabad	AJK
20	Liaqat	1 <sup>st</sup> Cook	Sarati	Burj, Dalola, Abotabad	KPK
21	Tanveer Ahmed	2 <sup>nd</sup> Cook	MZD	Jaho, Kanyinia, Dakhkhana Ghari Dupata, Hytia Bala, Ajk	AJK
HSE Department					
1	Syed Qamar Ali Shah	Senior Manager	Swabi	Shah Gram Karokaly P.O madeen , tehsil bahreen, Dist Sawat KPK Pakistan	KPK
2	Muhammad Imran Yousaf	Senior Officer Environment	MZD	Ward No 18, Chella Bandi, Muzaffarabad, AJK.	AJK
3	Sundas Maqsood	Senior Officer HSE	MZD	Majhui,Dakkana Ghari Dupata,Muzaffarabad	AJK
4	Majid Abbasi	CLO	Alra	Alra Muzaffarabad	AJK
5	Jarar Ul Hassan Khan	CLO	Patrind	Village Boi Tehsil & Distt Abbottabad	AJK

#### Total Employment of the Affectees

Sr. No	Affectes Name	Village	Designation/Working Role	Department
1.	Majid Abbasi	Alda	CLO	HSE
2.	Mohsin	Alda	Driver	Support Services
3.	Tabarak Ali	Alda	Office Boy	Support Services
4.	Imran	Sirrati	Driver	Support Services
5.	Zameer	Patrind	Driver	Support Services
6.	Jalal Aurangzeb	Patrind	Office Boy	Support Services
7.	Fareed	Patrind	Security Guard	Security
8.	Sheraz	Patrind	Security Guard	Security
9.	Javed	Sirrati	Security Guard	Security
10.	Umer	Sirrati	Security Guard	Security



## CAREER OPPORTUNITIES AT HYDRO POWER PLANT

A hydro power sector company is looking for hire the services of experienced professionals for the following positions for O&M of Patrind Hydro Power Plant:

Sector	Minimum Qualification	Position & Experience
Maintenance	DAE Electronics or Equivalent	Possesses high skill and sound knowledge in all maintenance aspects of hydro Power Plant (HPP). Well versed with operating of HPP facilities (PLC, Excitation, Protection, Sensors, CCTV, Telephone Exchange, and Networking). <b>(Sub Technician Control and Instrumentation )</b> Having minimum 2 years of experience in O&M of HPP/CCPP Preference shall be given to HPP personal.
Maintenance	DAE or Equivalent	Possesses high skill and sound knowledge in all maintenance aspects of hydro power plant (HPP). Well versed with operating of HPP facilities (troubleshooting of 0.4kV switchgear, 11kV sweatchgear, 11kV transmission line and all other electrical facility in Powerhouse). (Elec. Sub Technician ) Having minimum 2 years of experience in O&M of HPP/CCPP Preference shall be given to HPP personal
Support Service	BA/BSc. in Business Management or Equivalent	<b>(Officer -Administration, Finance &amp; Procurement)</b> Graduation in business management or related field from a recognized university with more than 60% marks.

- I. Fluency in written and spoken English is mandatory.
- II. Only shortlist candidates will be call for test and interview.
- III. Proficient in computer application skills including Word, Excel, Power Point, etc.
- IV. Send your latest CV mentioning current & expected salary along with photograph, contact number and current job title to the following: [powersector11@gmail.com](mailto:powersector11@gmail.com) latest by **31<sup>st</sup> July 2018 with clear job title** in email "subject".  
(If the CV has not include information mentioned above, it may be a disadvantage during the document review)
- V. Management can cancel any or all positions at any time without prior notice.
- VI. Use of any influence during the selection process would immediately result in disqualification of the candidate

**Only shortlisted candidates will be contacted.**

**The company will not respond to any query or email.**

## **Annexure-5**

# **Vegetation Monitoring Study**

**Patrind Hydropower Project**

**Vegetation Study**

**Jul-Sep 2019**



**Edinburgh Direct Aid (EDA)**

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## **VEGETATION STUDY OF PATRIND HYDROPOWER PROJECT**

**July-September 2019**

### **1. Abstract**

Economically, socially and more important, environmentally a state is supposed to be stable when its 25% of the area is covered by the forests. The area with hilly tract needs more forest cover to control erosion, land sliding and water conservation. Forest cover in Pakistan is less than 5% of the total land area (GoP 1991) and is said to be rapidly deteriorating due to unplanned and unsustainable use of the resources, especially in the mountain regions (IUCN 2002). Forest land of AJK covers 45% of the total State land but productive forests are about 9%. The forests of the state are under threat from over and unplanned exploitation.

