Water Use Management Plan (WUMP)

Plan for Tank Zam, District Tank, Khyber-Pakhtunkhwa

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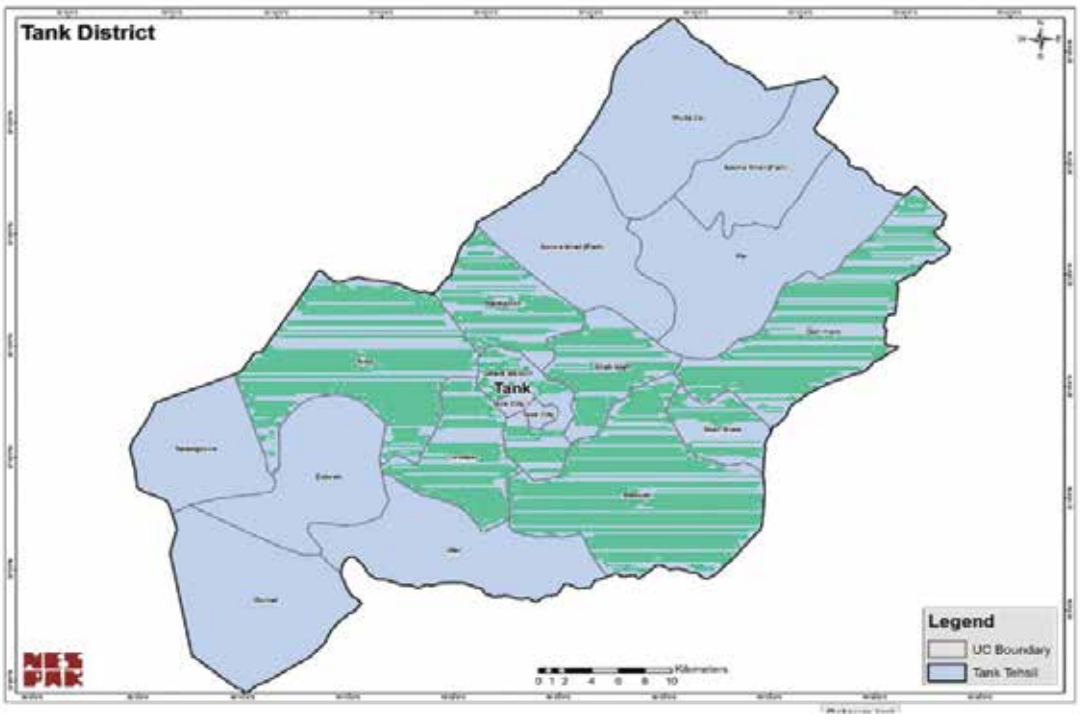
Glossary of Terms

Terms	Definition
Bala Jamal	Common property of the village.
Chahab	The small Dam prepared with earth, wood, stones to stop and divert water in the stony terrain area or the areas through which water has already passed
Canal Command Area	The area which can be irrigated from a canal
Dumba	Strengthening and protection of Saad by raising the Saad
Gandi	The small dam made from earth, stone wood etc. to divert water from one Gaung to another
Gatta or Gatti	A prepared water course which is smaller than Saad or Gangi to divert water from Kaas to lands
Gaung	Perennial water channel
Kaas or Khullah or Waah	The course through which the water is lifted/ diverted through Saad or Gandi flowing in to irrigate lands
Kalapani	Perennial Water flowing from springs etc.
Kuliyat-e-Riwajat-e-Aabpashi	Customary water rights in larger systems of Suleiman Range in Pakistan (D.I. Khan and D.G. Khan) were codified and documented by the Colonial British Revenue administration (in 1905) in the form of Riwajat and Kuliyat-e-Abpashi. This is a set of rules for diverting flood flows into head water areas. The original copy of the registers Kulyate Rudhwar is kept in the Revenue Department.
Morin	The landmarks or signs prepared throughout for distribution of water to the lands
Mouhan	The passage through which water enters the field
Nouz	Water flowing from the mountains that flows through a Pass (Dara). Its passage is called Dara.
Paal or Larra	To prevent water from going into lower level, a canal like structure (paal) is made to allow water to flow into lands
Raqba mutalliqa and Raqba gher mutalliqa	Land Concerned or land entitled for water from a scheme or canal and land not-concerned is land unentitled for water use from a particular scheme or canal
Saad or Gandi	The dam constructed in the Rudh to stop and divert water
Sheher Panah	Flood Protection Wall or Embankment
Shull	The wooden scale through which perennial water is distributed
Wakra	The water channel that leads water to the fields/lands from Kaas

Fig-1: Map of District Tank



Acronyms

AC	Assistant Commissioner
ASER	Annual Status and Education Report
BHU	Basic Health Unit
BI	Bubbler Irrigation
CD	Civil Dispensary
CRBC	Chashma Right Bank Canal
DC	Deputy Commissioner
DEO	District Education Officer
DHO	District Health Officer
DHQ	District Headquarter
DHQH	District Headquarter Hospital
DI	Drip Irrigation
DRR	Disaster Risk Reduction
DWSS	Drinking Water Supply Scheme
FE	Field Engineer
FR	Frontier Region (buffer between settled district and FATA Agency)
FSO	Female Social Organizer
GoNGOs	Government Organised Non-Governmental Organisation
GTF	Green Tunnel Farming
HEIS	High Efficiency Irrigation System
HKH	HiuduKush Himalayan Region
IC	Intercooperation, Pakistan
IMR	Infant Mortality Rate
KRA	Kulyat-e-Riwajat-e-Aabpashi
MMR	Maternal Mortality Rate
MSO	Male Social Organizer
NWA	North Waziristan Agency
OHT	Over-Head Water Tank
PE	Project Engineer
PHED	Public Health Engineering Department
PRA	Participatory Rural Appraisal
RHC	Rural Health Center
RK	Rudh Kohi
SAF	Social Assessment Format
SDC	Swiss Agency for Development and Cooperation
SDO	Sub-Divisional Officer
SI	Sprinkler Irrigation
SSS	Sanitation & Sewerage Schemes
SWA	South Waziristan Agency
SWD	Social Welfare Department
TAF	Technical Assessment Format
THQ	Tehsil Headquarter
THQH	Tehsil Headquarter Hospital
TMA	Tehsil Municipal Administration
TMO	Tehsil Municipal Officer
UC	Union Council
UNICEF	United Nations' International Children's Emergency Fund
VC	Village Council
VDO	Veer Development Organization
XEN	Executive Engineer

Foreword

The preparation of Water Use Management Plan (WUMP) at a local level around a single agenda, water, is an important instrument of good governance. This well thought out plan was prepared in 2016 by Water for Livelihoods Project after a series of intense discussions on water resources, issues, potentials and priorities. On top of it this consultation was carried out with respective District Administration, Government Line Agencies working in Water Sector and communities as important stakeholders.

The Plan provides vision for addressing the water sector issues to ensure equitable access to water for drinking and production purposes apart from catering to water related disasters influencing the mentioned drinking and irrigation objectives. The main theme of WUMP remains to be the community managed initiatives, improving liaison with Government Line Agencies, cost sharing, sharing of responsibilities especially of operation and maintenance with Water User Groups and enhancing role of Water User Associations in dealing with water sector issues in Tehsil/Valley/UC and thenceforth bridging with GLAs.

The Swiss Agency for Development and Cooperation (SDC) is much appreciated for financing an initiative such as Water for Livelihoods Project implemented by Intercooperation. It has lead to a path of assisting the district government in preparing this plan that will ultimately help in improving delivery of clean drinking water and water for production through optimum use of technology and participation of locals. A high expectation is also placed in all the officers of the relevant government departments and other development actors to consider this plan while planning their financial targets and providing direly needed assistance in the district.

Executive Summary

Water is a basic necessity and a common concern of communities in district Tank, as it is direly needed for domestic as well as irrigational needs. IC is exploring options in an attempt to devise a consensus Water Use Management Plan (WUMP) for improved access to safe drinking water and irrigational needs through improved water governance and water management practices on a sustainable basis.

Water Quantity
According to WUMP findings, water quantity is sufficient for meeting bare minimum human, animal and half of irrigation needs for target communities. 1. Rain = 327mm (dampens entire land), 2. T-wells = 876,960-litres/day, 3. Surface water = 40-cusecs (97,873,920-litre/day for population of 250,000 in target area per 15-litre/person/day), 4. Floods = 1,000-2,500-cusecs (6,117,120,000-litre/day), 5. Flashfloods=120,000-cusecs (293,621,760,000-litre/day)
Water Quality
The quality of water especially that which is stored in ponds is unfit for human consumption and is a cause of many diseases. It needs attention of stakeholders for introducing affordable purification methods e.g. chlorination.
Water Governance and Management
Water governance and water management are in a deplorable state (usurpation of water by upper riparians, siltation of Rudhs etc.) and needs keenest attention of the quarters concerned, by disallowing erection of more gatties and demolishing 31 gatties erected after 1960s, desilting of Rudhs, afforestion at Rudhs' banks, dispute resolution among riparians for equitable distribution of water among target communities through WUAs/WUGs

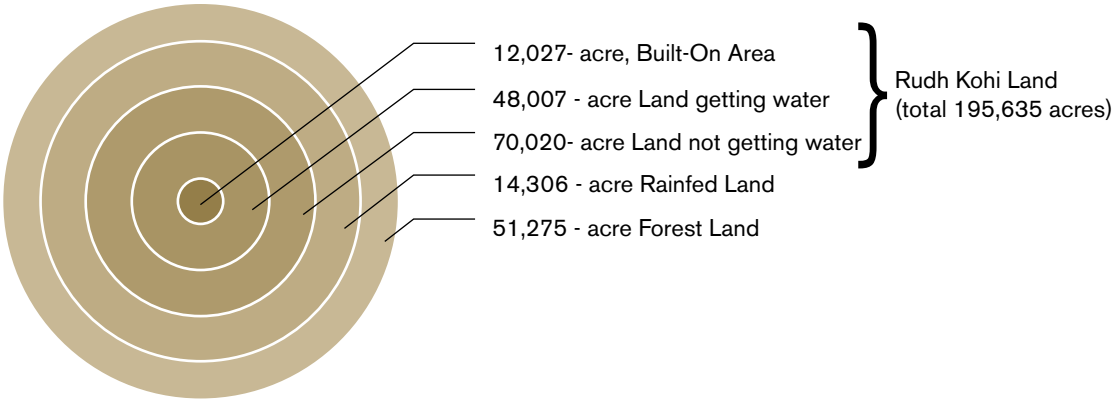
Apart from rainwater, groundwater and flood water, Tank is dependent on surface water from Tank Zam for its irrigational and domestic water needs.

Out of total 195,635-acre land in the target area of 9 UCs/Command area of Tank Zam, land under Kulyat-e-Riwajat-e-Aabpashi (KRA) or Tank Zam command area entitled land with water rights is 130,054-acre (66.5%), out of which 48,007-acre (37%) land is getting water whereas 70,020-acre (54%) is not receiving any despite entitled water rights while 12,027-acre (9%) is built-on the area. Remaining 65,581-acre comprises of Forests 51,275-acre (26%) and Rainfed 14,306-acre (7.5%) of the total target area land. Despite sufficient perennial and flood water, water is lost as 21 new Gattis have been approved by influential and powerful landlords through bureaucracy under political duress in addition to 40 Gattis at the time Pakistan came into being. Communities at downstream are deprived of access to water despite having entitled rights and thus bear the brunt of the mismanagement due to bad water governance. Access to water can be facilitated through improvement of water governance and water management practices of preventing upstream communities from usurping water destined for lower riparians, demolition of 31 gatties erected after 1960s, desiltation of all Rudhs, ensuring discharge of allocated water in all Rudhs at Tank Zam heads, making WUAs/WUGs more efficient and effective, organising meetings among farmers and stakeholders.

Table-1: Land Distribution in Target Area

S No.	Total Area	Land	Division of Area	Division of Rudh Kohi (RK) Area	Acreage	%age	Total %age of 9 UCs
1	Total Area of Targeted 9 UCs	Rudh Kohi Land	130,054-acre	Land Getting Water	48,007-acre	37%	66.5%
				Land Not Getting Water	70,020-acre	54%	
				Built-On Area	12,027-acre	9%	
				Total RK Area	130,054-acre	100%	
2		Scrub Forest and Rangelands	65,581-acre	-	51,275-acre	26%	33.5%
				-	14,306-acre	7.5%	
3		Rain-fed Land					
Total	195,635-acre		195,635-acre		195,635-acre		100%

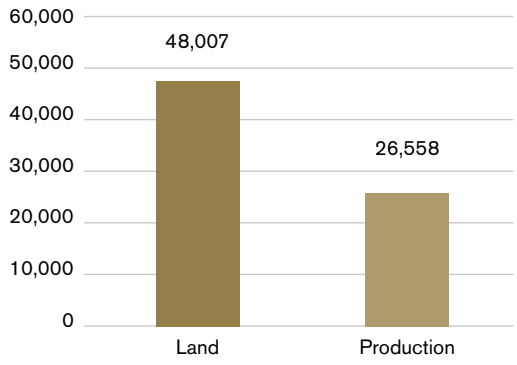
Land in Targeted 9 UCs



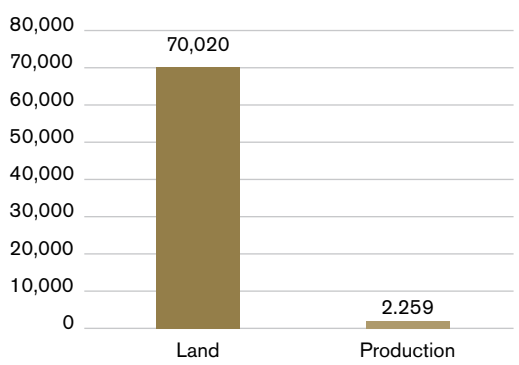
However, agriculture production from the irrigated land (48,007-acre), is 26,558- per annum, while production from 70,020-acre land having water rights but no flood water for irrigation every year, was 2,259- of agricultural produce.

The figures indicate that the un-irrigated land (70,020 acre) can produce around 38,736- of agriculture produce if measures could be identified to irrigate culturable waste. The measures will not be less than a revolution in ensuring not only food security for the target communities but ensuring a sustainable livelihood for them by boosting economy. This could be achieved after streamlining Rudh Kohi system through good water governance by dispensation of justice and ensuring every farmer gets his due water share, desiltation of Rudhs, afforestation and introduction of High Efficiency Irrigation Schemes (HEIS).

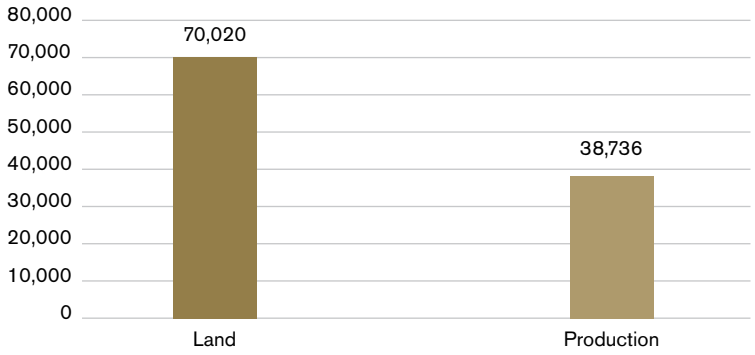
Irrigated land (acre) and production (ton)



Un-irrigated land (acre) and production (ton)



Projected Agricultural Production of Culturable Waste Land after Irrigation



Rudh Kohi comprises of 6 Rudhs, receives water from various sources in the shape of Kalapani and flood. The sources are as far as SWA, NWA and FR Tank.

Findings

Findings of the WUMP tool are very encouraging as the situation could be salvaged through a comprehensive strategy to streamline agricultural activities and improve access to water/facilitate water supply within existing resources or nominal charges through identified and prioritised water-sector interventions. Communities have expressed their willingness to coordinate and cooperate during implementation of recommended solutions.

As communities annually face floods they have also identified disaster risk reduction as one of their priorities. Following are the prioritised water sub-sector:

- Drinking Water (statistics)
- Irrigation (stats)
- Sanitation (stats)
- DRR (stats)

During the WUMP process, communities prioritised the following water sector interventions for drinking and irrigation purposes

a) Drinking Water

S No.	Prioritised Interventions
1	Repair of tube-wells
2	Installation and repair of hand pumps
3	Installation of filtration plants
4	Installation of pipelines
5	Construction of Over-Head water Tanks (OHTs)

b) Irrigation

S No.	Prioritised Interventions
1	De-siltation of Rudhs' from Zam head till Rudh length
2	Construction of Inlets and Spillways

c) Sanitation

S No.	Prioritised Interventions
1	Pavement of streets
2	Lining of drains/drainage System
3	Sewerage system

d) Disaster Risk Reduction

S No.	Prioritised Interventions
1	Embankment of Rudhs' banks/plantation on Rudhs' banks
2	Flood protection wall (Sheher Panah)

Health and Hygiene

Cholera, dysentery, typhoid, hepatitis, malaria, dengue and skin diseases are common in Tank as per respondents. Cent per cent respondents claimed that typhoid is a common disease, while 97% respondents contended that dysentery, hepatitis, malaria and skin diseases are common and 89% claimed cholera to be common. 94% respondents informed that dengue in uncommon most probably because there is hardly any clean water available where dengue mosquitoes could flourish.

All the stated diseases are water-borne which implies a need for adopting sanitation measures, vector control and water purification methodologies to overcome these maladies.

- Target communities can be sensitised and capacitated about preventive measures for these diseases through extensive Water, Sanitation and Hygiene (WASH) sessions. Such sessions ought to be held throughout the area simultaneously for both men and women of the communities especially at education institutes for effective adaptation by the new generation. Hand-washing practices and safe water handling by women at homes will indeed prove to be instrumental in enhancing communities' understanding about importance and significance of preventive health. The sessions will also urge communities to adopt affordable hygienic methods to purify water, adopt personal hygiene and manage solid waste to decrease incidence of morbidity

Limitations

- 'Uncertainty' came out to be the major limitation while this report was being compiled, especially regarding exact area and population of the target area. Tank as a whole is Tehsil and district, however command area of Tank Zam which comprises 9 UCs, has unclear, inexact and inconclusive statistics regarding many aspects such as population, agriculture, livestock, literacy, water in cusecs, total land, irrigated, un-irrigated land, raqba mutalliqa and raqba gher mutalliqa. The consultant has explored avenues and employed his contacts and efforts for obtaining nearest possible data and has processed the same for Tank WUMP Report (TWR)

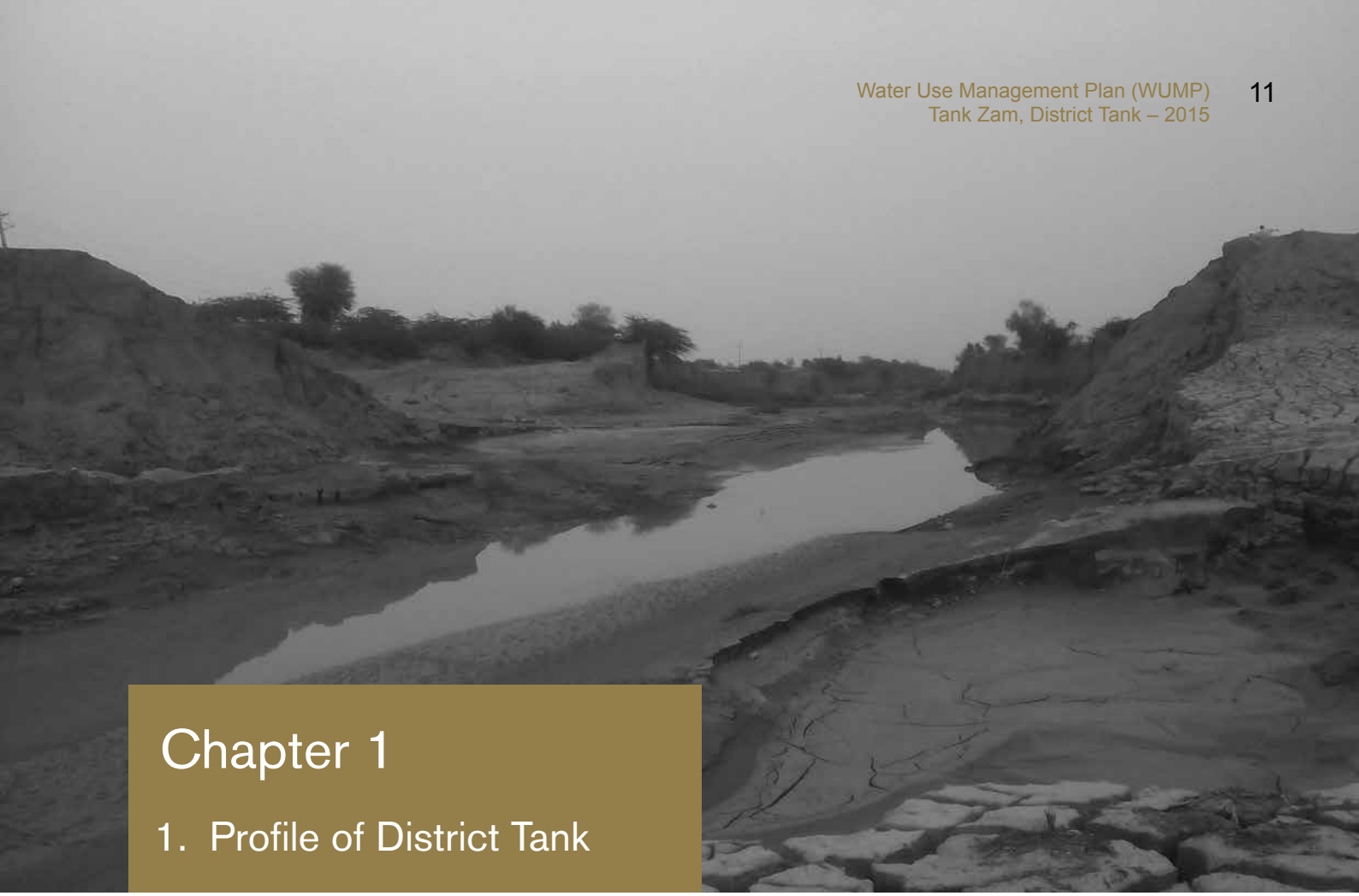
Responsibilities and Sequence of the WUMP Field Activity

Step	Activity	Responsible
1	SAF: Social Assessment Format. TAF: Technical Assessment Format Designing	Consultant
2	Teams' Formation	VDO
3	PRAs with WUGs for S/TAFs	Consultant + VDO Teams
4	Prioritisation of Schemes	VDO Field Engineers (FEs)
5	Data Cleaning and Processing	Consultant
6	Tank WUMP Report	Consultant

Recommended Interventions and Conclusions

As it is an acknowledged fact that due to rapidly diminishing water resources and galloping population growth, the future of agriculture lies in HEIS, therefore this report recommends water-efficient, High Efficiency Irrigation Schemes (HEIS) for district Tank such as

- Alternative but sustainable water schemes
- Drip irrigation,
- Bubbler irrigation,
- Sprinkler irrigation,
- Green tunnel farming
- For rapid and quality growth of 205 suitable species for district Tank that also includes species that are salt tolerant
- The report also recommends plantation of Date Palm trees, Olive trees and Ber trees to prevent soil erosion and reduce velocity of flash floods so that flash floods are more controllable, manageable and manipulative. The trees will also prove beneficial to birds and other wildlife besides offering shade in extreme hot season. It will not only improve ecology and environment of the region but will also provide nutritional and economical benefits to the community. Plantation of these trees at Rudhs' banks will be of immense advantage in preventing soil erosion at Rudhs' banks.



Chapter 1

1. Profile of District Tank

1.1 Geography and Administration

District Tank is situated between Dera Ismail Khan and South Waziristan Agency (SWA) and serves as the gateway to South Waziristan Agency. Tank was included as a Tehsil in district Dera Ismail Khan in 1878 and was upgraded to the status of District in 1992. District Tank lies from 31o-15' to 30o-31' N latitudes and 70o- 22' E longitudes. Tank is bounded by the districts of Lakki Marwat to the northeast, Dera Ismail Khan to the east and southeast, and Frontier Region Tank and South Waziristan Agency (SWA) to the north and northwest. The altitude varies from 260 to 300 meters above the sea level.

Tank word is derived from Tanka (patch/junction) as it adjoins or patches Koh-e-Suleman (hills) with plains (Daamaan) stretching out to The River Indus. Spellings ideally should be Taank and Daamaan rather than Tank and Daman. Early British administrators and writers spelled Tank as Tonk which is closer phonetic of Taank.

Table-2: Union Councils of District Tank

S No.	Union Council	S No.	Union Council	S No.	Union Council	S No.	Union Council
1	City-1	5	Jatatarh	9	Shah Alam	13	Gomal
2	City-2	6	Ranwal	10	Dabarah	14	Pai
3	Gul Imam	7	Tatta	11	Utar	15	Sarangzuna
4	Garah Baloch	8	Wraspun	12	Amakhel	16	Mulazai

District Tank is a part of Dera Ismail Khan Division and thus general administrative structure of District Tank is supervised by Commissioner D. I. Khan Division while police administration is supervised by Deputy Inspector General (DIG) DI Khan Division. Deputy Commissioner is the head of Administration in the district with an Assistant Commissioner, Additional Assistant Commissioner and Assistant Commissioner Revenue and Rudh Kohi Executive Engineer, Irrigation with additional charge of Rudh Kohi, serving from DI Khan.

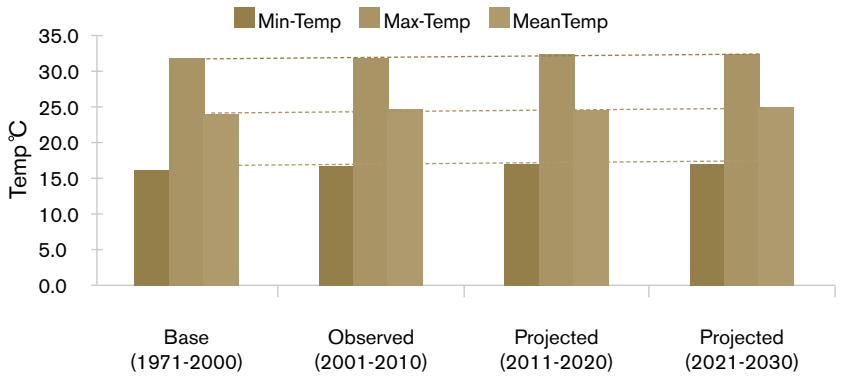
1.2 Climate

No specific meteorological data is available for district Tank as the Meteorological Department installs observatory only at a distance

of 100-km whereas Tank is at a distance of 64-km from Dera Ismail Khan, where the nearest observatory is installed. Therefore, the report is relying on meteorological data of nearest Dera Ismail Khan for its analysis.

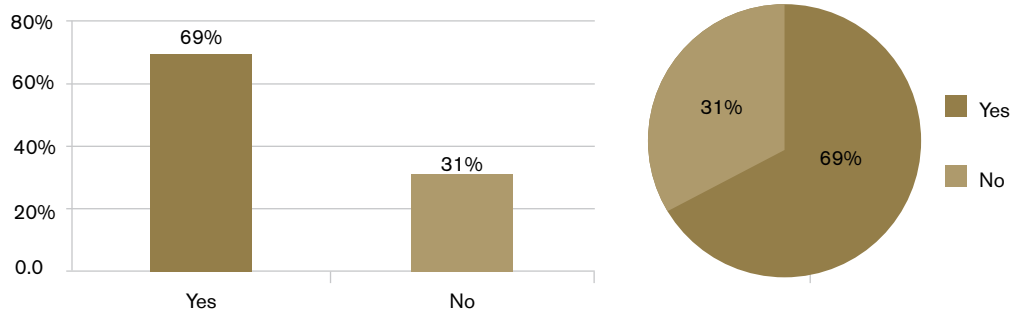
The climate is semiarid. The winter is cold and bracing. The hottest month is June when the mean maximum and minimum temperature is 420C and 270C, respectively. The humidity is lowest during May and June. During these months the area is under periodic dust storms. The hot wind known as 'Loo' blows across the district. The cold wave lasts from December to February which are the coldest months with severefrost. The mean maximum and minimum recorded temperature during January is 200C and 40C respectively. The annual rainfall is about 226 mm which is generally received during months of July and August.

