

# Environmental and Social Monitoring Report

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Project Number: 44914-014  
Quarterly Report (April-June 2019)  
June 2019

## Pakistan: Patrind Hydropower Project

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

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# **147 MW PATRIND HYDRO POWER PROJECT**

**2019**

## **Environmental & Social Monitoring Report April 2019 to June 2019**



**Star Hydro Power  
Limited**

6/30/2019



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**List of Abbreviations**

AJK	Azad Jammu & Kashmir
KPK	Khyber Pakhtoon Khwa
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

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

Table 1: HSE Performance Indicators

Indicators	Data
Plant Safe Man-Hours Plant Safe-Days	247,008 (0.247008) 605 (From November 08, 2017 to June 30, 2019)
Lost Time Injury (LTI)	00
HSE / Environmental Accidents	00
Fire	00
Spills	00
HSE Audits / Inspections	18
HSE Training Sessions	12
Emergency Drills (Evacuation, Firefighting & First Aid)	04
Permit-to-works (PTWs) Issued	147
Community Consultations	28

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## 6.2. 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 <a href="#">Annex-1</a> 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. Data is being shared regularly. <a href="#">Sensors are installed on five (05) different locations. Data is being recorded on real-time basis on 10 minutes interval. Please refer to the Annex-2 for details about metering arrangements.</a>
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.
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

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EPA Condition No	EPA NOC Conditions	Compliance Status	Compliance Action/Notes
			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. During the reporting period, one (01) fish study was conducted. 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 <a href="#">Annex-32</a> 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. <a href="#">Before conducting the audit, audit terms of reference (ToR) will be prepared and shared with lenders.</a>
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 last 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. <a href="#">The</a> 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 deputed on powerhouse and weir site areas. No complaint was received in the reporting period.
XI.	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.

EPA Condition No	EPA NOC Conditions	Compliance Status	Compliance Action/Notes
XII.	Arrangements in-place for the execution of CSR plan	Yes	CSR procedure is in place. Based on the CSR procedure, annual CSR plan is developed 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. Please refer to <b>Annex-43</b> for CSR Plan 2019.
XIII.	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.
XIV.	Local Employment	Yes	<p><u>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.</u></p> <p><u>Please refer to the <b>Annex-5</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. In short, local people are working from junior to senior roles including drivers, sub-technicians, technicians, operators, officers, assistant managers and managers etc.</u></p> <p><u>Currently, no female staff is employed. However, there is no gender discrimination during job advertising and hiring process. Please refer to the <b>Annex-5</b> for photo of job advertisement.</u></p> <p><u>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</u></p>

EPA Condition No	EPA NOC Conditions	Compliance Status	Compliance Action/Notes
			and Police. Hiring is being done keeping the locals on priority. Currently, the total staff is 70, out of which 66% from AJK, 17% from KPK and 17% from other parts of Pakistan. In addition, 5 unskilled and 14 security staff are also working, all of them are locals.
XV.	Liability for the correctness and validity of the information provided in EMP	Yes	Agreed.
XVI.	Facilitate EPA team for any visit for inspection/monitoring, etc.	Yes	The Company will always facilitate all the stakeholders including EPA for site visits.

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

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Table 3: Compliance Status of ESMP

ESMP Reference #	ESMP Requirement	Compliance Status	Compliance Action/Notes
Section 6.1	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 waste water analysis conducted in the reporting period. Please refer to <b>Annex-64</b> for the report.
	Quarterly Flora/vegetation monitoring	Yes	During the reporting period, one (01) 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-75</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 power house). This monitoring is being done internally by the HSE team.  Noise monitoring is being done regularly and data is being maintained.



ESMP Reference #	ESMP Requirement	Compliance Status	Compliance Action/Notes
			<p>All the noise readings were in compliance with NEQS except basement where noise level was slightly above the NEQS. This <del>may be</del> due to variations in process conditions. All the staff were instructed to use proper PPEs i.e. hear-plugs while working in the basement and to work in the area only when required to minimize noise exposure. Hear-plugs have already been provided to all staff for hearing protection. Maintenance department is ensuring the regular maintenance of plant equipments for their efficient working. This will also help in controlling noise level.</p> <p>Please refer to <b>Annex-86</b> for the noise monitoring reports.</p> <p>All the noise readings are in compliance with NEQS. Please refer to <b>Annex-6</b> for the noise monitoring reports.</p> <p>Further company has conducted a hearing tests of all staff. These tests were conducted to gather baseline data of staff for their hearing levels and will be used for comparison with subsequent periodic hearing test results during the operational phase. The baseline test results show that 95% of staff has normal results while 5% have minor hearing issues. As per the Audiologist, these minor hearing issues were due to age factor, reaction of some antibiotics and personal life style factors. The Audiologist also proposed to the individuals mitigation measures for hearing protection and improvement. These tests will be repeated periodically. As mentioned earlier that hear-plugs have already been provided to all staff for hearing protection.</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. Please refer to <b>Annex-97</b> waste transfer notes.</p>

ESMP Reference #	ESMP Requirement	Compliance Status	Compliance Action/Notes
	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	Labors / Employees are being managed as per applicable regulations and standards. <a href="#">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 Annex-10</a>
	Workers/Staff Health & Safety as per applicable regulations and standards	Yes	Please refer to <b>Row XIII of Table 2, Section 2.</b>
	Grievances from communities and any affected people Grievances from civil society organizations Grievances from labor/employees	Yes	For external grievance redressal mechanism, please refer to <b>Row X of Table 2, Section 2.</b>  Internal grievance redressal mechanism is also in place. Internal GRC has been formed and the complaint box has been installed. No complaint received in the reporting period.

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

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Table 4: Compliance Status of EMP of EIA Addendum

EIA Addendum Reference #	Impacts	EMP Requirement	Monitoring Frequency	Compliance Status	Compliance Action/Notes
Table: 6.4	Water Impoundment	Water Elevation Level Incoming/outgoing flow	Monthly	Yes	Water impoundment is being monitored via sensors. Every <del>ten minutes</del> <del>three-second</del> data is being uploaded on the system. <a href="#">Sensors are being calibrated annually through third-party experts while all the sensors are being inspected/checked</a>

					visually by maintenance team on monthly basis.  For details on sensors, please refer to the <b>Annex-2</b> .
	Environmental Flow	Water flowing downstream 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 is planned in the coming quarter.

## 5. Compliance Actions against other HSE Plans

**Table 5: Compliance Actions against other HSE Plans**

S. N	Plan	Compliance Actions in the Reporting Period
1	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 will be released by K-water Head Office in third quarter.</li> <li>CSR activities will be conducted in forth quarter.</li> <li>CSR activities by SHPL are conducted.</li> </ul>

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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 drivers management as per the TMP for public safety</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> </ul>

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

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- CSR plan 2019 has been approved. Please refer to **Annex-43** for details.
- No grievance from the local communities was recorded (both at powerhouse and weir site areas) in the reporting period.
- Job advertisements for daily labors in local languages pasted in local villages by CLOs.
- Deputy Commissioner Abbottabad was briefed about company social management activities in open public meeting. His visit to the weir site was successfully managed.
- Community Liaison Officer (CLO) supported to service support department for issuance of local employees' character certificates from local police stations.
- 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. All these were awareness sessions. However, during these sessions issues like local employment and social welfare also came under discussion. CLO briefed the communities about company hiring procedure and locals working currently in the company. CLO also briefed them about company CSR procedure and plan.
- Company is planning to hire temporarily ten (10) watch guards during upcoming flushing program. These guards will be deployed at key sensitive locations at weir upstream and downstream to avoid any negative social impact/incident during the flushing program. CEO of the Patrind O&M Private Limited (POPL) has approved the hiring of the watch guards.

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

- Compliance with HSE plans is being ensured for staff and public safety. Please refer above the Section 05.
- HSE award ceremony was conducted in the month of April 2019 and letters of appreciation were awarded by CEO POPL to the best safety performers.
- For gathering baseline data; the hearing tests/audiometry of all employees were completed during the reporting quarter. Please refer to [Annex-11](#) for sample test reports of staff. These tests were conducted to gather baseline data of staff for their hearing levels and will be used for comparison with subsequent periodic hearing test results during the operational phase. The baseline test results show that 95% of staff has normal results while 5% have minor hearing issues. As per the Audiologist, these minor hearing issues were due to age factor, reaction of some antibiotics and personal life style factors. The Audiologist also proposed to the individuals mitigation measures for hearing protection and improvement. These tests will be repeated periodically. As mentioned earlier that hear-plugs have already been provided to all staff for hearing protection.
- 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.
- Contracts renewed regarding waste management and third-party monitoring studies due to the company shifting to POPL from K-water.
- Waste generated during operations at sites is being managed in accordance with environmental and waste management plan. Different color waste bins are placed for segregation of waste. Waste collection and transfer by the waste contractor is in accordance with environmental standards.
- 550 liters of used oil has been handed over to the recycling contractor in the reporting period and the certificate has been obtained from the contractor. Please refer to [Annex-97](#) for oil disposal certificate.
- 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 2nd quarter. Overall there is no significant negative impact of operational activities however due to annual plantation campaigns and presence company security guards vegetation cover on both sites has been improved significantly.
- Blood pressure (BP) apparatus was procured by HSE and all employees can avail the facility to monitor their blood pressure.
- Lock-out and tag-out (LOTO) training were given to operation and maintenance staff by HSE to avoid undesirable consequences in the form of unexpected energization or startup of machinery and equipments during service or maintenance activities.
- Awareness sessions were given to staff in the reporting period regarding environmental and social management plan (ESMP).
- Three (03) HSE inspections were conducted in the reporting period. Overall HSE compliance was satisfactory and no major HSE issues were recorded. Some minor

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issues observed include exposed conductor / panel at weir site; discharged fire extinguishers at some places; stairs sharp edges in B3 area (Powerhouse); and littering around the O&M building etc. All these issues were rectified by the relevant departments.

- Sampling for water quality analysis was carried out on both sites (powerhouse & weir) in the reporting period. (09) Samples were collected from powerhouse area and (06) samples were collected from weir site area. These samples were collected from Kunhar River, Jhelum River, springs, septic tanks, filtration plant; and office & accommodation areas etc. Laboratory analysis of the samples has been completed and results have been received. Results are in compliance with NEQSS. Please refer to **Annex-64** for the laboratory results.
- On the basis of risk assessments, HSE training plan was revised in the reporting period. Please refer to **Annex-129** for the revised training plan.
- HSE team visited Kaghan gauging station in the reporting period for conducting work at height (WAH) risk assessment.
- New cover-alls have been procured for maintenance team including daily labors. Two (02) cover-alls were given to each staff member of the maintenance team.