The area of Patrind Project on both sides of the hill, lies in the Himalayas subtropical zone with Chirpine as a major associate of the broad-leaved trees. Forest composition, community structure and diversity patterns are important ecological attributes significantly correlated with prevailing environmental as well as anthropogenic variables.

High deforestation and disturbed regeneration on the private land has been observed during the study period of the project. A sharp decline in forest vegetation occurred with continuously increased levels of human and livestock interference.

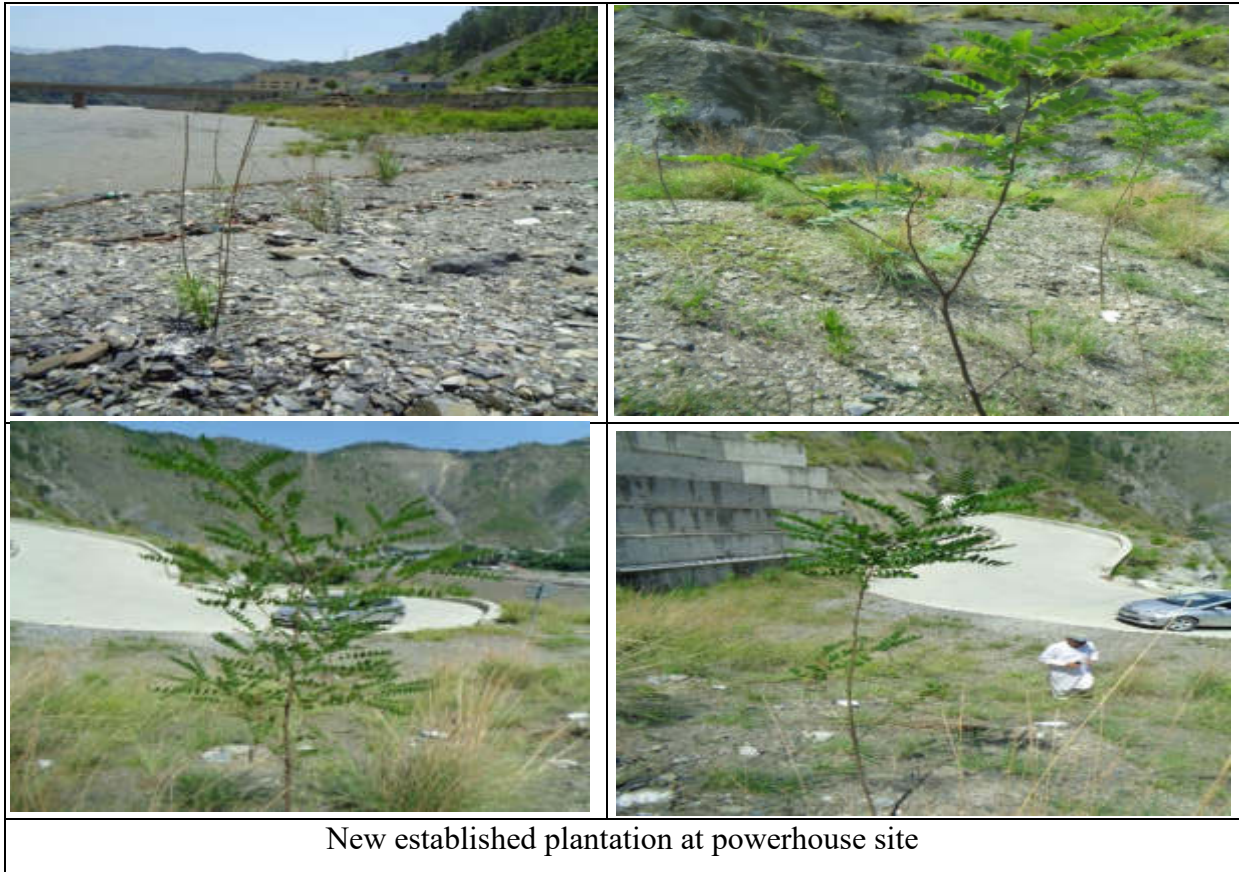
During the last three decades, the mainstream view of deforestation in the Hindu Kush-Himalayan region attributed the phenomenon to increased local use due to population growth.