Fig- 2: DI Khan- Decadal Temperature Scenarios (Annual)



Cent per cent respondents informed that heat is increasing and timing of cropping is changing with the passage of every year. 94% respondents from target area believe that weather is getting extreme with the passage of every year. Both heat and intensity in floods or disasters is increasing, Figure 3 shows 69% respondents believe that their lifestyle is changing due to changing climate.

Fig- 3: Decadal Temperature Scenarios



1.3 Hydrology

Besides rain water, ground water, flood water and Kalapani (perennial water), source of surface water flowing from South Waziristan and FR Tank hills irrigating small lands in the area. The government of Pakistan has initiated a Dam at the river Gomal called Gomal Zam Dam (GZD). Its daily output is estimated as 17.5 MW electricity and providing permanent irrigation to more than 160,000 acres of alluvial silt plains. These hill torrents originate from the eastern slope of South Waziristan and FR Tank hills. However, the Tank Zam command area of 9 UC, the topic/subject of this report, receives no share from the canal system of Gomal Zam Dam due to its geographical location. Mean annual rainfall in DI Khan/Tank is 327.4 millimeter.

Fig-4: Rainfall (last 30 years) at DI Khan

Month wise 30 years Average Rainfall (mm) at DI Khan District

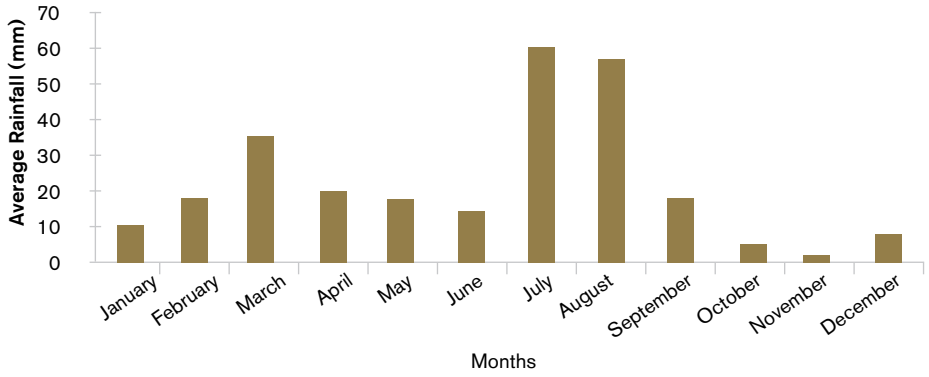
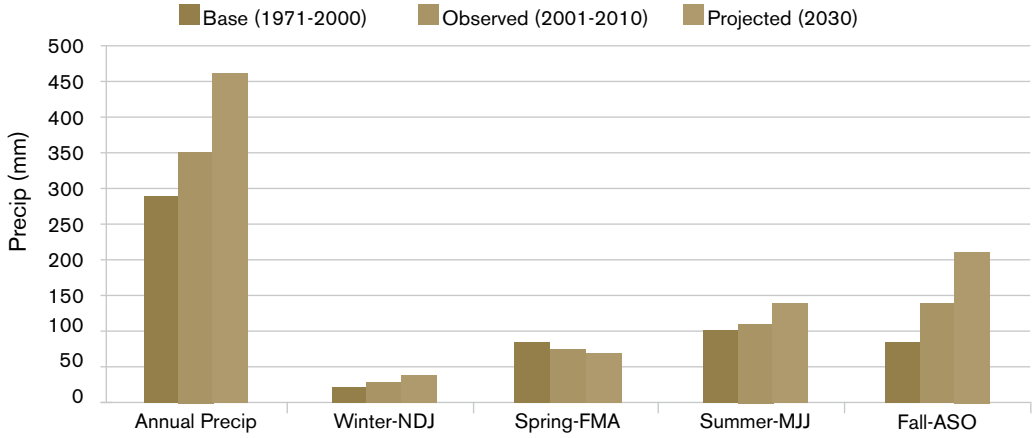


Fig-5: DI Khan: Precipitation Scenarios



(For Fig 5 NDJ stands for Nov, Dec, Jan; FMA Feb, Mar, Apr; MJJ May, Jun, Jul; and ASO Aug, Sep, Oct.)

Table-3: Mean Temperature, Rainfall and Humidity at DI Khan (2013)

Mean Temperature		Mean Rain fall	Mean Humidity	Mean Humidity
Maximum	Minimum	(Avg.)	8.00 AM	5.00 PM
31.49	16.93	327.4	76.75	45.5

Tank Zam has its catchment from North Waziristan Agency and Mehsud area of South Waziristan Agency and FR Tank. The water originates from Razmak, Pir Ghal, Makeen, Ladha, Sararogha and Kaniguram and its sources in FR Tank are Jandola, Warwor, Wurmanrhai, Kir'rhi, Kirhiwam, Khairgi and Sohbati Kach.

1.4 Geology and Soil

Tank is surrounded by sedimentary rocks ranging in age from Permian and recent. The town of Tank is underlined by a blanket of quaternary alluvium composed of unconsolidated conglomerate, sand, siltstone and loess. The Marwat ranges are dominated by sandstone, siltstone, shell and clay. The soil is mostly developed either from sub recent or old prominent plains. Soils are very deep silt, clay or clay – loam.

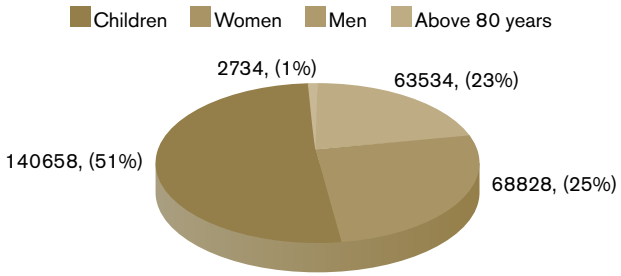
Chapter 2

2. Socio Economic Factors

2.1 Demography

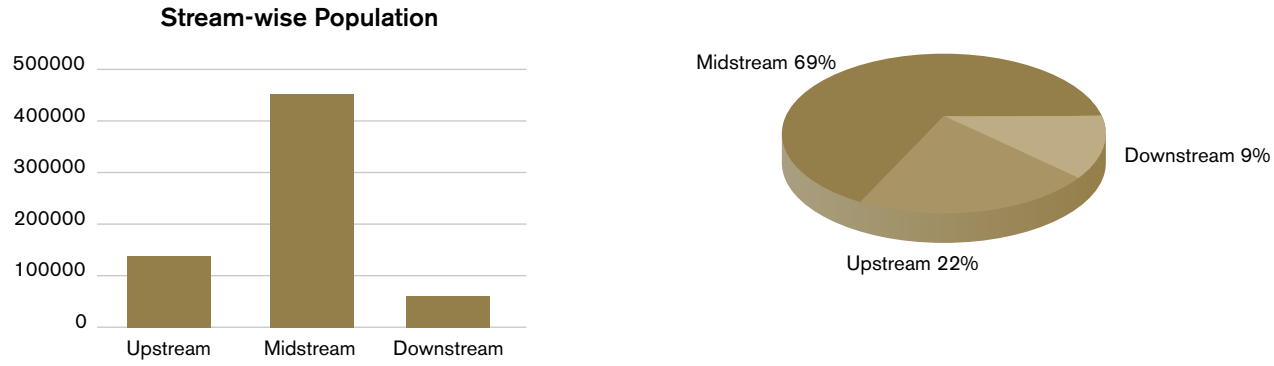
According to verbal official estimate, population of 9 UCs is around 250,000 however according to Tank WUMP process, the target 9 union councils have 277,288 people with 63,534 (23%) men, 68,828 (25%) women, 140,658 (51%) children and 2,734 (1%) octogenarians (80-year and older). The figures offer an encouraging trend as children are more than half of the total population and that calls for arrangements of services for them in future. The numbers of octogenarians also indicate that ecology and circumstances of target area are resilient enough to sustain lives till 80 years.

Fig-6: Population Segregation



Source: Tank WUMP Database 2015

Fig-7: Population according to Water Resources



Total population of the target community of 9 UCs is 68% of the total population of district Tank. Moreover, overwhelming population 191,329 (69%) out of 277,288 inhabit midstream of Tank Zam, while a mere 24,956 (9%) inhabit downstream and 61,003 lives across upstream of the Tank Zam catchment area. It implies that most attention will be focused at midstream villages' water resource management and water governance. Lowest percentage of population inhabiting downstream indicates hostile living environment and circumstances due to scarcity of water. People are found to migrate from downstream due to lack of water for agriculture, livestock

and sustaining life. Water shortage works as push factor for population to migrate to greener pastures with water availability for sustaining life.

More than half of the population comprises of children which is a great potential in WASH sector as they are not only more likely to mould their behaviour regarding sanitation and hygiene but their careful upbringing will also determine their fate and good future.

2.2 Construction of Houses

Exactly half number of the houses i.e. 5,873 (50%) of total 11,792 houses, are constructed with mud, 3,076 (26%) are made up of mud-cum-concrete while 2,837 (24%) are constructed with concrete. The trend indicates gradual transformation from mud to concrete with the adapting affordability and capacity of the dwellers. However, authorities should recommend weather-proof housing and environment-friendly green housing techniques besides adding basements/cellars and architectural designs to owners, which are compatible with the area's climate for better tolerance during harsh and hot summers.

Fig-8: Nature of Houses

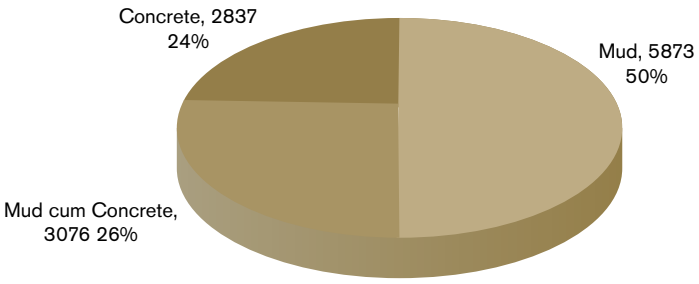
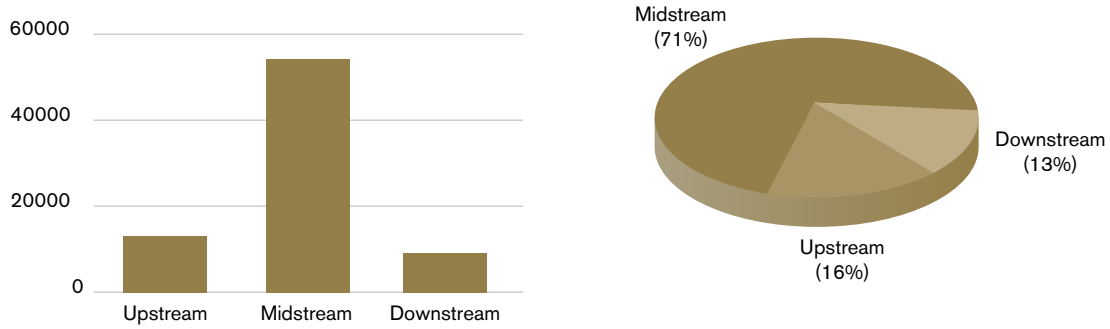


Fig-9: Number of Houses



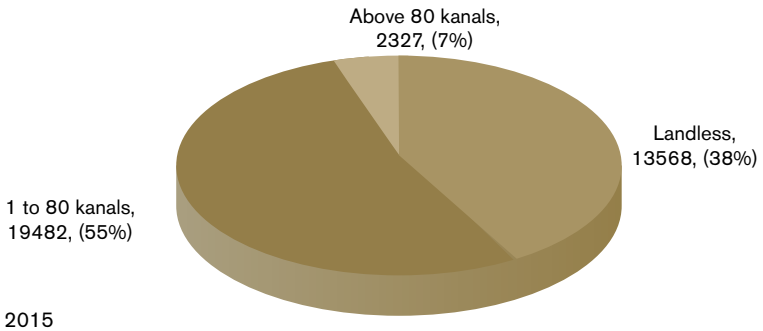
Source: Tank WUMP Database 2015

Again, overwhelming majority of 8,372 (71%) houses are situated across midstream, only 1,533 (13%) across downstream and 1,887 (16%) are situated upstream of Tank Zam command area. The figures indicate importance of water resource management at midstream communities during planning phase. The data indicates inhospitable environment at downstream villages due to water shortages.

2.3 Landholding Pattern

A mere 2,327 (7%) out of total 35,377 households possess landholdings more than 80-Kanal or 10-Acre, while 19,482 (55%) households possess less than or nearly 80-Kanal or 10-Acre of landholdings and 13,568 (38%) households are landless relying for their livelihood on off-farm income sources. However, landless families depend for their food needs (such as wheat, maize, vegetables and dairy products) on their landholding co-villagers.

Fig-10: Landholding Pattern



Source: Tank WUMP Database 2015

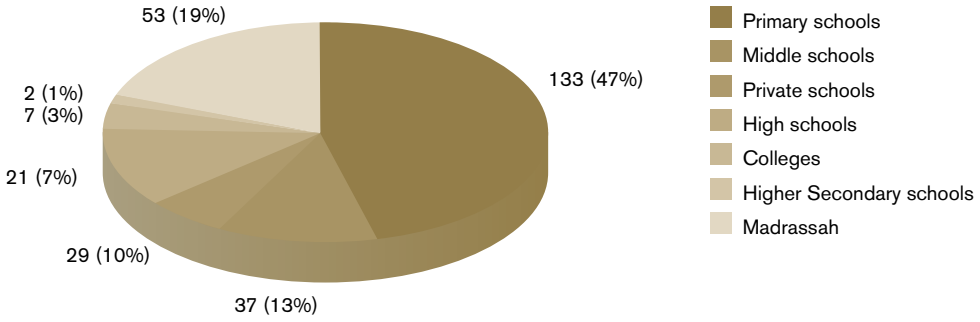
The figures imply that 62% people are landholders and rely for their livelihood directly on agro-based produce. Rest of the 38% landless people depend (for their food, dairy or protein needs) on their landholding co-villagers. It means that 62% landholders will take need of food, dairy and meat of the remaining 38% neighbours in account, while planning food or dairy production.

In addition, drinking water is the main requirement of all the community while water irrigation still remains the requirement of 62% households for agro-based production and livestock rearing.

2.4 Education

Out of total 282 education institutes, there are 7 colleges, 2 higher secondary schools, 21 high schools, 37 middle schools and 133 primary schools, with 29 private educational institutions and 53 religious seminaries educating people in the area. Literacy rate of the district is 26%.

Fig-11: Educational Institutes



Schools especially at primary level, are seen in every village. The enrollment of students, especially girls in schools is encouraging and indicates parents' interest in educating their children. Functional private schools indicate peoples' interest in provision of quality education services at affordable fees.

Seven colleges with 2 for girls is again a very encouraging sign of the parents' desire for educating their daughters till higher studies. Despite challenges, the district education department is also taking keen interest in the promotion of education and the incumbents are often on visits to different schools to not only monitor but for ensuring better education services' delivery to students. Measures adopted and envisaged by provincial government in its Integrated Development Strategy IDS 2014-2018, are being implemented in letter and spirit.

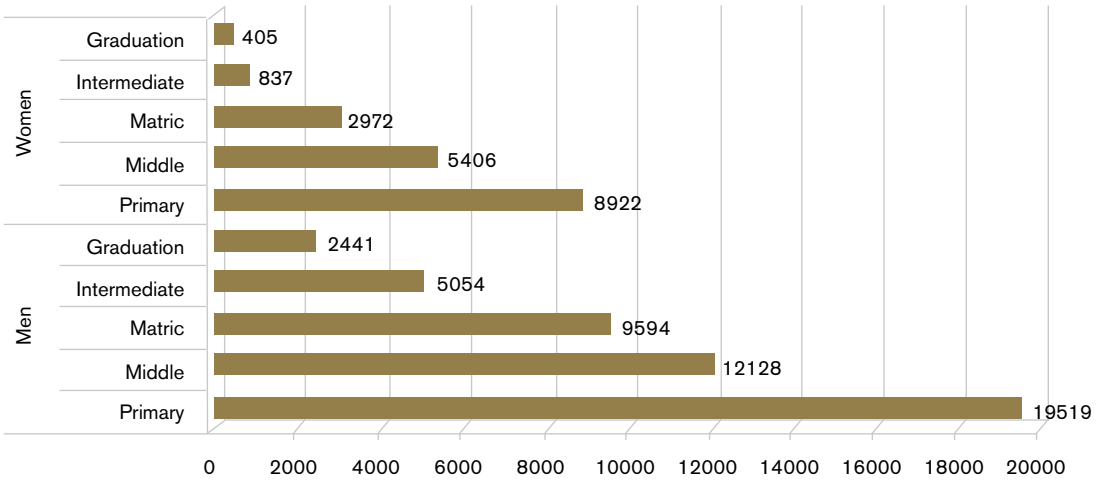
> The non-availability of basic facilities has resulted in low enrolment and high dropout rates, and the low quality of education in KP is often reflected in the poor physical condition of public schools. KP was ranked last among all provinces in this regard, with only 32% of all ASER-surveyed primary schools having useable facilities. Expanding the number of schools to fill major gaps in coverage has been a strong focus of investment in recent decades. However, the emphasis on new buildings has led to a neglect of the maintenance of the existing and of the existing schools' management. Around one-third of the schools do not have water, half do not have electricity, and close to a quarter do not have boundary walls or latrines. The slow accretion of needed facilities reflects the inadequacy of resources and a lack of investment, along with low development allocations. A significant proportion of schools have more than one missing facility, which highlights the fact that, in many schools, the lack of facilities is not random but rather a systemic problem. As is expected, this diminishes the quality of the learning environment.
> (Integrated Development Strategy – KP – 2014 – 2018)

As per IDS recommendations, unavailability of basic needs and amenities such as water, washrooms and electricity serves as push-factor for students leading to absenteeism and drop-out of students. Inversely, availability of basic amenities such as water, washrooms and electricity at schools serves as pull factor for students and proves instrumental in retaining students at schools. Availability of water and washrooms is very important for retaining girls at schools.

> The province falls short in terms of meeting the challenge of providing quality education to its children, who are often either taken out of schools due to poverty, missing facilities or absentee teachers. In this respect, remote areas are even more disadvantaged.
> (Integrated Development Strategy – KP 2014 - 2018

Schools are ideal platforms for disseminating Water, Sanitation and Hygiene (WASH) messages through WASH sessions at intervals. New generations are more likely to mould their behavior regarding health and hygiene and can bring behavioural changes at household level and therefore should be targeted for annual WASH sessions. Students can also persuade their parents and elders in adopting behavioural changes in their lifestyle and can trigger change for better.

Fig-12: Enrollment at Different Levels of Govt. Institutes



Tank enjoys good national and provincial ranking in terms of enrollment, learning, retention and gender parity scoring for primary and middle schools announced by Alif Ailaan NGO by the end of 2015.

Table-4: Tank National and Provincial Education Ranking (2015)

District Education Score							
Status	National Score	Provincial Score	Education Score	Enrollment Score	Learning Score	Retention Score	Gender Parity Score
Primary	103/148	22/25	56.7	50.38	37.27	49.85	89.31
Middle	110/148	-	57.19	49.52	71.93	58.76	48.75

Tank also enjoys good national and provincial ranking in terms of availability of electricity, water, toilets, boundary wall and building construction satisfaction of primary and middle schools

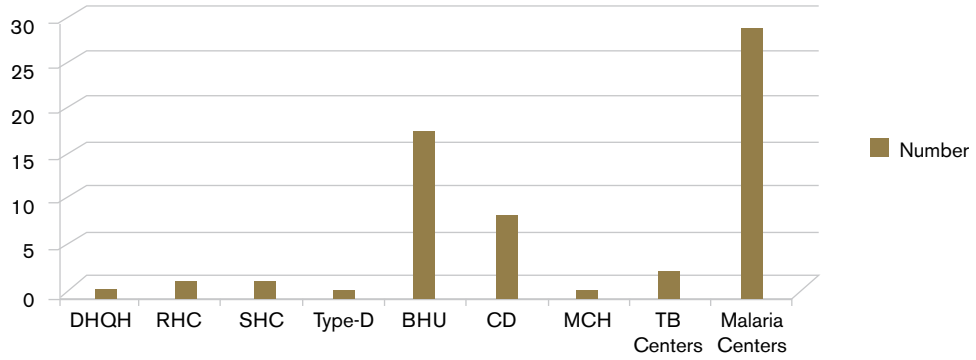
Table-5: District Tank School Infrastructure Score

District School Infrastructure Score								
Status	National Score	Provincial Score	School Infra-structure Score	Electricity	Water	Toilet	Boundary Wall	Building Satisfacto-ry Construction
Primary	44/148	9/25	78.00	68.89	58.33	88.33	90.00	84.44
Middle	47/148	9/25	85.91	81.82	65.91	100.00	81.82	100.00

2.5 Health

Communities are facilitated with one (1) District Head Quarter Hospital (16 beds), one (1) Christian Hospital (50 beds), one (1) Maternal and Child Health Center, two (2) Rural Health Centers (RHCs), two (2) Sub-Health Centers (SHCs), eighteen (18) Basic Health Units (BHUs), three (3) TB Centers and nine (9) Civil Dispensaries (CDs) by the government of Khyber-Pakhtunkhwa province.

Fig-13: Health Facilities in Tank



According to the District Health Officer (DHO), most of the toilets and water supply systems at health facilities are dysfunctional or damaged due to negligence of staff. Staff doesn't perform or discharge duty due to lack of incentives and residential facilities at far-flung health facilities.

Malaria, typhoid, diarrhea, respiratory tract infections, skin diseases and hepatitis are common diseases among patients. Medicines are insufficient due to allocation of inadequate funds. Patients' inflow increases with provision of free medicines and drops drastically after exhaustion of medicine stocks.

Moreover, there are no storage facilities at health facilities especially for storing vaccines and medicines that are supposed to be kept in low temperatures in refrigerators.

There are five (5) Medical Officers (MOs) serving at health facilities at peripheries while the rest are reluctant to perform duties due to lack of residential and associated facilities. Medical Officers decline to perform at Tank reportedly due to insecurity and lack of incentives.

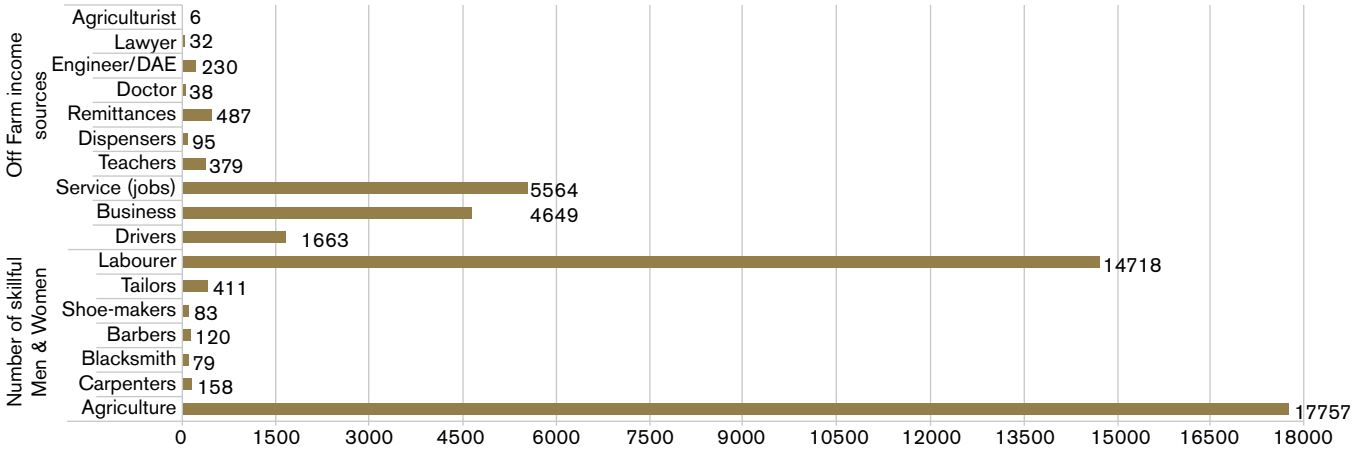
The clerk at DHO office lamented at discrimination meted out to them despite being in a 'war zone'. The health staff in Tank is neglected in provision of incentives while health staff at adjoining FR Tank is being paid with 'war zone' allowance.

There are a number of private clinics and medical treatment centers operating in district Tank including a renowned and historical missionary Christian Hospital Tank Christian Hospital is serving the communities meritoriously since 1868. The present hospital can accommodate 85 patients. There are separate male and female wards and pleasant shaded courtyards for attendants. There are medical, surgical and obstetric wards and a rehabilitation centre. A surgical operation theatre and an out patient's department remain busy in serving patients from across the region.

2.6 Income sources

The figures indicate that an overwhelming majority of men rely on agriculture and daily wages for their livelihoods. It implies that agriculture is the most common livelihood and needs attention of the policy makers for its promotion and growth. Water dominates measures for the agro-based sector and thus needs to be explored for exploiting its potential. Jobs, businesses and driving are other common livelihoods for men. Presence of qualified professionals such as lawyers, doctors, engineers and dispensers in the area indicates that people have interest in acquiring professional and high qualification if they can afford it. It also shows emerging trend in adopting new and diverse professions and qualifications.

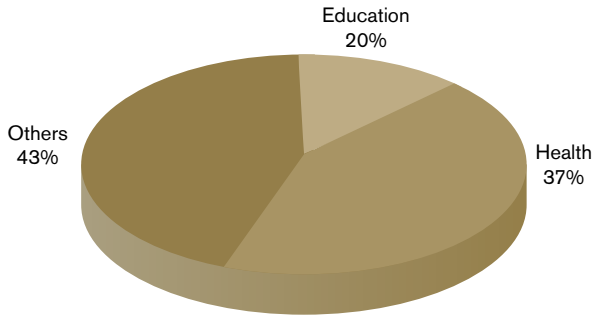
Fig-14: Income Sources of Men and Women



A great number of women are serving as teachers in nearby schools and once again indicates interest of community in promotion of education and allowing women to disseminate education to their daughters. However, overwhelming majority is associated with agriculture and livestock rearing besides tailoring specifically for womenfolk, for their livelihood.

Driving seems to be the most common profession followed by tailoring. It also indicates that transport business is booming in the area due to population increase, same reason is for tailoring. Farmers and labourers are directly at risk of poverty due to insufficient water quantity and therefore improvement in water governance and water management practices will not only facilitate access to water but will also prove to be instrumental in alleviating poverty as labourers and agriculturists will receive a direct boost in their livelihoods.

Fig-15: Trend in Household Expenses



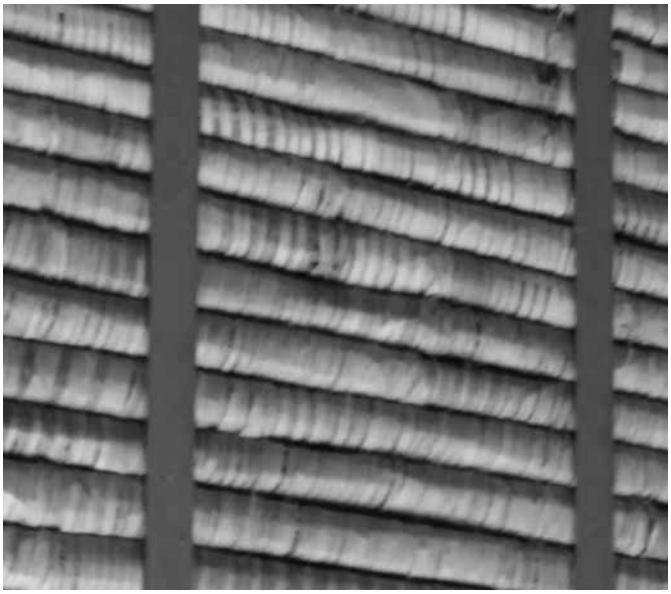
Source: Tank WUMP Database

Data obtained through WUMP process indicates that generally, communities spend 37% and 20% of their income on health and education and remaining 43% on their general domestic needs.