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#### 11.8. Livelihood Restoration Program

Apart from the employment to male members of **APSAPs (10 persons from affectees)**, 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 earn some money but they are now capable to stitch for their families which is a cost saving side of the program.

The Company as part of income restoration program is conducting vocational trainings for females of the local communities both in AJK and KP. Recently two programs were completed in Patrind Village (AJK) and Deedal Village (KP). During the training, the Company recommended the training instructors to train the females in making schools dresses for the children. The dresses made by the participants during the training were to be distributed in the children of local primary schools as part of Corporate Social Responsibility (CSR) activity of the Project.

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Approx. 50 school dresses were made during the training which were distributed in the school children in primary school Deedal and Basic Education School in Patrind. For the distribution of these dresses, the Company invited DG PPC-AJK as Chief Guest on May 17, 2019.

All the trainees were present during the distribution ceremony at both the schools along with the instructors.

### **12.9. CSR Activitties**

As part of the CSR activities conducted by the Company, on the instructions of Chief Secretary AJ&K, the Company arranged Ifar/Dinner at general public at two locations i.e. CMH Hospital and AIMS Hospital Ambore in Muzaffarabad. The activity continued for five days at both the locations and at least 300 persons were being served every day.

The arrangements were done at the hospitals from Tuesday, 14th May 2019 to Saturday 18th May 2019.

The government departments i.e. PPC and district administration were also satisfied with entire arrangement.

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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.

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<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.



#### 14.11. Photographs

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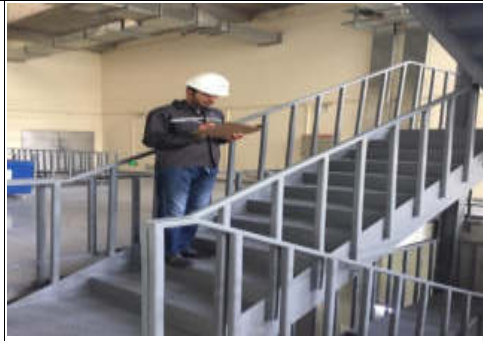
Safety Star Award Ceremony



Employees Hearing Tests



Fire Extinguishers Inspection



Noise Monitoring



Waste Management



Fish Monitoring Study



Vegetation Monitoring Study



Procurement of Blood Pressure Apparatus



Community Consultations





Visit of HSE Team at Kaghan Gauging Station



Water Quality Monitoring



Awareness Session on LOTO



Power House HSE Inspection

**DRESS DISTRIBUTION PICTURES**



**IFTAR/DINNER PICTURES**



## **Annexures**

## **Annexure-1**

### **Environmental Flow Data**



Environmental Flow Data- 2 <sup>nd</sup> Quarter-2019					
April, 2019		May, 2019		June, 2019	
Day / Sensor	Water Flow (m3/s)	Day / Sensor	Water Flow (m3/s)	Day / Sensor	Water Flow (m3/s)
1 Day	2.44	1 Day	2.31	1 Day	79.41
2 Day	2.45	2 Day	4.56	2 Day	71.08
3 Day	2.49	3 Day	2.35	3 Day	92.24
4 Day	2.43	4 Day	2.33	4 Day	122.75
5 Day	2.44	5 Day	4.81	5 Day	66.41
6 Day	2.45	6 Day	2.37	6 Day	42.44
7 Day	8.48	7 Day	2.36	7 Day	14.17
8 Day	2.55	8 Day	2.35	8 Day	19.22
9 Day	2.55	9 Day	4.15	9 Day	46.21
10 Day	20.23	10 Day	4.97	10 Day	76.66
11 Day	5	11 Day	14.42	11 Day	150.79
12 Day	7.23	12 Day	13.25	12 Day	139.17
13 Day	2.69	13 Day	2.44	13 Day	65.56
14 Day	2.64	14 Day	2.33	14 Day	36.6
15 Day	4.19	15 Day	49.95	15 Day	102.73
16 Day	44.51	16 Day	36.97	16 Day	82.41
17 Day	10.29	17 Day	2.31	17 Day	68.89
18 Day	23.16	18 Day	3.12	18 Day	64.94
19 Day	6.46	19 Day	13.33	19 Day	92.54
20 Day	2.41	20 Day	25.24	20 Day	87.83
21 Day	2.43	21 Day	15.96	21 Day	58.04
22 Day	2.42	22 Day	20.9	22 Day	91.19
23 Day	16.22	23 Day	32.34	23 Day	104.17
24 Day	2.39	24 Day	13.43	24 Day	130.46
25 Day	35.19	25 Day	10.93	25 Day	88.1
26 Day	38.17	26 Day	65.94	26 Day	89.87
27 Day	2.23	27 Day	50.15	27 Day	110.07
28 Day	2.22	28 Day	47.79	28 Day	52.62
29 Day	20.61	29 Day	42.81	29 Day	83.6
30 Day	2.32	30 Day	59.74	30 Day	104.62
		31 Day	91.06		

Monthly Discharge Measurement at Bella (Boi)

Sr. No	Month	Flow Reading (Cumec)	EPA Requirement (Cumec)
<sup>1</sup>	April, 2019	4.032	3.7
<sup>2</sup>	May, 2019	5.115	3.7
<sup>3</sup>	June, 2019	No monitoring was carried out as the flow was more than the required flow. <sup>2</sup>	3.7

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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.

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## **Annexure-2**

### **Water Sensors Location**

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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**

**Impact of Patrind Hydropower on the Fish Resources of Kunhar River**



*January-March 2019*

*Edinburgh Direct Aid*

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## 1. Executive Summary

The K-Water Company has constructed 147 megawatts (MW) Patrind Hydropower Project on the Kunhar River. The Project is located about 13 km upstream of the point of confluence of River Kunhar with River Jhelum, straddling the state of Azad Jammu and Kashmir (AJK) and the province of KPK. The Project will generate electricity to be fed into Pakistan's national transmission network. Main features of the Project include about 80 m high dam, and a reservoir that will extend about 8 km upstream of the dam wall. The fish and aquatic life in the Project area is under pressure from illegal fishing, use of dynamites, poison and unregulated sand and gravel mining which damage the fish habitat and breeding areas. These pressures, though limited, are projected to increase over time. Developments in similar rivers in the region indicate that if present trends continue, the damage to river ecology will be highly significant in the long run, possibly overshadowing the impact from the Project itself.

There are 12 fish species reported in Kunhar River and its tributaries upstream of confluence point of Kunhar with Jhelum River that are important breeding grounds for fish. In addition to Mahasheer and Snow Trout that are classified as Endangered and Vulnerable respectively in the IUCN Red List of Threatened species. There are fish species present that are endemic, only found in this region of the world. In addition to Mahasheer and Snow Trout, species of food value include the Common Carp as well. The most affected fish species will be the comparatively long-distance migratory Snow Trout which migrates from downstream in spring to higher upstream elevations for breeding and returns to lower elevations in the fall. Its migration has been impacted due to dam which may result in decline in its population downstream of the dam. The Endangered Mahasheer shows local movement between the main river where the larger specimens take refuge in winter, and tributaries in the summer where they breed. This species is almost extinct even before the inception of the Patrind Project.

The dam is operated in the peaking mode in the winter season when the river flow drops. In this mode of operation, water is stored in the reservoir during the day, and released through power generation turbines for three to four hours in the evening to meet the peak electricity demand. Sudden changes in flow may impact aquatic life when the water is released from the dam for peaking purposes.

The impact on the aquatic life can be reduced to a certain level and for that mitigation measures were suggested in the newly developed Fisheries Management Plan.

### 1. The Objectives of the study

The objectives of the study in relation to dams are of two types. First, the conventional objectives which apply to almost all types of dams and secondly specific objectives which apply to the localized conditions of the dams. ~~It is important to develop a~~ comprehensive



Fisheries Management Plan has been prepared to achieve these objectives in a particular time with a well-defined budget line.

1. To maintain stock abundance at high levels.
2. To reduce the risk of overexploitation and stock collapse.
3. To achieve sustainability of the production of commercially important species.
4. To prevent the loss of fish biodiversity.

~~Dams impose very specialized and rigorous conditions on fisheries and aquatic environments. Therefore, a further set of dam specific objectives may be formulated to support and elucidate the above general objectives. These include:~~

- ~~• To develop the new fisheries potentials created in the reservoir of the dam.~~
- ~~• To maintain fish biodiversity and production in affluent streams entering the reservoir.~~
- ~~• A To maintain fish biodiversity and production in the riverine environments downstream from the dam by the provision of artificial and safe breeding grounds for the fish.~~

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## 4.2. INTRODUCTION

~~Impounded rivers are relatively new aquatic ecosystems in the global landscape. They represent an important economic and environmental resource that provides benefits such as flood-control, hydropower generation, navigation, water supply, commercial and recreational fishing, and various other recreational values. The ecological impacts of impounding a river have been dramatic and extensive. Construction of dams has been driven by economic needs, while ecological consequences have received less consideration. Construction of reservoirs in industrialized countries has slowed down after a peak near the middle of the last century because nearly all suitable sites have been impounded and ecological concerns have become more prevalent. In other parts of the globe, construction continues at a rapid pace (Avakyan and Iakovleva, 1998). Consequently, criteria to develop new reservoirs and understand their impact remain a need in some parts of the world, whereas demand for criteria to manage existing reservoirs to maximize their benefits and minimize or mitigate their ecological impacts continue to increase.~~

Previous fish studies conducted~~Last studies~~ have shown that the Patrind dam has ~~an some~~ impacts on the fish resources of the river Kunhar. The specific impact is on the downstream flow below the dam point and in the water reservoir. The comparative graph shows the downstream decline in the number of the fish over the time after the construction of the dam at Patrind. The impact behind the reservoir is not considerable as the fish can maintain its

migratory behavior. Downstream migration is restricted up to the weir point where the accumulation of fish has been observed during the breeding season of the fish. The flow regime downstream is subject to changes depending on the water quantum during the period of time and during the maintenance period when tunnel water is released. It is important to provide safe artificial breeding grounds, which are not disturbed by the changes in the flow.

During this study, the foot prints of the common Indian Otter (*Lutra lutra*) were observed at the side channel of the area downstream of the weir at point-III (Domel Boi) which indicates the existence of this animal. This is the first time to witness the existence of this rare animal during our study spell before and after the construction of the dam. It can safely be said that dam has nothing to do with the survival of Indian Otter. This could not be sighted but local witness also confirmed its presence. The Presence of common otter (*Lutra lutra*) has been witnessed for the first time of our periodic studies which is a clear indication of the presence of dietary fish of the animal (All Schizothorax species).