Some of the other issues relevant to low vegetative cover are common property management, including political influence, property rights, and co-management. Main tree uses are firewood consumption and timber extraction from the private and State land. Another main reason for low tree cover is the high demand for grazing land and fodder for the animals. Local people in the area burn the land after cutting the grass in the month of October and November. This leads to the loss of all vegetative cover on the steep slopes and leaving behind the exposed surface to the mercy of the Nature. The soil loses the water pecculation capability hence, giving support to start of gully making and surface erosion on larger scales.

The loss of vegetation is not compensated fully by reforestation and protection resulting into more forest depletion due to population growth.

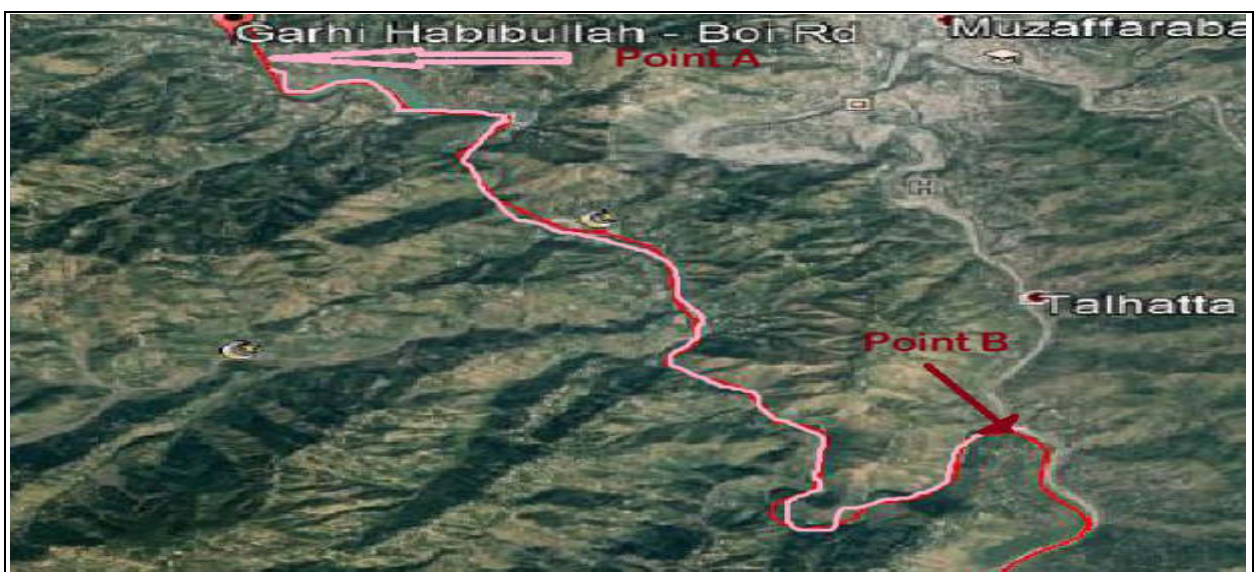
There is no land use policy implemented in Pakistan and AJK, due to which fertile lands are being used for housing schemes like in Lagarpura and Thotha in Muzaffarabad and the steep slopes are not wisely treated resulting into the massive vegetation loss which ultimately causes the land destabilization.





## 2. Introduction

The vegetative study area is about 10 km up and downstream of river Kunhar from the weir point at Patrind (34° 20' 36" N and 73° 25' 10" E) at an elevation of 2516-3123 ft a.m.s.l) and around the powerhouse at Alda (34° 20' 06.05" N, 73° 27' 18.6" E) in AJK. It covers both the eastern aspects on the left bank of river Kunhar and right bank of river Jhelum in AJK. Total Area is about 100 Acres.



*Image of Patrind Hydropower project area (Intake and outlet)*

### 3. Objectives

- a) Immediate objective of the study is ‘to assess the impact of the Patrind Hydropower Project on the vegetation of the area and to restore it by appropriate means’.
- b) ‘To suggest measure to overcome the losses in shape of land erosion and green belts due to the project activities.’


### 4. Forest Types (Ecological Zonation):

The Patrind project area lies in the Sub-tropical ecological zone of the country. This zone is again classified in:

- a) Subtropical Scrub forest with broad leave tree species in the foot hills and
- b) Subtropical Chirrpine Forest with a major tree species of Chirrpine.

### 5. Vegetation Cover

The dominant species of the area is Chirrpine (*Pinus roxburghii*) associated with broadleaved species and bushes. Major associates on the Patrind side are Walnut (*Juglan regia*), Drek (*Melia azedrach*), Phagwarr (*Ficus palmata*). Density of the Chirrpine forest behind the powerhouse is quite good with some wide gaps. This is the forest area up to the top of the hill and other side of the hill is private land.