The data also indicates that communities are spending more than one-third of their income on healthcare which indicates prevalence of high morbidity that are caused by contaminated water and prevailing unhygienic conditions. There is a need for WASH campaigns to sensitise communities on importance of hygienic practices, appropriate methods of solid waste management, proper sanitation practices and water purification methodologies for strengthening preventive aspect of healthcare.

2.7 Traditional Skills and Prospective Products

Women in Tank are skillful and laborious; their capacity-building may lead to better livelihoods opportunities within local resources and can generate decent income for contributing to their family livelihood. Mazari is one of the local agricultural by-product used by women for making baskets, for carrying agricultural products (such as vegetables and fruits for preventing them from rotting), bread baskets, bread pot (shkor) and even shoes. Mazari baskets are ideal alternative for polythene bags that are extremely hazardous for environment. The product can be gradually promoted in other districts and areas as an alternative to polythene bags. Mazari is also used as a cushion between bamboos and T-irons in making ceilings.



Khar Shrub: Khar is a local shrub that has been used as detergent since centuries in Tank. People burn the shrub and cover it with soil for few days. After which, the shrub would have turned into charcoal-like petrified/stone material, used by people to wash their clothes. The practice is dying with arrival of affordable soaps and detergent powder in the market. However, it is still used in rural and far-flung areas which indicates that the shrub has some detergent properties that can be used in manufacturing of detergents or soaps. The research will turn the shrub into a most-sought-after commodity and may fetch income for communities.

2.8 Public Departments & I/NGOs Mapping

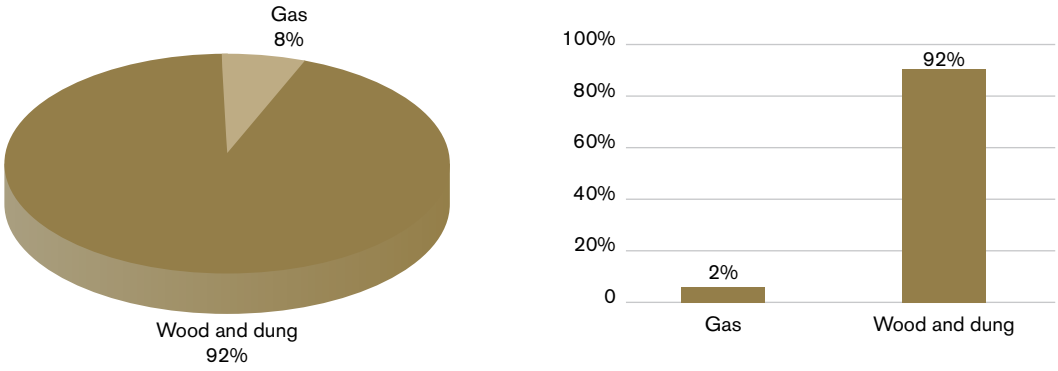
In total six Humanitarian and Development organisations including three (3) GoNGOs are implementing various projects in health, education and community infrastructure. PRIME (a local NGO), is engaged in Mother and Child Health (MCH) sector focusing on Ante-Natal Care (ANC), routine immunisations and Injectable Polio Vaccine (IPV) in Garah Baloch, Pai, Jatatarh, Gul Imam and Shah Alam UCs of district Tank.

> Productivity in the agriculture sector is seriously hampered by inefficient irrigation systems and their low levels of efficiency.
> (IDS, KP, 2014-2018)

2.9 Water Sector Interventions

Numbers of NGOs have made humanitarian interventions in Tank during and after 2010 floods. Recently the government implemented multiple water-related projects across the district through South Area Development Projects (SADP) and Government Development Projects (GDP). Unicef has carried-out an extensive WASH assessment/survey across Tank and has identified many gaps besides recommending interventions.

Fig-16: Fuel Mode



Only 8% respondents in target area are using natural gas for cooking or heating purposes while 92% respondents use Perasu (Tamarix) wood and animal dung as fuel for cooking and heating purposes. The data indicates that fuelling of communities indirectly depends upon arboriculture and livestock. Attention should be paid to promotion of livestock and arboriculture especially Perasu tree for ensuring provision of fuel wood and dung to the communities.

Excessive dependence for fuel on Perasu will eventually lead to ecological imbalance thus, besides promotion of Perasu, date palm, olive and Ber trees should be planted extensively all across the target area not only to reduce the velocity of flashfloods but to provide habitat for birds and wildlife, shade to farmers and nutritional and economical benefits to communities. Forest and rangeland in entire district Tank is 112,165-acre (1998-Census) while in target area it spans over 51,275-acre. The plantation of suitable species of trees will help secure both short term and long term interests of food, nutritional, economic, ecological and environmental for the communities.

Moreover, installation of bio-gas plants and training communities about mechanism of bio-gas plants will also allow them to take benefit of livestock dung in meeting their energy needs. Abundant animal dung will be put to its best use in bio-gas plants for overcoming energy crisis. It is also an ideal base for mushroom growth that will offer nutritional and economic benefits to communities.

Table-6: Biogas Potential from Animal Dung in district Tank (Per Day)

S No.	Animal	No. of Livestock	Dung Kg/Day	Fresh Weight	Dry Weight	Bio-Gas (cubic meter)
1	Poultry	268,503	0.1	26,850	16,110.18	3,222.04
2	Goat	154,455	1	154,455	92,673.00	18,534.60
3	Sheep	99,779	1	99,779	59,867.40	11,973.48
4	Cow	85,894	4	343,576	206,145.60	41,229.12
5	Buffalo	23,008	5	115,040	69,024.00	13,804.80
6	Donkeys	13,394	2	26,788	16,072.80	3,214.56
7	Horse	1,121	2.5	2,803	1,681.50	336.30
8	Mule	141	2	282	169.20	33.84
9	Camel	4,882	2	9,764	5,858.40	1,171.68
	Total	651,177		779,337	467,602.08	93,520.42

Chapter 3

3. Rudh Kohi System

Rudh Kohi is a Persian word meaning hill torrent. In Rudh Kohi system, torrential water gushes down towards plains (Daamaan) of Tank and parts of DI Khan districts and rushes/flows towards the River Indus. Centuries' old conventional Rudh Kohi system flows perennial or flood water from Tank Zam across the district of Tank and some parts of DI Khan through six (6) Rudhs (water channels) of Kiryani, Lohra, Pir Kach, Choha, Sidqi and Takwara originating from Tank Zam. All six Rudhs have command areas (Raqba Mutalliqa – Land concerned) entitled with 'Water Rights' under 'Kulyat-e-Riwajat-e-Aabpashi' (Collection/Formulae and Conventional Irrigation Practices/Summation of Customary Irrigation Practices) in registers known as 'Kulyat-e-Rudhwar' comprehensively devised and implemented by the then British Administration in 1908. Irrigation through Rudh Kohi system is a humble yet ambitious attempt by farmers to 'take the bull of mighty floods by the horns' in order to manipulate, divert and channelize flood water to irrigate sprawling agricultural fields. It is an attempt to turn the disaster from floods into an opportunity for livelihoods through promoting agriculture and livestock. It is a method to harness water for optimum irrigational utilisation. Th system is labour-intensive yet unpredictable. The six (6) Rudhs today are silted and need to be de-silted for optimum utilisation. The middle and lower riparian communities claim that water is diverted or stolen by upper riparian, depriving them (middle and lower riparian) of their share of water for more or less the last 30 years. Improved water governance assumes importance in prevailing scenario as influential and mighty landlords are not only erecting illegal Gattis through political maneuvering but they are also allowing excess water to go waste instead of sparing it for deprived segments despite having entitled rights for the water.

In the early 20th century, the British administration appointed first administrator in the district for spate irrigation D.I.Khan, after completion of land settlement and establishment of water rights. Similar activities were undertaken in D .G.Khan and Zoab. Management of these systems was improved after fixing operational procedures, which were printed and named as 'Kulyat-e-Rudh-Kohi'. These procedures were followed strictly until late 1960s. Participatory actions were much more common during the tribal system, which was abolished during mid 70s. Later, the interference of large and politically influenced water users has resulted in increased number of diversion structures and violation of water rights. Co-ordination among water users is also less effective compared to the tribal system. Water Management in HKH Region by Shahid Ahmad

Table 7: Per Water Source Beneficiaries

S No.	Source	Discharge (Cusecs)	Litres/day	15-liter/ Person/day	Livestock	Irrigation	Access water from Flash-flood (lit)
1	Tubewell		876,960	58,464	-	-	251,300,875,940
2	Perennial	40	97,873,920	191,536	4,905,601	90,095,279	
3	Flood	1,000-2,500	6,117,120,000	-	-	6,117,120,000	
4	Flashflood	120,000	293,621,760,000	-	-	42,320,884,060	

Fig-17: Drinking Water Beneficiaries

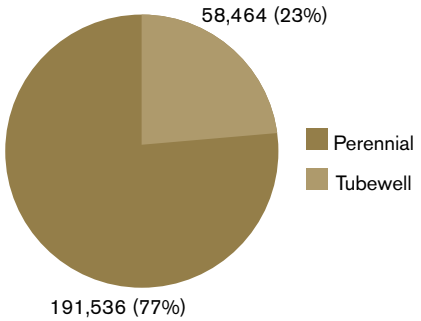


Table-8: Irrigation Water Sources

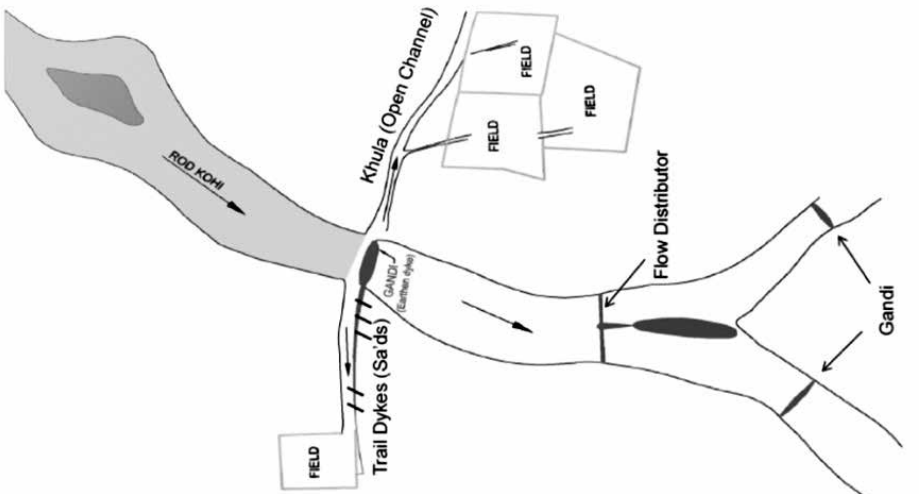
Source	Water for Irrigation (lit)
Perennial	90,095,279
Flood	6,117,120,000
Total	6,207,215,279
Acreage	118,027
Litre/Acre	52,591

3.1 Components of Rudh Kohi Irrigation System

Water Use Management Plan (WUMP), is a process that documents the overall water resources, different uses of water (drinking, irrigation/agriculture, livestock, eco-system enhancement, disaster risk management etc.), its issues, causes and options for future use in a judicious way/manner of a particular unit area such as Tehsil, UC, catchment/valley. Based on its learning, the project up-scaled WUMP process from Daraban Zam, DI Khan to Tank Zam. WUMP intends to assess water availability (quantity), water quality (drinkability, purification) and to explore cost-effective and practical solutions for efficient and streamlined water supply and management through community participation and ownership.

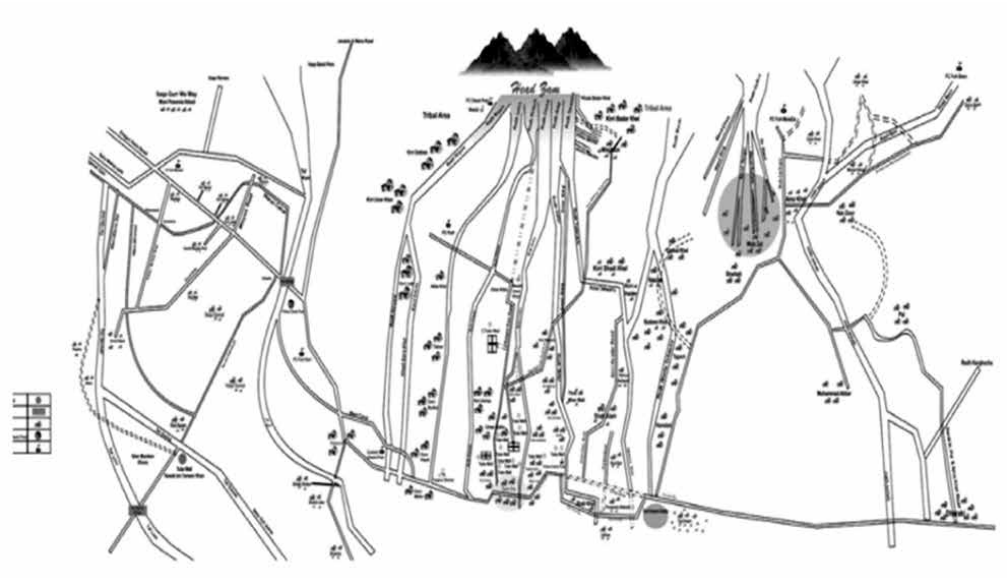
Step	System Dynamics
1	Hill torrent flows down through gravitational force to plain fields through natural channels (Rudhs) at primary level
2	Already established soil Saad/Gandi controls the flow at secondary level
	Gandis divert water to sub-streams called Wah at secondary level
3	Another structure called Gatta/Wakra diverts water to tertiary level
	Water enters fields at tertiary level for irrigation
4	Gandis are broken/breached after irrigation of Raqba Mutalliqa, to allow flow of water to respective Raqba Mutalliqa of lower riparian for irrigation

Fig-18: Components of Rud Kohi Irrigation System



Whereas, catchment areas of Tank Zam are Razmak, Kunigaram, Makeen and FR Tank areas of Warmunrhai, Warwor, Jandola, Kir'rhi, Kirri Wam.

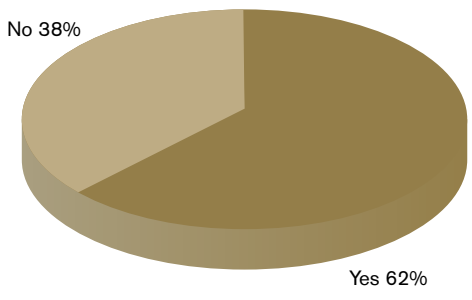
Fig-19: Six Rudhs and Command Area of Tank Zam in 9 UCs of district Tank



3.2 Water Disputes

During the WUMP process, 62% respondents admitted having water-related disputes, however they hardly register complaints with Law-Enforcement Agencies (LEAs) due to lack of trust viz-a-viz influential landlords. They have tried to approach influential segments however they have received threats in return instead of any positive response. Major losers are downstream communities and midstream to some extent. Pashtoon Bhittanis have gained notoriety for usurping water of Seraiki population of Jatatarh region. Recent assassination of police raiding party without any retribution at Umar Khan Kalay has pushed Seraikis further to the back foot.- International The News, 2015.

Fig-20: Existence of Water Disputes



Concerned quarters believe that separation of executive and judicial authorities was the last nail in the coffin of Kulyat-e-Rudhwar, fortifying the powerful and weakening the weaker further. Bureaucracy finds itself helpless/toothless/spineless in front of political stalwarts who support their peers and safeguard their interests at the cost and expense of weaker communities. Lots of expectations are pinned at newly-introduced local government to salvage situation on sustainable basis however with little hope.

A further insight into so-called 'water dispute' between upstream and downstream communities, in-fact is 'inefficiency' of the authorities that has led to the usurpation of one party to the detriment of another rather than dispute between communities. If authorities implement Kulyat-e-Rudhwar judiciously and in its letter and spirit, all disputes will be buried and system will resume delivering to all parties concerned.

Apart from rainwater, ground water, floods, Kalapani, the District Tank is also dependent on surface water from Tank Zam and hill torrent (Rudh Kohi) for its domestic and irrigation water needs since centuries. Rudh Kohi system primarily depends on rains falling on adjacent mountains of South Waziristan and FR Tank.

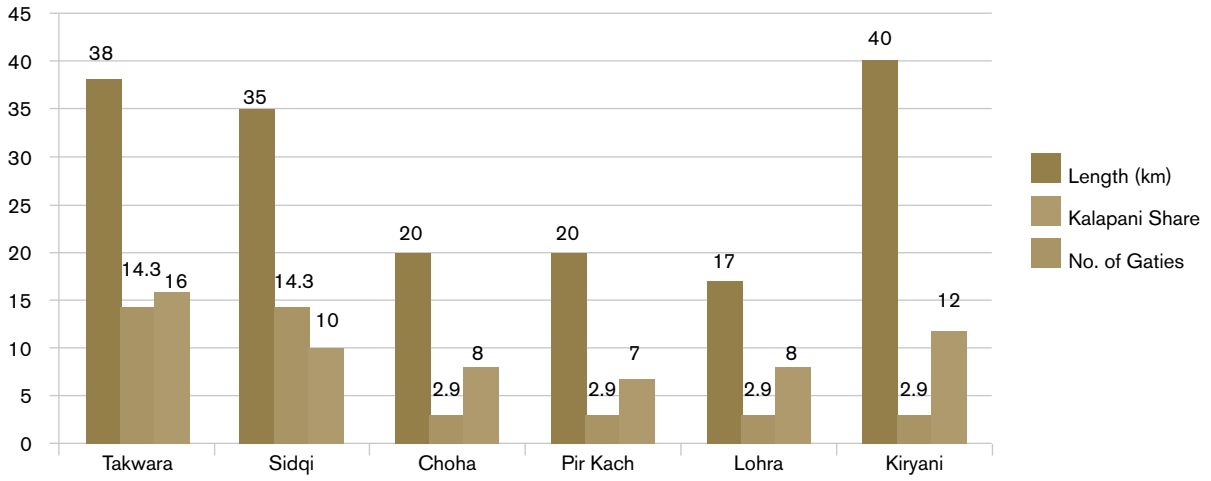
> Improved governance of law and order services, the judicial system, and prosecution services is included among the strategic priorities of the Government.
> Integrated Development Strategy, KP, 2014-2018)

Table-9: Rudh Kohi Rules and Regulations

S No.	Rule	Explanation
1	Saroba-Paina	a. Saroba means head while Paina means Tail, the rule implies that farmers at head have the natural right or entitlement to use water and Paina (tail-ender) farmer will have right to water once excess from Saroba farmer. b. It's a 'first-come-first-served' concept in geographical sense and proximity of lands in flood route c. Saroba has the natural right to water even if the quantum is small for years until a heavy flood water is flowed down to Paina after breaking Saad/Gandi d. Saroba is duty bound to de-silt or clear the Rudh for smooth flow of water to Paina
2	Wandara	Wandara means distribution of water in sub-streams
3	Raqba Mutalliqa	Is the land having water rights under Kuliyat-o-Riwajat-e-Aabpashi
4	Kamara	Is the communal duty of farmers from Raqba Mutalliqa to construct earthen Bunds/ Gandis before, during or after the floods. Collective labour work for Gandi erection is called for.
4	Permanent Structure Forbidden	Permanent structure is forbidden in main Rudh as it may get filled with silt and may cause destruction in subsequent years
5	Permanent Structure Allowed to Paina	a. Permanent structure is allowed to Paina (tail-enders) to store as much water as they can, as otherwise water will drain and be wasted or more lands have no water rights b. Concrete structure is allowed only at Rudh banks to control overflow of water

Table-10: Length and Kalapani Water-share of Rudhs and no. of Gattis

S No.	Rudh	Length (km)	Kalapani Share (2+5=7)	No. of Gattis
1	Takwara	38	14.3 cusecs	16
2	Sidqi	35	14.3 cusecs	10
3	Choha	20	2.9 cusecs	8
4	Pir Kach	20	2.9 cusecs	7
5	Lohra	17	2.9 cusecs	8
6	Kiryani	40	2.9 cusecs	12
	Total	170-km	40-cusecs	61-Gaties



Catchment areas of Tank Zam are NWA, SWA and FR Tank which supply water to target 9 UCs of district Tank through six (6) Rudhs.

Table-11: Command Area (in acres) of Tank Zam Rudhs (channels) with Entitled Water Rights

S No.	Rudh	Total Land	Built-On Land	% age	Land Receiving Water	% age	Land Not Receiving Water	% age
1	Takwara	21,610	1,995	9	7,681	36	11,934	55
2	Sidqi	29,738	2,009	7	16,981	57	10,748	36
3	Choha	13,483	2,005	15	5,737	42	5,741	43
4	Pir Kach	33,791	2,004	6	8,168	24	23,619	70
5	Lohra	19,738	2,010	10	6,691	34	11,038	56
6	Kiryani	11,694	2,004	17	2,749	24	6,940	59
Total		130,054	12,027	9	48,007	37	70,020	54

The data indicates that Rudhs are irrigating a little more than one-third of its potential command area. Due to rapid construction of 21 more Gattis over 7 decades, most of the water is utilised by influential farmers or landlords for irrigating their Raqba Gher Mutalliqa depriving downstream farmers of the right to irrigate their Raqba Mutalliqa despite having rights under Kulyat-e-Rudhwar. Another reason for 21 more Gattis may be increase in population of the Raqba Mutalliqa, however complainants believe that land doesn't increase with the increase of population. Moreover, complainants contend that in-fact the 21 new Gattis were approved without proper assessment under political duress to please influential landlords.

These six (6) Rudhs cover and command 65 Villages in 31 Village Councils (VCs) of 9 Union Councils (UCs) of City-1, City-2, Ranwal, Tatta, Shah Alam, Jatatarh, Wraspun, Garah Baloch and Gul Imam located at the middle of district Tank.

The total area of cultivable land of the province is 6.55 million acres, whereas the irrigated area only amounts to 2.27 million acres. A major proportion of cultivatable land (49%) 24 million acre is rain fed and mainly depends on the timeliness of rains, exposing a large proportion of the rural population to weather-induced risks. Out of the remaining land, 22.3% is forested and 27% is cultivated, while another 10.6% is cultivable but lying fallow due to water shortages. Of the total cultivated area of the country, KP's area under cultivation represents 7.67%. (Integrated Development Strategy, KP, 2014-2018)

3.3 Early Warning System

Early warning system is based on common sense without any technicality. Whenever it rains on mountains, a cold breeze blowing over Daamaan area brings harbinger of water flowing their way to communities in Tank. Quantity of water however depends on intensity and duration of rainfall or hill torrent. At the advent of rains in spring or especially during monsoon season of July-August farmers assume that floods will hit their area. Floods hit Tank in low intensity (1,000-cusec), medium intensity (1,300-1,500-cusec) and high intensity (2,000-2,500-cusec) while quantum of flashfloods from Tank Zam, so far recorded, has been 120,000-cusecs.

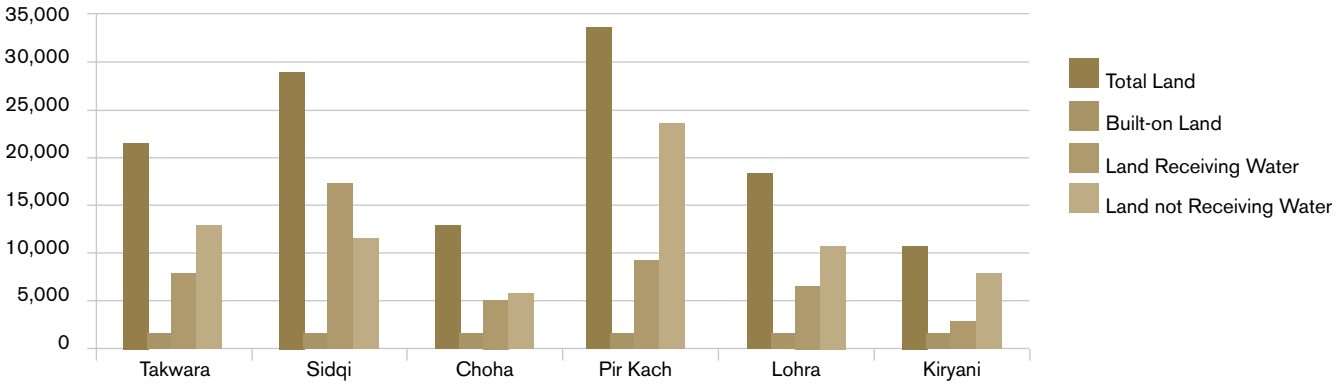
Farmers carry-out estimation of quantum Kalapani while observing quantum snowfall on Suleman range in winter (after advent of summer).

3.4 Land Utilisation (Rudh Kohi, Irrigated)

The figures show that largest irrigated land 16,981-acre (57%) is in the catchment area of Rudh Choha while the smallest irrigated land is 2,749-acre (24%) in the catchment area of Rudh Kiryani. Overall, out of total 130,054-acre land in command area of all six Rudhs, they are only capable of irrigating 48,007-acre (37%) land leaving 70,020-acre (54%) potential land irrigation-less. The vast potential of almost 100pc implies that water is needed for irrigating 58% of potential land through improving water governance and water management or applying water-efficient High Efficiency Irrigation Systems (HEIS) for tapping great and colossal agronomical potential of the sprawling virgin lands.

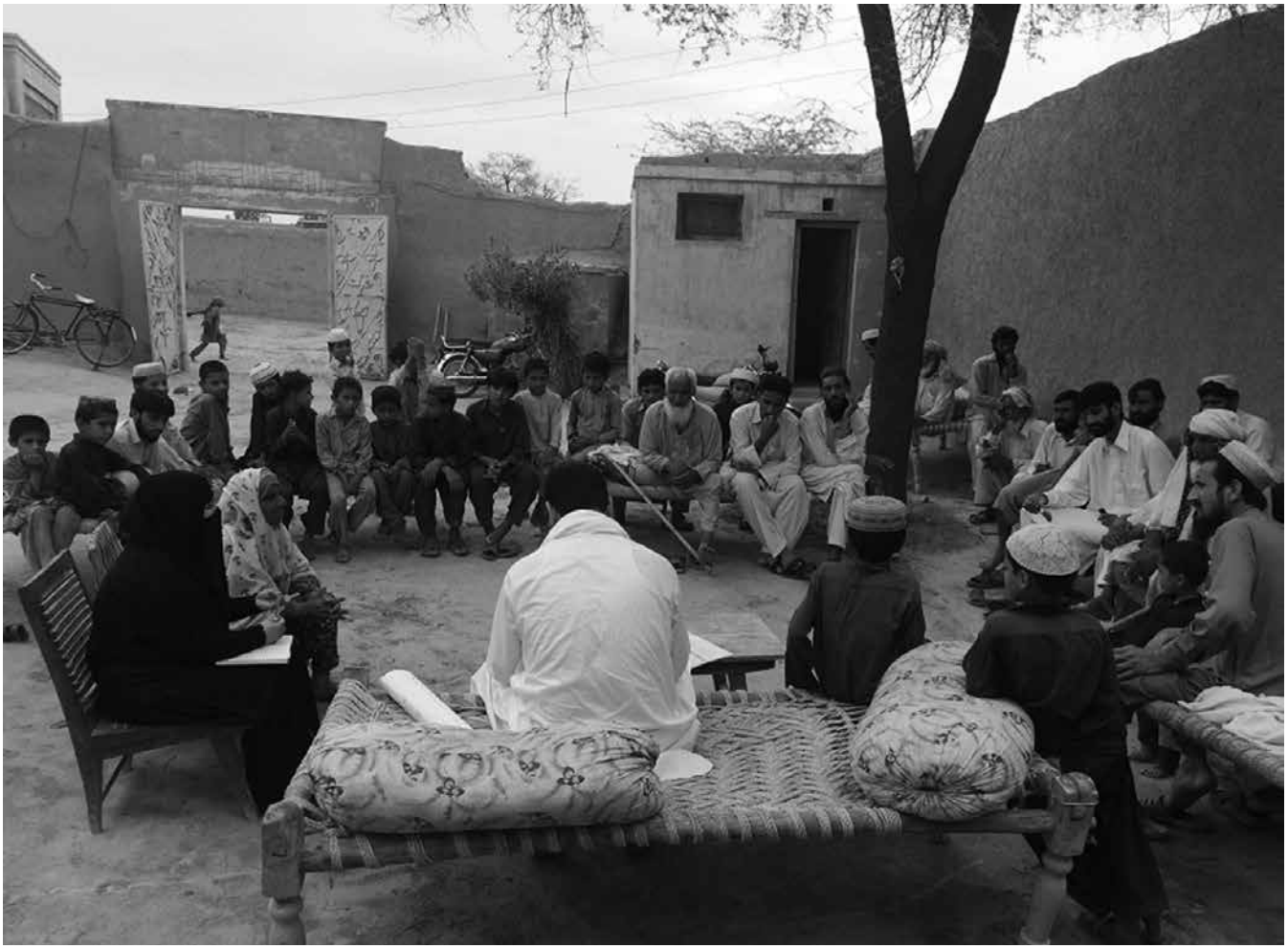
Dr. Mumtaz Khan, District Officer, Soil Conservation Department suggested organizing 'Stream Bank Training' through participatory approach by encouraging afforestation of Rudhs' banks and construction of spurs, Gabion structures and inlets.