### **2.3. Methods and Material**

The study area has been divided into six sampling points for comparative impact assessment at a stretch of about 14 km down and upstream. The points selected were based on the potential of existence of the fish, their breeding ground, abundance of food ingredients, confluence of side streams and migration possibility of the fish. Four points were selected during the pre-construction phase of the dam and sampled during the construction and now 02 new sampling points have been set as the fish catch had become impossible at previous Point III (Parri) and Point V (Disposal area). One point towards down side near village Batangi and one at upstream near village Dalola have been set for further assessment. There are two points where sampling has now become impossible; one at Parri (Point-III) where water flow has become centralized and large boulders have made it impossible for casting or erecting any type of net and second is Point-V at disposal area where casting of net in the reservoir is of no use because of the absence of the fish catch and depth of the reservoir water.

Cast net of 2x2 inch mesh size with a weight of 6 kg has been used and gill net of 1.5x1.5-inch mesh size was used at Point-IV (Weir) to catch fish. A professional fisherman, Mr. Sajid Mehmood was engaged for catching the fish at the sample points of the river Kunhar. The electronic balance was used to weigh the caught fish and normal tap to measure the length.



*Discussion with fishermen for study*

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PH paper was used to measure the hardness and TDS meter was used to measure the total dissolved solid and DO meter for the dissolved oxygen in the stream water. Water samples were collected for other parameters of the river water.

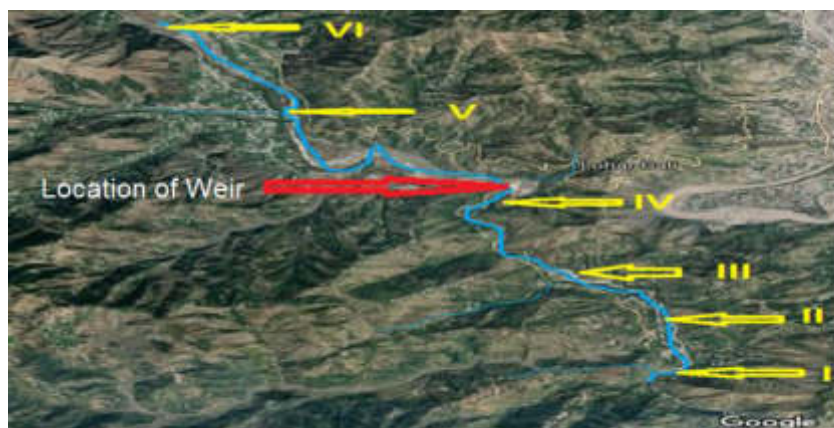


River stretch of Kunhar River from Gahri Habibullah (Point A) to the confluence at Rarra (Point B)

### 3.4. Local wisdom about the fish in river Kunhar

Village Dalola is the new sixth sampling point of the study. During the study, a few locals also came to chat with us. Mr. Arsalan Abbasi told that the fish catch has declined even before the project construction ~~downstream very much and upstream has also been affected~~. The size of the fish has reduced and Glyptothorax species have disappeared altogether. The local fishermen catch the fish by cast net and gill net and sell it in the bazar of Gharri Habibullah. No fisheries staff was met during our field sampling.

### 4.5. Field Results: (Sampling Points)



Google site map of Study Area

#### 4.5.1 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 creek has brought some gravels and sand and making the bed suitable for possible breeding of the fish. Water flow is slow and river water is greyish muddy while the stream water is clear. Water flow is 90 meter per minute, TDS is 530, water temperature is 12.5°C and pH is 6.5. One fish of 165 grams and 24 cm length has been caught here.

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Point 1 View and Fish Caught at Point 1

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#### 4-5.2 Sampling 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 is muddy greyish and water flow is slow, air temperature at this point is 32°C, water temperature 12.5°C and pH 6.5. Four number of fish (*shizothorax plagiostomus*) could be caught here with a weight of 104 grams with 23 cm length, 153 gms with 25 cm length, 81 gms with 20 cm length, 62 grams with 19 cm length.





*Fishing at Point-2*



*Fish caught at sampling point 2*

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#### 4.5.3 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 water is muddy and very slow but nallah water is clear. Air temperature 32°C and water temperature 12.5°C. The river water quantity is high as compared to the last study of March 2019. 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. One fish of 89 gms with 19 cm length fish could be caught here.

	
<i>Clean water of Nallah Boi joining muddy Kunhar river water</i>	<i>The fresh foot print of Otter (Lutra lutra)</i>

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#### 4.5.4 Point IV (Outlet)

The 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 60 ft by 4 ft size 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 and September. The months of April and September-October are the migratory months of the Schizothorax species (*Schizothora plagiostomus*, *S. curvifrons*, *S. dilatate*). The migration is blocked here because of the weir constructed at this point. The water flow is higher (about 60cumecs) because of high water level in the upstream. The pH value of the water is 6.5 and temperature 12°C.



Point IV outlet



Solid waste accumulation at Weir Point

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#### 4.5.5 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 flow of water is faster as compared to the last time 25 km/hr. most probably the reservoir water was low because of the release of water during 7<sup>th</sup> of April 2019. The sides of the river are rich and thick in vegetation. The air temperature is 31°C and the water temperature was 12°C with pH 6.5. The area has become a good ground for the mosquitos and mollusks. Ono small juvenile fish (*S. plagiosomus*) was caught here.



Thick vegetation cover at Shorran



Small juvenile *S. plagiosomus* fish caught at point-V

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#### 2-5.6 Point VI (Dalola)

This is a new set sampling point for comparative study. It is situated at 34° 22' E // N and 73° 23' 34" with an elevation of 780 meters. The river flow is quite fast here 35km/h. water temperature is 13°C and ph. 12. TDS 520. There is a stone crusher placed beside the river and many trucks and tractor trolleys visit to transport sand and crush for the market.



▲ View of point-VI

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#### 4.6. Water Tests

##### 4.7.1 Water quality

The water of Kunhar River having hydropower structures is well oxygenated, less polluted and suitable for cold-water fish (Table 1). The water color and total dissolved solids (TDS) reading is higher than the previous study results (2<sup>nd</sup> and 3<sup>rd</sup> quarters of 2018 ) but within the allowable limits as the water having the flood water with silt and suspended particles in it.

##### 2-7.2 Aquatic life

The Presence of one common otter (*Lutra lutra*) has been witnessed for the first time of our periodic studies which is a clear indication of the presence of dietary fish (All Schizothorax species) of the animal. Kunhar River harbors rich phytoplankton, zooplankton and zoo benthos as the main source of food of fish (Table 2). The reported wet weight of large invertebrates averages 0.7 kg/m<sup>2</sup> in the River. Among the large invertebrates, molluscs comprised 36 percent,

followed by chironomids (34 percent), oligochaetes (16 percent), and crustaceans (14 percent) (Analysis by Ms. Samina Tahir Ph D Scholar). The ecological studies of the Kunhar River have shown a higher density of benthos downstream than upstream (comparative study by Samina Tahir). This may be an important factor supporting the presence of a large number of cold-water fish species, with high abundance, in river Kunhar.

**Table 1**

**Water quality of River Kunhar**

Parameter	Point -1	Point- 2	Point- 3	Point- 4	Point- 5	Point-6
Electrical conductivity (mS)	62	62	65	76	76	79
Temperature (°C)	12.5	12.5	12.5	12	12	12
Dissolved oxygen (mg/L)	9	9	9	9	9.5	10
pH	6.5	6.5	6.5	6.5	6.5	6.5
Total dissolved solids (mg/L)	549	530	545	524	587	565
Transparency	Muddy	Muddy	Muddy	Muddy	Muddy	Muddy
Odor	No	No	No	No	No	No
Taste	No	No	No	No	No	No

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Table 2

Aquatic organisms

Organisms	1	2	3	4	5	6
<b>Aquatic flora</b>						
Chlorophyceae	*	-	-	-	-	-
Bacillariophyceae	*	-	-	-	*	-
Cyanophyceae	*	-	-	-	-	-
Desmidiaceae	*	-	-	-	-	-
Submerged plants	*	-	-	-	-	-
<b>Aquatic fauna</b>						
Protozoa	-	-	-	-	-	*
Rotifera	*	*	*	*	*	*
Copepoda	*	*	*	*	*	*
Cladocera	*	*	*	*	*	*
Plecoptera	*	*	*	-	*	-
Ephemeroptera	*	*	*	*	*	*
Odonata	*	-	-	*	*	*
Diptera	*	*	-	*	*	*
Coleoptera	*	*	*	*	*	*
Hemiptera	*	*	*	*	-	*

Source: Ms. Samina Tahir Ph. D Scholar University of AJK

### 4.7.3 Fish

*Schizothorax* and *Schizothoraichthys* spp are dominant among the cold-water fish at all six sampling points of the River in terms of catch and abundance in all seasons except during floods. They are caught by a series of loops made from a long nylon thread and set across the river in the daytime and harvested in the morning. This fish of River Kunhar is classified as mid and short distance migratory. The cold-water species are important for fisheries and need to be protected.

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Factors triggering the fish migration in the Kunhar River are not well known. Migration is possibly done to find suitable spawning and feeding grounds. Plankton and benthos are washed away by the turbid monsoon water at a lower altitude, but the rapid growth of insects takes place in headwaters during the high-water level phase (June-September). Abundant food and increased water volume may attract large long-distance migratory fish to headwaters during the monsoon. A diminishing flow rate in headwaters and an abundance of fish food organisms downstream induce these fish to migrate back. The short distance migratory fish *Schizothorax* and *Schizothorachthys* move upstream in response to high turbidity, higher water temperature, and due to the scarcity of food during the rainy season in the lower reaches.

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

##### **Family: Salmonidae**

*Oncorhynchus mykiss* {*Salmo gairdneri*} (Rainbow Trout)

*Salmo trutta* (Brown Trout)

##### **Family: Cyprinidae**

*Schizothorax esomus*

*Schizothorax plagiostomus*

*Schizothorax micropogon*

*Schizothorax curvifrons* (Snow Trout)

*Schizothorax labiatus*

*Tor putitora*

*Tor tor*

*Labeo* spp

*Cyprinus carpio*

##### **Family: Sisoridae**

*Glyptothorax kashmiriensis*

#### 4.7. Discussion

Our analyses indicate that the dam has an impact on fish biodiversity in the downstream and in the reservoir at Patrind. The extent and intensity of impact depend on both the location of the dam (with mainstream dams being particularly damaging) and its combined generating capacity. In part, this is because a dam has been constructed in a location where its downstream impacts would influence the areas of the highest species richness index.

It is difficult to extrapolate directly from the results of this study to the possible impacts of damming and global warming on fisheries in the region in general and the Kunhar River in

particular. The species caught shows that there are only one commercially important fish species, (*Schizothorax plagiostomus*) found here. *S. curvifrons* and *S. labiatus* were caught in few studies but now they are not found. There is little or no catch of other species reported in the past and thus our data on the richness and habitable area cannot be directly related to predictions about changes in fishery yields (i.e., reductions in biomass). However, there are continuous reports of reduced size, especially in the downstream area. Other reported species are almost extinct and no more proof of the existence is available.