	
<p><i>Plantation at the base of Alda landslide</i></p>	<p><i>New Chirrpine saplings behind the residential area</i></p>





Three years plantation at Corner-1 of the back of the powerhouse

## 6. Methods

Riversides on the inlet side were observed and effect of the project was visualized on the riparian plant species. The plant regeneration on the right side of the river at Boi have been washed away by the sudden flood due to drainage of the reservoir for maintenance purposes in the month of August 2019. There is a positive impact observed on the vegetation at farther side of the river as the density of the vegetation has been thickened during the course of study.

Survival of the planted species was calculated on the basis of dead plant count in the sample plot of all six corners. Chir pine forest under and around the heavy and light transmission lines were also analyzed on the basis of observations of the last study. Plant species of lower story were noted down and their health was analyzed. Plant species on the plots were also analyzed on the basis of dry number of plants with relation to success. Loose soil patches were observed and noted down for proper treatment inside the project area.

## 7. Plant Species of the area

Following tree species were documented in the project area both in Patrind and in Alda:

Common Name	Botanical Name	Status	Type of Tree
Akhrot (Wallnut)	<i>Juglans regia</i>	Fruit	common
Anjeer	<i>Ficus carica</i>	Fruit	Rare
Batang	<i>Pyrus patia</i>	Fruit	common
Batculd	<i>Celtis australis</i>	Soil binder	Rare
Beence	<i>salix spp</i>	Firewood	Common
Ber	<i>Zizyphus mauritiana</i>	Fruit	Common
Chir	<i>Pinus roxburglii</i>	Timber	Common
Dhaman	<i>Grewia oppositifolia</i>	Fodder	Common
Drawa	<i>Ailanthus anus</i>	Firewood	Common
Drek	<i>Melia azadrach</i>	Firewood	Common

Kangarr	<i>Pistacia khunjak</i>	Soil binder	Rare
Kau	<i>Olea cuspidate</i>	Agri tools	Common
Kiker	<i>Acacia nilotica</i>	Firewood	Common
Nim	<i>Azadirachata indica</i>	Firewood	Common
Phagwarr	<i>Ficus Palmata</i>	Soil binder	Common
Phulai	<i>Acacia modesta</i>	Firewood	Common
Pipal	<i>Ficus religiosa</i>	Firewood	Common
Robinia	<i>Robinia pseudoacacia</i>	Firewood	Common
Shahtoot	<i>Morus alba</i>	Fruit	Common
Sherol	<i>Alnus nitida</i>	Firewood	Common
Snatha	<i>Dodonaea viscosa</i>	Soil binder	Common
Talli (shisham)	<i>Dalbergia sisso</i>	Furniture wood	Common

The main contributor grass species were *Heteropogon contortus* (Sariala), *Cenchrus ciliaris* (Dhaman), *Desmostachya bipinnata* (Dab ghaas), and *Cynodon dactylon* (Khabbal).

Comparatively low vegetation cover was recorded in the flat area and high from steep slope areas (74.29%) followed by gentle slope and gully bed areas.



*New Injeer Plant (Ficus caraca)*

## 8. OUTCOME OF THIS STUDY

### Riparian (Streamside) Vegetation

Riparian zone on the downstream side (the areas along streamside that are periodically flooded due to maintenance) contain highly diverse plant communities that are structured by flooding, which creates disturbance and acts as a dispersal mechanism for plants. Because the Patrind dam potentially changes the flood disturbance regime and block the downstream dispersal of plant propagules (seeds), they may cause a downstream change in native and exotic plant species diversity. Dam has also drowned the riparian zone within the impoundment and caused the ecosystem to be fragmented.

The plantation carried out last time is showing good results except the chirpine saplings planted towards the corner 3 and 4. This has been fully damaged by the Porcupine and need to be replanted with taking measures to control the porcupine attack.

The base of the creek and slide area got established to some extent and getting green. This area needs more plantation and gabion work during the December. Planting and engineering works have to be completed within the prescribed period of December to end of January.

Engineering structures alone cannot control the slides and again this will require a huge amount of funds for engineering structures. Treating with short creating instead of treating it with plantation and bio engineering will not be a permanent solution to it. The project is mostly looked after by the Engineers and to them, it is the easiest and permanent solution for treating the slides.