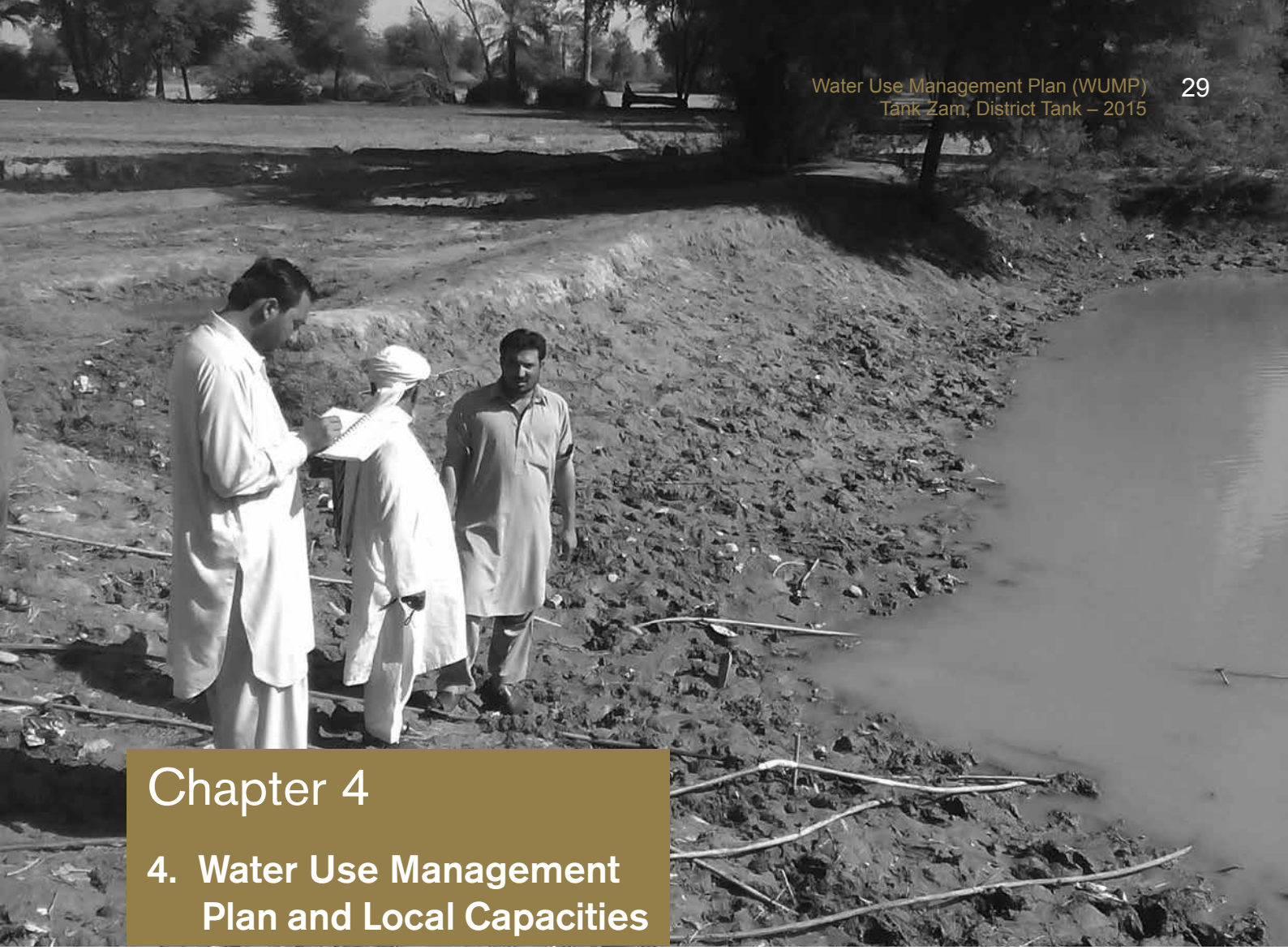
Fig-21: Rudh Irrigated Land



3.5 SWOT Analysis of Rudh Kohi System District Tank

	Strengths	Weaknesses
Internal	• Established and documented rules and regulations • Established Institution of Rudh Kohi department • Established disciplinary/retributary mechanism • Presence of human memory/Indigenous knowledge/ Expertise • Availability of machinery • Sufficient water discharge to fulfill needs of target communities under kamara • Established social institution of Kamara/WUGs/ WUAs	• Non-compliance/Non-implementation of established rules and regulations (bad governance) • Disassociation/Detachment of concerned authorities with ground realities/farmers (bad governance) • Lack of Grievances Redressal Mechanism (GRM) and non-compilation of complaints, anomalies (bad governance) • No disciplinary/retributary actions taken against perpetrators/violators (bad governance) • Vulnerability to political pressure (bad governance) • Absence of Tank Zam profile (bad governance)
	Opportunities	**Threats**
External	• Rules can be improved on basic formulae • Rudh Kohi department can be strengthened through capacity-building • Indigenous experts could be linked and involved for recommendations • Better water management can enhance agricultural productivity • Defects in Kamara system should be addressed through indigenous experts	• Rapid growth of Gattis under political duress • Uneven water distribution • Water diversion to Raqba Gher Mutalliqa under influence • Absence of genuine field assessments and surveys • Absence of record and data for policy makers • Collapse of overburdened/mismanaged Rudh Kohi system • Wastage of water, increased culturable waste • Increased poverty and destruction through disasters





Chapter 4

4. Water Use Management Plan and Local Capacities

4.1 Local Traditional Management System

Patti dari system is mostly followed in the Canal Command Area (CCA) however it is practiced in Rudh Kohi system as well.

In Patti Dari system, local landlords select a person after consensus and appoint him as Patti Dar for their area. Patti Dar is a kind of secretary/focal person for and on behalf of landlords/owners. Patti Dar organises a committee of farmers from concerned lands and identifies land for irrigation in a meeting. He passes a resolution in meetings and submits it as application on behalf of all to AC Rudh Kohi. In response to application, the AC Rudh Kohi after few days informs Patti Dar about release of water on a particular date to their lands. The Patti Dar intimates information of date and timing to farmers about the release of water to their lands and to start preparation for controlling and manipulating water to the lands concerned (Raqba Mutalliqa) for irrigation.

Raakha (keeper/watchman/guard) is another fellow who is responsible for safeguarding Gandi/Gati/Saad etc. and keeps vigil for any breach, leakage or breakage in Gandi/Gati/Saad etc. and takes remedial measures to plug leakages or prevent breaches or breakage of Gandi/Gati/Saad etc. Raakhas keep close liaison with nearest Raakhas for plugging or unplugging Gandi/Gati/Saad etc. after irrigation of Raqba Mutalliqa.

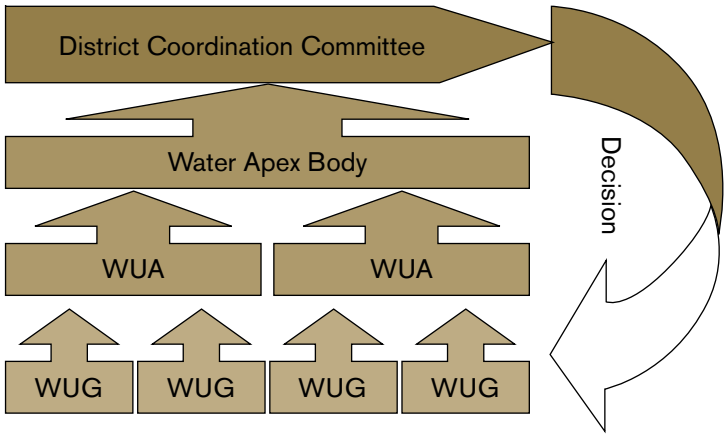
A pair of oxen (Jorha) is a unit of labour contribution in Rudh Kohi system that can contribute to irrigate a unit of land during flood season. A farmer is supposed to offer a Jorha on his behalf during Kamaara.

4.2 Community Organisations and their Capacities

The system is a kind of Grievances Redressal Mechanism (GRM) component for farmers to lodge their grievances and get their problems either resolved, clarified/explained or given feedback on their grievance or complaint. Water for Livelihoods (W4L) Project of Intercooperation (IC) constituted Water User Groups (WUGs) at village level, Water User Associations (WUAs) at Village Council (VC) level and Apex Water Body (AWB) at Tehsil and District level at District Coordination Committee (DCC) to raise and discuss water-related issues in order to identify reasonable and realistic solutions.

It is a kind of liaison corridor or communication channel between farmers and authorities for submission of grievances and remedial actions in response from authorities. This forum can restore confidence and trust of aggrieved farmers in Rudh Kohi system by addressing their problems in line with Kulyat-e-Riwajat-e-Aabpashi (KRA) for smooth and streamlined supply of water according to water rights established and entitled under KRA. Quantum of land remains the same despite quadrupled increase in population over decades. Thus distribution of water ideally should be supplied to same lands without erecting more Gattis. WUG-WUA-AWB-DCC is a platform that can revive good governance through promoting enhanced water governance and water management by upholding rule of law and observing discipline in light of Kulyat-e-Riwajat-e-Aabpashi (KRA).

Fig-22: WUMP Mechanism Flow Chart



Though the WUAs at catchment area of Tank Zam have been formed and organised, however following is the plan for their strengthening.

- Apex WUA will be registered
- Building conceptual clarity and the institutional capacity so that they can better understand their role and responsibilities, which will enable them to play a vital role in equitable water distribution at different stages
- Capacitate WUA members to better understand water related problems, properly document, prioritise and incorporate in WUMP
- Create effective linkages of WUAs with government line agencies/Local government system to mobilise resources in their areas
- WUA in collaboration with Rudh Kohi dept and new local government system will develop a development plan to synergise efforts
- WUA will have a clear mission and vision regarding water policy in Rudh Kohi area
- WUA will facilitate the Rudh Kohi Dept like in past Patti Dar did, it will strengthen the WUA
- Members of Local Government will be sensitised to involve WUA members in water sector planning
- WUA linkages with GLAs will be developed at all levels
- WUA will be supported by the Chamber of Agriculture and private sector for better utilisation of resources
- WUA will be expanded to FR areas so that water should be managed at source level of Tank Zam near FR Tank
- WUA will be effectively linked with WUGs through specific and relevant activities. WUGs will be the general body of WUA and WUA will be accountable to WUGs
- Lobbying shall be carried out for funds allocation, from different sources
-

4.3 Status of Water User Groups (WUG)

At present WUA at apex level (formed by VEER) consists of farmers. WUGs will be actively involved at village, union council, district level and at apex level. WUA will coordinate at district level. The Local Govt system will provide an opportunity to forums like WUA especially in Rudh Kohi area to solve water issues. On the basis of previous experience, knowledge, and manpower, the WUA will better facilitate and guide GLAs, local government and other concerned authorities for effective implementation and redressal of issues.

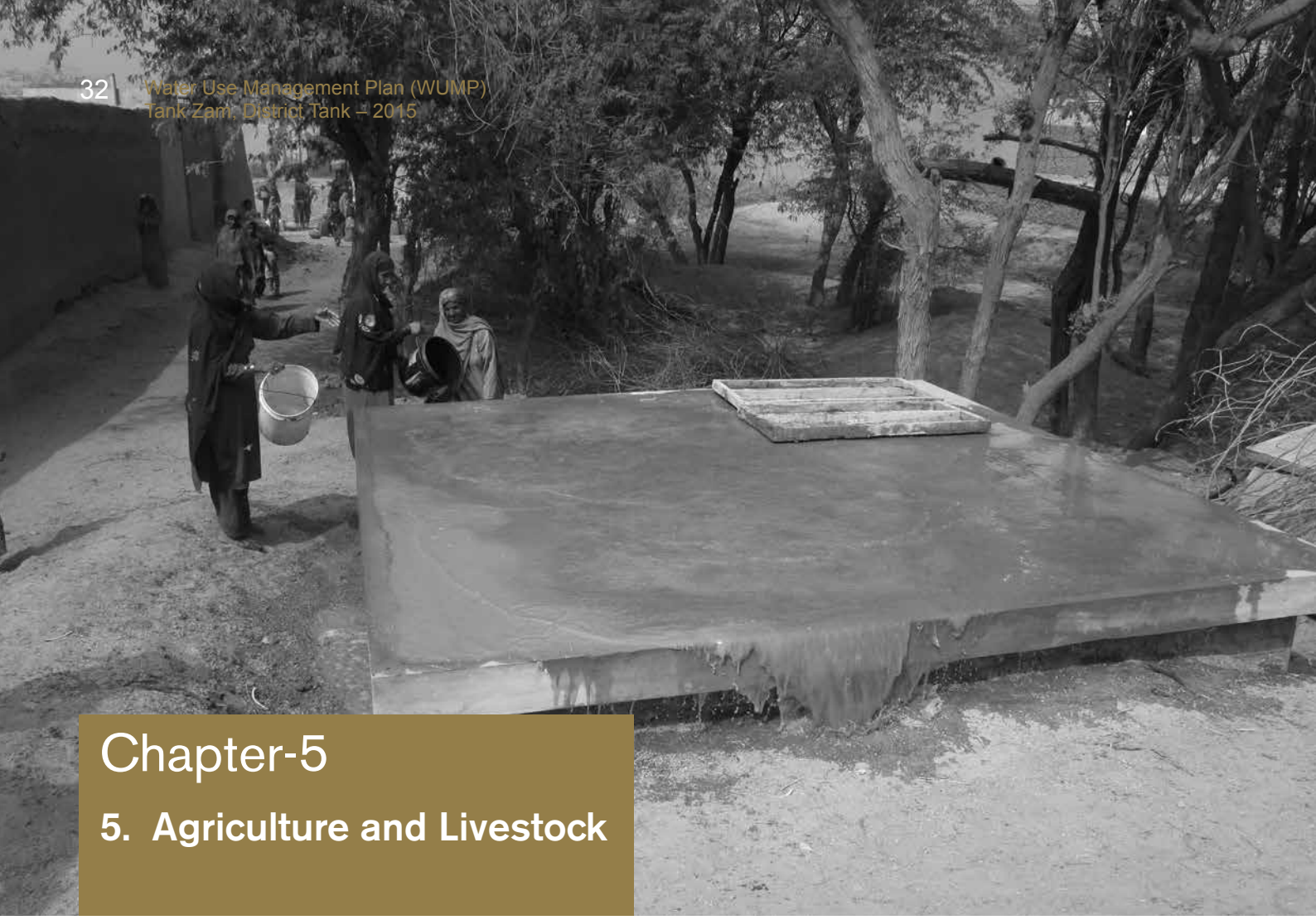
4.4 District Coordination Committee (DCC)

As collection of data and WUMP process was implemented in field, an advisory committee i.e. DCC was formed and notified by the Deputy Commissioner (DC) Tank with the Assistant Commissioner, Rudh Kohi as the Focal Person. The purpose of the DCC is

to steer the WUMP process and implementation at Tehsil or target area level. Such a district steering/coordination committee (of the W4L) was also conceptualised for the second phase to keep track of all developments. The coordination committee is holding meetings bi-annually or when specifically required. The WUMP team keeps close interaction with DCC to keep them updated about project interventions and seeks support for timely provision of services by the concerned actors (PHED, Irrigation Dept, Rudh Kohi Dept, OFWM). The DCC will also ensure ownership for the WUMP at District/Tehsil level.

4.5 Capacity Building of WUG/WUA and GLAs

At the beginning of Phase-II, before initiating the process of WUMP preparation, training was conducted for all stakeholders in the target area along with partner organisations to conceptualise the IWRM concept and to understand the WUMP preparation in the field. This inspires easy flow of information about previous experiences of various bodies involved in the process.



Chapter-5

5. Agriculture and Livestock

5.1 Agriculture

Agriculture production of irrigated land 48,007-acre is 26,558-ton per annum, while production of 70,020-acre land having water rights but do not get flood water for irrigation every year and rain-fed area i.e. 14,306-acre together with 84,326-acre produced 3,539-ton of agriculture produce.

> Agriculture contributes 21% to provincial GDP. Livestock and agriculture together provide livelihoods to 83% of the people living in rural areas.
> (Integrated Development Strategy, 2014-2018)

The figures indicate that the culturable waste of 70,020-acre (54%) land can produce around 38,736-ton of agriculture produce if identified measures or measures could be identified to irrigate culturable waste. The measures will not be less than a revolution in ensuring not only food security for the target communities but ensuring a sustainable livelihood as well.

Due to semi-arid terrain , a small portion of land is under irrigation. The area mostly depends on rainfall in winter as well as summer. The major crops sown are Sorghum, and Millet in summer, melon in spring, while oilseeds, gram and wheat are the winter crops. Besides tomato, various vegetables are grown in different seasons. Date Palm (Phoenix Dactylifera) and melon (Cumumis Sativus) etc. are the common fruits in the area.

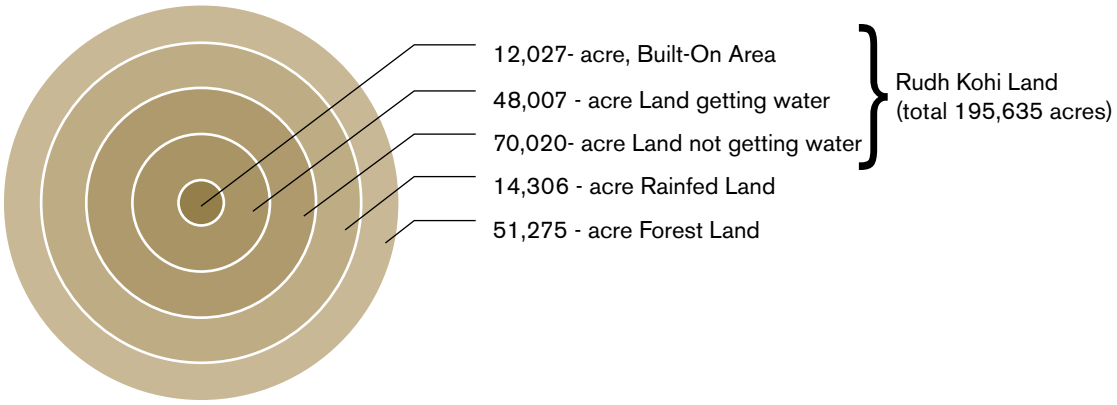
5.2 Farming Practices

The community is adopting mixed farming methodologies and practices. They are utilising both traditional and mechanised farming implements for enhancing their agricultural produce. Agriculture Extension District Tank is trying to introduce new production technologies to farmers through trainings, demonstration field visits, workshops and seminars. Capacity-building of farmers is reflected through their farming.

5.3 Flood-cum-perennial (Kalapani) Irrigated, Un-Irrigated and Rainfed Land

Out of total 195,635-acre land in the target area of 9 UCs/Command area of Tank Zam, built-on area is 12,027-acre (6%), while out of the remaining 48,007-acre (24%) land is irrigated and 70,020-acre (37%) of land in un-irrigated, while 14,306-acre (7%) is rainfed and 51,275 (26%) is forest area. In total (37%) of un-irrigated 70,020 acre land is culturable waste.

Fig-23: Land of Targeted 9 UCs



Out of total land of target area under Kulyat-e-Riwajat-e-Aabpashi (KRA) or Tank Zam command area, entitled land with water rights under Kulyat-e-Riwajat-e-Aabpashi (KRA), 130,054-acre, only 48,007-acre (37%) land is getting water whereas 70,020-acre (54%) is not getting water despite entitled water rights due to mismanagement in RK system while 12,027-acre (9%) is built-on area. Despite sufficient perennial and flood water, water is lost as 21 new Gattis have been approved by influential and powerful landlords through bureaucracy under political duress in addition to 40 Gattis at the time Pakistan came into being. Communities at downstream are deprived of access to water despite having entitled rights and thus bear the brunt of the mismanagement due to bad water governance. Access to water can be facilitated through improvement of water governance and water management practices otherwise prevailing unfair system would further deteriorate water scarcity at downstream.

However, agriculture production of irrigated land 48,007-acre is 26,558-ton per annum, while production of land 70,020-acre land (having water rights but do not get flood water for irrigation every year) produced 2,259-ton of agricultural produce.

The figures indicate that the un-irrigated land 70,020 land can produce around 38,736-ton of agriculture produce if measures could be identified to irrigate culturable waste. The measures will not be less than a revolution in ensuring not only food security for the target communities but ensuring a sustainable livelihood for them by boosting economy. By introducing frequent interaction mechanism among stakeholders, desiltation of Rudhs and introducing High Efficiency Irrigation Systems (HEIS).

Fig-24: Irrigated land (acre) and production (ton)

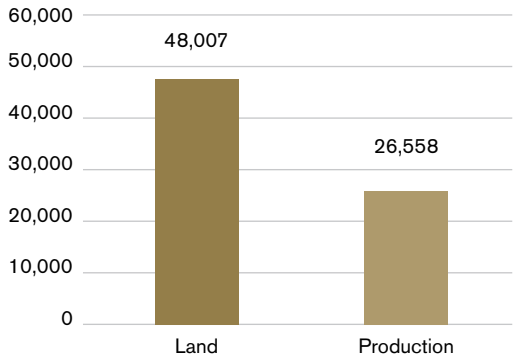


Fig-25: Un-irrigated land (acre) and production (ton)

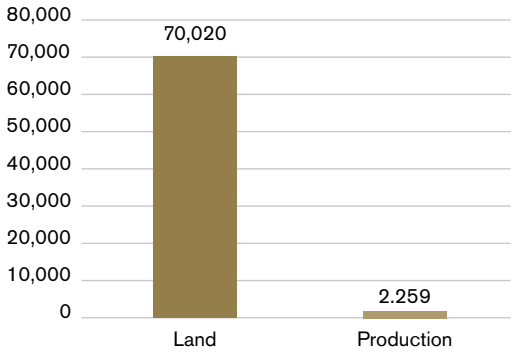
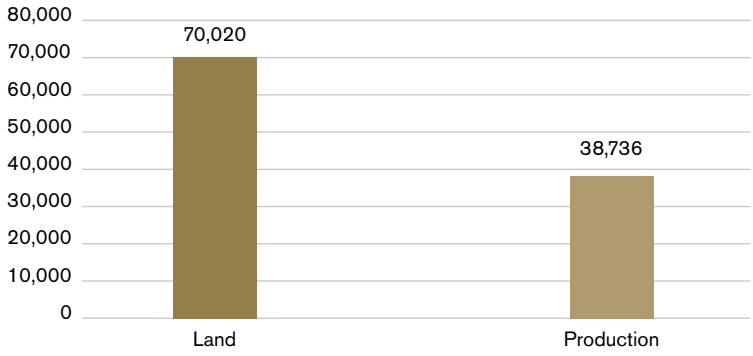


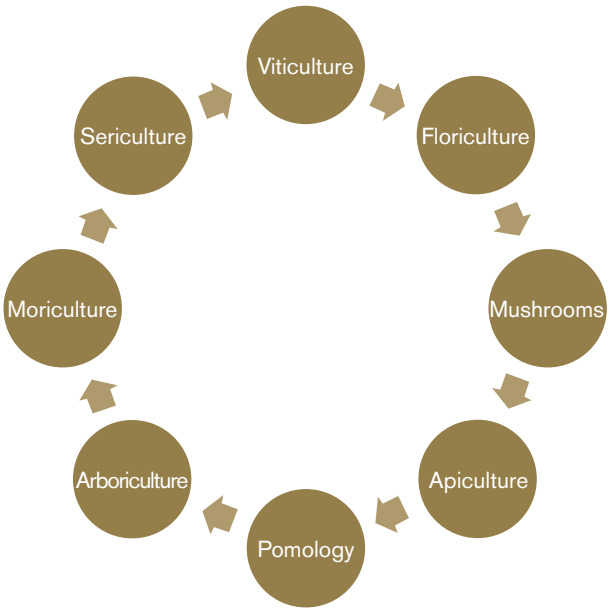
Fig-26: Projected Agricultural Production of Culturable Waste Land after Irrigation



Rudh Kohi comprises of 6 Rudhs, receives water from various sources in the shape of Kalapani and flood. The sources are as far as SWA, NWA and FR Tank.

5.4 A Viable District Tank

Fig-27: Greening of Tank



Source: Tank WUMP Database 2015

Afforestation has associated cycle of nutritional, economic, ecological and environmental benefits. Plantation of trees of suitable species such as date palm, olive and Ber (Zizyphus) will not only control intensity of flashfloods but also better maneuverability for irrigation and pond storage as well as provide habitat for birds and wildlife especially bees, not to forget providing much-sought-after shade during intensive heat during prolonged summer. In addition, trees (arboriculture) will produce fruit (Pomology) that has high nutritional and economic value and will cater to needs of bees for producing honey. Cultivation of flowers (Floriculture), mulberry (Moriculture) and vineyards (Viticulture) will also help to flourish bee-keeping (Apiculture) and silk production (Sericulture). Cultivation of mushrooms at livestock dung will produce a high-value product that can fetch good profits for communities. The plantations will secure both short-term and long-term interests of food and nutritional security, economy and environment for communities.

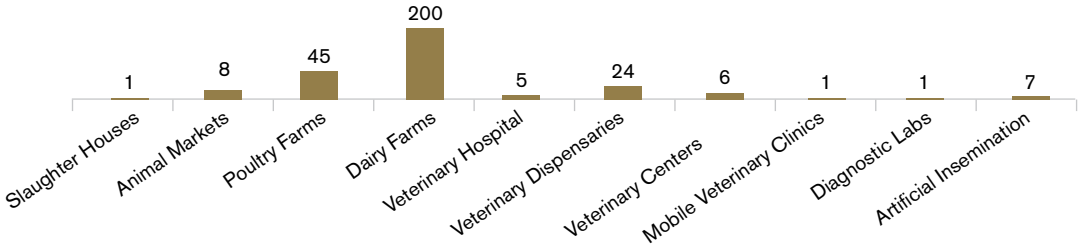
Peanut is yet another prospective crop suitable for Tank. Soil profile of Tank is ideal for growing peanuts and can fetch good income for farmers. Peanuts can be grown in aisles between fruit trees in orchards.

5.5 Livestock Facilities at Tank

Tank has a very efficient Livestock and Dairy Development Department (LDDD) busy in extending valuable services to the farmers and livestock owners. Interestingly there are 200 dairy farms across Tank fulfilling dairy product needs of the communities. Dairy farms are mostly owned by big landlords.