Breeding grounds might have been disturbed downstream (not identified in ESIA and there is no information available regarding their location) and, in the reservoir, due to changes in the water flow. Detailed survey will be conducted during the follow-up of the Fisheries Management Plan covering the area from the point of confluence of river Kunhar with river Jhelum to the town of Ghari Habibullah up and downstream. The reservoir needs to be managed carefully by the project authorities or by the Fisheries Department of KPK as has been discussed before. There is good coordination of the project authorities with the responsible officials of the Fisheries Department of KPK and this needs to be further improved for developing the proposed Fisheries Management Plan and its implementation with clear responsibility under the supervision of Fisheries expert. The present level of watch & ward and information sharing system is efficient and this must be continued to control any incident due to change in the downstream flow regime of the river Kunhar.

## 2.8. Comparative Findings and Results

The table given below reflects the catch of fish of periodic study at six sampling points of the area.

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Table-3

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

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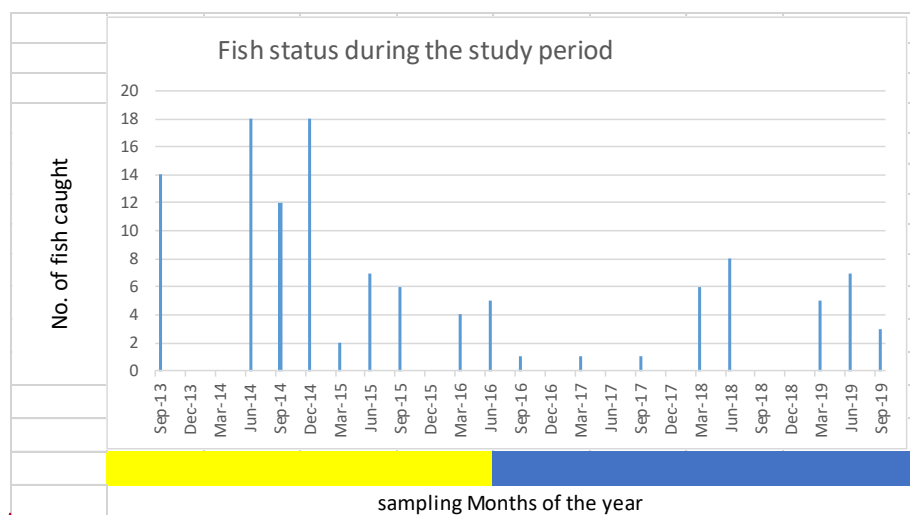
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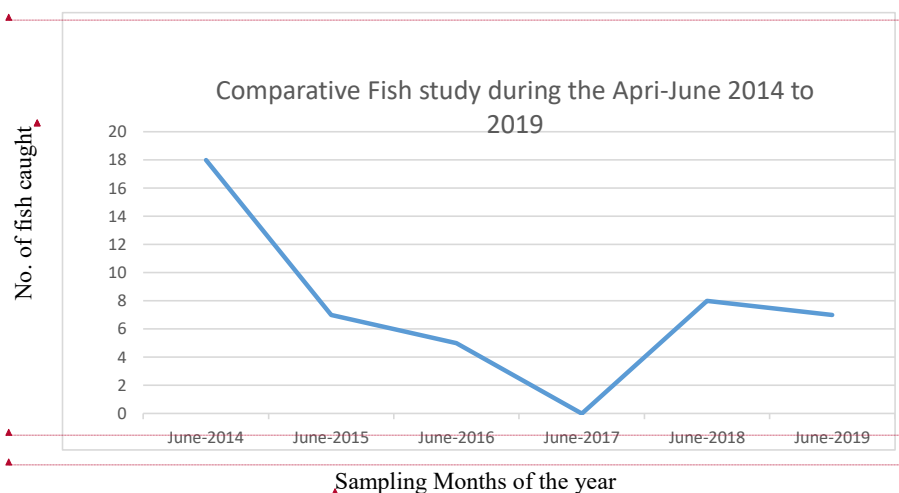
The graph below shows the trend of fish caught over the study period of September 2013 to March 2019



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The line graph above shows the changes in the fish catch. After December 14, the fish catch has reduced as the construction of the dam completed during December 2017. After that, the population of fish is re-establishing but improvement can come if breeding grounds are made available to the fish downstream.



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This line graph shows the fish catch decline in trend from 2014 to 2017 during the March-April study period and then re-establishment during 2018-19 to some extent.

### **3.9. Recommendations**

1. Adequate attention should be given to the conservation of cold-water fish to maintain their gene pool. There is no staff of KPK or AJK Fisheries department for the protection of the area but the project has few this facility at a limited level. Both the department should authorize the project staff to exercise the legal provisions of protection in the area. This will also control the illegal methods used for poaching of fish.
2. Expansion of cold-water aquaculture will help local people and sustain the livelihood of fisher communities
3. Development of sport fishery will enhance tourism and strengthen local and national income
4. Fish breeding grounds should be improved downstream for the resident and semi migratory species.
5. Provisions in the laws should be made to oblige power companies to pay for the most efficient mitigation measure and to prove its efficiency
6. Establishment of a regional cold-water fish center in the upper reaches of Kunhar river would help in the conservation and development of cold-water fishery in the river.

### **4.10. Acknowledgment**

I'm thankful to the organization for having confidence in me and giving me the responsibility of conducting this study. I'm 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 the University of AJK has facilitated me for laboratory work and water sampling. I'm grateful to her and Madam Nuzhat Shafi, Head of the Zoology Department, University of AJK for supporting me in the 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'm so grateful to all of them.

### **5.11. References**



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**Annexure-4**  
**CSR Plan 2019**

	Procedure for Corporate Social Responsibility			The Best Water Partner
	Doc. ID:	Issue Date	Rev. #	
	K Water / HSEP-002	June 11, 2018	00	

Table 01: Annual CSR Plan 2019 (Tentative)

S. #	Area	Scheme / Project	Location	Tentative Cost (Rs)	Tentive Execution Date	Beneficiaries / Benefits / Purpose
01	Drinking Water	Donation of water tank and water pipes to residents of Alra Village	Alra (Powerhouse Area)	65,000	September 2019	To improve drinking water supply to local communities
02	Livelihood	Distribution of 20 sewing machines among poor women of Alra and Lower Chatter villages	Alra, Lower Chatter (Powerhouse Area)	160,000	September 2019	To improve livelihood of poor women / families of local communities
03	Water	Donation of water pump to residents of Lower Chatter living close to powerhouse	Lower Chatter (Powerhouse Area)	20,000	September 2019	To improve drinking water supply to local communities
04	Cultural	Donation of UPS to local mosque in Lower Chatter Village	Lower Chatter (Powerhouse Area)	30,000	October 2019	To facilitate local communities in performing their cultural work
05	Livelihood	Distribution of 30 sewing machines among poor women of Patrind, Sirati and Tarchella villages	Patrind, Sirati, Tarchella (Weir site)	240,000	October 2019	To improve livelihood of poor women / families of local communities
06	Cultural	Donation of fan, water cooler and carpet to local mosque in Shoran Village	Shoran Village (Weir site)	85,000	October 2019	To facilitate local communities in performing their cultural work
Total Cost (Rs / USD)				Rs. 600,000 / USD 4,280.21 (01 USD=Rs 140.18)		

Note: Schemes / projects may change, if required / demanded by communities.

Prepared By:	 Manager HSE & CSR
Approved By:	 GM Patrind HPP
Date:	March 21, 2019

**Annexure-5**  
**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%	

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List of employees with their details

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

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, Dakhkhana 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

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## 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 switchgear, 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-6**  
**Bi-Annual Water Quality Analysis**

 <b>Green Crescent</b> Environmental Consultants (Pvt) Ltd.	 Punjab EPA Certified Laboratory Federal EPA Certified Chemical Laboratory
<h1>Analysis Report</h1>	
<ul style="list-style-type: none"> <li>• Drinking Water</li> <li>• Surface Water</li> <li>• Waste Water</li> </ul>	<h2>PATRIND HYDRO-POWER PROJECT</h2> <p>17 Jul 2019</p>
<p>Job Reference No.: GCEC-PK-262/2019</p>	
<p><small>Green Crescent Environmental Consultant Pvt. Ltd. has prepared this report in accordance with the instructions of Client for their specific purpose. Any other individuals using the content presented in the document shall do so at their own liability. © GCEC Pvt. Limited 112 C/E-1, Hali Road, Golberg III, Lahore TNO +92 42 35761380 <a href="mailto:enquiries@ecgpcpk.com">enquiries@ecgpcpk.com</a> <a href="http://www.gceec.com">www.gceec.com</a></small></p>	



**Green Crescent**  
Environmental Consultants (Pvt) Ltd.



Punjab-EPA Certified  
Laboratory  
Federal-EPA Certified  
Microbial Laboratory

## **DRINKING WATER SAMPLING**



1-Alda Natural Spring (Babli)



2-Alda Natural Spring (Thanda Nars)



3-Korean Accomodation Kitchen Tap Water



4-Powerhouse Support Service Kitchen Tap Water



**Green Crescent**

Environmental Consultants (Pvt) Ltd.



Punjab-EPA Certified  
 Lahore Laboratory  
 Federal-EPA Certified  
 Islamabad Laboratory



5-O & M Building Kitchen Tap Water



6-Mineral Water (Blue)



9-Natural Spring Near Reservoir



10-Natural Spring of Lower Chatter



**Green Crescent**  
Environmental Consultants (Pvt) Ltd.



Punjab-EPA Certified  
Laboratory  
Federal-EPA Certified  
Laboratory

Parameters	Analysis Method	Unit	LOR								NEQS
			01	02	03	04	05	06	09	10	
			MICROBIOLOGICAL ANALYSIS								
Total Coliforms	APHA 9222 B	CFU/ml	Absent	Absent	TNTC	Absent	Absent	Absent	Absent	TNTC	0/100ml
Abbreviations: LOR: Limit of Reporting NEQS: National Environmental Quality Standard TNTC: Too Numerous to Count											
Note: *Certification of all the parameters and laboratory activities at the time of analysis will be provided as per client requirement.											