The present status of vegetation on Patrind side does not depend upon the water of river Kunhar but it depends on natural precipitation or water channels taken out of the side nallahs. So reduction in water regime downstream will not affect the vegetation of the area. The average biomass for forage that is submerged under water after the construction of weir was calculated as 3,468 Kg/ha. The total biomass inundated is estimated to about 200 tons. (Farmer Study Report for Patrind project)

The area affected on the weir site due to inundation is 57.2 ha and on the powerhouse site is 5.5 ha which has come under the construction works.

## **9. Possible Impacts of the Project**

The result indicates that landscape, the nature of the rock and the redistribution of rainfall water by run-off are the main sources of spatial variation in the study area. The construction of the dam has positive effect on the groundwater at the upstream and negatively at the downstream of Patrind. Downstream vegetation composition along the banks will make a huge difference as some area which is under river water will have no more water and some invasive plant species may appear on the tract. Impoundment above the dam has some impact on the limited local ecology of the area due to increase of the moisture content and submerging some of the plant species of the area. Ground water will be affected downstream of the Patrind, but apparently dependence on that water is not existing; so no social impact has ever been observed.

## **10. Recommendations**

1. The recent flooding has washed away the new regeneration at close ends of the sides of the river but the farther sides show strengthened density in the vegetation. The present watch and ward should be continued in a longer run for the sustainable establishment of natural vegetation cover along the riverside.
2. Some gabions have been placed in the wider base of the landslide adjacent to powerhouse but it needs more intensive work with more plantation and bioengineering works so that it could be stabilized.
3. The mass of soil under the slide at the right bank of river Neelam should be planted with root-shoot cuttings of bamboo. These cuttings can be extracted from the bamboo plants just near to the old office building at Lower Chatter.
4. The coming planting season must not be missed and in time actions are required to plan the work in December 2019 and January 2020.



5. Attention should be paid in the months of October and November to take care of the forest fires.
6. The newly designed Management Plan should now be implemented, especially during this season of winter to address the issues of plantation and landslide stabilization

#### **11. References**

- Amlin NM, Rood SB (2002) Comparative tolerances of riparian willows and cottonwoods to water-table decline. *Wetlands* 22:338–346
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- Positive and negative impacts of dams a debate – Shodhganga
- Dams and their environmental impacts
- Flora of Pakistan-TJ Roberts
- UND Pakistan-Field Manual on Slope Stabilization

## **Annexure-6**

# **Noise Monitoring Report**



## Monthly - Noise Survey Report

Date: 20<sup>th</sup> Aug. 2019

Sr. No	Location	Type	Time Day/Night	1 <sup>st</sup> Reading db (A)	2 <sup>nd</sup> Reading db (A)	3 <sup>rd</sup> Reading db (A)	Average Reading db (A)	NEQ90 db (A)	Remarks
1.	First Floor	Office Area (Commercial)	Day	52.8	52.9	52.6	52.7	65	
2.	Ground Floor	Office Area (Commercial)	Day	49.3	52.4	52.3	51.3	65	
3.	Basement-1	Process Area (Industrial)	Day	86.0	85.9	85.7	85.8	85	Staff working or visiting these areas must wear ear plugs. Unnecessary exposure must be avoided.
4.	Basement-2	Process Area (Industrial)	Day	90.2	91.3	89.8	90.4	85	
5.	Basement-3	Process Area (Industrial)	Day	87.3	89.5	90.1	88.9	85	
6.	O & M Building	Residential Area	Day	53.5	51.5	51.6	52.2	55	
7.	Korean Accommodation	Residential Area	Day	54.8	55.7	53.8	54.7	55	
8.a	Alda Village Point 1 Day Time	Residential Area	Day	52.6	52.1	51.9	52.2	55	
8.b	Alda Village Point 1 Night Time	Residential Area	Night	44.6	44.0	44.3	44.3	45	
9.a	Alda Village Point 2 Day Time	Residential Area	Day	52.2	53.4	50.1	51.9	55	
9.b	Alda Village Point 2 Night Time	Residential Area	Night	42.3	42.9	43.6	42.9	45	

Note: 03 turbines are operational at 69% efficiency and generating 104 MW.