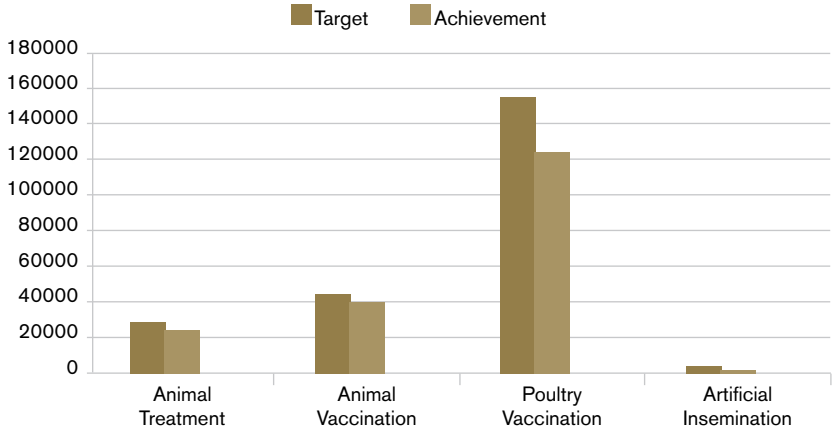
> "The livestock sector contributes 39% of the total agricultural income in the province and complements the agricultural incomes of small and landless families. More than 70% of families own ruminant livestock.
> IDS, KP, Govt Stats\Integrated-Development-Strategy.pdf 2014 - 2018

Fig-28: Veterinary Facilities in Tank



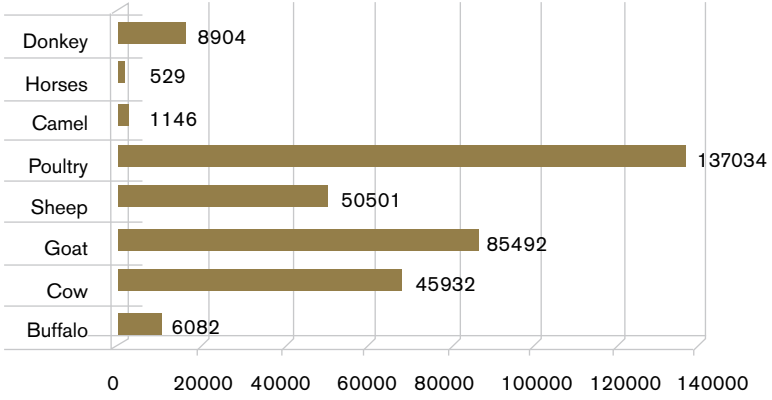
Small ruminants such as goats seem to be the favorite livestock of the people in the area followed by sheep. Poultry population however is the highest in the district. Veterinary facilities across district Tank have successfully achieved 85% of their targets. The achievement indicates efficient performance of the department and their staff.

Fig-29: Veterinary Facilities



Source: Livestock and Dairy Development Department, Tank 2015

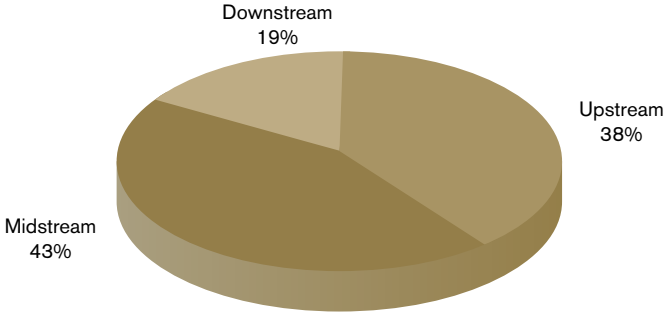
Fig-30: Livestock Status/Holding



Midstream communities rear the highest number of livestock i.e. 43% of the total population while upstream and downstream communities hold 19% and 38% livestock of the total animal population.

5.6 Stream-wise Livestock Population

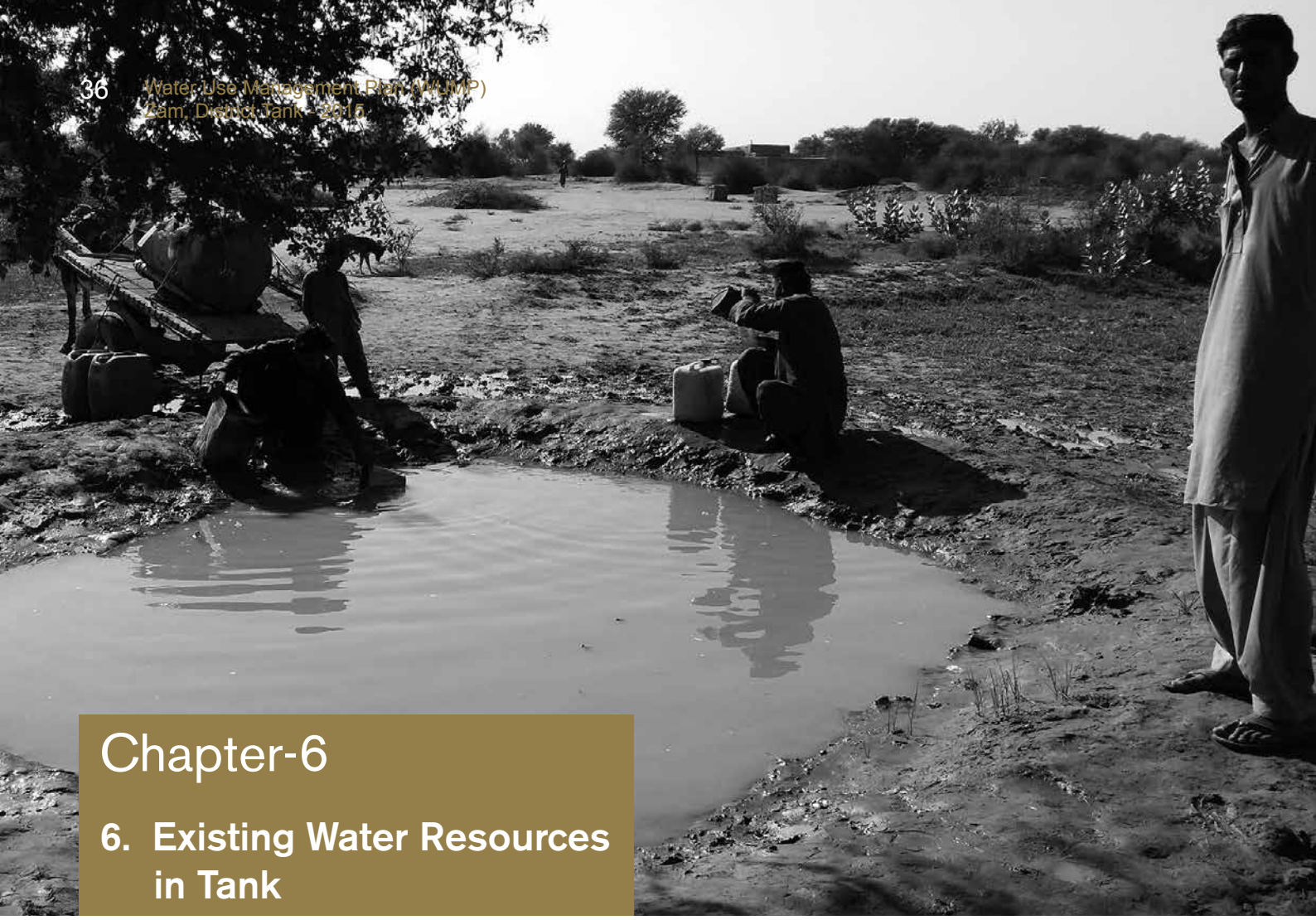
Fig-31: Livestock Population according to Water Sources



Source: Tank WUMP Database, 2015

Communities and authorities have suggested constructing concrete ponds for livestock in order to conserve water and avoid water seepage or percolation which will ensure enhanced meat and milk production, improved animal health by preventing metabolic diseases.

Dr. Umar Khan, District Director, Livestock and Dairy Development Department (LDDD) suggested organising trainings and workshops on the importance of water in healthy livestock rearing and judicious use of water.



Chapter-6

6. Existing Water Resources in Tank

Target area of WUMP in Tank has ideal surface water flowing through Rudhs from Tank Zam. Communities fill their ponds with water and use it till it dries up or till next flow of perennial water, rain or flash-floods.

> The delivery of social services, education, health, water supply and sanitation is a basic right of citizens.
> IDS, KP, 2014 - 2018

Ground water is sweet and shallow at Bhittani area above Tank city. However, ground water table at areas below Tank city is not only brackish but at a depth of 900 to 1800 feet. It is indeed very difficult to pump the water due to 20-hour-long power outages and dysfunctional tube-wells.

PHED has installed 9 tube-wells (list annexed) for the midstream and downstream villages at upstream of Umar Khan Kalay, Shah Alam. The assigned tube-wells were planned at 10-hour daily water pumping to meet the needs of target communities, however due to power outages they are hardly capable of pumping water for 4-hours. PHED and communities have recommended conversion of tube-wells' power supply from WAPDA to solar for sufficient water pumping to meet the needs of the communities.

Moreover, the Temporarily Displaced Persons (TDPs) of the Mehsud tribe have settled at different locations and are disrupting water supply by breaking pipelines forto get water for their domestic needs. Therefore, the target communities do not get sufficient water supply. PHED recommended installation of solar systems to run tube-wells for longer periods to fulfill needs of both TDPs and native communities simultaneously. PHED also recommended installation of bypass pipelines to meet the needs of target communities.

6.1 Water Resources Classification

Water sources of the target area Tank district can be classified into following three categories

1. Surface Water

Surface water is perennial water flowing from Tank Zam through 6 Rudhs. Perennial water is supposed to be distributed under Kulyat-e-Rudhwar among communities. However, the system of Kulyat-e-Rudhwar is almost dysfunctional for more than 20-years according to community members. According to sources, minimum discharge of Tank Zam is 40 cusecs while the most is 120,000 cusecs. Surface water has been tested and found to be suitable for irrigation for all kinds of crops.

2. Ground Water

Ground water is abundant, sweet and shallow at upstream and is spared by PHED for drinking water to all Tank villages. This is because ground water at midstream and downstream is brackish and at depth more than 900-feet.

3. Rain-fed lands and Annual Floods

Rain especially during July and August, is the source of water for communities as they try to store rainwater in ponds inside and outside houses for domestic use. Farmers also carry out harvesting through rainwater as Rudh Kohi. Mean rainfall in DI Khan/Tank is 327.4mm.

4. Extreme Flood Events

Floods hit Tank generally once a year in July-August allowing farmers to store water in their bund-protected fields for subsequent harvesting. Low to high floods from Tank Zam ranges from 1,000-cusecs to 2,500-cusecs. (Irrigation Dept., DI Khan)

5. Flash flood

Extreme floods hit the area after hill-torrents in three to five years however it is challenging for farmers to manage these extreme flood gushing water due to its velocity and volume. The extreme flood flow over their lands eroding soil as run-off to Indus River. Maximum water discharge of Tank Zam during such flood season has been recorded at 120,000 cusecs. (Irrigation Dept., DI Khan)

6.2 Water Governance System

Status of water governance and water management is in pathetic and deplorable condition and needs serious and immediate attention as well as intervention of the authorities concerned. The water rights of a large number of small and weaker farmers are being usurped by mighty and influential farmers without any remedial action, mediation or retribution by quarters concerned. Water rights are generally violated by upstream farmers depriving farmers at midstream and downstream of water rights and jeopardizing their food security.

Authorities need to implement Kulyat-e-Rudhwar in letter and spirit for facilitating farmers to ensure food security for their families at least.

6.3 Water Rights & Irrigation System

Out of total 195,635-acre land in the target area of 9 UCs/Command area of Tank Zam, land under Kulyat-e-Riwajat-e-Aabpashi (KRA) or Tank Zam command area entitled land with water rights is 130,054-acre (66.5%), out of which 48,007-acre (37%) land is getting water whereas 70,020-acre (54%) is not receiving any despite entitled water rights while 12,027-acre (9%) is built-on the area. Remaining 65,581-acre comprises of Forests 51,275-acre (26%) and Rainfed 14,306-acre (7.5%) of the total target area land. Despite sufficient perennial and flood water, water is lost as 21 new Gattis have been approved by influential and powerful landlords through bureaucracy under political duress in addition to 40 Gattis at the time Pakistan came into being. Communities at downstream are deprived of access to water despite having entitled rights and thus bear the brunt of the mismanagement due to bad water governance.

Scenario of water rights in the target area of Tank WUMP is deplorable and lamentable. Everywhere people are complaining of usurpation of their water rights at the hands of upstream Bhittani and Mehsud Temporarily Displaced Persons (TDPs).

Irrigation system is redundant and farmers rely on and wait for either rain or flash floods that reach and hit their areas because upper riparian cannot control it.

6.4 Domestic Water System

Water is stored in earthen ponds and taken from the pond for cooking, washing and bathroom or toilet needs. At most water from the same pond is stored in jerry cans, pitchers, buckets or other utensils at kitchen, room or toilets for use.

Very few, affluent people have overhead tanks which are filled through pumping water from the same ponds to overhead plastic or concrete tanks. Water flows down through pipes in bathrooms, toilets and kitchens. Filtration through cloth is a common method of purification.

6.5 Water Resources Analysis

In urban settlements TMA's provide tube well pumped water and in rural villages PHED caters to drinking water, whereas communities on self help bring water from Tank Zam and stored into open ground tank and reserved.

PHED has installed 9 tube-wells at upstream as there water is sweet and potable while water at midstream and downstream is not only brackish but at a depth of 900-1800-feet. PHED designed 9 tube wells for a target population of 250,000 in 9 UCs at 10-hour per hour uplifting, however due to prolonged power outages, tube wells lift and supply water for 3-4-hours per day as per availability of electricity supply. Only one tube well destined for UC Ranwal has been installed with solar electricity supply. Collective discharges of 9 tubes wells cover drinking water needs of 58,464 people. Rest of the 191,536 people fulfill their drinking water needs from perennial water (Kalapani). Digging more tube wells is unsuitable as underground water table is decimating rapidly leading to environmental and ecological imbalance. Therefore solar systems could be installed at existing tube wells to both fulfill needs of the population and maintain water table.

PHED: There are 9 tube-wells assigned for the targeted 9 UCs of
1. City-1
2. City-2
3. Garah Baloch
4. Gul Imam
5. Shah Alam
6. Tatta
7. Wraspun
8. Jatatarh
9. Ranwal

Due to the disruption by settled TDPs target communities do not get appropriate water supply. The only solution offered by PHED officials was installation of solar power systems to pump water for up to 15-hours per day to meet needs of both TDPs and target communities. Besides, PHED officials suggested installation of bypass pipelines for uninterrupted water supply to both the communities. Additionally, repair of different tube-wells and replacement of pipes are the other needs.

6.6 Tehsil Municipal Administration

A few families disclosed that they purchase water from the Tehsil Municipal Administration which is delivered in a water tanker for about Rs. 2,200. The water is filled into earthen ponds or underground reservoirs for a month-long use.

6.7 Migration Trends

In District Tank, 12% of the population migrates to parts of Punjab Lakki Marwat to work as labourers during crop hervest during drought spell and returns when flood water reaches their lands. 'Water' is both the push and pull factor for migrating families.

Fig-32: Migration and Frequency

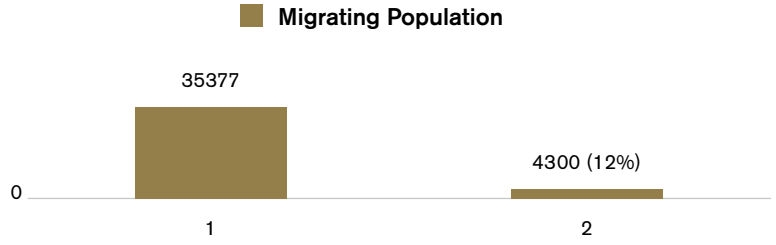
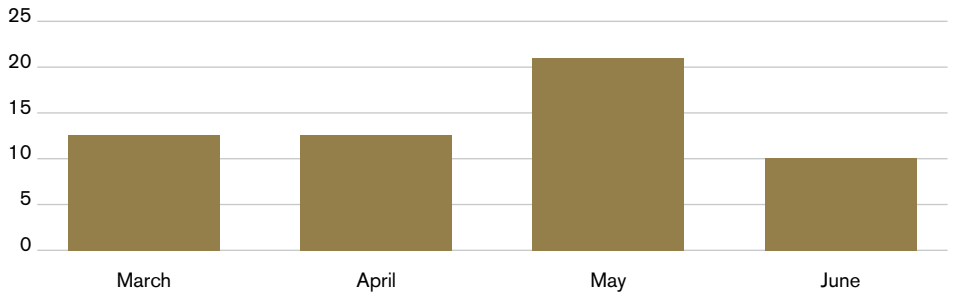


Fig- 33: Usual months for Migration



The trend indicates that migrations take place during water-scarce months from March to June and returns when floods are expected in their areas of origin during June and July.

6.8 Disaster Risk Reduction (DRR)

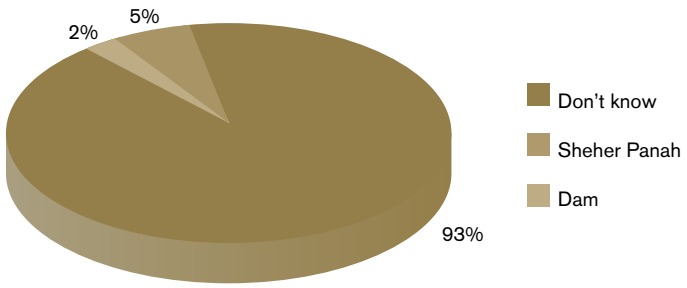
Target communities are receiving floods every year while extreme floods hit after an interval of 3-5 years. Extreme floods deprive communities mostly of their belongings and livestock. Being flat all across, it is difficult of avoid losses. The only measure prioritised by communities during WUMP process is a protection wall. However, experts have recommended tree plantations of Date Palm, Olive and Ber (Zizyphus) in order to reduce intensity of flashfloods for water diversion and manipulation for irrigation purposes.

Embankments/Protection Wall/Sheher Panah

As far as Disaster Risk Reduction (DRR) measures are concerned, embankments have been constructed at a few villages, locally known as Sheher Panah (City's Protection). The embankment or protection wall is meant to divert gushing flood water from city towards plain areas.

Interestingly, 94% of respondents expressed their ignorance about responses to disasters while 2% suggested construction of dams and 5% suggested Sheher Panah (embankment/protection wall) as a befitting response to impending disasters expected every three years. The impact of floods could be minimised efficiently by desilting Rudhs for smooth flow of water.

Fig-34: Response to Disasters



Source: Tank WUMP Database

Tree Plantation/Afforestation

Tank WUMP humbly suggests plantation of Date Palm, Olive and Ber (Zizyphus) trees on large scale especially at field borders and Rudhs' banks in order to prevent soil erosion, soil retention, shade provision, nutrition provision, oxygen production and it will also provide habitat for birds and other wildlife. The trees will also help flourish Apiculture (bee-keeping) that will lead to honey production which has medicinal and nutritional value bringing in good exchange and market value of approximate PKR 1,500 per kilogram honey. The suggested tree species have high survival rate and long life span up to thousand years. The trees are not only suitable but ideal for district Tank and will have far-reaching ecological, environmental, nutritional and economic benefits for the native communities. Tree plantation or afforestation is the most ideal, sustainable, ecological and environment-friendly method of preserving soil and wildlife.

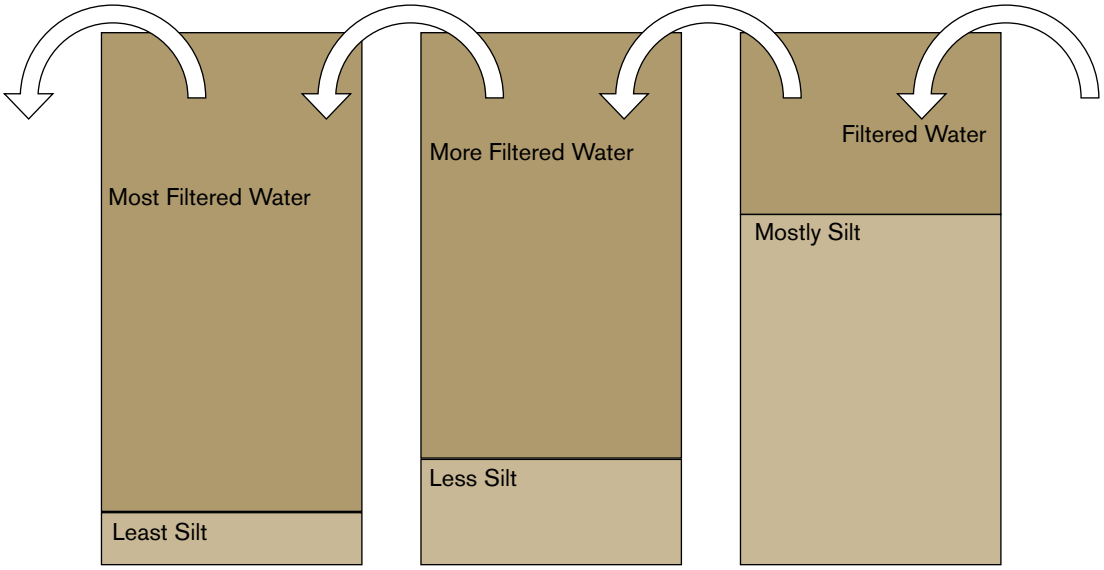
Construction of Weirs

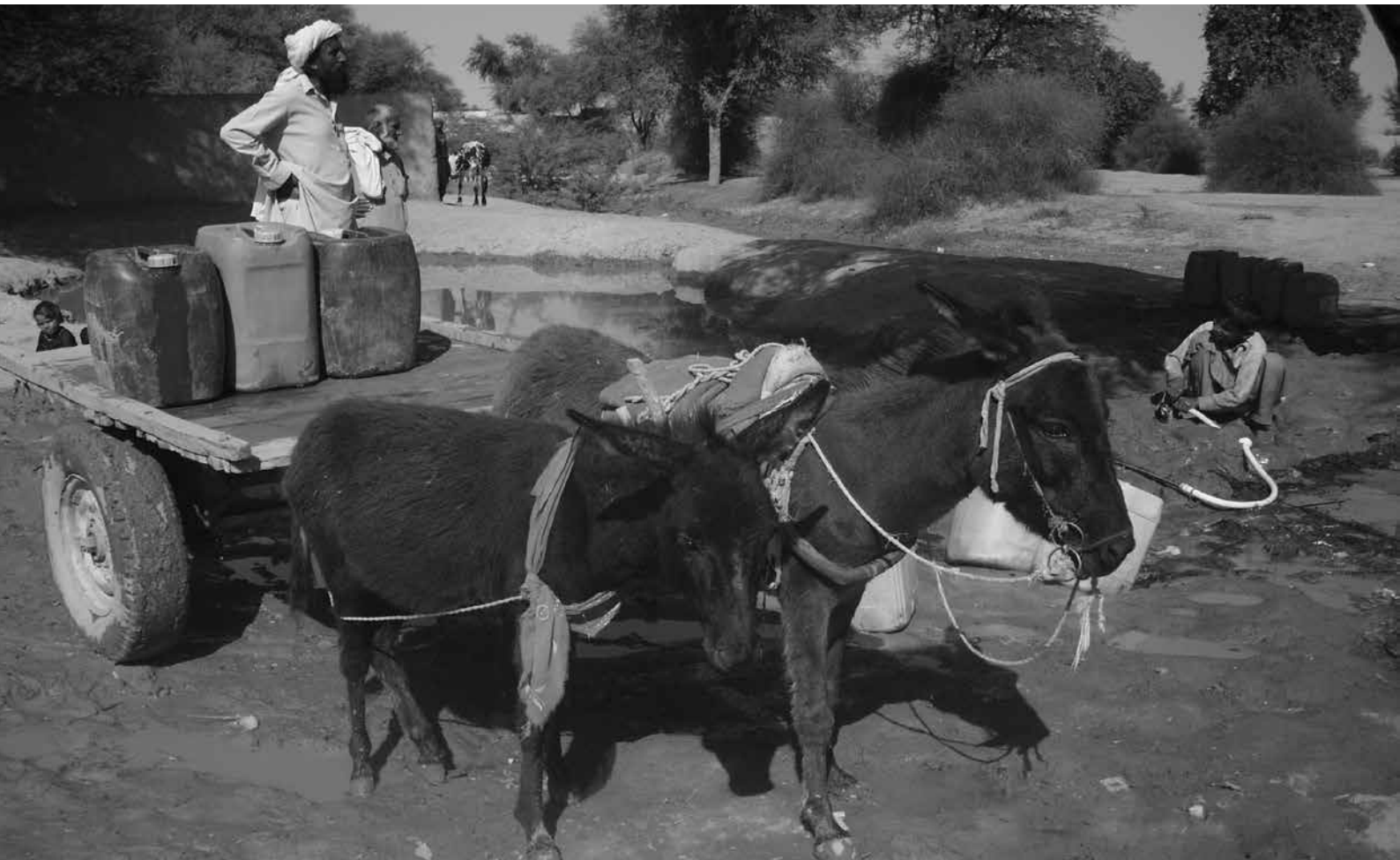
Construction of Weirs, reduce or break the speed of flash-floods rendering water to be more manageable while mitigating risk of destruction as a result of flashfloods.

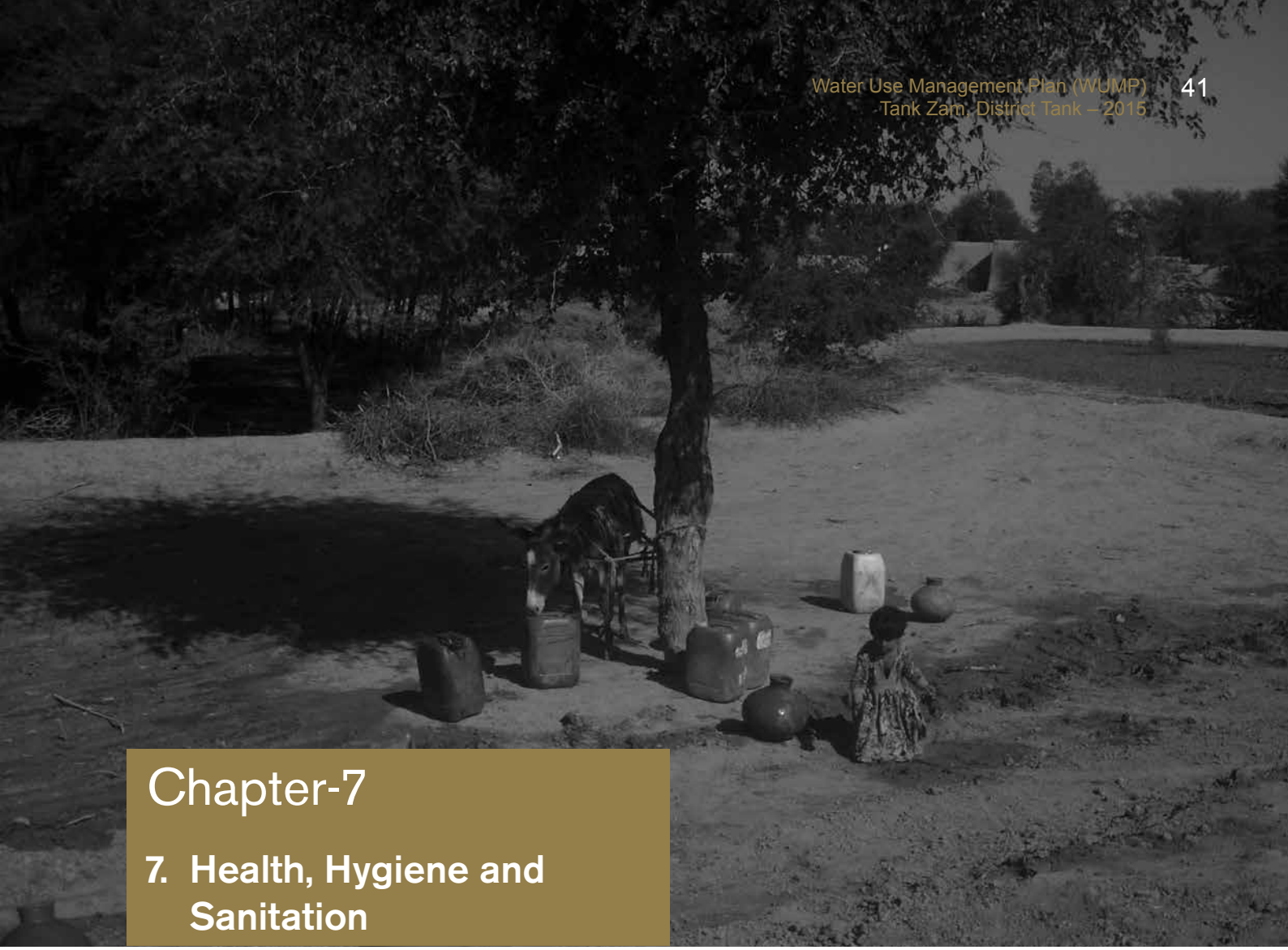
Water Purification

Moreover, water purification through sunlight is the most sustainable method and the easiest for every community member as in Tank, the photoperiod is more than 11-months per year. Communities just need to be sensitized on the practice and or provided with glass bottles with enhanced storage capacity. 60% water is lost through evaporation and absorption in semi-arid areas like district Tank, therefore covered water storage facility could be an ideal facility to avoid evaporation.