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**Sample Details**


Job Ref. No:	GCEC-PC-262/2019	Sample Matrix:	Drinking Water Samples
No. of Samples:	Eight	Sample Date:	02-07-2019
Sample Receipt Date:	02-07-2019	Sampled By:	GCEC

**Sample Identification**

01	Aids Natural Spring (Babli)	02	Aids Natural Spring (Thanda Nara)
03	Kareem Accommodation Kitchen Tap Water	04	Poweshome Support Service Kitchen Tap Water
05	O & M Building Kitchen Tap Water	06	Mineral Water (Blue)
09	Natural Spring Near Reservoir	10	Natural Spring of Lower Chatter


Parameters	Analysis Method	Unit	LOR	Result										NEQS
				01	02	03	04	05	06	09	10			
PHYSICAL & CHEMICAL ANALYSIS														
pH	APHA-4500H <sup>+</sup> B	-	0.01	7.01	7.19	7.07	7.24	7.31	7.02	7.16	6.89	6.5-8.5		
Turbidity	APHA-2130 B	NTU	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Hardness	APHA-2340 C	mg/l	0.5	141.12	164.64	70.56	90.18	74.48	98.0	98.0	164.64	< 500		
Total Dissolved Solid (TDS)	APHA-2340 C	mg/l	1.0	577.0	473.0	183.0	242.0	193.0	224.0	246.0	382.0	< 1000		
Chloride	APHA-4500Cl <sup>-</sup> B	mg/l	0.25	11.31	16.97	3.63	7.34	7.34	56.57	11.31	32.06	< 250		
Fluoride (F)	APHA-4500F <sup>-</sup> C	mg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chlorine	APHA-4500Cl <sup>-</sup> B	mg/l	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Sodium	APHA-3500-Na <sup>+</sup> B	mg/l	0.005	3.01	3.09	2.83	3.16	3.21	2.96	3.12	2.96	-		
Potassium	APHA-3500K <sup>+</sup> B	mg/l	0.0009	0.93	1.11	1.01	1.21	1.09	1.23	1.17	1.09	-		
Calcium	3900 Ca D EDTA Titrimetric Method	mg/l	0.4	34.49	43.37	17.25	23.08	20.36	36.65	28.22	43.90	-		
Electrical Conductivity	APHA-2310 B	µs	1.0	568.0	716.0	289.0	346.0	289.0	338.0	372.0	662.0	-		
Carbonate	APHA-2320 B	mg/l	0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
Bi-Carbonate	APHA-2320 B	mg/l	1.2	392.00	309.60	121.52	143.04	125.44	141.12	132.80	411.80	-		






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## SURFACE WATER SAMPLING




11-Jhelum River Down-Stream



12-Jhelum River Up-Stream




13-Weir Site Impounding Area




14-Reservoir (Weir Site)

PAGE 3 OF 5



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Sample Details			
Job Ref. No:	GCEC-PH/262/2019	Sample Matrix:	Surface Water Samples
No. of Samples:	Four	Sample Date:	02-07-2019
Sample Receipt Date:	03-07-2019	Sampled By:	GCEC

Sample Identification			
11	Bachan River Down-Stream	12	Bachan River Up-Stream
13	Weir Site Impounding Area	14	Reservoir (Weir Site)

Parameters	Analysis Method	Unit	LOR	Results				NEQS
				11	12	13	14	
<b>PHYSICAL &amp; CHEMICAL ANALYSIS</b>								
pH	APHA-4500M <sup>+</sup> B	pH unit	0.01	7.10	6.87	7.01	6.92	6-9
Turbidity	APHA-2130 B	NTU	0.1	24.0	28.0	19.0	11.0	-
Biological Oxygen Demand	APHA, 5210	mg/l	1.0	21.0	27.0	7.1	5.2	80
Chemical Oxygen Demand	APHA-5220-D	mg/l	1.0	83.0	90.0	30.0	18.0	150
Total Suspended Solid	APHA-2540-D	mg/l	1.0	13.0	10.0	33.0	6.0	200
Dissolved Oxygen	APHA-4500 O G	mg/l	0.1	5.9	5.3	6.8	6.9	-
<b>MICROBIOLOGICAL ANALYSIS</b>								
Total Coliforms	APHA: 9222 B	CFU/ml	TNTC	TNTC	TNTC	TNTC	TNTC	0/100ml

**Abbreviations:**  
 ND: Not Detected      LOR: Limit of Reporting      NEQS: National Environmental Quality Standard  
 TNTC: Too Numerous to Count

**Notes:**  
*\*Corrections of all the parameters and laboratory conditions at the time of analysis will be provided as per clients requirement*

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## **WASTE WATER SAMPLING**



15-Powarhouse Septic Tank





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Sample Details					
Job Ref. No:	GCEC-PSC-262/2019	Sample Matrix:	Waste Water Sample		
No. of Samples:	One	Sample Date:	03-07-2019		
Sample Receipt Date:	03-07-2019	Sampled By:	GCEC		
Sample Identification					
15	Powerhouse Septic Tank				

Parameters	Analysis Method	Unit	LOR	Result	NEQS
				15	
<b>PHYSICAL &amp; CHEMICAL ANALYSIS</b>					
pH	APHA-4500H <sup>+</sup> B	pH unit	0.01	6.92	6.9
Turbidity	APHA-2130 B	NTU	0.1	52.0	-
Biological Oxygen Demand	APHA-5210	mg/l	1.0	251.0	50
Chemical Oxygen Demand	APHA-5220-D	mg/l	1.0	731.0	150
Total Suspended Solid	APHA-2540-D	mg/l	1.0	230.0	300
Dissolved Oxygen	APHA-4500 O.G	mg/l	0.1	0.9	-
Carbonate	APHA-2320 B	mg/l	0.12	<0.12	-
Total Hardness	APHA-2340 C	mg/l	0.5	983.92	-
Fluoride (F)	APHA-4500F <sup>-</sup> C	mg/l	0.01	<0.01	10.0
Sodium	APHA-3500-Na-B	mg/l	0.0037	1.11	-
Potassium	APHA-3500K-B	mg/l	0.0009	1.88	-
Arsenic	APHA-3500As-B	mg/l	0.01	0.03	1.0
<b>MICROBIOLOGICAL ANALYSIS</b>					
Total Coliforms	APHA-9222 B	CFU/100ml		1800	0/100ml

**Abbreviations:** ND: Not Detected      LOR: Limit of Reporting      NEQS: National Environmental Quality Standard

**Note:** \*Certificate of all the parameters and laboratory conditions at the time of analysis will be provided as per client requirement.

QA/QC

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**Note:** COD, BOD and TSS values are above NEQS level in sample #15. To control the COD level all the staff were educated about minimization and better usage of soaps, Shampoos, detergents etc. while to reduce the values of BOD and TSS company is planning to conduct maintenance of the septic tank to improve its operational efficiency.

**Annexure-75**  
**Vegetation Monitoring Study**

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## **Vegetation Status of the Area**

### **Patind Hydropower Project**



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**Edinburgh Direct Aid**

**April-June, 2019**

**Table of Contents**

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## **VEGETATION STUDY OF PATRIND HYDRO POWER PROJECT**

### **1. Executive Summary**

Impact of small hydropower dams on vegetative cover of the project is of two types. (1). The change in water flow and impoundment of the river affects the riparian species and macrophytes due to change in the micro ecosystem pattern.

(2). Construction of the dam itself affects the vegetation due to tunneling and disturbing the hydrological pattern of the area. The area under the reservoir of Patrind Hydropower Project has submerged many plant species of upper and lower canopy class. The patterns of species composition and diversity in the lesser Himalayan subtropical forests of the project area were studied in relation to environmental variables and underlying anthropogenic influence. Forest composition, community structure and diversity patterns are important ecological attributes significantly correlated with prevailing environmental as well as anthropogenic variables.

The species appeared along the right bank of the River Kunhar during the early studies have washed away due to off and on flooding in the river. New saplings of different species have been sighted but they are not stable and may be washed away during the coming maintenance action of the dam in the month of July/August 2019.

Increase in human population is another major factor in deforestation of the area. More concrete houses are appearing in the mountainous area where forest cover should have been in place. The phenomenon of climate change is a result of decrease in plant cover and increase in the carbon dioxide in the environment.

During the last three decades, the mainstream view of deforestation in the Hindukush-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 ecology, property rights, and co-management. Main tree uses are firewood consumption and timber extraction from the private and State land. The cost of the liquid petroleum gas has gone up in recent hike in price. This will cause the increase in the fuel wood and hence pressure on the natural resources. 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, due to which the steep slopes are not wisely used resulting into the massive vegetation loss which ultimately causes the land destabilization. Patrind is not the only area which has become so prone to land erosion, instead all adjacent areas on both sides of the river Kunhar, Jhelum and Neelum are showing the same picture.

Forest cover in Pakistan is only 5% of the total land area (GoP 1991). and is said to be rapidly deteriorating due to unsustainable use of the resources, especially in the mountain regions (IUCN 2002). 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 percolation capability hence, giving support to start of gully making and erosion on larger scales. Thus, we can say, that the original vegetation is almost destroyed due to the heavy grazing, lopping, poor agricultural practices and urbanization. Because of this shortage of vegetative cover, the area is very badly suffering from soil erosion.

## **2. Introduction**

River damming leads to strong hydro morphological alterations of the watercourse, consequently affecting river vegetation pattern. A multi temporal and spatial analysis of the dam effect on composition, structure and dynamic of the upstream vegetation was performed on Kunhar River in KPK. The main research questions were as follows: How does plant landscape vary over time and along the river? Where does the dam effect on vegetation end? How does naturalistic importance of the vegetation affect by damming change over time? Data collection was performed on comparison of photographs of the previous studies and secondary information from the surrounding locals' communities. The plant landscape has significantly changed over time and along the river, particularly as a result of the dam construction (2015). The major vegetation changes have involved riparian forests and macrophytes. Dam effect on vegetation is evident up to 3 km, and gradually decreases along an attenuation zone for about another 3 km. Despite the fact that the damming has caused strong local hydro morphological modification of the river ecosystem transforming it into a sub-lacustrine habitat, it has also led to the formation of wetlands of considerable naturalistic importance. Indeed, in this man-made wetland under Patrind project, optimal hydrological conditions have been created by favoring both the expansion of pre-existing riparian communities and the rooting of new aquatic communities, change in typical lacustrine ecosystems. Some of these plant communities have become an important food resource, refuge or nesting habitats for aquatic fauna, while others fall into category of Natura 2000 habitats. Therefore, Kunhar river damming seems to have indirectly had a "favorable" effect for habitat conservation and local biodiversity on the weir side of the area.

The 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 outlet 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.

The agricultural production system consists of upper catchments and gullied areas (wastelands), covering some 56% of the area, terraced fields along hillsides (39% of area) and irrigated agriculture (5%). Natural forests and rangelands are the major land use in the upper catchments.

Another factor of land quarrying is destabilizing the slope and loss of vegetation on the hills. A slope near the bazar of Gharri Habibullah is being excavated for stone crush machine which is not only causing the destabilization of the slope but vegetative cover is also damaged.