Monitored By: Imran Yousaf

Signature: 

## Monthly - Noise Survey Report

Date: 25<sup>th</sup> Sep. 2019

Sr. No	Location	Type	Time Day/Night	1 <sup>st</sup> Reading db (A)	2 <sup>nd</sup> Reading db (A)	3 <sup>rd</sup> Reading db (A)	Average Reading db (A)	NEQ/8h db (A)	Remarks
1.	First Floor	Office Area (Commercial)	Day	66.2	63.4	65.3	64.9	65	
2.	Ground Floor	Office Area (Commercial)	Day	60.6	66.5	67.5	64.8	65	
3.	Basement-1	Process Area (Industrial)	Day	83.1	86.9	87.3	85.7	85	Staff working or visiting these areas must wear ear plugs. Unnecessary exposure must be avoided.
4.	Basement-2	Process Area (Industrial)	Day	90.4	90	91.3	90.5	85	
5.	Basement-3	Process Area (Industrial)	Day	90.3	91.2	91.7	91.06	85	
6.	O & M Building	Residential Area	Day	53.2	52.4	53.7	53.1	55	
7.	Korean Accommodation	Residential Area	Day	53.3	53.9	52.9	53.3	55	
8.a	Alda Village Point 1 Day Time	Residential Area	Day	51.3	50.2	47.8	49.7	55	
8.b	Alda Village Point 1 Night Time	Residential Area	Night	44.8	44.6	44.1	44.8	45	
9.a	Alda Village Point 2 Day Time	Residential Area	Day	53.2	53.1	53.3	53.2	55	
9.b	Alda Village Point 2 Night Time	Residential Area	Night	44.3	43.9	43.5	43.9	45	

Note: 02 turbines are operational at 38 % efficiency and generating 56 MW.

Monitored By: Imran Yousaf

Signature: 

## **Annexure-7**

# **Waste Transfer Notes**





## M/s. QADRI ENTERPRISES

PEST CONTROL, WASTE MANAGEMENT & WATER TANK CLEANING SERVICES

### Certificate of Waste Management Service

Waste collected from Patrind hydropower Project was disposed off at Shadra disposal site (Government Approved Disposal Site) after segregation having particular listed below:

Month of July-2019

#### Waste Management Service

##### Particulars

DATE	WASTE TYPE	WEIGHT	RECYCLE WASTE
03-Jul-19	Non Hazardous waste	322 KG	25 KG
10-Jul-19	Non Hazardous waste	305 KG	
17-Jul-19	Non Hazardous waste	276KG	
23-Jul-19	Non Hazardous waste	289 KG	
29-Jul-19	Non Hazardous waste	292KG	



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Issue Date 4, Aug, 2019

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**M/S QADRI ENTERPRISES**

**Waste Management Service**

**Dry, Food, Oily Rags & Recycle Waste According to Waste Tracking From**

**DRY TRASH**

Location : Patrind Hydro Power Project

MONTH OF JULY:2019

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTAL KG
KG	0	0	240	0	0	0	0	0	0	220	0	0	0	0	0	0	195	0	0	0	0	0	215	0	0	0	0	0	210	0	0	1080

**FOOD WASTE**

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTAL KG
KG	0	0	70	0	0	0	0	0	0	75	0	0	0	0	0	0	70	0	0	0	0	0	65	0	0	0	0	0	70	0	0	390

**OILY RAGS**

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTAL KG
KG	0	0	12	0	0	0	0	0	0	10	0	0	0	0	0	0	11	0	0	0	0	0	9	0	0	0	0	0	12	0	0	64

322

305

276

289

292

Description	FOOD WASTE	DRY TRASH	OILY RAGS	FOOD+DRY+OILY =TOTAL	RECYCLE	RECYCLE USED OIL
Total Kg	390	1080	64	1484	25	0



# M/s Qadri Enterprises

PEST CONTROL WASTE MANAGEMENT & WATER TANK CLEANING SERVICE

## Certificate of Waste Management Service

Waste collected from Patrind hydropower Project was disposed off at Shadra disposal site (Government Approved Disposal Site) after segregation having particular listed below:

Month of Aug-2019

### Waste Management Service

#### Particulars

DATE	WASTE TYPE	WEIGHT	RECYCLE WASTE
02-Aug-19	Non Hazardous waste	271 KG	19 KG
08-Aug-19	Non Hazardous waste	304 KG	
16-Aug-19	Non Hazardous waste	348KG	
22-Aug-19	Non Hazardous waste	285KG	
28-Aug-19	Non Hazardous waste	289KG	



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**M/S QADRI ENTERPRISES**

**Waste Management Service**

**Dry, Food, Oily Rags & Recycle Waste According to Waste Tracking From**

**DRY TRASH**

Location : Patrind Hydro Power Project

MONTH OF AUG :2019

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTAL KG
KG	0	200	0	0	0	0	0	230	0	0	0	0	0	0	255	0	0	0	0	0	0	205	0	0	0	0	0	220	0	0	0	1110

**FOOD WASTE**

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTAL KG
KG	0	60	0	0	0	0	0	65	0	0	0	0	0	0	0	80	0	0	0	0	0	70	0	0	0	0	0	60	0	0	0	335