Fig-35: Overflowing water filter







Chapter-7

7. Health, Hygiene and Sanitation

7.1 Health & Hygiene Practices

Malaria, diarrhea, skin diseases and gastric diseases are common in the district. The diseases can be prevented through raising awareness among communities about importance of hygiene practices.
Water-borne diseases are common which indicates use of contaminated water by communities. Specific sessions should be organised during WASH sessions regarding importance and significance of water purification in preventing diseases. Communities should also be sensitised on affordable water purification methods.

Water contamination is the biggest issue and concern of the stakeholders. Water stored in ponds is turbid and is replete with clay, silt and biomasses. Ponds are shared by animals and humans leading to high incidence of morbidity. During survey, communities shared that they have never been sensitised on health and hygiene and on filtration or water purification methods.

There is a dire need for organising intensive and extensive Water, Sanitation and Hygiene (WASH) sessions simultaneously among male and female communities at Mohallah/Street level to create awareness about importance and significance of cleanliness and water purification methods for domestic use in cooking and drinking purposes. Hygiene Kits containing essential hygiene items

should be distributed at household level and regular follow-up should be carried-out for achievement of positive and effective results. Refresher sessions should be organised on a quarterly basis to observe behaviour change vis-à-vis adoption of hygienic lifestyle.

> Access to safe drinking water and safe sanitation are the most effective means of improving public health and saving lives. It is empirically proven that improved water and sanitation services significantly improve health and also engender many secondary benefits. Clean drinking water is critical to the prevention and control of water-borne diseases. Similarly, inadequate sanitation is linked to a wide range of illnesses such as typhoid, diarrhoea, intestinal worms and hepatitis. Poor water supply and sanitation is considered a key determinant of IMR and MMR in the province.
>
> Figures describing access to improved water and sanitation in KP depict an alarming picture. Overall, 71% of KP households have access to an improved water supply. The coverage varies from district to district, with the lowest coverage observed in Kohistan – at just 11%. Access to sanitation is an even larger problem; only 66% of the population has access to sanitation and only 39% of latrines are considered safe. Access to sanitation in urban areas is much higher than in rural areas.
>
> The lower literacy rate in the province contributes to the dismal state of sanitation and use of clean drinking water, as illiterate people tend to be unaware of the hygiene implications of both. Mass awareness campaigns to spread the messages on linkages between poor health, unclean water and sanitation appear to have failed to reach communities.
>
> The province's growing population also has an impact on the provision of sanitation and water supply services, as resources come under pressure and resultantly less and less financial allocations are available for the sector. A large number of provincial water supply schemes in the province – i.e. 1, 06432 – have fallen into disrepair and require major rehabilitation and extensions to cover new areas.
> (Integrated Development Strategy, KP, 2014 – 2018)

The proposed hygiene advocacy sessions should ideally include most economical water purification methods for prompt adoption by target communities.

The successful adoption of hygienic practices will bring drastic change in behaviour change and lifestyle of the communities leading to a decrease in morbidity or disease prevalence.

7.2 Sanitation

Though using flush and pit latrines, the community has no concept of septic tanks hence faeces are drained without any treatment. The faeces are mostly dumped into soil. Washing water is drained directly into streets rendering them impassable. Pavement of streets and lining of drains is essential for proper drainage of sewage and waste water and in order to avoid waste water becoming colony for mosquitoes and flies. Communities need to be oriented on hygienic practices and risks associated with contaminated environment and open defecation. They also need awareness on importance of personal hygiene and preventive health practices.

Sunlight is the best germicide as well as anti-septic and District Tank is certainly not lacking in this resource, therefore Tank WUMP suggests environment-friendly water-purification methods e.g. through sunlight in glass bottles. Filtered water filled in glass bottles kept in sunlight for 4-hours is potable and ready to be used for cooking and drinking purposes. Cholination or chlorine tablets are also an affordable method of water purification. Pavement of streets, lining of drains will indeed resolve sewerage problems and drainage.

Table-12: Common Diseases in Tank

S No.	Diseases	Yes (%)	No (%)
1	Typhoid	100%	0%
2	Dysentery	97%	3%
3	Cholera	89%	11%
4	Hepatitis	97%	3%
5	Malaria	97%	3%
6	Skin diseases	97%	3%
7	Dengue	6%	94%

The above-mentioned seven diseases are common in Tank as per respondents. Cent per cent respondents claimed that typhoid is a common disease, while 97% respondents contended that dysentery, hepatitis, malaria and skin diseases are common, 89% claimed

cholera to be common. 94% respondents informed that dengue is uncommon most probably because there is hardly clean water available where dengue mosquitoes flourish.

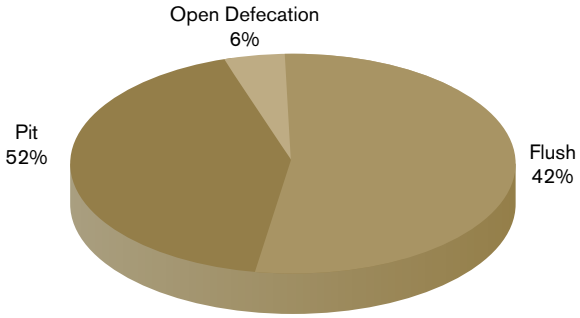
All the stated diseases are water-borne which implies need for adopting sanitation measures, vector control and water purification methodologies to overcome these maladies.

Target communities can be sensitised and capacitated regarding preventive measures for these diseases through extensive Water, Sanitation and Hygiene (WASH) sessions held throughout the area. The sessions simultaneously catered to both male and female segments of the society especially at education institutes for effective adaptation by new generation.

7.3 Toilet Types

During the WUMP process, 42% and 52% respondents said that they were using flush and pit latrines respectively. However, only 6% respondents admitted that they were carrying-out open defecation. If the deserving and needy population within the target area is given more sustainable choices in their daily hygiene, it will reduce a source of contamination and will help in prevention of diseases.

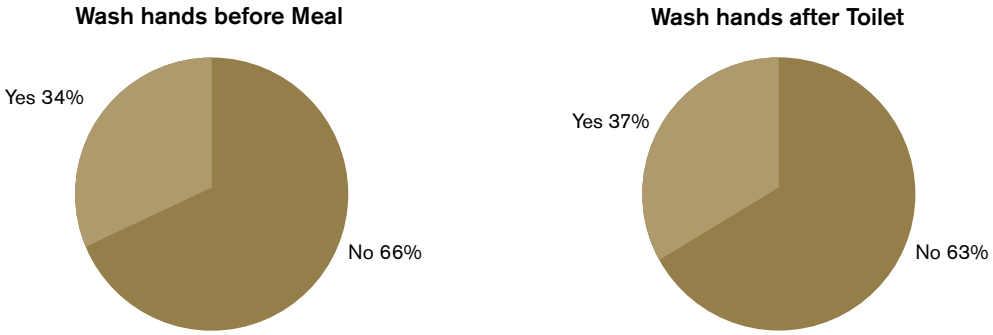
Fig-36: Types of Toilets



However, the people who are using flush-toilets have no septic tanks even across city-1 and city-2 UCs. The faeces are just flushed out to drains or onto streets. The DHO himself pointed out this phenomenon and even those who have septic tanks for their flush latrines have constructed it outside their houses in streets, which ideally should be inside their houses.

Seven diseases are common in Tank as per respondents. All respondents claimed that typhoid is a common disease, while 97% respondents contended that dysentery, hepatitis, malaria and skin diseases are common, 89% claimed cholera to be common. 94% respondents informed that dengue in uncommon most probably because there is hardly clean water available where dengue mosquitoes flourish. All the stated prevailing diseases are water-borne which implies need for adopting sanitation measures, vector control and water purification methodologies to overcome these maladies. Special attention should be paid to safe water handling by women at homes for promoting preventive health practices.

Fig- 37: Hygiene Practices



66% and 63% respondents informed that they do not wash hands before preparing or eating food and after attending toilet respectively. The figures indicate that improper and unhygienic practices lead to prevalence of common diseases mentioned in the report. The WUMP also established that families generally spend 37% of income on medical treatments. Hence, sensitisation and orientation of extensive WASH sessions especially among women can improve lifestyle of communities that will not only reduce prevalence of morbidity but will also reduce their medical expenses.

Chapter-8

8. Planning & Development and WUMP

8.1 Integrated Planning and Development Strategy

For the sake of forming a cohesive grasp over the recommendations evolving from the locals to the WUAs's prioritisation exercises, including the participating partner organisations to the (advice from and for) the local government of 9 UCs of Tank, district DI Khan, the following categorical discourse is meant to serve a multi-purpose. It elaborates on what the water user associations say they want, what the government thinks they want and ideas which they can also look into. It also chalks out a few recommendations for the WUAs (or the locals), the local organisations and the local government personnel. All in all, the recommendations are only the surface of a sea of possibilities, the only way to explore would be to take every involved party into confidence and work with a genuine goodness of heart.

8.2 IWRM Approaches

The formulation of IWRM Plan follows a distinct four phase approach:

- Identify the range of water resource issues across the target area and assess their severity, mutual dependence and frequency of occurrence. A "user requirement issue" results from an inadequate matching of user requirements (demand) and water resources availability and quantity (supply) while an "impact issue" results from human activities (which negatively affects the quantity or quality of the water resource)or from natural causes in the case of floods and droughts. National and international issues should also be taken into account, for instance upstream- downstream issues.

- Identify measures and management interventions at all levels – national, basin/ valley, local–which are necessary to address the issues identified. From the interventions required identify the management functions at each level. Management functions include such items as policy development, planning and coordination, water allocation, discharge regulation, monitoring, enforcement and information dissemination. Trans-boundary problems may require concerted international cooperation and joint efforts.

- Analyse the present institutional capacities at all levels–national, basin/ valley, local and examine the potentials and constraints relating to the issues to be dealt with and functions to be undertaken. The capacities relate to factors such as the efficiency of institutional structures and the adequacy of human and financial resources as well as the adequacy of policies and legislation.

Prepare strategies in consultation with different water related stakeholders for removal of any deficiency in the framework of national policies, legislation and regulations for IWRM, for the development of institutional roles that allow a coordinated implementation of IWRM with required management instruments and associated skills. International strategies have to be developed in collaboration with other riparian nations.

8.3 Conservation and Protection of Water Resources

Water Resource Base desperately needs to be improved at 9 UCs of Tank Zam catchment area. As it identifies and minimises factors responsible for degradation of water resources, it also promotes activities for optimization of water resources.

8.4 Multiple Uses of Water

This plan recognises and strategises to diversify water utilisation pattern. 9 UCs of district Tank suffer from lack of water at certain times of the year yet at other times it has sufficient. Still being an arid district, water resources need to be used for fostering social and economic development activities through using new and improved technologies.

8.5 Balanced Uses of Water

It identifies overall water situation and ensures distribution of water according to needs of the communities to minimise water wastage issues. It also emphasises on equitable allocation of water resources among all user groups.

8.6 Productive Uses of Water

To harness productive use of water as a resource, it should multiply livelihood opportunities for poor and marginalised communities in 9 UCs of Tank.

8.7 Efficient Uses of Water

To reduce water wastage, it adopts methods and prescribes improvement in the existing water utilisation systems.

8.8 Water Resource Use Conflicts

During the social & technical assessment, careful attention was given to identify the disputes for any past, present utilisation of water sources and future plan. In the assessment process, major disputes exist in different VCs among the different tribes for irrigation, water utilisation and water rights.

In relation to water management, the following specific challenges and constraints have been identified in the Rudh Kohi area:

1. Weaknesses and problems of the traditional Rudh Kohi water distribution system

- Upstream landowners do not respect the Kuliyat & Riwajat-e-Abpashi (Irrigation laws), which ultimately adversely affect the traditional water distribution system.
- The recognised management structure (Pathi Dari, WUA) has weakened and no longer plays an effective role in water regulation and distribution.
- Political interference by the local influentials who influence the Rudh Kohi department for both not respecting the Kuliyat & Riwajat, also for bribing (bulldozers hours etc) either for their own bund construction or giving to their affiliated peoples.
- Uneven distribution of expenses/investment among farmers & landowners in construction of infrastructure (bunds etc.) causing problems.
- Lack of appropriate technologies for water harvesting and moisture conservation at farm level.
- Unawareness about efficient water usage techniques, like irrigation scheduling etc.
- Sometimes Rudh Kohi system itself becomes a source of conflicts as major disputes occur due to disrespect to Rudh Kohi irrigation rules and principles.

2. Weakness/Problems of Government Line Agencies (GLAs)

- Rudh Kohi Irrigation Department is not effective due to interference from local influential, administration & limited financial

resources available due to the abolishment of the Agriculture Engineering Department.
- Rudh Kohi Irrigation Department is not effective in application of rules in case of violation.
- Rudh Kohi irrigation department has no control over upstream landowners, who often cause disparity in water allocation for downstream land owners.
- Non-availability of machinery (bulldozers) during peak season causes delay in bund construction.

3. Lack of infrastructure & access to market
- Remote villages have no proper metalled access roads and people cross the agricultural fields for commutation. When these fields are filled with water due to floods for irrigation, access to markets is made more difficult
- Lack of infrastructure for irrigation and drinking water
- Lack of infrastructure or rehabilitation/de-siltation. Most of the Rudh Kohi irrigation water diverges into the irrigated land of nullas which have either no water rights or water rights of which are awarded after the land has been diverged due to siltation.

4. Lack of access to safe drinking water
- In most of the villages people are using rainwater, which they store in open unprotected ponds and use it without further treatment. This leads to a high incidence of waterborne diseases.
- Some villages have piped water supply provided by the Public Health Engineering Department (PHED). However, most of these systems are in disrepair, pipes are old or damaged.
- People of downstream villages have no access to drinking water. This is the main reason for the migration of local people to CRBC command area villages.

8.9 Gender and Social Inclusion

Women constitute 52% of the population of Tank. The condition is as deplorable as is the condition of women in other poor parts of the country. In Tank, the concept of "feminisation of poverty" is very evident and prominent. Women are poor, under-nourished, weak and over worked. They are malnourished, less educated with a very restricted access to health facilities - which are generally limited as well. The population is highly deprived of basic necessities of life.

In the study area, women are generally married soon after puberty. They work up to 16 hours a day, doing household chores, fetching water and fuel, looking after farm animals and working in the fields. Customs and social norms restrict her access to services and laws that openly discriminate against her, providing little protection of basic human rights. Custom and culture dictates her mobility, which is generally limited, within and outside the village.

8.10 Water Use Management Plan

Prioritisation Process:
During PRA of WUMP process, both men and women participated actively for prioritising their water needs. The Male and Female Social Organizers (M/FSOs) enquired every participant one by one about priority of listed proposed interventions and tabulated those on a chart on wall. The communities, after completion of the chart agreed with the outcome and ratified it.

Table-13: Schemes' Prioritisation Process at Village Alikhel

(E) Desiltation of Nullahs	(D) Concrete Inlets	(C) DRR	(B) Desiltation of Rudh	Wanda at Alikhel	
A	A	C	A	____	(A) Wandara at Alikhel
B	B	C	____	A	(B) Desiltation of Rudh
E	C	___	C	C	(C) DRR
E	____	C	B	A	(D) Concrete Inlets
_____	E	E	B	A	(E) Desiltation of Nullahs

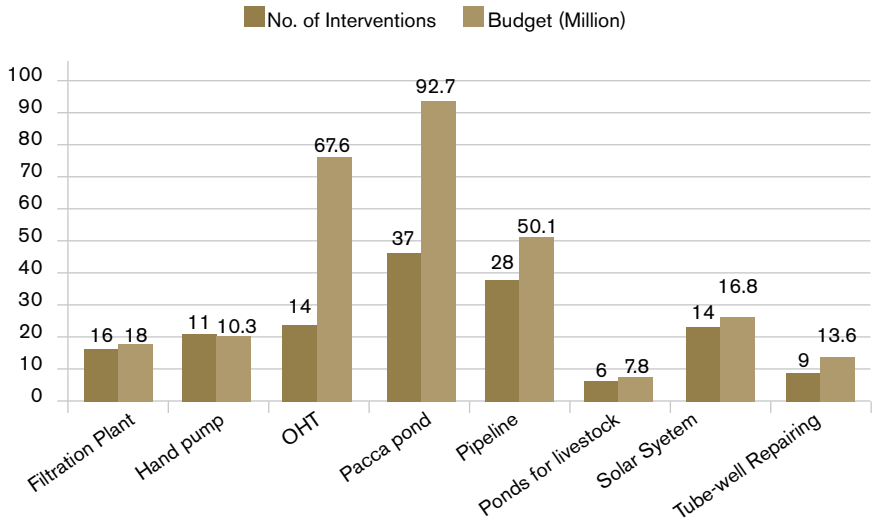
A = Construction of Wandara System at Ali Khel = 6
C = Construction of DRR = 6
E = Desiltation of Nullahs = 4
B = Desiltation of Rudh = 4
D = Construction of Concrete Inlets = 0

8.11 Village Council WUMP

Table-14: Summary of Prioritised Drinking Water Supply Schemes (DWSS)

Interventions		No. of Interven-tions	Budget of ST Int.	No. of ST Int.	Budget of MT Int.	No. of MT Int.	Budget of LT Int.	No. of LT Int	Total (Mil-lion.)
Category	Sub- Category								
Drinking	Filtration Plant	16	4.5	4	8	8	5.5	4	18
	Hand pump	11	6.6	7	3.5	3	0.2	1	10.3
	OHT	14	14.6	5	47	7	6	2	67.6
	Pacca pond	37	34.7	19	52	14	6	4	92.7
	Pipeline	28	30.7	19	12.4	5	7	3	50.1
	Ponds for livestock	6	0	0	4	3	3.8	3	7.8
	Solar System	14	9.3	8	6.5	5	1	1	16.8
	Tube-well Repairing	9	7.6	5	5.5	3	0.5	1	13.6
		135	108	67	138.9	48	30	19	276.9

ST = Short Term, MT = Mid Term, LT = Long Term, Int. = Intervention

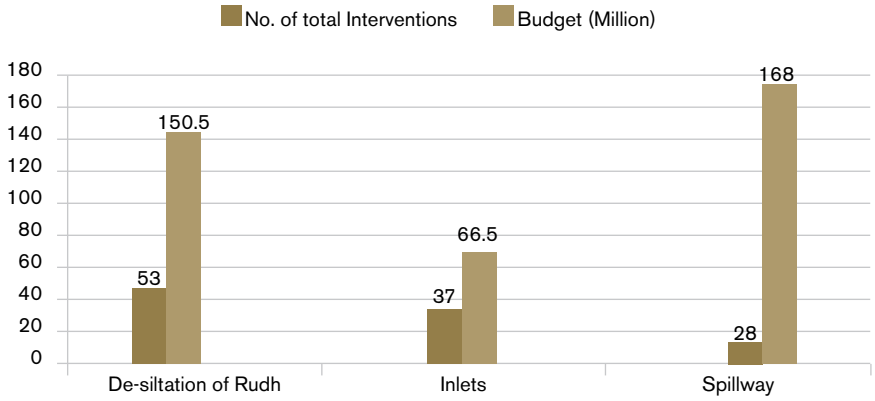


8.12 Prioritised Irrigation Interventions (IR)

Table-15: Summary of Prioritised Irrigation Water Supply Schemes

Interventions		Nos. of Total Interventions	Budget of ST Int.	No. of ST Int.	Budget of MT Int.	No. of MT Int.	Budget of LT Int.	No. of LT Int.	Total (Million.)
Category	Sub- Category								
Irrigation	De-siltation of Rudh	53	98.2	24	45.3	16	7	3	150.5
	Inlets	37	22.2	13	33.8	18	10.5	6	66.5
	Spillway	28	129	21	39	7	0	0	168
		118	249.4	58	118.1	41	17.5	9	385

ST = Short Term, MT = Mid Term, LT = Long Term, Int. = Intervention



8.13 Prioritised Sanitation Interventions

Table-16: Summary of Prioritised Sanitation Interventions

Interventions		No. of Total Interventions	Budget of ST Int.	No. of ST Int.	Budget of MT Int.	No. of MT Int.	Budget of LT Int.	No. of LT Int.	Total (Million.)
Category	Sub- Category								
Sanitation	Sanitation	30	34.4	13	30.9	12	7.5	5	72.8
	Sewerage	20	16.6	7	20	8	18	5	54.6
		50	51	20	50.9	20	25.5	10	127.4

ST = Short Term, MT = Mid Term, LT = Long Term, Int. = Intervention

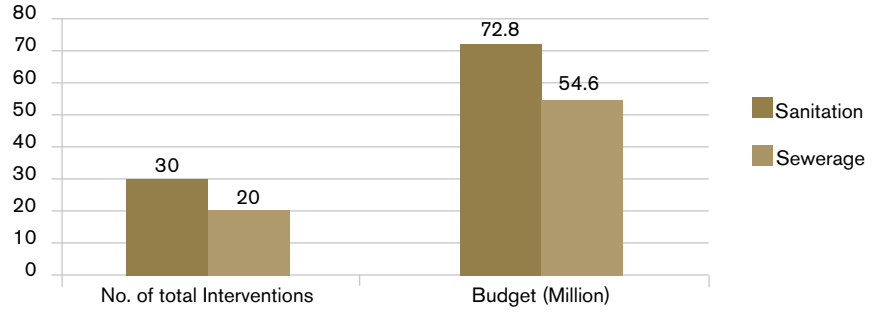


Table-17: Grand Total Summary of Prioritised Interventions (DWSS, IR, Sanitation, DRR)

S No.	Interventions		No. of Total Interven-tions	Budget of ST Int.	No. of ST Int.	Budget of MT Int.	No. of MT Int.	Budget of LT Int.	No. of LT Int	Total (Million)
1	Category	Sub-Category								
	Drinking	Filtration Plant	16	4.5	4	8	8	5.5	4	18
		Hand pump	11	6.6	7	3.5	3	0.2	1	10.3
		OHT	14	14.6	5	47	7	6	2	67.6
		Pacca pond	37	34.7	19	52	14	6	4	92.7
		Pipeline	28	30.7	19	12.4	5	7	3	50.1
		Ponds for livestock	6	0	0	4	3	3.8	3	7.8
		Solar System	14	9.3	8	6.5	5	1	1	16.8
		Tube-well Repairing	9	7.6	5	5.5	3	0.5	1	13.6
Total Drinking Water Supply Schemes			135	108	67	138.9	48	30	19	276.9
2	Irrigation	De-siltation of Rudh	53	98.2	24	45.3	16	7	3	150.5
		Inlets	37	22.2	13	33.8	18	10.5	6	66.5
		Spillway	28	129	21	39	7	0	0	168
Total Irrigation Schemes			118	249.4	58	118.1	41	17.5	9	385
3	Sanitation	Sanitation	30	34.4	13	30.9	12	7.5	5	72.8
		Sewerage	20	16.6	7	20	8	18	5	54.6
Total Sanitation Schemes			50	51	20	50.9	20	25.5	10	127.4
4	DRR	Protection wall	26	51.5	18	17	7	4	1	72.5
Total Disaster Risk Reduction			26	51.5	18	17	7	4	1	72.5
Grand Total			329	459.9	163	324.9	116	77	39	861.8

ST = Short Term, MT = Mid Term, LT = Long Term, Int. = Intervention

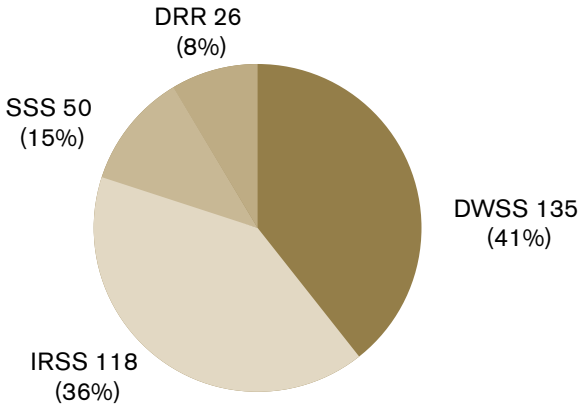


Table-18: Drinking Water Supply Schemes (DWSS)

S.No	Code	Union Council (UC) Name	Village Council (VC) Name	Village Name	Sub Type of Scheme	Cause/Reason	Benefitted Population	Estimated Cost of Scheme (PKR)	Village level Priority (Category Rank)
Sub-Category : Filteration Plant									
1	DWSS	Ranwal	Korho Khan	Korho Khan	Filteration plant	Un-hygienic perennial water	170	2500000	5
2	DWSS	City-1	City-1	City-1	Filteration plant	Contaminated Water	1800	1000000	4
3	DWSS	Jatatar	Garah Budha	Kot Mir Zaman	Filteration plant	Contaminated Water	155	1000000	4
4	DWSS	Jatatar	Garah Budha	Adam Abad	Filteration plant	Contaminated Water	153	1000000	5
5	DWSS	Jatatar	Garah Budha	Garah Budha	Filteration plant	Install a filtration plant at Rudh water to make it safe for drinking	450	1000000	4
6	DWSS	Jatatar	Tattor	Tattor	Filteration plant	Install filtration plant for kala pani to make safe for drinking	710	2000000	3
7	DWSS	Jatatar	Garah Hayat	Shah Zamani	Filteration plant	Contaminated Water	170	1000000	4
8	DWSS	Jatatar	Garah Hayat	Garah Hayat	Filteration plant	Un-hygienic perennial water	500	1000000	4
9	DWSS	Jatatar	Garah Mithu	Garah Mithu	Filteration plant	Install filtration plant for kala pani to make safe for drinking	530	1000000	5
10	DWSS	Garah Baloch	Kirri Ahmad Shah	Piron Kot	Filteration plant	Un-hygienic perennial water	350	2000000	2
11	DWSS	Garah Baloch	Kirri Ahmad Shah	Aba Khel	Filteration plant	Contaminated Water	300	1000000	5
12	DWSS	Garah Baloch	Garah Baloch	Garah Baloch	Filteration plant	Contaminated Water	450	1000000	3
13	DWSS	Shah Alam	Naurang	Naurang	Filteration plant	Contaminated Water	510	1000000	1
14	DWSS	Tatta	Kirri Lati	Aba Khel	Filteration plant	Un-hygienic perennial water	300	1000000	5
15	DWSS	Warhaspoon	Jandar	Jandar	Filteration plant	Un-hygienic perennial water	All villagers	1000000	2
16	DWSS	Warhaspoon	Dhana	Janaki	Filteration plant	Un-hygienic perennial water	170	500000	1
Sub-Category : Hand Pump									
17	DWSS	Jatatar	Garah Hayat	Shah Zamani	Hand pump	Install 10 Hand pumps at village level	170	1000000	2
18	DWSS	Jatatar	Garah Budha	Kot Mir zaman	Hand pump	Provide 10 hand pumps for drinking water	All villagers	500000	1
19	DWSS	Garah Baloch	Kirri Ahmad Shah	Piron Kot	Hand pump	Install Hand pumps at village level	350	1000000	1