Agricultural production on the terraced fields depends on runoff water harvesting and soil moisture conservation. These terraced fields were created by leveling with bulldozers/manual labor during the last 3-4 decades. Subsidized machinery encouraged the farmers to level the hillsides without considering the requirements for water harvesting and safe disposal of surplus runoff during high rain storms.

The surrounding area of the powerhouse has badly been disturbed due to forest fire. The area is outside the project but the danger was there for the land under the chirpine species cover as the dry needles on the area are highly combustible to fire.



Picture showing Forest Fire

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Manual labor has been engaged by the project to clear the land from grasses as a precautionary measure for fire control. This is wonderful work carried out by the project authorities and should be continued every year.



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*Image showing the fresh planted and gabion check walls fixed area behind the powerhouse during the last quarter*

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Area behind the powerhouse was planted by the project authorities during the plantation season of February – March 2019 under the guidance of the expert. The new plantation is showing good results except the chirpine plantation. These new plants have been damaged along the whirling roadside of the project by porcupine. The scholars from the University of AJK visited the area and they suggested some remedial actions when beating up activity is carried out in the next season.

Plantation in the season nallah is also showing excellent results

### **3. 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 Chir pine Forest with a major tree species of Chir Pine.

### **4. Vegetation Cover**

Project site vegetation does not contain any species listed as endangered or threatened by the Government of Pakistan or IUCN. Only two species *Celtis australis* (Batculd) and *Ficus carica* (Enjeer) were found rare in Pakistan but they are listed as common for the rest of the world. The presence of these two species will not be disturbed as they were found above the submerged area and away from the area where trees needed to be felled down. The rest of the vegetation species were found protected and common in Pakistan and for the rest of the world. So, it is concluded that there will be no negative impacts of Patrind Hydropower Project on conservation status of the vegetation of the area.

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

<u>Common Name</u>	<u>Botanical Name</u>	<u>Type of Tree</u>	<u>Status</u>
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
Gajar Booti	<i>Bethium species</i>	Pest	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
Chahla Toot	<i>Broussonetia papyrifera</i>	none	pest
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 highest from steep slope areas (74.29%) followed by gentle slope and gully bed areas.

#### 1.5. Methodology

Survey was conducted on both the sides of the project area. Downstream 10 km and upstream 10 km area was observed and possible impact was noted. Similarly, the area behind the powerhouse was also surveyed in detail. Gaps in the forest cover were measured, land slide details were taken, Success percentage of planted species inside the forest area and on the tunnel outlet were recorded. The species combination was also recorded and site observation was made for the selection of appropriate plant species beneficial for these types of slopes. Landslide surveyed and different techniques were spelled out to stabilize it to a maximum possibility. Biological, Bio-engineering and Engineering techniques were identified in different parts of the slide.

#### 6. Comparison of the studies

Vegetative cover of the area around the project area has been badly damaged by the forest fire during the last few weeks. There are three types of forest fires causing different level of losses to the vegetative Cover:

- i) Ground Fire
- ii) Crown Fire
- iii) Stump fire

Ground fire covers the soil surface and burns the grasses and dry leaves or pine needles.

Crown fire burns both grasses, bushes and foliage of the bigger trees due to which some bigger trees also dry up.

Stump fire is more dangerous. The stems of the trees catch fire and whole vegetative cover gets burnt.

The areas around the project sites are grazing land of the cattle of local communities. They deliberately burn the area for avoiding the grasses of low nutritional value like saryala (*Heteropogon contortus*) and burning the dry needles of the Chir Pine. This is mostly the ground fire which is not much harmful for the forest cover. Even the bushes are not affected by this type of fire. But; when the quantity of combustion material is more, then the ground fire converts into crown fire. This fire burns all the under growth and soil becomes exposed to the heavy shower of rain during the monsoon. This type of fire also damages the foliage part of the bigger trees.

The intention of burning the area was to give better chances of growing the grasses of nutritional value and eliminating the domination of unwanted grass species but, this ground fire became the crown fire damaging almost all the undergrowth of the tall tree species. Following are the plant species which are damaged to an extent of 90% in the fire affected area:

Ber	<i>Zizyphus mauritiana</i>
Snatha	<i>Dodonaea viscosa</i>
Sumbal	<i>Berberis lycium</i>
Bhakarr	<i>Adhatoda vesica</i>
Timber	<i>Zanthoxylum altum</i>
Phulai	<i>Acacia modesta</i>

## **7. OUTCOME OF THIS STUDY**

There has been observed a great change from the last study of January-March 2019. The new plantation is quite successful except the chirpine trees. The porcupine has damaged these chir pine plants. There is a need to develop coordination with the Zoology Department of the AJK University as they have already visited the area on our request. Their scholars will take remedial action for the pest control. The check dams and plantation in the nallah just beside the powerhouse has started controlling the fast erosion process. Forest fire protection measures were adopted by the project authorities as was suggested during the last studies. Combustible grasses have been cut by the manual labour. The fire hazard in the neighborhood has not affected the project area due to excellent precautionary steps taken by the project responsible staff. The bushy plants established at the end side of the river and this, if established successfully in the future, will control the scouring of the edges.

The slide area around Alladra is spreading continuously and needs more intensive effort by the provision of Bio-engineering works and more biological steps during the coming season in January-February 2020. Engineering structures alone cannot control the slides and again this will require a huge amount of funds for engineering structures. The loss of biomass quantum is not so significant as there has been a low vegetative cover in these areas.





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Picture showing project plantation at the base of the slide and gabion work by Forest Department during the last quarter

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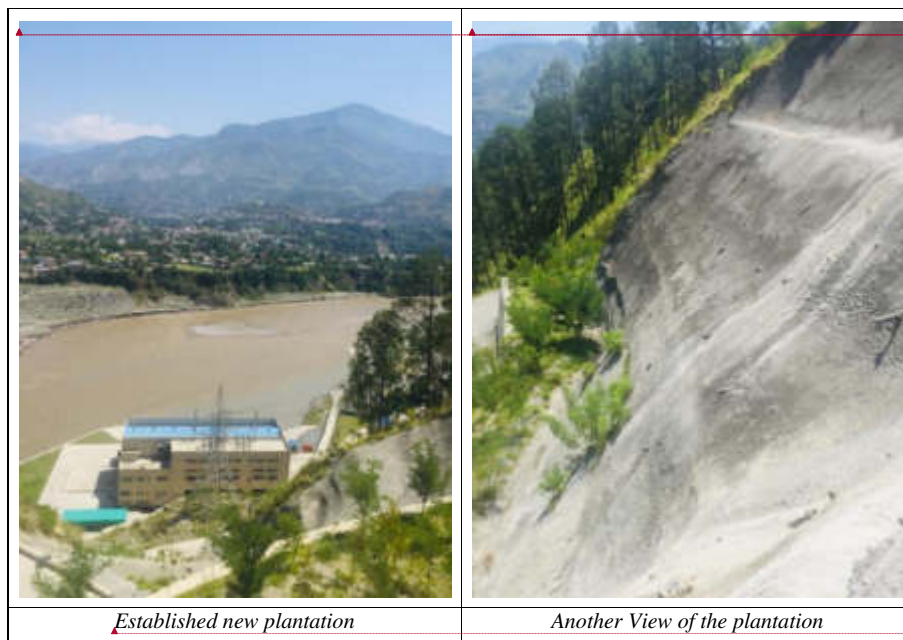
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Plantation along the river bed to stabilize the area

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The leaning trees have been removed in light of the recommendations. The pace of compliance of the recommendations is very satisfactory and needs to be continued in the future for controlling the environmental and physical hazards.



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### **8. Possible Impact 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 dams will positively affect the groundwater at the upstream and negatively at the downstream. Downstream the 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 species may appear on the tract. Water retention capacity of the soil above the tunnel will reduce as the percolation rate will increase and drain out from the tunnel. This will definitely have a negative impact on the water loving plant species and species of low water requirement will dominate changing the ecology of small area above the tunnel. Some dry tree species on the area present the effect due to tunneling, but large has not been affected.

The area above the tunnel has no housing so apparently, there is no social impact seen.



*The expanding slide behind the powerhouse*

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## 9. Recommendations

5-1. The slope area close to weir point has been planted with good recommended plant species.

Their survival percentage seems to be higher than 60%, which shows a good result. The dyed back plants should be replanted in the coming plantation season

6-2. The chirpine saplings have been damaged along the roadside by porcupine. The scholars of the University of AJK have visited the area and shown their commitment to tackle this issue. A coordination mechanism must be developed between the project and the University in the near future after planting the new trees.

7-3. The flushing flood have affected the natural plant growth but this will continue due to dam maintenance process and flooding in the river. There is a very positive impact of the dam on the riparian species down and upstream and new watch and ward system will improve the position in the area. This watch and ward should be continued in a longer run for the sustainable establishment of natural vegetation cover along the riverside.

8-4. Left bank of the lake just opposite to the dumping site has not been strengthened as it has been done on the right bank. The probability of its sinking in the lake is very high with a mass land movement in the future. Proper treatment should be done here.



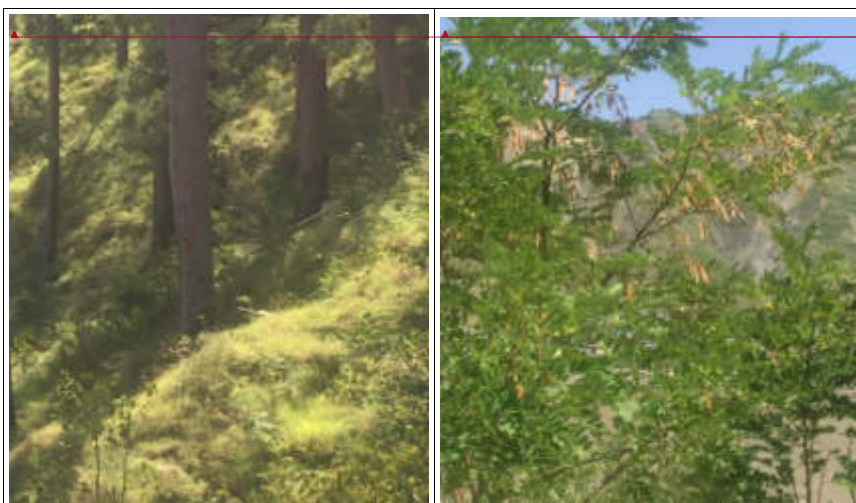
9-5. The mass of soil under the slide at the right bank of river Jhelum has been planted with root-shoot cuttings of bamboo. This should be repeated for at least two more years to get the plantation well established.

10-6. There is a weed, Gajar Booti (*Bethium* species) near the residential building just adjacent to the slide. This has been cut by the labour at this time. This is scavenger plant causes much damage to the environment and soil. Its permanent removal is required before it flowers.