**OILY RAGS**

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTAL KG
KG	0	11	0	0	0	0	0	9	0	0	0	0	0	0	0	13	0	0	0	0	0	16	0	0	0	0	0	9	0	0	0	52

271

304

348

285

289

Description	FOOD WASTE	DRY TRASH	OILY RAGS	FOOD+DRY+OILY=TOTAL	RECYCLE	RECYCLE USED OIL
Total Kg	335	1110	52	1497	19	0



**M/s. QADRI ENTERPRISES**  
PEST CONTROL, WASTE MANAGEMENT & WATER TANK CLEANING SERVICES

**Certificate of Waste Management Service**

Waste collected from Patrind hydropower Project was disposed off at Shadra disposal site (Government Approved Disposal Site) after segregation having particular listed below:

Month of Sept-2019

**Waste Management Service**

**Particulars**

DATE	WASTE TYPE	WEIGHT	RECYCLE WASTE
03-Sept-19	Non Hazardous waste	303 KG	20 KG
11-Sept-19	Non Hazardous waste	321 KG	
17-Sept-19	Non Hazardous waste	295 KG	
23-Sept-19	Non Hazardous waste	271 KG	
27-Sept-19	Non Hazardous waste	269 KG	



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Issue Date 1, Oct, 2019

Page 1 of 1

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M/S QADRI ENTERPRISES

Waste Management Service

Dry/Food/Oily Rags & Recycle Waste According to Waste Tracking From

DRY TRASH		Location : Patrind Hydro Power Project															MONTH OF SEPT.2019															
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTAL KG
KG	0	0	225	0	0	0	0	0	0	0	240	0	0	0	0	0	210	0	0	0	0	0	200	0	0	0	185	0	0	0	0	1060
FOOD WASTE																																
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTAL KG
KG	0	0	65	0	0	0	0	0	0	0	70	0	0	0	0	0	75	0	0	0	0	0	60	0	0	0	65	0	0	0	0	335
OILY RAGS																																
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTAL KG
KG	0	0	13	0	0	0	0	0	0	0	11	0	0	0	0	0	10	0	0	0	0	0	11	0	0	0	5	0	0	0	0	54
		303					321					295					271					269										
Description		FOOD WASTE					DRY TRASH					OILY RAGS					FOOD+DRY+OILY =TOTAL					RECYCLE					RECYCLE + USED OIL					
Total Kg		335					1060					54					1449					2025					20					

## **Annexure-8**

### **Internal Grievances Log**

Sr. #	Ref No.	Date	Summary	Committee Meeting Date	Actions taken / being taken	Status
1	GRC-001	6-Sep-18	Deployment of Office boy	8-Sep-18	Committee decision: Office boy will not do any job except of cleaning	Completed
2	GRC-002	4-Sep-18	Gym for employees	4-Sep-18	Committee decision: Prepare the plan & implement it. The Gym will be established in O&M Accommodation for local employees.	Completed
3	GRC-003	Nov-18	Pick and drop for shift employees	Nov	Committee decision: Arrange the rental vehicle to support shift employees.	Completed
4	GRC-004	Dec-18	Pick and drop for shift employees	Dec	Committee decision: Arrange the rental vehicle to support shift employees.	Completed
5	GRC-005	Mar-19	Increase the space (area) of Mess Hall and salary of cook and his helper	March	Committee decision: The plan approved for increase of Mess hall.	Completed
6	GRC-006	1-July-19	Harassment of employees' family due to letter send by administration for character verification	12-July-19	Committee decision: Such condition will be considered in carefully in the future.	Completed
7	GRC-007	1-July-19	Provision of following details: a. Provident fund b. Food allowance c. Medical allowance	12-July-19	Committee decision: The (a, c) shall be consider in the future. However (b) the food allowance will be increased considering the rate of inflation.	Completed
8	GRC-008	16-Aug-19	Provision of room refrigerator to all O&M accommodation	19-Sep-19	The big size refrigerator will be installed this year. However, in future room refrigerator will be provided, considering budget aspects.	Completed
9	GRC-009	18-Sep-19	Daily Labor demand a. Permanent job b. Increase the salary			Ongoing
10	GRC-10	18-Sep-19	Amendments/revision in the HR-Policy a. Revision of agreement b. Increment policy c. Provident fund d. Mobile allowance e. Get-together f. Rent/Fuel			On going
11	GRC-11	18-Sep-19	Extra duty time of drivers			On going