20	DWSS	Garah Baloch	Kirri Ahmad Shah	Aba Khel	Hand pump	Installation of 30 hand pump	60	2000000	4
21	DWSS	Shah Alam	Shah Alam	Kirri Pak	Hand pump	Install 10 hand pumps	200	1000000	1
22	DWSS	Shah Alam	Shah Alam	Shah Alam	Hand pump	Installation of 30 hand pump for drinking water	200	3000000	2
23	DWSS	Shah Alam	Kot Katt	Badin Khel	Hand pump	Provide 9 submersible motors for drinking water	450	1000000	4
24	DWSS	Tatta	Kirri Lati	Baba Khel	Hand pump	Install 3 pressure pumps at village level	All villagers	200000	5
25	DWSS	Tatta	Kirri Lati	Kot Golan	Hand pump	Install 10 hand pumps for drinking water purpose	20	1000000	1
26	DWSS	Warhaspoon	Maghzai	Maghzai	Hand pump	Installation of 2 pressure pumps for the poor	30	500000	3
27	DWSS	Warhaspoon	Dhana	Kirri marwati	Hand pump	Install 5 pressure pumps at village level for drinking water purpose	200	500000	1
Sub-Category : Water Tank/ Over Head Tank									
28	DWSS	Ranwal	Ranwal	Ranwal	OHT	Construct OHT for storage of water	All villagers	8000000	3
29	DWSS	Ranwal	Bara Khel	Bara Khel	OHT	Construct OHT at village level	All villagers	8000000	4
30	DWSS	Ranwal	Bara Khel	Diyal	OHT	Construct OHT tank at Jamal Korai Line	All villagers	11000000	3
31	DWSS	Ranwal	Shahbaz	Garah Shahbaz	OHT	Construct the OHT at village level	All villagers	1000000	2
32	DWSS	Garah Baloch	Garah Baloch	Garah Baloch	OHT	Construct OHT tank at village level	All villagers	8000000	3
33	DWSS	Garah Baloch	Yaqoob Colony	Qazi abad	OHT	Construct OHT at village level	All villagers	2500000	1
34	DWSS	Garah Baloch	Yaqoob Colony	Razzaq Colony	OHT	Construct OHT tank at village level	All villagers	1000000	1
35	DWSS	Shah Alam	Naurang	Pirwana	OHT	Construct the OHT at village level	All villagers	2000000	4
36	DWSS	Shah Alam	Toran Nau	Audal	OHT	Construct OHT for villagers	All villagers	6000000	5
37	DWSS	Shah Alam	Kot Katt	Kot Katt	OHT	Construct the OHT at village level	All villagers	6000000	3
38	DWSS	Shah Alam	Kot Katt	Badin Khel	OHT	Construct the OHT at village level	All villagers	11000000	1

39	DWSS	Gul Imam	Gul Imam	Gul Imam	OHT	Construct OHT tank at village level.	All villagers	1000000	1
40	DWSS	Tatta	Kirri Umar khan	Kirri Umar khan	OHT	Construct the OHT at village level	All villagers	8000000	4
41	DWSS	Warhaspoon	Dhana	Ali Khel	OHT	Construct the OHT at village level	All villagers	8000000	4
Sub-Category : Pacca (Cemented or Concrete) Pond									
42	DWSS	Ranwal	Ranwal	Ranwal	Construction of pacca pond	Construct pacca pond for storage of water	All villagers	2000000	5
43	DWSS	Ranwal	Bara Khel	Bara Khel	Construction of pacca pond	Construct pacca Pond	All villagers	1500000	5
44	DWSS	Ranwal	Bara Khel	Diyal	Construction of pacca pond	Construct pacca Pond	All villagers	2000000	2
45	DWSS	Ranwal	Korho Khan	Korho Khan	Construction of pacca pond	Construct pacca Pond	All villagers	1500000	2
46	DWSS	Ranwal	Shahbaz	Garah Shahbaz	Construction of pacca pond	Construct pacca Pond	All villagers	2000000	3
47	DWSS	City-1	City-1	City-1	Construction of pacca pond	Construct pacca Pond	All villagers	2000000	3
48	DWSS	Jatatar	Garah Mithu	Garah Mithu	Construction of pacca pond	Construct pacca Pond	All villagers	1500000	5
49	DWSS	Jatatar	Garah Hayat	Garah Hayat	Construction of pacca pond	Construct pacca Pond	500	2000000	1
50	DWSS	Jatatar	Garah Hayat	Shah Zamani	Construction of pacca pond	Construct pacca Pond	170	3000000	3
51	DWSS	Jatatar	Garah Budha	Adam Abad	Construction of pacca pond	Provide pacca pond for drinking water	153	1000000	1
52	DWSS	Jatatar	Garah Budha	Kot Mir zaman	Construction of pacca pond	Provide pacca pond for drinking water	All villagers	500000	2
53	DWSS	Garah Baloch	Garah Baloch	Garah Baloch	Construction of pacca pond	Provide pacca pond for drinking water	All villagers	8000000	4
54	DWSS	Garah Baloch	Yaqoob Colony	Qazi abad	Construction of pacca pond	Provide pacca pond for drinking water	700	3000000	5
55	DWSS	Garah Baloch	Yaqoob Colony	Razzaq Colony	Construction of pacca pond	Provide pacca pond for drinking water	700	1500000	5

56	DWSS	Garah Baloch	Kirri Ahmad Shah	Niamat Khel	Construction of pacca pond	Provide pacca pond for drinking water	80	3000000	2
57	DWSS	Garah Baloch	Kirri Ahmad Shah	Pir Katch	Construction of pacca pond	Provide pacca pond for drinking water	All villagers	3000000	1
58	DWSS	Shah Alam	Naurang	Naurang	Construction of pacca pond	Construct pacca pond for drinking water	All villagers	1000000	5
59	DWSS	Shah Alam	Naurang	Pirwana	Construction of pacca pond	Construct pacca pond for drinking water	All villagers	2000000	2
60	DWSS	Shah Alam	Naurang	Gola Korai	Construction of pacca pond	Construct pacca pond for drinking water	150	1000000	1
61	DWSS	Shah Alam	Toran Nau	Toran Nau	Construction of pacca pond	Construct pacca pond for drinking water	400	2000000	4
62	DWSS	Shah Alam	Toran Nau	Khanu	Construction of pacca pond	Construct pacca pond for drinking water	All villagers	4000000	2
63	DWSS	Shah Alam	Toran Nau	Audal	Construction of pacca pond	Construct pacca pond for drinking water	200	1000000	4
64	DWSS	Shah Alam	Shah Alam	Kirri Pak	Construction of pacca pond	Construct pacca pond for drinking water	200	1500000	2
65	DWSS	Shah Alam	Kot Katt	Kot Katt	Construction of pacca pond	Construct pacca pond for drinking water	100	1000000	5
66	DWSS	Shah Alam	Kot Katt	Badin Khel	Construction of pacca pond	Construct pacca pond for drinking water	450	5000000	3
67	DWSS	Shah Alam	Toran Nau	Sheran	Construction of pacca pond	Construct pacca pond for drinking water	451	5000000	2
68	DWSS	Gul Imam	Andari	New garah	Construction of pacca pond	Construct pacca pond for drinking water	All villagers	1000000	4
69	DWSS	Tatta	Kirri Lati	Baba Khel	Construction of pacca pond	Construct pacca pond for drinking water	All villagers	1000000	3
70	DWSS	Tatta	Kirri Umar khan	Kirri Umar khan	Construction of pacca pond	Construct pacca pond for drinking water	425	500000	1
71	DWSS	Warhaspoon	Maghzai	Bahader Khel	Construction of pacca pond	Construct pacca pond for drinking water	150	1000000	1
72	DWSS	Warhaspoon	Maghzai	Raghzai	Construction of pacca pond	Construct pacca pond for drinking water	200	2000000	1
73	DWSS	Warhaspoon	Jandar	Jandar	Construction of pacca pond	Construct pacca pond for drinking water	2000	3500000	1

74	DWSS	Warhaspoon	Dhana	Janakai	Construction of pacca pond	Construct pacca pond for drinking water	All villagers	12000000	3
75	DWSS	Warhaspoon	Kirri Haider	Kirri Haider	Construction of pacca pond	Construct pacca pond for drinking water	1500	4000000	1
76	DWSS	Warhaspoon	Dhana	Warooki	Construction of pacca pond	Construct pacca pond for drinking water	All villagers	4000000	1
77	DWSS	Warhaspoon	Dhana	Kirri marwati	Construction of pacca pond	Construct pacca pond for drinking water	200	1000000	2
78	DWSS	Warhaspoon	Dhana	Ali Khel	Construction of pacca pond	Construct pacca pond for drinking water	700	500000	1
Sub-Category : Pipeline for water distribution									
79	DWSS	Ranwal	Ranwal	Ranwal	Pipe line Distribution system	As the villagers use kala pani for drinking water	All villagers	2000000	1
80	DWSS	Ranwal	Bara Khel	Bara Khel	Pillar for Pipe line	Provide support pillar for pipeline at Rudh because the flood water damages it	All villagers	3000000	2
81	DWSS	Ranwal	Bara Khel	Bara Khel	3 Km Pipeline	Provide pipeline for a solar run T/W to the village. At the village Bara khel solar run T/W is initiated	All villagers	2500000	3
82	DWSS	Ranwal	Bara Khel	Diyal	Pipe line	Provide pipe line from Chadrar Tubewell	All villagers	5000000	4
83	DWSS	City-1	City-1	City-1	Pipe line	Provide pipe line from kacha pond to sabir abad. OHT almost 2000 feet also provide pipe line for street	All villagers	1000000	1
84	DWSS	City-2	City-2	City-2	Pipe line	Provide 2 km pipe line from pond to SABIR ABAD as old pipe line is damaged and also pipe line for SHIEKH OHT to station road	All villagers	1500000	2
85	DWSS	Jatatar	Garah Hayat	Garah Hayat	Pipe line	Provide 4000 ft pipeline from Muhammad Ali to Village	500	500000	1
86	DWSS	Jatatar	Garah Hayat	Shah Zamani	Pipe line	Distribute water according to Kuliyat And Riwajat	170	2000000	1

87	DWSS	Garah Baloch	Garah Baloch	Garah Baloch	Pipe line	Provide pipeline for New basti	All villagers	5000000	5
88	DWSS	Garah Baloch	Yaqoob Colony	Qazi abad	Pipe line	Provide 3 Km pipeline from OHT to Razaq colony because the old one has burst	550	2000000	2
89	DWSS	Garah Baloch	Yaqoob Colony	Razzaq Colony	Pipe line	Provide 3 Km pipeline from OHT Tank which is Initiated at Tank city 1 because the old one has burst	700	1500000	2
90	DWSS	Shah Alam	Naurang	Naurang	Pipe line	Provide pipe line for distribution system	1000	1000000	2
91	DWSS	Shah Alam	Naurang	Pirwana	Pipe line	Provide 6 km pipeline at village level	All villagers	1100000	1
9	DWSS	Shah Alam	Toran Nau	Aazami	Pipe line	Provide new separate pipeline to village Azimi	All villagers	1200000	1
93	DWSS	Shah Alam	Toran Nau	Noor Chirrie	Pipe line	Provide new main pipeline.	All villagers	400000	1
94	DWSS	Shah Alam	Shah Alam	Rodi khel	Pipe line	Proved new pipeline at village level because old pipeline has burst	All villagers	500000	4
95	DWSS	Shah Alam	Kot Katt	Kot Katt	Pipe line	Provide pipeline from tube well to village	300	500000	1
96	DWSS	Shah Alam	Kot Katt	Badin Khel	Pipe line	Provide pipeline from tube well to village 1km	450	1000000	2
97	DWSS	Gul Imam	Gul Imam	Gul Imam	Pipe line	Provide pipeline from Amma khel to Gul imam	All villagers	1800000	2
98	DWSS	Gul Imam	Andari	New garah	Pipe line	Provide pipeline it will benefit 3 villages Gara ghazi, Gara Nawaz and Gara Mamdu.	All villagers	4100000	1
99	DWSS	Tatta	Kirri Lati	Baba Khel	Pipe line	New pipeline for water distribution system	All villagers	1000000	2
100	DWSS	Tatta	Kirri Umar khan	Kirri Umar khan	Pipe line	Provide pipeline for house to house distribution system	All villagers	1000000	5
101	DWSS	Tatta	Chesan Katch	Chesan Katch	Pipe line	Provide pipeline for house to house	All villagers	1000000	3
102	DWSS	Warhaspoon	Maghzai	Raghzai	Pipe line	Provide pipeline for drinking water	All villagers	400000	4
103	DWSS	Warhaspoon	Kirri Haider	Kirri Haider	Pipe line	Provide pipeline for tube well.	All villagers	1000000	3

104	DWSS	Warhaspoon	Dhana	Warooki	Pipe line	Provide pipeline at village level for tube well.	3 villages and 1 primary school	3000000	2
105	DWSS	Warhaspoon	Dhana	Ali Khel	Pipe line	Provide pipeline for house to house distribution system	325	1000000	5
106	DWSS	Warhaspoon	Dhana	Janaki	Pipe line	Provide pipeline for house to house distribution system	130	1000000	2
Sub-Category : Ponds for Livestock									
107	DWSS	Jatatar	Garah Hayat	Shah Zamani	Pond for Animals	Construct 2 ponds for livestock	All villagers	1500000	5
108	DWSS	Garah Baloch	Kirri Ahmad Shah	Piron Kot	Pond for Animals	Construct 3 pacca ponds for livestock as there is no drinking system for livestock	All villagers	1500000	4
109	DWSS	Shah Alam	Naurang	Pirwana	Pond for Animals	Construct 2 ponds for livestock drinking water	All villagers	2000000	5
110	DWSS	Shah Alam	Toran Nau	Sheran	Pond for Animals	Construct New Pond For Livestock	All villagers	300000	5
111	DWSS	Shah Alam	Toran Nau	Noor Chirrie	Pond for Animals	Construct livestock pond	All villagers	500000	3
112	DWSS	Shah Alam	Toran Nau	Khanu	Pond for Animals	Construct two new ponds for livestock drinking water	All villagers	2000000	4
Sub-Category : Solar system for Tube-well									
113	DWSS	Ranwal	Manji khel	Kot Allah dad	Solar system	Due to load shedding tube well does not operate	All villagers	1000000	1
114	DWSS	City-1	City-1	City-1	Solar system	Provide solar system for tube well	1400	1000000	2
115	DWSS	City-2	City-2	City-2	Solar system	Provide solar system	1350	1500000	3
116	DWSS	Garah Baloch	Garah Baloch	Garah Baloch	Solar system	Install solar system on tube well	All villagers	1200000	2
117	DWSS	Shah Alam	Naurang	Naurang	Solar system	Request to govt. to start tube well	200	1200000	4
118	DWSS	Shah Alam	Naurang	Gola korai	Solar system	Provide solar system at PATHAN KOT	150	1200000	4
119	DWSS	Shah Alam	Toran Nau	Khanu	Solar system	Install solar system	All villagers	3000000	1
120	DWSS	Shah Alam	Shah Alam	Rodi khel	Solar system	Install solar system	All villagers	1200000	1
121	DWSS	Shah Alam	Toran Nau	Aazami	Solar system	Install solar system	All villagers	1500000	2

122	DWSS	Shah Alam	Toran Nau	Toran Nau	Solar system	Install solar system	400	1500000	2
123	DWSS	Shah Alam	Pathan Kot	Pathan Kot	Solar system	Provide solar system for tube well	300	1400000	2
124	DWSS	Tatta	Manzai	Kanzai	Solar system	Due to high load shedding, install a solar system	100	1000000	4
125	DWSS	Tatta	Chesan Katch	Chesan Katch	Solar system	Install solar system for tube well	All villagers	1000000	5
126	DWSS	Warhaspoon	Dhana	Ali Khel	Solar system	Provide a solar system for tube well	240	1000000	2
Sub-Category : Tube-well Repairing									
127	DWSS	Garah Baloch	Yaqoob Colony	Razzaq Colony	Repair motor	Construct water tank to store water, Repair the water motor.	220	500000	3
128	DWSS	Shah Alam	Toran Nau	Aazami	Repairing of Motor	Repair the motor of tube well in Phatan Kot	All villagers	1500000	2
129	DWSS	Shah Alam	Toran Nau	Toran Nau	Repairing of tube well	Tubewell is damaged	240	1500000	2
130	DWSS	Tatta	Kirri Lati	Baba Khel	Repairing of submersible pump	Repairing of submersible pump	All villagers	100000	1
131	DWSS	Tatta	Chesan Katch	Chesan Katch	Repair motor	Make it functional	All villagers	1000000	1
132	DWSS	Warhaspoon	Jandar	Jandar	Tubewell	Provide tube well	250	3000000	3
133	DWSS	Jatatar	Tattor	Tattor	Install pressure pump	As perennial water is not safe for health so install pressure pump	200	500000	2
134	DWSS	City-1	City-1	City-1	Installation of motor pump	Provide motor pump for SABIR ABAD OHT	2000	200000	5
135	DWSS	Garah Baloch	Yaqoob Colony	Qazi abad	Installation of motor pump	Repair the motor	All villagers	1000000	5

Table-19: Irrigation Schemes (IRSS)

S. No	Code	Union Council (UC) Name	Village Council (VC) Name	Village Name	Sub Type of Scheme	For	Bene-fitted Popula-tion	Estimated Cost of Scheme (PKR)	Village level Priority (Category Rank)
Sub-Category : De-siltation of Rudhs									
136	IRSS	Ranwal	Ranwal	Ranwal	De-siltation of sub channel	Excavate sub channel as water is wasted due to siltation	NA	3000000	2
137	IRSS	Ranwal	Kirri Lati	Baba Khel	De-siltation of sub channel	Excavate 1 Km	NA	1000000	2
138	IRSS	Ranwal	Kirri Lati	Aba Khel	De-siltation of sub channel	Excavate 1 Km in Abakhel	NA	1000000	1
139	IRSS	Ranwal	Kirri Lati	Kirri Lati	De-siltation	Excavate the sub channel about 3 Km	NA	2500000	3
140	IRSS	Ranwal	Bara Khel	Bara Khel	Excavation	Excavate Pir kach in Bara khel	NA	3000000	2
141	IRSS	Ranwal	Bara Khel	Diyal	Excavation	Excavate the Rudh Lohra near Diyal	NA	3000000	2
142	IRSS	Ranwal	Manji khel	Kot Allah dad	De-siltation of Rudh	Excavate 1 km PIR KATCH Rudh so that water come freely	NA	3000000	4
143	IRSS	Ranwal	Korho Khan	Korho Khan	De-siltation of sub channel	Excavate sub channel from Niamat khel to village	NA	4000000	5
144	IRSS	Ranwal	Shahbaz	Garah Shahbaz	De-siltation of sub channel	Excavate sub channel which passes through Garah Shahbaz	NA	3000000	2
145	IRSS	City-1	City-1	City-1	De-siltation of Rudh	Excavate 1 km Rudh CHOHA from Civil 1 to TANK CITY	NA	3000000	2
146	IRSS	City-2	City-2	City-2	De-siltation of Rudh	Excavate 1 km Rudh CHOHA as it is filled due to siltation	NA	3000000	2
147	IRSS	Jatatar	Garah Mithu	Garah Mithu	De-siltation of Rudh	Excavation	NA	3000000	1
148	IRSS	Jatatar	Garah Hayat	Garah Hayat	De-siltation	Excavate the Rudh Lohra near Garah Hayat	NA	2000000	2
149	IRSS	Jatatar	Garah Hayat	Shah Zamani	De-siltation	Excavate the Rudh Lohra	NA	5000000	2
150	IRSS	Jatatar	Tattor	Tattor	De-siltation of sub channel	Excavate 1 km Rudh	NA	3 000000	3
151	IRSS	Jatatar	Garah Budha	Garah Budha	De-siltation of channel	Excavate 1 km main Rudh LOHRA	NA	3000000	1
152	IRSS	Jatatar	Garah Budha	Adam Abad	De-siltation of Rudh	Excavate 1 km Rudh LOHRA	NA	2000000	1

153	IRSS	Jatatar	Garah Budha	Kot Mir zaman	De-siltation	Due to siltation, channel is filled excavate PIR KATCH Rudh	NA	2000000	1
154	IRSS	Jatatar	Chadrarh	Chadrarh	De-siltation	Excavate PIR KATCH Rudh	NA	2000000	3
155	IRSS	Jatatar	Garah Pathar	Garah Pathar	Excavation	Excavate Rudh Kiryani	NA	4000000	4
156	IRSS	Garah Baloch	Kirri Ahmad Shah	Niamat Khel	De-siltation of sub channel	Excavate sub channel named as MEHTAB, BISMAL and GHULAM JAN gandi	NA	2500000	3
157	IRSS	Garah Baloch	Kirri Ahmad Shah	Piron Kot	De-siltation of sub channel	Excavate sub channel almost 3 Km	NA	4000000	3
158	IRSS	Garah Baloch	Kirri Ahmad Shah	Aba Khel	De-siltation of sub channel	De-siltation of ABA KHEL sub channel 1 km and at the start of TATTOR sub channel	NA	1000000	1
159	IRSS	Garah Baloch	Kirri Ahmad Shah	Pir Katch	De-siltation of sub channel	Excavate the Rudh Pir Kach	NA	2000000	1
160	IRSS	Garah Baloch	Garah Baloch	Garah Baloch	De-siltation	Excavate Rudh Pir kach from Gandi Dagiya wali up to end	NA	2500000	5
161	IRSS	Shah Alam	Naurang	Naurang	De-siltation	Excavate Rudh Sidqi 1 km	NA	2000000	1
162	IRSS	Shah Alam	Naurang	Pirwana	De-siltation	Excavate Rudh Sidqi 1 km	NA	4000000	4
163	IRSS	Shah Alam	Naurang	Gola Korai	De-siltation	Excavate Rudh Sidqi 1 km	NA	2000000	3
164	IRSS	Shah Alam	Toran Nau	Aazami	De-siltation	Excavate Rudh Sidqi 1 km	NA	6000000	2
165	IRSS	Shah Alam	Toran Nau	Noor Chirrie	De-siltation	Excavate Rudh Sidqi 1 km	NA	6000000	2
166	IRSS	Shah Alam	Toran Nau	Toran Nau	De-siltation	Excavate Rudh Sidqi 1 km	NA	10000000	4
167	IRSS	Shah Alam	Toran Nau	Sheran	De-siltation	Excavate Rudh Sidqi 1 km	NA	5000000	2
168	IRSS	Shah Alam	Toran Nau	Khanu	De-siltation	Excavate the sub channel from Toran to Khanu	NA	3000000	1
169	IRSS	Shah Alam	Toran Nau	Audal	De-siltation	De-siltation of Rudh Sidqi almost 2 km	NA	5000000	2
170	IRSS	Shah Alam	Shah Alam	Kirri Pak	De-siltation	De-siltation of Rudh Sidqi almost 2 km	All Villagers	2000000	2
171	IRSS	Shah Alam	Shah Alam	Shah Alam	Excavate sub channel	Excavate sub channel named as SHAH ALAM WAND	NA	4000000	2

172	IRSS	Shah Alam	Pathan Kot	Pathan Kot	De-siltation of sub channel	Excavate 2 km sub channel from PATHAN KOT to RODI KHEL and also SHAGAI WAND and also WARAN NALA	NA	3000000	1
173	IRSS	Shah Alam	Kot Katt	Kot Katt	De-siltation of Rudh TAKWARA	De-siltation of 2 km Rudh so the water will not be wasted	NA	4000000	1
174	IRSS	Gul Imam	Gul Imam	Gul Imam	Excavation	Excavation of Rudh Takwara at gandi Nisar and gandi Mitho	NA	1000000	1
175	IRSS	Gul Imam	Andari	New garah	De-siltation of Rudh TAKWARA	Excavate TAKWARA Rudh	NA	2000000	1
176	IRSS	Tatta	Manzai	Kanzai	De-siltation of sub channel	Excavate 1 km sub Rudh named as KHUSHAL WAND	NA	2000000	1
177	IRSS	Tatta	Kirri Umar khan	Kirri Umar khan	De-siltation of sub channel	Excavate almost 1 km sub channel near ALI KHEL village	NA	1000000	3
178	IRSS	Tatta	Chesan Katch	Chesan Katch	De-siltation of channel	De-siltation of Kiryani Rudh from Bazai to Chesan kach almost 2 km	NA	8000000	1
179	IRSS	Tatta	Chesan Katch	Bazai	Excavation of sub channel	Excavation of Sub Channel Nahara and Landai	NA	3000000	1
180	IRSS	Warhaspoon	Maghzai	Bahader Khel	De-siltation of sub channel	Excavate 1 km sub channel named as BAHADAR KHEL wand	NA	4000000	2
181	IRSS	Warhaspoon	Maghzai	Raghzai	De-siltation of sub channel	Excavate sub channels of GULLOT KHEL, HAJI M KHEL, NAHARA WAND, WAND MERABAT and AYAZ WAND	NA	4000000	2
182	IRSS	Warhaspoon	Jandar	Umar Kali	De-siltation of sub channel	De-siltation of 1 km sub channel in Umar kali	NA	1000000	2
183	IRSS	Warhaspoon	Jandar	Jandar	De-siltation of sub channel	2 km De-siltation of Shiekh wand Rudh and sub channel in Ameen	NA	3000000	5
184	IRSS	Warhaspoon	Jandar	Kirri Ashiqi	Excavation	Excavate Sub channel from Toti fields to Kaka khel almost 1 Km	NA	1000000	2

185	IRSS	Warhaspoon	Kirri Haider	Kirri Haider	De-siltation of channel	Excavate 2 km Rudh named as TAKWARA and SIDQI	NA	3000000	2
1186	IRSS	Warhaspoon	Dhana	Warooki	Excavation	Excavate Sub channel Shagai and Nahara	NA	3000000	1
187	IRSS	Warhaspoon	Dhana	Kirri marwati	De-siltation of sub channel	Excavate 2 km Rudh named as SHAH GAI WAND	NA	3 000000	3
188	IRSS	Warhaspoon	Dhana	Ali Khel	De-siltation of sub channel	Excavate almost 1 km sub channel near ALI KHEL village	NA	1000000	3
Sub-Category : Construction of Inlets									
189	IRSS	Ranwal	Ranwal	Ranwal	Construction of inlets	Construct inlet as per need	All Villagers	3000000	4
190	IRSS	Ranwal	Kirri Lati	Baba Khel	Construction of inlets	Construct 2 inlets	All Villagers	800000	1
191	IRSS	Ranwal	Bara Khel	Bara Khel	Construction of inlets	Construct 12 Inlets	All Villagers	6000000	3
192	IRSS	Ranwal	Bara Khel	Diyal	Construction of inlets	Construct 4 inlets	All Villagers	2000000	1
193	IRSS	Ranwal	Manji khel	Kot Allah dad	Construction of inlets	Construct inlet as per need	All Villagers	2000000	5
194	IRSS	Ranwal	Korho Khan	Korho Khan	Construction of inlets	Construct 12 Inlets	All Villagers	3000000	2
195	IRSS	Ranwal	Shahbaz	Garah Shahbaz	Construction of inlets	Construct inlets as per need	All Villagers	2000000	3
196	IRSS	Jatatar	Garah Mithu	Garah Mithu	Construction of inlets	Construct inlets at Gandi Gara Budha, Gandi Gara Hayat, Gandi Adam Abad	All Villagers	1000000	2
197	IRSS	Jatatar	Garah Hayat	Garah Hayat	Construction of inlets	Construct 15 inlets	All Villagers	4500000	1
198	IRSS	Jatatar	Garah Hayat	Shah Zamani	Construction of inlets	Construction 8 inlets	All Villagers	3000000	3
199	IRSS	Jatatar	Tattor	Tattor	Construction of inlets	Construct inlet as per need	All Villagers	3000000	5
200	IRSS	Jatatar	Garah Budha	Kot Mir zaman	Construction of inlets	Construct 8 to 10 inlets on PIR KATCH Rudh	All Villagers	2000000	2
201	IRSS	Garah Baloch	Kirri Ahmad Shah	Niamat Khel	Construction of inlets	Construct inlet at MEHTAB GANDI and GHULAM JAN GANDI	All Villagers	2000000	4
202	IRSS	Garah Baloch	Kirri Ahmad Shah	Aba Khel	Construction of inlets	Construction of inlet at SARDAR gandi	All Villagers	500000	3
203	IRSS	Garah Baloch	Kirri Ahmad Shah	Pir Katch	Construction of inlets	Construct the inlets as per need	All Villagers	1500000	3
204	IRSS	Garah Baloch	Garah Baloch	Garah Baloch	Construction of inlets	Construct inlets as per need	All Villagers	2000000	5