11-7. The concreted area has provision of steps which can be used for placing earthen pots with some creepers so that it clouds look green and represent a pleasant view

12-8. The small slide appeared just at the corner 4 has been planted but needs continues watch to control its expansion.

13-9. The area under the Power Poles at corner 4 have also been planted with plants for the land cover and beautification and coming season will give look of the area. Die back should be covered with replantation.



*A fallen tree*

*Roboinea tree with ripe seed*

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#### 14-10. Status of Implementation of recommendations:

1-a. A sufficient effort has been done to cover the slopes with appropriate plant species and it needs to be continued with beating up the gapes

- 2-b. Vegetation Plan is under process and this should be finalized for the application of planned measures in controlling the slide area and increasing the vegetative cover.
- 3-c. Landslide needs special attention of Bio-engineering works as has been done in the foothill.
- 4-d. Gulley plugging is requires through check dams mixed with plantation
- 5-e. No plan mentioned to strengthen the left bank of the reservoir at Patrind
- 6-f. New recommendations should become the part of the Vegetation Management Plan
- 7-g. Bethium weed has been removed by engaging the labour but needs continues watch of its regrowth.



A walnut plant near the powerhouse

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#### 46-11. Acknowledgements

I am thankful to the administration of Patrind Hydropower Project to show their confidence in me to conduct this study. They not only provided the logistic facility to our team of experts but their relevant staff also supported us during the field visits. My special thanks to Mr. Qamar, Mr. Atif and Mr. Imran Yousaf for their valuable inputs during all our field work.

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#### 47-12. References

- [1-i\)](#) Plants of Pakistan, TJ Roberts
- [a-ii\)](#) Pakistan Journal of Forestry, periodic publications of Pakistan Forest institute Peshawar
- [b-iii\)](#) Impact of small farm dams on the environment of South Africa
- [c-iv\)](#) Environmental and social impacts of dams in India-Ice virtual Library
- [d-v\)](#) Positive and negative impacts of dams a debate – Shodhganga
- [e-vi\)](#) Dams and their environmental impacts  
<https://www.slideshare.net/MOHDSALMAN52/dams-and-thier-environmental-impacts>
- [f-vii\)](#) Manual of Land stabilization in Pakistan-dr. Bashir Ahamd

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**Annexure-86**  
**Noise Monitoring Reports**

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## Monthly - Noise Survey Report

Date: 25<sup>th</sup> April, 2019

No. 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)	Noise dB (A)	Remarks
1.	First Floor	Office Area (Commercial)	Day	55.5	59.2	60.1	58.2	65	"
2.	Ground Floor	Office Area (Commercial)	Day	56.5	57.6	57.3	57.1	65	
3.	Basement-1	Process Area (Industrial)	Day	80.6	82.6	81.0	81.4	85	
4.	Basement-2	Process Area (Industrial)	Day	84.6	83.9	84.2	84.2	85	
5.	Basement-3	Process Area (Industrial)	Day	82.9	84.1	83.7	83.5	85	
6.	O & M Building	Residential Area	Day	53.1	52.8	53.6	53.1	55	
7.	Koreas Accommodation	Residential Area	Day	52.3	53.2	50.2	51.9	55	
8.a	Abda Village Point 1 Day Time	Residential Area	Day	50.2	51.6	50.2	50.6	55	
8.b	Abda Village Point 1 Night Time	Residential Area	Night	43.9	44.2	41.5	43.2	45	
9.a	Abda Village Point 2 Day Time	Residential Area	Day	52.8	53.2	53.9	53.3	55	
9.b	Abda Village Point 2 Night Time	Residential Area	Night	41.3	41.9	42.6	41.9	45	

Note: 63 turbines are being operated at 112 MW

Monitored By: Imran Yousaf

Signature: 





## Monthly - Noise Survey Report

Date: 26<sup>th</sup> June, 2019

Sr. No	Location	Type	Time Day/Night	1 <sup>st</sup> Reading dB (L)	2 <sup>nd</sup> Reading dB (L)	3 <sup>rd</sup> Reading dB (L)	Average Reading dB (L)	Std. Dev. dB (L)	Remarks
1.	First Floor:	Office Area (Commercial)	Day	56.6	60.3	60.9	59.2	65	
2.	Ground Floor	Office Area (Commercial)	Day	55.3	58.2	57.1	56.8	65	
3.	Basement-1	Process Area (Industrial)	Day	86.6	86.8	85.9	86.4	85	The noise level in these areas are above the stipulated exposure limits. All staff is instructed to work in the open area. When required and on one place, maintenance department is advised to ensure regular maintenance of the plant equipment & electrical equipment is required to ensure the maximum efficiency of operational equipment is maintained.
4.	Basement-2	Process Area (Industrial)	Day	84.9	85.7	86.8	85.8	85	
5.	Basement-3	Process Area (Industrial)	Day	85.7	83.8	84.7	85.4	85	
6.	O & M Building	Residential Area	Day	53.6	52.6	53.7	53.3	55	
7.	Korant Accommodation	Residential Area	Day	53.2	51.8	52.9	52.6	55	
8.a	Akda Village Point 1 Day Time	Residential Area	Day	51.3	52.6	50.4	51.4	55	
8.b	Akda Village Point 1 Night Time	Residential Area	Night	44.8	44.8	44.1	44.5	45	
9.a	Akda Village Point 2 Day Time	Residential Area	Day	53.2	53.9	53.7	53.6	55	
9.b	Akda Village Point 2 Night Time	Residential Area	Night	42.3	42.9	43.4	42.8	45	

Note: 63 turbines are being operated at full capacity (150 MW)

Monitored By: Imran Yousaf

Signature: 

**Annexure-97**  
**Waste Transfer Notes**



## Certificate of Waste Management Service

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

Month of April-2019

### Waste Management Service

#### Particulars

DATE	WASTE TYPE	WEIGHT	RECYCLE WASTE
05-April-19	Non Hazardous waste	331 KG	25 KG
10-April-19	Non Hazardous waste	250 KG	
16-April-19	Non Hazardous waste	257 KG	
22-April-19	Non Hazardous waste	232 KG	
29-April-19	Non Hazardous waste	275 KG	

  
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Issue Date 2, May, 2019

Page 1 of 1

1st Floor, Haji Saeed Plaza,  
Bazar Chowk, Chhatta  
stwar Park Road,  
Shahzad Islamabad.

House # A/3, Near Block T,  
Mustafabad, Nazrat Bhotto Colony,  
North Nazimabad, Karachi

• qadri319@gmail.com  
• khandameed-qadri319@gmail.com  
• nishatkhan319@gmail.com

051-8355816 - 8355817  
0331-8182097 - 0343-8395387  
0355-8113085, 0355-8117474,  
0346-8182071

**QE M/s Qadri Enterprises**  
PEST CONTROL WASTE MANAGEMENT & WATER TANK CLEANING SERVICE

**Certificate of Used Oil for Recycling**

Used oil Power 46 collected from Patrind hydropower Project was recycling through Contractor having particular listed below:

Month of May-2019

**Used Oil Power 46**

**Particulars**

DATE	OIL TYPE	LTR	RECYCLE
31-May-19	Power 46 /Used	550 Ltr	Through Contractor



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Issue Date 3, June, 2019

Page 1 of 1

First Floor, Haji Saad Plaza,  
Main Bazar Chowk, Chara  
Baitanwar Park Road,  
Kashifabad Islamabad.

House # A/5, Near Block E,  
Mustafabad, Nurst Blooms Colony,  
North Nazimabad, Karachi

\* qadri079@gmail.com  
\* khandamerd.qadri079@gmail.com  
\* nitheethan319@gmail.com

031-8335816 - 8335817  
0331-8182895 - 0343-8193387  
0335-8113095, 0335-8113478,  
0346-8183071

**QE M/s Qadri Enterprises**  
PEST CONTROL, WASTE MANAGEMENT & WATER TANK CLEANING SERVICE

**Certificate of Waste Management Service**

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

Month of May-2019

**Waste Management Service**

Particulars			
DATE	WASTE TYPE	WEIGHT	RECYCLE WASTE
04-May-19	Non Hazardous waste	316 KG	20 KG
10-May-19	Non Hazardous waste	269 KG	
15-May-19	Non Hazardous waste	262 KG	
21-May-19	Non Hazardous waste	236 KG	
26-May-19	Non Hazardous waste	241 KG	



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Issue Date 3, June, 2019

Page 1 of 1

**M/S QADRI ENTERPRISES**  
**Waste Management Service**

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

DRY TRASH		Location : Patind Hydro Power Project																				MONTH OF MAY 2019												TOTAL
Date		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23										
KG		0	0	0	245	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0										
																								245										

FOOD WASTE																						TOTAL		
Date		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
KG		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
																								0

OILY RAGS																						TOTAL		
Date		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
KG		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
																								0

Description	FOOD WASTE	DRY TRASH	OILY RAGS	FOOD+DRY+OILY+FOOD	RECYCLE	RECYCLE - USED FOR POWER PLANT
Total Kg	245	0	0	245	0	0

**QE M/s Qadri Enterprises**  
PEST CONTROL WASTE MANAGEMENT & WATER TANK CLEANING SERVICE

## Certificate of Waste Management Service

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

Month of Jun-2019

### Waste Management Service

Waste Management Service			
PARTICULARS	WASTE TYPE	WEIGHT	RECYCLE WASTE
03-Jan-19	Non Hazardous waste	320 KG	
10-Jan-19	Non Hazardous waste	278 KG	
17-Jan-19	Non Hazardous waste	253 KG	
22-Jan-19	Non Hazardous waste	250 KG	17 KG
28-Jan-19	Non Hazardous waste		



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Issue Date 2, July, 2019

Page 1 of 1

First Floor, Hall Street Plaza,  
Main Bank Chowk, Chitra  
Hastinapur Park Road,  
Chak Shikhar Island Road.