## **Annexure-9**

# **HSE Flushing Report**

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## 1. Flushing and Impounding

### 1.1 HSE management

- Letters were sent to relevant government departments / stakeholders (DC Muzaffarabad, DC Abbottabad, SSP Muzaffarabad, Police Station Gari Habibullah, Police Station Sadar-Muzaffarabad and Police Station Barar Kot) to inform them about the flushing and impounding program and to request them to take actions for public safety at their end.
- Letters were sent to all commercial boat operators in weir upstream and to schools in weir downstream.
- Company community Liaison officers (CLOs) and HSE team conducted meeting, consultations and awareness sessions among local communities in weir upstream and weir downstream.
- Company CLOs pasted and distributed public safety notices among local communities in weir upstream and weir downstream.
- Company CLOs remained in constant follow-up with communities' voluntary representatives for information dissemination among local communities in weir upstream and weir downstream.
- Announcements were made periodically in all mosques in weir upstream and weir downstream.
- Local communities were continuously alerted by company siren system at weir site.
- For public safety company deployed 16 watch / security guards at 08 key sensitive locations at weir upstream and downstream.
- Company CLOs and HSE team made constant & continuous monitoring / supervision and announcements in weir upstream and weir downstream.

### 1.2 Recommendations / Feedback

- Law enforcement agencies involvement to limit the access of local communities and sand / gravel mafia particularly in Shoran & disposal areas and generally in weir upstream and downstream

## 2. Waterway Tunnel Inspection (HRT, MIV & Penstock)

### 2.1 HSE management

- Confined space (CS) risk assessment was conducted.
- Company HSE and PPE policies & procedures were implemented.
- Permit to work system implemented for CS entry.
- Tool-Box-Talks were conducted before entering into CS.
- In-&-out status log-sheets were maintained for staff working in CS (HRT, MIV, Penstock etc.)
- Fall protection system was installed at HRT access and all required PPEs were provided.
- Multi-gas detector was calibrated through third-party.
- Gas testing inside CS (HRT, MIV and penstock) was conducted by HSE team.
- The oxygen level was satisfactory (20.9 %) there were no presence of toxic gases (like H<sub>2</sub>S, CO etc.)
- Self-contained breathing apparatuses (SCBAs) were procured and provided.
- There was a stand-by company vehicle throughout the activity along with driver with a sufficient amount of cash for emergency.
- First-aid kits were provided at power-house and weir site.
- Emergency contact list was made available at power-house and weir site.
- HSE team conducted consistent and continuous supervision & monitoring of all activities.



- HSE team maintained consistent and close coordination with all departments.

## 2.2 Challenges

- Communication among staff working inside HRT and staff working outside HRT particularly the attendant outside the HRT
- Cable management inside MIV and penstock

## 2.3 Recommendations / Feedback

- Provision of walkie-talkies to staff working inside HRT and attendant outside HRT to improve communication
- Proper cable management inside MIV and penstock need to be ensured in future by making separate routes for electrical cords / cables to avoid obstruction and electrocution in case of insulation damage; and provision of waterproof distribution boxes (DBs) should be ensured inside MIV and penstock, if required.

## 3. Photographs



Conducting Toolbox Talk (TBT)



Installation of Fall Arresting Device at HRT Access



**Gas testing inside HRT**



**Awareness Session & Community Alerting at Shoran Area**



* Must fill in all spaces and provide the date							
Project: Pakistan Pipeline Hydro Project Group 1							
Company: KWH							
Location: HRT Jinnah SDO							
Name	Designation	Date	Time In	Signature	Time Out	Signature	
CHAND BAKSH	Inspector	25/7/19	8:25 AM	[Signature]	9:00 AM	[Signature]	
KAMRAN BAKSH	Inspector	25/7/19	8:28 AM	[Signature]	9:00 AM	[Signature]	
ALI NAJIB	Inspector	25/7/19	8:29 AM	[Signature]	9:00 AM	[Signature]	
RAJIB KHAN	Inspector	25/7/19	8:30 AM	[Signature]	9:00 AM	[Signature]	
SALIM JAMALI	Inspector	25/7/19	8:35 AM	[Signature]	9:00 AM	[Signature]	
MR. KHALID	HOD	25/7/19	9:10 AM	[Signature]	11:00 AM	[Signature]	
MR. HANIF	PTA	25/7/19	9:15 AM	[Signature]	11:00 AM	[Signature]	

**Maintaining In-&-Out Status Log-sheet**



**Barricading the Area to Stop Vehicle Movement**

**Wearing Body Harness with Double Lanyard**