205	IRSS	Shah Alam	Naurang	Pirwana	Construction of inlets	Construct 5 inlets	All Villagers	1500000	6
206	IRSS	Shah Alam	Naurang	Gola Korai	Construction of inlets	Construction of inlet at GOLA KORAI Gandi	All Villagers	1000000	2
207	IRSS	Shah Alam	Toran Nau	Aazami	Construction of inlets	Construct inlets at moza sarfaraz and moza azami	All Villagers	1000000	5
208	IRSS	Shah Alam	Toran Nau	Sheran	Construction of inlets	Construct 12 inlets	All Villagers	2000000	4
209	IRSS	Shah Alam	Toran Nau	Khanu	Construction of inlets	Construct the inlets at Audal Gandapur place	All Villagers	400000	2
210	IRSS	Shah Alam	Toran Nau	Khanu	Construction of inlets	Construct the inlets at Toran nau	All Villagers	2000000	4
211	IRSS	Shah Alam	Toran Nau	Audal	Construction of inlets	Construct inlet as per need	All Villagers	2000000	1
212	IRSS	Shah Alam	Shah Alam	Rodi khel	Construction of inlets	Construct Inlets as per needs.	All Villagers	1000000	3
213	IRSS	Shah Alam	Shah Alam	Shah Alam	Construction of inlets	Construction of inlet as per need	All Villagers	2000000	3
214	IRSS	Shah Alam	Pathan Kot	Pathan Kot	Construction of inlets	Construct 10 inlets	All Villagers	2000000	4
215	IRSS	Shah Alam	Kot Katt	Badin Khel	Construction of inlets	Construct inlet as per need in fields	All Villagers	3000000	5
216	IRSS	Gul Imam	Gul Imam	Gul Imam	Construction of inlets	Construct inlets in Takwara as per need	All Villagers	3000000	3
217	IRSS	Gul Imam	Andari	New garah	Construction of inlets	Construct 10 inlets on TAKWARA Rudh	All Villagers	3000000	2
218	IRSS	Tatta	Kirri Umar khan	Kirri Umar khan	Construction of inlets	Construct 10 inlets	All Villagers	3000000	4
219	IRSS	Tatta	Chesan Katch	Chesan Katch	Construction of inlets	Provision of 5 inlets	All Villagers	1500000	5
220	IRSS	Tatta	Chesan Katch	Bazai	Construction of inlets	Construct 12 inlets at field level as per need	All Villagers	4000000	4
221	IRSS	Warhaspoon	Maghzai	Raghzai	Construction of inlets	Construction of inlet as per need	All Villagers	200000	3
222	IRSS	Warhaspoon	Jandar	Kirri Ashiqi	Construction of inlets	Construct inlets	All Villagers	500000	1
223	IRSS	Warhaspoon	Dhana	Warooki	Construction of inlets	Construct inlets on Gandi Teepar, Mamoti gandi, Shawal gandi, Asmatullah gandi	All Villagers	2000000	2
224	IRSS	Warhaspoon	Dhana	Ali Khel	Construction of inlets	Construct 10 inlets	All Villagers	3000000	4
225	IRSS	Shah Alam	Toran Nau	Toran Nau	Construction of inlets	Construct inlet near Haji Fazal Rahim	All Villagers	2000000	3
Sub-Category : Construction of Spillway									
226	IRSS	Ranwal	Ranwal	Ranwal	Construct spillway	Construct a spillway	220	3000000	5

227	IRSS	Ranwal	Kirri Lati	Kot Golan	Construct spillway	Construct spillway at AYYUB and HAYATULLAH Gandi	216	5000000	1
228	IRSS	Ranwal	Bara Khel	Bara Khel	Construct spillway	Construct spillway at gati bailla, 6 villages will benefit	175	3000000	1
229	IRSS	Ranwal	Bara Khel	Diyal	Construct spillway	Construct spillway at gandi Sorat khan	160	5000000	3
230	IRSS	Ranwal	Bara Khel	Diyal	Construct spillway	Construct spillway at gandi Laaj Mir	180	5000000	4
231	IRSS	Ranwal	Shahbaz	Garah Shahbaz	Construct spillway	Construct spillway at gandi Bahara	415	1000000	1
232	IRSS	Jatatar	Tattor	Tattor	Construct spillway	Construct a spillway at GANDI MAHABAT KHAN	340	5000000	1
233	IRSS	Jatatar	Chadrarh	Chadrarh	Construct spillway	Construct spillway at gandi Habib Ullah	210	12000000	2
234	IRSS	Jatatar	Chadrarh	Chadrarh	Construct spillway	Construct spillway near Toran.	140	10000000	4
235	IRSS	Jatatar	Garah Pathar	Garah Pathar	Construct spillway	Construct spillway at gandi Muhammad Nawaz (Kiryani Rudh)	145	20000000	1
236	IRSS	Garah Baloch	Kirri Ahmad Shah	Niamat Khel	Construct spillway	Construct a spillway at BOSTAN gandi as water is wasted	230	2000000	2
237	IRSS	Shah Alam	Naurang	Naurang	Construct spillway	Construct spillway at BARA GANDI near RODI KHEL	250	1000000	2
238	IRSS	Shah Alam	Naurang	Gola Korai	Construct spillway	BAHARA SPILLAWAY (NAMED AS RODIHEL KADH)	150	10000000	1
239	IRSS	Shah Alam	Toran Nau	Aazami	Construct spillway	Construct Spillway at Bahara gandi.	NA	5000000	1
240	IRSS	Shah Alam	Toran Nau	Noor Chirrie	Construct spillway	Initiate spillway at Rudhikhel in Sidqi	175	5000000	1
241	IRSS	Shah Alam	Toran Nau	Toran Nau	Construct spillway	Due to high water head, Gandi can be broken	180	1000000	1
242	IRSS	Shah Alam	Toran Nau	Sheran	Construct spillway	A lot of water is wasted at BARA GANDI construct spillway	190	10000000	1
243	IRSS	Shah Alam	Shah Alam	Rodi khel	Construct spillway	Construct Spillway At RodiKhel in Rudh Seidgi	340	5000000	1
244	IRSS	Shah Alam	Shah Alam	Shah Alam	Construct spillway	Construct spillway near RASHEED KHAN GANDI	540	3000000	1

245	IRSS	Shah Alam	Pathan Kot	Pathan Kot	Construct spillway	In 1973 a spillway was constructed which was destroyed by flood in 2010 so construct a spillway	180	10000000	3
246	IRSS	Shah Alam	Kot Katt	Kot Katt	Construct spillway	Construct spillway at BARA GANDIN trench named as RODI KHEL KHAD	300	5000000	1
247	IRSS	Shah Alam	Kot Katt	Badin Khel	Construct spillway	Due to high water head, Gandi is endangered so construct spillway	320	2000000	2
248	IRSS	Tatta	Manzai	Kanzai	Construct spillway	Construction of spillway at KHUSHAL WAND near SAID KHAN GANDI	250	5000000	3
249	IRSS	Tatta	Kirri Umar khan	Kirri Umar khan	Construct spillway	Construct a spillway near ZARIF KHAN korona	325	3000000	2
250	IRSS	Tatta	Chesan Katch	Bazai	Construct spillway	Construct Spillway at Kot Golan	150	1000000	3
251	IRSS	Warhaspoon	Jandar	Jandar	Construct spillway	Construct spillway at Kot saidan	180	5000000	2
252	IRSS	Warhaspoon	Kirri Haider	Kirri Haider	Construct spillway	Construct spillway at SORORHO KORONA	160	3000000	4
253	IRSS	Warhaspoon	Dhana	Ali Khel	Construct spillway	Construct a spillway near ZARIF KHAN korona	155	3000000	2

Table-20: Sanitation & Sewerage Schemes (SSS)

S. No	Code	Union Council (UC) Name	Village Council (VC) Name	Village Name	Sub Type of Scheme	Detail	Benefitted Population	Estimated Cost of Scheme (PKR)	Village level Priority (Category Rank)
Sub-Category : Sanitation									
254	SSS	Ranwal	Manji khel	Kot Allah dad	Sanitation system	Construct sewer line so that waste water does not accumulate in streets	All villagers	3000000	2
255	SSS	City-1	City-1	City-1	Sanitation system	Improve sewerage system by construction of sewer lines where sewer line are not present	1520	2000000	5
256	SSS	City-2	City-2	City-2	Sanitation system	As waste water is standing in street so construct pacca sewer lines to improve the life standard	1740	1000000	5
257	SSS	Jatatar	Tattor	Tattor	Sanitation system	Waste household water comes into street and creates problems for villagers so construct sewer lines	350	5000000	1
258	SSS	Jatatar	Garah Budha	Garah Budha	Sanitation system and construction of pacca street	Construct pacca sewer line in whole village as in rainy season villagers face a lot of problems and also construct pacca street	170	4000000	2
259	SSS	Jatatar	Garah Budha	Adam Abad	Sanitation system	As waste water is standing in street so construct pacca sewer lines to improve the life standard	153	1000000	4
260	SSS	Jatatar	Garah Pathar	Garah Pathar	Construction of streets and sewerage system	Construct streets and also ensure the sewerage system	350	3000000	3
261	SSS	Jatatar	Garah Pathar	Garah Pathar	To make sanitation system and pacca street	Rain water is standing in street so villagers have to face problems	All villagers	2000000	4
262	SSS	Jatatar	Garah Budha	Kot Mir zaman	Sanitation System	Construct pacca street and sewer line	All villagers	3000000	3
263	SSS	Garah Baloch	Kirri Ahmad Shah	Niamat Khel	Sanitation system and construction of pacca pond	As there are problems of standing water in streets so construct pacca sewer lines and also pacca street in whole village	80	3000000	3
264	SSS	Garah Baloch	Kirri Ahmad Shah	Aba Khel	Sanitation system	Construct pacca street and sewers for whole village	300	2000000	1

265	SSS	Shah Alam	Naurang	Gola Korai	Sanitation system and pacca street	Construct pacca street and ensure proper sanitation system in all village	150	3000000	2
266	SSS	Shah Alam	Toran Nau	Audal	Sanitation system	Construct pacca sewer line in all village to facilitate the people	200	3000000	1
267	SSS	Shah Alam	Shah Alam	Rodi khel	Sanitation	Construct Sewer line	All villagers	1000000	2
268	SSS	Shah Alam	Shah Alam	Shah Alam	Sanitation system	As waste water is standing in streets so construct pacca sewers lines in all village	400	4000000	1
269	SSS	Shah Alam	Pathan Kot	Pathan Kot	Sanitation system	Waste water is standing in street so construct pacca sewer lines	450	3000000	1
270	SSS	Shah Alam	Kot Katt	Kot Katt	Sanitation system	As waste water is standing in street so construct sewer line and pacca street to facilitate the community	300	3000000	2
271	SSS	Shah Alam	Kot Katt	Badin Khel	Sanitation system	Construct sewer lines in all streets	450	2000000	5
272	SSS	Andari	Andari	New garah	Sanitation system	People have sanitation problems so construct pacca street and sewer lines	All villagers	2000000	5
273	SSS	Tatta	Kirri Lati	Baba Khel	Pacca street and sanitation system	Construct pacca street and provide sanitation system,	All villagers	3000000	5
274	SSS	Tatta	Kirri Lati	Aba Khel	Sanitation system	Construct pacca street and sewer for whole village	300	2000000	1
275	SSS	Tatta	Kirri Lati	Kot Golan	Sanitation system	As waste water is standing in street so construct sewer line to facilitate the community	216	3000000	5
276	SSS	Tatta	Manzai	Kanzai	Sanitation system	Construct pacca sewer line in whole village as in rainy season villagers faces a lot of problems	100	2500000	3
277	SSS	Tatta	Manzai	Kanzai	Provide sanitation system	Drainage system	120	3000000	4
278	SSS	Tatta	Chesan Katch	Chesan Katch	Sanitation system	Construct sewerage system	All villagers	2000000	5
279	SSS	Warhaspoon	Maghzai	Bahader Khel	Sanitation system	As waste water is accumulated in street so construct sewer lines and also pacca street for whole village	200	3000000	3
280	SSS	Warhaspoon	Maghzai	Maghzai	Sanitation system and pacca street	Construct pacca sewer lines for villages also construct pacca street	300	4000000	2

281	SSS	Warhaspoon	Kirri Haider	Kirri Haider	Sanitation system	As waste water is standing in street so construct pacca sewer lines in all village	500	3000000	4
282	SSS	Warhaspoon	Dhana	Kirri marwati	Sanitation system	As waste water is accumulated in street so construct pacca sewer lines	200	3000000	4
283	SSS	Warhaspoon	Dhana	Janaki	Sanitation system	As waste water is accumulated in street so construct pacca sewer lines	170	3000000	4
		Sub-Category : Sewerage system							
284	SSS	Ranwal	Shahbaz	Garah Shahbaz	Sewerage System	Ensure sewerage system at village level	420	2000000	4
285	SSS	Jatatar	Garah Mithu	Garah Mithu	Sewerage system	Construct sewerage system because during rains, water stands in streets and villagers face problems	450	1000000	4
286	SSS	Jatatar	Garah Budha	Garah Budha	Sewerage system	Construct pacca sewerage line in whole village as in rainy season villagers face problems and also construct pacca street	450	4000000	2
287	SSS	Jatatar	Garah Pathar	Garah Pathar	Sewerage system	Ensure sewerage system at village level and construct the streets	144	3000000	1
288	SSS	Jatatar	Garah Pathar	Garah Pathar	Construction of streets and sewerage system	Construct streets and also ensure the sewerage system	350	3000000	3
289	SSS	Jatatar	Garah Pathar	Garah Pathar	Hygiene	Deliver Hygiene Session, trainings and also distribute hygiene kits because people are not aware about hygiene.	420	4000000	4
290	SSS	Garah Baloch	Yaqoob Colony	Razzaq Colony	Sewerage System and Streets	Construct pacca streets and also ensure sanitation system	700	4000000	5
291	SSS	Garah Baloch	Kirri Ahmad Shah	Niamat Khel	Sewerage System and Streets	As there are problems of standing water in streets so construct pacca sewerage lines and also pacca streets in whole village	80	3000000	3
292	SSS	Garah Baloch	Garah Baloch	Garah Baloch	Sewerage system	Ensure sewerage system because during rains people face problems	250	2000000	5

293	SSS	Shah Alam	Naurang	Gola Korai	Sewerage system	Construct pacca streets and ensure proper sanitation system in all villages	150	3000000	2
294	SSS	Shah Alam	Kot Katt	Kot Katt	Sewerage system	Construct the sewerage system along the road	210	500000	4
295	SSS	Tatta	Kirri Lati	Baba Khel	Sewerage system	Construct pacca streets and provide sanitation system,	All villagers	3000000	5
296	SSS	Tatta	Manzai	Kanzai	Sewerage system	Construct pacca streets and provide sanitation system	240	3000000	4
297	SSS	Tatta	Manzai	Kanzai	Construct Street & sewerage System	Pave all streets & also ensure the sewerage system	330	1000000	2
298	SSS	Tatta	Chesan Katch	Bazai	Construct Street & sewerage System	Pave remaining streets and ensure sewerage system at village level	320	2000000	1
299	SSS	Tatta	Chesan Katch	Bazai	Construct Street & sewerage System	As the streets are kacha, villagers face problems so construct pacca street	280	4000000	5
300	SSS	Tatta	Jandar	Umar Kali	Construct Street & sewerage System	Construct pacca street and sewerage for whole village	280	2000000	1
301	SSS	Tatta	Jandar	Kirri Ashiqi	Construct Street & sewerage System	Construct pacca streets and ensure sewerage system	180	6000000	2
302	SSS	Tatta	Jandar	Kirri Ashiqi	Construct Street & sewerage System	Ensure sewerage system because during the rains villagers face problem	340	2000000	4
303	SSS	Warhaspoon	Maghzai	Maghzai	Construct Street & sewerage System	Construct pacca sewerages lines for villages also construct pacca street	300	4000000	2
S.No	Code	Union Council (UC) Name	Village Council (VC) Name	Village Name	Sub Type of Scheme	Detail	Benefitted Population	Estimated Cost of Scheme (PKR)	Village level Priority (Category Rank)

Table-21: Disaster Risk Reduction (DRR)

Sub-Category : DRR									
304	DRR	Ranwal	Kirri Lati	Aba Khel	Flood protection wall	Construction of flood protection wall near Aziz khan Gandi	480	500000	2
305	DRR	Ranwal	Kirri Lati	Kot Golan	Protection wall	Construct flood protection wall on KHUSHAL WAND sub channel	100	2000000	2
306	DRR	Ranwal	Kirri Lati	Kirri Lati	Flood protection wall	Construct flood protection wall at Kriyani and Nahara Side	500	2000000	1
307	DRR	Ranwal	Bara Khel	Bara Khel	Protection wall	Construct protection wall around the village	All Villagers	4000000	5
308	DRR	Ranwal	Korho Khan	Korho Khan	Protection wall	Construct Protection wall or repair old one near the head Zam	All Villagers	3000000	1
309	DRR	Ranwal	Shahbaz	Garah Shahbaz	Protection wall	Construct protection wall around the village	All Villagers	4000000	4
310	DRR	City-2	City-2	City-2	Flood protection wall	Flood water add with Rudh PIR KACH damaged a lot of property	1000	2000000	1
311	DRR	Jatatar	Garah Mithu	Garah Mithu	Protection wall	Construct Protection at Mohallah Zahid Gull	All Villagers	2000000	3
312	DRR	Jatatar	Tattor	Tattor	Flood protection wall	Construct flood protection wall at TATTOR	100	2000000	2
313	DRR	Garah Baloch	Garah Baloch	Garah Baloch	Protection wall	Construct protection wall from Wana road bridge to Dagiya	350	2000000	2
314	DRR	Shah Alam	Toran Nau	Aazami	Protection wall	Construct protection wall around village	All Villagers	2000000	3
315	DRR	Shah Alam	Toran Nau	Sheran	Flood protection wall	Floods damage homes & fields so construct flood protection wall	All villagers	2000000	3
316	DRR	Shah Alam	Shah Alam	Kirri Pak	Protection wall	Construct Protection wall at the side of Rudh takwara and and sayedgai	200	2000000	1
317	DRR	Shah Alam	Pathan Kot	Pathan Kot	Flood protection wall	Construct a flood protection wall	120	3000000	2
318	DRR	Shah Alam	Kot Katt	Kot Katt	Flood protection wall	Construct flood protection wall for the villagers	100	4000000	2
319	DRR	Tatta	Manzai	Kanzai	Flood protection wall	Construct a flood protection wall 1300 feet for whole village to provide safety against floods	100	6000000	2
320	DRR	Tatta	Kirri Umar khan	Kirri Umar khan	Flood protection wall	Construct flood protection wall from GUL MOHAMMAD field to MALAK RAFIQ	100	1000000	1

321	DRR	Tatta	Chesan Katch	Bazai	Protection wall	Construct protection wall around the village	125	8000000	2
322	DRR	Warhaspoon	Maghzai	Bahader Khel	Flood protection wall	Construct flood protection wall near IBRAHIM LAND	100	5000000	1
323	DRR	Warhaspoon	Maghzai	Maghzai	Flood protection wall	Provide flood protection wall near Sher korona maghzai korona and Baz korona	300	2000000	1
324	DRR	Warhaspoon	Jandar	Umar Kali	Flood protection wall	Construction of flood protection wall	280	2000000	4
325	DRR	Warhaspoon	Jandar	Jandar	Flood protection wall	Provide flood protection wall near Umar kali and Kot said khan	260	1000000	4
326	DRR	Warhaspoon	Kirri Haider	Kirri Haider	Flood protection wall	Construct flood protection wall b/w AMANZAI and SHORA	175	3000000	1
327	DRR	Warhaspoon	Dhana	Warooki	Protection wall	Construct protection wall around the village	All Villagers	4000000	4
328	DRR	Warhaspoon	Dhana	Kirri marwati	Flood protection wall	Construct flood protection wall at REHMAT ABAD	100	3000000	1
329	DRR	Warhaspoon	Dhana	Ali Khel	Flood protection wall	Construct flood protection wall from GUL MOHAMMAD field to MALAK RAFIQ	100	1000000	1

8.14 WASH and Solid Waste Management Plan

Extensive and intensive WASH sessions should be organised at community level both for male and female segments simultaneously at village per day besides a WASH session at girls' schools on alternative days. Schools and colleges should be targeted actively as the impact of WASH through students, the younger generation, will have far-reaching impact upon communities as they are not only supposed and expected to adopt hygienic behaviour themselves but will persuade their parents to follow hygienic lifestyle. The impact ratio of WASH through students is higher and more effective than sessions with adults.

At 2 sessions each for both male and female at village should be planned besides all government and private schools functioning in the target villages. 8 sessions per village including education institutes will make 520 sessions. Per week 8 sessions will be appropriate and sufficient. 5-day working will take 240 days in 12-months to complete the process in 2 years.

WASH Sessions should include

1. Personal Hygiene
2. Environmental Hygiene
3. Water Purification Methodologies

Proper Solid Waste Management (SWM) plan will be devised for identifying various kinds of waste/garbage.

1. Recyclable material
2. Burning garbage
3. Compost to be used as manure/fertilizer
4. Vector Control Program to prevent malaria and dengue

8.15 Livestock Drinking Water Schemes

In order to avoid shared water ponds by animals and humans, during PRA communities requested for 6 ponds specifically spared for livestock. The size of the ponds ideally should be 20´x 2o´x 5´. The estimated budget for construction of ponds is PKR 7,800,000 or PKR 7.8 million.

8.16 Environment and Ecology plan

Embankments/Protection Wall/Sheher Panah

As far as Disaster Risk Reduction (DRR) measures are concerned, few embankments have been constructed at few villages locally known as Sheher Panah (City's Protection). The embankment or protection wall is meant to divert gushing flood water from city towards plain areas (see fig-33).

Interestingly, 94% of respondents expressed their ignorance about their responses to disasters while 2% suggested dam and 5% suggested Sheher Panah (embankment/protection wall) as a befitting response to impending disasters.

Tree Plantation/Afforestation

Tank WUMP suggests plantation of Date Palm, Olive and Ber (Zizyphus) trees on large scale especially at field borders and Rudhs' banks in order to prevent soil erosion, soil retention, shade provision, nutrition provision, oxygen production and it will also provide habitat for birds and other wildlife. The trees will also help flourish Apiculture (bee-keeping) that will lead to honey production which has medicinal and nutritional value as well as good exchange and market value.

The suggested tree species have high survival rate and long life span up to thousand years. The trees are not only suitable but ideal for district Tank and will have far-reaching ecological, environmental, nutritional and economic benefits for the native communities. Tree plantation or afforestation is the most ideal, sustainable, ecological and environment-friendly method of preserving soil and wildlife.

Construction of Weirs

Construction of Weirs, reduce or break the speed of flash-floods rendering water to be more manageable while mitigating risk of destruction as a result of flashfloods.

Water Purification
Moreover, water purification through sunlight is the most sustainable method and the easiest for every community member as in Tank photo period is more than 11-months per year. Communities just need to be sensitised on the practice and/or provided with glass bottles with enhanced storage capacity.

8.17 Required Resources and Skills

Advertisement of Positions
The respective NGO or IP/CP will advertise required positions of professional required to run projects. CVs will be scrutinised for selection of appropriate staff for required positions after proper tests and interviews.

Training of Hired Staff
Professional training will be imparted to hired staff for their orientation on the project background and work plan.

Administrator/Procurement
A specific administrator or procurement officer should be deputed to carryout administrative activities for smooth and streamlined project implementation.

Procurement
Procurement of required material and services such as rental vehicles will be carried-out on time for smooth and streamlined project implementation.

Action Plan
Project staff should get actively involved with GLAs for smooth and streamlined project activities.

Need Assessment Surveys (NAS)
Project staff will carry out Need Assessment Surveys (NAS) to identify specific needs for designing proper implementation plan.

WUG/WUA Capacity-Building
Capacity-building of WUG/WUAs should be carried-out for better understanding of emerging issues, their causes and assigning solutions. WUGs and WUAs will be oriented on procedures of solutions to their problems and monitoring of the solutions' implementation.

Interviews with Experts and GLAs
Noman Latif, DG AZRC (PARC), DI Khan

Noman Latif Sadozai while shedding light on host of issues concerning Rudh Kohi and the way forward.

Tree Plantation: Noman Latif strongly supported the idea of tree plantations of Date Palm, Olive and Ber trees on fields' bunds especially on Rudhs' banks for soil and water conservation. In addition, the trees will also help in improving the eco-cycle by providing, shade and habitat to birds and wildlife besides producing oxygen, absorbing carbon-dioxide and providing nutrition to communities and exchangeable commodities for economic returns. He termed tree plantations as the most befitting and sustainable response towards disaster risk reduction and environment enhancement.

Cultures: Noman Latif especially advocated plantation of Ber (Zizyphus) as it can not only serve as disaster risk reducer but can also be helpful in honey production and apiculture (bee-keeping). He equally supported introduction of Moriculture (mulberry cultivation), Floriculture (flower cultivation), Sunflower cultivation for edible oil production, Sericulture (silk worm rearing) for silk production. Similarly he advocated cultivation of fruit orchards, vegetables and peanut cultivation as the crop is water-efficient.

Peanuts: Peanut is ideal and suitable for soil profile of Tank and can be grown among trees in orchards and can fetch good income for communities.

Bio-Gas Plants: In the wake of abundant dung-cakes and manure, Noman Latif also suggested introduction of Bio-gas Plants as an alternative energy source for native communities. He shared his experience of successful bio-gas plant production.

HEIS: Noman Latif seconded idea of HEIS schemes of drip irrigation and Green Tunnel Farming on condition of introducing it only to willing farmers after complete capacity-building with regular monitoring for successful functioning of the systems.

Major Rtd. Aminullah Khan Gandapur
Major Rtd. Aminullah Khan Gandapur is a landlord from Hathala, Kulachi and has interest in Rudh Kohi system and written articles and books on the Rudh Kohi system and history of the area.

He introduced me to a distinction between Rudh Kohi and Spate Irrigation systems which are generally considered as synonymous. He in an explicit manner narrated different dynamics of both the systems.

Meer Akbar, Kissan Councilor
Fazle Akbar, hailing from Garah Budha, is an elected Kisan Councilor in Local Government and is a keen activist regarding agricultural problems of the area. He provided us with a quantum of land mass per Rudh inherited to him by his elders and issued by British Administration.

Humayun Khan, Auditor Finance Department, KP, Gomal University, DI Khan
Humayun Khan is a landlord from Takwara area and shared land revenue documents and Bolton report stipulating wider water rights for lower riparian which were strictly followed during British rule, and partially implemented till late 90s after abolition of magistracy power of the executive and disregarded completely afterwards. Now they are at the mercy of nature with no solution and hope whatsoever in front of mighty and influential politicians and landlords.

Aslam Awan, Bureau Chief, Dunya News Channel, DI Khan
Aslam Awan is the Bureau Chief of Dunya News channel, a senior journalist, columnist and intellectual. He informed that Rudh Kohi System was introduced by British Colonialists somewhere in Africa. The same Engineer, Mr. Noel was deputed in DI Khan before settlement in 1860s. Mr. Noel also introduced Perasu from Africa, the most common shrub commonly used as fuel wood in the region. He shared that British Administration streamlined Rudh Kohi system after extraordinary and extensive leg work, consultations and assessments over decades. He said that the then British Deputy Commissioner constructed headworks at Tank Zam for equitable distribution of water in all Rudhs. The DCs supervised distribution of water at Tank Zam themselves on horseback. No influential during British rule could usurp water rights of anybody, however after British rule and especially abolition of magistracy power after separation of executive and judiciary, the situation worsened with no solution in sight.

To support his argument he claimed that Kulachi had been generating highest revenue from agriculture sector till the British era and it can be confirmed through revenue records. However, after the British era, the influential took control of the system and thus the revenue plummeted.

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