Elaine W. A. F. Ngai, M.B., Ch.B.,  
Neurophysiology, Nephrology, Hypertension, Diabetes,  
University of Manchester, Manchester

- `quid@1313@igmpall.com`
- `k8.authenticated@quid1313@igmpall.com`
- `quid@k8.auth1313@igmpall.com`

電話：(02) 2509-1111 傳真：(02) 2509-1112  
 地址：台北市中山區南京東路二段111號11樓  
 郵政信箱：105 台北市中山區南京東路二段111號11樓

M/S QADRI ENTERPRISES  
State Management Service

**Dry Food, Oil Rags & Recycle** Waste According to Waste Tracking Form

Location : Patind Hydro Power Project										MONTH OF JUN 2018																					
DRY TRASH																															
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	TOTAL
KG	0	0	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	200
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	TOTAL
KG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	TOTAL
KG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300																															

Description	FOOD WASTE	DRY TRASH	ONLY RAGS	FOOD+DRY+ONLY+TOTAL	RECYCLE	RECYCLE - WASTE
Total Kg	131	993	88	1345	97	6

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## **Annexure-10**

### **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

## **Annexure-11**

### **Hearing Test Sample Reports**

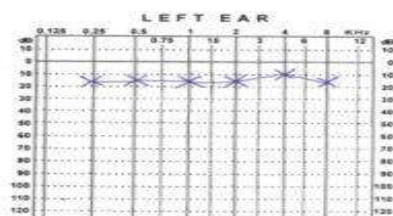
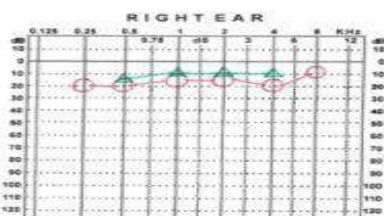
**HEARTECH**

Heartech (Pvt.) Ltd.  
Excellence in Hearing Health Care

**WASSAY ENT CLINIC &  
AUDIO-VESTIBULAR LABS.**  
Upper Plate Road, Muzaffarabad A.K  
Tel: 05822-444646

**AUDIOMETRIC EXAMINATION**

Name <u>Zamir Ahmad</u>		No <u>4281/19</u>		Sex <u>M</u>	Age <u>40 yrs</u>								
Employment		Address <u>P. Jind</u>		Date <u>20/4/19</u>									
Average AC 500 - 2000													
A I R C O N D U C T I O N													
RIGHT			LEFT										
Right	Left	125	250	500	1000	2000	3000	4000	5000	6000	8000		
16	15	20	20	15	15	20	10	15	15	15	15		
Effective masking in Opp. Ear.													
Average BC 500 - 2000						B O N E C O N D U C T I O N							
RIGHT						LEFT							
Right	Left	250	500	1000	2000	4000	8000	250	500	1000	2000	4000	8000
11		15	10	10	10								
Effective masking in Opp. Ear.						Unmasked							



**History:**

For audiometric assessment.

O/E: No wax in ears.  
Both tympanic membranes intact.

**Clinical Impression:**

PTA: Peripheral Hearing Thresholds  
in both ears are within  
normal limits.  
No A-B gaps seen.  
Responses reliable.

  
Dr. Abdul Muneer  
ENT Specialist  
Speech & Hearing Center  
Dhaka, Bangladesh

**Recommendations:**

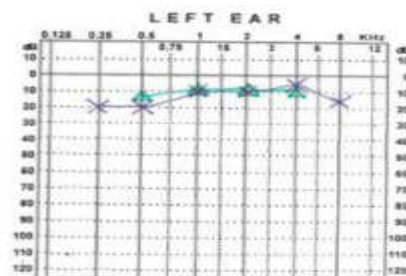
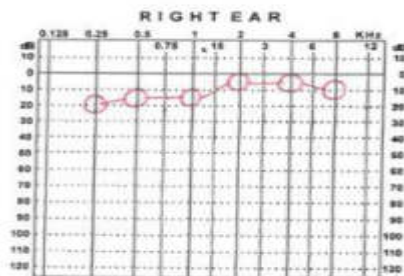
**HEARTECH**

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Excellence in Hearing Health Care

**WASSAY ENT CLINIC &  
AUDIO-VESTIBULAR LABS.**  
Upper Plate Road, Muzaffarabad A.K  
Tel: 05822-444646

**AUDIOMETRIC EXAMINATION**

Name <u>Jahid Aurangzaib.</u>		No <u>4279/1414</u>		Sex <u>M</u>	Age <u>24 yrs.</u>												
Employment <u>JO</u>		Address <u>Pabind.</u>		Date <u>04/19</u>													
<b>AIR CONDUCTION</b>																	
Average AC 500 - 2000		<b>RIGHT</b>				<b>LEFT</b>											
Right	Left	125	250	500	1000	2000	3000	4000	8000	125	250	500	1000	2000	3000	4000	8000
11	13		20	15	15	05	05	10		20	20	10	10		05	15	
Effective masking in Opp. Ear.																	
<b>BONE CONDUCTION</b>																	
Average BC 500 - 2000		<b>RIGHT</b>				<b>Audiometric Weber</b>				<b>LEFT</b>							
Right	Left	250	500	1000	2000	4000	8000	300	1000	2000	4000	250	500	1000	2000	4000	8000
	11												15	10	10	10	
Effective masking in Opp. Ear.		Unmasked.															



**History:**

For audiological assessment.

O/E: No wax in ears.  
Both TMs intact.

**Clinical Impression:**

PSA

Peripheral Hearing Thresholds  
in both ears are within  
normal limits.  
No A-B gaps detected.  
Responses reliable.

  
Dr. Anand Choudhary  
AUDIOLOGIST  
K-water & Training Center  
K-water Global

**Recommendations:**

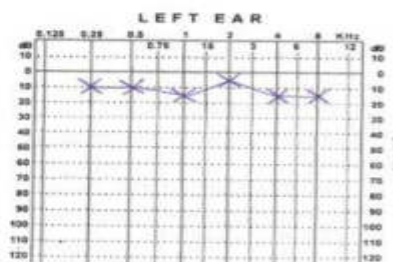
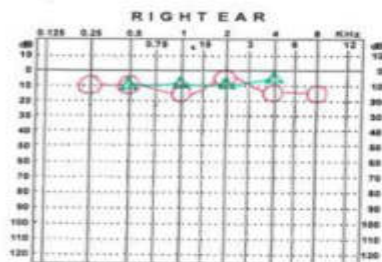
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AUDIO-VESTIBULAR LABS.**  
Upper Plate Road, Muzaffarabad A.K  
Tel: 05822-444646

**AUDIOMETRIC EXAMINATION**

Name <u>Ahmad Shamas</u>		No <u>4304617</u>		Sex <u>M</u>		Age <u>25 yrs</u>											
Employment		Address <u>Airport - Muzaffarabad</u>		Date <u>26/4/19</u>													
Average AC 500 - 2000		A I R C O N D U C T I O N															
		RIGHT								LEFT							
Right	Left	125	250	500	1000	2000	3000	4000	8000	125	250	500	1000	2000	3000	4000	8000
10	10		10	10	15	05	—	15	15	10	10	15	05	—	15	15	
Effective masking in Opp. Ear:																	
Average BC 500 - 2000		B O N E C O N D U C T I O N															
		RIGHT								LEFT							
Right	Left	250	500	1000	2000	4000	8000	Audiometric Weber				250	500	1000	2000	4000	8000
10			10	10	10	05		500	1000	2000	4000						
Effective masking in Opp. Ear		Unmasked															



**History:**

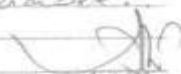
For audiometric assessment.

O/E: No wax in ears.  
Both TMs intact.

**Clinical Impression:**

PTA

Peripheral hearing thresholds  
in both ears are within  
normal limits.  
No A-B gaps detected.  
Responses reliable.

  
Dr. Adam El-Ghazal  
AUDOLOGIST  
Speech & Hearing Center  
Muscat, Oman (P.O.)

**Recommendations:**



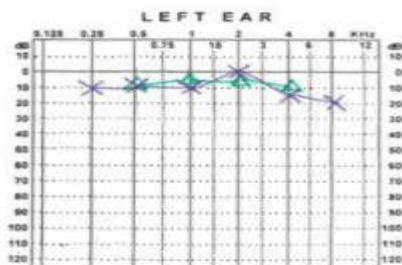
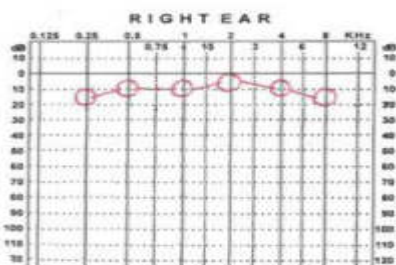
**HEARTECH**

Heartech (Pvt.) Ltd.  
Excellence in Hearing Health Care

**WASSAY ENT CLINIC &  
AUDIO-VESTIBULAR LABs.**  
Upper Plate Road, Muzaffarabad A.K  
Tel: 05822-444646

**AUDIOMETRIC EXAMINATION**

Name <u>Tarar-ul-Hassan Khan</u>		No <u>4310/04/19</u>		Sex <u>M</u>		Age <u>46 yrs</u>											
Employment		Address <u>K-Water</u>		Date <u>30/11/19</u>													
Average AC 500 - 2000		AIR CONDUCTION															
		RIGHT								LEFT							
Right	Left	125	250	500	1000	2000	3000	4000	8000	125	250	500	1000	2000	3000	4000	8000
08	06		15	10	10	05	10	15		10	10	10	00	15	20		
Effective masking in Opp. Ear.																	
Average BC 500 - 2000		BONE CONDUCTION															
		RIGHT								LEFT							
Right	Left	250	500	1000	2000	4000	8000	500	1000	2000	4000	250	500	1000	2000	4000	8000
	06												10	05	05	10	
Effective masking in Opp. Ear.		Un-masked															



For audiometric assessment.

Q/E: No wave in ees.  
Both TMs intact.

PTA

Peripheral Hearing Thresholds  
in both ears are within  
normal limits.  
No A-B gaps detected.  
Response reliable.

Dr. Albert Mennschröder  
Speech & Hearing Center  
Massachusetts, U.S.A.

**Recommendations:**

## **Annexure-12**

### **Revised HSE Training Plan 2019**

### HSE Trainings Plan 2019



Serial No	Types Of Trainings	JAN				FEBRUARY				SEPTEMBER				OCTOBER				NOVEMBER				DECEMBER			
		W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4
1	ESMP	✓				✓				✓				✓								✓			
2	OHS Plan	✓								✓				✓								✓			
3	Emergency Response and Evacuation									✓				✓								✓			
4	Firefighting																								✓
5	First Aid																						✓		
6	Defensive Driving																	✓		✓					
7	LOTO																	✓							
8	Work at Height					✓																			
9	Manual Handling									✓															
10	Hand and Power Tools											✓													
11	Mechanical and Electrical Safety							✓																	
12	Welding and Cutting		✓																						
13	Office Ergonomics													✓											
14	Confined Space					✓																			

Note: Trainings conducted in Jan 2019-June 2019

(1) sessions of fire-fighting; (2) sessions of first aid; (3) emergency drills (Evacuation, fire-fighting, first aid); (1) session of ESMP; (1) session of LOTO; (3) sessions of defensive driving; (2) sessions of hand and power tools safety; (1) sessions of work at height

  
 Approved By:  
 Young-Ho Kim  
 CEO Purocil O&M (Private) Limited